WATER POLLUTION ABATEMENT PLAN

FOR

VERAMENDI PRECINCTS 23-1

APRIL 9, 2025

Prepared For:
Veramendi PE – Gold Coast, LLC
2168 Oak Run Parkway, Suite 101
New Braunfels, TX, 78132

Prepared By:

LJA ENGINEERING, INC.
TBPE Firm Registration No. F-1386
9830 Colonnade Blvd Ste 300
San Antonio, Texas 78256
Phone (210) 503-2700

LJA FILE NO. SA3856-0405-460

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 Precinct 23 Unit 1						**2. Regulated Entity No.:**			
3. Customer Name: Veramendi PE - Gold Coast, 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):**			39.29 ac
9. Application Fee:	$4,000		**10. Permanent BMP(s):**			Detention Pond & Vegetative Filter Strips			
11. SCS (Linear Ft.):			**12. AST/UST (No. Tanks):**						
13. County:	Comal		**14. Watershed:**			Comal River-Guadalupe River			

Application Distribution

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

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

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

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	__	__	__
Region (1 req.)	__	__	__
County(ies)	__	__	__
Groundwater Conservation District(s)	__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.)	__	X	__	__	__
Region (1 req.)	__	X	__	__	__
County(ies)	__	X	__	__	__
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 X 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. Nicholas Gower, PE.
Print Name of Customer/Authorized Agent Nicholas Gower 7/8/2025 Signature of Customer/Authorized Agent Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Nicholas Gower, PE

Date: 7/8/2025

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Veramendi Precinct 23 Unit 1
2. County: Comal
3. Stream Basin: Blieders Creek
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:

   [X] Recharge Zone
   [ ] Transition Zone

6. Plan Type:

   [X] WPAP
   [ ] SCS
   [ ] Modification
   [ ] AST
   [ ] UST
   [ ] Exception Request

7. Customer (Applicant):

   Contact Person: Garrett Mechler
   Entity: Veramendi PE - Gold Coast, LLC
   Mailing Address: 2168 Oak Run Parkway, Suite 101
   City, State: New Braunfels, TX Zip: 78132
   Telephone: (830)643-5633 FAX: _____
   Email Address: garrett.mechler@asaproperties.us.com

8. Agent/Representative (If any):

   Contact Person: Nicholas Gower, PE.
   Entity: LJA Engineering, LLC
   Mailing Address: 9830 Colonnade Blvd, Suite 300
   City, State: San Antonio, TX Zip: 78230
   Telephone: (210)503-2700 FAX: _____
   Email Address: ngower@lja.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.

    2400 LF north of the intersection between Loop 337 and River Rd

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: _____

14. [X] **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:

- [X] Area of the site
- [X] Offsite areas
- [X] Impervious cover
- [X] Permanent BMP(s)
- [X] Proposed site use
- [X] Site history
- [X] Previous development
- N/A [ ] 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)
- [X] Undeveloped (Undisturbed/Uncleared)
- [ ] Other: _____

Prohibited Activities

16. [X] 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. [X] 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:

- [X] 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. [X] 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)
- [X] San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. [X] 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. [X] 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.

VERAMENDI
PRECINCT 23 UNIT-1

CITY OF NEW BRAUNFELS ETJ

LOCATION EXHIBIT

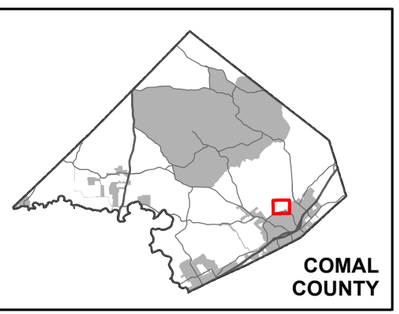
MARCH 2025

LEGEND

PROJECT BOUNDARY

N
W E
S

0 400 800 1,600
FEET



AERIAL PHOTOGRAPH: 2025 NEARMAP

THIS PRODUCT IS FOR INFORMATIONAL PURPOSES AND MAY NOT HAVE BEEN PREPARED FOR OR BE SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES. IT DOES NOT REPRESENT AN ON-THE-GROUND SURVEY AND REPRESENTS ONLY THE APPROXIMATE RELATIVE LOCATION OF PROPERTY BOUNDARIES.

LJA
9830 Colonnade Boulevard, Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.com

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VERAMENDI
PRECINCT 23 UNIT-1

CITY OF NEW BRAUNFELS ETJ

DRAINAGE PATH EXHIBIT

APRIL 2025

LEGEND

- DRAINAGE PATH
- PRECINCT 23 - 1
- EDWARDS AQUIFER RECHARGE ZONE
- EDWARDS AQUIFER TRANSITION ZONE

N
W E
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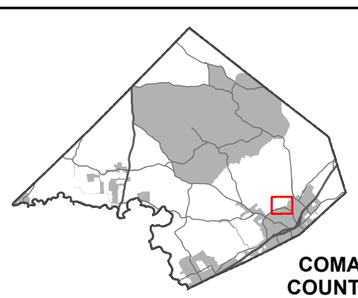
0 500 1,000 2,000 FEET



BASEMAP: NEW BRAUNFELS WEST - USGS

THIS PRODUCT IS FOR INFORMATIONAL PURPOSES AND MAY NOT HAVE BEEN PREPARED FOR OR BE SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES. IT DOES NOT REPRESENT AN ON-THE-GROUND SURVEY AND REPRESENTS ONLY THE APPROXIMATE RELATIVE LOCATION OF PROPERTY BOUNDARIES.

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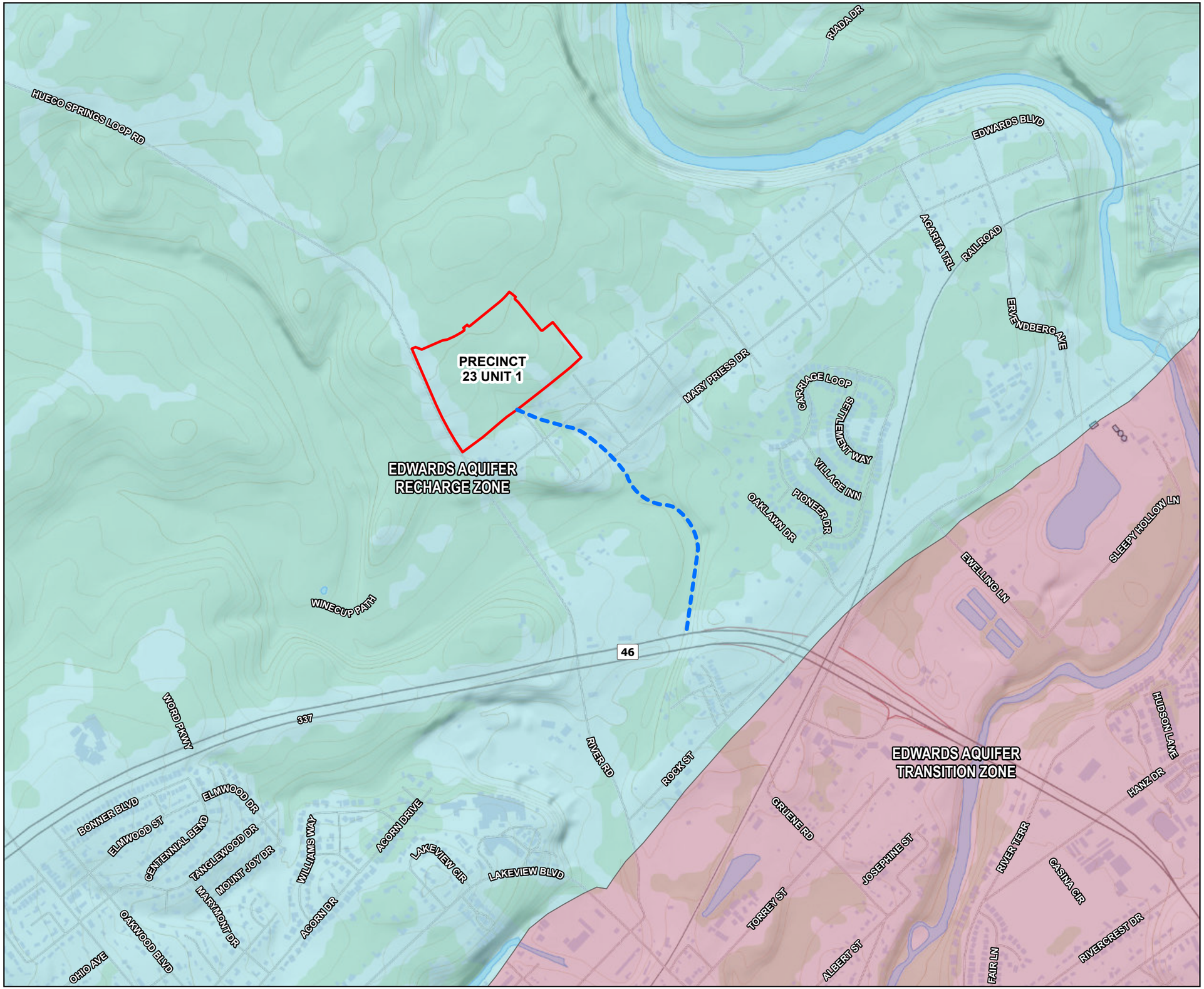
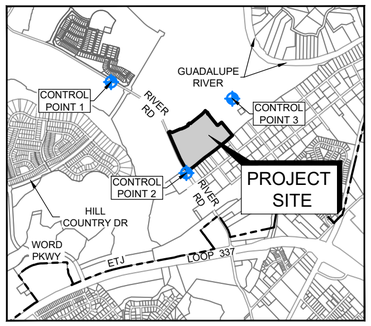
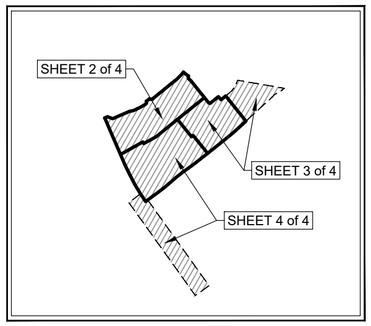




LOCATION MAP

N.T.S.



SHEET INDEX

N.T.S.

SUBDIVISION PLAT OF VERAMENDI PRECINCT 23 UNIT 1

BEING 29.23 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

CERTIFICATE OF APPROVAL

APPROVED THIS THE _____ DAY OF _____, 20 _____, BY THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT OF THE CITY OF NEW BRAUNFELS, TEXAS.

APPROVED FOR ACCEPTANCE

_____ __ _____
PLANNING DIRECTOR

_____ __ _____
CITY ENGINEER

SURVEYOR NOTES:

1. MONUMENTS WERE FOUND OR SET AT EACH CORNER OF THE SURVEY BOUNDARY OF THE SUBDIVISION AS NOTED. MONUMENTS AN LOT MARKERS WILL BE SET WITH ½" IRON ROD WITH CAP MARKED "LJA" OR MAG NAIL WITH DISK MARKED "LJA" AFTER THE COMPLETION OF UTILITY INSTALLATION AND STREET CONSTRUCTION UNLESS NOTED OTHERWISE.
2. COORDINATES SHOWN ARE BASED ON THE NORHT AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00 FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE DISPLAYED IN GRID VALUES DERIVED FROM THE NGS COOPERATIVE CORS NETWORK.
3. DIMENSIONS SHOWN ARE SURFACE (SCALE FACTOR = 1.00014)
4. BEARINGS ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00, FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE.

STATE OF TEXAS
COUNTY OF BEXAR

I, THE UNDERSIGNED GORDON ANDERSON , A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXS, HEREBY CERTIFY THAT THIS PLAT IS TRUE AND CORRECTLY MADE UNDER MY SUPERVISION AND IN COMPLIANCE WITH CITY AND STATE SURVEY REGULATIONS AND LAWS AND MADE ON THE GROUND AND THAT THE CORNER MONUMENTS WER PROPERLY PLACED UNDER MY SUPERVISION

_____

GORDON ANDERSON

REGISTERED PROFESSIONAL LAND SURVEYOR #6617

LJA ENGINEERING, INC.

9830 COLONNADE BOULEVARD, SUITE 300

SAN ANTONIO, TEXAS 78230

NBU NOTES:

1. MAINTENANCE OF DEDICATED UTILITY EASEMENTS IS THE RESPONSIBILITY OF THE PROPERTY OWNER. ANY USE OF AN EASEMENT, OR ANY PORTION OF IT, INCLUDING LANDSCAPING OF DRAINAGE FEATURES, IS SUBJECT TO AND SHALL NOT CONFLICT WITH THE TERMS AND CONDITIONS IN THE EASEMENT, MUST NOT ENDANGER OR INTERFERE WITH THE RIGHTS GRANTED BY THE EASEMENT TO NEW BRAUNFELS UTILITIES, ITS SUCCESSORS AND ASSIGNS, AND SHALL BE SUBJECT TO APPLICABLE PERMIT REQUIREMENTS OF THE CITY OF NEW BRAUNFELS OR ANY OTHER GOVERNING BODY. THE PROPERTY OWNER MUST OBTAIN, IN ADVANCE, WRITTEN AGREEMENT WITH THE UTILITIES TO UTILIZE THE EASEMENT, OR ANY PART OF IT.
2. UTILITIES WILL POSSESS A 5' WIDE SERVICE EASEMENT TO THE BUILDING STRUCTURE ALONG THE SERVICE LINE TO THE SERVICE ENTRANCE. THIS EASEMENT WILL VARY DEPENDING UPON LOCATION OF DWELLING AND SERVICE.
3. UTILITIES SHALL HAVE ACCESS TO THE METER LOCATIONS FROM THE FRONT YARD AND METER LOCATIONS SHALL NOT BE LOCATED WITHIN A FENCED AREA.
4. EACH LOT MUST HAVE ITS OWN WATER AND SEWER SERVICE AT THE OWNER/DEVELOPER'S EXPENSE.
5. DO NOT COMBINE ANY NEW UTILITY EASEMENTS (UE) WITH DRAINAGE EASEMENTS (DE) OR MAKE CHANGES IN GRADE WITHIN THE UTILITY EASEMENTS (UE) WITHOUT WRITTEN APPROVAL FROM NEW BRAUNFELS UTILITIES.
6. NBU IS NOT RESPONSIBLE FOR LANDSCAPING OR IRRIGATION IN UE/LE.

FLOOD ZONE NOTES:

NO PORTION OF THE SUBDIVISION IS LOCATED WITHIN ANY SPECIAL FLOOD HAZARD AREA (100 YR. FLOOD), AS DEFINED BY THE COMAL COUNTY, TEXAS, FLOOD INSURANCE RATE MAP NO. 48091C0435F EFFECTIVE DATE 5/8/2024 AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

UTILITY PROVIDER NOTES:

THE PROPERTY WILL BE SERVED BY THE FOLLOWING:
- NEW BRAUNFELS UTILITIES (WATER, SEWER, ELECTRIC)
- AT&T (TELECOMMUNICATIONS)
- SPECTRUM (TELECOMMUNICATIONS)

NBU NOTES:

1. MAINTENANCE OF DEDICATED UTILITY EASEMENTS IS THE RESPONSIBILITY OF THE PROPERTY OWNER. ANY USE OF AN EASEMENT, OR ANY PORTION OF IT, INCLUDING LANDSCAPING OF DRAINAGE FEATURES, IS SUBJECT TO AND SHALL NOT CONFLICT.

DRAINAGE EASEMENT NOTES:

1. DRAINAGE EASEMENTS SHALL "REMAIN FREE OF ALL OBSTRUCTIONS.
2. MAINTENANCE OF DRAINAGE EASEMENT SHOWN OUTSIDE OF LOT LINES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER'S, OR THE PROPERTY OWNER'S ASSOCIATION, OR ITS SUCCESSORS OR ASSIGNS AND NOT THE RESPONSIBILITY OF THE CITY OF NEW BRAUNFELS OR COMAL COUNTY.
3. NO STRUCTURES, WALLS OR OTHER OBSTRUCTIONS OF ANY KIND SHALL BE PLACED WITHIN THE LIMITS OF DRAINAGE EASEMENTS SHOWN ON THIS PLAT. NO LANDSCAPING, FENCES, OR OTHER TYPE OF MODIFICATIONS WHICH ALTER THE CROSS SECTIONS OF THE DRAINAGE EASEMENTS OR DECREASES THE HYDRAULIC CAPACITY OF THE EASEMENT, AS APPROVED, SHALL BE ALLOWED WITHOUT THE APPROVAL OF THE CITY ENGINEER. THE CITY OF NEW BRAUNFELS AND COMAL COUNTY SHALL HAVE THE RIGHT OF INGRESS AND EGRESS OVER GRANTORS ADJACENT PROPERTY TO REMOVE ANY OBSTRUCTIONS PLACED WITHIN THE LIMITS OF SAID DRAINAGE EASEMENTS AND TO MAKE ANY MODIFICATIONS OR IMPROVEMENTS WITHIN SAID DRAINAGE EASEMENTS.

SIDEWALK NOTES:

1. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE HOME BUILDER PER CITY STANDARDS AT THE TIME OF BUILDING CONSTRUCTION ALONG:
   A. SWEETWOOD DR.
   B. CAPULIN TRL.
   C. DEWBERRY LN.
   D. CIERRO DR.
   E. MAYHAW DR.
2. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG:
   A. SWEETWOOD DR. - LOT 900, BLK 230; LOT 900, BLK 233; LOT 900, BLK 235
   B. CAPULIN TRL. - LOT 900, BLK 232; PROPERTY BOUNDARY FRONTAGE
   C. DEWBERRY LN. - LOT 900, BLK 234; LOT 900, BLK 235; PROPERTY BOUNDARY FRONTAGE
   D. CIERRO DR. - LOT 900, BLK 230; LOT 900, BLK 231; LOT 900, BLK 232
   E. MAYHAW DR. - LOT 900, BLK 230; LOT 900 BLK 235
3. SIX (6) FOOT WIDE SIDE WALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION CONSTRUCTION WITHIN:
   A. GOLD COAST DR. - LOT 900, BLK 230; LOT 900, BLK 235; PROPERTY BOUNDARY FRONTAGE

PLAT NOTES:

1. THIS PLAT IS SUBJECT TO THE REQUIREMENTS AND REGULATIONS OF THE VERAMENDI DEVELOPMENT COMPANY DEVELOPMENT AGREEMENT, RECORDED AS DOCUMENT NO. 201506029547 AND AS AMENDED.
2. THIS PLAT IS LOCATED WITHIN THE NEIGHBORHOOD (MIXED DENSITY) RESIDENTIAL PLANNING AREA.
3. STANDARDS FOR PLANT MATERIALS SHALL CONFORM TO THE STANDARDS OF THE LATEST EDITION OF THE *AMERICAN NATIONAL STANDARD A300 PLANTING AND TRANSPLANTING NURSERY STOCK* PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. TREE REPLACEMENT SHALL OCCUR WITHIN 12 MONTHS OF REMOVAL OF THE HIGH VALUE TREE UNLESS DEFERRED TO AN ADJACENT UNIT. WHERE A REPLACEMENT TREE DOES NOT SURVIVE FOR A PERIOD OF AT LEAST 24 MONTHS, THE ORIGINAL APPLICANT OR CURRENT LANDOWNER SHALL REPLACE THE TREE, PREFERABLY DURING OCTOBER - FEBRUARY, UNTIL THE TREE SURVIVES A 12-MONTH PERIOD.
5. SHOULD ANY TREE DESIGNATED FOR RETENTION IN AN APPROVED TREE PROTECTION PLAN DIE PRIOR TO, OR WITHIN 12 MONTHS OF THE COMPLETION OF CONSTRUCTION WORKS, THE APPLICANT SHALL REPLACE THE DEAD TREE WITH A REPLACEMENT TREE/S EQUAL TO THE TOTAL CALIPER INCHES OF THE DEAD TREE. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK TO BE PERFORMED BY HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST.
6. DURING CONSTRUCTION, THE CLEANING OF EQUIPMENT OR MATERIALS AND/OR THE DISPOSAL OF ANY WASTE MATERIAL, INCLUDING, BUT NOT LIMITED TO PAINT, OIL, SOLVENTS, ASPHALT, CONCRETE, MORTAR, ETC., UNDER THE CANOPY OR DRIP LINE OF ANY HIGH VALUE TREE SHALL BE PROHIBITED. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED OR USED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK SHALL BE PERFORMED BY HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST. NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHALL BE ATTACHED TO ANY HIGH VALUE TREE.
7. LOTS TO BE HELD IN COMMON PROPERTY BY A HOMEOWNERS' OR PROPERTY OWNERS' ASSOCIATION SHALL BE SHOWN ON THE PLAT AS A SEPARATE LOT.
8. NO BUILDING SHALL BE SITED WITHIN THE EXTENT OF A SENSITIVE FEATURE AND ASSOCIATED BUFFER. FOR ANY LOT WHICH CONTAINS A HIGH VALUE TREE, AND A BUILDING ENVELOPE WAS NOT APPROVED AS PART OF A FINAL PLAT, THE LOCATION OF A BUILDING ENVELOPE SHALL BE APPROVED BY THE PLANNING DIRECTOR PRIOR TO A BUILDING PERMIT BEING ISSUED.
9. FUTURE DEVELOPMENT IS SUBJECT TO CHAPTER 114 (STREETS, SIDEWALKS AND OTHER PUBLIC SPACES) OF THE NEW BRAUNFELS CODE OF ORDINANCES.
10. IMPERVIOUS COVER - THE MAXIMUM CUMULATIVE IMPERVIOUS COVER PERCENTAGE FOR THE PROPERTY AS A WHOLE AND FOR EACH SECTOR PLAN SHALL NOT EXCEED SIXTY-FIVE PERCENT (65%).
11. AMENDMENTS TO THE PARK PROGRAMMING SCHEDULE, INCLUDING BUT NOT LIMITED TO THE PROVISION OF ADDITIONAL IMPROVEMENTS OR SUBSTITUTING IMPROVEMENTS, SHALL BE ADMINISTRATIVELY APPROVED BY THE PARKS DIRECTOR.
12. THIS PLAT WILL COMPLY WITH LOCATION AND AMENITY STANDARDS FOR TRAILS AS SHOWN IN THE SECTOR PLAN.
13. (103) RESIDENTIAL LOTS, (4) COMMON SPACE LOTS.
14. THE ELEVATION OF THE LOWEST FLOOR OF A STRUCTURE SHALL BE AT LEAST (10) INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND, WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE; PROPERTIES ADJACENT TO STORMWATER CONVEYANCE STRUCTURES MUST HAVE A FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR JOIST A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE.

COMMON SPACE NOTES:

- LOT 900, BLOCK 230 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 232 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 234 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 204 IS A LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.

ALL AFOREMENTIONED LOTS TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION OR PROPERTY OWNER AND NOT THE CITY OF NEW BRAUNFELS.

STATE OF TEXAS
COUNTY OF COMAL

I (WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HERIN AS THE VERAMENDI PRECINCT 23 UNIT 1 SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

_____

OWNER/DEVELOPER: GARRETT MECHLER, Co-CEO DATE
VERAMENDI PE - GOLD COAST, LLC.
2168 OAK RUN PARKWAY, SUITE 101
NEW BRAUNFELS, TEXAS 78132

STATE OF TEXAS
COUNTY OF COMAL

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____DAY OF _____, 20 _____, BY _____.

_____
NOTARY PUBLIC
THE STATE OF TEXAS

MY COMMISSION EXPIRES:_____

STATE OF TEXAS
COUNTY OF COMAL

I (WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HERIN AS THE VERAMENDI PRECINCT 23 UNIT 1 SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

_____

OWNER/DEVELOPER: COMAL COUNTY WCID 1B DATE
14755 PRESTON ROAD, SUITE 600
DALLAS, TEXAS 75254

STATE OF TEXAS
COUNTY OF COMAL

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____DAY OF _____, 20 _____, BY _____.

_____
NOTARY PUBLIC
THE STATE OF TEXAS

MY COMMISSION EXPIRES:_____

STATE OF TEXAS
COUNTY OF COMAL

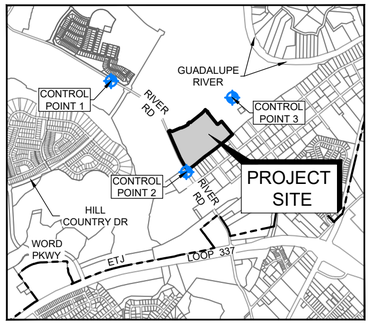
I, _____ , DO HEREBY CERTIFY THAT FOREGOING INSTRUMENT WAS FILED FOR RECORD IN THE MAP AND PLAT RECORDS, DOC# _____ OF COMAL COUNTY ON THE _____ DAY OF _____, 20 _____ AT _____ M.

WITNESS MY HAND AND OFFICIAL SEAL, THIS _____ DAY OF _____, 20 _____.

_____
COUNTY CLERK, COMAL COUNTY, TEXAS

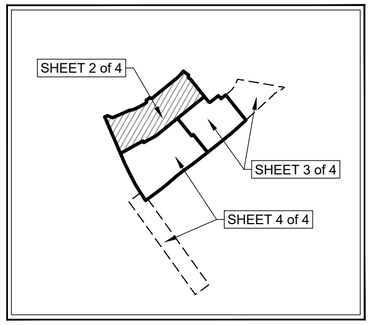
_____
DEPUTY

K:\SA3856 ASA Properties\2405 23-1\426 Site Development Plans\DWG-Sheets\sh_Plat.dwg
User: ngower Plot Date/Time: Jul 08, 25 - 20:35:19



LOCATION MAP

N.T.S.



SHEET INDEX

N.T.S.

SUBDIVISION PLAT OF VERAMENDI PRECINCT 23 UNIT 1

BEING 33.95 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

100 50 0 100 200

SCALE IN FEET
SCALE 1" = 100'

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

LEGEND

●	FOUND 1/2" IRON ROD WITH YELLOW CAP STAMPED "PAPE DAWSON" (UNLESS NOTED)
○	SET 5/8" IRON ROD WITH YELLOW CAP STAMPED "LJA"
1190	EXISTING CONTOURS
(1190)	PROPOSED CONTOURS
AC	ACRES
DOC NO.	DOCUMENT NUMBER
OPR	OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS
MPR	MAP AND PLAT RECORDS OF COMAL COUNTY, TEXAS
R.O.W.	RIGHT-OF-WAY
VOL.	VOLUME
PG.	PAGE(S)
V.N.A.E.	VEHICULAR NON-ACCESS EASEMENT (NTS)
ESM'T	EASEMENT
ETJ	EXTRATERRITORIAL JURISDICTION
NCB	NEW CITY BLOCK
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B	15' UTILITY ESM'T
C	10' UTILITY ESM'T
D	27' R.O.W. DEDICTION
E	OFF-LOT 50' x 52' WATER, WASTEWATER & DRAINAGE ESM'T (TO EXPIRE UPON INCORPORATION INTO PLATTED STREET R.O.W.)
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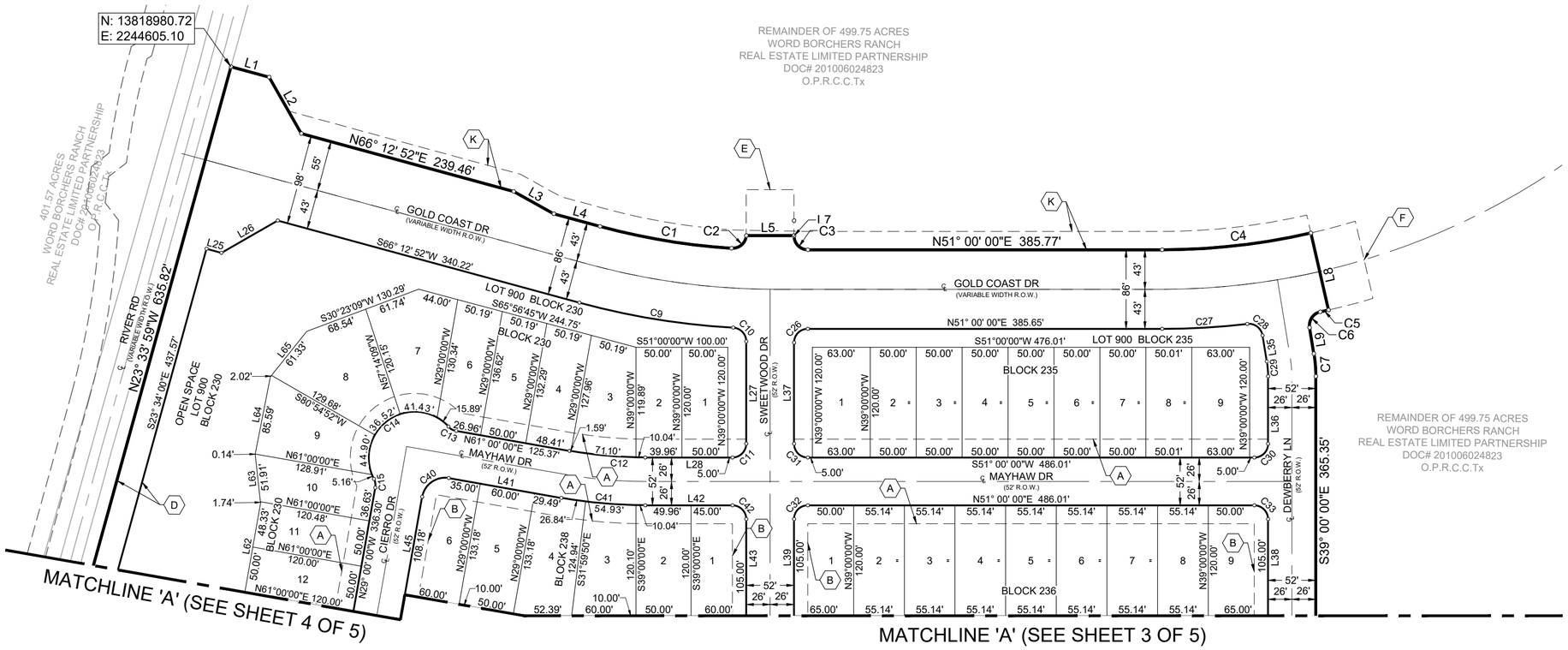
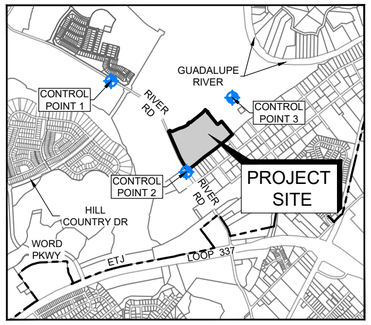


PLAT NOTES APPLY TO EVERY PAGE OF THIS MULTIPLE PAGE PLAT

SEE SHEET 5 OF 5 FOR LINE & CURVE TABLES

K:\SA3856_ASA_Properties\2405_23-1,426_Site Development Plans\DWG-Sheets\sh_Plat.dwg
User: ngower Plot Date/Time: Jul. 08, 25 - 20:36:06



LOCATION MAP

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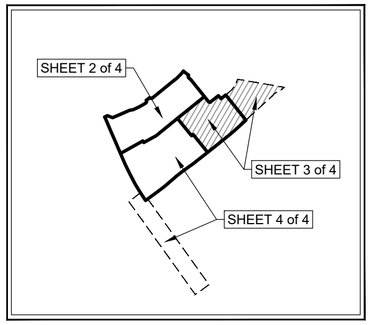

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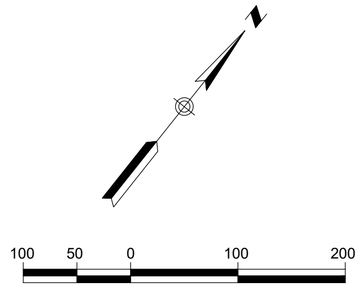

SCALE IN FEET
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LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

LEGEND

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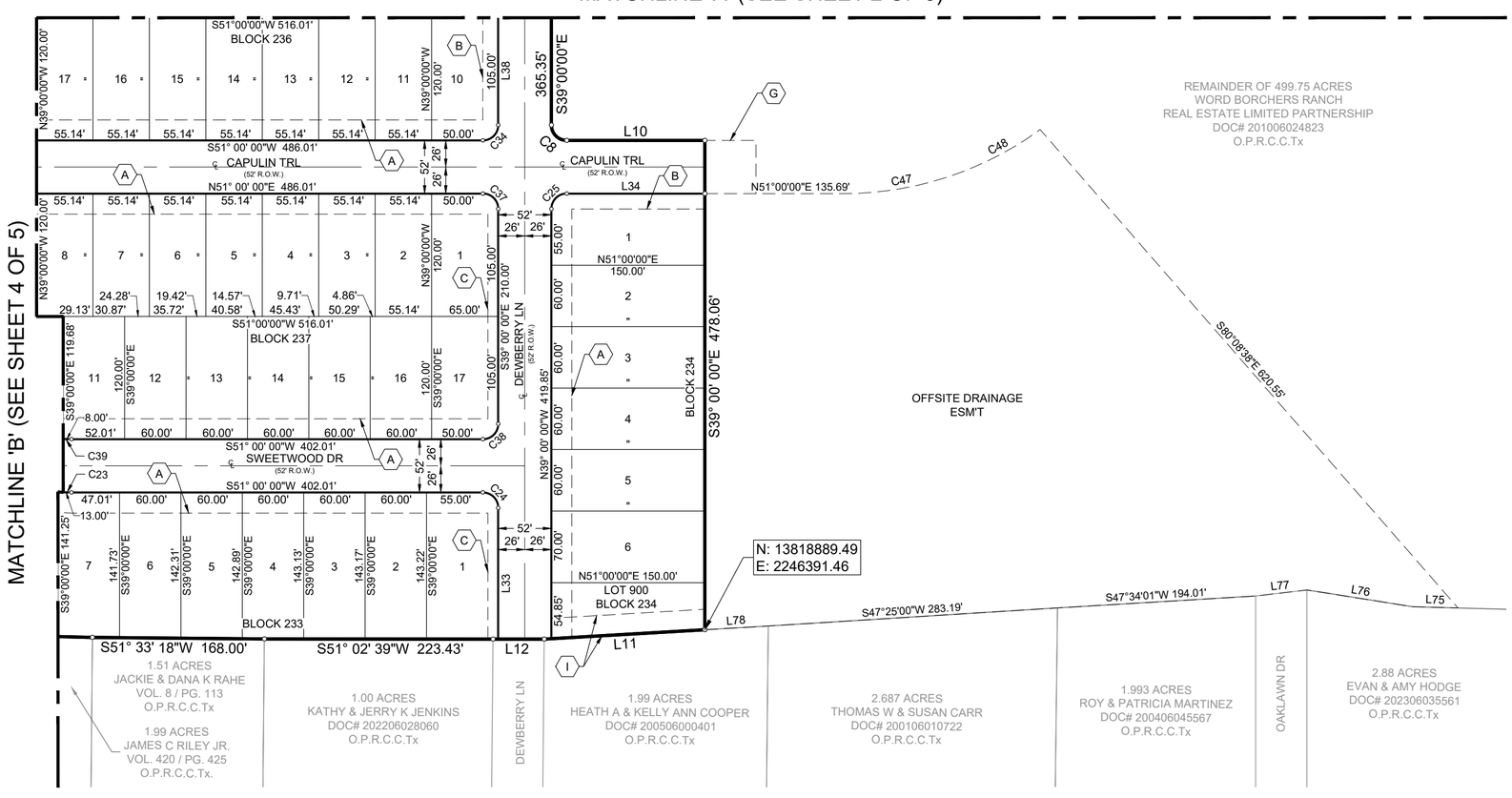
MATCHLINE 'A' (SEE SHEET 2 OF 5)

MATCHLINE 'B' (SEE SHEET 4 OF 5)



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K:\SA_Misc ASA Properties\2405 23-1\426 Site Development Plans\DWG-Sheets\sh_Plat.dwg
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SUBDIVISION PLAT
OF
VERAMENDI PRECINCT 23 UNIT 1

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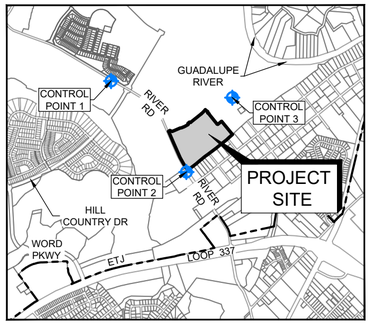
DATE OF PREPARATION: 7/8/2025



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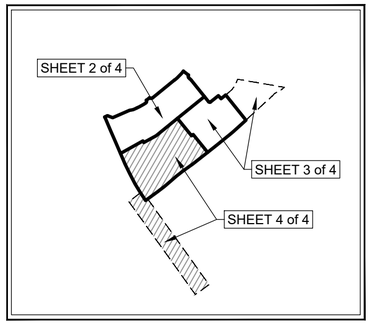

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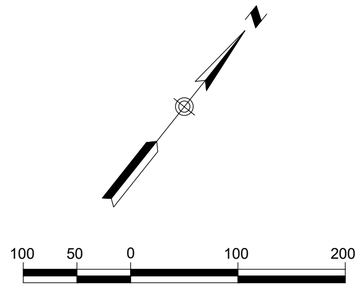

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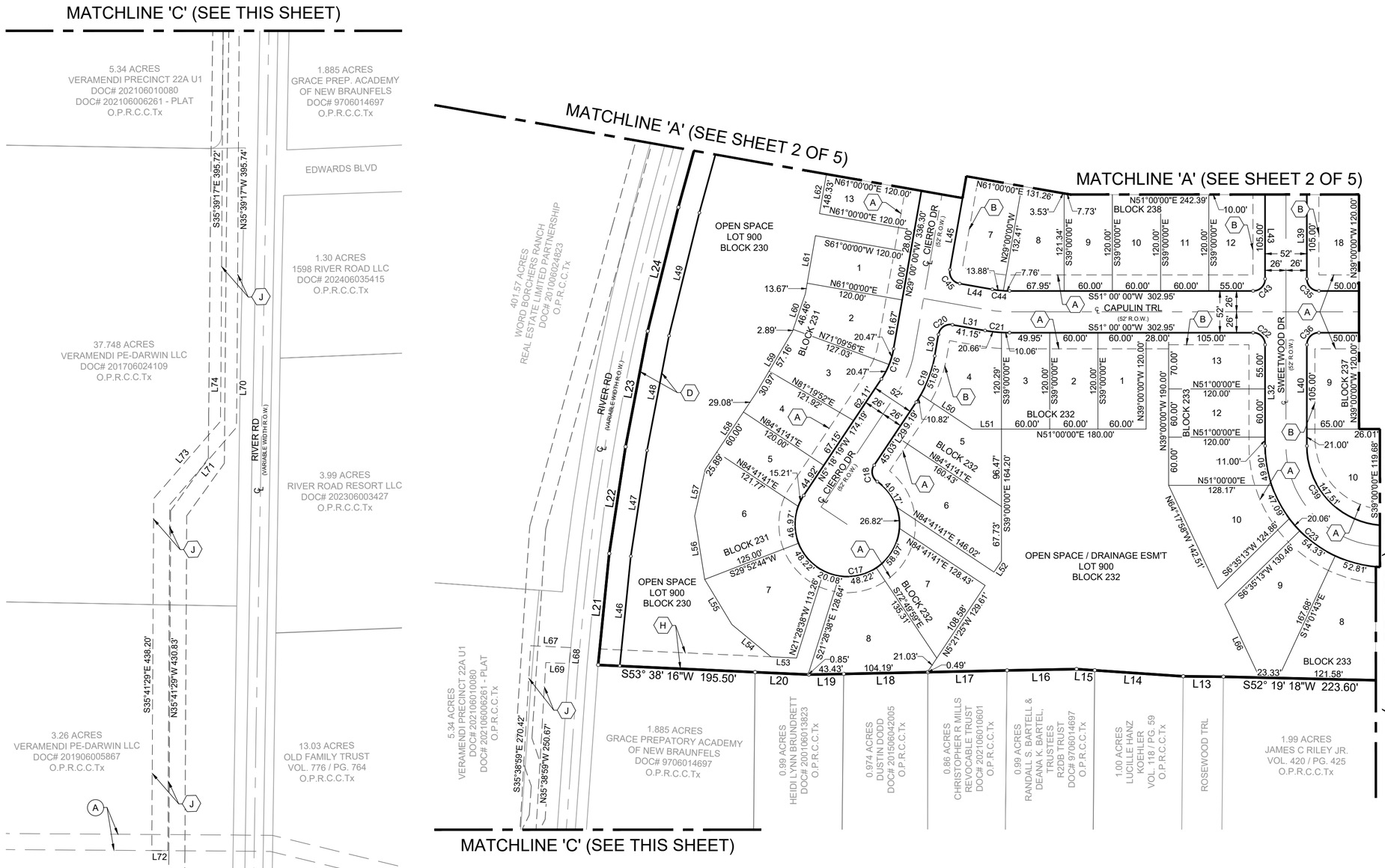

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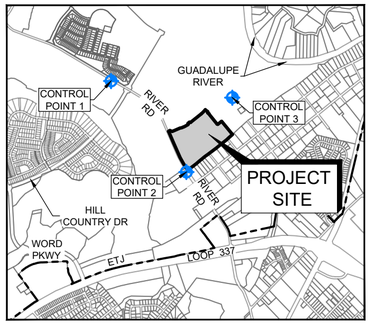

LOCATION MAP

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DATE OF PREPARATION: 7/8/2025

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N66° 16' 34"E	42.95
L2	S68° 47' 08"E	70.71
L3	N80° 06' 03"E	50.00
L4	N66° 12' 52"E	52.22
L5	N51° 00' 00"E	52.04
L7	S39° 00' 00"E	0.40
L8	S51° 52' 46"E	86.00
L9	S48° 23' 12"E	28.74
L10	N51° 00' 00"E	135.00
L11	S47° 38' 48"W	157.22
L12	S50° 58' 55"W	50.00
L13	S51° 33' 18"W	50.00
L14	S54° 55' 18"W	110.37
L15	S54° 55' 18"W	22.70
L16	S49° 48' 33"W	86.56
L17	S49° 48' 33"W	98.47
L18	S49° 48' 33"W	104.68
L19	S49° 48' 33"W	43.43
L20	S53° 38' 16"W	66.98
L21	N33° 16' 44"W	139.30

LINE TABLE		
LINE	BEARING	DISTANCE
L22	N30° 16' 44"W	134.50
L23	N28° 11' 44"W	146.50
L24	N25° 06' 44"W	158.90
L25	S66° 16' 15"W	16.71
L26	S21° 12' 52"W	70.71
L27	N39° 00' 00"W	111.32
L28	N51° 00' 00"E	94.96
L29	S5° 18' 19"E	94.22
L30	S29° 00' 00"E	27.06
L31	S61° 00' 00"W	41.15
L32	N39° 00' 00"W	126.00
L33	N39° 00' 00"W	128.27
L34	N51° 00' 00"E	135.00
L35	S48° 23' 12"E	28.74
L36	S39° 00' 00"E	73.35
L37	N39° 00' 00"W	110.00
L38	S39° 00' 00"E	210.00
L39	N39° 00' 00"W	210.00
L40	N39° 00' 00"W	126.00
L41	N61° 00' 00"E	124.49

LINE TABLE		
LINE	BEARING	DISTANCE
L42	N51° 00' 00"E	94.96
L43	S39° 00' 00"E	210.00
L44	S61° 00' 00"W	41.15
L45	N29° 00' 00"W	226.36
L46	S33° 16' 44"E	137.14
L47	S30° 16' 44"E	133.30
L48	S28° 11' 44"E	145.28
L49	S25° 06' 44"E	157.77
L50	N84° 41' 41"E	76.90
L51	N51° 00' 00"E	36.53
L52	N5° 18' 19"W	16.63
L53	N53° 38' 16"E	31.87
L54	S89° 27' 00"E	63.00
L55	S70° 03' 46"E	65.61
L56	S47° 59' 52"E	79.81
L57	S26° 20' 23"E	59.64
L58	S5° 18' 19"E	114.96
L59	S8° 28' 39"E	88.14
L60	S20° 08' 50"E	49.35
L61	S29° 00' 00"E	73.67

LINE TABLE		
LINE	BEARING	DISTANCE
L62	S29° 00' 00"E	148.33
L63	S45° 09' 16"E	53.65
L64	S27° 54' 43"E	85.73
L65	S0° 18' 05"E	63.35
L66	N64° 17' 58"W	101.07
L67	S53° 38' 16"W	49.88
L68	N33° 36' 38"W	20.02
L69	N53° 38' 16"E	29.17
L70	N35° 30' 38"W	98.41
L71	N4° 50' 46"E	127.10
L72	N54° 22' 25"E	20.00
L73	S4° 50' 46"W	127.14
L74	S35° 30' 38"E	91.04
L75	S52° 33' 55"W	44.41
L76	S59° 59' 58"W	104.64
L77	S44° 13' 14"W	50.35
L78	S47° 38' 48"W	62.08

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C1	145.38	727.00	11°27'27"	72.93	N60° 29' 08"E	145.14
C2	23.42	15.00	89°26'46"	14.86	N10° 02' 02"E	21.11
C3	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C4	163.37	727.00	12°52'31"	82.03	N44° 33' 45"E	163.02
C5	9.23	813.00	0°39'03"	4.62	S38° 26' 59"W	9.23
C6	22.82	15.00	87°09'42"	14.27	S4° 48' 21"E	20.68
C7	24.74	151.00	9°23'12"	12.40	S43° 41' 36"E	24.71
C8	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C9	170.05	813.00	11°59'04"	85.34	S60° 13' 20"W	169.74
C10	22.72	15.00	86°46'12"	14.18	N82° 23' 06"W	20.61
C11	23.56	15.00	90°00'00"	15.00	N6° 00' 06"E	21.21
C12	82.73	474.00	10°00'00"	41.47	N56° 00' 00"E	82.62
C13	9.80	15.00	37°26'38"	5.08	N79° 43' 19"E	9.63
C14	143.89	50.00	164°53'17"	376.94	N16° 00' 00"E	99.13
C15	9.80	15.00	37°26'38"	5.08	N47° 43' 19"W	9.63
C16	40.94	99.00	23°41'41"	20.77	N17° 09' 09"W	40.65
C17	304.68	65.00	268°34'03"	66.65	S40° 24' 40"W	93.07
C18	23.19	15.00	88°34'03"	14.63	S49° 35' 20"E	20.95
C19	62.45	151.00	23°41'41"	31.68	S17° 09' 09"E	62.00
C20	23.56	15.00	90°00'00"	15.00	S16° 00' 00"W	21.21

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C21	30.72	176.00	10°00'00"	15.40	S56° 00' 00"W	30.68
C22	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C23	237.19	151.00	90°00'00"	151.00	N84° 00' 00"W	213.55
C24	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C25	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C26	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C27	92.92	813.00	6°32'54"	46.51	N47° 43' 33"E	92.87
C28	22.82	15.00	87°09'42"	14.27	N88° 01' 57"E	20.68
C29	16.22	99.00	9°23'12"	8.13	S43° 41' 36"E	16.20
C30	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C31	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C32	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C33	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C34	23.56	15.00	89°59'57"	15.00	S5° 59' 58"W	21.21
C35	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C36	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C37	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C38	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C39	155.51	99.00	90°00'00"	99.00	N84° 00' 00"W	140.01
C40	39.27	25.00	90°00'00"	25.00	N16° 00' 00"E	35.36

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C41	91.80	526.00	10°00'00"	46.02	N56° 00' 00"E	91.69
C42	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C43	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C44	21.64	124.00	10°00'00"	10.85	S56° 00' 00"W	21.61
C45	23.56	15.00	90°00'00"	15.00	N74° 00' 00"W	21.21
C47	116.95	326.00	20°33'14"	59.11	N40° 43' 23"E	116.32
C48	88.40	326.00	15°32'09"	44.47	N22° 40' 42"E	88.12

K:\SA3856.ASA Properties\2405 23-1\426 Site Development Plans\DWG-Sheets\sh_Plat.dwg
User: ngower Plot Date/Time: Jul 08, 25 - 20:38:19

Attachment C – Project Narrative

The proposed site is located 2400 LF North of the intersection between Loop 337 and River Rd in New Braunfels, Texas. Proposed use for the development will be a Residential (single family). The site is in the New Braunfels ETJ. The Veramendi Precinct 23 Unit 1 WPAP will consist of a 79.55-acre tract for single family houses and offsite that will be draining through the site. 17.08 acres will be under impervious cover which require a total of 15,567 lbs of TTS to be treated.

BMP practices are being constructed with this application that will treat future improvements and impervious cover that will be draining to our site. We are treating a total of 15.28 acres of the total impervious cover with two (2) proposed extended detention basins. Also, we are treating a total of 0.6 acres of impervious cover with vegetated filter strips.

Proposed Conditions

The proposed improvements addressed by this Water Pollution Abatement Plan (WPAP) for proposed conditions are 2 extended detention basins and vegetative filter strips. Our site receives offsite drainage from the north. Drainage area B1 consists of 2.51 acres that will be captured by an earthen drainage channel, which will discharge into drainage area B2. Ultimately, the discharge from drainage area B1 & B2 will flow into an offsite bar ditch to the east of our site, at a flow rate lower than existing conditions. The total impervious cover area for drainage area B1 & B2 is 0.63 acres. There will be vegetative filter strips in drainage area B2 that will treat 0.37 acres (332 lbs) of TSS.

Offsite flow will also come from drainage area A4, which consists of 7.51 total acres and 0.0 acres of impervious cover. This water will flow into an earthen channel which will flow into a storm pipe system. This storm pipe system will be discharged into proposed detention basin ‘A’. The onsite drainage areas A1-A3 & A5-A7 will also flow into detention basin ‘A’ via streets, storm pipe system, or sheet flow. The total drainage area flowing into detention basin ‘A’ is 31.78 acres which consists of an impervious cover acreage of 10.60 acres. The required TSS treatment for detention basin ‘A’ for proposed conditions is 9,515 lbs. Detention basin ‘A’ is designed to remove 10,335 lbs. of TSS which exceeds the required amount.

There will also be offsite flow that will be captured by offsite detention basin ‘E’, which is located northeast, adjacent to our site. These is a total of 33.69 acres flowing to the pond, with an impervious cover acreage of 4.73 acres. The required TSS treatment for detention basin ‘E’ for proposed conditions is 4,246 lbs. Detention basin ‘A’ is designed to remove 4,900 lbs. of TSS which exceeds the required amount.

The proposed detention basins and vegetative filter strips have enough treatment capacity for the proposed development.

Ultimate Conditions

The sites 2 water quality basins will also account for the future developments impervious cover that is going through the water quality ponds.

The Ultimate conditions will consist of 79.55 acres of single family development. 30.74 acres is estimated to be impervious cover, which will require There is a total of 30.74 acres of impervious area going towards these ponds.

The total drainage area flowing into detention basin ‘A’ is 31.78 acres with 17.02 acres of impervious cover. A total of 15,277 lbs TSS is required for removal, detention basin ‘A’ will remove 16,040 lbs of TSS. For the offsite detention basin ‘E’, there is 39.69 acres with 12.94 acres of impervious cover draining to the pond. A total of 11,615 lbs of TSS is required for removal, the basin will remove 12,630 lbs.

The proposed detention basins have enough treatment capacity for the proposed development and the future development that will be draining through our site.

The Permanent Pollution Abatement Measures (BMPs) for Veramendi Precinct 23 Unit 1 development will consists of 2 detention basins designed in accordance with the TCEQ Technical Guidance Manual to remove 91% of the increased Total Suspended Solids (TSS) for the proposed improvements.

Potable water and wastewater disposal are provided New Braunfels Wastewater Treatment Plan. Wastewater is disposed of by conveyance to the existing treatment center operated by New Braunfels Wastewater Treatment Plan.

GEOLOGIC ASSESSMENT (WPAP)

VERAMENDI
PHASE 23-1
+/- 39.29 ACRES
NEW BRAUNFELS, TEXAS

FROST GEOSCIENCES, INC. PROJECT NO.: FGS-E25160
MAY 19, 2025

Prepared exclusively for

ASA Properties
PO Box 310699
New Braunfels, Texas 78131

Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental

Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental

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TBPG Firm Registration # 50040

May 19, 2025

ASA Properties
PO Box 310699
New Braunfels, Texas 78131

Attn: Mr. Garrett Mechler, P.E.

SUBJECT:
Geologic Assessment (WPAP)
for the Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi Phase 23-1
+/- 39.29 ACRES
New Braunfels, Texas
FGS Project N^{o} FGS-E25160

Dear Mr. Mechler:

Frost GeoSciences, Inc., (FGS) is pleased to submit the enclosed Geologic Assessment 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 Texas Commission on Environmental Quality (TCEQ) "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04).

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.

We appreciate the opportunity to perform these services for ASA Properties. Please contact the undersigned if you have questions regarding this report.

Respectfully submitted,
Frost GeoSciences, Inc.

Ethan Levine
Project Geologist

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

Copies Submitted: (1) Mr. Garrett Mechler, P.E.; ASA Properties
(1) Electronic (pdf) Copy

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APPENDIX B - SITE PHOTOGRAPHS

APPENDIX C - GEOLOGIC MAP

GEOLOGIC ASSESSMENT

Texas Commission on Environmental Quality

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

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

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

Signature

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

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

Date: May 19, 2025 Fax: (210) 372-1318

Representing: Frost GeoSciences, Inc. #50040 (Name of Company and TBPG or TBPE registration number)

Signature of the Geologist:

Regulated Entity Name: Veramendi Phase 23-1

Project Information

1. Date(s) Geologic Assessment was performed: May 14 and May 16, 2025
2. Type of Project:

   ☒ WPAP ☐ AST
   ☐ SCS ☐ UST
3. Location of Project:

   ☒ Recharge Zone
   ☐ Transition Zone
   ☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
CrD	D	0.5-1
RuD	D	1-1.5

Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.
B. Soils having a moderate infiltration rate when thoroughly wetted.
C. Soils having a slow infiltration rate when thoroughly wetted.
D. Soils having a very slow infiltration rate when thoroughly wetted

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

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

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan.

   Applicant's Site Plan Scale: 1" = 200'
   Site Geologic Map Scale: 1" = 200'
   Site Soils Map Scale (if more than 1 soil type): 1" = 500'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☒ Other method(s). Please describe method of data collection: 2023 Aerial Photograph

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

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

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

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

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

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

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

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

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

Administrative Information

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

STRATIGRAPHIC COLUMN

EXPLANATION OF HYDROSTRATIGRAPHIC UNITS

Group or Formation	Formal and informal member		Hydrologic unit or Informal hydrostratigraphic unit
Taylor Group (Pecan Gap)		Kpg	Upper Confining Unit (UCU)
Austin Group		Ka	
Eagle Ford Group		Kef	
Buda Limestone		Kb	
Del Rio Clay		Kdr	
Georgetown Formation		Kg	I
Person Formation	Cyclic and marine, undivided	Kpcm	II
	Leached and collapsed	Kplc	III
	Regional dense member	Kprd	IV
Kainer Formation	Grainstone	Kkg	V
	Kirschberg evaporite	Kkke	VI
	Dolomitic	Kkd	VII
	Basal nodular	Kkbn	VIII
Glen Rose Limestone	Upper Glen Rose Limestone	Kgrc	Cavernous
		Kgrcb	Camp Bullis
		Kgrue	Upper evaporite
		Kgrf Kgruf	Fossiliferous Upper
		Kgrf Kgrlf	Lower
		Kgrle	Lower evaporite
	Lower Glen Rose Limestone	Kgrb	Bulverde
		Kgrlb	Little Blanco
		Kgrts	Twin Sisters
		Kgrd	Doeppenschmidt
		Kgrr	Rust
		Kgrhc	Honey Creek
Pearsall Formation	Hensell Sand	Kheh	Hensell
	Cow Creek Limestone	Kcccc	Cow Creek
	Hammett Shale	Khah	Hammett

Frost GeoSciences

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Veramendi Phase 23-1 **PROJECT NUMBER:** FGS-E25160

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
S-138	29°44'22.92"N	98° 7'41.22"W	SH	20	Kep	30	40	2	-	-	-	-	F	15	35	35		X		Hillside

Datum: NAD 83

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, Floodplain, Streambed

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

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

Steve Frost

Steve Frost, C.P.G., P.G.

Date: May 19, 2025

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

LOCATION

The project site is located along and east of River Road approximately 0.46 miles north of the intersection of River Road and Highway 337 in New Braunfels, Comal County, Texas. An overall view of the area is shown on copies of the site plan, a street map, the U.S.G.S. Topographic Map, the EAA-Edwards Aquifer Recharge Zone and Contributing Zone Map, the FIRM Map, the U.S. Geological Survey, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, U.S. Geological Survey: Water Resources Investigations Report (WRI) 94-4117 Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, a NRCS Web Soil Survey aerial photograph at a scale of 1"=500', and a 2023 aerial photograph at a scale of 1"=500'. These maps are included as Figures 1 through 10 in Appendix A.

METHODOLOGY

The Geologic Assessment was performed by Steve Frost, C.P.G., P.G., President and Principal Geologist, and Ethan Levine, Project Geologist, with Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License #315).

Frost GeoSciences, Inc. researched the geology of the area north of Word Parkway in New Braunfels, Comal County, Texas. The research included, but was not limited to FEMA flood maps, Edwards Aquifer Recharge Zone Maps, U.S.G.S. 7.5 Minute Quadrangle Maps, the Bureau of Economic Geology-Geologic Atlas of Texas, the U.S. Geological Survey, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the U.S.G.S. Water-Resources Investigations Report 94-4117, and the U.S.D.A. Soil Survey of Comal and Hays Counties, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man-made Potential Recharge Features (PRFs). A transect spacing of approximately 50 feet, or less depending on vegetation thickness, was used to inspect the project area. A 2023 aerial photograph, in conjunction with a hand-held Garmin GPS 72H Global Positioning System with an Estimated Potential Error ranging from 10 to 14 feet, was used to navigate around the property and identify the locations of PRFs, as recommended in the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04). The locations of any PRFs noted in the field were marked with blue and white flagging. The flagging is numbered with the same potential recharge feature I.D. # that is used on the Site Geologic Map. The Site Geologic Map, indicating the limits of the project site, and the locations of PRFs and rock outcrops noted on the project site, is included in Appendix C at the end of this report. A copy of a 2023 Aerial Photograph at an approximate scale of 1" = 500' indicating the limits of the project site, and the locations of PRFs and rock outcrops noted on the project site, is included on Figure 10 in Appendix A. The Geologic Assessment Form TCEQ-0585, (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 through 5.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West Quad (1988), the elevation across the project site ranges from 700 to 760 feet above mean sea level. The project site has a total relief of approximately 60 feet. Runoff from the project site flows to the south into an unnamed tributary of Blieders Creek. A residential subdivision is located to the adjacent south of the project site. A copy of the U.S.G.S. 7.5 Minute Quadrangle Map indicating the location of the project site is included on Figure 3 in Appendix A.

Recharge/Transition Zone

According to the E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map, New Braunfels West (2014) and the TCEQ website: Edwards Aquifer Viewer – https://tceq.maps.arcgis.com/apps/webappviewer/index.html, the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map indicating the location of the project site is included on Figure 4 in Appendix A.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Flood Insurance Map, Community Panel Number 48091C0435F, dated September 2, 2009 was reviewed to determine if the project site is located in areas prone to flooding. A review of the above-mentioned Panel No. indicates that the project site is located within "Zone X". According to the Panel Legend, Zone X represents areas determined to be outside the 0.2% annual chance floodplain. A copy of the above referenced FIRM panel indicating the location of the project site is included on Figure 5 in Appendix A.

Soils

According to the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Comal and Hays Counties (1984) and the USDA NRCS Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov, the Site is located on the Comfort-Rock outcrop complex, undulating (CrD), the Lewisville silty clay, 1-3% slopes (LeB), the Orif soils, frequently flooded (Or), and the Rumple-Comfort Association (RuD). A copy of the 2022 aerial photo (approximate scale: 1"=500') obtained from the Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov has been included on Figure 6 in Appendix A

- Comfort-Rock outcrop complex, undulating (CrD) consists of shallow, clayey soils and Rock outcrops on the side slopes, hilltops, and ridgetops in the uplands area of the Edwards Plateau. This soil complex is composed of the Comfort extremely stony clay (~49% to ≥95% of the complex), the Rock outcrop (5-36% of the complex), and small amounts of the Rumple, Purves, Eckert, and Real soils. Typically, the surface layer of the Comfort soil is dark brown extremely stony clay about 6 inches thick. Stones and cobbles (some as much as 4' across) cover approximately 45% 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 non-calcareous throughout. The soil is well drained, surface runoff is slow to medium, permeability is slow, and the available water capacity is very low. Water erosion is a slight hazard. Typically, the Rock outcrop is dolomitic limestone that is barren of soil except in narrow fractures in the rock. Some areas may have as much

as 3 inches of soil on top of the outcrop.

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

- Orif soils, frequently flooded (Or) consists of deep, nearly level soils on flood plains of large creeks and rivers. Slopes are convex and on the average are less than 1 percent. They are adjacent to the stream channel. The areas are long and narrow and range from 10 to 350 acres in size. The surface texture is gravelly loam, gravelly loamy sand, gravelly sandy loam, or a very gravelly counterpart. The texture does not vary in a regular pattern. 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. The available water capacity is low. The rooting zone is deep. Water erosion is a severe hazard.

- 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.

Narrative Description of the Site Geology

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low. The locations of the PRFs are identified on the 2023 aerial photograph on Figure 10 in Appendix A, and on the Site Geologic Map provided in Appendix C. Color photos of the project site and PRFs are included in Appendix B.

PRF #S-138 consists of an area 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 this is a sinkhole in the classic sense that a collapse has occurred creating a depression. Rather, FGS believes this feature is purely the result of erosion of surface soils into subsurface features. This feature contained small areas with no grasses indicating that water ponds for prolonged periods of time. As a result, it did not appear that this feature provides rapid

infiltration into the subsurface. This feature is not considered sensitive by FGS. This feature scores a 35 on the sensitivity scale, column 10 of the Geologic Assessment Table.

The project site is covered by moderately dense stand of vegetative cover with numerous open grassy areas. Site visit photos indicating the condition of the property at the time of the on-site inspection are included in Appendix B. Overall vegetation on the project site consists of ashe juniper (Juniperus ashei), live oak (Quercus virginiana), and cedar elm (Ulmus crassifolia), with Texas persimmon (Diospyros texana), agarita (Berberis trifoliolata), yucca (Yucca treculeana), and prickly pear cactus (Opuntia lindheimeri). The variations in the vegetative cover on the property are visible in the 2023 aerial photo on Figures 9 and 10 in Appendix A. A copy of the site layout indicating the boundary of the project site and the elevations is included on the Site Geologic Map in Appendix C of this report.

According to the U.S. Geological Survey: Water Resources Investigations Report (WRI) 94-4117 Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas and the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle the project site is located on the Cretaceous Person Formation, Leached and Collapsed Members, Undivided (Kep). A copy of the WRI map and the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle are included on Figures 7 and 8 in Appendix A. A copy of the Stratigraphic Column highlighting the outcropping formations is included on Page 3 of this report.

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

According to the site plan provided by ASA Properties, the surveyed elevations on the project site range from 706 to 756 feet. According to this survey, the total relief on the project site is approximately 50 feet. A copy of the site plan indicating the boundary of the project site and the elevations is included on the Site Plan on Figure 1 in Appendix A and the Site Geologic Map in Appendix C of this report.

BEST MANAGEMENT PRACTICES

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to range from low to moderate. The potential always exists to encounter solution cavities within the subsurface during excavating activities. Frost GeoSciences, Inc. is of the opinion that it is very important for construction personnel to be informed of the potential to encounter cavities in the subsurface that lack a surface expression. Construction personnel should also be informed of the proper protocol to follow in the event a karst feature is encountered during the development of the project site.

DISCLAIMER

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

This report has been prepared for the exclusive use of ASA Properties. This report is based on available known records, a visual inspection of the project site, and the work generally accepted for a Geologic Assessment for Regulated Activities / Developments on the Edwards Aquifer Recharge / Transition Zone, relating to 30 TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

1. USGS - 7.5 Minute Topographic Quadrangle of New Braunfels West, 1988

2. E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map, New Braunfels West (2014).

3. Official Edwards Aquifer Recharge Zone Map, New Braunfels West, 1988

4. The Texas Commission on Environmental Quality (TCEQ) website: Edwards Aquifer Viewer – https://tceq.maps.arcgis.com/apps/webappviewer/index.html.

5. Clark, A.K., Golab, J.A. and Morris, R.R., 2016, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, United States Geological Survey.

6. Collins, Edward, W., 2000, Geologic Map of the New Braunfels 30 X 60 Minute Quadrangle, Bureau of Economic Geology, The University of Texas at Austin, Texas.

7. Stein, W.G. and Ozuna, G.B., 1995, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas, U.S. Geological Survey Water Resources Investigations 94-4117.

8. Federal Emergency Management Agency, Federal Insurance Administration, National Flood Insurance Program, Flood Insurance Map, Community Panel Number 48091C0435F, dated September 2, 2009

9. United States Department of Agriculture Soil Conservation Service Soil Survey of Comal County 1984

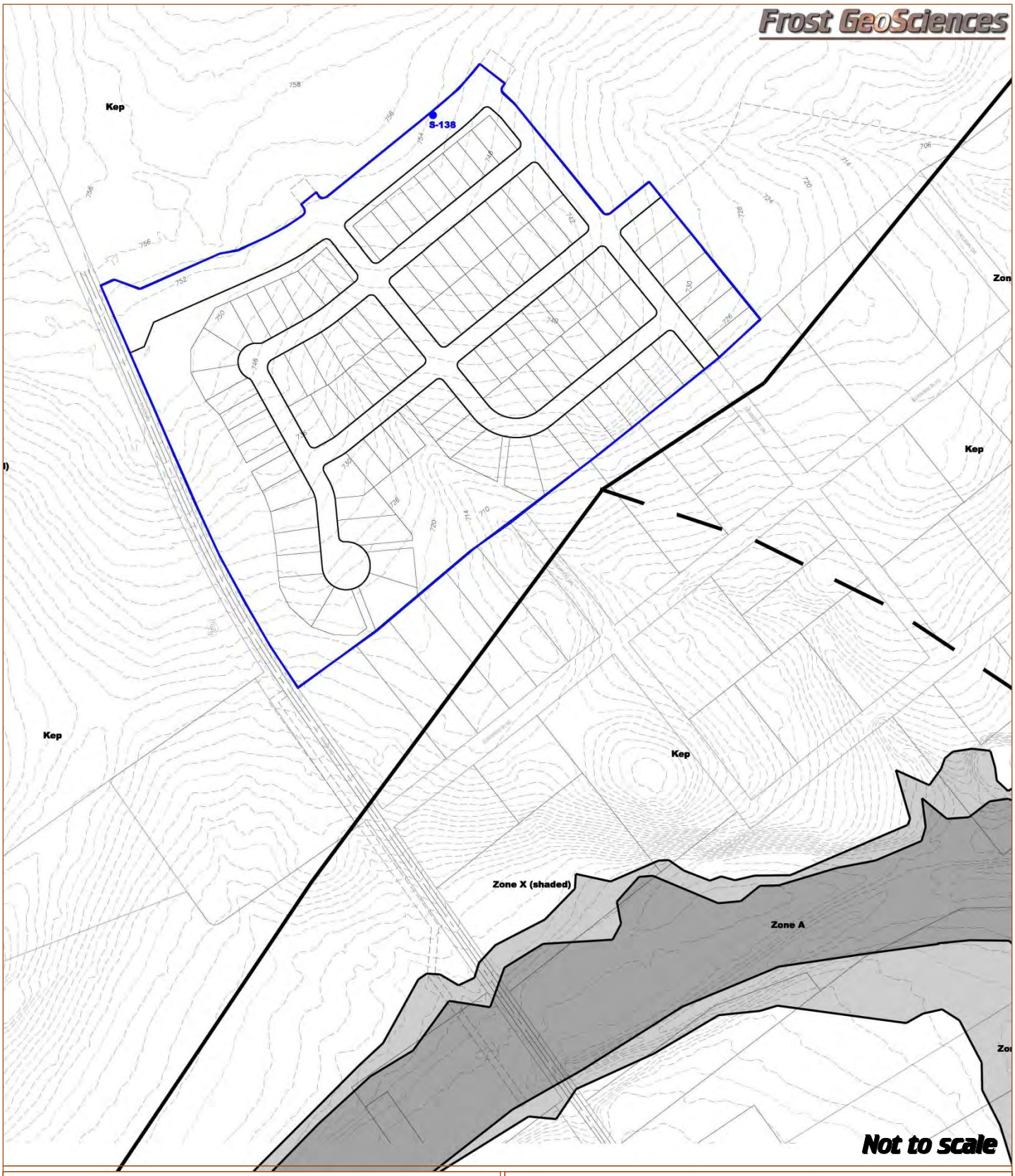
10. USDA NRCS Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov (2014)

11. TCEQ-0585-Instructions (Rev. 10-1-04), “Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone”.

APPENDIX A

SITE LOCATION FIGURES

Frost GeoSciences

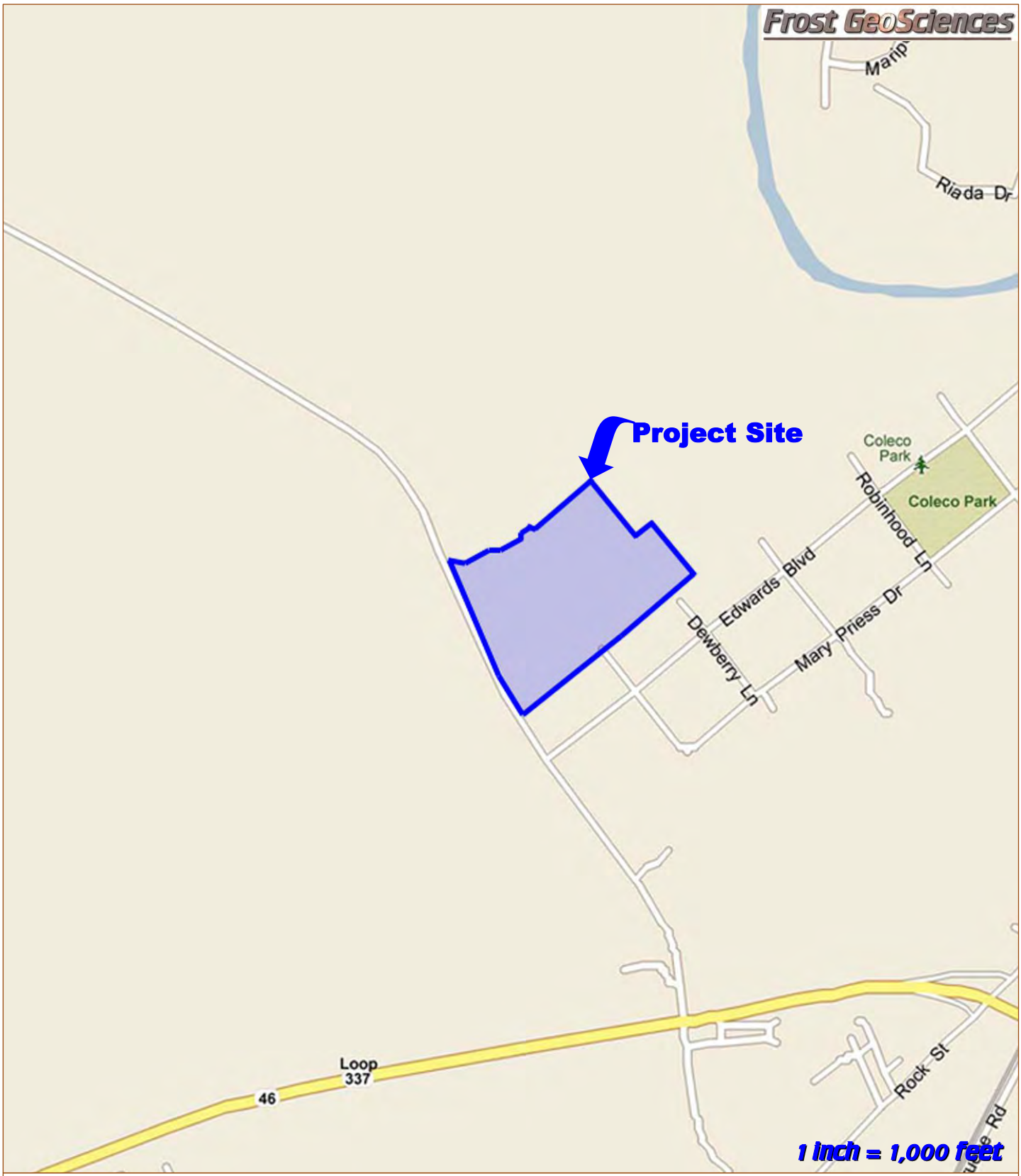


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Veramendi 23-1
Comal County, Texas

Site Plan

PROJECT No.: FGS-E25159

DATE: May 19, 2025

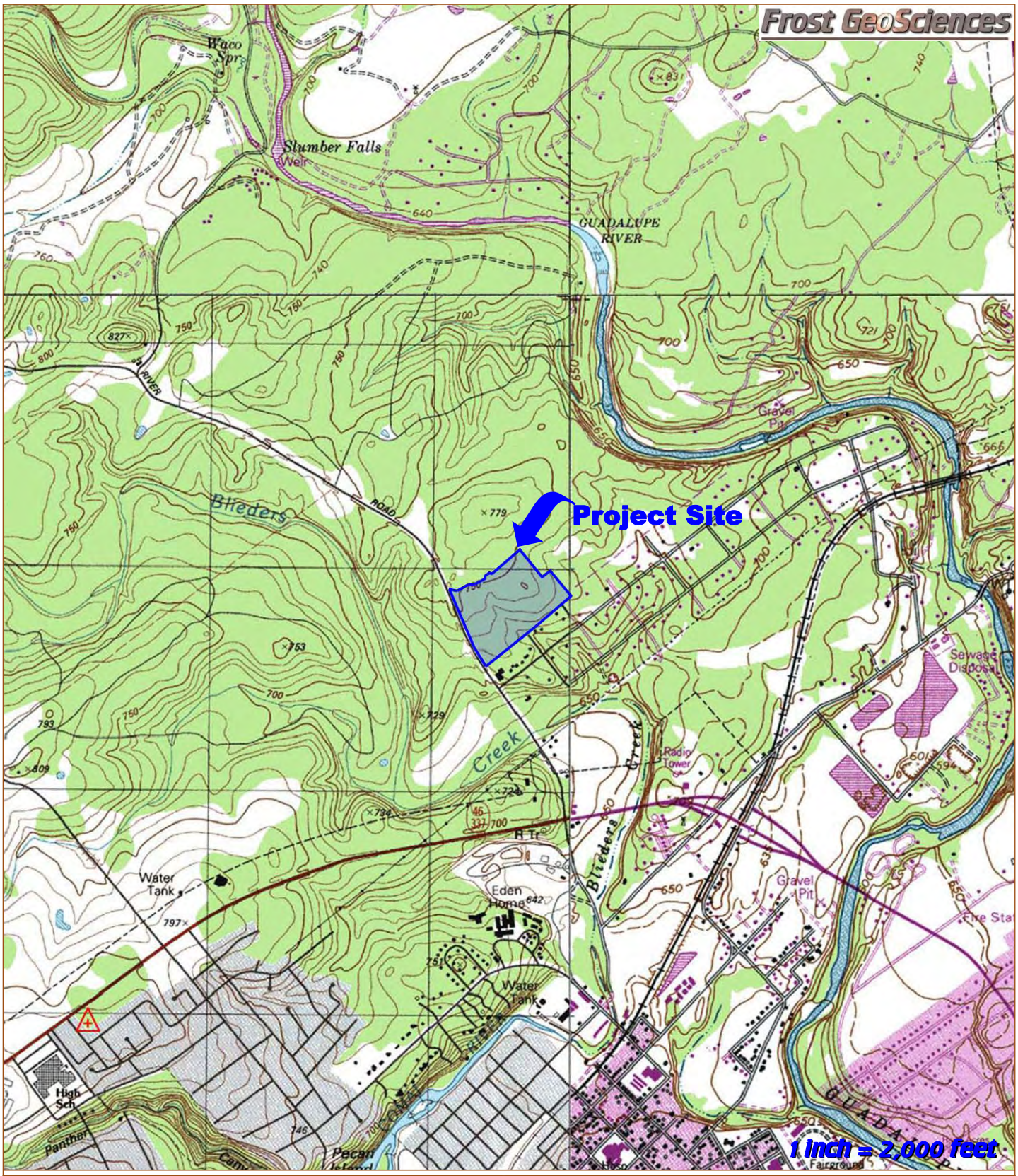


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Veramendi 23-1
Comal County, Texas

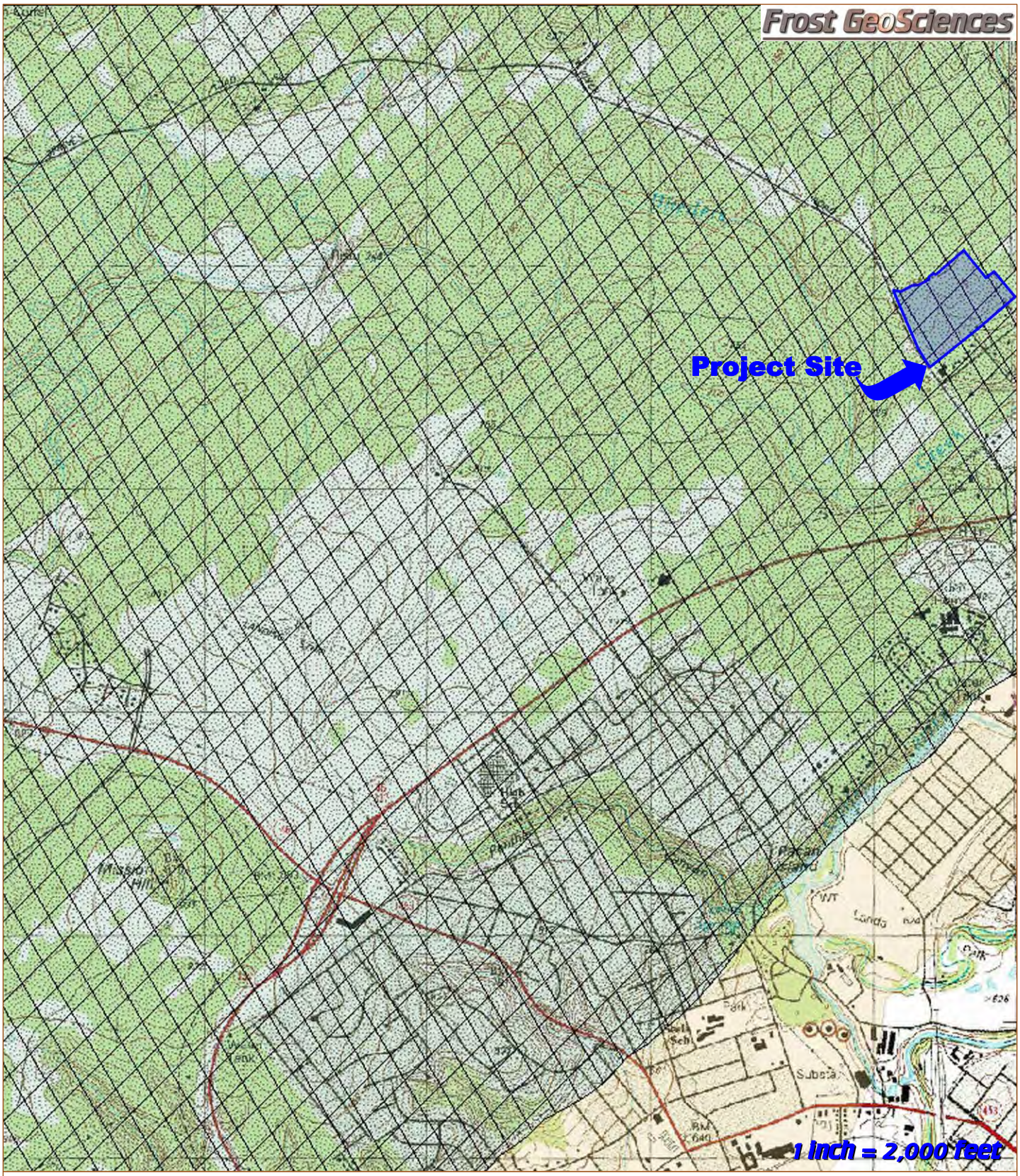
Street Map
Microsoft Streets and Trips (2013)

PROJECT No.: FGS-E25159

DATE: May 19, 2025



PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	U.S.G.S. 7.5 Minute Quadrangle Map New Braunfels West, TX Sheet (1988)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025

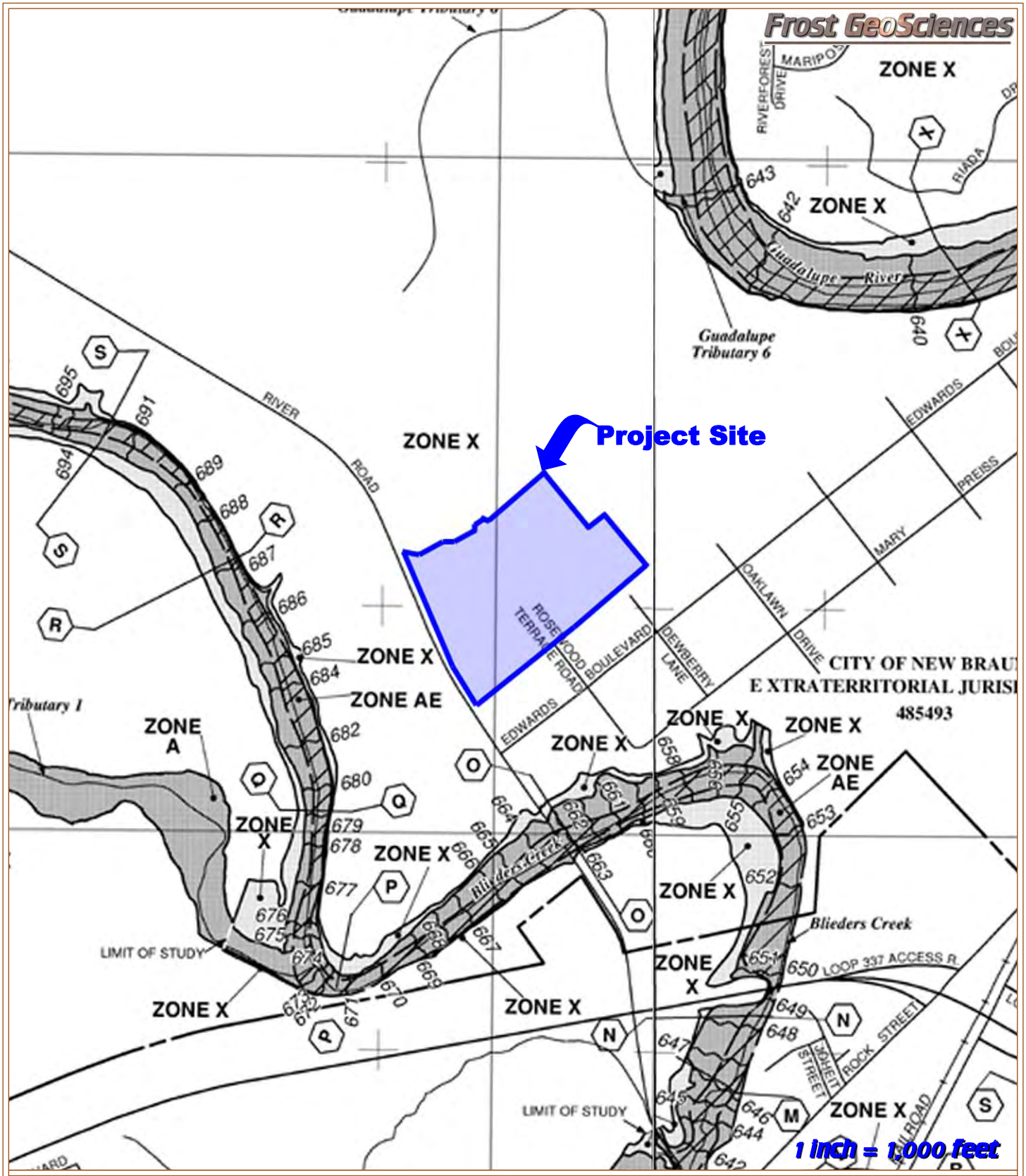


PROJECT NAME:
Geologic Site Assessment (WPAP)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Veramendi 23-1
Comal County, Texas

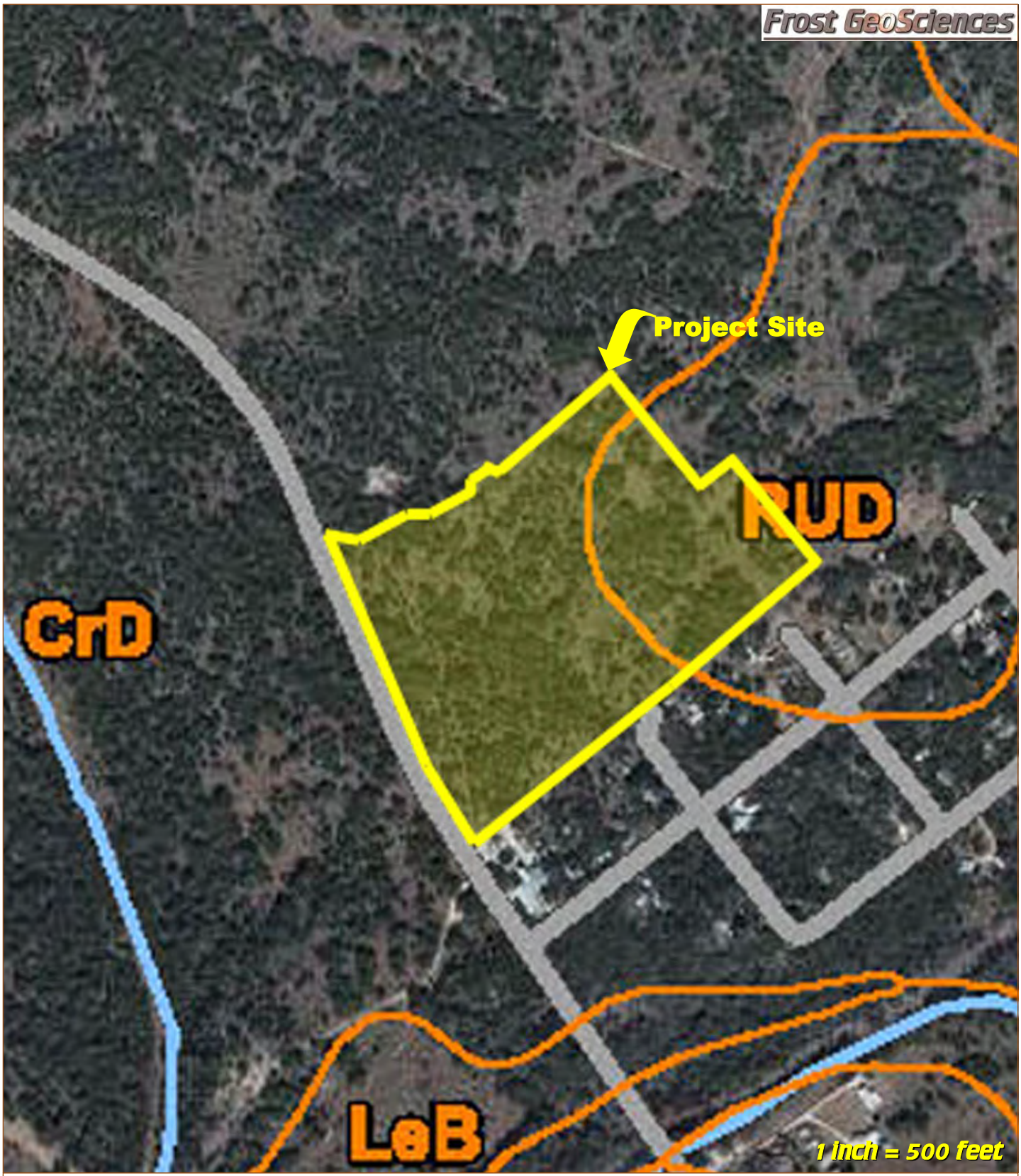
EAA Recharge & Contributing Zone Map
New Braunfels West, Texas (2014)

PROJECT No.: FGS-E25159

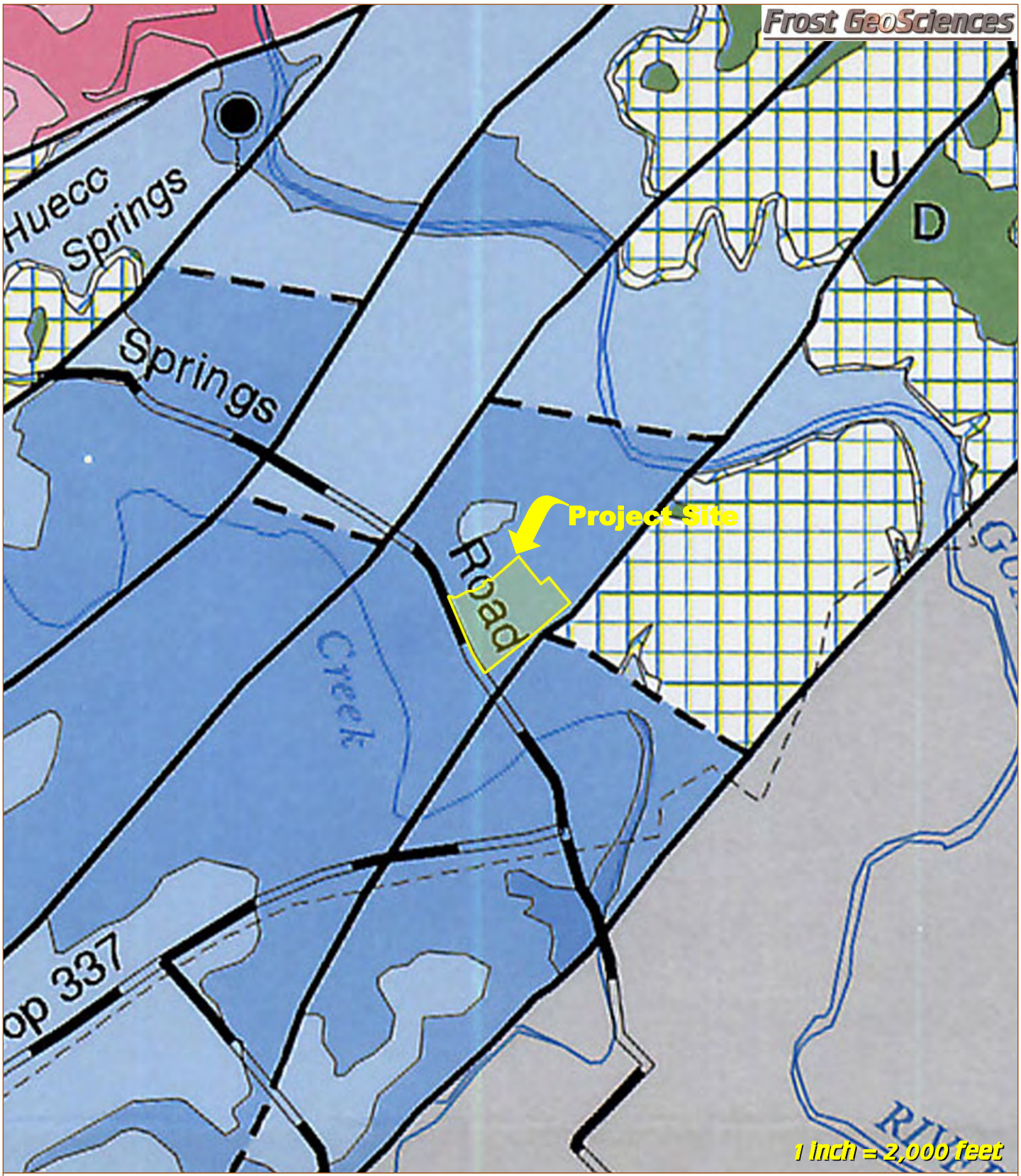
DATE: May 19, 2025



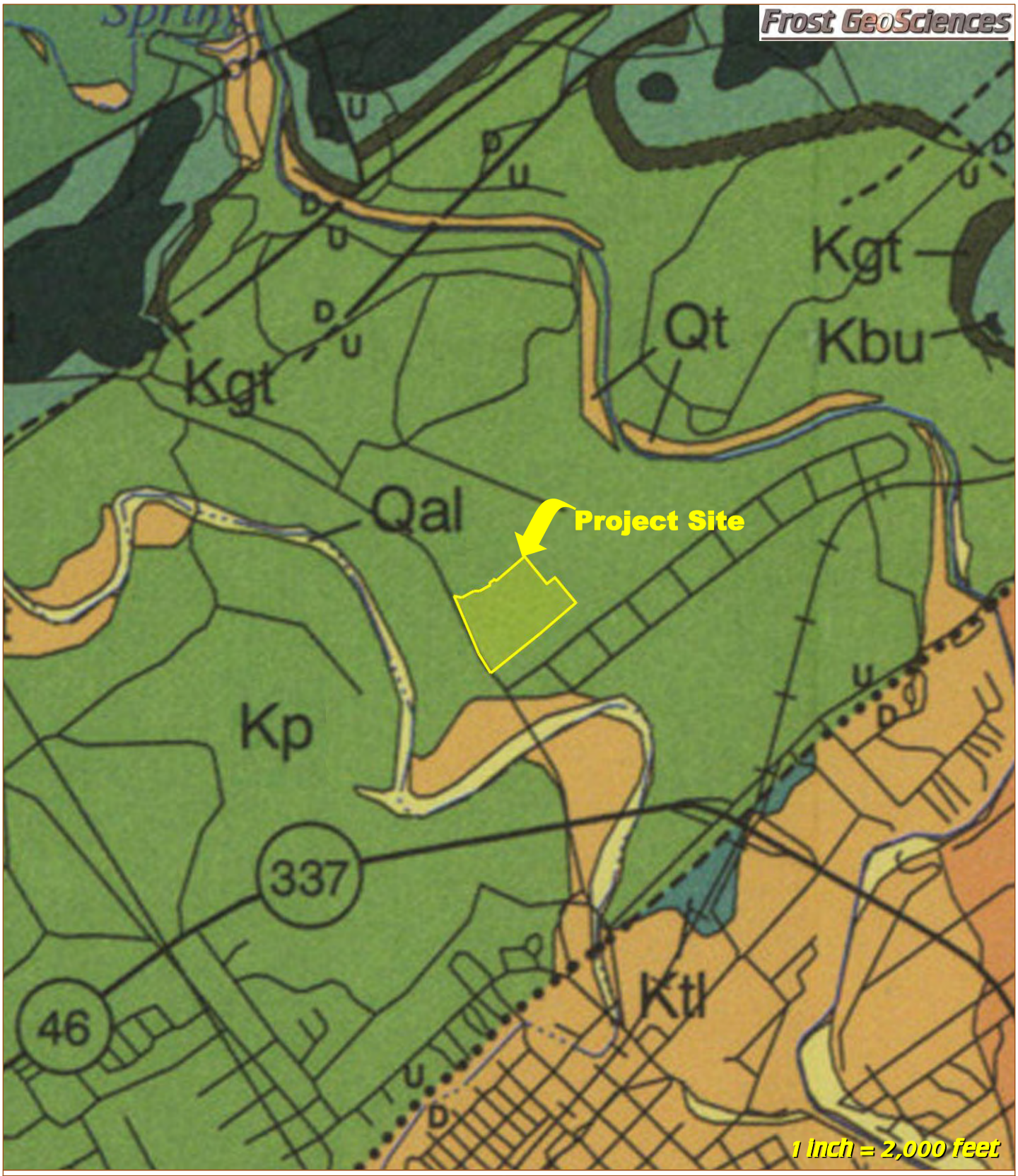
PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	Flood Insurance Rate Map (FIRM) Community Panel # 48091C0435F Revised 9/2/2009
PROJECT No.: FGS-E25159	**DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	Soils Map Comal County Soil Survey NRCS website: websoilsurvey.nrcs.usda.gov
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	United States Geological Survey Water Resource Investigation Map 94-4117 Comal County, Texas (1994)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	United States Geological Survey Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025

PROJECT NAME: Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Comal County, Texas	2023 Aerial Photograph Google Earth Aerial Imagery
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025

PROJECT NAME:	2023 Aerial Photograph with PRFs Google Earth Aerial Imagery	
Geologic Site Assessment (WPAP) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Comal County, Texas	PROJECT No.: FGS-E25159	DATE: May 19, 2025

APPENDIX B

SITE PHOTOGRAPHS

Photo #1 – View of the eastern portion of the Site.

Photo #2 – Additional view of the eastern portion of the Site.

Photo #3 – Additional view of the eastern portion of the Site.

Photo #4 – View of the east-central portion of the Site.

Photo #5 – Additional view of the east-central portion of the Site.	Photo #6 – Additional view of the east-central portion of the Site.
Photo #7 – View of the northern portion of the Site.	Photo #8 – Additional view of the northern portion of the Site.

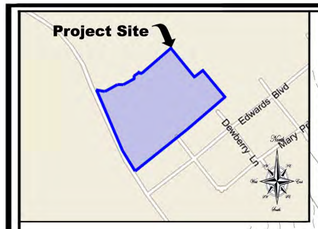
Photo #9 – Additional view of the northern portion of the Site.	Photo #10 – View of PRF #S-138.
Photo #11 – View of the central portion of the Site.	Photo #12 – Additional view of the central portion of the Site.

Photo #13 – Additional view of the central portion of the Site.	Photo #14 – View of the central portion of the Site.
Photo #15 – Additional view of the western portion of the Site.	Photo #16 – Additional view of the western portion of the Site.

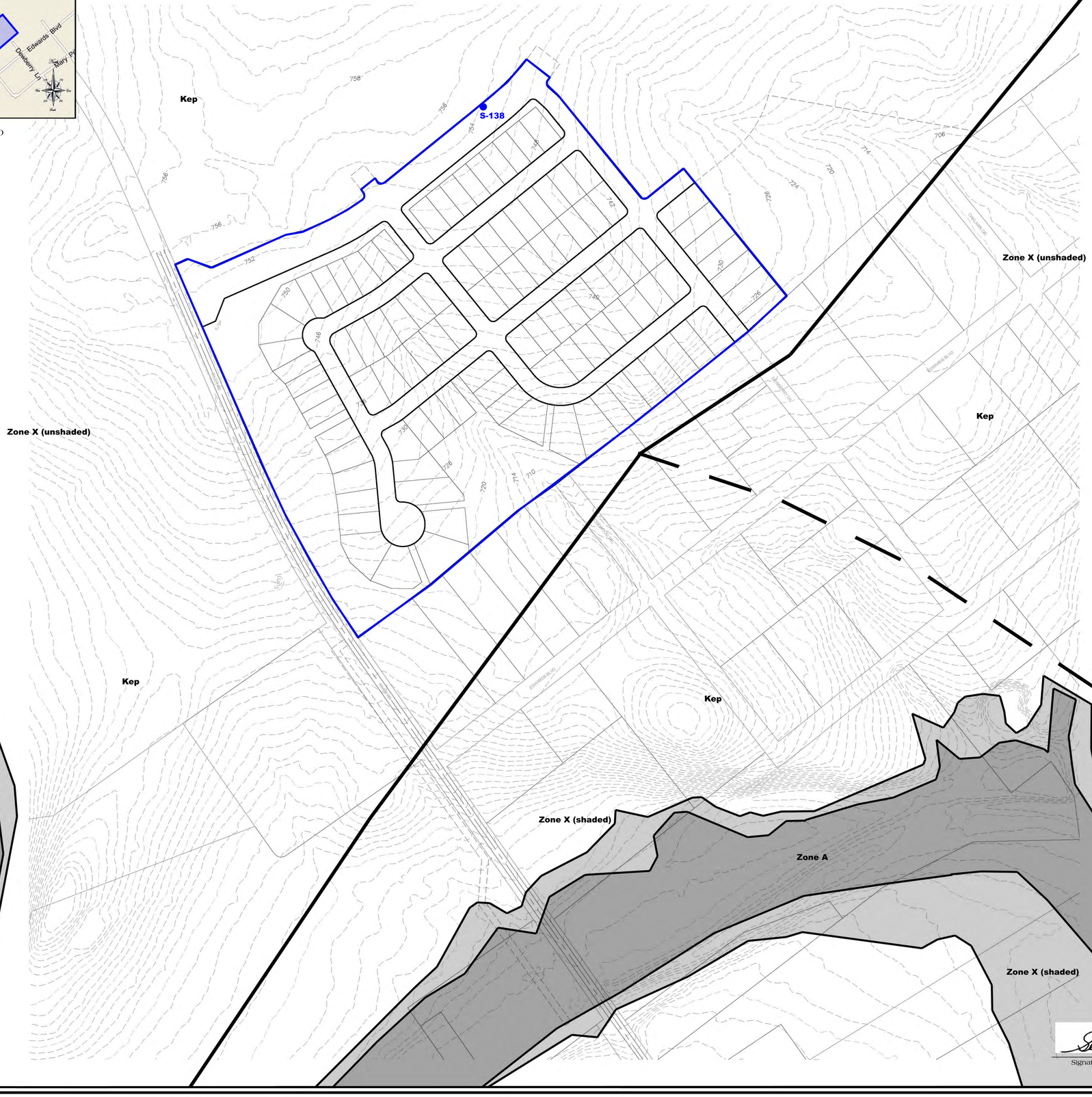
Photo #17 – Additional view of the western portion of the Site.	Photo #18 – View of the southern portion of the Site.
Photo #19 – Additional view of the southern portion of the Site.	Photo #20 – Additional view of the southern portion of the Site.

APPENDIX C

GEOLOGIC MAP



Location Map



Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental
13406 Western Oak ▪ Helotes, Texas 78023
Phone: (210) 372-1315 ▪ Fax: (210) 372-1318

Site Geologic Map

Geologic Site Assessment (WPAP)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the

Veramendi
Phase 23-1
+/- 39.29 Acres
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E25160

Legend

- Potential Recharge Feature (PRF)
- Site Boundary
- Fault
- Floodplain Zone X (shaded)
- Floodplain Zone A

Kep - Cretaceous Person Formation, leached and collapsed

Floodplain Information Obtained From
FIRM: Flood Insurance Rate Map
Comal County, Texas: Panel # 48091C0435F, Revised 9/2/2009

Fault Information Obtained From:
U.S. Geological Survey, Water Resources Investigations Report 94-4117 (1994)
Bureau of Economic Geology, Geologic Map of the New Braunfels, Texas
30 X 60 Minute Quadrangle (2000)
U.S. Geological Survey, Clark (2016) Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366

North

Graphic Scale

200 0 100 200 400

(In Feet)

1 inch = 200 feet
Representative Fraction 1:2400

Contour Interval - 2 foot

STATE OF TEXAS
Steve M. Frost
Geology
License No. 315
PROFESSIONAL GEOSCIENTIST
SMF 10/7/2025

Signature of Texas Licensed Geoscientist
Steve Frost License No. 315

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Nicholas Gower, PE

Date: 7/28/2025

Signature of Customer/Agent:

Regulated Entity Name: Veramendi Precincts 23-1

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property): 39.29 AC

3. Estimated projected population:_____

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

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	425,275	÷ 43,560 =	9.76
Parking		÷ 43,560 =	
Other paved surfaces	318,869	÷ 43,560 =	7.32
Total Impervious Cover	744,144	÷ 43,560 =	17.08

Total Impervious Cover 17.08 **÷ Total Acreage** 39.29 **X 100 =** 43.5 **% Impervious Cover**

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

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

For Road Projects Only

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

7. Type of project:

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

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

   [ ] Concrete
   [ ] Asphaltic concrete pavement
   [ ] Other: _____

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

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

10. Length of pavement area: _____ feet.

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

11. [ ] A rest stop will be included in this project.

    [ ] A rest stop will not be included in this project.

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

100 % Domestic	_____Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day
TOTAL gallons/day _____	

15. Wastewater will be disposed of by:

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

- ☐ **Attachment C - Suitability Letter from Authorized Agent**. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.
- ☐ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☒ Sewage Collection System (Sewer Lines):

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

- ☐ The SCS was previously submitted on_____.
- ☒ The SCS was submitted with this application.
- ☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

[X] The sewage collection system will convey the wastewater to the New Braunfels Utilities (name) Treatment Plant. The treatment facility is:

[X] Existing.
[ ] Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = _____'.

18. 100-year floodplain boundaries:

[ ] Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
[X] No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): 48091C0435G

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

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

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

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

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

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

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

[X] All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.
[ ] No sensitive geologic or manmade features were identified in the Geologic Assessment.
[ ] **Attachment D - Exception to the Required Geologic Assessment**. A request and justification for an exception to a portion of the Geologic Assessment is attached.

22. [X] The drainage patterns and approximate slopes anticipated after major grading activities.

23. [X] Areas of soil disturbance and areas which will not be disturbed.

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

25. [X] Locations where soil stabilization practices are expected to occur.

26. [ ] Surface waters (including wetlands).

    [X] N/A

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

    [X] There will be no discharges to surface water or sensitive features.

28. [X] Legal boundaries of the site are shown.

Administrative Information

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

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

Attachment A – Factors Affecting Surface Water Quality

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site during construction include:

- Soil erosion due to the clearing of the site
- Oil grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings
- Hydrocarbons from asphalt paving operations
- Miscellaneous trash and litter from construction workers and material wrappings
- Concrete truck washout
- Spills/Overflow from portable toilets

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site after development include:

- Oil, grease, fuel and hydraulic fluid contamination from vehicle drippings
- Dirt and dust which may fall off vehicles
- Miscellaneous trash and litter

Attachment B – Volume and Character of Stormwater

The site is currently undeveloped, with slopes from 0.5%-16%. The overall runoff coefficient prior to development of the 33.95 acre lot is estimated to be 0.47 based on the existing terrain and slopes. The western portion of the site will flow into an existing bar ditch. The remaining portion of the property will flow into 2 batch detention basins that will discharge to an existing subdivision to the south of our site at a lower flow rate than what is existing. The flow from our site will ultimately continue to the south and into Blieders Creek.

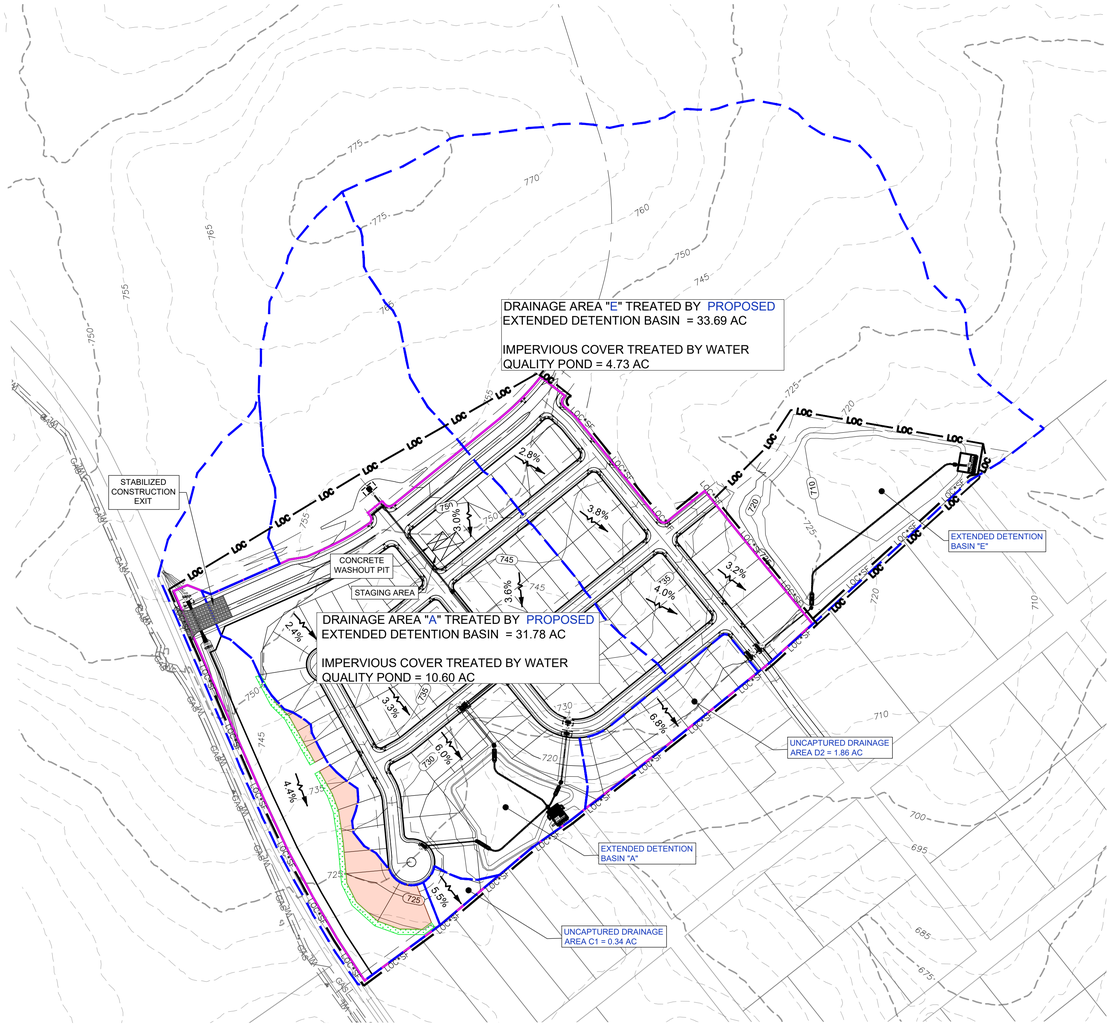
The proposed use for this property will be a single family that consist of 33.95 acres and 17.08 ac (50.3%) of impervious cover for the entire site. A proposed c-value of 0.79 was calculated based on the runoff coefficient from City of New Braunfels.

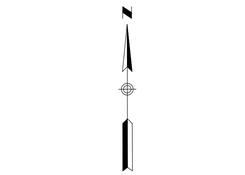
Attachment C – Suitability Letter from Authorized Agent

No OSSF will be used with this project.

Attachment D – Exception to the Requiered Geologic Assessment

N/A – No sensitive geologic or manmade features were identified in the Geologic Assesment.





SCALE IN FEET

SCALE: 1"=200'

LEGEND

- 740 — EXISTING CONTOUR
- 740 — PROPOSED CONTOUR
- XXX — FLOW ARROWS
- ROCK BERM
- TEMP. SPOILS & STORAGE AREA
- CONCRETE TRUCK WASHOUT PIT
- CONSTRUCTION ENTRANCE
- LOC*SF — LIMITS OF CONSTRUCTION/ SILT FENCE
- INLET PROTECTION
- PROPOSED ENGINEERED FILTER TRIPS
- DRAINAGE AREA TREATED BY PROPOSED BATCH DETENTION PONDS
- DRAINAGE AREA TREATED BY PROPOSED ENGINEERED FILTER STRIPS
- PROPERTY BOUNDARY

VERAMENDI PRECINCT 23 UNIT 1

WPAP DRAINAGE MAP EXHIBIT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: W1.1_Drainage Area_23-1.dwg

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. W1.1

FOR PERMIT

K:\SA3856.405 Properties\2405 23-1\401 WPAP\05_Temporary Stormwater Section_Form 0602\W1_Drainage Area_23-1.dwg
Xrefs: None
Last Modified: Jul 09, 25 - 21:12
Last Modified By: mk_ng - 14:14:45

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Veramendi 23-1
Date Prepared: 7/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	17.08	acres
Total post-development impervious cover fraction * =	0.21	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	15331	lbs.

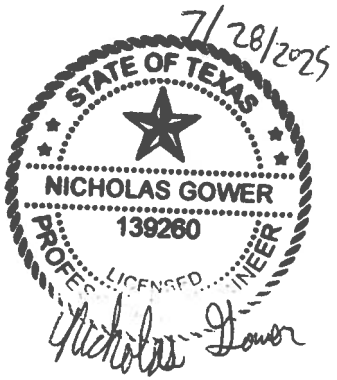
* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 3

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Pond

Total drainage basin/outfall area =	79.55	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	17.08	acres
Post-development impervious fraction within drainage basin/outfall area =	0.21	
$L_{M\ THIS\ BASIN}$ =	15331	lbs.



Texas Commission on Environmental Quality

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Project Name: Veramendi 23-1
Date Prepared: 7/8/2025

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A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	17.08	acres
Total post-development impervious cover fraction * =	0.21	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	15331	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Pond

Total drainage basin/outfall area =	31.78	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	10.60	acres
Post-development impervious fraction within drainage basin/outfall area =	0.33	
$L_{M\ THIS\ BASIN}$ =	9515	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** This is Batch Detention, TCEQ Spreadsheet wont let me change it
Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**31.78**	acres
A_I =	**10.60**	acres
A_P =	**21.18**	acres
L_R =	**11357**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

$L_{M\ THIS\ BASIN}$ = **10335** lbs. **Note Lm=Lr for this basin**

F = **0.91**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.27	
On-site Water Quality Volume =	57087	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	11417	
Total Capture Volume (required water quality volume(s) x 1.20) =	68,504	cubic feet

7/28/2025

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER

Nicholas Gower

Water Quality Outfall Velocity Requirement					
Drawdown Time Required	48	hrs			
	2880	min			
	172800	sec			
Volume Required	68,504	cubic feet			
Flow Required	0.40	cfs			
Riser Pipe Normal Dia.	6	inches	Hole Diameter	1	inches
Vertical Spacing b/w Rows (Center to Center)	4	inches		0.08	feet
# of perforations per Row	3	inches	area of 1 hole	0.01	SF
Length of Perforated pipe=L	2.5	Feet	Possible Rows	6.00	
Total area of holes	0.10	SF	100-yr WS	707	FT
Cloggin factor =B	0.5		Pipe Invert	702.22	FT
coefficient= Cd	0.62		Flow through Perforated Pipe $Q = L*B*Cd*A*\sqrt{2*g*h}$		
total open area per unit lenth of pipe= A	0.10	SF			
gavity =G	32.2	FT/Sec^2			
total head of water over perforated pipe=(Hmax)	2.28	FT			
total head of water over perforated pipe=(Hmin)	0.08	FT			
Q Max	0.92	CFS			
Q min	0.17	CFS	>0.08 CFS		

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Veramendi 23-1
Date Prepared: 7/8/2025

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1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	17.08	acres
Total post-development impervious cover fraction * =	0.21	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	15331	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Pond

Total drainage basin/outfall area =	33.69	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.73	acres
Post-development impervious fraction within drainage basin/outfall area =	0.14	
$L_{M\ THIS\ BASIN}$ =	4246	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** This is Batch Detention, TCEQ Spreadsheet wont let me change it

Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_I \times 34.6 + A_P \times 0.54)$

where:

A_C = Total On-Site drainage area in the BMP catchment area

A_I = Impervious area proposed in the BMP catchment area

A_P = Pervious area remaining in the BMP catchment area

L_R = TSS Load removed from this catchment area by the proposed BMP

A_C = **33.69** acres

A_I = **4.73** acres

A_P = **28.96** acres

L_R = **5384** lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

$L_{M\ THIS\ BASIN}$ = **4900** lbs. **Note Lm=Lr for this basin**

F = **0.91**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.16	
On-site Water Quality Volume =	34917	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6983	
Total Capture Volume (required water quality volume(s) x 1.20) =	41,900	cubic feet

7/28/2025

STATE OF TEXAS
NICHOLAS GOWER
139260
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PROFESSIONAL ENGINEER

Nicholas Gower

Water Quality Outfall Velocity Requirement					
Drawdown Time Required	48	hrs			
	2880	min			
	172800	sec			
Volume Required	41,900	cubic feet			
Flow Required	0.24	cfs			
Riser Pipe Normal Dia.	6	inches	Hole Diameter	1	inches
Vertical Spacing b/w Rows (Center to Center)	4	inches		0.08	feet
# of perforations per Row	3	inches	area of 1 hole	0.01	SF
Length of Perforated pipe=L	2.5	Feet	Possible Rows	6.00	
Total area of holes	0.10	SF	100-yr WS	707	FT
Cloggin factor =B	0.5		Pipe Invert	702.22	FT
coefficient= Cd	0.62		Flow through Perforated Pipe $Q = L*B*Cd*A*\sqrt{2*g*h}$		
total open area per unit lenth of pipe= A	0.10	SF			
gavity =G	32.2	FT/Sec^2			
total head of water over perforated pipe=(Hmax)	2.28	FT			
total head of water over perforated pipe=(Hmin)	0.08	FT			
Q Max	0.92	CFS			
Q min	0.17	CFS	>0.08 CFS		

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Veramendi 23-1**
Date Prepared: **7/8/2025**

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where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	17.08	acres
Total post-development impervious cover fraction * =	0.21	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	15331	lbs.

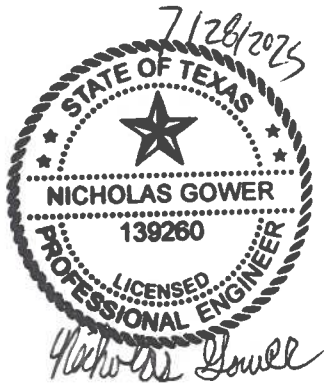
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Vegetative Filter Strips

Total drainage basin/outfall area =	5.41	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.37	acres
Post-development impervious fraction within drainage basin/outfall area =	0.07	
$L_{M\ THIS\ BASIN}$ =	332	lbs.



Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Veramendi 23-1 Ultimate**
Date Prepared: **7/8/2025**

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where:

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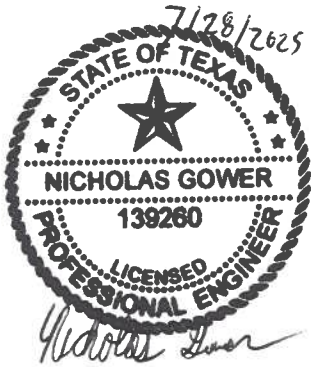
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	30.74	acres
Total post-development impervious cover fraction * =	0.39	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	27592	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 3



2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	Site	
Total drainage basin/outfall area =	79.55	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	30.74	acres
Post-development impervious fraction within drainage basin/outfall area =	0.39	
$L_{M\ THIS\ BASIN}$ =	27592	lbs.

Texas Commission on Environmental Quality

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A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	30.21	acres
Total post-development impervious cover fraction * =	0.38	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	27116	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Pond

Total drainage basin/outfall area =	31.78	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	17.02	acres
Post-development impervious fraction within drainage basin/outfall area =	0.54	
$L_{M\ THIS\ BASIN}$ =	15277	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** This is Batch Detention, TCEQ
Removal efficiency = **91** percent Spreadsheet wont let me change it

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**31.78**	acres
A_I =	**17.02**	acres
A_P =	**14.76**	acres
L_R =	**17924**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

$L_{M\ THIS\ BASIN}$ = **16040** lbs. **Note Lm=Lr for this basin**

F = **0.89**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.60	inches
Post Development Runoff Coefficient =	0.38	
On-site Water Quality Volume =	69753	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	13951	
Total Capture Volume (required water quality volume(s) x 1.20) =	83,704	cubic feet

7/28/2025

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER

Nicholas Gower

Water Quality Outfall Velocity Requirement					
Drawdown Time Required	48	hrs			
	2880	min			
	172800	sec			
Volume Required	83,704	cubic feet			
Flow Required	0.48	cfs			
Riser Pipe Normal Dia.	6	inches	Hole Diameter	1	inches
Vertical Spacing b/w Rows (Center to Center)	4	inches		0.08	feet
# of perforations per Row	3	inches	area of 1 hole	0.01	SF
Length of Perforated pipe=L	2.5	Feet	Possible Rows	6.00	
Total area of holes	0.10	SF	100-yr WS	707	FT
Cloggin factor =B	0.5		Pipe Invert	702.22	FT
coefficient= Cd	0.62		Flow through Perforated Pipe $Q = L*B*Cd*A*\sqrt{2*g*h}$		
total open area per unit lenth of pipe= A	0.10	SF			
gavity =G	32.2	FT/Sec^2			
total head of water over perforated pipe=(Hmax)	2.28	FT			
total head of water over perforated pipe=(Hmin)	0.08	FT			
Q Max	0.92	CFS			
Q min	0.17	CFS	>0.08 CFS		

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Veramendi 23-1 Ultimate**
Date Prepared: **7/8/2025**

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where:

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A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	30.21	acres
Total post-development impervious cover fraction * =	0.38	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	27116	lbs.

* **The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = **Pond**

Total drainage basin/outfall area =	39.69	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	12.94	acres
Post-development impervious fraction within drainage basin/outfall area =	0.33	
$L_{M\ THIS\ BASIN}$ =	11615	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** This is Batch Detention, TCEQ Spreadsheet wont let me change it

Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:

A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	**39.69**	acres
A_I =	**12.94**	acres
A_P =	**26.75**	acres
L_R =	**13879**	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

$L_{M\ THIS\ BASIN}$ = **12630** lbs. **Note Lm=Lr for this basin**

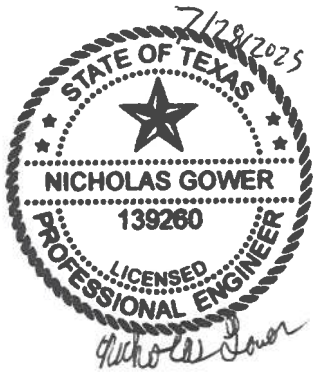
F = **0.91**

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.27	
On-site Water Quality Volume =	70337	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	14067	
Total Capture Volume (required water quality volume(s) x 1.20) =	84,404	cubic feet



Water Quality Outfall Velocity Requirement					
Drawdown Time Required	48	hrs			
	2880	min			
	172800	sec			
Volume Required	84,404	cubic feet			
Flow Required	0.49	cfs			
Riser Pipe Normal Dia.	6	inches	Hole Diameter	1	inches
Vertical Spacing b/w Rows (Center to Center)	4	inches		0.08	feet
# of perforations per Row	3	inches	area of 1 hole	0.01	SF
Length of Perforated pipe=L	2.5	Feet	Possible Rows	6.00	
Total area of holes	0.10	SF	100-yr WS	707	FT
Cloggin factor =B	0.5		Pipe Invert	702.22	FT
coefficient= Cd	0.62		Flow through Perforated Pipe $Q = L*B*Cd*A*\sqrt{2*g*h}$		
total open area per unit lenth of pipe= A	0.10	SF			
gavity =G	32.2	FT/Sec^2			
total head of water over perforated pipe=(Hmax)	2.28	FT			
total head of water over perforated pipe=(Hmin)	0.08	FT			
Q Max	0.92	CFS			
Q min	0.17	CFS	>0.08 CFS		

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Veramendi 23-1 Ultimate
Date Prepared: 7/8/2025

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:

$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Comal	
Total project area included in plan * =	79.55	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	30.21	acres
Total post-development impervious cover fraction * =	0.38	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	27116	lbs.

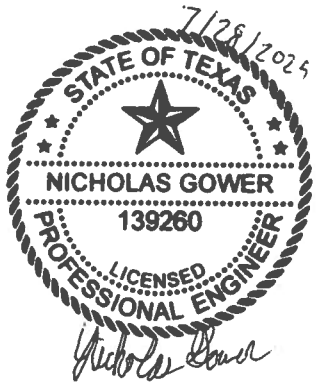
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 1

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = Vegetative Filter Strips

Total drainage basin/outfall area =	5.41	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.37	acres
Post-development impervious fraction within drainage basin/outfall area =	0.07	
$L_{M\ THIS\ BASIN}$ =	332	lbs.



Texas Commission on Environmental Quality
Water Pollution Abatement Plan
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 (ED), nor do they constitute a comprehensive listing of rules or conditions to be followed during construction. Further actions may be required to achieve compliance with TCEQ regulations found in Title 30, Texas Administrative Code (TAC), Chapters 213 and 217, as well as local ordinances and regulations providing for the protection of water quality. Additionally, nothing contained in the following/listed "construction notes" restricts the powers of the ED, the commission or any other governmental entity to prevent, correct, or curtail activities that result or may result in pollution of the Edwards Aquifer or hydrologically connected surface waters. The holder of any Edwards Aquifer Protection Plan containing "construction notes" is still responsible for compliance with Title 30, TAC, Chapters 213 or any other applicable TCEQ regulation, as well as all conditions of an Edwards Aquifer Protection Plan through all phases of plan implementation. Failure to comply with any condition of the ED's approval, whether or not in contradiction of any "construction notes," is a violation of TCEQ regulations and any violation is subject to administrative rules, orders, and penalties as provided under Title 30, TAC § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the ED to any part of Title 30 TAC, Chapters 213 and 217, or any other TCEQ applicable regulation

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

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 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 sedimentation 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.

9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.

10. 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 Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

    A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;

    B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;

    C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

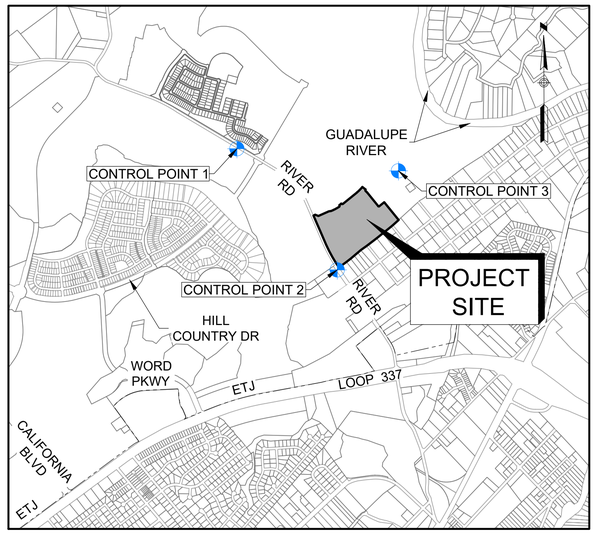
THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

VERAMENDI PRECINCT 23 UNIT 1

CONSTRUCTION DOCUMENT SET

NEW BRAUNFELS, TEXAS 78132
COMAL COUNTY

NBU #: W-263129 / WW-263130
TCEQ SCS #: RNXXXXXXXXX
CONB #: PI2025-0027



LOCATION MAP
1" = 1500'

SUBMITTAL DATE: APRIL 2025

NBU NOTES:

1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, NEW BRAUNFELS UTILITIES MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER OF RECORD.
2. THE ENGINEER OF RECORD ACKNOWLEDGES THAT ALL PROPOSED WATER AND WASTEWATER IMPROVEMENTS MUST COMPLY WITH CRITERIA FROM THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY, THE CITY OF NEW BRAUNFELS, NBU W&WW DESIGN CRITERIA, AND OTHER GOVERNING ENTITY ORDINANCES OR CODES, AND SOUND ENGINEERING JUDGEMENT.
3. THE ENGINEER OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR THE NBU WATER SYSTEM IS THE MAIN SIDE OF THE SERVICE/LATERAL/LEAD FROM THE CUSTOMER'S METER, BACKFLOW PREVENTER, OR EASEMENT EDGE. THE CUSTOMER IS RESPONSIBLE FOR THE DESIGN, PERMITTING, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER IT'S INSTALLATION.
4. THE ENGINEERING OF RECORD ACKNOWLEDGES THAT THE POINT OF DELIVERY FOR A NBU WASTEWATER SYSTEM IS THE MAIN SIDE OF THE SERVICE LATERAL FROM THE CUSTOMER'S CLEAN OUT OR PROPERTY LINE, WHICHEVER IS NEARER. THE CUSTOMER IS RESPONSIBLE FOR THE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE BEYOND THE POINT OF DELIVERY AND HAS SOLE CONTROL AND SUPERVISION OVER ITS INSTALLATION.
5. WATER IS A PRECIOUS COMMODITY IN THE STATE OF TEXAS AND NEW BRAUNFELS UTILITIES (NBU) IS PASSIONATE ABOUT PROTECTING THE LOCAL RESOURCE. THE CONTRACTOR IS FULLY RESPONSIBLE FOR ACQUIRING A FIRE HYDRANT METER SO THAT ALL WATER USED FOR CONSTRUCTION OR TESTING PURPOSED IS PROPERLY ACCOUNTED FOR. NBU WILL NOT TOLERATE ANY WATER THEFT, REGARDLESS OF THE AMOUNT. IF WATER THEFT IS DISCOVERED, THE CONTRACTOR SHALL BE SUBJECT TO MONETARY PENALTIES, CRIMINAL CHARGES, AND STOPPAGE OF ALL CONSTRUCTION ACTIVITIES RELATED TO THE PROJECT. COSTS ASSOCIATED WITH ANY WORK STOPPAGE RESULTING FROM WATER THEFT SHALL BE AT THE FULL EXPENSE OF THE CONTRACTOR.

NBU AS-BUILT REQUIREMENTS:

NBU REQUIRES GPS POINTS FOR CERTAIN WATER, WASTEWATER AND ELECTRIC IMPROVEMENTS. SOME OF THIS INFORMATION/DATA MUST BE PERFORMED DURING CONSTRUCTION, PRIOR TO BACKFILLING OPERATIONS. CONTRACTOR SHALL COORDINATE WITH NBU INSPECTOR TO VERIFY ANY ADDITIONAL ITEMS NOT SHOWN BELOW THAT NEED TO BE GPS LOCATED AND THE SURVEY/DELIVERY REQUIREMENTS REGARDING THIS INFORMATION.

GPS POINTS SHALL BE REQUIRED FROM THE DEVELOPER'S CONTRACTOR OR ENGINEER. A MINIMUM OF THREE COORDINATE POINTS FOR GEOREFERENCING SHALL BE REQUIRED. THE WATER AND WASTEWATER GPS POINTS SHALL BE TO SURVEY GRADE. THE ELECTRIC GPS POINTS SHALL BE TO MAP GRADE.

WATER

- VERTICAL BENDS AND EDGE OF STEEL CASING (IF APPLICABLE) PRIOR TO BACKFILL
- HORIZONTAL BENDS PRIOR TO BACKFILL
- TEES PRIOR TO BACKFILL
- FITTINGS (REDUCERS AND COUPLINGS) PRIOR TO BACKFILL
- FIRE HYDRANTS (TOP OF FLANGE)
- VALVES
- METERS (TOP CENTER OF BOX)
- BLOW OFF ASSEMBLY
- CORNER SLAB OF WATER TANK & GATE VALVE ON TANK

WASTEWATER

- MANHOLES (AND INVERT DEPTH(S)
- CLEANOUTS
- CORNER SLAB OF LIFT STATION

ELECTRIC

- POLES
- TRANSFORMERS, BOTH ABOVE AND UNDERGROUND (FRONT LOCK)
- PULL BOXES
- STREET LIGHTS
- SEE NBU'S "CAD/GPS DELIVERABLES" ON NBU WEBSITE AT NBUTEXAS.COM FOR COMPLETE DETAILS AND REQUIREMENTS.

NOTES:

1. TYPE 3 DEVELOPMENT.
2. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER OF RECORD. IN ACCEPTING THESE PLANS, THE CITY OF NEW BRAUNFELS MUST RELY UPON THE ADEQUACY OF THE WORK OF THE ENGINEER RECORD.
3. IF CONSTRUCTION HAS NOT COMMENCED WITHIN ONE YEAR OF CITY APPROVAL FOR CONSTRUCTION INSPECTION, THAT APPROVAL IS NO LONGER VALID.
4. THIS PROJECT IS WITHIN THE EDWARDS AQUIFER JURISDICTIONAL ZONES.
5. NO PORTION OF THIS PROJECT IS WITHIN AN INDICATED SPECIAL FLOOD HAZARD ZONE ACCORDING TO THE FEMA FIRM MAP NO.48091C0435F EFFECTIVE DATE 9/2/2009.
6. GAS UTILITIES ARE NOT INCLUDED IN THE CIVIL CONSTRUCTION PLANS. FINAL GAS UTILITY DESIGN SHALL BE APPROVED BY THE CITY FOR ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY.
7. FOLLOWING PERMITS ARE REQUIRED PRIOR TO START OF CONSTRUCTION:
   A. CITY OF NEW BRAUNFELS PUBLIC INFRASTRUCTURE PERMIT
   B. NEW BRAUNFELS UTILITY APPROVAL
   C. TCEQ WATER POLLUTION ABATEMENT PLAN APPROVAL
   D. TCEQ SEWAGE COLLECTION SYSTEM APPROVAL

BENCHMARK INFORMATION:

CONTROL POINT 1: SET 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LJA SURVEYING"
NORTHING: 13820380.9523
EASTING: 2243003.3305
ELEVATION: 738.93'

CONTROL POINT 2: SET 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LJA SURVEYING"
NORTHING: 13817841.2523
EASTING: 2245105.1175
ELEVATION: 708.04'

CONTROL POINT 3: SET 5/8" IRON ROD W/ ALUMINUM CAP STAMPED "LJA SURVEYING"
NORTHING: 13819917.9313
EASTING: 2246387.8215
ELEVATION: 736.64'

ALL COORDINATES SHOWN HEREON ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (2011 ADJUSTMENT EPOCH 2010.00) COORDINATES ARE IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID BY MULTIPLYING THE SURFACE ADJUSTMENT FACTOR OF 0.999860020.

ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), GEOID 18.

SURVEY OBSERVATIONS WERE MADE ON THE GROUND USING A COMBINATION OF RTK AND STATIC NETWORKS.

THIS INFORMATION PROVIDED BY LJA SURVEYING.

PROPERTY DESCRIPTION

BEING 33.95 ACRES OF LAND, OUT OF A CALLED 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NUMBER 202206035304 IN THE OFFICIAL PUBLIC RECORDS OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI SURVEY NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

DEVELOPER: VERAMENDI PE - GOLD COAST, LLC
2168 OAK RUN PARKWAY, SUITE 101
NEW BRAUNFELS, TEXAS 78132
CONTACT PERSON: GARRETT MECHLER, Co-CEO
TELEPHONE: (830) 643-5633

ENGINEER: LJA ENGINEERING, INC.
9830 COLONNADE BLVD, SUITE 300
SAN ANTONIO, TEXAS 78230
CONTACT PERSON: PRISCILLA FLORES, P.E.
PHONE # (210) 503-2700
LJA.COM

SURVEYOR: LJA SURVEYING
9830 COLONNADE BOULEVARD,SUITE 300
SAN ANTONIO, TEXAS 78230
CONTACT PERSON: GORDON ANDERSON
PHONE # (210) 503-2700

CONTOUR DATA: FIELD SURVEY BY LJA SURVEYING

LJA JOB NO. SA3856.2405

REVISIONS			
NO.	DESCRIPTION	BY	DATE

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

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2.1	PLAT (SHEET 2 OF 5)
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3.0	UTILITY LAYOUT (SHEET 1 OF 6)
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6.2	GRADING PLAN
6.3	GRADING PLAN
6.4	GRADING PLAN
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6.6	GOLD COAST DR PLAN & PROFILE STA. 9+50 TO STA. 13+59
6.7	SWEETWOOD DR PLAN & PROFILE STA. 17+00 TO STA. 24+00
6.8	SWEETWOOD DR PLAN & PROFILE STA. 24+00 TO STA. END
6.9	CAPULIN TRAIL PLAN & PROFILE STA. 1+00 TO STA. 12+96
6.10	DEWBERRY LN PLAN & PROFILE STA. 1+00 TO STA. 11+58
6.11	MAYHAW DR PLAN & PROFILE STA. 1+00 TO STA. 10+67
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8.10	WASTEWATER LINE 'C' STA. 1+00 TO END
8.11	WASTEWATER LINE 'D' STA. 1+00 TO END
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8.13	WASTEWATER LINE 'F' STA. 1+00 TO STA. 6+00
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9.4	TREE PRESERVATION PLAN (SHEET 3 OF 4)
9.5	TREE PRESERVATION PLAN (SHEET 4 OF 4)
9.6	TREE PRESERVATION PLAN DETAILS

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
FRN-F-1386

FOR PERMIT

CONSTRUCTION PLAN NOTES

Revised 03/2020

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

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

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

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

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

For Public Infrastructure Permit or Grading Permit Projects:

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

For Commercial Permit **(CP)** Projects:

- All inspections are to be called in at 830-221-4068 or,
- Faxed in at 830-608-2117 or,
- E-mailed at inspections@nbtexas.org.

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

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

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

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

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

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

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

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

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

Item 340
Asphaltic concrete pavement shall be the type of hot mix asphalt as defined in TxDOT's standard specifications for current TxDOT Standard Specifications for Construction of Highways, Street and Bridges.

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

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

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

Curb Cut Due to Construction of New Right-Of-Way Construction
(Indicate the 2 Options on the construction plans).
1. Sawcut existing street and match to new construction.
2. Sawcut existing curb to tie into existing construction.

Construction Stabilized Entrance
Sawcut curb for construction entrance.

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

(Notes to Be Placed on All WW Plan & Detail Sheets)
Ensure all driveway approaches are built in general accordance with A.D.A. specifications.

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

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

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

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

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

Areas requiring permanent vegetation (earthen channels, ponds, etc.) are required to meet TxDOT Specifications for Item 160 Topsoil. Testing per Tex-128-E will be required at the City's request.

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

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

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY 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 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 ANT 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 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 SEDIMENTATION 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.
9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.
10. 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 AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:
    A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;
    B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;
    C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

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

INSPECTION AND MAINTENANCE SCHEDULE FOR PERMANENT POLLUTION ABATEMENT MEASURES

Recommended Frequency	*Task to be Performed*		
	1	*2*	*3*
*Annually**	√	√	√

***Inspections to occur quarterly during the first year of operation.**
√Indicates maintenance procedure that applies to this specific site.

See description of maintenance task to be performed on the following pages. Frequency of maintenance tasks may vary depending on amount of rainfall and other weather-related conditions but may not be altered without TCEQ approval. Inspection frequency is assumed years is based on the maintenance plan developed in the first year but must occur annually at a minimum.

A written record will be kept of inspection results and maintenance performed.

Task No. & Description	*Included in this project*	
1. Cleaning	**Yes**	**No**
2. Manual Backflush / Flow Rate Test	**Yes**	**No**
3. External Rinsing	**Yes**	**No**

INSPECTION AND MAINTENANCE SCHEDULE – BATCH DETENTION BASIN FOR PERMANENT POLLUTION ABATEMENT MEASURES

Recommended Frequency	Task to be Performed											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
After Rainfall	√							√			√		√
Biannually*	√	√	√	√	√	√	√	√	√	√	√	√	√

***At least one biannual inspection must occur during or immediately after a rainfall event.**
√Indicates maintenance procedure that applies to this specific site.

See description of maintenance task to be performed on the following pages. Frequency of maintenance tasks may vary depending on amount of rainfall and other weather related conditions but may not be altered without TCEQ approval.

A *written record should be kept of inspection results and maintenance performed.*

Task No. & Description	*Included in this project*	
1. Mowing	**Yes**	~~**No**~~
2. Litter and Debris Removal	**Yes**	~~**No**~~
3. Erosion Control	**Yes**	~~**No**~~
4. Level Sensor	**Yes**	~~**No**~~
5. Nuisance Control	**Yes**	~~**No**~~
6. Structural Repairs and Replacement	**Yes**	~~**No**~~
7. Discharge Pipe	**Yes**	~~**No**~~
8. Detention and Drawdown Time	**Yes**	~~**No**~~
9. Sediment Removal	**Yes**	~~**No**~~
10. Logic Controller	**Yes**	~~**No**~~
11. Vegetated Filter Strips	~~**Yes**~~	**No**
12. Visually Inspect Security Fencing for Damage or Breach	**Yes**	~~**No**~~
13. Recordkeeping for Inspections, Maintenance, and Repairs	**Yes**	~~**No**~~

CHANNEL MAINTENANCE PLAN

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

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

DRAINAGE MAINTENANCE PLAN

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

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 Policy".
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 two (2) working days (48 hours) notice. WORK COMPLETED BY THE CONTRACTOR, WHICH HAS NOT RECEIVED A NOTICE TO PROCEED FROM 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 Contractor and acceptance by the New Braunfels Utilities Water System. NBU will own and maintain said water / wastewater mains which are located within platted utility easements or public ROW of proposed developments. (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 to contact the engineer-of-record (EOR) for any field changes. Any revisions or changes to the approved construction plans will require additional approval by NBU in writing.
6. 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.
7. Contractor shall be responsible for restoring to its original or better condition, any damage to existing fences, curbs, streets, driveways, landscaping and structures, and existing utilities (not adjusted on plans). Cost of Restoration, if any, shall be the Contractor's entire expense.
8. The Contractor shall avoid cutting roots larger than one (1) inch in diameter when excavating near existing trees. Excavation in vicinity of trees shall proceed with caution.
9. 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.
10. 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.
11. 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.
12. 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.
13. Barricades and warning signs shall conform to the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) 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.
14. Contractor is required to verify project elevations. The term "match existing" shall be understood to signify both horizontal and vertical alignment.
15. 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.
16. OSHA regulations prohibit operations that will bring persons or equipment within 10 feet of an energized line. Where workmen and/or equipment must 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.
17. It shall be the contractor's responsibility to locate utility service lines as required for construction. Contractors shall call the One Call System for water/wastewater location.
18. 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.
19. 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. The continuous movement of the traffic in one direction, at minimum, shall be maintained 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.
20. Prior to ordering materials to be used in construction, contractor shall provide the engineer with four (4) copies of the source, type, gradation, material specification data and / or shop drawings, as applicable, to satisfy the requirements of the following items and all material items referred to in these listed items:
    a. Water mains and services
    b. Wastewater mains and services
21. Water jetting the backfill within a street will not be permitted. Wastewater trenches subject to traffic shall conform to NBU Connection and Construction Policy Manual.
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.
    a. All utility trench compaction test within the street pavement section shall be the responsibility of the developer's Geo-technical engineer.
    b. Fill material shall be placed in uniform layers not to exceed twelve inches (12") loose.
    c. Each layer of material shall be compacted as specified and tested for density and moisture in accordance with Text Methods TEX-113-E, TEX-114-E, TEX-115-E.
    d. The number and location of required tests shall be determined by the Geo-technical Engineer and approved by the City of New Braunfels Street Inspector.
    e. Upon completion of testing the Geo-technical Engineer shall provide the City of New Braunfels Street inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans.

PROPOSED CONSTRUCTION SEQUENCE

1. INSTALL TEMPORARY STORMWATER EROSION CONTROL MEASURES IN AFFECTED CONSTRUCTION AREAS AND STABILIZED CONSTRUCTION ENTRANCES/EXITS.
2. INSTALL TREE PRESERVATION MEASURES, IF REQUIRED.
3. EXCAVATE STREETS.
4. CONSTRUCT DRAINAGE.
5. CONSTRUCT WASTEWATER SYSTEM.
6. CONSTRUCT WATER SYSTEM.
7. CONSTRUCT SUBGRADE AND BASE FOR STREETS.
8. CONSTRUCT CURBS FOR STREETS.
9. CONSTRUCT ASPHALT PAVEMENT FOR STREETS.
10. ESTABLISH SITE STABILIZATION.
11. REMOVE ALL TEMPORARY STORMWATER EROSION CONTROL MEASURES.

NOTES:

1. SOME ITEMS ABOVE WILL OCCUR SIMULTANEOUSLY OR MAY OCCUR OUT OF SEQUENCE INDICATED.
2. ALL SEQUENCES SUBJECT TO CHANGE.
3. COORDINATE GPS REQUIREMENTS WITH NBU INSPECTOR
4. DRAINAGE IMPROVEMENTS SUFFICIENT TO MITIGATE THE IMPACT OF CONSTRUCTION SHALL BE INSTALLED PRIOR TO ADDING IMPERVIOUS COVER.

X:\LJA\SDSK_KSA Properties\U2405 23-1\U25 Site Development Plans\03WC-Sheets\sh_General Notes.dwg
User: Nicholas Gower
Last Modified: Jun. 05, 25 - 16:58
Last Plotted: Jun. 05, 25 - 16:58

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

GENERAL NOTES

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

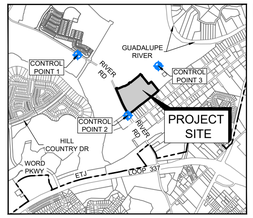
DATE: 6/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: 01_General Notes.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

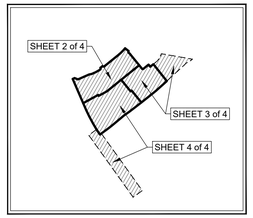
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 1.1



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

SUBDIVISION PLAT OF VERAMENDI PRECINCT 23 UNIT 1

BEING 29.23 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

CERTIFICATE OF APPROVAL

APPROVED THIS THE _____ DAY OF _____, 20 _____,
BY THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT OF THE CITY OF NEW BRAUNFELS, TEXAS.

APPROVED FOR ACCEPTANCE

_____ _____
PLANNING DIRECTOR

_____ _____
CITY ENGINEER

SURVEYOR NOTES:

1. MONUMENTS WERE FOUND OR SET AT EACH CORNER OF THE SURVEY BOUNDARY OF THE SUBDIVISION AS NOTED. MONUMENTS AN LOT MARKERS WILL BE SET WITH ½" IRON ROD WITH CAP MARKED "LJA" OR MAG NAIL WITH DISK MARKED "LJA" AFTER THE COMPLETION OF UTILITY INSTALLATION AND STREET CONSTRUCTION UNLESS NOTED OTHERWISE.
2. COORDINATES SHOWN ARE BASED ON THE NORHT AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00 FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE DISPLAYED IN GRID VALUES DERIVED FROM THE NGS COOPERATIVE CORS NETWORK.
3. DIMENSIONS SHOWN ARE SURFACE (SCALE FACTOR = 1.00014)
4. BEARINGS ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 NAD83 (NA2011) EPOCH 2010.00, FROM THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE.

STATE OF TEXAS
COUNTY OF BEXAR

I, THE UNDERSIGNED GORDON ANDERSON , A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXS, HEREBY CERTIFY THAT THIS PLAT IS TRUE AND CORRECTLY MADE UNDER MY SUPERVISION AND IN COMPLIANCE WITH CITY AND STATE SURVEY REGULATIONS AND LAWS AND MADE ON THE GROUND AND THAT THE CORNER MONUMENTS WER PROPERLY PLACED UNDER MY SUPERVISION

_____
GORDON ANDERSON
REGISTERED PROFESSIONAL LAND SURVEYOR #6617
LJA ENGINEERING, INC.
9830 COLONNADE BOULEVARD, SUITE 300
SAN ANTONIO, TEXAS 78230

NBU NOTES:

1. MAINTENANCE OF DEDICATED UTILITY EASEMENTS IS THE RESPONSIBILITY OF THE PROPERTY OWNER. ANY USE OF AN EASEMENT, OR ANY PORTION OF IT, INCLUDING LANDSCAPING OF DRAINAGE FEATURES, IS SUBJECT TO AND SHALL NOT CONFLICT WITH THE TERMS AND CONDITIONS IN THE EASEMENT. MUST NOT ENDANGER OR INTERFERE WITH THE RIGHTS GRANTED BY THE EASEMENT TO NEW BRAUNFELS UTILITIES, ITS SUCCESSORS AND ASSIGNS, AND SHALL BE SUBJECT TO APPLICABLE PERMIT REQUIREMENTS OF THE CITY OF NEW BRAUNFELS OR ANY OTHER GOVERNING BODY. THE PROPERTY OWNER MUST OBTAIN, IN ADVANCE, WRITTEN AGREEMENT WITH THE UTILITIES TO UTILIZE THE EASEMENT, OR ANY PART OF IT.
2. UTILITIES WILL POSSESS A 5' WIDE SERVICE EASEMENT TO THE BUILDING STRUCTURE ALONG THE SERVICE LINE TO THE SERVICE ENTRANCE. THIS EASEMENT WILL VARY DEPENDING UPON LOCATION OF DWELLING AND SERVICE.
3. UTILITIES SHALL HAVE ACCESS TO THE METER LOCATIONS FROM THE FRONT YARD AND METER LOCATIONS SHALL NOT BE LOCATED WITHIN A FENCED AREA.
4. EACH LOT MUST HAVE ITS OWN WATER AND SEWER SERVICE AT THE OWNER/DEVELOPER'S EXPENSE.
5. DO NOT COMBINE ANY NEW UTILITY EASEMENTS (UE) WITH DRAINAGE EASEMENTS (DE) OR MAKE CHANGES IN GRADE WITHIN THE UTILITY EASEMENTS (UE) WITHOUT WRITTEN APPROVAL FROM NEW BRAUNFELS UTILITIES.
6. NBU IS NOT RESPONSIBLE FOR LANDSCAPING OR IRRIGATION IN UE/LE.

FLOOD ZONE NOTES:

NO PORTION OF THE SUBDIVISION IS LOCATED WITHIN ANY SPECIAL FLOOD HAZARD AREA (100 YR. FLOOD), AS DEFINED BY THE COMAL COUNTY, TEXAS, FLOOD INSURANCE RATE MAP NO. 48091C0435F EFFECTIVE DATE 5/8/2024 AS PREPARED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

UTILITY PROVIDER NOTES:

THE PROPERTY WILL BE SERVED BY THE FOLLOWING:
- NEW BRAUNFELS UTILITIES (WATER, SEWER, ELECTRIC)
- AT&T (TELECOMMUNICATIONS)
- SPECTRUM (TELECOMMUNICATIONS)

NBU NOTES:

1. MAINTENANCE OF DEDICATED UTILITY EASEMENTS IS THE RESPONSIBILITY OF THE PROPERTY OWNER. ANY USE OF AN EASEMENT, OR ANY PORTION OF IT, INCLUDING LANDSCAPING OF DRAINAGE FEATURES, IS SUBJECT TO AND SHALL NOT CONFLICT.

DRAINAGE EASEMENT NOTES:

1. DRAINAGE EASEMENTS SHALL "REMAIN FREE OF ALL OBSTRUCTIONS.
2. MAINTENANCE OF DRAINAGE EASEMENT SHOWN OUTSIDE OF LOT LINES SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER'S, OR THE PROPERTY OWNER'S ASSOCIATION, OR ITS SUCCESSORS OR ASSIGNS AND NOT THE RESPONSIBILITY OF THE CITY OF NEW BRAUNFELS OR COMAL COUNTY.
3. NO STRUCTURES, WALLS OR OTHER OBSTRUCTIONS OF ANY KIND SHALL BE PLACED WITHIN THE LIMITS OF DRAINAGE EASEMENTS SHOWN ON THIS PLAT. NO LANDSCAPING, FENCES, OR OTHER TYPE OF MODIFICATIONS WHICH ALTER THE CROSS SECTIONS OF THE DRAINAGE EASEMENTS OR DECREASES THE HYDRAULIC CAPACITY OF THE EASEMENT, AS APPROVED, SHALL BE ALLOWED WITHOUT THE APPROVAL OF THE CITY ENGINEER. THE CITY OF NEW BRAUNFELS AND COMAL COUNTY SHALL HAVE THE RIGHT OF INGRESS AND EGRESS OVER GRANTORS ADJACENT PROPERTY TO REMOVE ANY OBSTRUCTIONS PLACED WITHIN THE LIMITS OF SAID DRAINAGE EASEMENTS AND TO MAKE ANY MODIFICATIONS OR IMPROVEMENTS WITHIN SAID DRAINAGE EASEMENTS.

SIDEWALK NOTES:

1. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE HOME BUILDER PER CITY STANDARDS AT THE TIME OF BUILDING CONSTRUCTION ALONG:
   A. SWEETWOOD DR.
   B. CAPULIN TRL
   C. DEWBERRY LN.
   D. CIERRO DR.
   E. MAYHAW DR.
2. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG:
   A. SWEETWOOD DR. - LOT 900, BLK 230; LOT 900, BLK 233; LOT 900, BLK 235
   B. CAPULIN TRL - LOT 900, BLK 232; PROPERTY BOUNDARY FRONTAGE
   C. DEWBERRY LN. - LOT 900, BLK 234; LOT 900, BLK 235; PROPERTY BOUNDARY FRONTAGE
   D. CIERRO DR. - LOT 900, BLK 230; LOT 900, BLK 231; LOT 900, BLK 232
   E. MAYHAW DR. - LOT 900, BLK 230; LOT 900 BLK 235
3. SIX (6) FOOT WIDE SIDE WALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION CONSTRUCTION WITHIN:
   A. GOLD COAST DR. - LOT 900, BLK 230; LOT 900, BLK 235; PROPERTY BOUNDARY FRONTAGE

PLAT NOTES:

1. THIS PLAT IS SUBJECT TO THE REQUIREMENTS AND REGULATIONS OF THE VERAMENDI DEVELOPMENT COMPANY DEVELOPMENT AGREEMENT, RECORDED AS DOCUMENT NO. 201506029547 AND AS AMENDED.
2. THIS PLAT IS LOCATED WITHIN THE NEIGHBORHOOD (MIXED DENSITY) RESIDENTIAL PLANNING AREA.
3. STANDARDS FOR PLANT MATERIALS SHALL CONFORM TO THE STANDARDS OF THE LATEST EDITION OF THE *AMERICAN NATIONAL STANDARD A300 PLANTING AND TRANSPLANTING NURSERY STOCK* PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
4. TREE REPLACEMENT SHALL OCCUR WITHIN 12 MONTHS OF REMOVAL OF THE HIGH VALUE TREE UNLESS DEFERRED TO AN ADJACENT UNIT. WHERE A REPLACEMENT TREE DOES NOT SURVIVE FOR A PERIOD OF AT LEAST 24 MONTHS, THE ORIGINAL APPLICANT OR CURRENT LANDOWNER SHALL REPLACE THE TREE, PREFERABLY DURING OCTOBER - FEBRUARY, UNTIL THE TREE SURVIVES A 12-MONTH PERIOD.
5. SHOULD ANY TREE DESIGNATED FOR RETENTION IN AN APPROVED TREE PROTECTION PLAN DIE PRIOR TO, OR WITHIN 12 MONTHS OF THE COMPLETION OF CONSTRUCTION WORKS, THE APPLICANT SHALL REPLACE THE DEAD TREE WITH A REPLACEMENT TREE/S EQUAL TO THE TOTAL CALIPER INCHES OF THE DEAD TREE. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK TO BE PERFORMED BY HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST.
6. DURING CONSTRUCTION, THE CLEANING OF EQUIPMENT OR MATERIALS AND/OR THE DISPOSAL OF ANY WASTE MATERIAL, INCLUDING, BUT NOT LIMITED TO PAINT, OIL, SOLVENTS, ASPHALT, CONCRETE, MORTAR, ETC., UNDER THE CANOPY OR DRIP LINE OF ANY HIGH VALUE TREE SHALL BE PROHIBITED. NO GRADING, TRENCHING OR EQUIPMENT SHALL BE CONDUCTED OR USED IN THE AREA IDENTIFIED IN THE ROOT PROTECTION ZONE. ALL WORK SHALL BE PERFORMED BY HAND OR UNDER THE SUPERVISION OF A CERTIFIED ARBORIST. NO ATTACHMENTS OR WIRES OF ANY KIND, OTHER THAN THOSE OF A PROTECTIVE NATURE, SHALL BE ATTACHED TO ANY HIGH VALUE TREE.
7. LOTS TO BE HELD IN COMMON PROPERTY BY A HOMEOWNERS' OR PROPERTY OWNERS' ASSOCIATION SHALL BE SHOWN ON THE PLAT AS A SEPARATE LOT.
8. NO BUILDING SHALL BE SITED WITHIN THE EXTENT OF A SENSITIVE FEATURE AND ASSOCIATED BUFFER. FOR ANY LOT WHICH CONTAINS A HIGH VALUE TREE, AND A BUILDING ENVELOPE WAS NOT APPROVED AS PART OF A FINAL PLAT, THE LOCATION OF A BUILDING ENVELOPE SHALL BE APPROVED BY THE PLANNING DIRECTOR PRIOR TO A BUILDING PERMIT BEING ISSUED.
9. FUTURE DEVELOPMENT IS SUBJECT TO CHAPTER 114 (STREETS, SIDEWALKS AND OTHER PUBLIC SPACES) OF THE NEW BRAUNFELS CODE OF ORDINANCES.
10. IMPERVIOUS COVER - THE MAXIMUM CUMULATIVE IMPERVIOUS COVER PERCENTAGE FOR THE PROPERTY AS A WHOLE AND FOR EACH SECTOR PLAN SHALL NOT EXCEED SIXTY-FIVE PERCENT (65%).
11. AMENDMENTS TO THE PARK PROGRAMMING SCHEDULE, INCLUDING BUT NOT LIMITED TO THE PROVISION OF ADDITIONAL IMPROVEMENTS OR SUBSTITUTING IMPROVEMENTS, SHALL BE ADMINISTRATIVELY APPROVED BY THE PARKS DIRECTOR.
12. THIS PLAT WILL COMPLY WITH LOCATION AND AMENITY STANDARDS FOR TRAILS AS SHOWN IN THE SECTOR PLAN.
13. (103) RESIDENTIAL LOTS, (4) COMMON SPACE LOTS.
14. THE ELEVATION OF THE LOWEST FLOOR OF A STRUCTURE SHALL BE AT LEAST (10) INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND, WHICH SHALL BE SLOPED IN A FASHION SO AS TO DIRECT STORMWATER AWAY FROM THE STRUCTURE; PROPERTIES ADJACENT TO STORMWATER CONVEYANCE STRUCTURES MUST HAVE A FLOOR SLAB ELEVATION OR BOTTOM OF FLOOR JOIST A MINIMUM OF ONE FOOT ABOVE THE 100-YEAR WATER FLOW ELEVATION IN THE STRUCTURE.

COMMON SPACE NOTES:

- LOT 900, BLOCK 230 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 232 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 234 IS A OPEN SPACE, DRAINAGE, LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.
- LOT 900, BLOCK 204 IS A LANDSCAPE, PEDESTRIAN AND ACCESS EASEMENT.

ALL AFOREMENTIONED LOTS TO BE MAINTAINED BY THE HOMEOWNERS ASSOCIATION OR PROPERTY OWNER AND NOT THE CITY OF NEW BRAUNFELS.

STATE OF TEXAS
COUNTY OF COMAL

I (WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HERIN AS THE VERAMENDI PRECINCT 23 UNIT 1 SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

_____ DATE
OWNER/DEVELOPER: GARRETT MECHLER, Co-CEO
VERAMENDI PE - GOLD COAST, LLC.
2168 OAK RUN PARKWAY, SUITE 101
NEW BRAUNFELS, TEXAS 78132

STATE OF TEXAS
COUNTY OF COMAL

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____DAY OF _____, 20 _____, BY _____.

_____
NOTARY PUBLIC
THE STATE OF TEXAS

MY COMMISSION EXPIRES:_____

STATE OF TEXAS
COUNTY OF COMAL

I (WE), THE UNDERSIGNED OWNER(S) OF THE LAND SHOWN ON THIS PLAT, AND DESIGNATED HERIN AS THE VERAMENDI PRECINCT 23 UNIT 1 SUBDIVISION TO THE CITY OF NEW BRAUNFELS, COUNTY OF COMAL, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, DO HEREBY SUBDIVIDE SUCH PROPERTY AND DEDICATE TO THE USE OF THE PUBLIC ALL STREETS, ALLEYS, PARKS, DRAINS, EASEMENTS, AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSES AND CONSIDERATION THEREIN EXPRESSED.

_____ DATE
OWNER/DEVELOPER: COMAL COUNTY WCID 1B
14755 PRESTON ROAD, SUITE 600
DALLAS, TEXAS 75254

STATE OF TEXAS
COUNTY OF COMAL

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____DAY OF _____, 20 _____, BY _____.

_____
NOTARY PUBLIC
THE STATE OF TEXAS

MY COMMISSION EXPIRES:_____

STATE OF TEXAS
COUNTY OF COMAL

I, _____, DO HEREBY CERTIFY THAT FOREGOING INSTRUMENT WAS FILED FOR RECORD IN THE MAP AND PLAT RECORDS, DOC# _____ OF COMAL COUNTY ON THE _____ DAY OF _____, 20 _____ AT _____ M.

WITNESS MY HAND AND OFFICIAL SEAL, THIS _____ DAY OF _____, 20 _____.

_____
COUNTY CLERK, COMAL COUNTY, TEXAS

_____
DEPUTY

THE STATUS, DATE OF APPROVAL, AND ANY CHANGES MADE TO THE PLAT SHALL BE INDICATED ON THE PLAT SHEET.

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

PLAT (SHEET 1 OF 5)

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Plat.dwg

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 2.0

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User: rgarner
Last Modified: Jul. 08, 25 - 12:57
Last Plotted: Jul. 08, 25 - 13:44

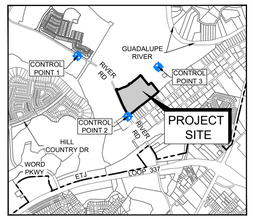
K:\SA3856_ASA Properties\2405 23-1\435 Site Development Plans\GMC-Sheets\sh_Plat.dwg
User: rgarner
Last Modified: Jul. 08, 25 - 13:44

SUBDIVISION PLAT
OF
VERAMENDI PRECINCT 23 UNIT 1

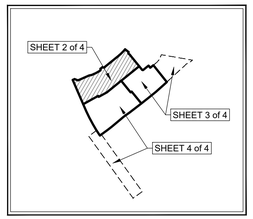
BEING 33.95 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025



LOCATION MAP
N.T.S.



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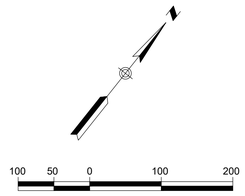

SCALE IN FEET
SCALE 1" = 100'

LEGEND

●	FOUND 1/2" IRON ROD WITH YELLOW CAP STAMPED "PAPE DAWSON" (UNLESS NOTED)
○	SET 5/8" IRON ROD WITH YELLOW CAP STAMPED "LJA"
1190	EXISTING CONTOURS
1190	PROPOSED CONTOURS
AC	ACRES
DOC NO.	DOCUMENT NUMBER
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MPR	MAP AND PLAT RECORDS OF COMAL COUNTY, TEXAS
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PG.	PAGE(S)
V.N.A.E.	VEHICULAR NON-ACCESS EASEMENT (NTS)
ESM'T	EASEMENT
ETJ	EXTRATERRITORIAL JURISDICTION
NCB	NEW CITY BLOCK
BLK	BLOCK
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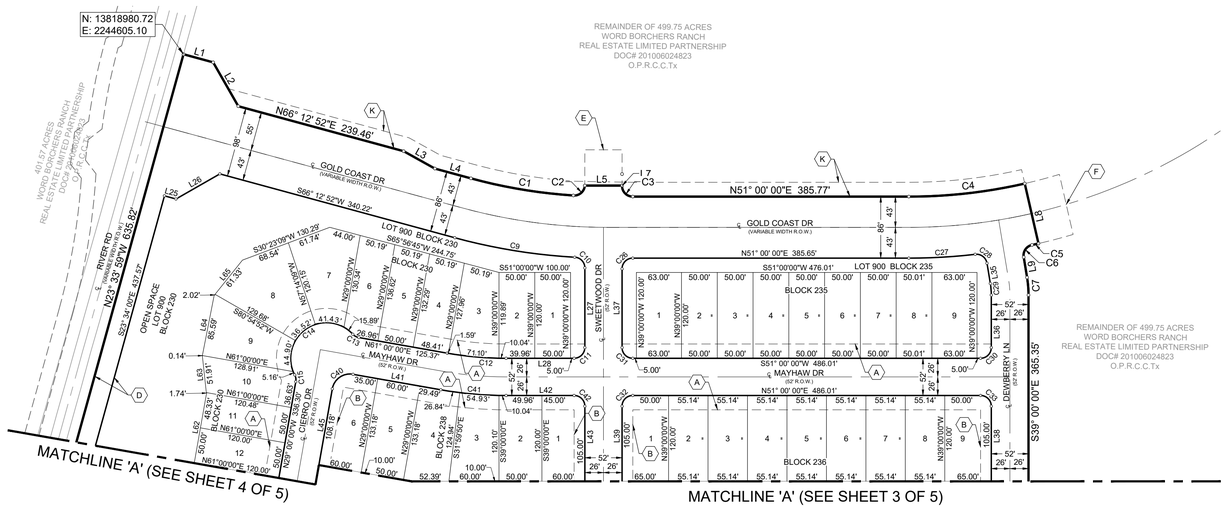

PLAT NOTES APPLY TO EVERY PAGE OF THIS MULTIPLE PAGE PLAT
SEE SHEET 5 OF 5 FOR LINE & CURVE TABLES

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FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

PLAT (SHEET 2 OF 5)

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Plat.dwg

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 2.1

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User: ngomez
Last Modified: Jul 08, 25 - 12:57
Xrefs Bound: ...ec, ...ec, ...ec, ...ec
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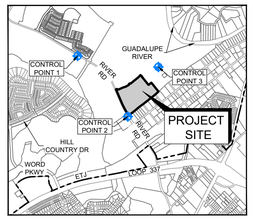
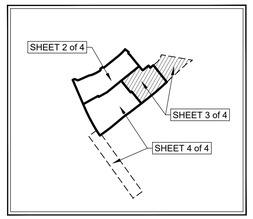
User: ngomez - Plot: 08/08/25 - 08:45 - 1:1=1:1

SUBDIVISION PLAT OF VERAMENDI PRECINCT 23 UNIT 1

BEING 33.95 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.



LOCATION MAP
N.T.S.



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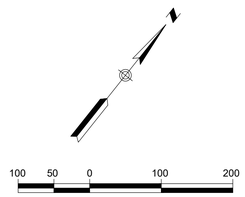

SCALE IN FEET
SCALE 1" = 100'

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

LEGEND

●	FOUND 1/2" IRON ROD WITH YELLOW CAP STAMPED "PAPE DAWSON" (UNLESS NOTED)
○	SET 5/8" IRON ROD WITH YELLOW CAP STAMPED "LJA"
1190	EXISTING CONTOURS
(1190)	PROPOSED CONTOURS
AC	ACRES
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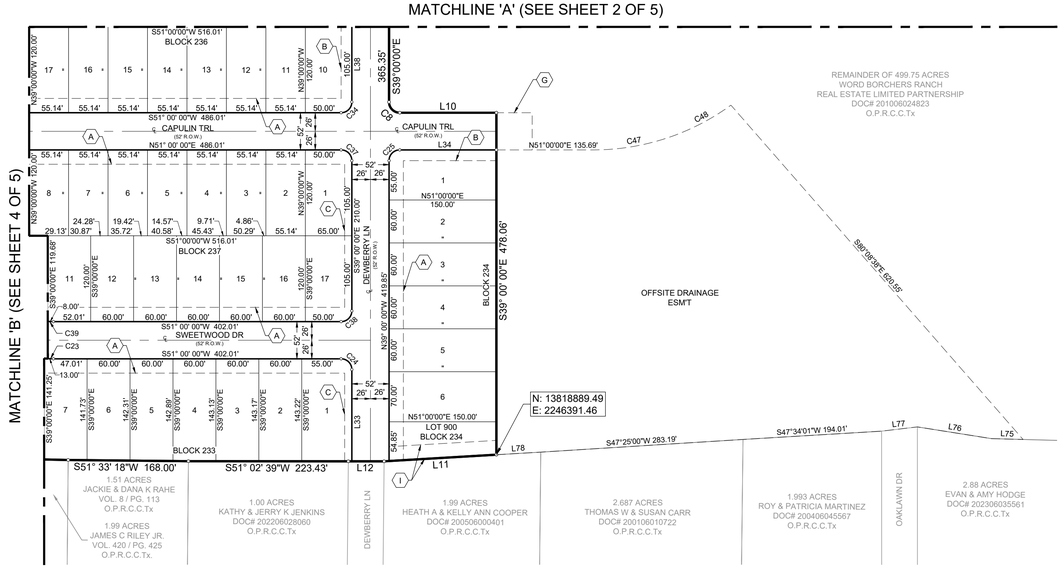
⬡ K	20' OFF-SITE UTILITY ESM'T

MATCHLINE 'A' (SEE SHEET 2 OF 5)

MATCHLINE 'B' (SEE SHEET 4 OF 5)



PLAT NOTES APPLY TO EVERY PAGE OF THIS MULTIPLE PAGE PLAT

SEE SHEET 5 OF 5 FOR LINE & CURVE TABLES

SHEET 3 OF 5

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Layer: Layout1 Plotted: Jul 08, 25 - 12:37
Last Modified: Jul 08, 25 - 12:37
Last Saved By: ASA, NG - 7:44:46

VERAMENDI PRECINCT 23 UNIT 1

PLAT (SHEET 3 OF 5)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Plat.dwg

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

SHEET NO.
2.2

THE STATUS, DATE OF APPROVAL, AND ANY CHANGES MADE TO THE PLAT SHALL BE INDICATED ON THE PLAT SHEET.

FOR PERMIT

SUBDIVISION PLAT
OF
VERAMENDI PRECINCT 23 UNIT 1

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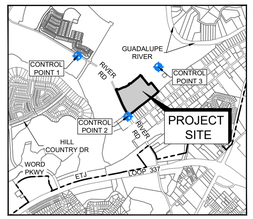

LOCATION MAP
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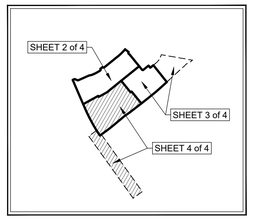

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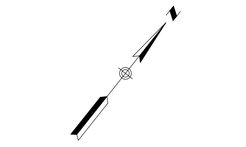

100 50 0 100 200

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TBPELS FIRM NO. 10194382

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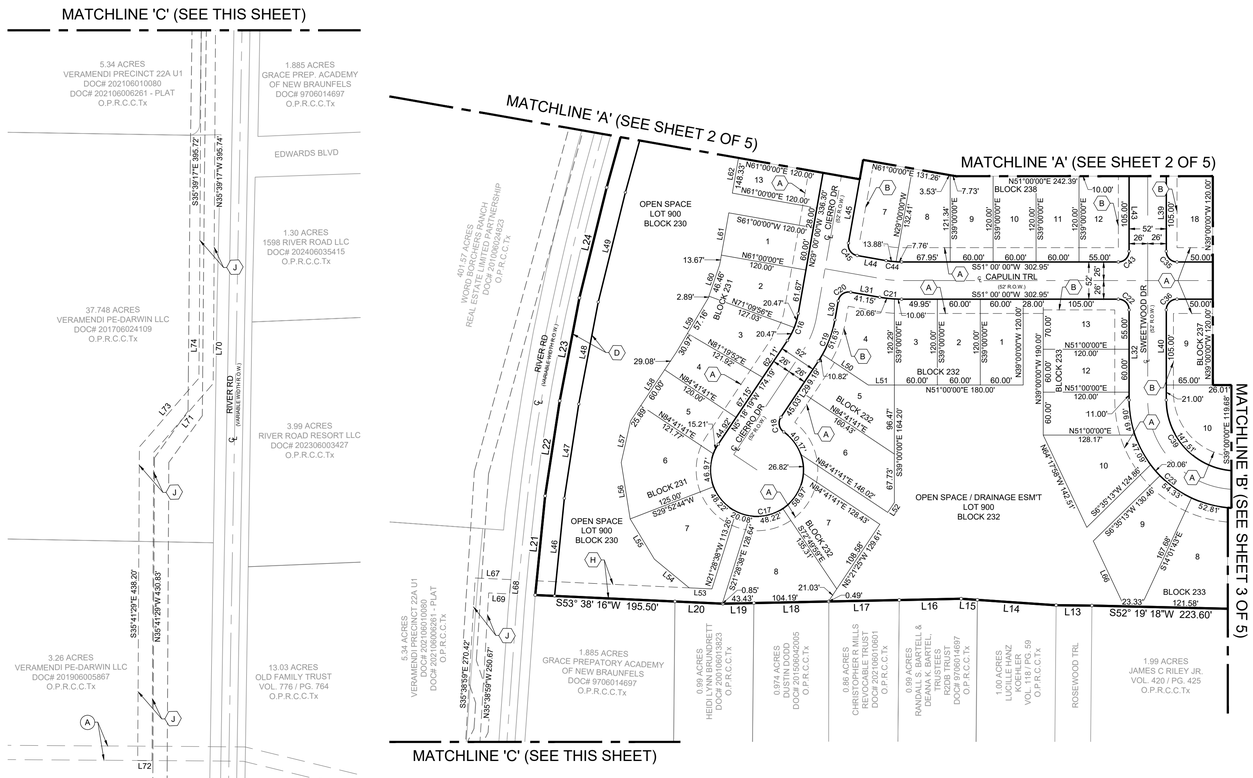
(J)	20' OFF-SITE SANITARY SEWER ESM'T
(K)	20' OFF-SITE UTILITY ESM'T



PLAT NOTES APPLY TO EVERY PAGE OF THIS MULTIPLE PAGE PLAT

SEE SHEET 5 OF 5 FOR LINE & CURVE TABLES

SHEET 4 OF 5

K:\SA3856.ASA Properties\2405 23-1\428 Site Development Plans\DWG-Sheets\Veh_Plat.dwg
Xrefs Opened: Jul. 08, 25 - 12:57
Last Modified: Jul. 08, 25 - 12:57
Last Modified By: jw.ayo

VERAMENDI PRECINCT 23 UNIT 1
PLAT (SHEET 4 OF 5)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Plat.dwg

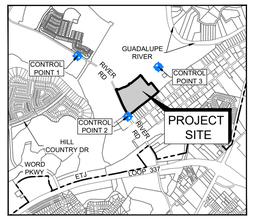
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **2.3**

THE STATUS, DATE OF APPROVAL, AND ANY CHANGES MADE TO THE PLAT SHALL BE INDICATED ON THE PLAT SHEET.

FOR PERMIT



LOCATION MAP

N.T.S.

SUBDIVISION PLAT OF VERAMENDI PRECINCT 23 UNIT 1

BEING 33.95 ACRES OF LAND, OUT OF THE 499.75 ACRE TRACT OF LAND DESCRIBED IN DOCUMENT NO. 202206035304 IN THE OFFICIAL PUBLIC RECORD OF COMAL COUNTY, TEXAS, IN THE JUAN MARTIN VERAMENDI NO. 2, ABSTRACT 3, COMAL COUNTY, TEXAS.

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPELS FIRM NO. 10194382

DATE OF PREPARATION: 7/8/2025

LINE TABLE		
LINE	BEARING	DISTANCE
L1	N66° 16' 34"E	42.95
L2	S68° 47' 08"E	70.71
L3	N80° 06' 03"E	50.00
L4	N66° 12' 52"E	52.22
L5	N51° 00' 00"E	52.04
L7	S39° 00' 00"E	0.40
L8	S51° 52' 46"E	86.00
L9	S48° 23' 12"E	28.74
L10	N51° 00' 00"E	135.00
L11	S47° 38' 48"W	157.22
L12	S50° 58' 55"W	50.00
L13	S51° 33' 18"W	50.00
L14	S54° 55' 18"W	110.37
L15	S54° 55' 18"W	22.70
L16	S49° 48' 33"W	86.56
L17	S49° 48' 33"W	98.47
L18	S49° 48' 33"W	104.68
L19	S49° 48' 33"W	43.43
L20	S53° 38' 16"W	66.98
L21	N33° 16' 44"W	139.30

LINE TABLE		
LINE	BEARING	DISTANCE
L22	N30° 16' 44"W	134.50
L23	N28° 11' 44"W	146.50
L24	N25° 06' 44"W	158.90
L25	S66° 16' 15"W	16.71
L26	S21° 12' 52"W	70.71
L27	N39° 00' 00"W	111.32
L28	N51° 00' 00"E	94.96
L29	S5° 18' 19"E	94.22
L30	S29° 00' 00"E	27.06
L31	S61° 00' 00"W	41.15
L32	N39° 00' 00"W	126.00
L33	N39° 00' 00"W	128.27
L34	N51° 00' 00"E	135.00
L35	S48° 23' 12"E	28.74
L36	S39° 00' 00"E	73.35
L37	N39° 00' 00"W	110.00
L38	S39° 00' 00"E	210.00
L39	N39° 00' 00"W	210.00
L40	N39° 00' 00"W	126.00
L41	N61° 00' 00"E	124.49

LINE TABLE		
LINE	BEARING	DISTANCE
L42	N51° 00' 00"E	94.96
L43	S39° 00' 00"E	210.00
L44	S61° 00' 00"W	41.15
L45	N29° 00' 00"W	226.36
L46	S33° 16' 44"E	137.14
L47	S30° 16' 44"E	133.30
L48	S28° 11' 44"E	145.28
L49	S25° 06' 44"E	157.77
L50	N84° 41' 41"E	76.90
L51	N51° 00' 00"E	36.53
L52	N5° 18' 19"W	16.63
L53	N53° 38' 16"E	31.87
L54	S89° 27' 00"E	63.00
L55	S70° 03' 46"E	65.61
L56	S47° 59' 52"E	79.81
L57	S26° 20' 23"E	59.64
L58	S5° 18' 19"E	114.96
L59	S8° 28' 39"E	88.14
L60	S20° 08' 50"E	49.35
L61	S29° 00' 00"E	73.67

LINE TABLE		
LINE	BEARING	DISTANCE
L62	S29° 00' 00"E	148.33
L63	S45° 09' 16"E	53.65
L64	S27° 54' 43"E	85.73
L65	S0° 18' 05"E	63.35
L66	N64° 17' 58"W	101.07
L67	S53° 38' 16"W	49.88
L68	N33° 36' 38"W	20.02
L69	N53° 38' 16"E	29.17
L70	N35° 30' 38"W	98.41
L71	N4° 50' 46"E	127.10
L72	N54° 22' 25"E	20.00
L73	S4° 50' 46"W	127.14
L74	S35° 30' 38"E	91.04
L75	S52° 33' 55"W	44.41
L76	S59° 59' 58"W	104.64
L77	S44° 13' 14"W	50.35
L78	S47° 38' 48"W	62.08

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C1	145.38	727.00	11°27'27"	72.93	N60° 29' 08"E	145.14
C2	23.42	15.00	89°26'46"	14.86	N10° 02' 02"E	21.11
C3	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C4	163.37	727.00	12°52'31"	82.03	N44° 33' 45"E	163.02
C5	9.23	813.00	0°39'03"	4.62	S38° 26' 59"W	9.23
C6	22.82	15.00	87°09'42"	14.27	S4° 48' 21"E	20.68
C7	24.74	151.00	9°23'12"	12.40	S43° 41' 36"E	24.71
C8	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C9	170.05	813.00	11°59'04"	85.34	S60° 13' 20"W	169.74
C10	22.72	15.00	86°46'12"	14.18	N82° 23' 06"W	20.61
C11	23.56	15.00	90°00'00"	15.00	N6° 00' 06"E	21.21
C12	82.73	474.00	10°00'00"	41.47	N56° 00' 00"E	82.62
C13	9.80	15.00	37°26'38"	5.08	N79° 43' 19"E	9.63
C14	143.89	50.00	164°53'17"	376.94	N16° 00' 00"E	99.13
C15	9.80	15.00	37°26'38"	5.08	N47° 43' 19"W	9.63
C16	40.94	99.00	23°41'41"	20.77	N17° 09' 09"W	40.65
C17	304.68	65.00	268°34'03"	66.65	S40° 24' 40"W	93.07
C18	23.19	15.00	88°34'03"	14.63	S49° 35' 20"E	20.95
C19	62.45	151.00	23°41'41"	31.68	S17° 09' 09"E	62.00
C20	23.56	15.00	90°00'00"	15.00	S16° 00' 00"W	21.21

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C21	30.72	176.00	10°00'00"	15.40	S56° 00' 00"W	30.68
C22	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C23	237.19	151.00	90°00'00"	151.00	N84° 00' 00"W	213.55
C24	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C25	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C26	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C27	92.92	813.00	6°32'54"	46.51	N47° 43' 33"E	92.87
C28	22.82	15.00	87°09'42"	14.27	N88° 01' 57"E	20.68
C29	16.22	99.00	9°23'12"	8.13	S43° 41' 36"E	16.20
C30	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C31	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C32	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C33	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C34	23.56	15.00	89°59'57"	15.00	S5° 59' 58"W	21.21
C35	23.56	15.00	90°00'00"	15.00	N84° 00' 00"W	21.21
C36	23.56	15.00	90°00'00"	15.00	N6° 00' 00"E	21.21
C37	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C38	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C39	155.51	99.00	90°00'00"	99.00	N84° 00' 00"W	140.01
C40	39.27	25.00	90°00'00"	25.00	N16° 00' 00"E	35.36

CURVE TABLE						
CURVE #	ARC	RAD	DELTA	TAN	CHORD BEARING	CHORD
C41	91.80	526.00	10°00'00"	46.02	N56° 00' 00"E	91.69
C42	23.56	15.00	90°00'00"	15.00	S84° 00' 00"E	21.21
C43	23.56	15.00	90°00'00"	15.00	S6° 00' 00"W	21.21
C44	21.64	124.00	10°00'00"	10.85	S56° 00' 00"W	21.61
C45	23.56	15.00	90°00'00"	15.00	N74° 00' 00"W	21.21
C47	116.95	326.00	20°33'14"	59.11	N40° 43' 23"E	116.32
C48	88.40	326.00	15°32'09"	44.47	N22° 40' 42"E	88.12

SHEET 5 OF 5

K:\SA3856.KSA Properties\2405.23-1\426 Site Development Plans\DWG+Sheets\sh_Plat.dwg
Xrefs Opened: Jul. 08, 25 - 12:57
Last Modified: Jul. 08, 25 - 14:49
Plotted By: Jul. 08, 25 - 14:49

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Xrefs Opened: Jul. 08, 25 - 12:57

THE STATUS, DATE OF APPROVAL, AND ANY CHANGES MADE TO THE PLAT SHALL BE INDICATED ON THE PLAT SHEET.

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

PLAT (SHEET 5 OF 5)

REVISIONS

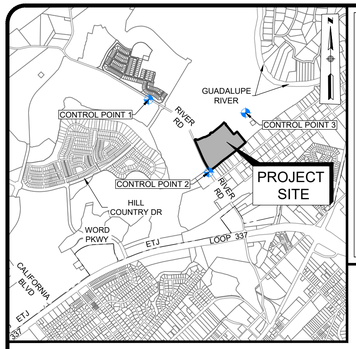
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Plat.dwg

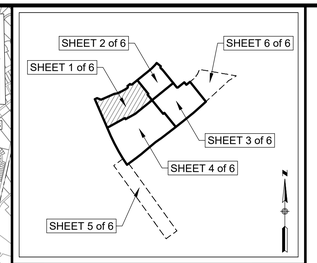
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

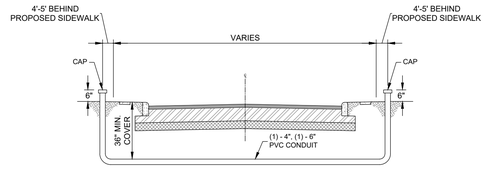
SHEET NO. **2.4**



LOCATION MAP
N.T.S.



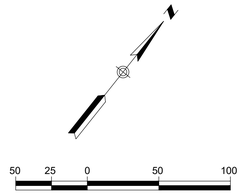
SHEET INDEX
N.T.S.



TYPICAL CONDUIT DETAIL
N.T.S.

CONDUIT NOTES:

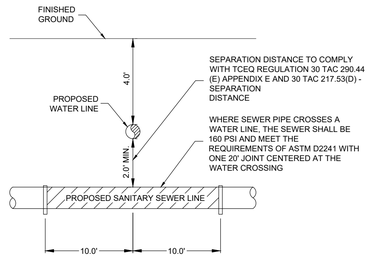
1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 30 INCHES. SCHEDULE 80 TO BE USED FOR NBU CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. (1) - 4", (1) - 6" PVC SCH 40, WILL BE REQUIRED FOR IRRICATION UTILITIES CROSSING.



SCALE IN FEET
SCALE: 1"=50'

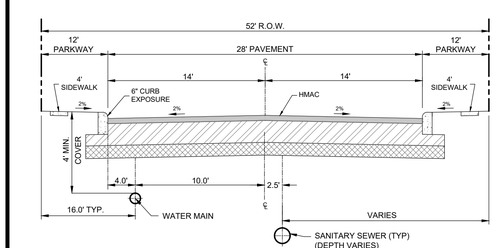
LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

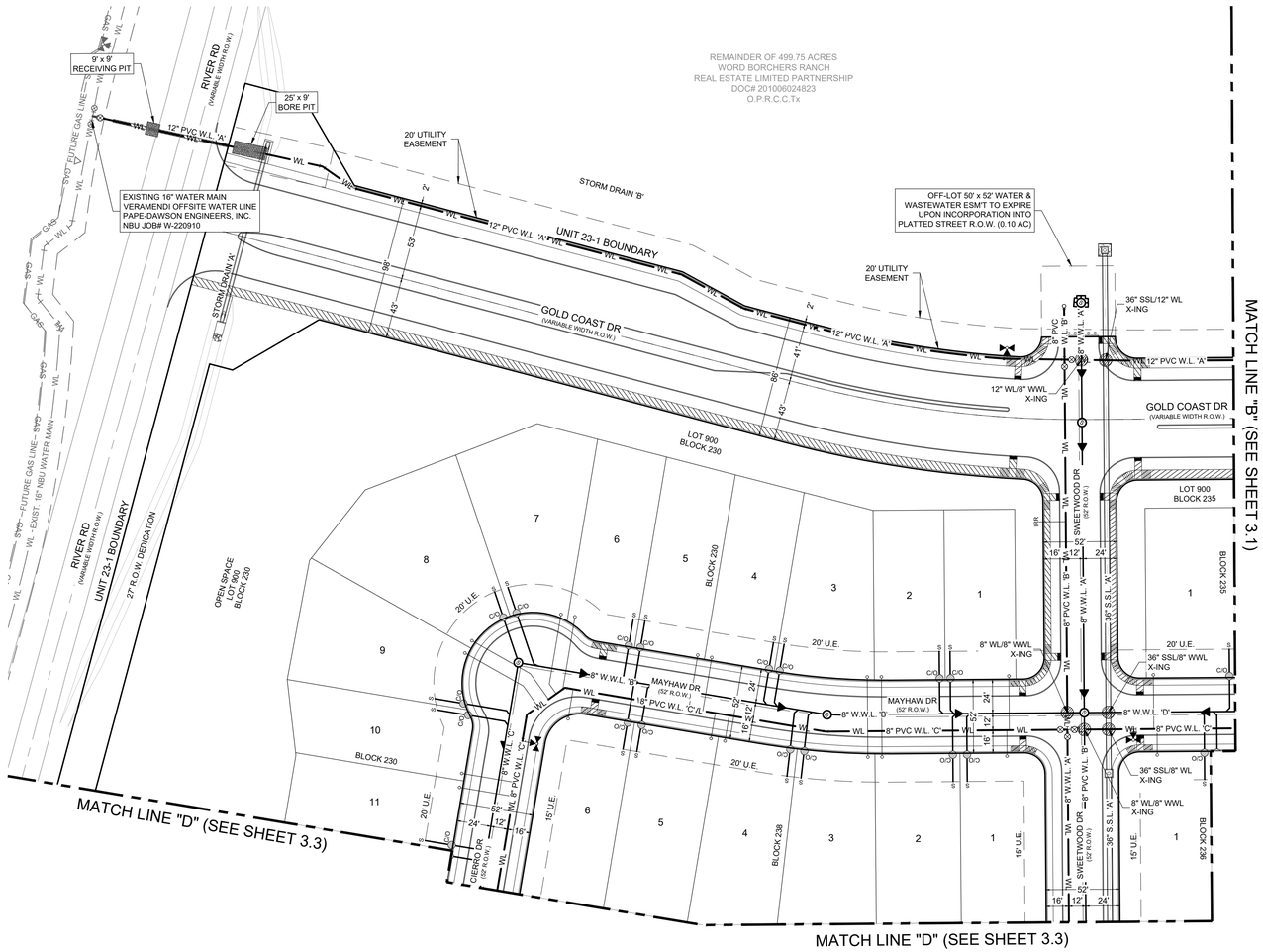


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

STANDARD 86' ROW STREET SECTION (UTILITIES)
N.T.S.



STANDARD 52' ROW STREET SECTION (UTILITIES)
N.T.S.



GENERAL NOTES

1. FIRE HYDRANT SHALL BE LOCATED BEHIND SIDEWALK IN ACCORDANCE WITH THE FIRE HYDRANT INSTALLATION NBU STANDARD DETAIL DWG NO. 240.
2. CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
3. ALL VALVES SHALL READ **"OPEN RIGHT"**.
4. ALL FIRE HYDRANTS SHALL BE PAINTED APPROPRIATE NBU COLORS.
5. FIRE HYDRANTS AND VALVE BOXES TO BE RAISED TO THE PROPOSED TOP OF PAVEMENT OR GROUND ELEVATION.
6. ALL WATER PIPE TO BE C-900, DR-18, CLASS 150 UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY GRAVITY INVERTS PRIOR TO CONSTRUCTION AND NOTIFY CIVIL ENGINEER IN WRITING OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 95% COMPACTION ON ALL UTILITY TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PREFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
9. CONTRACTOR TO REFERENCE MOST CURRENT NBU DETAILS & SPECIFICATIONS. FOR SEWER MANHOLES REFERENCE NBU STANDARD DETAIL DWG NO. 852.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING NBU STANDARD DETAIL DWG NO. 804 FOR EXCAVATION, TRENCHING AND BACKFILLING REQUIREMENTS AND NBU STANDARD DETAIL DWG NO. 812 FOR WATER/SEWER SEPARATION REQUIREMENTS.

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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

NEW BRAUNFELS UTILITIES

1. R/P BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED WITH IRRIGATION METERS.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 1 OF 6)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

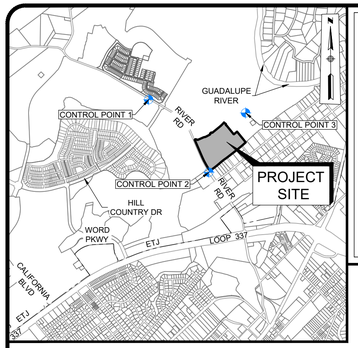
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

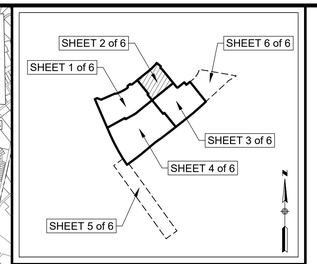
SHEET NO. **3.0**

FOR PERMIT

K:\SAD\855 JAS Properties\2025 23-1\455 Site Development Plans\DWG\Sheets\sh_Utility.dwg
User: hgomez
Last Modified: Jul. 03, 25 - 07:01
Plot Modified: Jul. 08, 25 - 14:44



LOCATION MAP
N.T.S.



SHEET INDEX
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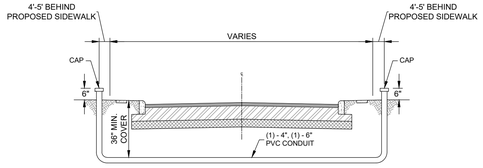
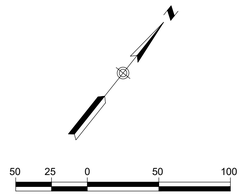


TYPICAL CONDUIT DETAIL
N.T.S.

CONDUIT NOTES:

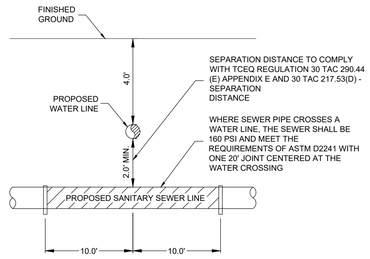
1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 30 INCHES. SCHEDULE 80 TO BE USED FOR NBU CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. (1) - 4", (1) - 6" PVC SCH 40, WILL BE REQUIRED FOR IRRICATION UTILITIES CROSSING.



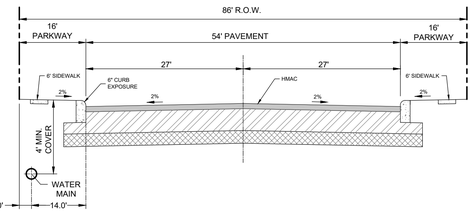
SCALE IN FEET
SCALE: 1"=50'

LEGEND

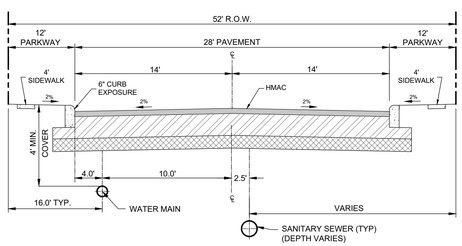
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



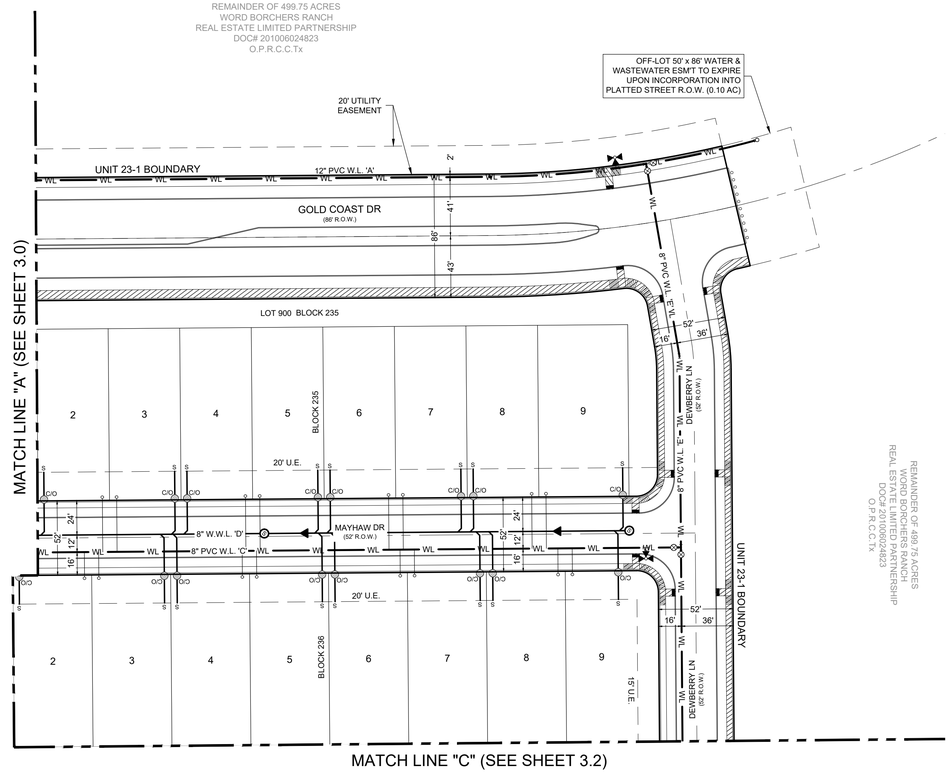
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



STANDARD 86' ROW STREET SECTION (UTILITIES)
N.T.S.



STANDARD 52' ROW STREET SECTION (UTILITIES)
N.T.S.



GENERAL NOTES

1. FIRE HYDRANT SHALL BE LOCATED BEHIND SIDEWALK IN ACCORDANCE WITH THE FIRE HYDRANT INSTALLATION NBU STANDARD DETAIL DWG NO. 240.
2. CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
3. ALL VALVES SHALL READ **"OPEN RIGHT"**.
4. ALL FIRE HYDRANTS SHALL BE PAINTED APPROPRIATE NBU COLORS.
5. FIRE HYDRANTS AND VALVE BOXES TO BE RAISED TO THE PROPOSED TOP OF PAVEMENT OR GROUND ELEVATION.
6. ALL WATER PIPE TO BE C-900, DR-18, CLASS 150 UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY GRAVITY INVERTS PRIOR TO CONSTRUCTION AND NOTIFY CIVIL ENGINEER IN WRITING OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 95% COMPACTION ON ALL UTILITY TRENCH BACKFILL AND PAVING FOR THE TESTS TO BE PREFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
9. CONTRACTOR TO REFERENCE MOST CURRENT NBU DETAILS & SPECIFICATIONS. FOR SEWER MANHOLES REFERENCE NBU STANDARD DETAIL DWG NO. 852.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING NBU STANDARD DETAIL DWG NO. 804 FOR EXCAVATION, TRENCHING AND BACKFILLING REQUIREMENTS AND NBU STANDARD DETAIL DWG NO. 812 FOR WATER/SEWER SEPARATION REQUIREMENTS.

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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

NEW BRAUNFELS UTILITIES

1. R/P BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED WITH IRRIGATION METERS.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 2 OF 6)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility .dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **3.1**

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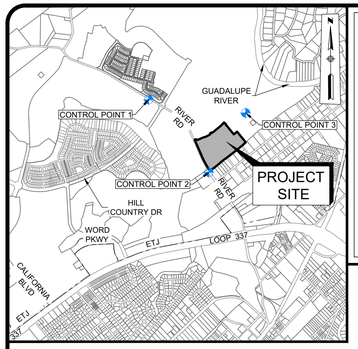
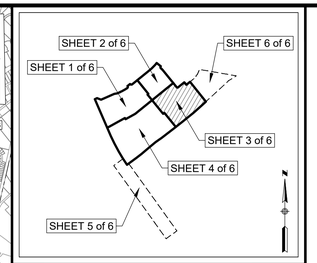


LOCATION MAP
N.T.S.



SHEET INDEX
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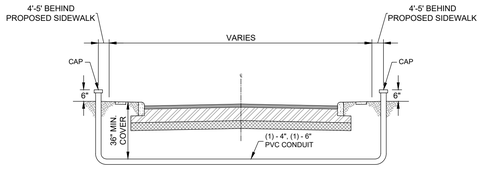
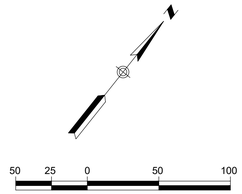


TYPICAL CONDUIT DETAIL
N.T.S.

CONDUIT NOTES:

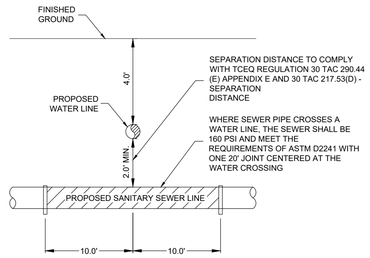
1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 30 INCHES. SCHEDULE 80 TO BE USED FOR NBU CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. (1) - 4", (1) - 6" PVC SCH 40, WILL BE REQUIRED FOR IRRICATION UTILITIES CROSSING.



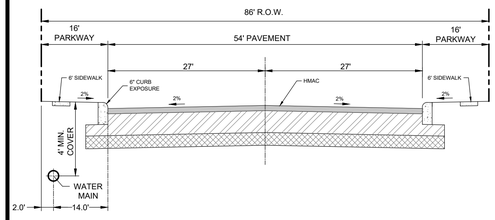
SCALE IN FEET
SCALE: 1"=50'

LEGEND

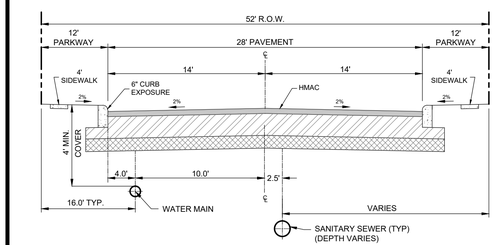
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

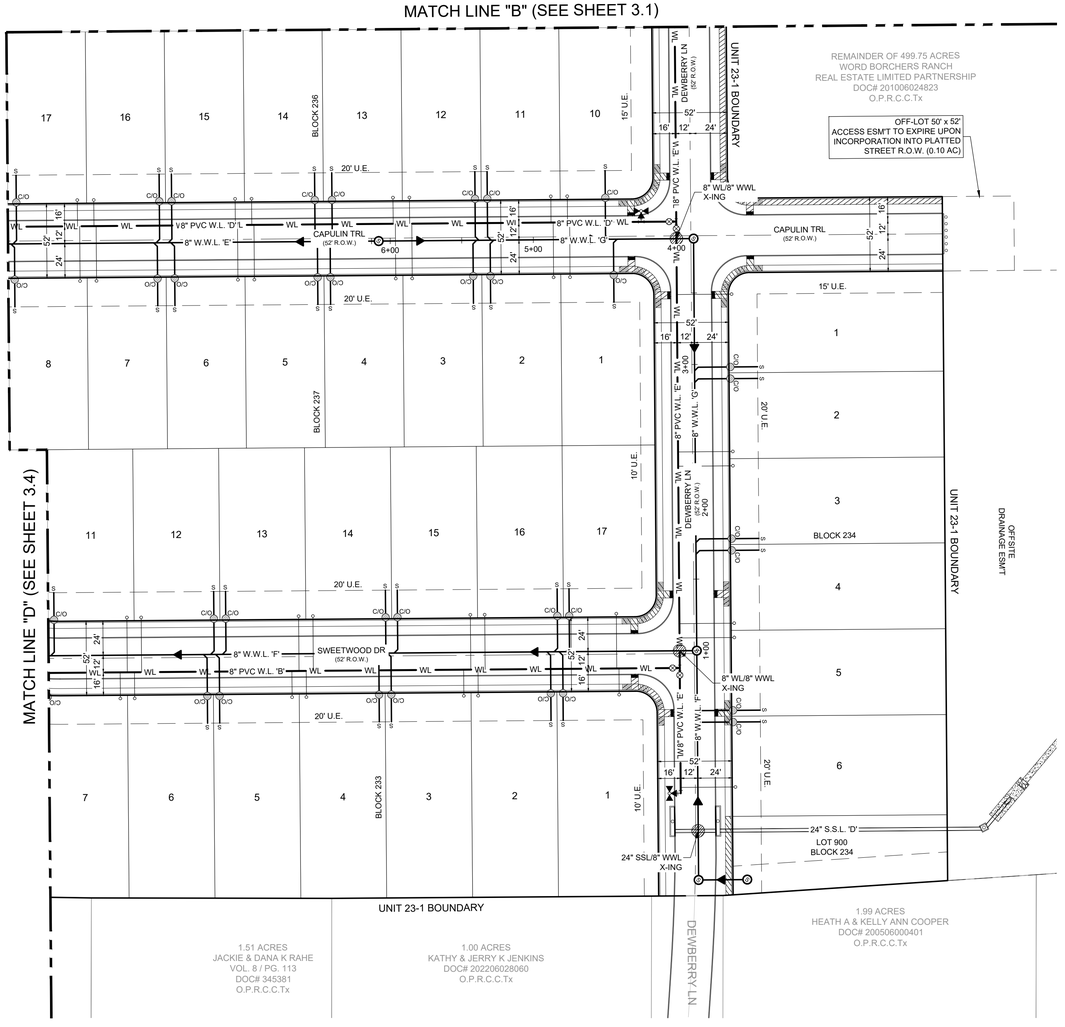


STANDARD 86' ROW STREET SECTION (UTILITIES)
N.T.S.



STANDARD 52' ROW STREET SECTION (UTILITIES)
N.T.S.

MATCH LINE "B" (SEE SHEET 3.1)



GENERAL NOTES

1. FIRE HYDRANT SHALL BE LOCATED BEHIND SIDEWALK IN ACCORDANCE WITH THE FIRE HYDRANT INSTALLATION NBU STANDARD DETAIL DWG NO. 240.
2. CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
3. ALL VALVES SHALL READ **"OPEN RIGHT"**.
4. ALL FIRE HYDRANTS SHALL BE PAINTED APPROPRIATE NBU COLORS.
5. FIRE HYDRANTS AND VALVE BOXES TO BE RAISED TO THE PROPOSED TOP OF PAVEMENT OR GROUND ELEVATION.
6. ALL WATER PIPE TO BE C-900, DR-18, CLASS 150 UNLESS OTHERWISE NOTED.
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8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 95% COMPACTION ON ALL UTILITY TRENCH BACKFILL AND PAVING FOR THE TESTS TO BE PREFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
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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 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.

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 3 OF 6)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **3.2**

FOR PERMIT

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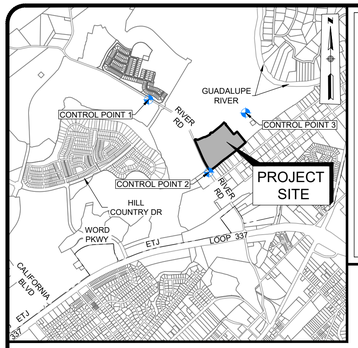
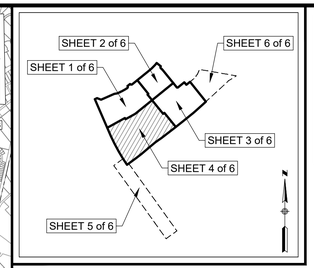
Last Modified: Jul. 03, 25 - 01:01
Pen Table Files: ACAD_R14_CTB



LOCATION MAP
N.T.S.

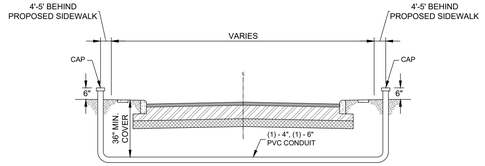


SHEET INDEX
N.T.S.

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 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.

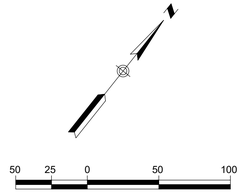
CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.



TYPICAL CONDUIT DETAIL
N.T.S.

CONDUIT NOTES:

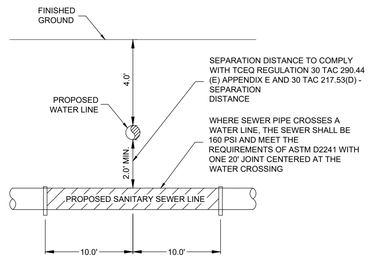
1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 30 INCHES. SCHEDULE 80 TO BE USED FOR NBU CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. (1) - 4", (1) - 6" PVC SCH 40, WILL BE REQUIRED FOR IRRIGATION UTILITIES CROSSING.



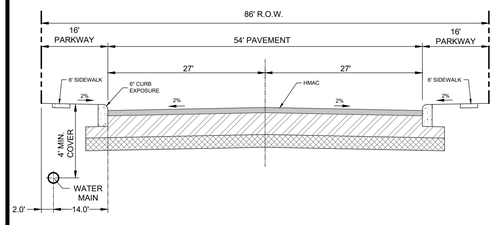
SCALE IN FEET
SCALE: 1"=50'

LEGEND

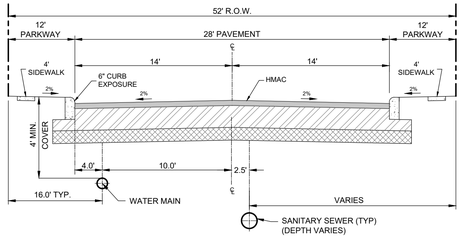
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



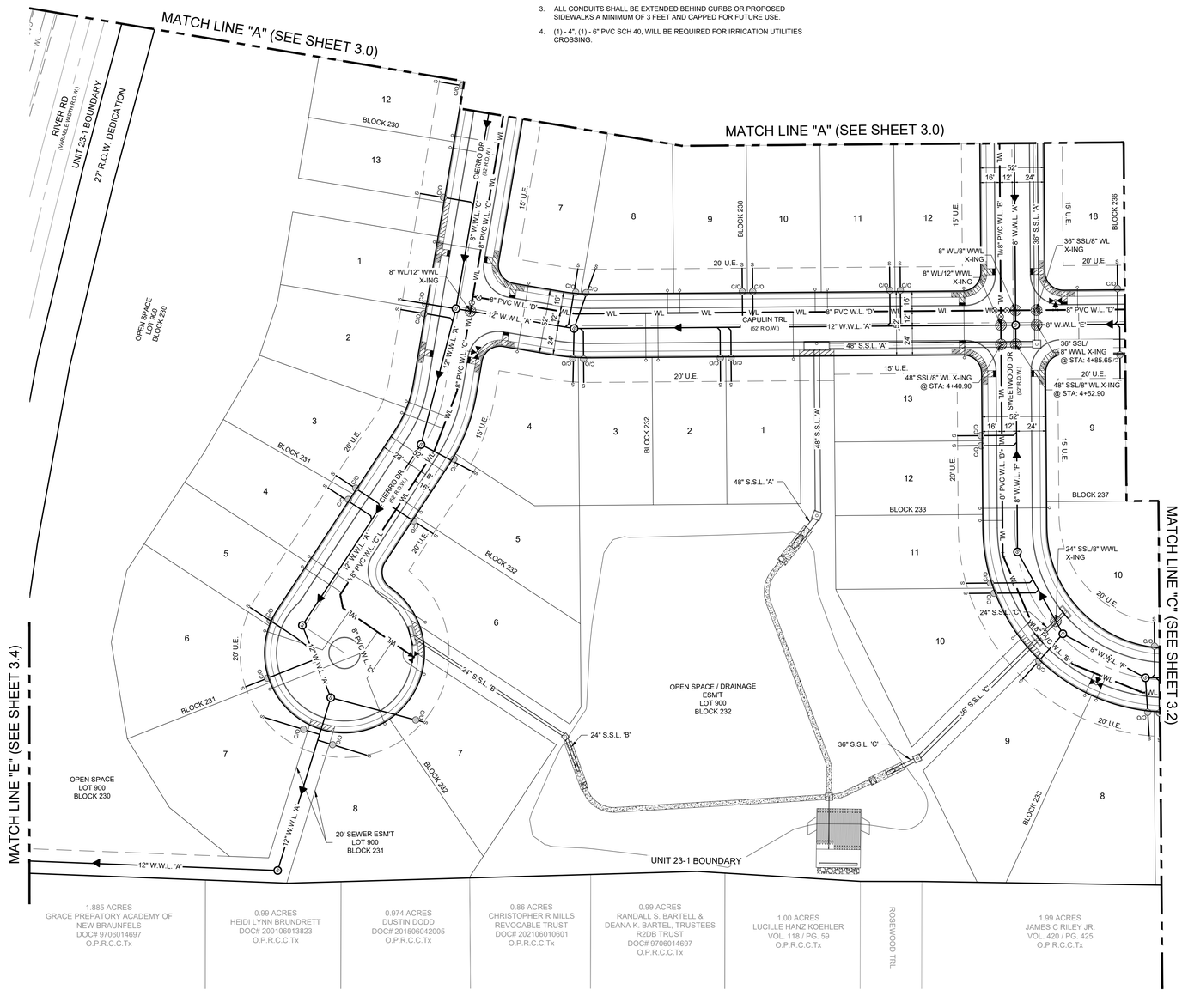
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



STANDARD 86' ROW STREET SECTION (UTILITIES)
N.T.S.



STANDARD 52' ROW STREET SECTION (UTILITIES)
N.T.S.



GENERAL NOTES

1. FIRE HYDRANT SHALL BE LOCATED BEHIND SIDEWALK IN ACCORDANCE WITH THE FIRE HYDRANT INSTALLATION NBU STANDARD DETAIL DWG NO. 240.
2. CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
3. ALL VALVES SHALL READ **"OPEN RIGHT"**.
4. ALL FIRE HYDRANTS SHALL BE PAINTED APPROPRIATE NBU COLORS.
5. FIRE HYDRANTS AND VALVE BOXES TO BE RAISED TO THE PROPOSED TOP OF PAVEMENT OR GROUND ELEVATION.
6. ALL WATER PIPE TO BE C-900, DR-18, CLASS 150 UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY GRAVITY INVERTS PRIOR TO CONSTRUCTION AND NOTIFY CIVIL ENGINEER IN WRITING OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 95% COMPACTION ON ALL UTILITY TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PREFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER. PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
9. CONTRACTOR TO REFERENCE MOST CURRENT NBU DETAILS & SPECIFICATIONS. FOR SEWER MANHOLES REFERENCE NBU STANDARD DETAIL DWG NO. 852.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING NBU STANDARD DETAIL DWG NO. 804 FOR EXCAVATION, TRENCHING AND BACKFILLING REQUIREMENTS AND NBU STANDARD DETAIL DWG NO. 812 FOR WATER/SEWER SEPARATION REQUIREMENTS.

CITY OF NEW BRAUNFELS NOTES

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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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

NEW BRAUNFELS UTILITIES

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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

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User: sgower
Last Modified: Jul. 03, 25 - 01:01
Xrefs Attached: ...ALTA_BC_1.dwt

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 4 OF 6)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility.dwg

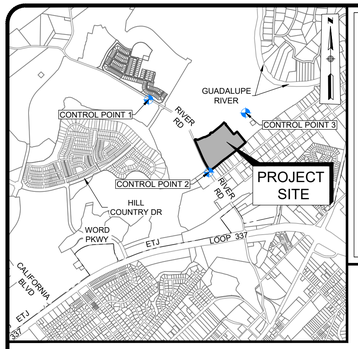
STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

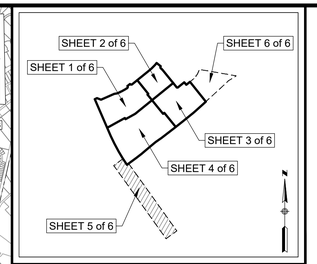
JOB NUMBER: SA3856.2405

SHEET NO. **3.3**

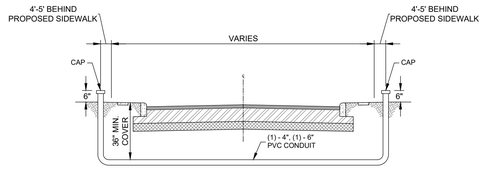
FOR PERMIT



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.



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1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
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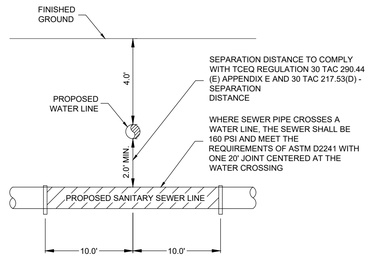

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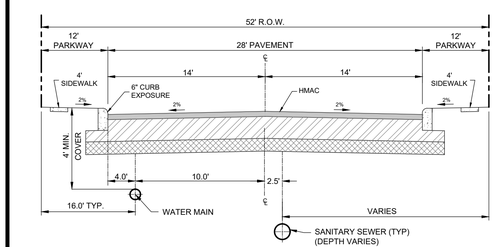

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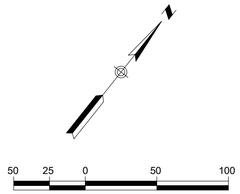
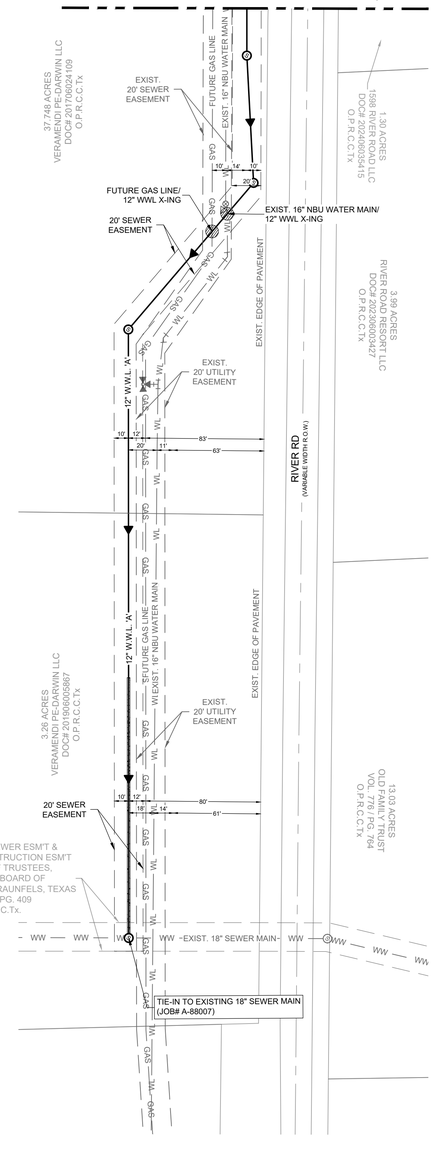


SCALE IN FEET
SCALE: 1"=50'



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
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GAS	GAS	GAS LINE
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		CURB INLET
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		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
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	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
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		UTILITY XING

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FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 5 OF 6)

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility.dwg

STATE OF TEXAS — NICHOLAS GOWER — 139260 — LICENSED PROFESSIONAL ENGINEER — 07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **3.4**

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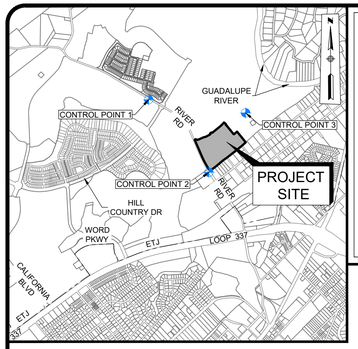
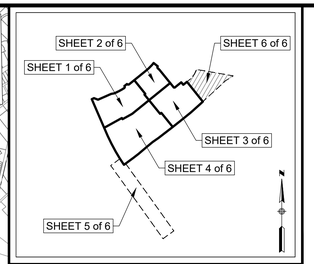


LOCATION MAP
N.T.S.



SHEET INDEX
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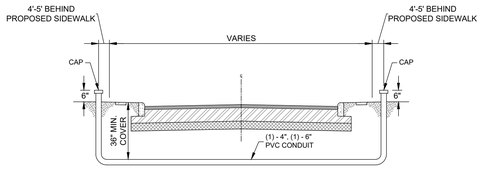

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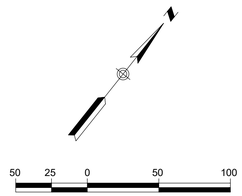
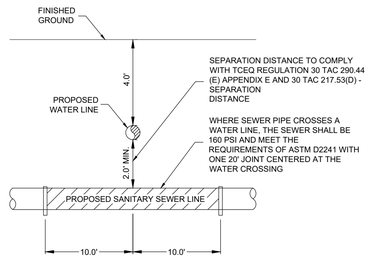


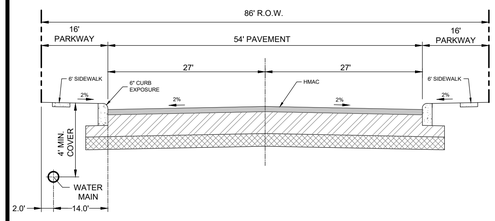
SCALE IN FEET
SCALE: 1"=50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



STANDARD 86' ROW STREET SECTION (UTILITIES)
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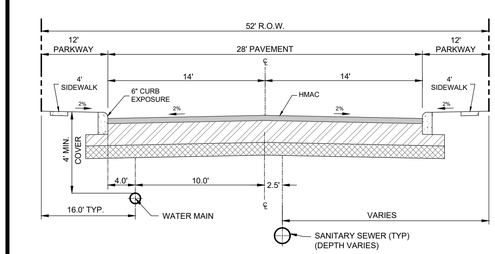
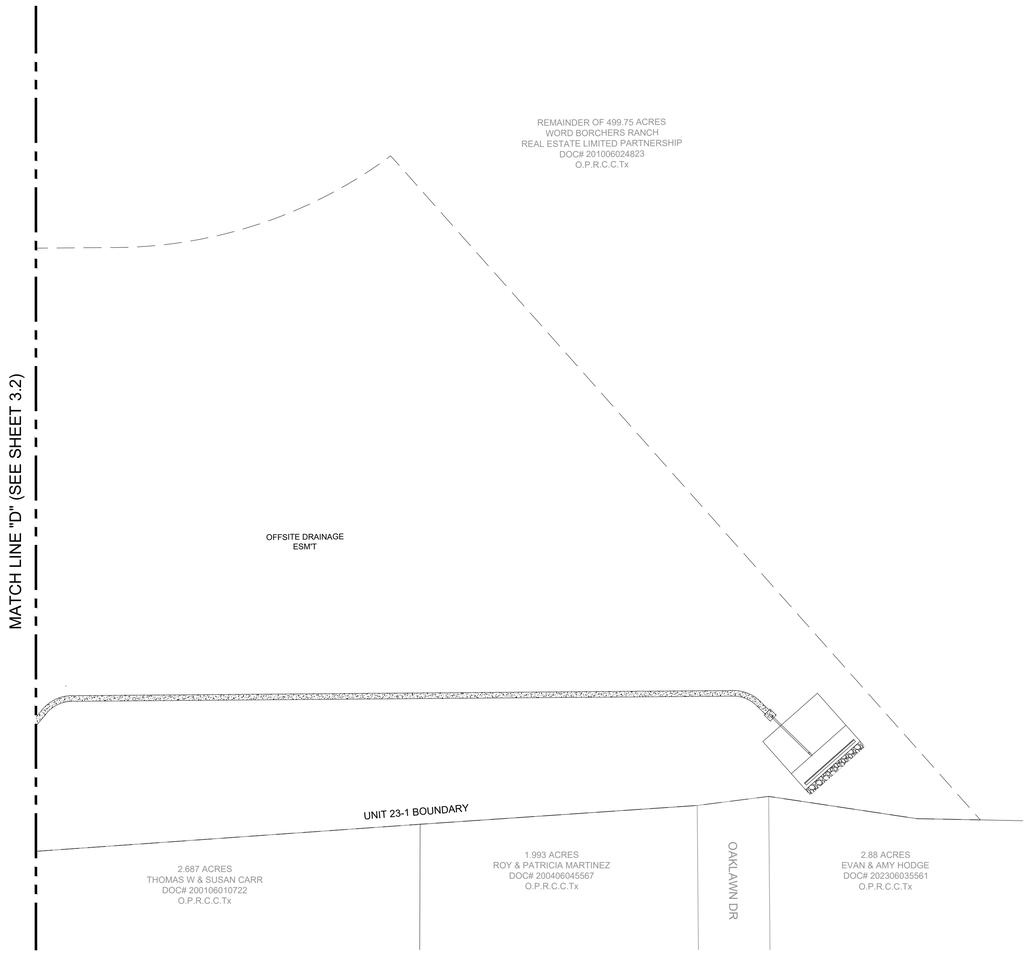


STANDARD 52' ROW STREET SECTION (UTILITIES)
N.T.S.



GENERAL NOTES

1. FIRE HYDRANT SHALL BE LOCATED BEHIND SIDEWALK IN ACCORDANCE WITH THE FIRE HYDRANT INSTALLATION NBU STANDARD DETAIL DWG NO. 240.
2. CONTRACTOR TO FIELD VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
3. ALL VALVES SHALL READ **"OPEN RIGHT"**.
4. ALL FIRE HYDRANTS SHALL BE PAINTED APPROPRIATE NBU COLORS.
5. FIRE HYDRANTS AND VALVE BOXES TO BE RAISED TO THE PROPOSED TOP OF PAVEMENT OR GROUND ELEVATION.
6. ALL WATER PIPE TO BE C-900, DR-18, CLASS 150 UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL VERIFY GRAVITY INVERTS PRIOR TO CONSTRUCTION AND NOTIFY CIVIL ENGINEER IN VRITING OF ANY DISCREPANCIES.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 95% COMPACTION ON ALL UTILITY TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PREFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
9. CONTRACTOR TO REFERENCE MOST CURRENT NBU DETAILS & SPECIFICATIONS. FOR SEWER MANHOLES REFERENCE NBU STANDARD DETAIL DWG NO. 852.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING NBU STANDARD DETAIL DWG NO. 804 FOR EXCAVATION, TRENCHING AND BACKFILLING REQUIREMENTS AND NBU STANDARD DETAIL DWG NO. 812 FOR WATER/SEWER SEPARATION REQUIREMENTS.

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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

NEW BRAUNFELS UTILITIES

1. R/P BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED WITH IRRIGATION METERS.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

VERAMENDI PRECINCT 23 UNIT 1

UTILITY LAYOUT (SHEET 6 OF 6)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/26/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Utility.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 3.5

FOR PERMIT

K:\SA3856.405 Properties\2405 23-1425 Site Development Plans\DWG\Sheets\sh_Utility.dwg
User: ngower
Last Modified: Jul 02, 25 - 01:01
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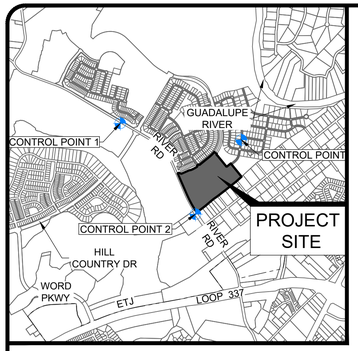
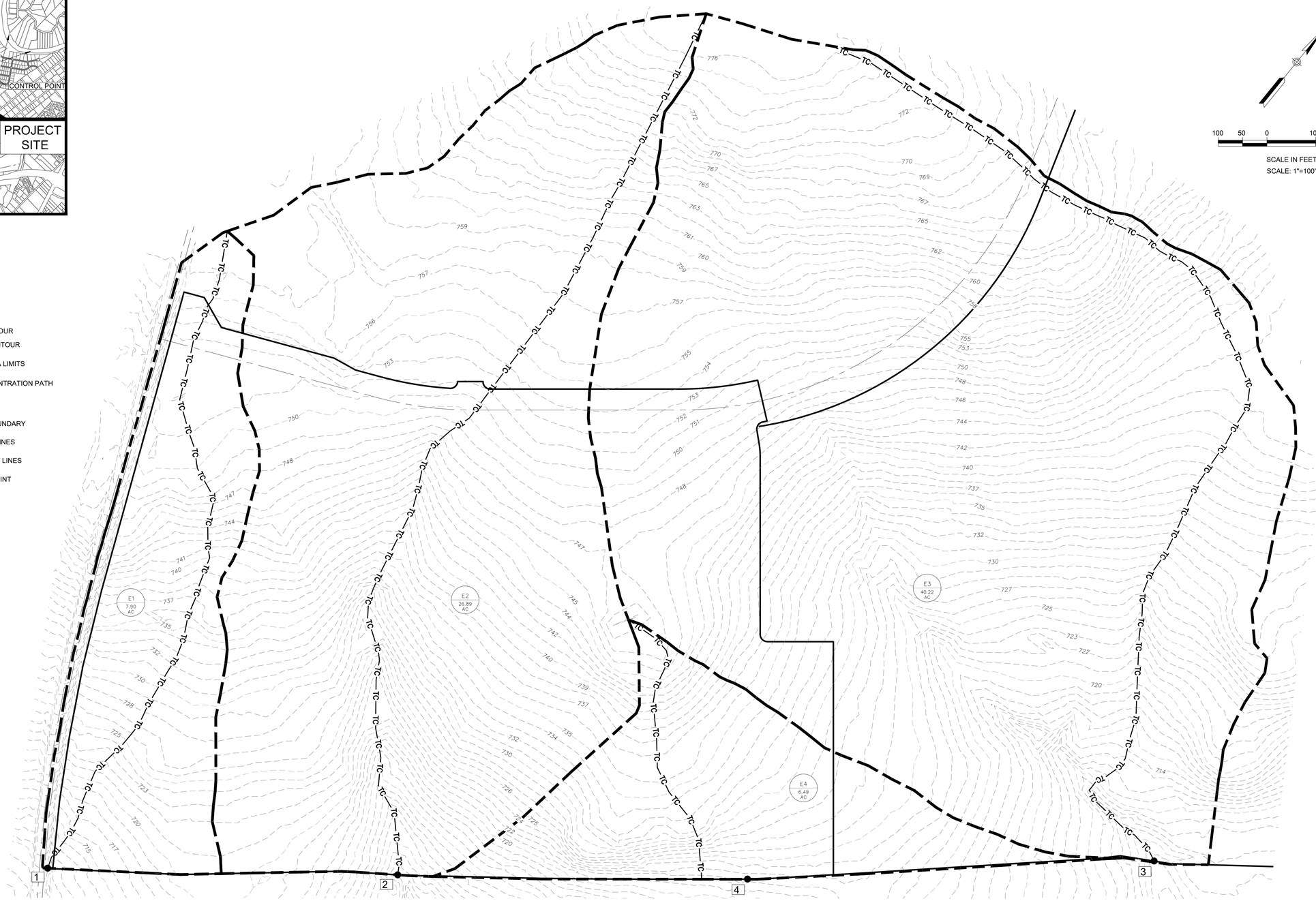


LOCATION MAP

SCALE: 1" = 2000'

LEGEND

A / X.X	AREA (BASIN) ACREAGE
740	EXISTING CONTOUR
740	PROPOSED CONTOUR
	DRAINAGE AREA LIMITS
TC TC TC	TIME OF CONCENTRATION PATH
	FLOW ARROWS
	PROPOSED BOUNDARY
	EXISTING LOT LINES
	PROPOSED LOT LINES
A	REFERENCE POINT



100 50 0 100 200

SCALE IN FEET

SCALE: 1"=100'

Veramendi Precinct 23-1 Atlas14 Existing Time of Concentration Table PA_NB

Study Point	Drainage Area	Sheet Row (max length = 150')					Shallow Concentrated Row					Channel Flow				Total	Total
		n	L_t(ft)	P_2(in)	S_t%	T_t(min)	Paved/Unpaved	L_{sc}(ft)	S_{sc}%	k	T_{sc}(min)	L(ft)	V(ft/sec)	T_{ch}(min)	T_c(min)	Lag(min)
1	E1	0.24	100	4.08	0.5	20.0	Unpaved	1,000	3.1	16.13	5.9	330	6	0.9	**26.8**	**16.1**
2	E2	0.24	100	4.08	1.4	14.58	Unpaved	925	3.0	16.13	5.5	960	6	2.7	**22.8**	**13.7**
3	E3	0.24	100	4.08	2.2	12.2	Unpaved	1,000	3.2	16.13	5.8	1167	6	3.2	**21.2**	**12.7**
4	E4	0.24	100	4.08	1.3	15.0	Unpaved	501	4.6	16.13	2.4	0	6	0.0	**17.4**	**10.4**
		Eq. 5.4.1 $T_t=\frac{0.007(nL_t)^{0.8}}{(P_2)^{0.5}\,S_t^{0.4}}$					Eq 5.4.2 $T_{sc}=\frac{L_{sc}}{3600KS_{sc}^{0.5}}$					Eq 5.4.3 $T_{ch}=\frac{L_{ch}}{3600*V}$			Eq 5.4 $T_t+T_{sc}+T_{ch}$	

Veramendi Precinct 23-1 Atlas14 Existing Q Flow Table PA_NB

Study Point	Drainage Area		Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Intensity					Flow				
	Area(s)	A (ac.)	C_2	C_{10}	C_{25}	C_{50}	C_{100}	I_2(in/hr)	I_{10}(in/hr)	I_{25}(in/hr)	I_{50}(in/hr)	I_{100}(in/hr)	Q_2(ft³/s)	Q_{10} (ft³/s)	Q_{25}(ft³/s)	Q_{50}(ft³/s)	Q_{100}(ft³/s)
1	E1	7.90	0.31	0.36	0.40	0.43	0.47	3.15	4.62	5.55	6.27	7.06	7.7	13.1	17.5	21.3	26.2
2	E2	26.89	0.31	0.36	0.40	0.43	0.47	3.42	5.01	6.03	6.82	7.68	28.5	48.5	64.8	78.9	97.0
3	E3	40.22	0.31	0.36	0.40	0.43	0.47	3.55	5.20	6.26	7.09	7.97	44.3	75.3	100.7	122.5	150.7
4	E4	6.49	0.31	0.36	0.40	0.43	0.47	3.93	5.76	6.94	7.88	8.87	7.9	13.5	18.0	22.0	27.1
Eq 5.3.1			Q=CIA														

VERAMENDI PRECINCT 23 UNIT 1

EXISTING DRAINAGE AREA MAP

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: Sh_DAM.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

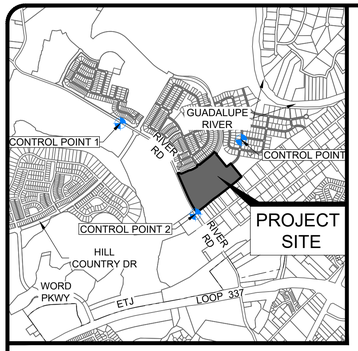
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **4.0**

FOR PERMIT

K:\SA3856.KSA Properties\2405.23-1\426 Site Development Plan\03WD-Sheets\Sh_DAM.dwg
User: Nicholas Gower
Last Modified: Jul. 07, 25 - 18:45
Plot Scale: 1=40.00' Plot Date: Jul. 08, 25 - 11:41:47

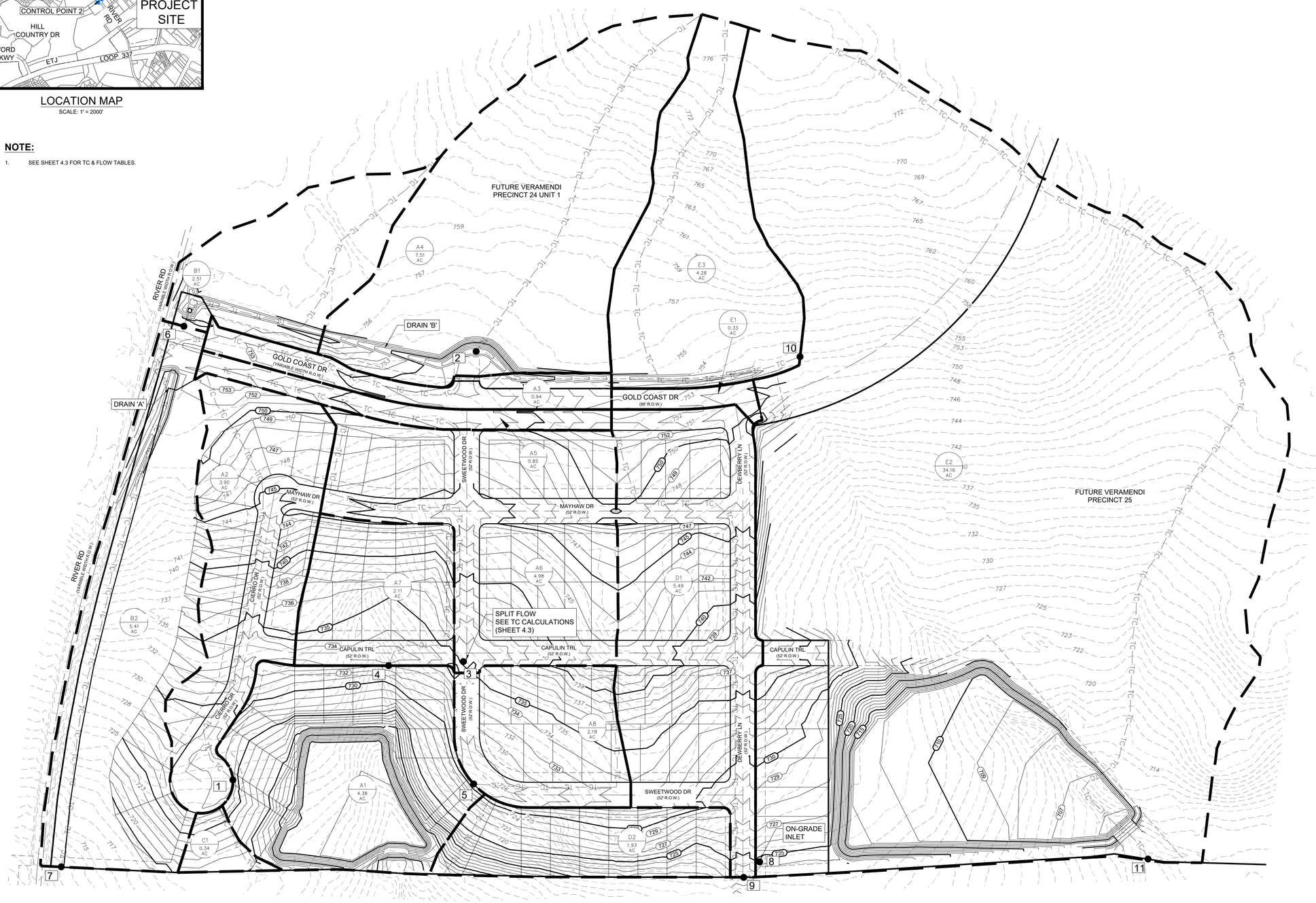


LOCATION MAP

SCALE: 1" = 2000'

NOTE:

1. SEE SHEET 4.3 FOR TC & FLOW TABLES.



SCALE IN FEET
SCALE: 1"=100'

LEGEND

- AREA (BASIN) ACREAGE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE AREA LIMITS
- TIME OF CONCENTRATION PATH
- FLOW ARROWS
- PROPOSED BOUNDARY
- EXISTING LOT LINES
- PROPOSED LOT LINES
- REFERENCE POINT

VERAMENDI PRECINCT 23 UNIT 1

PROPOSED DRAINAGE AREA MAP

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: St_DAM.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
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Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 4.1

FOR PERMIT

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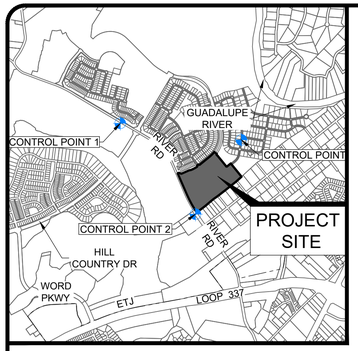
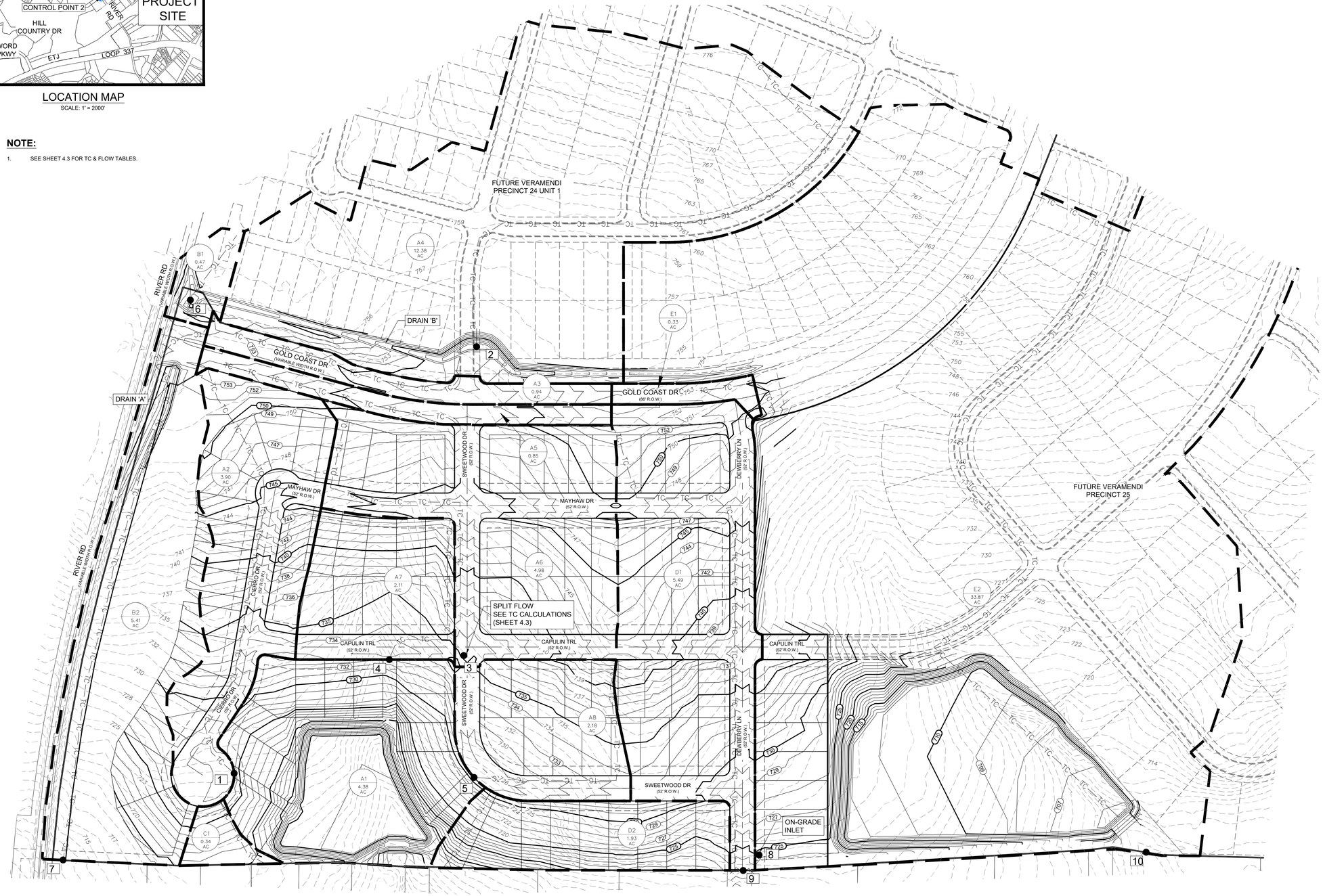
Xref Name(s):
Last Modified: Jul 07, 25 - 18:45
Last Plotted: Jul 08, 25 - 14:51

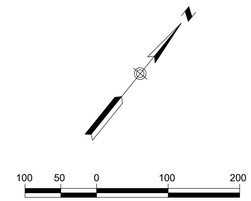


LOCATION MAP
SCALE: 1" = 2000'

NOTE:

1. SEE SHEET 4.3 FOR TC & FLOW TABLES.





LEGEND

- AREA (BASIN) ACREAGE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DRAINAGE AREA LIMITS
- TIME OF CONCENTRATION PATH
- FLOW ARROWS
- PROPOSED BOUNDARY
- EXISTING LOT LINES
- PROPOSED LOT LINES
- REFERENCE POINT

VERAMENDI PRECINCT 23 UNIT 1

ULTIMATE DRAINAGE AREA MAP

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: Sh_DAM.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
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TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 4.2

FOR PERMIT

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Xref Name(s):
Last Modified: Jul 07, 25 - 18:45
Last Plotted: Jul 08, 25 - 11:40:20

Veramendi Precinct 23-1 Atlas14 Proposed Time of Concentration Table PA_NB

Study Point	Drainage Area	Sheet Flow (max length = 150')					Shallow Concentrated Row					Channel Row			Total	Total
		n	L_t(ft)	P_2(in)	S_t%	T_t(min)	Paved/Unpaved	L_{sc}(ft)	S_{sc}%	k	T_{sc}(min)	L(ft)	V(ft/sec)	T_{ch}(min)	T_c(min)	Lag(min)
	A1	SEE VERAMENDI PRECINCT 23 UNIT 1 STORM WATER MANAGEMENT PLAN REPORT														
1	A2	0.24	100	4.08	2.8	11.0	Unpaved	171	3.5	16.13	0.9	0	6	0.0	**14.9**	**8.9**
							Paved	630	3.3	20.32	2.9					
	A3	0.24	41	4.08	0.50	10.8	Paved	546	1.5	20.32	3.7	0	6	0.0	**14.4**	**8.6**
	A4	0.24	100	4.08	0.5	20.0	Unpaved	753	3.0	16.13	4.5	0	6	0.0	**24.5**	**14.7**
2	A3+A4	CARRY OVER FROM A4									24.5	0	6	0.0	**24.5**	**14.7**
	A5	0.24	26	4.08	3.60	5.0	Paved	530	1.5	20.32	3.5	0	6	0.0	**10.0**	**6.0**
	A6	0.24	100	4.08	3.3	10.3	Unpaved	71	1.5	16.13	0.6	0	6	0.0	**12.9**	**7.7**
							Paved	437	3.4	20.32	2.0					
3	A5+A6	CARRY OVER FROM A6									12.9	0	6	0.0	**12.9**	**7.7**
3	SHEET FLOW TO STUDY POINT 4															
3	SHEET FLOW TO STUDY POINT 5															
	A7	0.24	100	4.08	4.9	8.8	Unpaved	151	2.6	16.13	1.0	0	6	0.0	**10.5**	**6.3**
							Paved	144	3.0	20.32	0.7					
4	A7 +SHEET FLOW TO STUDY POINT 4	CARRY OVER FROM A7									10.5	0	6	0.0	**10.5**	**6.3**
	A8	0.24	100	4.08	5.3	8.6	Unpaved	152	3.0	16.13	0.9	0	6	0.0	**11.7**	**7.0**
							Paved	293	1.2	20.32	2.2					
5	A8+SHEET FLOW TO STUDY POINT 5	CARRY OVER FROM A8									11.7	0	6	0.0	**11.7**	**7.0**
6	B1	0.24	100	4.08	2.10	12.4	Unpaved	366	1.4	16.13	3.2	286	6	0.8	**16.4**	**9.8**
	B2	0.24	100	4.08	1.2	15.5	Unpaved	1,000	3.9	16.13	5.2	103	6	0.3	**21.0**	**12.6**
7	B1+B2	CARRY OVER FROM B2									21.0	0	6	0.0	**21.0**	**12.6**
	C1	0.24	100	4.08	6.7	7.8	Unpaved	65	1.5	16.13	0.5	0	6	0.0	**10.0**	**6.0**
	D1	0.24	100	4.08	2.5	11.6	Unpaved	60	1.9	16.13	0.4	0	6	0.0	**16.3**	**9.8**
							Paved	947	3.3	20.32	4.3					
8	ON GRADE INLET															
9	BYPASS															
	D2	0.24	100	4.08	8.1	7.2	Unpaved	88	13.1	16.13	0.3	0	6	0.0	**10.0**	**6.0**
	E1	0.24	100	4.08	0.5	20.0	Unpaved	987	3.5	16.13	5.5	0	6	0.0	**25.5**	**15.3**
	E2	0.24	100	4.08	2.0	12.6	Unpaved	1,000	3.2	16.13	5.8	1167	6	3.2	**21.7**	**13.0**
10	E3	0.24	100	4.08	0.5	20.0	Unpaved	987	3.5	16.13	5.5	0	6	0.0	**25.5**	**15.3**
11	E1+ E2+ E3 + STUDY POINT 8 ON GRADE INLET	CARRY OVER FROM E2									21.7	0	6	0.0	**21.7**	**13.0**
		Eq. 5.4.1 $T_t = \frac{0.007(nL_t)^{0.8}}{(P_2)^{0.5}S_t^{0.4}}$					Eq 5.4.2 $T_{sc} = \frac{L_{sc}}{3600KS_{sc}^{0.5}}$					Eq 5.4.3 $T_{ch} = \frac{L_{ch}}{3600 * V}$			Eq 5.4 $T_t+T_{sc}+T_{ch}$	

Veramendi Precinct 23-1 Atlas14 Ultimate Time of Concentration Table PA_NB

Study Point	Drainage Area	Sheet Flow (max length = 150')					Shallow Concentrated Row					Channel Row			Total	Total
		n	L_t(ft)	P_2(in)	S_t%	T_t(min)	Paved/Unpaved	L_{sc}(ft)	S_{sc}%	k	T_{sc}(min)	L(ft)	V(ft/sec)	T_{ch}(min)	T_c(min)	Lag(min)
	A1	SEE VERAMENDI PRECINCT 23 UNIT 1 STORM WATER MANAGEMENT PLAN REPORT														
1	A2	0.24	100	4.08	2.8	11.0	Unpaved	171	3.5	16.13	0.9	0	6	0.0	**14.9**	**8.9**
							Paved	630	3.3	20.32	2.9					
	A3	0.24	41	4.08	0.50	10.8	Paved	546	1.5	20.32	3.7	0	6	0.0	**14.4**	**8.6**
	A4	0.24	100	4.08	2.2	12.2	Unpaved	141	2.4	16.13	0.9	0	6	0.0	**18.1**	**10.9**
							Paved	1,002	2.7	20.32	5.0					
2	A3+A4	CARRY OVER FROM A4									18.1		6	0.0	**18.1**	**10.9**
	A5	0.24	26	4.08	3.60	5.0	Paved	530	1.5	20.32	3.5	0	6	0.0	**10.0**	**6.0**
	A6	0.24	100	4.08	3.3	10.3	Unpaved	71	1.5	16.13	0.6	0	6	0.0	**12.9**	**7.7**
							Paved	437	3.4	20.32	2.0					
3	A5+A6	CARRY OVER FROM A6									12.9	0	6	0.0	**12.9**	**7.7**
3	SHEET FLOW TO STUDY POINT 4															
3	SHEET FLOW TO STUDY POINT 5															
	A7	0.24	100	4.08	4.9	8.8	Unpaved	151	2.6	16.13	1.0	0	6	0.0	**10.5**	**6.3**
							Paved	144	3.0	20.32	0.7					
4	A7 +SHEET FLOW TO STUDY POINT 4	CARRY OVER FROM A7									10.5	0	6	0.0	**10.5**	**6.3**
	A8	0.24	100	4.08	5.3	8.6	Unpaved	152	3.0	16.13	0.9	0	6	0.0	**11.7**	**7.0**
							Paved	293	1.2	20.32	2.2					
5	A8+ SHEET FLOW TO STUDY POINT 5	CARRY OVER FROM A8									11.7	0	6	0.0	**11.7**	**7.0**
6	B1	0.24	100	4.08	0.50	20.0	Unpaved	46	1.6	16.13	0.4	0	6	0.0	**20.4**	**12.2**
	B2	0.24	100	4.08	1.2	15.5	Unpaved	1,000	3.9	16.13	5.2	103	6	0.3	**21.0**	**12.6**
7	B1+B2	CARRY OVER FROM B1									20.4	0	6	0.0	**20.4**	**12.2**
	C1	0.24	100	4.08	6.7	7.8	Unpaved	65	1.5	16.13	0.5	0	6	0.0	**10.0**	**6.0**
	D1	0.24	100	4.08	2.5	11.6	Unpaved	60	1.9	16.13	0.4	0	6	0.0	**16.3**	**9.8**
							Paved	947	3.3	20.32	4.3					
8	ON GRADE INLET															
9	BYPASS															
	D2	0.24	100	4.08	8.1	7.2	Unpaved	88	13.1	16.13	0.3	0	6	0.0	**10.0**	**6.0**
	E1	0.24	100	4.08	1.7	13.5	Unpaved	208	2.1	16.13	1.5	0	6	0.0	**17.7**	**10.6**
							Paved	368	1.2	20.32	2.7					
	E2	0.24	100	4.08	1.9	12.9	Unpaved	80	5.0	16.13	0.4	645	6	1.8	**19.6**	**11.8**
							Paved	1,000	3.3	20.32	4.5					
10	E1+E2+ STUDY POINT 8 ON GRADE INLET	CARRY OVER FROM E2									19.6	0	6	0.0	**19.6**	**11.8**
		Eq. 5.4.1 $T_t = \frac{0.007(nL_t)^{0.8}}{(P_2)^{0.5}S_t^{0.4}}$					Eq 5.4.2 $T_{sc} = \frac{L_{sc}}{3600KS_{sc}^{0.5}}$					Eq 5.4.3 $T_{ch} = \frac{L_{ch}}{3600 * V}$			Eq 5.4 $T_t+T_{sc}+T_{ch}$	

Veramendi Precinct 23-1 Atlas14 Proposed Q Flow Table PA_NB

Study Point	Drainage Area		Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Intensity					Flow				
	Area(s)	A (ac.)	C_2	C_{10}	C_{25}	C_{50}	C_{100}	I_2(in/hr)	I_{10}(in/hr)	I_{25}(in/hr)	I_{50}(in/hr)	I_{100}(in/hr)	Q_2(ft^3/s)	Q_{10} (ft^3/s)	Q_{25}(ft^3/s)	Q_{50}(ft^3/s)	Q_{100}(ft^3/s)
	A1	4.38	SEE VERAMENDI PRECINCT 23 UNIT 1 STORM WATER MANAGEMENT PLAN REPORT														
1	A2	3.90	0.55	0.62	0.67	0.70	0.75	4.26	6.26	7.55	8.59	9.68	9.1	15.2	19.7	23.6	28.3
	A3	0.94	0.62	0.69	0.74	0.78	0.82	4.33	6.38	7.70	8.76	9.87	2.5	4.1	5.3	6.4	7.6
	A4	7.51	0.29	0.35	0.39	0.42	0.46	3.31	4.83	5.81	6.57	7.40	7.2	12.7	17.0	20.7	25.5
2	A3+A4	8.45	0.33	0.39	0.43	0.46	0.50	3.31	4.83	5.81	6.57	7.40	9.1	15.8	21.0	25.5	31.3
	A5	0.85	0.60	0.68	0.72	0.76	0.81	5.05	7.50	9.12	10.38	11.70	2.6	4.3	5.6	6.7	8.0
	A6	4.98	0.57	0.64	0.69	0.72	0.77	4.56	6.75	8.16	9.29	10.46	12.9	21.5	27.9	33.4	40.0
3	A5+A6	5.83	0.57	0.64	0.69	0.73	0.77	4.56	6.75	8.16	9.29	10.46	15.2	25.4	32.9	39.4	47.2
3	SHEET FLOW TO STUDY POINT 4												8.1	11.2	13.2	14.7	16.5
3	SHEET FLOW TO STUDY POINT 5												7.3	14.4	20.0	25.0	31.1
	A7	2.11	0.57	0.64	0.69	0.73	0.77	4.96	7.37	8.95	10.19	11.48	6.0	10.0	13.0	15.6	18.7
4	A7 +SHEET FLOW TO STUDY POINT 4												14.1	21.2	26.2	30.3	35.2
	A8	2.18	0.58	0.65	0.70	0.73	0.78	4.75	7.05	8.55	9.72	10.96	6.0	10.0	13.0	15.5	18.6
5	A8+SHEET FLOW TO STUDY POINT 5												13.3	24.4	33.0	40.5	49.7
6	B1	2.51	0.29	0.35	0.39	0.42	0.46	4.05	5.95	7.16	8.14	9.17	3.0	5.3	7.0	8.6	10.6
	B2	5.41	0.34	0.40	0.45	0.48	0.52	3.57	5.23	6.29	7.12	8.01	6.6	11.4	15.2	18.4	22.4
7	B1+B2	7.92	0.33	0.39	0.43	0.46	0.50	3.57	5.23	6.29	7.12	8.01	9.2	16.1	21.4	25.9	31.7
	C1	0.34	0.43	0.49	0.53	0.57	0.61	5.05	7.50	9.12	10.38	11.70	0.7	1.3	1.7	2.0	2.4
	D1	5.49	0.58	0.66	0.70	0.74	0.79	4.06	5.97	7.19	8.17	9.20	13.0	21.5	27.8	33.2	39.7
8	ON GRADE INLET												13.1	21.1	24.7	26.7	28.4
9	BYPASS												0.0	0.5	3.2	6.6	11.5
	D2	1.93	0.54	0.61	0.66	0.69	0.74	5.05	7.50	9.12	10.38	11.70	5.3	8.9	11.6	13.9	16.7
11	E1	0.33	0.57	0.64	0.68	0.72	0.77	3.24	4.74	5.70	6.44	7.25	0.6	1.0	1.3	1.5	1.8
	E2	34.16	0.30	0.36	0.40	0.43	0.47	3.51	5.14	6.19	7.00	7.88	36.3	63.8	85.3	103.8	127.7
11	E3	4.28	0.29	0.35	0.39	0.42	0.46	3.24	4.74	5.70	6.44	7.25	4.0	7.1	9.5	11.6	14.3
11	E1+ E2+ E3 + STUDY POINT 8 ON GRADE INLET												50.0	85.9	111.3	132.0	157.9

Eq 5.3.1 $Q = CIA$

Veramendi Precinct 23-1 Atlas14 Ultimate Q Flow Table PA_NB

Study Point	Drainage Area		Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Intensity					Flow				
	Area(s)	A (ac.)	C_2	C_{10}	C_{25}	C_{50}	C_{100}	I_2(in/hr)	I_{10}(in/hr)	I_{25}(in/hr)	I_{50}(in/hr)	I_{100}(in/hr)	Q_2(ft^3/s)	Q_{10} (ft^3/s)	Q_{25}(ft^3/s)	Q_{50}(ft^3/s)	Q_{100}(ft^3/s)
	A1	4.38	SEE VERAMENDI PRECINCT 23 UNIT 1 STORM WATER MANAGEMENT PLAN REPORT														
1	A2	3.90	0.55	0.62	0.67	0.70	0.75	4.26	6.26	7.55	8.59	9.68	9.1	15.1	19.6	23.5	28.2
	A3	0.94	0.65	0.73	0.77	0.81	0.86	4.33	6.38	7.70	8.76	9.87	2.6	4.4	5.6	6.7	8.0
	A4	12.38	0.53	0.60	0.64	0.68	0.72	3.85	5.64	6.79	7.72	8.69	25.0	41.6	53.9	64.6	77.5
2	A3+A4	13.32	0.53	0.60	0.65	0.69	0.73	3.85	5.64	6.79	7.72	8.69	27.4	45.5	58.8	70.5	84.6
	A5	0.85	0.64	0.72	0.76	0.80	0.85	5.05	7.50	9.12	10.38	11.70	2.8	4.6	5.9	7.1	8.5
	A6	4.98	0.57	0.64	0.69	0.72	0.77	4.56	6.75	8.16	9.29	10.46	12.9	21.5	27.9	33.4	40.0
3	A5+A6	5.83	0.58	0.65	0.70	0.73	0.78	4.56	6.75	8.16	9.29	10.46	15.4	25.6	33.2	39.7	47.6
3	SHEET FLOW TO STUDY POINT 4												8.1	11.2	13.2	14.7	16.5
3	SHEET FLOW TO STUDY POINT 5												7.3	14.4	20.0	25.0	31.1
	A7	2.11	0.57	0.64	0.69	0.73	0.77	4.96	7.37	8.95	10.19	11.48	6.0	10.0	13.0	15.6	18.7
4	A7 +SHEET FLOW TO STUDY POINT 4												14.1	21.2	26.2	30.3	35.2
	A8	2.18	0.58	0.65	0.70	0.73	0.78	4.75	7.05	8.55	9.72	10.96	6.0	10.0	13.0	15.5	18.6
5	A8+ SHEET FLOW TO STUDY POINT 5												13.3	24.4	33.0	40.5	49.7
6	B1	0.47	0.30	0.36	0.40	0.43	0.47	3.62	5.31	6.39	7.23	8.14	0.5	0.9	1.2	1.5	1.8
	B2	5.41	0.34	0.40	0.45	0.48	0.52	3.57	5.23	6.29	7.12	8.01	6.6	11.4	15.2	18.4	22.4
7	B1+B2	5.88	0.34	0.40	0.44	0.47	0.51	3.62	5.31	6.39	7.23	8.14	7.2	12.5	16.6	20.1	24.6
	C1	0.34	0.43	0.49	0.53	0.57	0.61	5.05	7.50	9.12	10.38	11.70	0.7	1.3	1.7	2.0	2.4
	D1	5.49	0.59	0.66	0.71	0.74	0.79	4.06	5.97	7.19	8.17	9.20	13.1	21.6	27.9	33.3	39.9
8	ON GRADE INLET												13.1	21.1	24.7	26.7	28.4
9	BYPASS												0.0	0.5	3.2	6.6	11.5
	D2	1.93	0.54	0.61	0.66	0.69	0.74	5.05	7.50	9.12	10.38	11.70	5.3	8.9	11.6	13.9	16.7
	E1	0.33	0.57	0.64	0.68	0.72	0.77	3.89	5.71	6.87	7.81	8.79	0.7	1.2	1.6	1.9	2.2
	E2	33.87	0.41	0.48	0.52	0.55	0.60	3.69	5.42	6.52	7.39	8.32	51.6	87.7	115.0	138.6	168.1
10	E1+E2+ STUDY POINT 8 ON GRADE INLET												65.4	110.0	141.3	167.2	198.7

Eq 5.3.1 $Q = CIA$

VERAMENDI PRECINCT 23 UNIT 1

DRAINAGE AREA MAP CALCULATIONS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: SH_DAM.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **4.3**

FOR PERMIT

K:\SA3856_KSA Properties\2405 23-1\425 Site Development Plans\DrawingSheets\sh_DAM.dwg
Xref Drawings:
Last Modified: Jul. 07, 25 – 16:45
Plotted: Jul. 07, 25 – 16:45

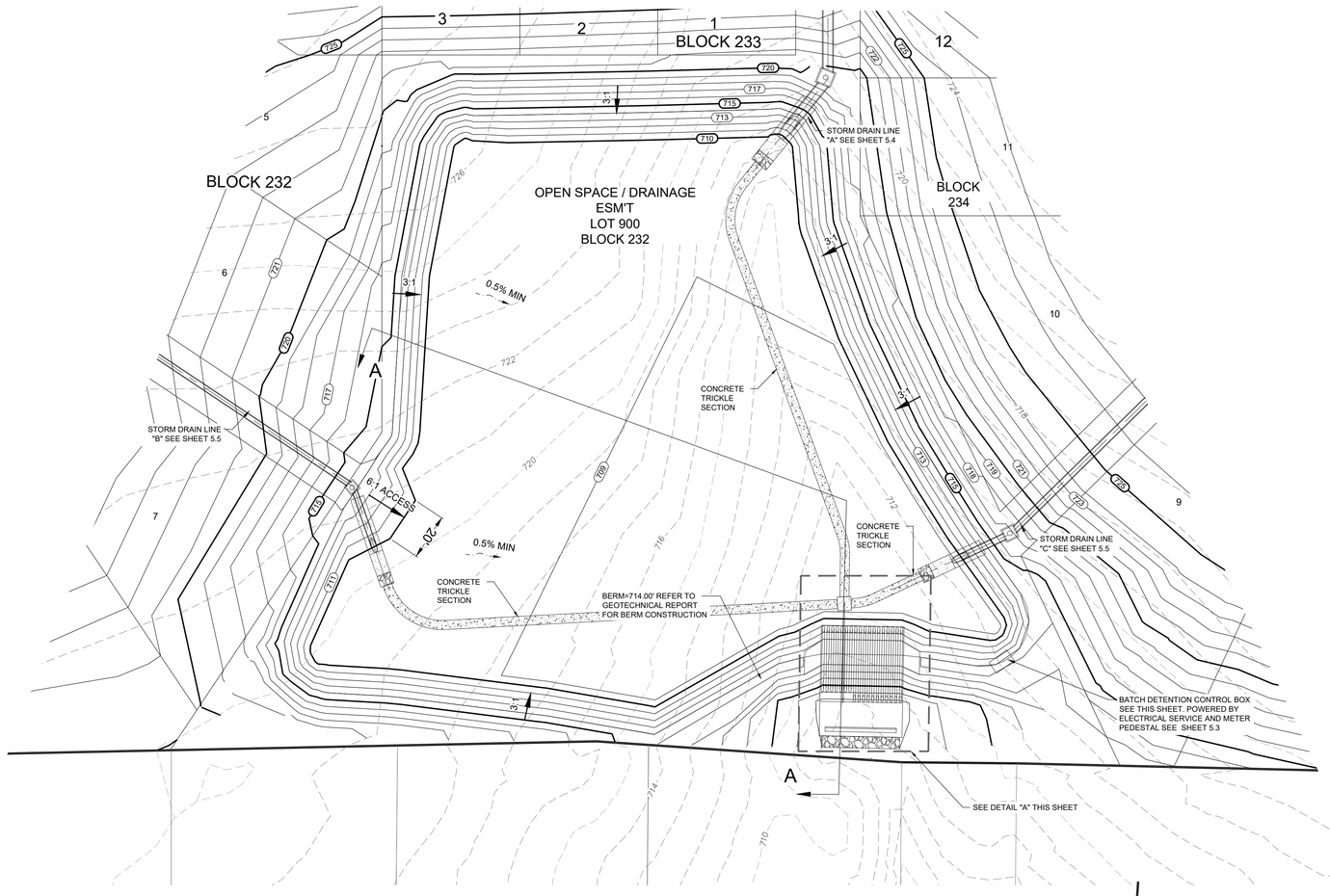
DRAINAGE & GRADING NOTES:

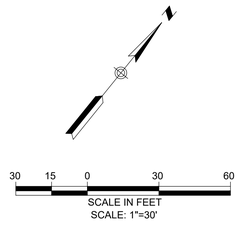
1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATION FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" CONCRETE AND MEET MINIMUM COMPRESIVE STRENGTH OF 3,000 PSI IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS ON SHEETS 5.10-5.12 FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATIUON BEFORE THE CITY OF NEW BRAUNFELS WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH "D" AS SHOWN IN THE PROFILE.
7. ALL RCP SHALL BE AASHTO M170 CLASS III RCP.
8. ALL WORK SHALL BE PERFORMED WITHIN SITE LIMITS OF CONSTRUCTION.
9. CONTRACTOR TO PROOF ROLL BOTTOM AND SIDES OF POND TO ENSURE FIRM BOTTOM. IF BOTTOM APPEARS FRACTURED CONTRACTOR TO NOTIFY ENGINEER PRIOR TO PLACEMENT OF SAND BED ON TOPSOIL.
10. THE CONTRACTOR WILL BE REQUIRED TO PERFORM TESTING REQUIREMENTS TO SATISFY CITY OF NEW BRAUFNELS INSPECTIONS. THIS SHALL INCLUDE BUT NOT LIMITED TO PROVIDING NECESSARY WATER AS REQUESTED BY INSPECTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR POSITIVE DRAINAGE IN BASIN AREA.
12. ALL DISTURBED AREAS TO BE STABILIZED WITH HYDROMULCH IMMEDIATELY AFTER ESTABLISHING FINAL GRADES UNLESS OTHERWISE NOTED.
13. UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION, AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED STRUCTURAL CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.
14. ALL CONCRETE LINING SHALL BE A MINIMUM OF SIX (6) INCHES THICK AND REINFORCED WITH NO. 4 ROUND BARS @ 18 INCHES ON CENTER EACH WAY OR WELDED WIRE FABRIC OF 6" x 6"-W/D6 x W/D6. THE DEPTH OF ALL TOEDOWNS SHALL BE 36 INCHES UPSTREAM, 24 INCHES DOWNSTREAM, AND 18 INCHES FOR SIDE SLOPES.
15. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER STORM SEWER LINES. 2.0'(MIN) COVER OVER WATER PRIOR TO CONSTRUCTION.
16. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF NEW BRAUNFELS SPECIFICATIONS.
17. ALL BENDS AND FITTINGS SHALL BE PREFABRICATED BY MANUFACTURER. NO FIELD FABRICATION OF FITTINGS IS ALLOWED.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.



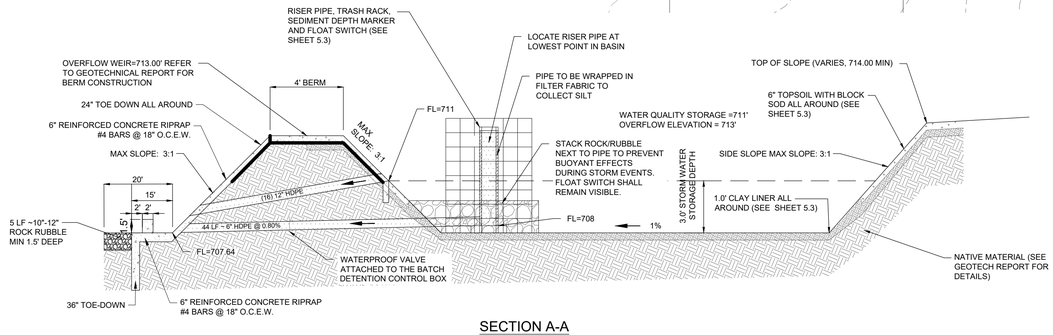


LEGEND

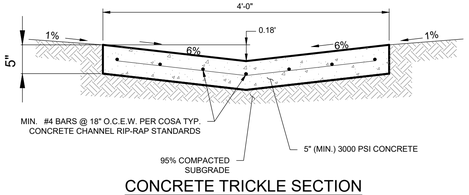
PROPOSED	EXISTING	
580	580	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
580.25	580.25	GROUND ELEVATION

EMERGENCY OVERFLOW WEIR CALCULATION

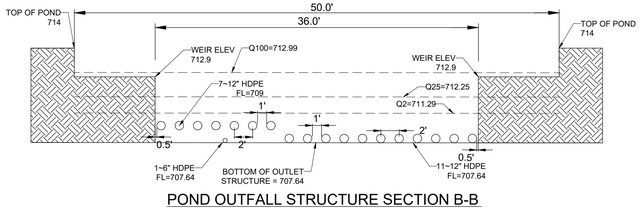
$Q_{CAP}=C*L*H^{3/2}$
C = 2.6
H = 1.0 FT
L = 50 FT WEIR
$Q_{CAP}=2.6*50*1.0^{3/2}$
Q_{CAP}=130.0 CFS
Q_{CAP}=109.24 CFS
130.0 CFS > 109.24 CFS = OK



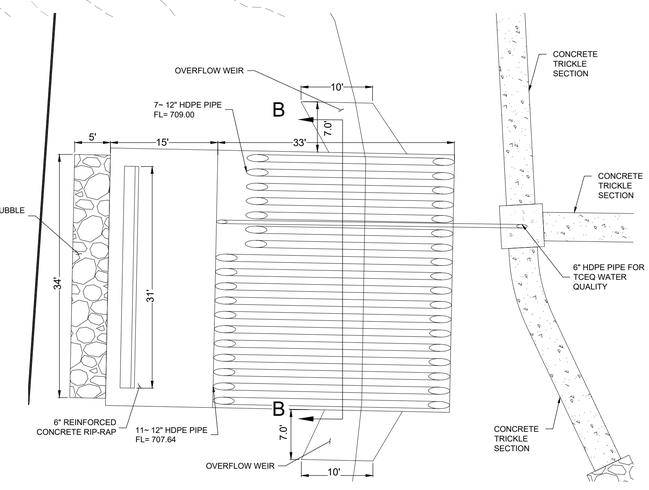
SECTION A-A
N.T.S.



CONCRETE TRICKLE SECTION
N.T.S.



POND OUTFALL STRUCTURE SECTION B-B
N.T.S.



DETAIL "A"
SCALE: 1"=10'

VERAMENDI PRECINCT 23 UNIT 1

DETENTION BASIN A

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: NG
CHECKED BY: PGF
DRAWING NAME: sh_Basin.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **5.0**

FOR PERMIT

X:\SUBDIR_KSA Projects\SA405 23-11\05 Site Development Plans\GWC-Sheets\sh_Basin.dwg
Xref: Paperspace
Last Modified: Jul. 07, 25 - 19:23
Plot By/Time: Jul. 08, 25 - 9:14:20

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3. REFERENCE DRAINAGE DETAILS ON SHEETS 5.10-5.12 FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATIUON BEFORE THE CITY OF NEW BRAUNFELS WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH "D" AS SHOWN IN THE PROFILE.
7. ALL RCP SHALL BE AASHTO M170 CLASS III RCP.
8. ALL WORK SHALL BE PERFORMED WITHIN SITE LIMITS OF CONSTRUCTION.
9. CONTRACTOR TO PROOF ROLL BOTTOM AND SIDES OF POND TO ENSURE FIRM BOTTOM. IF BOTTOM APPEARS FRACTURED CONTRACTOR TO NOTIFY ENGINEER PRIOR TO PLACEMENT OF SAND BED ON TOPSOIL.
10. THE CONTRACTOR WILL BE REQUIRED TO PERFORM TESTING REQUIREMENTS TO SATISFY CITY OF NEW BRAUFNELS INSPECTIONS. THIS SHALL INCLUDE BUT NOT LIMITED TO PROVIDING NECESSARY WATER AS REQUESTED BY INSPECTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR POSITIVE DRAINAGE IN BASIN AREA.
12. ALL DISTURBED AREAS TO BE STABILIZED WITH HYDROMULCH IMMEDIATELY AFTER ESTABLISHING FINAL GRADES UNLESS OTHERWISE NOTED.
13. UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION, AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED STRUCTURAL CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.
14. ALL CONCRETE LINING SHALL BE A MINIMUM OF SIX (6) INCHES THICK AND REINFORCED WITH NO. 4 ROUND BARS @ 18 INCHES ON CENTER EACH WAY OR WELDED WIRE FABRIC OF 6" x 6"-W/D6 x W/D6. THE DEPTH OF ALL TOEDOWNS SHALL BE 36 INCHES UPSTREAM, 24 INCHES DOWNSTREAM, AND 18 INCHES FOR SIDE SLOPES.
15. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER STORM SEWER LINES. 2.0'(MIN) COVER OVER WATER PRIOR TO CONSTRUCTION.
16. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF NEW BRAUNFELS SPECIFICATIONS.
17. ALL BENDS AND FITTINGS SHALL BE PREFABRICATED BY MANUFACTURER. NO FIELD FABRICATION OF FITTINGS IS ALLOWED.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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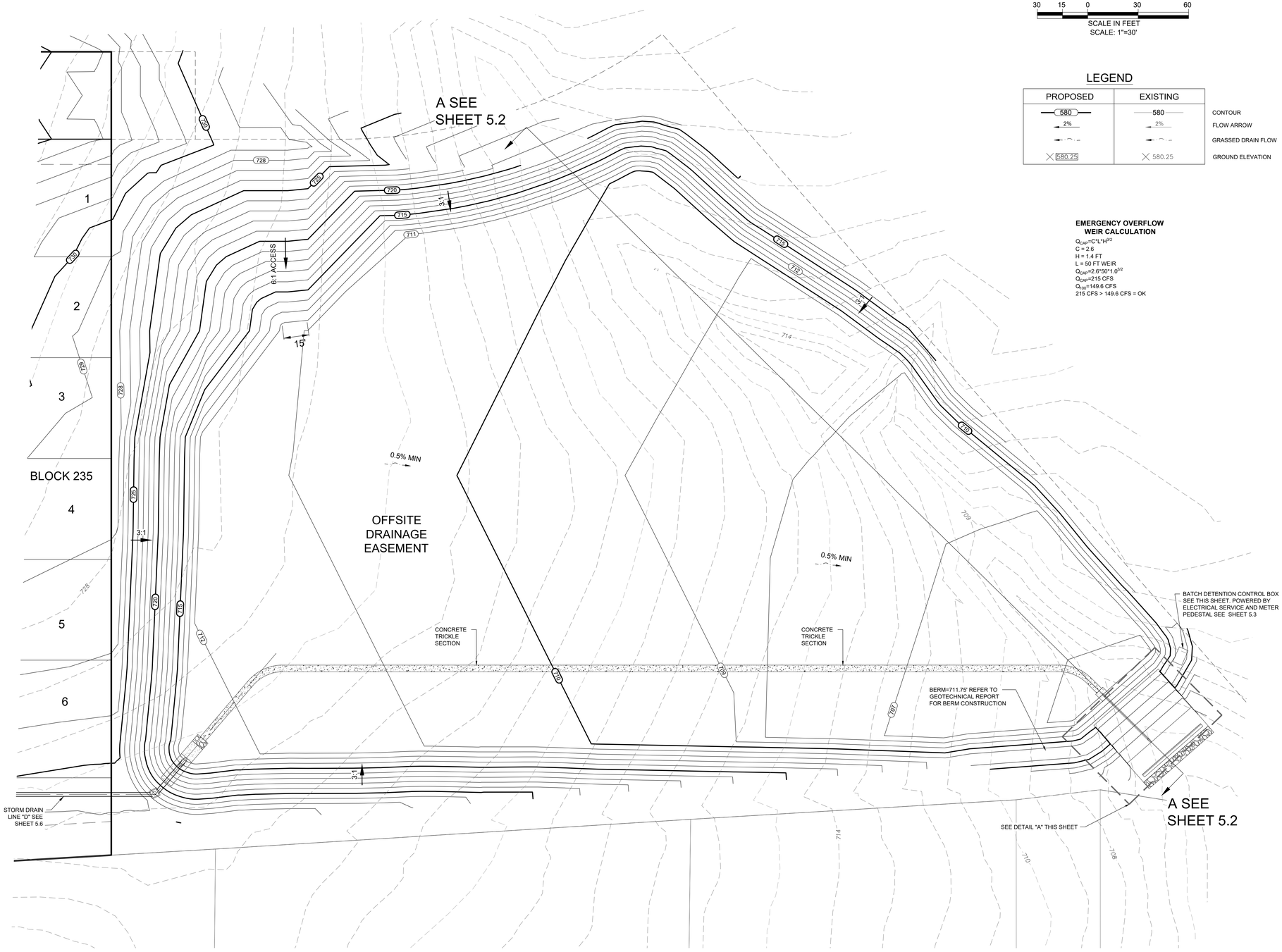
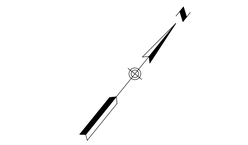
CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.





LEGEND

PROPOSED	EXISTING	
580	580	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
580.25	580.25	GROUND ELEVATION

EMERGENCY OVERFLOW WEIR CALCULATION

$Q_{CAP}=C*L*H^{3/2}$
C = 2.6
H = 1.4 FT
L = 50 FT WEIR
$Q_{CAP}=2.6*50*1.0^{3/2}$
Q_{CAP}=215 CFS
Q_{CAP}=149.6 CFS
215 CFS > 149.6 CFS = OK

VERAMENDI PRECINCT 23 UNIT 1

DETENTION BASIN E

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: NG
CHECKED BY: PGF
DRAWING NAME: sh_Basin.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **5.1**

FOR PERMIT

K:\SA3856.405 - AVA Properties\2405 23-1\426 Site Development Plans\2405-Sheets\sh_Basin.dwg
User: ngower
Last Modified: Jul. 07, 25 - 19:23
File Name: sh_Basin.dwg

DRAINAGE & GRADING NOTES:

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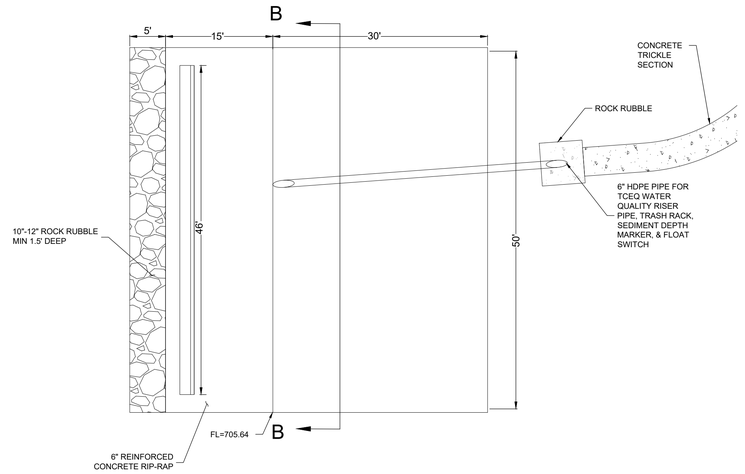
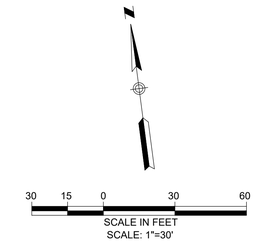
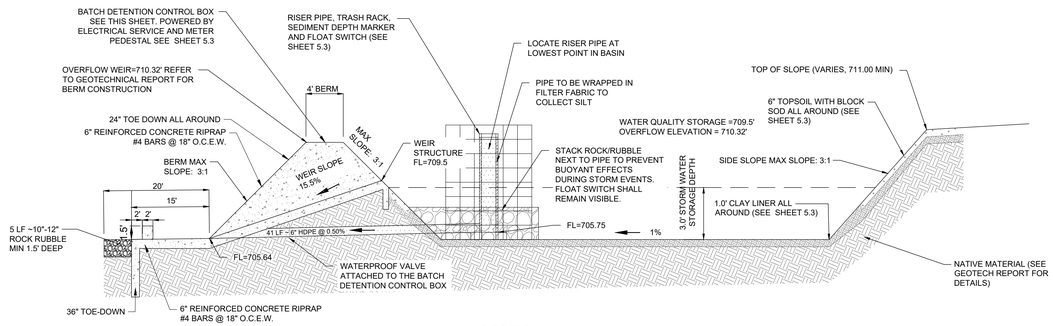


DETAIL "A"
SCALE: 1"=10'

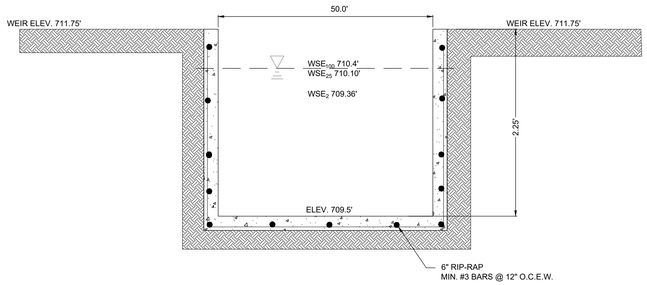


LEGEND

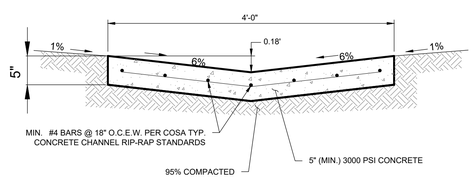
PROPOSED	EXISTING	
580	580	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
580.25	580.25	GROUND ELEVATION



SECTION A-A
N.T.S.



POND OUTFALL STRUCTURE & OVERFLOW WEIR SECTION B-B
N.T.S.



CONCRETE TRICKLE SECTION
N.T.S.

VERAMENDI PRECINCT 23 UNIT 1

DETENTION BASIN E CROSS SECTIONS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: NG
CHECKED BY: PGF
DRAWING NAME: sh_Basin.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 5.2

FOR PERMIT

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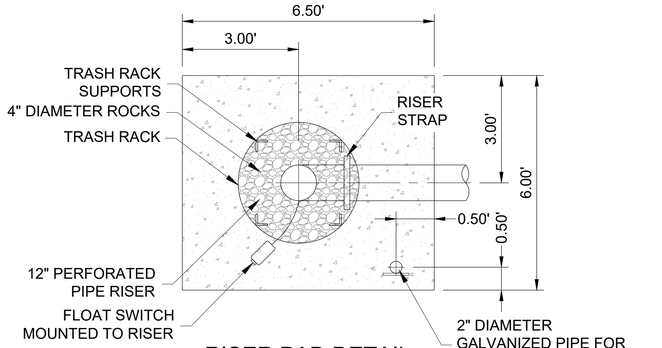
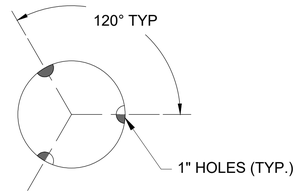
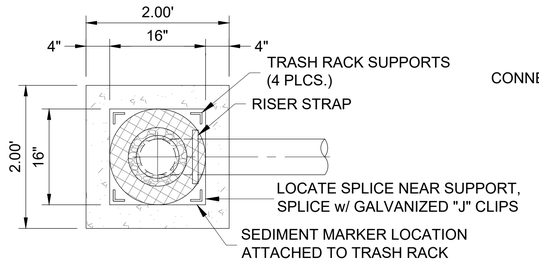
Xrefs Attached:
Last Modified: Jul. 07, 25 - 19:23
Civil BasePlot: Jul. 08, 25 - 07:51:11



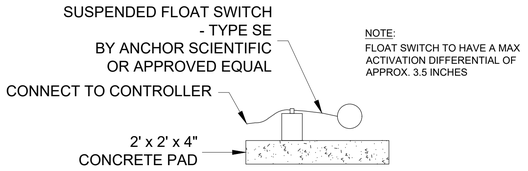
RISER PAD DETAIL
N.T.S.



HOLE LAYOUT DETAIL
N.T.S.

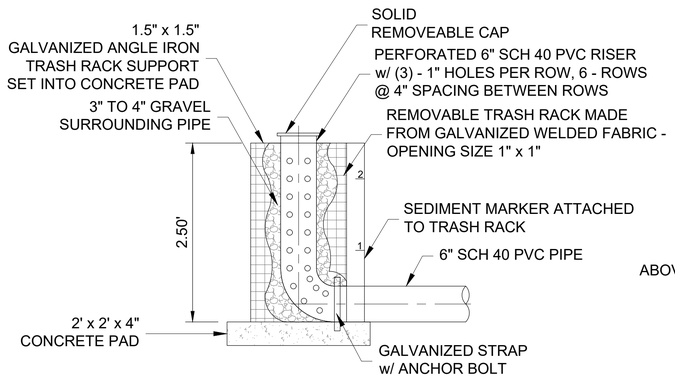


PLAN VIEW OF RISER
N.T.S.

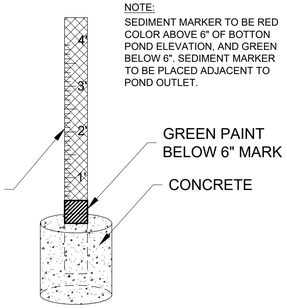


NOTE:
FLOAT SWITCH TO HAVE A MAX ACTIVATION DIFFERENTIAL OF APPROX. 3.5 INCHES

FLOAT SENSOR DETAIL
N.T.S.



SECTION VIEW OF RISER
N.T.S.

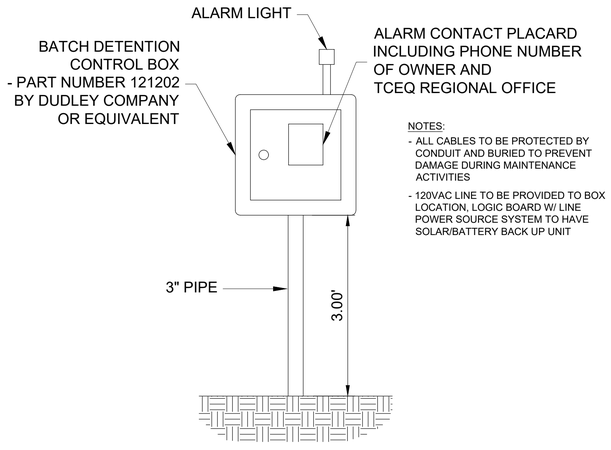


NOTE:
SEDIMENT MARKER TO BE RED COLOR ABOVE 6" OF BOTTON POND ELEVATION, AND GREEN BELOW 6". SEDIMENT MARKER TO BE PLACED ADJACENT TO POND OUTLET.

SEDIMENT DEPTH MARKER
(ATTACHED TO TRASH RACK)
N.T.S.

NOTES:

1. CONTRACTOR SHALL INSTALL AND ESTABLISH VEGETATION IN BASINS PER BASIN DETAIL SHEET PRIOR TO SITE CLOSEOUT.
2. UPON COMPLETION OF CONSTRUCTION, AND IN ACCORDANCE WITH TCEQ REGULATIONS, ALL PERMANENT BMP'S (FILTERSTRIPS AND BASINS) MUST BE CERTIFIED BY A REGISTERED PROFESSIONAL ENGINEER.
3. ALL AREAS DISTURBED AS PART OF CONSTRUCTION OF BASINS SHALL BE REVEGATATED PRIOR TO COMPLETION.



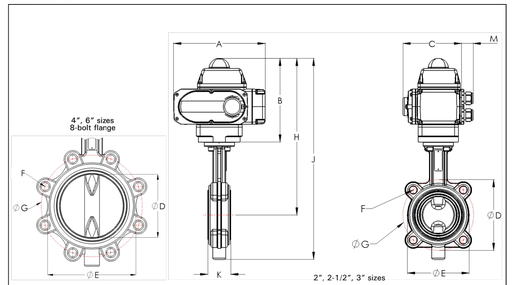
NOTES:
- ALL CABLES TO BE PROTECTED BY CONDUIT AND BURIED TO PREVENT DAMAGE DURING MAINTENANCE ACTIVITIES
- 120VAC LINE TO BE PROVIDED TO BOX LOCATION, LOGIC BOARD W/ LINE POWER SOURCE SYSTEM TO HAVE SOLAR/BATTERY BACK UP UNIT

BATCH DETENTION CONTROL BOX DETAIL
N.T.S.

Valworx

SERIES 5673

Dimensions:



Suitable between flanges:

- ANSI/ASME B16.5 CLASS150
- ANSI/ASME B16.1 CLASS125

Pipe Size		A	B	C	D	E	F	G	H	J	K	M	ISO	Weight (AC/DC)
2	inch	6.4	6.2	4.7	2.0	3.7	4) 5/8-11	4.7	11.1	14.1	1.8	1.0	F05	12.7 / 13.3 lbs
	mm	162.0	157.0	118.5	50.0	95.0	--	120.5	283.0	359.0	46.0	25.0		5.8 / 6.0 kg
2-1/2	inch	6.4	6.2	4.7	2.6	4.1	4) 5/8-11	5.5	11.5	14.7	1.9	1.0	F05	14.5 / 15.0 lbs
	mm	162.0	157.0	118.5	65.0	105.0	--	139.7	291.0	373.0	48.0	25.0		6.6 / 6.8 kg
3	inch	6.4	6.2	4.7	3.2	4.7	4) 5/8-11	6.0	12.4	16.1	1.9	1.0	F05	17.3 / 17.8 lbs
	mm	162.0	157.0	118.5	80.0	120.0	--	152.4	314.0	410.0	48.0	25.0		7.8 / 8.1 kg
4	inch	6.4	6.2	4.7	3.9	5.8	8) 5/8-11	7.5	12.8	17.2	2.2	1.0	F05/F07	22.1 / 22.6 lbs
	mm	162.0	157.0	118.5	100.0	147.0	--	190.5	324.0	438.0	56.0	25.0		10.0 / 10.3 kg
6	inch	10.1	8.5	6.3	5.9	8.1	8) 3/4-10	9.5	14.2	19.8	2.3	1.0	F07	50.0 / 51.0 lbs
	mm	256.0	216.0	160.0	150.0	205.0	--	241.3	360.0	502.0	59.0	25.0		22.7 / 23.1 kg

Doc: 5673.0922 Cornelius, N.C. • USA www.valworx.com

SEQUENCE OF OPERATION

1. UPON ACTIVATION OF FLOAT SWITCH, DDC CONTROLLER TO START DETENTION TIMER #1.
2. DETENTION TIMER #1 TO BE MANUALLY SET TO 12 HOURS AND TO BE USER ADJUSTABLE VALUE.
3. WHEN DETENTION TIMER #1 HAS ELAPSED, A 8" BUTTERFLY VALVE IS TO OPEN AND RELEASE DETAINED WATER BASIN.
4. UPON DEACTIVATION OF FLOAT SWITCH, DDC CONTROL TO START DETENTION TIMER #2.
5. DETENTION TIMER #2 TO BE MANUALLY SET TO 19-48 HOURS AND TO BE USER ADJUSTABLE.
6. WHEN DETENTION TIMER #2 HAS ELAPSED, THE 8" BUTTERFLY VALVE IS TO CLOSE.
7. VALVE TO BE ACTUATED PERIODICALLY TO SHOW ACTIVE REGARDLESS OF FLOAT SWITCH OPERATION.

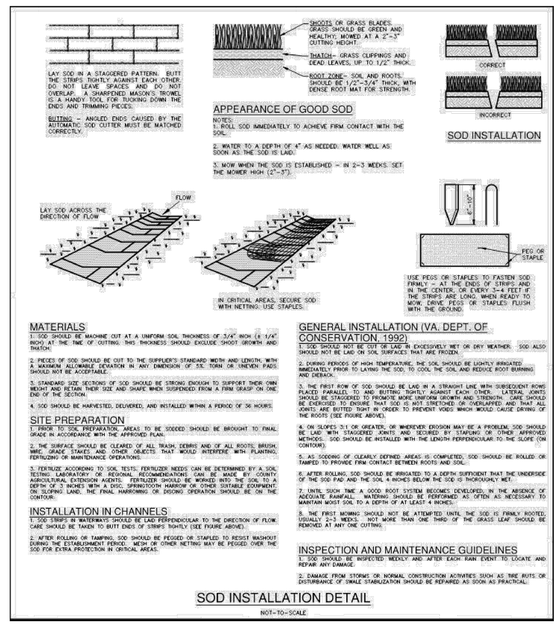
NOTES TO CONTRACTOR (*EACH PHASE OF BASIN CONSTRUCTION)

1. CONTRACTOR IS ADVISED THAT TCEQ DOES NOT ALLOW CHANGES TO PERMANENT POLLUTION ABATEMENT MEASURES WITHOUT THEIR PRIOR APPROVAL.
2. CONTRACTOR SHALL NOTIFY CERTIFYING ENGINEER WHEN:
   - REINFORCING STEEL FOR BASIN WALL OR RIPRAP LINER HAS BEEN SET, CONCRETE HAS NOT BEEN PLACED AND DRAIN PIPE AND RISER PIPE IS IN PLACE.
3. WORK SHALL NOT CONTINUE ON THE BASIN UNTIL THE ENGINEER HAS HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION. CONTRACTOR SHALL PROVIDE ENGINEER A MINIMUM OF 24 HOURS ADVANCE NOTICE PRIOR TO TIME THE BASIN WILL BE AT THE REQUIRED STAGE.
4. UPON SUBSTANTIAL COMPLETION, OR AS REQUESTED BY ENGINEER, CONTRACTOR TO PROVIDE CERTIFYING ENGINEER WITH FIELD SHOTS VERIFYING ELEVATIONS OF THE FOLLOWING:
   - TOP OF BANK/WALL AT EACH CORNER OF BASIN
   - TOE OF SLOPE AT EACH CORNER OF BASIN (INSIDE BASIN TOE)
   - SPLASH PAD/INLET PIPES
   - OVERFLOW WEIRS
5. BEFORE FINAL ACCEPTANCE OF CONSTRUCTION BY THE OWNER, THE CONTRACTOR WILL REMOVE ALL TRASH, DEBRIS, AND ACCUMULATED SILT FROM THE BASINS AND REESTABLISH THEM TO THE PROPER OPERATING CONDITION.

CLAY LINER SPECIFICATIONS

PROPERTY	TEST METHOD	SPECIFICATION
PERMEABILITY (CM/SEC)	ASTM D 2434	0.000001
PLASTICITY INDEX OF CLAY (%)	ASTM D 423/D 424	NOT LESS THAN 15
LIQUID LIMIT OF CLAY (%)	ASTM D 2216	NOT LESS THAN 30
CLAY PARTICLES PASSING (%)	ASTM 422	95% OF STANDARD PROCTOR DENSITY
CLAY COMPACTION (%)	ASTM D 2216	95% OF STANDARD PROCTOR DENSITY

NOTE:
1. THE CLAY LINER SHALL HAVE A MINIMUM THICKNESS OF TWELVE (12) INCHES.



SOD INSTALLATION DETAIL
NOT-TO-SCALE

VERAMENDI PRECINCT 23 UNIT 1

WATER QUALITY BASIN DETAILS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/23/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: SV_Basin Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 5.3

K:\SA3856.IGA Property\2405 23-1\1.0 Site Development Plans\GWE-Sheets\06_Basin Details.dwg
Xref Name(s):
Last Modified: Jul. 07, 25 - 19:24
By: Paul Flores - Jul. 07, 25 - 19:24

FOR PERMIT

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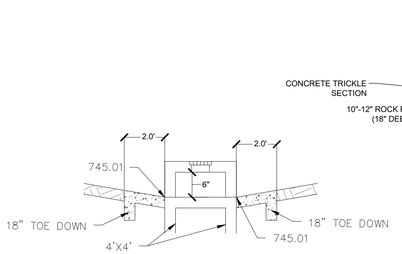
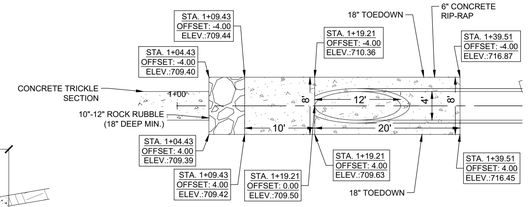
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATIUON BEFORE THE CITY OF NEW BRAUNFELS WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH "D" AS SHOWN IN THE PROFILE.
7. ALL RCP SHALL BE AASHTO M170 CLASS III RCP.
8. ALL WORK SHALL BE PERFORMED WITHIN SITE LIMITS OF CONSTRUCTION.
9. CONTRACTOR TO PROOF ROLL BOTTOM AND SIDES OF POND TO ENSURE FIRM BOTTOM. IF BOTTOM APPEARS FRACTURED CONTRACTOR TO NOTIFY ENGINEER PRIOR TO PLACEMENT OF SAND BED ON TOPSOIL.
10. THE CONTRACTOR WILL BE REQUIRED TO PERFORM TESTING REQUIREMENTS TO SATISFY CITY OF NEW BRAUFNELS INSPECTIONS. THIS SHALL INCLUDE BUT NOT LIMITED TO PROVIDING NECESSARY WATER AS REQUESTED BY INSPECTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR POSITIVE DRAINAGE IN BASIN AREA.
12. ALL DISTURBED AREAS TO BE STABILIZED WITH HYDROMULCH IMMEDIATELY AFTER ESTABLISHING FINAL GRADES UNLESS OTHERWISE NOTED.
13. UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION, AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED STRUCTURAL CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.
14. ALL CONCRETE LINING SHALL BE A MINIMUM OF SIX (6) INCHES THICK AND REINFORCED WITH NO. 4 ROUND BARS @ 18 INCHES ON CENTER EACH WAY OR WELDED WIRE FABRIC OF 6" x 6"-W/D6 x WIDE. THE DEPTH OF ALL TOEDOWNS SHALL BE 36 INCHES UPSTREAM, 24 INCHES DOWNSTREAM, AND 18 INCHES FOR SIDE SLOPES.
15. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER STORM SEWER LINES 2.0'(MIN) COVER OVER WATER PRIOR TO CONSTRUCTION.
16. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF NEW BRAUNFELS SPECIFICATIONS.
17. ALL BENDS AND FITTINGS SHALL BE PREFABRICATED BY MANUFACTURER. NO FIELD FABRICATION OF FITTINGS IS ALLOWED.



DETAIL B
N.T.S.



DETAIL A
SCALE: 1" = 10'

LEGEND

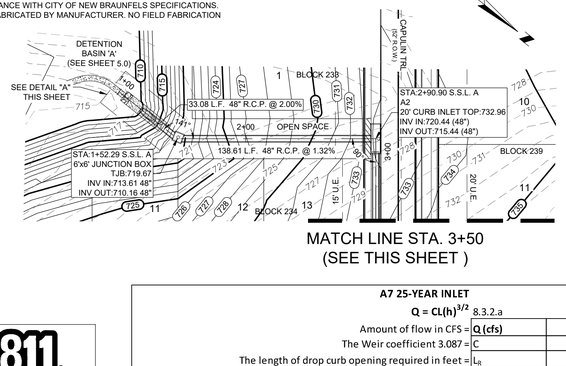
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		BENCHMARK

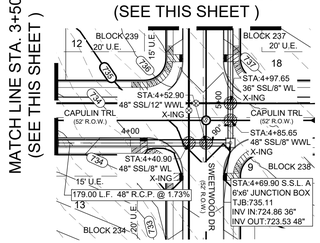
PROPOSED	EXISTING	
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING
EGL_{25}		25 YR ENERGY GRADE LINE
HGL_{25}		25 YR HYDRAULIC GRADE LINE
HGL_{100}		100 YR HYDRAULIC GRADE LINE

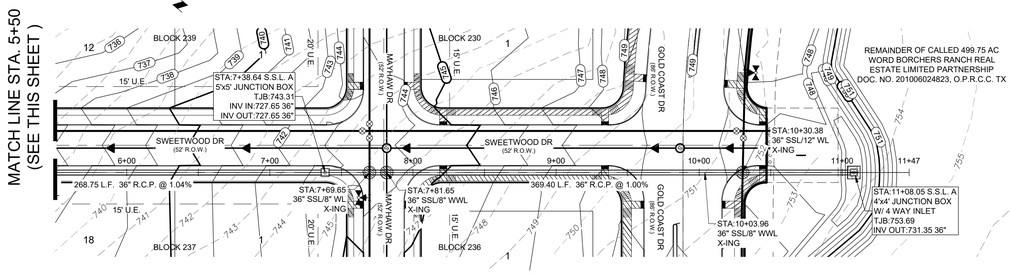
50 25 0 50 100
HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

MATCH LINE STA. 3+50
(SEE THIS SHEET)

MATCH LINE STA. 5+50
(SEE THIS SHEET)







A7 25-YEAR INLET

$Q = CL(h)^{3/2}$ 8.3.2.a

Amount of flow in CFS =	**Q (cfs)**	**26.2**	ft^3/sec
The Weir coefficient 3.087 =	C	3.087	
The length of drop curb opening required in feet =	L_a	12.09	ft
Length Provided =	L_o	20.00	ft
The head or depth of water at the opening in feet =	h	0.79	ft
	h^(3/2)	0.70	ft^2
	CHECK	26.2	ft^3/sec

DRAIN 'B' INLET

$Q = CA(2gh)^{(1/2)}$ 8.3.2.b

Discharge in cubic feet per second =	**Q**	**21**	ft^3/sec
Orifice coefficient of discharge (taken as 0.70) =	C	0.7	
Acceleration due to gravity =	g	32.2	ft/sec^2
Head on opening in feet from top of water surface to center of opening =	h	0.50	ft
Net area of opening in square feet (4 openings x 0.5' x 4.0') =	A	8.00	ft^2
Max Flow =	**CA(2gh)^(1/2)**	**31.78**	ft^3/sec
Water surface Height (this equation assumes taller than opening) =	*wse Height (dn)*	0.75	ft
Assumes 1/2 of 6.0" opening = 3.00" = 0.25' =	*cntr of water*	0.25	ft

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

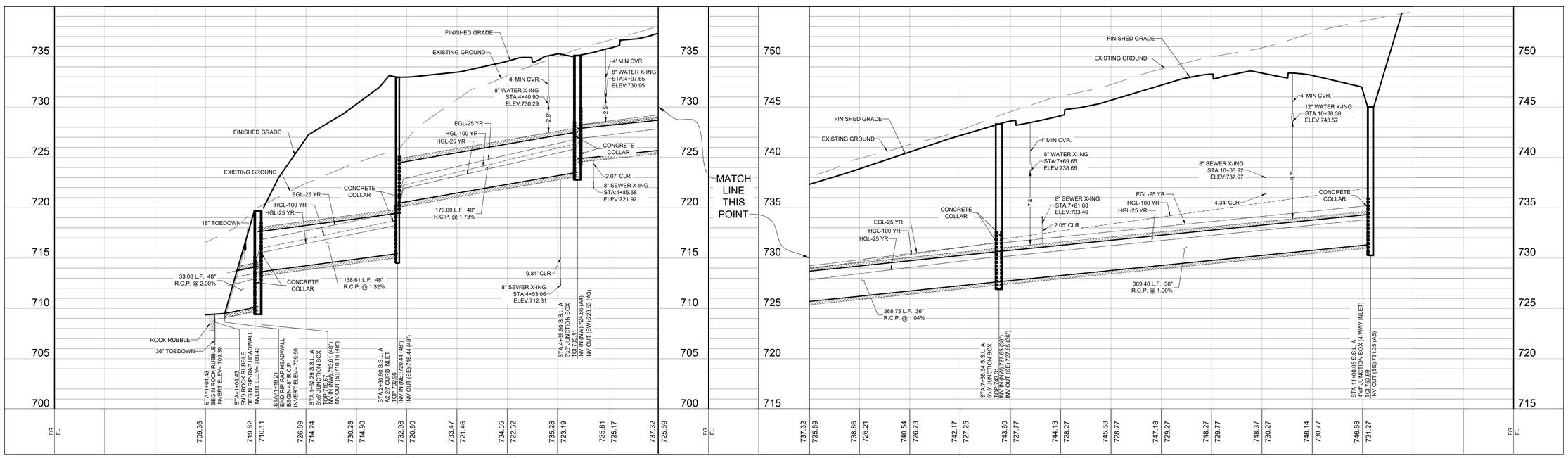
CAUTION:

CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

STORM DRAIN LINE 'A'



LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
07/08/2025

JOB NUMBER: SA3856.2405

SHEET NO. **5.4**

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: SH_SSL_X.dwg

VERAMENDI PRECINCT 23 UNIT 1

STORM DRAIN LINE 'A'

FOR PERMIT

P:\LJA3856 KSA Properties\Q400 23-1\Y426 Site Development Plans\CAD\~Sheets\sh_SSL_X.dwg
Xref Name: ...
Last Modified: Jul. 07, 25 - 22:06
Last Plotted: Jul. 07, 25 - 22:06

DRAINAGE & GRADING NOTES:

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2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" CONCRETE AND MEET MINIMUM COMPRESIVE STRENGTH OF 3,000 PSI IN 28 DAYS.
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15. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER STORM SEWER LINES. 2.0'(MIN) COVER OVER WATER PRIOR TO CONSTRUCTION.
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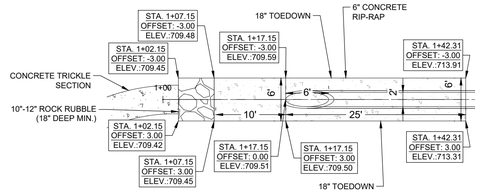


DETAIL A
SCALE: 1" = 10'

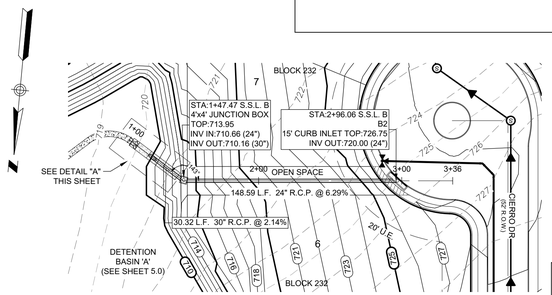
A2 25-YEAR INLET			
$Q = CL(h)^{3/2}$ 8.3.2.a			
Amount of flow in CFS =	**Q (cfs)**	**19.6**	ft^3/sec
The Weir coefficient 3.087 =	C	3.087	
The length of drop curb opening required in feet =	L_R	9.04	ft
Length Provided =	L_P	15.00	ft
The head or depth of water at the opening in feet =	h	0.79	ft
	h^(3/2)	0.70	ft^2
	CHECK	19.6	ft^3/sec

LEGEND

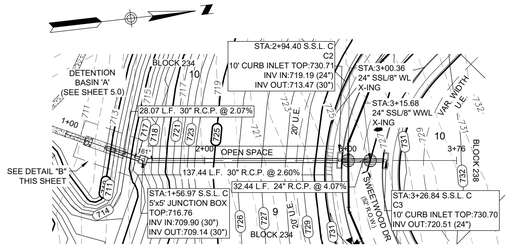
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
	WL	WATER LINE
S CIO	S CIO	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		BENCHMARK

PROPOSED	EXISTING	
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING
EGL_{25}		25 YR ENERGY GRADE LINE
HGL_{25}		25 YR HYDRAULIC GRADE LINE
HGL_{100}		100 YR HYDRAULIC GRADE LINE

50 25 0 50 100
HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'



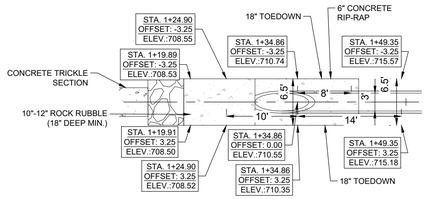
STORM DRAIN LINE 'B'



STORM DRAIN LINE 'C'

A8-1 25-YEAR INLET			
$Q = CL(h)^{3/2}$ 8.3.2.a			
Amount of flow in CFS =	**Q (cfs)**	**16.5**	ft^3/sec
The Weir coefficient 3.087 =	C	3.087	
The length of drop curb opening required in feet =	L_R	7.61	ft
Length Provided =	L_P	10.00	ft
The head or depth of water at the opening in feet =	h	0.79	ft
	h^(3/2)	0.70	ft^2
	CHECK	16.5	ft^3/sec

A8-2 25-YEAR INLET			
$Q = CL(h)^{3/2}$ 8.3.2.a			
Amount of flow in CFS =	**Q (cfs)**	**16.5**	ft^3/sec
The Weir coefficient 3.087 =	C	3.087	
The length of drop curb opening required in feet =	L_R	7.61	ft
Length Provided =	L_P	10.00	ft
The head or depth of water at the opening in feet =	h	0.79	ft
	h^(3/2)	0.70	ft^2
	CHECK	16.5	ft^3/sec



DETAIL B
SCALE: 1" = 10'

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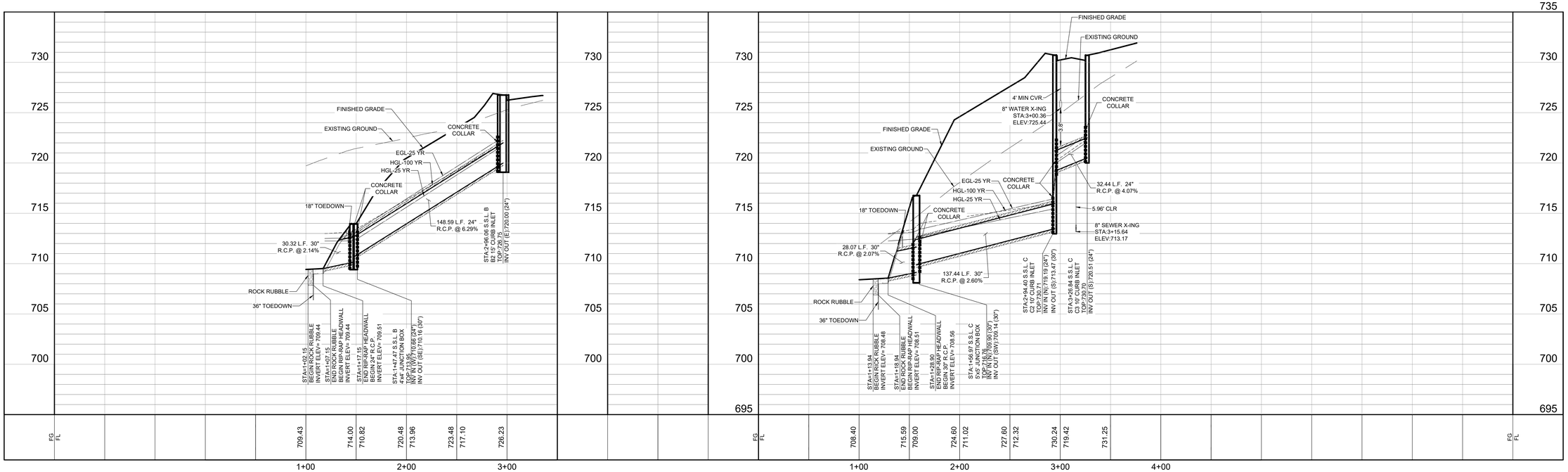

STORM DRAIN LINE 'C'

VERAMENDI PRECINCT 23 UNIT 1

STORM DRAIN LINE 'B' & 'C'

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: SH_SSL_B' 'C' 'D'.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 5.5

FOR PERMIT

K:\SA\3856.60A Properties\2405 23-1 (1.45) Site Development Plans\GWC-Sheets\sh_SSL_B' 'C' 'D'.dwg
Plotted: Jul. 07, 25 - 22:14
Last Modified: Jul. 07, 25 - 21:53
By: Brad Rose, P.E.

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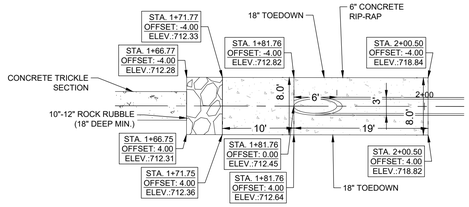

DETAIL A
SCALE: 1" = 10'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		BENCHMARK

PROPOSED	EXISTING	
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING
EGL_{25}		25 YR ENERGY GRADE LINE
HGL_{25}		25 YR HYDRAULIC GRADE LINE
		100 YR HYDRAULIC GRADE LINE

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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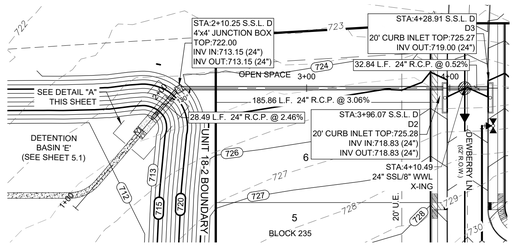
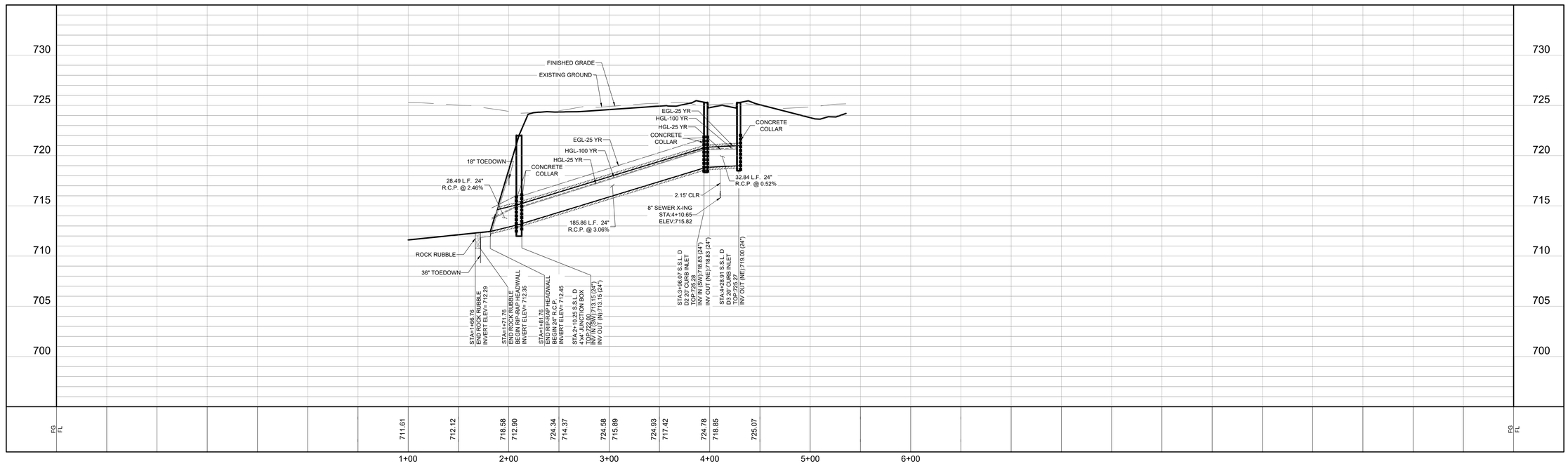


STORM DRAIN LINE 'D'

			25 YR New Braunfels On-Grade		13.95	13.95	
			TXDOT METHOD Equations 10-1 to 10-20		Left	Right	
			http://onlinemanuals.txdot.gov/txdotmanuals/hyd/gutter_and_inlet_equations.htm				
Q_{IN}			Amount ofoverland inflow in CFS =	Q_{25}	13.95	13.95	ft^3/sec
			Additional Carryover inflow (From Previous inlet, applies when on grade in series)	CO_{inflow}	0	0	ft^3/sec
			Total Inflow CFS	$Q_{25} + CO_{inflow}$	13.95	13.95	ft^3/sec
CURB INLET ANALYSIS			Depth of local depression (11.75" depression - 6" curb)	a	0.48	0.48	ft
			Width of local Depression (Apron Width)	W	2.00	2.00	ft
			Area of Depressed Gutter section = Aw = WSx (T-(w/2))+(1/2)aW	Aw	1.15	1.15	ft^2
			Wetted Perimeter of depressed gutter section = Pw = ((W*Sx+a)2 + W2)1/2	Pw	2.07	2.07	ft
			Conveyance in gutter section = K = (1.486*Aw^(5/3)) / (nPw^(2/3))	Ko	89.49	89.49	
			Area of Road Section Beyond Depressed Gutter = Ao = (Sx/2)((T-W)^2	Ao	2.521	2.521	ft^2
			Wetted Perimeter of Road Section Beyond Depressed Gutter Section = Po = T-W	Po	15.87668	15.8767	ft
			Conveyance in Road beyond gutter section = Ko = (1.486*Ao^(5/3)) / (nPo^(2/3))	Ko	84.48	84.48	
			Ratio of Depressed flow to Total Flow = Eo = Kw/(Kw + Ko)	Eo	0.51	0.51	
			Equivalent Cross Slope = Se = Sx + (a/W)*Eo	Se	14.32%	14.32%	
			Length of Curb Inlet Required for 100% Interception = Lr = 0.6*(Q^0.42)(SL^0.3)(1/(nSe))^0.6	Lr	28.60	28.60	ft
			Actual Inlet Length	La	20	20	ft
STREET & GUTTER			Mannings Roughness coefficient for gutter	n	0.013	0.013	
			Longitudinal slope of Roadway	SL	3.40%	3.40%	
			Street Slope	Sx	2.00%	2.00%	
			Gutter Depth of Flow	dn	0.36	0.36	ft
			(New Braunfels Curb Height)	h_{curb}	0.50	0.50	ft
Q_{OUT}			Carryover flow (to next inlet) = Cooutflow = Q * ((1-(La/Lr))^1.8	$CO_{outflow}$	1.60	1.60	ft^3/sec
			Actual Inlet Interception	Qi	12.35	12.35	ft^3/sec



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

STORM DRAIN LINE 'D'

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: Sh_SSL_'B'_'C'_'D'.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **5.6**

K:\SA3856 ASA Properties\2405 23-1\426 Site Development Plans\DWG-Sheets\sh_SSL 'B' 'C' 'D'.dwg
User: Nicholas Gower
Last Modified: Jul. 07, 25 – 22:14
Plot Date/Time: Jul. 08, 25 – 11:52:39

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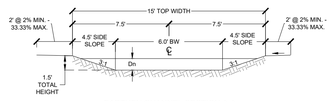
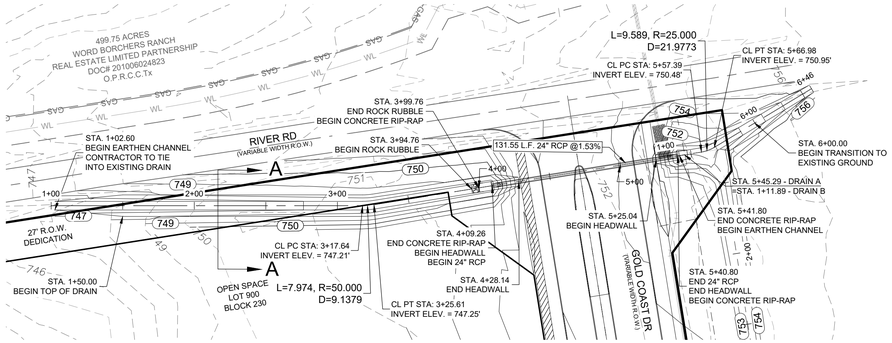
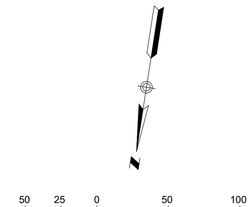


EARTHEN CHANNEL SECTION A-A
N.T.S. STA. 1+02.60 - STA. 4+08.95
STA. 5+28.73 - STA. 6+00.00

LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE		TMH	TOP OF MANHOLE
	WW	SANITARY SEWER LINE		EX.	EXISTING
	WL	WATER LINE		ESM'T.	EASEMENT
C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT		U.E.	UTILITY EASEMENT
		WATER VALVE		VOL	VOLUME
		SINGLE WATER SERVICE		PG	PAGE
		FIRE HYDRANT		DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
		WATER METER		OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		GAS VALVE			UTILITY XING
GAS	GAS	GAS LINE	EGL_{25}		25 YR ENERGY GRADE LINE
D	D	STORM SEWER MANHOLE	HGL_{25}		25 YR HYDRAULIC GRADE LINE
		CURB INLET			100 YR HYDRAULIC GRADE LINE
		BENCHMARK			





HORIZONTAL SCALE 1" = 50'
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VERAMENDI PRECINCT 23 UNIT 1

DRAIN A

NO.	REVISIONS DESCRIPTION	BY	DATE

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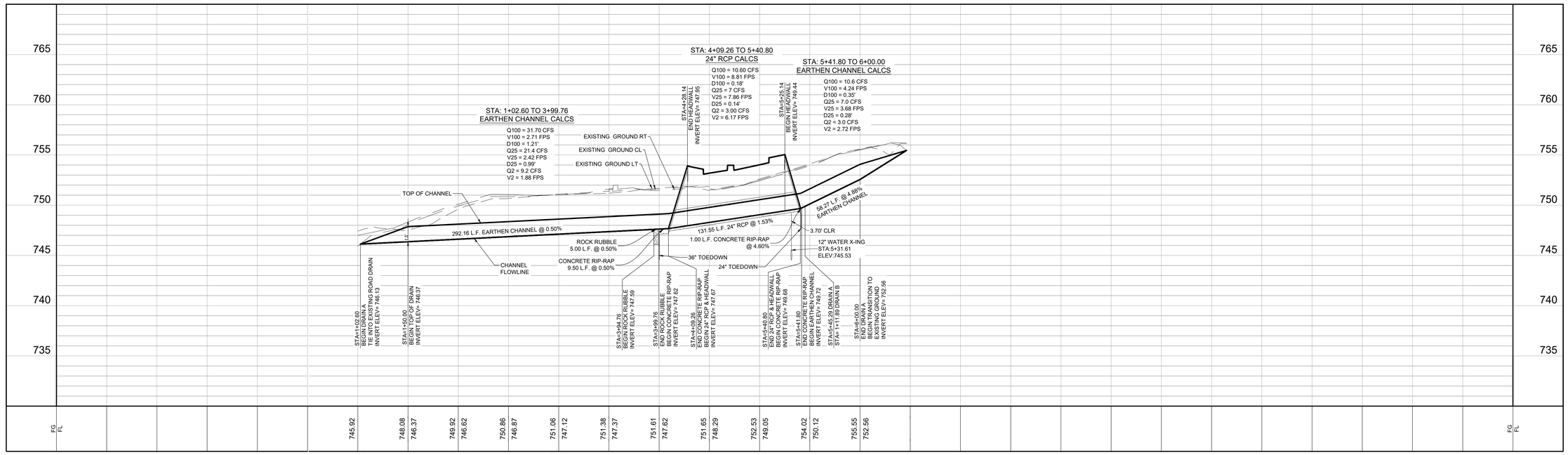
DRAIN A



LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: 5_Drainage Channel "A".dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

JOB NUMBER: SA3856.2405

SHEET NO. **5.7**

FOR PERMIT

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Plotted: 7/8/2025 - 10:09 AM
Last Modified: Jul. 07, 25 - 17:18
Last Modified By: ...

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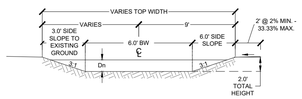

EARTHEN CHANNEL SECTION B-B
N.T.S. STA. 1+50.00 - STA. 8+83.51

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
	WL	WATER LINE
C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
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		FIRE HYDRANT
		WATER METER
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		BENCHMARK

PROPOSED	EXISTING	
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
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	PG	PAGE
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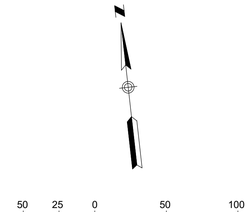

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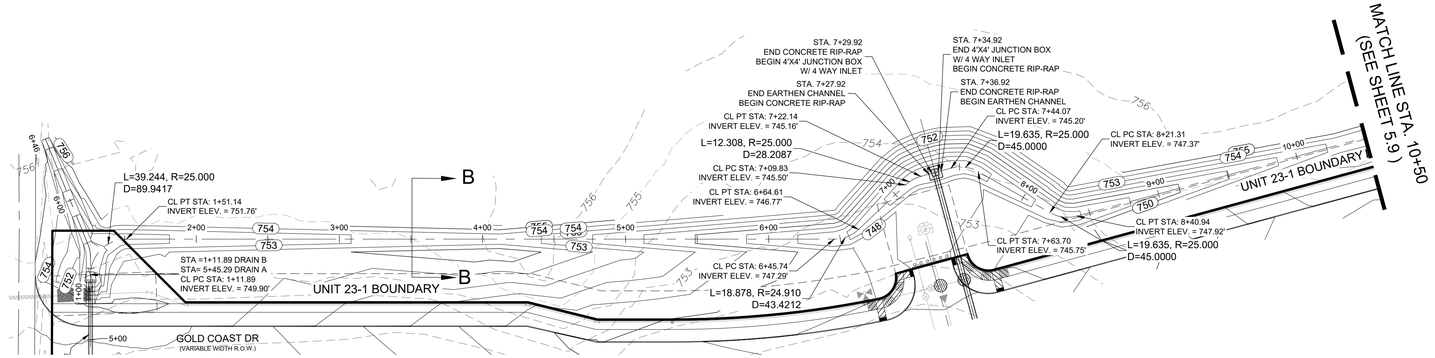

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DRAIN B (SHEET 1 OF 2)

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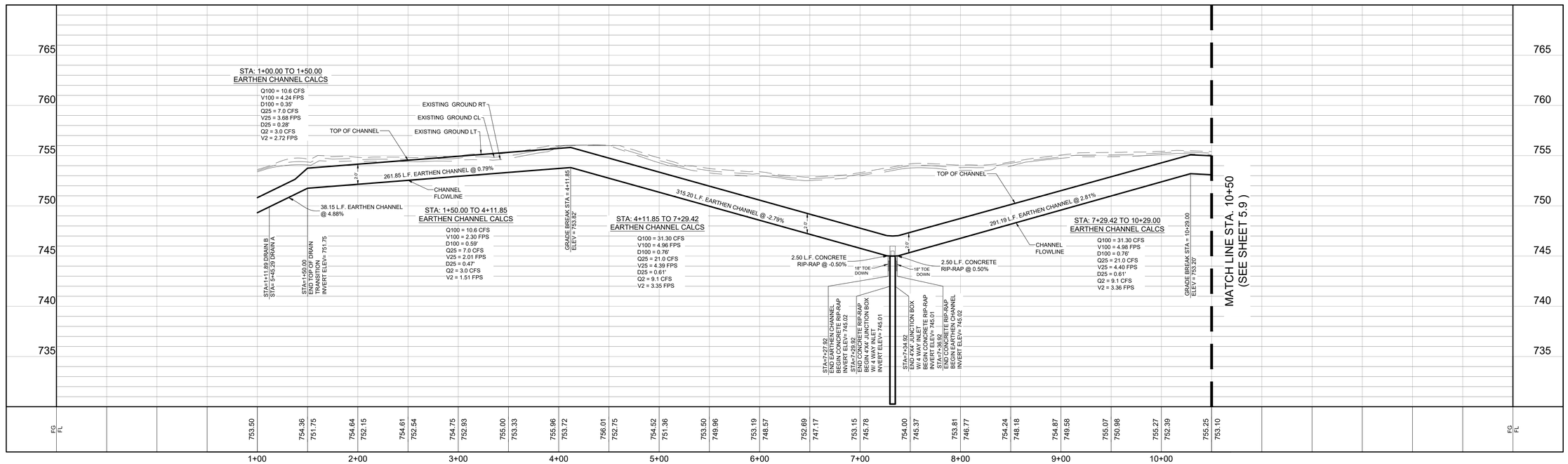


FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

DRAIN B (SHEET 1 OF 2)

NO.	DESCRIPTION	BY	DATE

REVISIONS

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: St_Drainage Channel_A1.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

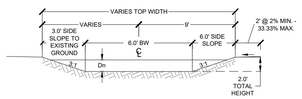
JOB NUMBER: SA3856.2405

SHEET NO. 5.8

P:\LJA3856_ASA Properties\12405 23-1\426 Site Development Plans\DWG-Sheets\Utl_Drainage Channel A1.dwg
Plotted: Jul. 07, 25 - 17:18
Last Modified: Jul. 07, 25 - 17:18
Last Modified By: Nicholas Gower

DRAINAGE & GRADING NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATION FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" CONCRETE AND MEET MINIMUM COMPRESIVE STRENGTH OF 3,000 PSI IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS ON SHEETS 5.10-5.12 FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATIUON BEFORE THE CITY OF NEW BRAUNFELS WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH "D" AS SHOWN IN THE PROFILE.
7. ALL RCP SHALL BE AASHTO M170 CLASS III RCP.
8. ALL WORK SHALL BE PERFORMED WITHIN SITE LIMITS OF CONSTRUCTION.
9. CONTRACTOR TO PROOF ROLL BOTTOM AND SIDES OF POND TO ENSURE FIRM BOTTOM. IF BOTTOM APPEARS FRACTURED CONTRACTOR TO NOTIFY ENGINEER PRIOR TO PLACEMENT OF SAND BED ON TOPSOIL.
10. THE CONTRACTOR WILL BE REQUIRED TO PERFORM TESTING REQUIREMENTS TO SATISFY CITY OF NEW BRAUNFELS INSPECTIONS. THIS SHALL INCLUDE BUT NOT LIMITED TO PROVIDING NECESSARY WATER AS REQUESTED BY INSPECTOR.
11. THE CONTRACTOR WILL BE RESPONSIBLE FOR POSITIVE DRAINAGE IN BASIN AREA.
12. ALL DISTURBED AREAS TO BE STABILIZED WITH HYDROMULCH IMMEDIATELY AFTER ESTABLISHING FINAL GRADES UNLESS OTHERWISE NOTED.
13. UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION, AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED STRUCTURAL CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.
14. ALL CONCRETE LINING SHALL BE A MINIMUM OF SIX (6) INCHES THICK AND REINFORCED WITH NO. 4 ROUND BARS @ 18 INCHES ON CENTER EACH WAY OR WELDED WIRE FABRIC OF 6" x 6"-W/D6 x W/D6. THE DEPTH OF ALL TOEDOWNS SHALL BE 36 INCHES UPSTREAM, 24 INCHES DOWNSTREAM, AND 18 INCHES FOR SIDE SLOPES.
15. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER STORM SEWER LINES. 2.0'(MIN) COVER OVER WATER PRIOR TO CONSTRUCTION.
16. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH CITY OF NEW BRAUNFELS SPECIFICATIONS.
17. ALL BENDS AND FITTINGS SHALL BE PREFABRICATED BY MANUFACTURER. NO FIELD FABRICATION OF FITTINGS IS ALLOWED.

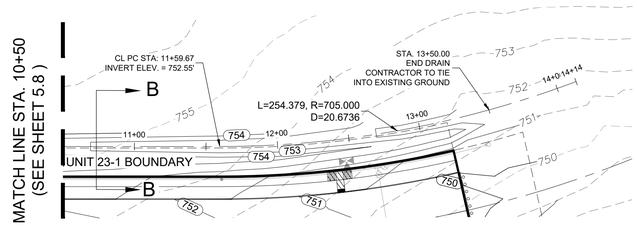


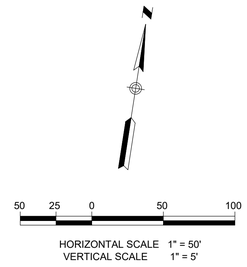
EARTHEN CHANNEL SECTION B-B
N.T.S. STA. 1+50.00 - STA. 8+83.51

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
	WL	WATER LINE
C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		BENCHMARK

PROPOSED	EXISTING	
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING
EGL_{25}		25 YR ENERGY GRADE LINE
HGL_{25}		25 YR HYDRAULIC GRADE LINE
		100 YR HYDRAULIC GRADE LINE





LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

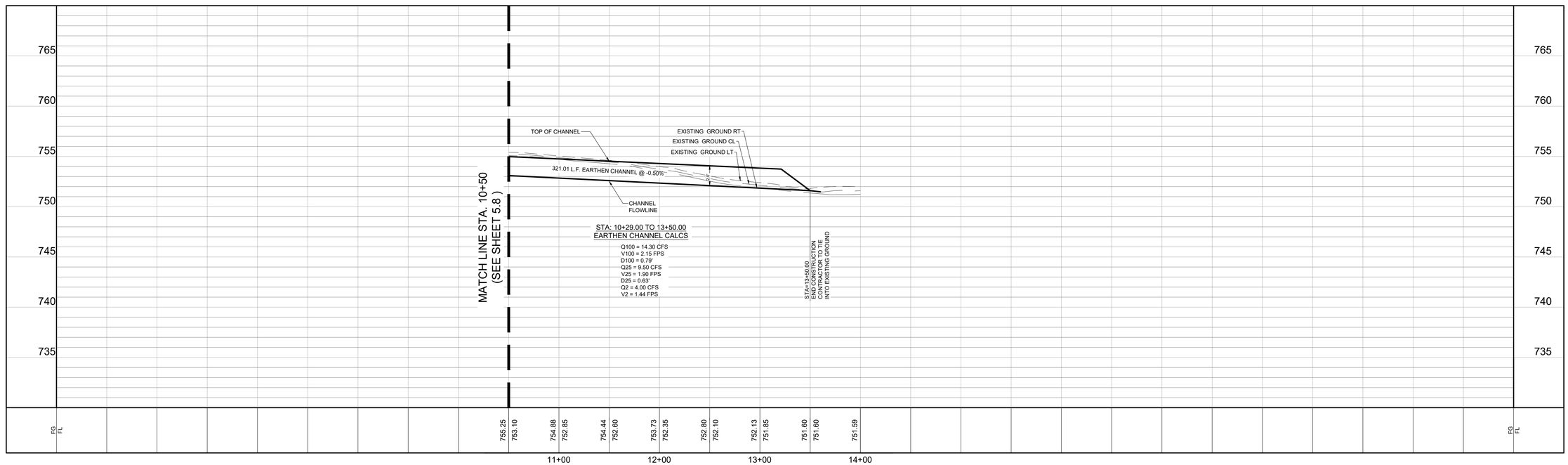
811 Know what's below. Call before you dig.

DRAIN B (SHEET 2 OF 2)

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.



VERAMENDI PRECINCT 23 UNIT 1

DRAIN B (SHEET 2 OF 2)

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: 5h_Drainage Channel_A1.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **5.9**

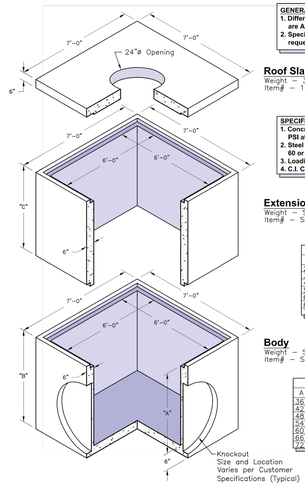
FOR PERMIT

P:\LJA3856_ASA Properties\2405 23-1\426 Site Development Plans\0Arc-Sheets\Lift_Drainage Channel_A1.dwg
Plotted: 7/8/2025 - 10:09AM
Last Modified: Jul. 07, 25 - 17:18
Last Modified By: ...ve.Arc_A1 - 11x17.arc

Oldcastle Precast

Water

6'-0"x6'-0" I.D. Junction Box
Model: JB-660



GENERAL NOTES:
1. Different Height of Extensions and Bodies are Available by Request.
2. Specific Cast Iron Ring and Cover by request, Cast-in or Loose.

Roof Slab
Weight – 3450 Lbs.
Item# – 1208280

SPECIFICATIONS:
1. Concrete has a design strength of 5000 PSI at 28 days.
2. Steel reinforcement: ASTM A-615 Grade 60 or ASTM A-497 Welded wire fabric.
3. Loading: Designed for H20 Loading.
4. C.I. Castings: ASTM A-48, Class 30/35.

Extension
Weight – See Table
Item# – See Table

Extension		
C	Weight	Item#
24"	3900 Lbs.	1205980
36"	5850 Lbs.	1206040
48"	7800 Lbs.	1206120
54"	8775 Lbs.	1206140
60"	9750 Lbs.	1206200
66"	10,725 Lbs.	1206230
72"	11,700 Lbs.	1206240

Body
Weight – See Table
Item# – See Table

Body			
A	B	Weight	Item#
36"	42"	9525 Lbs.	1206020
42"	48"	10,500 Lbs.	1206080
48"	54"	11,475 Lbs.	1206100
24"	60"	12,450 Lbs.	1206180
60"	66"	13,425 Lbs.	1206190
66"	72"	14,400 Lbs.	1206220
72"	78"	15,375 Lbs.	1206225

Knockout Size and Location Varies per Customer Specifications (Typical)

Texas Region

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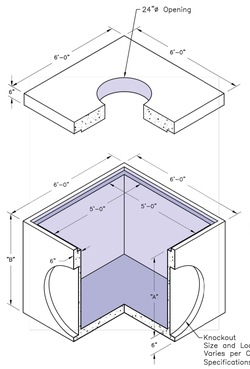
JB-12

888-9 Oldcastle (888-965-3227)

Oldcastle Precast

Water

5'-0"x5'-0" I.D. Junction Box
Model: JB-550



Roof Slab
Weight – 3150 Lbs.
Item# – 1207960

GENERAL NOTES:
1. Different Height of Bodies are Available by Request.
2. Frames and Covers Also Available.

SPECIFICATIONS:
1. Concrete has a design strength of 5000 PSI at 28 days.
2. Steel reinforcement: ASTM A-615 Grade 60 or ASTM A-497 Welded wire fabric.
3. Loading: Designed for H20 Loading.
4. C.I. Castings: ASTM A-48, Class 30/35.

Body
Weight – See Table
Item# – See Table

Body			
A	B	Weight	Item#
42"	48"	8475 Lbs.	1205600
48"	54"	9300 Lbs.	1205620
54"	60"	10,125 Lbs.	1205640
60"	66"	10,950 Lbs.	1205680

Knockout Size and Location Varies per Customer Specifications (Typical)

Texas Region

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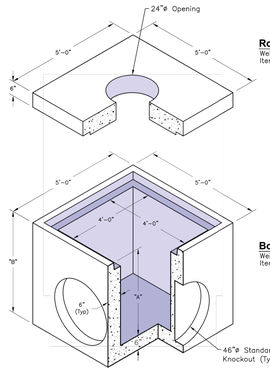
Water

4'-0"x4'-0" I.D. Junction Box
Model: JB-440



Roof Slab
Weight – 2,200 Lbs.
Item# – 1208240

GENERAL NOTES:
1. Different Height of Bodies are Available by Request.
2. Frames and Covers Also Available.

SPECIFICATIONS:
1. Concrete has a design strength of 5000 PSI at 28 days.
2. Steel reinforcement: ASTM A-615 Grade 60 or ASTM A-497 Welded wire fabric.
3. Loading: Designed for H20 Loading.
4. C.I. Castings: ASTM A-48, Class 30/35.

Bottom
Weight – See Table
Item# – See Table

Bottom Section			
A	B	Weight	Item #
18"	24"	3900 Lbs.	1204800
24"	30"	4575 Lbs.	1204820
30"	36"	5250 Lbs.	1204880
36"	42"	5925 Lbs.	1204920
42"	48"	6600 Lbs.	1204960
48"	54"	7275 Lbs.	1205060
54"	60"	7950 Lbs.	1205100
60"	66"	8625 Lbs.	1205140

46"ø Standard Knockout (Typical)

Texas Region

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ALL CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 4500 psi.

REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60, A706 GRADE 60 OR A497 GRADE 70. BAR BENDING AND PLACEMENT SHALL COMPLY WITH THE LATEST ACI STANDARDS

STANDARD STRUCTURAL DESIGN IS BASED ON AASHTO HS 20 WHEEL LOADING

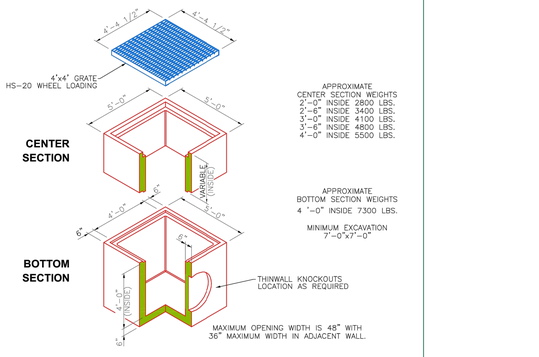
WATER TABLE IS AT 3'–0" BELOW GRADE FOR STANDARD STRUCTURAL DESIGN

THE STANDARD DESIGN IS BASED ON THE TOP AT GRADE AND THE BASE AT 8'–0" MAX. BELOW GRADE.

THE STRUCTURE SHALL BE PLACED ON A COMPACTED GRANULAR BASE TO INSURE UNIFORM DISTRIBUTION OF SOIL PRESSURES.

SPECIAL DESIGNS BASED ON OTHER LOADINGS OR DEEPER INSTALLATION DEPTHS ARE AVAILABLE ON REQUEST.

KNOCKOUTS OR PIPE OPENINGS OR CAN BE PROVIDED IN THE SIZE AND LOCATIONS REQUIRED.



APPROXIMATE CENTER SECTION WEIGHTS
2'–0" INSIDE 2800 LBS.
2'–6" INSIDE 3400 LBS.
3'–0" INSIDE 4100 LBS.
3'–6" INSIDE 4800 LBS.
4'–0" INSIDE 5500 LBS.

APPROXIMATE BOTTOM SECTION WEIGHTS
4'–0" INSIDE 7300 LBS.

MINIMUM EXCAVATION
7'–0"x7'–0"

Oldcastle Precast
1900 Rilling Road San Antonio, TX 78214
Phone: (210) 923–4523 Fax: (210) 921–0473

GI44	4'-0"x4'-0" GRATE INLET
FILE NAME: 44GI.dwg	
ISSUE DATE: March, 2005	
www.oldcastlesanantonio.com	

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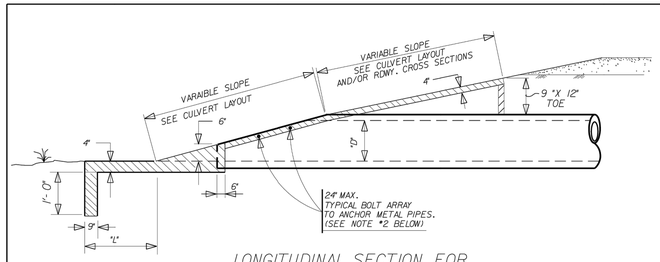
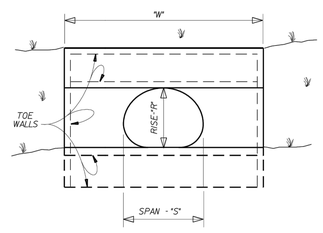
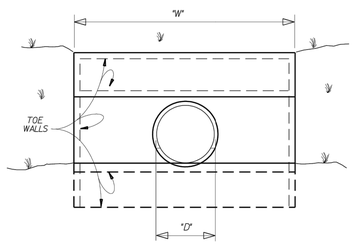


LONGITUDINAL SECTION FOR CIRCULAR & ARCH PIPES



SINGLE C.M.P. ARCH PIPE CULVERT

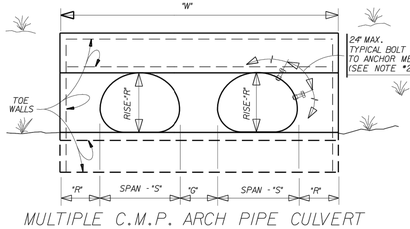


SINGLE CIRCULAR PIPE CULVERT
(CMP or RCP)

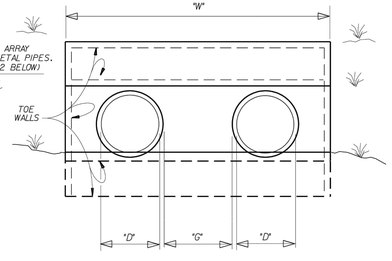
DIMENSIONS FOR CIRCULAR (CMP and RCP) PIPE CULVERTS

"D" INSIDE DIA. of PIPE	"L"	"G"		SINGLE	DOUBLE	TRIPLE	QUADRUPLE
		CGM	RCP	"W"			
18"	2'- 0"	1'- 2"	0'- 9"	4'- 6"	7'- 2"	9'- 10"	12'- 6"
21"	2'- 6"	1'- 3"	0'- 10"	5'- 3"	8'- 4"	11'- 4"	13'- 4"
24"	3'- 0"	1'- 5"	0'- 11"	6'- 0"	9'- 5"	12'- 10"	16'- 3"
30"	4'- 0"	1'- 8"	1'- 1"	7'- 6"	11'- 8"	15'- 10"	20'- 0"
36"	5'- 0"	1'- 11"	1'- 3"	9'- 0"	13'-11"	18'- 10"	23'- 9"
42"	6'- 0"	2'- 2"	1'- 5"	10'- 6"	16'- 2"	21'- 10"	27'- 6"
48"	7'- 0"	2'- 5"	1'- 7"	12'- 0"	18'- 5"	24'- 10"	31'- 3"
54"	8'- 0"	2'- 10"	1'- 11"	13'-6"	20'- 10"	28'- 2"	35'- 6"
60"	9'- 0"	3'- 2"	2'- 0"	15'- 0"	23'- 2"	31'- 4"	39'- 6"

"G" IS MEASURED BETWEEN THE OUTER SURFACES OF THE PIPES.



MULTIPLE C.M.P. ARCH PIPE CULVERT



MULTIPLE CIRCULAR PIPE CULVERT
(CMP or RCP)

DIMENSIONS FOR C.M.P. ARCH PIPE CULVERTS

DESIGN SIZE	APPROX. ARCH DIM.		"L"	"G"	SINGLE	DOUBLE	TRIPLE	QUADRUPLE
	SPAN "S"	RISE "R"			"W"			
2	21"	15"	2'- 0"	1'- 2"	4'- 3"	7'- 2"	10'- 1"	13'- 0"
3	28"	20"	3'- 0"	1'- 5"	5'- 8"	9'- 5"	13'- 2"	16'- 11"
4	35"	24"	4'- 0"	1'- 8"	6'- 11"	11'- 6"	16'- 1"	20'- 8"
5	42"	29"	5'- 0"	1'- 11"	8'- 4"	13'- 9"	19'- 2"	24'- 7"
6	49"	33"	6'- 0"	2'- 2"	9'- 7"	15'- 10"	22'- 1"	28'- 4"
7	57"	38"	7'- 0"	2'- 5"	11'- 1"	18'- 3"	25'- 5"	32'- 7"
8	64"	43"	8'- 0"	2'- 10"	12'- 5"	20'- 8"	28'- 10"	37'- 0"
9	71"	47"	9'- 0"	3'- 2"	13'- 9"	22'- 10"	31'- 11"	41'- 0"

BASED ON 2-2/3" X 1/2" CORRUGATION
"G" IS MEASURED BETWEEN THE OUTER SURFACES OF THE PIPES.

NOTES:
1.) FOR RIPRAP QUANTITIES AND SLOPES, SEE CULVERT LAYOUT SHEET. CONCRETE SHALL BE CLASS B UNLESS OTHERWISE SHOWN IN THE PLANS.
2.) ALL METAL PIPES (CIRCULAR AND/OR ARCH) SHALL HAVE 5/8"X 6" GALVANIZED BOLTS WITH 2 HEX NUTS AT 24" CENTERS TO ANCHOR THE PIPE TO THE CONCRETE. THIS WORK WILL BE SUBSIDIARY TO THE RIPRAP HEADWALL.
3.) FOR CONCRETE ARCH PIPES, THE CMP ARCH PIPE CULVERT DIMENSIONS WILL HAVE TO BE ADJUSTED FOR THE PIPE WALL THICKNESS.
4.) FOR PIPES LARGER THAN SHOWN, USE THE CLEAR DISTANCE BETWEEN PIPES SHOWN IN ITEMS 460 AND/OR 464.
5.) IF THE SIDES OF THE HEADWALL IS ADJACENT TO A RIPRAP SLOPE AND IF THE TOP OF THE HEADWALL IS ADJACENT TO THE ROADWAY FOUNDATION OR RIPRAP SLOPE, THE SIDE AND TOP TOE WALLS MAY BE ELIMINATED IF APPROVED BY THE ENGINEER.

SAN ANTONIO DISTRICT STANDARD
RIPRAP HEADWALL

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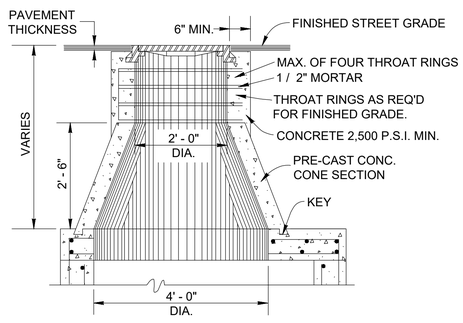
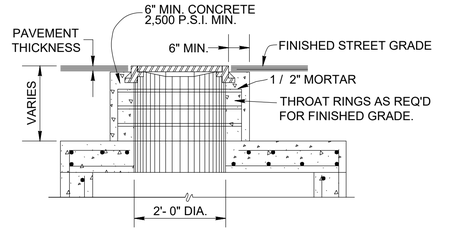
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			
STATE	STATE DISTRICT	COUNTY	
TEXAS	SAT.		
CONT.	SECT.	JOB	HIGHWAY NO.

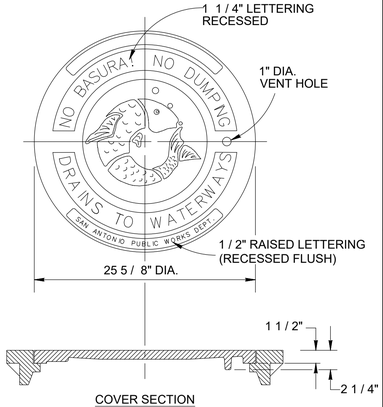
10/95





VARIATION OF VERTICAL STACK

*VERTICAL STACK DESIGN SHALL BE GOVERNED BY THE DEPTH OF THE TOP OF THE JUNCTION BOX BELOW THE FINISHED STREET GRADE.



COVER SECTION

MANHOLE LID & RING DETAIL

NOTES FOR MANHOLE LID AND RING
1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT." AND USE CITY OF NEW BRAUNFELS STANDARDS
2. CASTING NUMBER AND MANUFACTURE'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF H5-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.

VERAMENDI PRECINCT 23 UNIT 1

DRAINAGE DETAILS (SHEET 1 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 3/6/2025
DESIGNED BY: NG
DRAWN BY:
CHECKED BY: PF
DRAWING NAME: 00_Drainage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

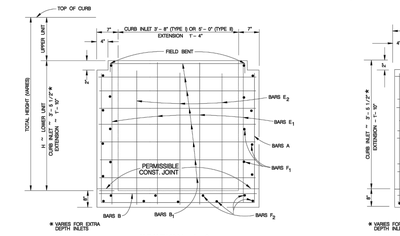
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO.
5.10

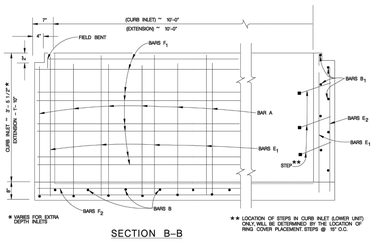
FOR PERMIT

K:\LJA3856_KSA Properties\2405 23-1\425 Site Development Plans\DWG-Sheets\Lift_Drainage Details.dwg
Last Modified: Apr 02, 25 - 18:07
Last Plotted: Apr 02, 25 - 18:07
STRUCTURE DESIGN
/B810EZ/STDS/DH4Headwl.dgn



SECTION A–A

* VARIES FOR EXTRA DEPTH INLETS



SECTION B–B

* VARIES FOR EXTRA DEPTH INLETS

** LOCATION OF STEPS IN CURB INLET (LOWER UNIT) ONLY WILL BE DETERMINED BY THE LOCATION OF RING COVER PLACEMENT. STEPS @ 10" O.C.

REINFORCING STEEL

LOWER UNIT 10' X 3'-8" (TYPE I)				
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	4'-8"
B_1	VARIES	#4	12"	4'-8"
E_1	20	#4	18"±	VARIES
E_2	6	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'-10"
F_2	9	#4	----	10'-10"

LOWER UNIT 10' X 5'-0" (TYPE II)				
BAR	NO.	SIZE	SPAC.	LENGTH
A	15	#4	12"	VARIES
B	11	#4	12"	5'-10"
B_1	VARIES	#4	12"	5'-10"
E_1	22	#4	18"±	VARIES
E_2	8	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'-10"
F_2	11	#4	----	10'-10"

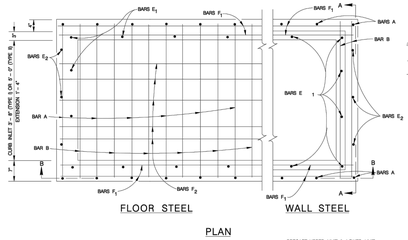
GENERAL NOTES

1. 5' INLETS AND 2' EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (L-C).
2. TYPE C-8 INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN-LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A-615, GRADE 40 REQUIREMENTS.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3 /4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL BARS INTERCEPTING MANHOLE RING & COVER SHALL BE CUT OR BENT.
12. PAYMENT FOR ALL EXCAVATION, BACK-FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".
13. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BENT.
17. ALL LOWER UNITS SHALL RECEIVE INVERT MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 3' BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SKEW OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE RAISED A MAXIMUM OF 6".

PHASE CONSTRUCTION

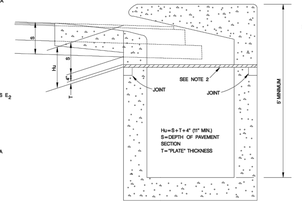
NOTES FOR PHASE CONSTRUCTION (WHEN DIRECTED BY THE ENGINEER):

1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH "Hu" BELOW THE INLET AND EXTENSION GUTTER LINE ELEVATION.
2. CAP THE CURB INLET AND EXTENSION WITH A STEEL PLATE APPROVED BY THE ENGINEER AND CONSTRUCT THE ROADWAY OVER THE PLATE.
3. AFTER THE ROADWAY IS COMPLETED, BUT PRIOR TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND / OR EXTENSION.

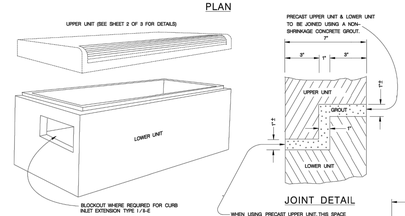


FLOOR STEEL

WALL STEEL

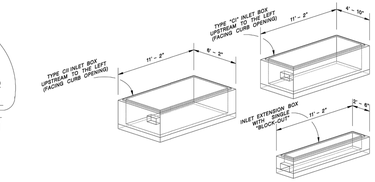


PLAN

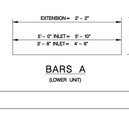


JOINT DETAIL

WHEN USING PRECAST UPPER UNIT, THIS SPACE IS FOR MAKING MINOR HORIZONTAL AND VERTICAL ADJUSTMENTS TO ACCOMODATE A FIT BETWEEN THE UPPER AND LOWER UNIT THAT ALLOWS FOR A MATCH LINE AND GRADE BETWEEN THE ROADWAY CURB AND THE UPPER UNIT OF THE INLET.



CONCRETE INLET BOX CONFIGURATIONS (LOWER UNITS)



BARS A
(LOWER UNIT)

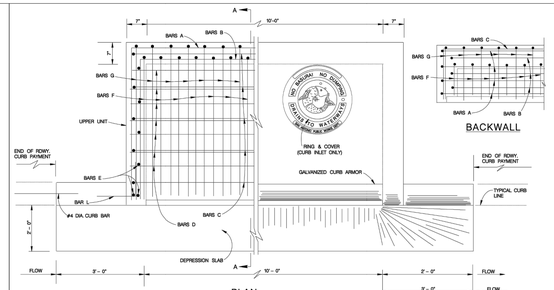
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

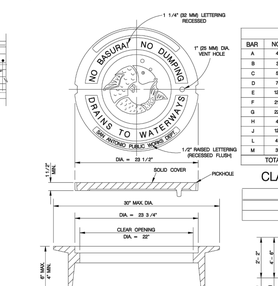
SHEET 1 OF 3

___% SUBMITTAL PROJECT NO.:_____ DATE:_____

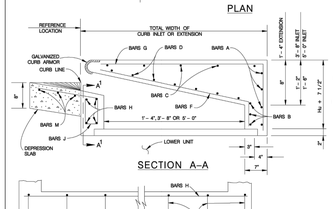
DRAWN BY:V. VASQUEZ DSGN. BY:L.E. MALTOS, P.E. CHKD. BY:R.S. HOSSEINI, P.E. SHEET NO.:____OF____



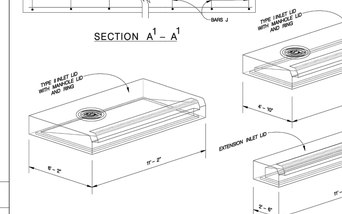
PLAN



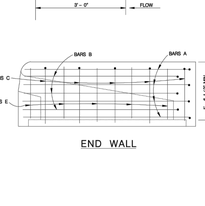
BACKWALL



SECTION A–A

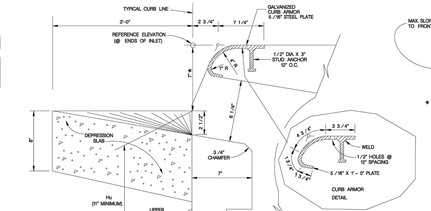


SECTION A^1 – A^1



END WALL

CONCRETE INLET LID CONFIGURATIONS (UPPER UNITS)



INLET OPENING DETAIL

REINFORCING STEEL (FOR Hu = 11")

UPPER UNIT 10' X 3'-8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	9'-10"	53
B	3	#4	----	18'-10"	38
C	5	#4	11"	13'-2"	44
D	7	#4	6"	10'-10"	51
E	12	#4	11"	1'-2"	9
F	21	#6	6"	4'-8"	147
G	22	#5	6"	5'-8"	187
H	4	#4	----	10'-10"	29
J	12	#4	12"	3'-6"	28
L	4	#4	----	2'-0"	5
M	3	#4	----	14'-8"	29
TOTAL WEIGHT					620 LBS.

UPPER UNIT 10' X 5' (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	22'-6"	60
B	3	#4	----	21'-6"	43
C	7	#4	11"	13'-2"	62
D	11	#4	6"	10'-10"	80
E	16	#4	11"	1'-2"	13
F	21	#6	6"	5'-8"	179
G	22	#5	6"	7'-2"	235
H	4	#4	----	10'-10"	29
J	12	#4	12"	3'-6"	28
L	4	#4	----	2'-0"	5
M	3	#4	----	14'-8"	29
TOTAL WEIGHT					759 LBS.

CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

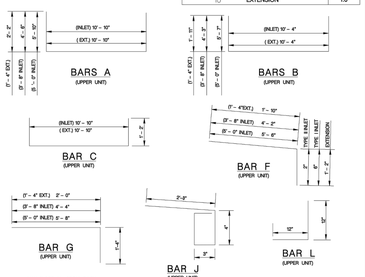
UPPER UNIT (ONLY)	C.Y.
10' X 3'-8" CURB INLET	1.9
10' X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0

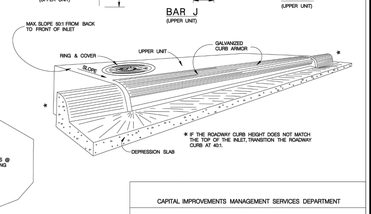
MANHOLE LID & RING DETAIL (ITEM 409)

NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT."
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.





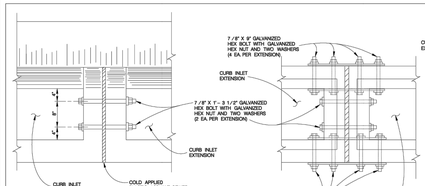
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 2 OF 3

___% SUBMITTAL PROJECT NO.:_____ DATE:_____

DRAWN BY:V. VASQUEZ DSGN. BY:L.E. MALTOS, P.E. CHKD. BY:R.S. HOSSEINI, P.E. SHEET NO.:____OF____



PLAN VIEW

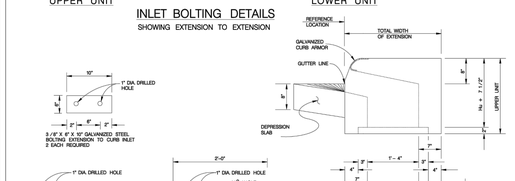
ELEVATION

UPPER UNIT

LOWER UNIT

INLET BOLTING DETAILS

SHOWING EXTENSION TO EXTENSION



PLATES

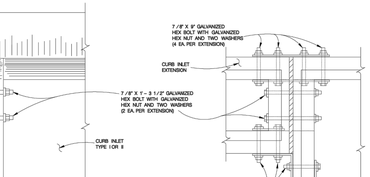
SECTION A–A CURB INLET EXTENSION TYPE E

UPPER UNIT EXTENSION (FOR Hu = 11")					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	10' – 2"	41
B	3	#4	----	14' – 2"	28
C	3	#4	11"	13' – 2"	26
D	3	#4	6"	10' – 10"	22
E	8	#4	11"	1' – 2"	6
F	21	#6	6"	2' – 0"	63
G	22	#6	6"	3' – 4"	110
H	4	#4	----	10' – 10"	29
J	12	#4	12"	3' – 6"	28
L	4	#4	----	2' – 0"	5
M	3	#4	----	14' – 8"	29
REINFORCING STEEL				LBS.	387
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	4' – 2"	49
B	11	#4	12"	2' – 2"	16
B_1	3	#4	12"	2' – 2"	4
T_1	18	#4	18" ±	2' – 1"	27
T_2	4	#4	18" ±	2' – 1"	6
F_1	16	#4	12" ±	10' – 10"	116
F_2	5	#4	----	10' – 10"	36
REINFORCING STEEL				LBS.	254
CLASS "A" CONCRETE				C.Y.	1.4

GENERAL NOTES

1. WHEN INLET EXTENSIONS ARE REQUIRED FOR ON GRADE INLETS THE EXTENSION(S) SHALL BE PLACED ON THE UPSTREAM END OF THE INLET.
2. FOR CURB INLET EXTENSION REINFORCING STEEL, NOTES & VARIOUS OTHER APPLICABLE DETAILS NOT FOUND ON THIS SHEET, REFER TO SHEETS 1 & 2.



PLAN VIEW

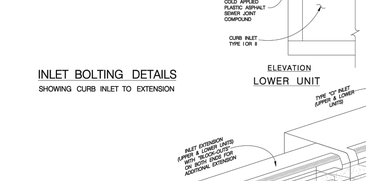
ELEVATION

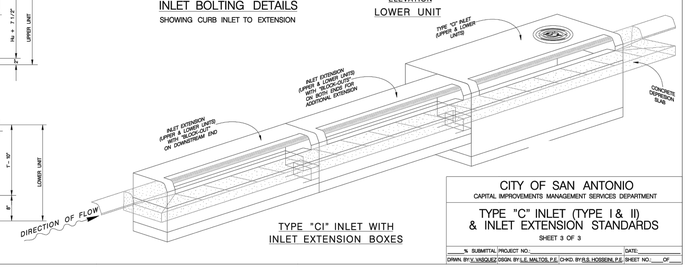
UPPER UNIT

LOWER UNIT

INLET BOLTING DETAILS

SHOWING CURB INLET TO EXTENSION





TYPE "CI" INLET WITH INLET EXTENSION BOXES

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

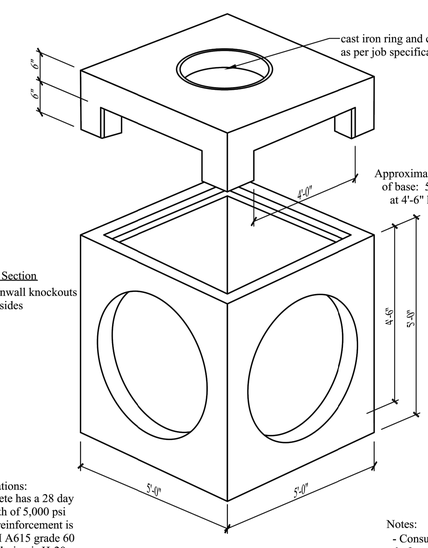
TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 3 OF 3

___% SUBMITTAL PROJECT NO.:_____ DATE:_____

DRAWN BY:V. VASQUEZ DSGN. BY:L.E. MALTOS, P.E. CHKD. BY:R.S. HOSSEINI, P.E. SHEET NO.:____OF____

4' x 4' x var 4-Way Inlet



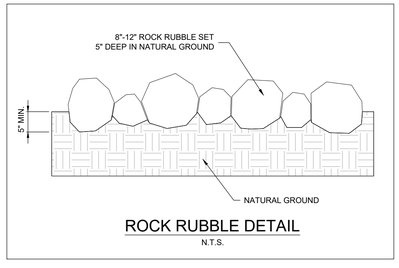
Bottom Section

48" dia thinwall knockouts all four sides

Specifications:
- Concrete has a 28 day strength of 5,000 psi
- Steel reinforcement is ASTM A615 grade 60
- Load design is H-20

Notes:
- Consult manufacturer before handling

Capital Precast	CAPITAL PRECAST, INC. 6905 SOUTH OLD BASTROP HWY SAN MARCOS, TEXAS 78666 PH. (830) 606-6200	FOR	4' x 4' x var 4-Way Inlet
		JOB	
		DRAWN RW	DATE 12/1/2015 Rev. No.
		FILE	catalog/areainlets/4x4 area inlet
		SHEET	1 OF 1



ROCK RUBBLE DETAIL

N.T.S.

VERAMENDI PRECINCT 23 UNIT 1

DRAINAGE DETAILS (SHEET 2 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 3/6/2025
DESIGNED BY: NG
DRAWN BY:
CHECKED BY: PF
DRAWING NAME: 8b_Drainage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO.

5.11

X:\LJA\3856 KSA Properties\2405 23-1\425 Site Development Plans\DWG+Sheets\Lift_Drainage Details.dwg
Last Modified: Apr 02, 25 - 18:07
Last Plotted: Apr 02, 25 - 18:07

FOR PERMIT

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DATE:
FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Dimensions					Variable Reinforcing				Estimated Quantities (3) per ft of wing length (2-wings)	
					Bars J1		Bars J2			
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf Lb/Ft	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#5	–	1'-0"
E	#4	–	1'-0"
F	#4	–	1'-0"
G	#6	4	–
M	#4	4	–
P	#4	–	1'-0"
R	#5	6	–
V	#4	–	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	–	1'-6"
Q	#4	1	–
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

Hw = H + T + C – 0.250'
Lw = (Hw – 0.333) (SL)

For cast-in-place culverts:
Ltw = (N) (S) + (N + 1) (U)

For precast culverts:
Ltw = (N) (2U + S) + (N – 1) (0.5')

Total Wingwall Area (two wings – SF) = (Hw + 0.333) (Lw)

Hw = Height of wingwall
SL:1 = Side slope ratio (horizontal:1 vertical)
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans

See applicable box culvert standard sheet for H, S, T, and U values.

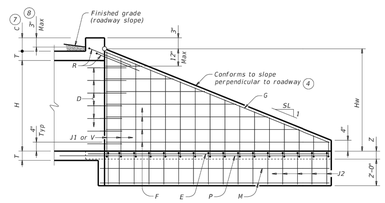
1. Extend Bars P 3'-0" minimum into bottom slab of box culvert.
2. Adjust as necessary to maintain 1 1#2" clear cover and 4" minimum between bars.
3. Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
4. Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
5. When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap." Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
6. At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
7. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
8. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

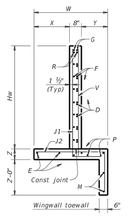
GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

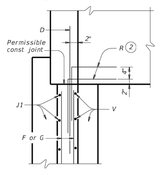


INSIDE ELEVATION

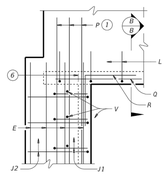
(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)



SECTION A-A

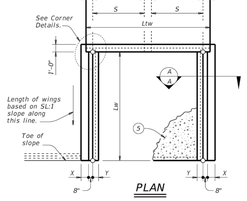


WINGWALL



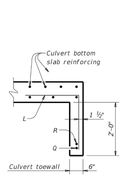
FOOTING AND TOEWALL

CORNER DETAILS



PLAN

(Showing dimensions.)



SECTION B-B (5)

BARS R

BARS D

BARS J1

BARS V

BARS L

BARS J2

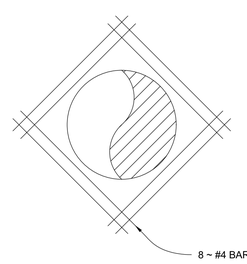
Texas Department of Transportation — Bridge Division Standard

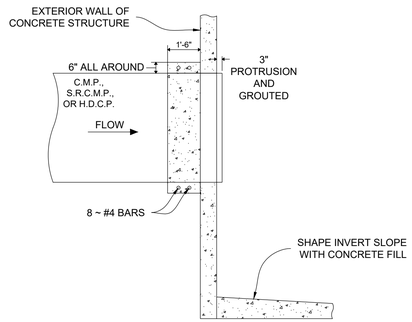
CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

SW-0

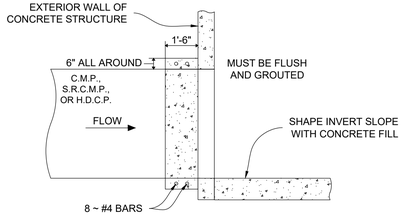
FILE: CD-SW0-20.dgn	DN: GF	CK: GF	DW: TxDOT	CK: TxDOT
©TxDOT February 2020 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

PROTRUDING PIPE FOR DROP STRUCTURES





PIPE FLUSH WITH INVERT



CONCRETE COLLAR DETAIL
(NOT TO SCALE)

NOTES:

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A", 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM. A-15, THE DEFORMATION SHALL CONFORM TO ASTM. A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 0.33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).

VERAMENDI PRECINCT 23 UNIT 1

DRAINAGE DETAILS (SHEET 3 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 3/6/2025
DESIGNED BY: NG
DRAWN BY:
CHECKED BY: PF
DRAWING NAME: sh_Drainage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

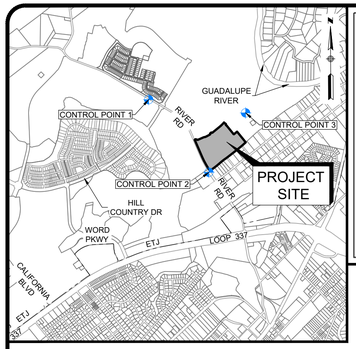
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

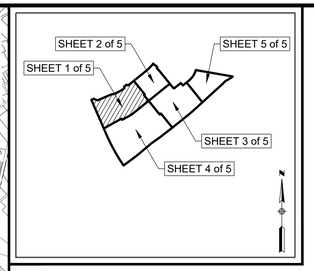
SHEET NO.
5.12

FOR PERMIT

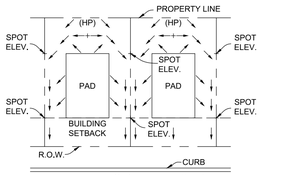
K:\SA3856.405 Properties\2405 23-1\428 Site Development Plans\GWD-Sheets\sh_Drainage Details.dwg
User: ngower
Last Modified: Apr. 02, 25 - 18:07
Last Plotted: Jul 08, 25 - 10:31:09



LOCATION MAP
N.T.S.

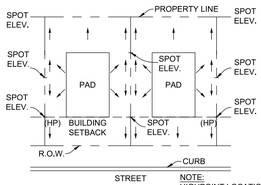


SHEET INDEX
N.T.S.



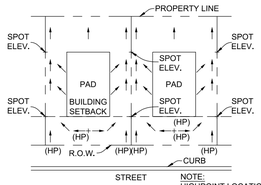
NOTE:
HIGHPOINT LOCATION TO BE FIELD LOCATED FOR EACH INDIVIDUAL LOT.

TYPICAL "A" LOT GRADING
N.T.S.



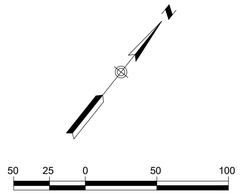
NOTE:
HIGHPOINT LOCATION TO BE FIELD LOCATED FOR EACH INDIVIDUAL LOT.

TYPICAL "B" LOT GRADING
N.T.S.

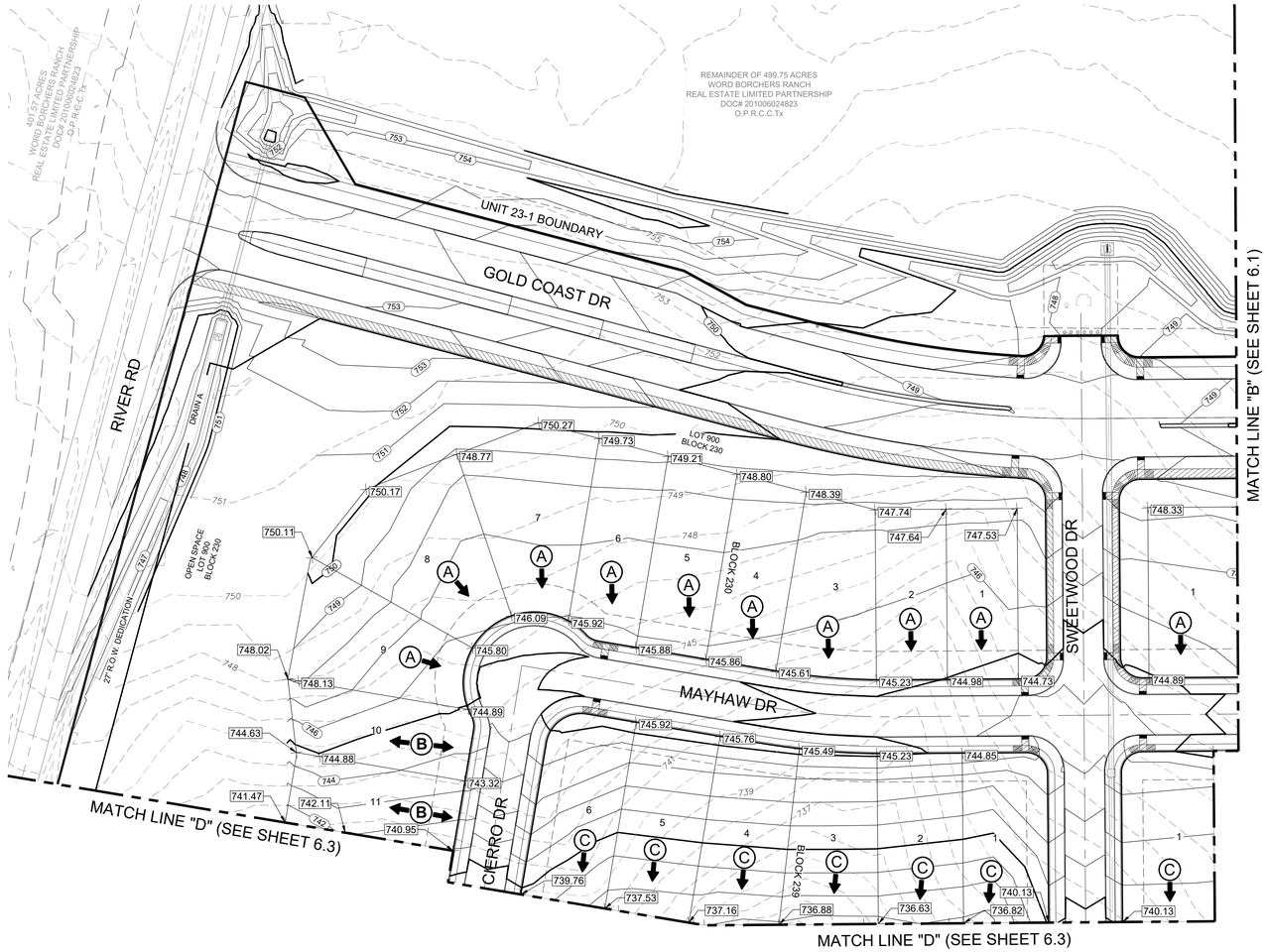


NOTE:
HIGHPOINT LOCATION TO BE FIELD LOCATED FOR EACH INDIVIDUAL LOT.

TYPICAL "C" LOT GRADING
N.T.S.



SCALE IN FEET
SCALE: 1"=50'



LEGEND

PROPOSED	EXISTING	
800	800	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
706.41	801.33	GROUND ELEVATION
TOW 706.41	EX TOW 706.41	TOP OF RETAINING WALL ELEVATION
BOW 706.41	EX BOW 706.41	BOTTOM OF RETAINING WALL ELEVATION
706.41 ME		MATCH EXISTING GROUND
A		LOT DRAINS TO FRONT
B		LOT DRAINS 1/2 TO FRONT AND 1/2 TO REAR
C		LOT DRAINS TO REAR
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	G,E,T,CA	GAS, ELEC, TELE & CABLE TV ESM'T.
	ESM'T.	EASEMENT
	VOL	VOLUME
	PG	PAGE
		RETAINING WALL

GRADING NOTES

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THIS SCOPE OF WORK, WHERE NOT SPECIFICALLY COVERED IN THE SPECIFICATIONS OR GEOTECHNICAL REPORT SHALL CONFORM TO ALL APPLICABLE CITY, COUNTY, AND TxDOT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
2. SITE PREPARATION, GRADING, EXCAVATION, AND FILL SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND SPECIFICATIONS.
3. ALL SELECT FILL MATERIAL PROVIDED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING AND COMPACTING.
4. ALL ELEVATIONS AND PROPOSED CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVING, BASE, GRASS, TOPSOIL, AND MULCH MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY QUESTIONS THAT MAY ARISE CONCERNING THE INTENT, PLACEMENT, OR LIMITS OF DIMENSIONS OR GRADES NECESSARY FOR CONSTRUCTION OF THIS PROJECT.
6. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED TO COMPLETE CONSTRUCTION OF THIS PROJECT.
8. THE CONTRACTOR SHALL REMOVE TOP SOIL, GRASS, ROOTS, DEBRIS, ETC. AND DISPOSE OFF SITE THOSE MATERIALS NOT SUITABLE FOR EMBANKMENT AND TOPSOIL. CLEAN STRIPPINGS AND TOPSOIL MAY BE STOCKPILED ON SITE FOR REUSE IN A LOCATION SPECIFIED BY THE OWNER.
9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE STABILIZATION, ALL DISTURBED AREAS SHALL BE REVEGETATED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND TPDES/SWPPP REQUIREMENTS. REFERENCE THE LANDSCAPE ARCHITECT'S PLAN, IF APPLICABLE.
10. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS (USE OF SILT FENCES. ETC.) TO KEEP DRAINAGE AND SILT FROM WASHING ONTO ADJACENT PROPERTY, STREETS, OR DRAINAGE WAYS. CONTRACTOR SHALL IMMEDIATELY REMOVE SILT/DEBRIS WHICH WASHES OFFSITE OR INTO EXISTING STORM DRAIN SYSTEMS (SEE SWPPP PLANS & TPDES BOOK).
11. THE CONTRACTOR SHALL OBTAIN GRADES SHOWN HEREON WITHIN +/- ONE-TENTH (0.10) FOOT.
12. IN PROPOSED PAVING AREAS. STREET DESIGN PLANS SHALL CONTROL ALL EARTHEN SLOPES SHALL BE A MAXIMUM OF 3:1 AND A MINIMUM OF 1.0% UNLESS OTHERWISE SHOWN.
13. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING SITE AND PROPOSED IMPROVEMENTS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL, OR BETTER, CONDITION ANY DAMAGE DONE TO EXISTING TREES, BUILDINGS, UTILITIES, FENCES, PAVEMENT, CURBS, OR DRIVEWAYS (NO SEPARATE PAY ITEMS).
15. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN WORKING NEAR UTILITIES. GAS LINES, SEWER, OR EXISTING APPURTENANCES. PRIOR TO PERFORMING ANY EXCAVATION, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND ASSURE HIMSELF THAT ALL UTILITIES HAVE BEEN ADEQUATELY LOCATED AND IDENTIFIED. THE ENGINEER SHALL BE NOTIFIED IF ANY UTILITY CONFLICTS ARE DISCOVERED.
16. UTILITIES SHOWN ON THE PLANS ARE FROM INFORMATION SOURCES AVAILABLE AT THE TIME OF DESIGN BUT MAY NOT REPRESENT ALL EXISTING UTILITIES ON SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION AND 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. WETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR, AT HIS OWN EXPENSE.
17. POSITIVE DRAINAGE SHALL BE MAINTAINED THROUGHOUT THE SCOPE OF THE PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW ANY PONDING OF WATER.
18. FOR FILL PLACEMENT ON HILL SIDES OR STEEP SLOPE AREAS, THE CONTRACTOR SHALL REFERENCE THE PROJECT SPECIFICATIONS AND GEOTECHNICAL REPORT FOR SPECIAL INSTRUCTIONS REGARDING BENCHING.
19. NO WORK SHALL BE PERFORMED IN A PUBLIC RIGHT-OF-WAY WITHOUT A PERMIT.
20. STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE NEW BRAUNFELS DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC.12.2(N).

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

VERAMENDI PRECINCT 23 UNIT 1

GRADING PLAN

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/1/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Grading Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

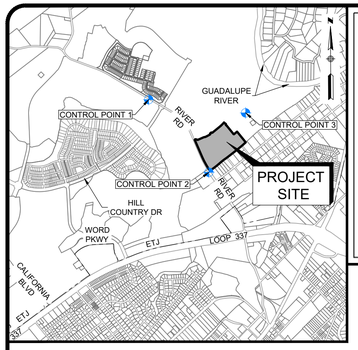
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

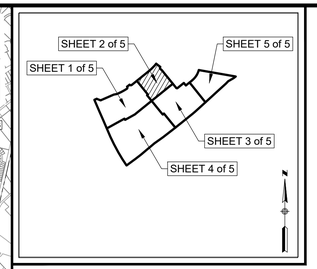
SHEET NO. 6.0

FOR PERMIT

K:\SA3856.2405 Properties\2405 23-1\426 Site Development Plans\DWG-Sheets\sh_Grading Plan.dwg
Tue, 07/08/25 - 17:26
Last Modified: Jul 07, 25 - 17:26
Last Modified By: ...



LOCATION MAP
N.T.S.



SHEET INDEX
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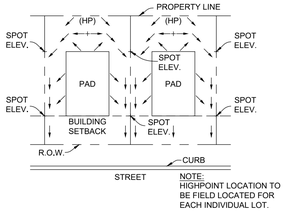
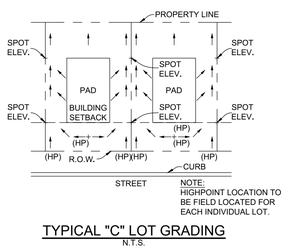
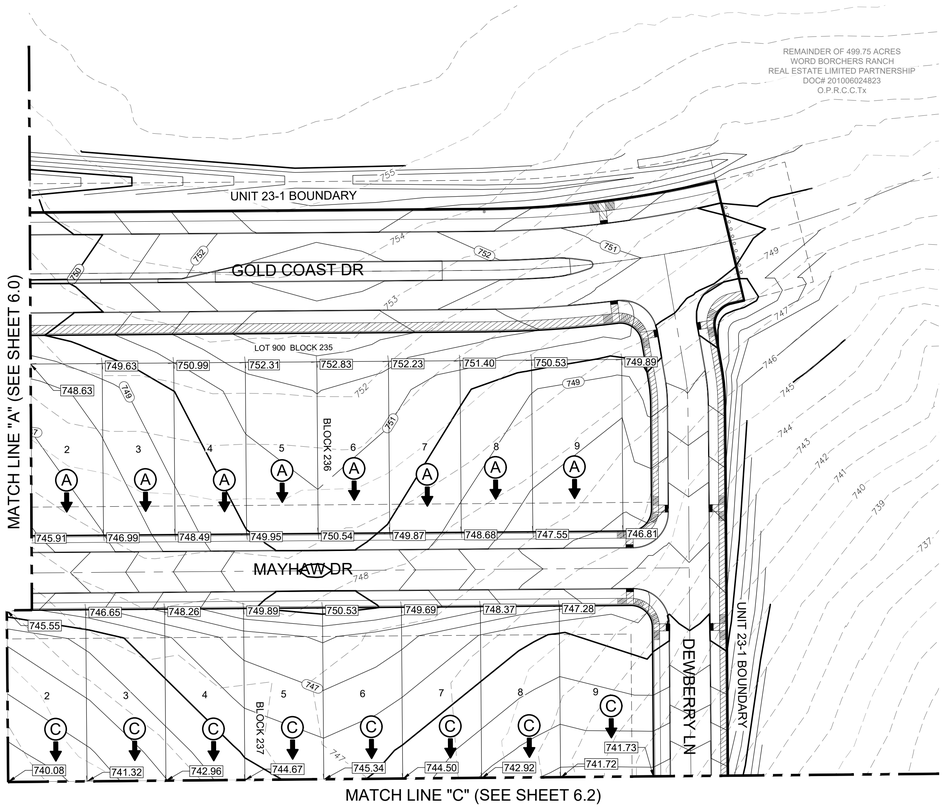


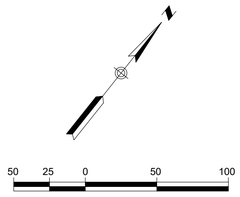
TYPICAL "A" LOT GRADING
N.T.S.

TYPICAL "B" LOT GRADING
N.T.S.



TYPICAL "C" LOT GRADING
N.T.S.





SCALE IN FEET
SCALE: 1"=50'

LEGEND

PROPOSED	EXISTING	
800	800	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
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BOW 706.41	EX BOW 706.41	BOTTOM OF RETAINING WALL ELEVATION
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B		LOT DRAINS 1/2 TO FRONT AND 1/2 TO REAR
C		LOT DRAINS TO REAR
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	G,E,T,CA	GAS, ELEC, TELE & CABLE TV ESM'T.
	ESM'T.	EASEMENT
	VOL	VOLUME
	PG	PAGE
		RETAINING WALL

GRADING NOTES

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4. ALL ELEVATIONS AND PROPOSED CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVING, BASE, GRASS, TOPSOIL, AND MULCH MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY QUESTIONS THAT MAY ARISE CONCERNING THE INTENT, PLACEMENT, OR LIMITS OF DIMENSIONS OR GRADES NECESSARY FOR CONSTRUCTION OF THIS PROJECT.
6. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED TO COMPLETE CONSTRUCTION OF THIS PROJECT.
8. THE CONTRACTOR SHALL REMOVE TOP SOIL, GRASS, ROOTS, DEBRIS, ETC. AND DISPOSE OFF SITE THOSE MATERIALS NOT SUITABLE FOR EMBANKMENT AND TOPSOIL. CLEAN STRIPPINGS AND TOPSOIL MAY BE STOCKPILED ON SITE FOR REUSE IN A LOCATION SPECIFIED BY THE OWNER.
9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE STABILIZATION, ALL DISTURBED AREAS SHALL BE REVEGETATED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND TPDES/SWPPP REQUIREMENTS. REFERENCE THE LANDSCAPE ARCHITECT'S PLAN, IF APPLICABLE.
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VERAMENDI PRECINCT 23 UNIT 1

GRADING PLAN

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 4/1/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sht_Grading Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

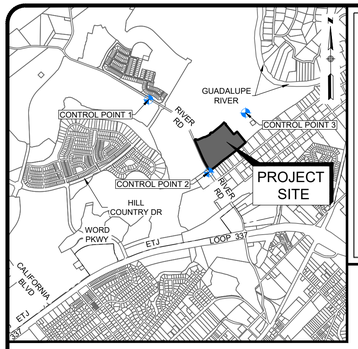
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

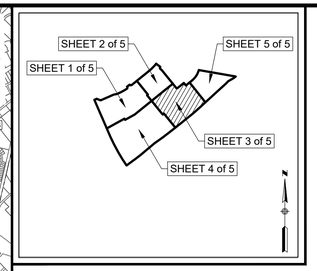
SHEET NO. 6.1

FOR PERMIT

K:\SA3856_ASA Properties\2405 23-1\426 Site Development Plans\GWD-Sheets\sht_Grading Plan.dwg
Xref Name: ...
Last Modified: Jul 07, 25 - 17:26
Last Plotted: Jul 07, 25 - 17:26



LOCATION MAP
N.T.S.



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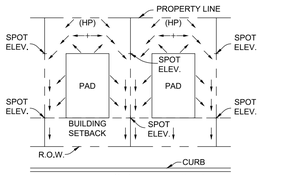

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TYPICAL "A" LOT GRADING
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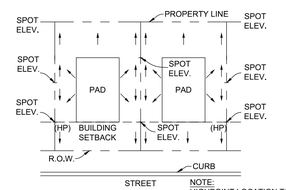

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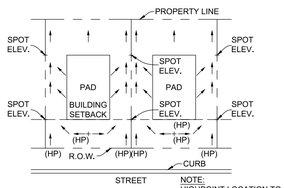

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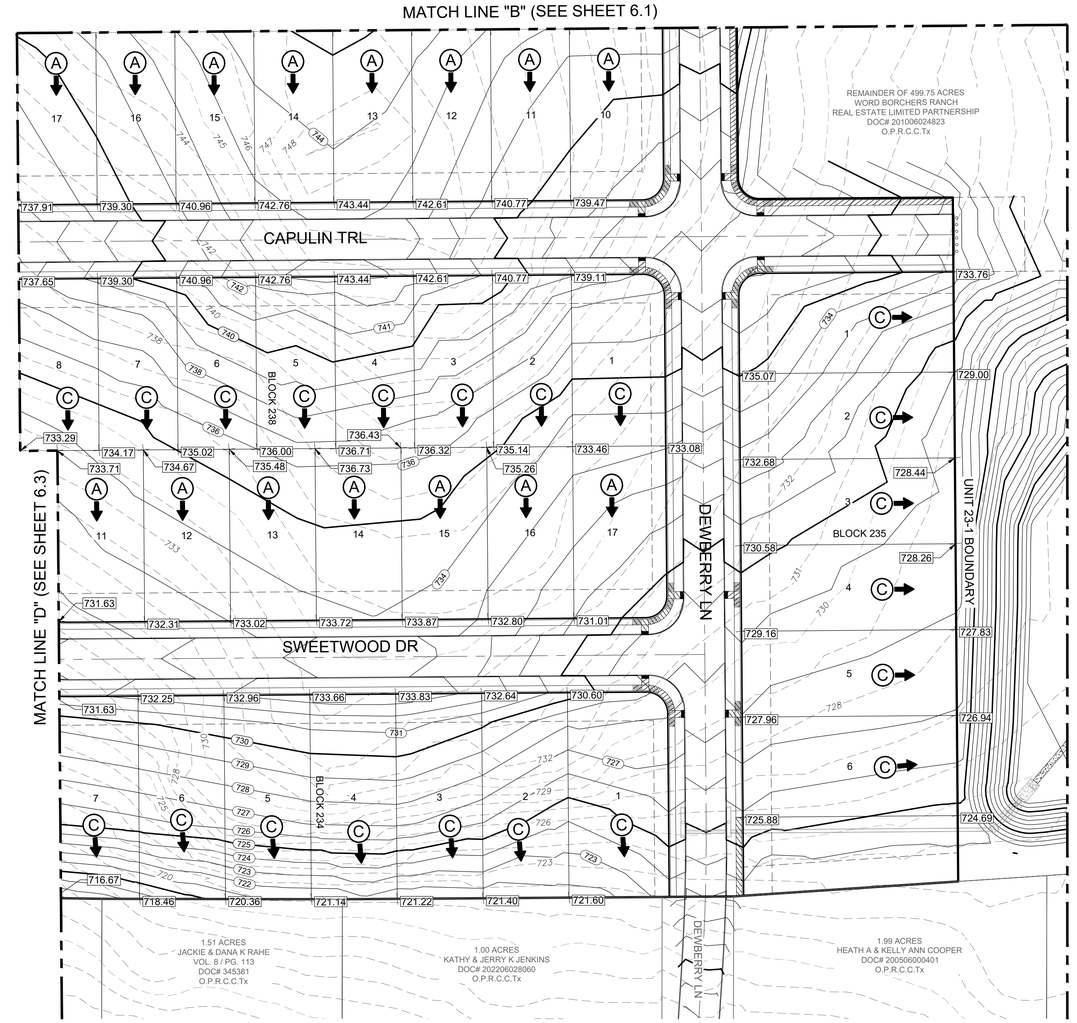

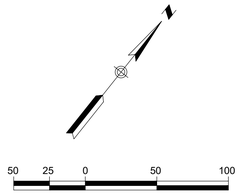

SCALE IN FEET
SCALE: 1"=50'

LEGEND

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		GRASSED DRAIN FLOW
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VERAMENDI PRECINCT 23 UNIT 1

GRADING PLAN

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/1/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: GRADING PLAN

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

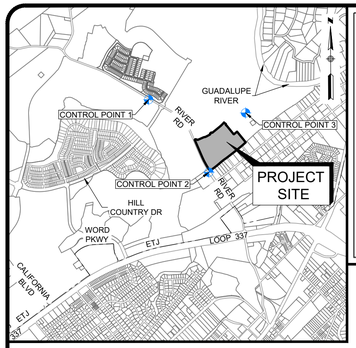
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

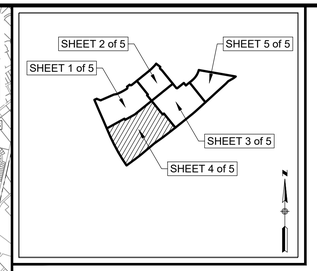
SHEET NO.
6.2

FOR PERMIT

K:\SA3856.2405 Properties\2405 23-1\426 Site Development Plans\GWD-Sheets\sh_Grading Plan.dwg
Plotted: Jul 07, 25 - 17:26
Last Modified: Jul 07, 25 - 16:54
by Nicholas.Gower



LOCATION MAP
N.T.S.



SHEET INDEX
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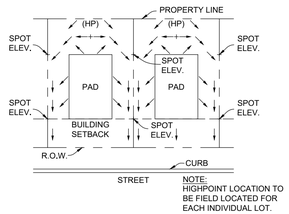

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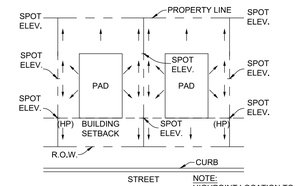

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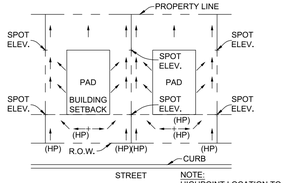

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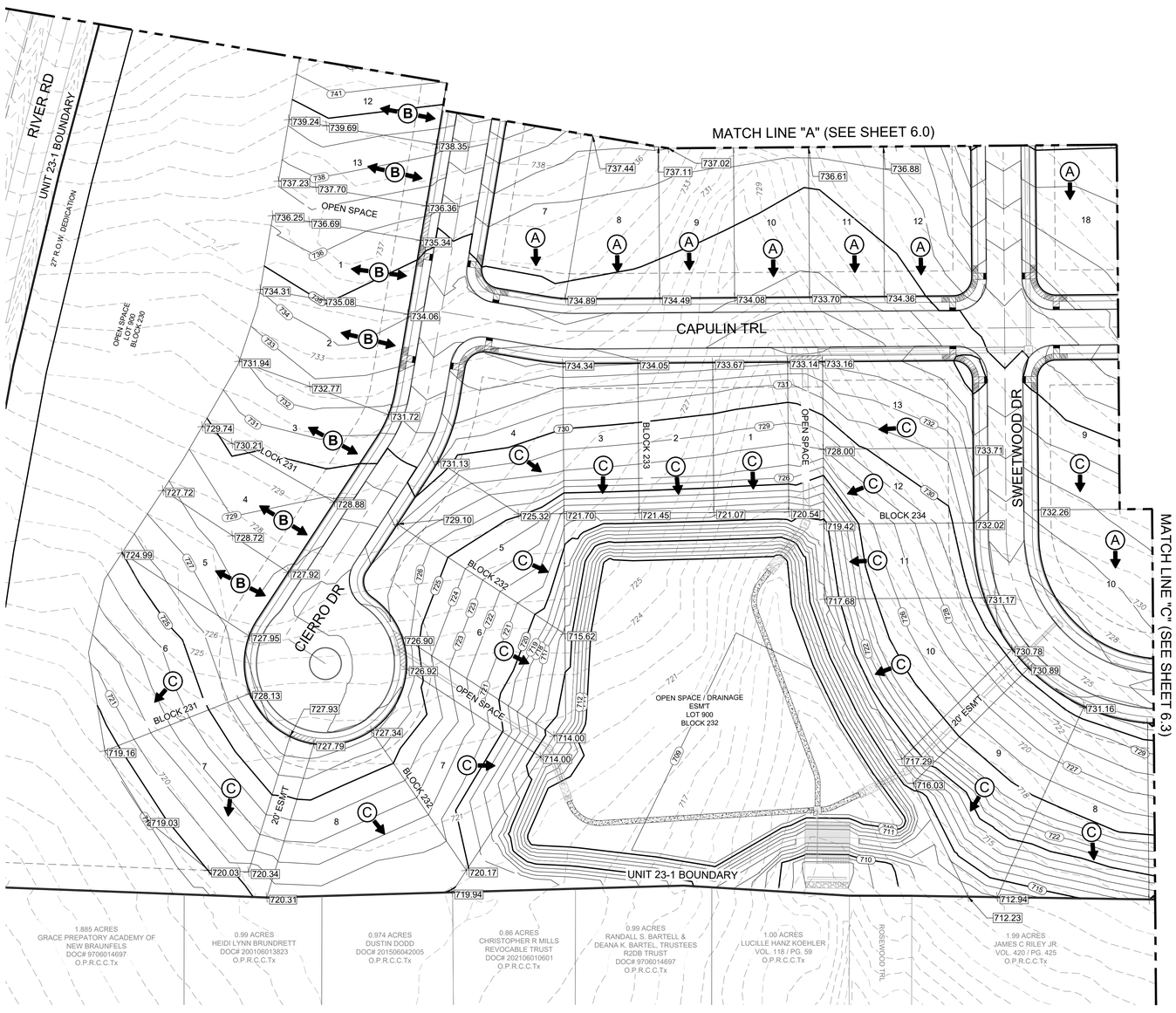

50 25 0 50 100
SCALE IN FEET
SCALE: 1"=50'

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GRADING PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 4/1/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Grading Plan.dwg

NICHOLAS GOWER 139260 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS 07/08/2025

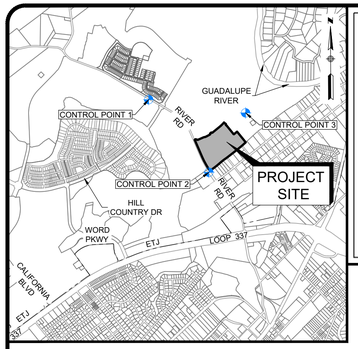
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

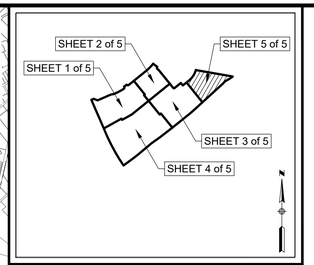
SHEET NO. 6.3

FOR PERMIT

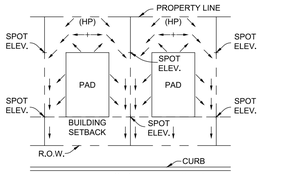
P:\LJA\3856 KSA Properties\2405 23-1\426 Site Development Plans\02-Sheets\sh_Grading Plan.dwg
Last Saved By: jwilliams Jul. 07, 25 - 17:26
Last Modified: Jul. 07, 25 - 17:26
Plotted By: jwilliams Jul. 08, 25 - 11:54 AM



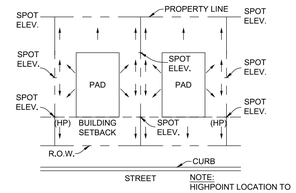
LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.



TYPICAL "A" LOT GRADING
N.T.S.



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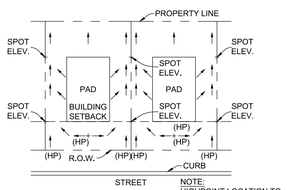
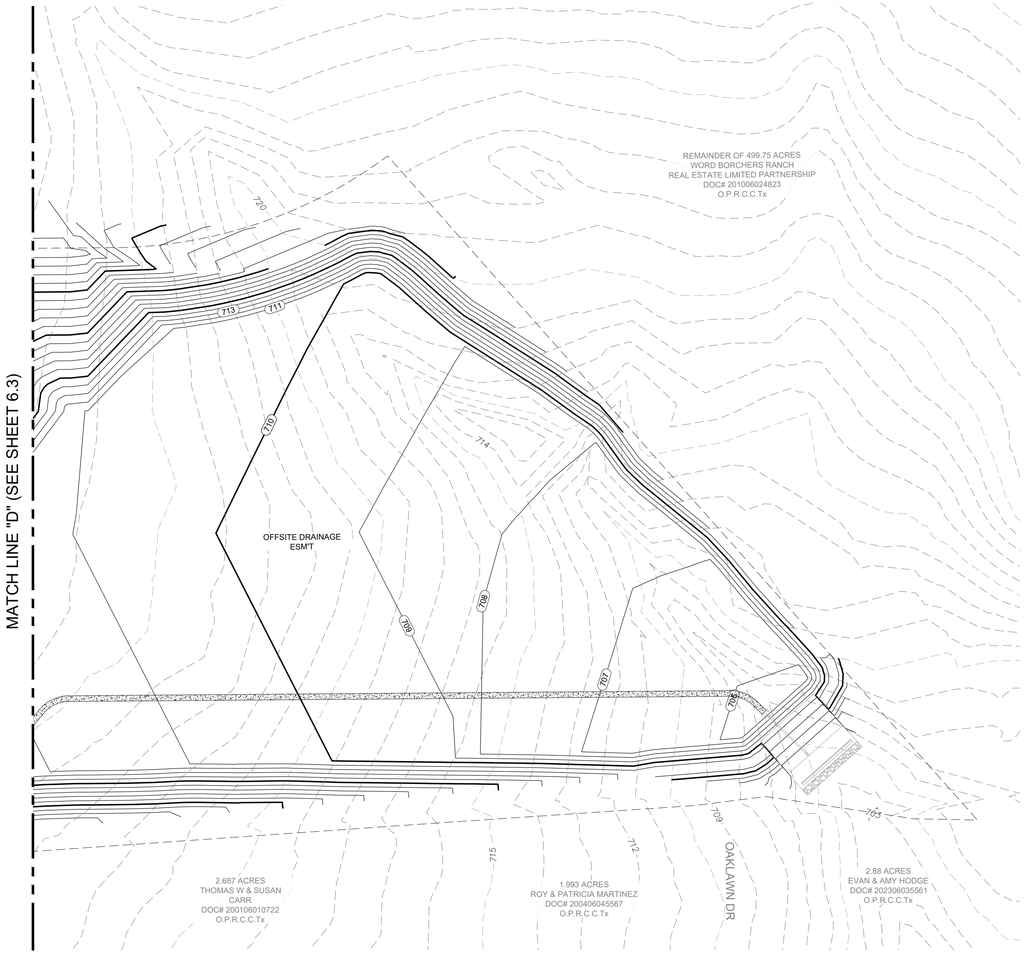
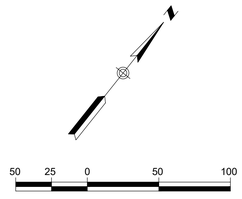


TYPICAL "C" LOT GRADING
N.T.S.





SCALE IN FEET
SCALE: 1"=50'

LEGEND

PROPOSED	EXISTING	
800	800	CONTOUR
2%	2%	FLOW ARROW
		GRASSED DRAIN FLOW
706.41	801.33	GROUND ELEVATION
TOW 706.41	EX TOW 706.41	TOP OF RETAINING WALL ELEVATION
BOW 706.41	EX BOW 706.41	BOTTOM OF RETAINING WALL ELEVATION
706.41 ME		MATCH EXISTING GROUND
A		LOT DRAINS TO FRONT
B		LOT DRAINS 1/2 TO FRONT AND 1/2 TO REAR
C		LOT DRAINS TO REAR
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	G,E,T,CA	GAS, ELEC, TELE & CABLE TV ESM'T.
	ESM'T.	EASEMENT
	VOL	VOLUME
	PG	PAGE
		RETAINING WALL

GRADING NOTES

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THIS SCOPE OF WORK, WHERE NOT SPECIFICALLY COVERED IN THE SPECIFICATIONS OR GEOTECHNICAL REPORT SHALL CONFORM TO ALL APPLICABLE CITY, COUNTY, AND TxDOT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).
2. SITE PREPARATION, GRADING, EXCAVATION, AND FILL SHALL BE PERFORMED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND SPECIFICATIONS.
3. ALL SELECT FILL MATERIAL PROVIDED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING AND COMPACTING.
4. ALL ELEVATIONS AND PROPOSED CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVING, BASE, GRASS, TOPSOIL, AND MULCH MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY QUESTIONS THAT MAY ARISE CONCERNING THE INTENT, PLACEMENT, OR LIMITS OF DIMENSIONS OR GRADES NECESSARY FOR CONSTRUCTION OF THIS PROJECT.
6. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED TO COMPLETE CONSTRUCTION OF THIS PROJECT.
8. THE CONTRACTOR SHALL REMOVE TOP SOIL, GRASS, ROOTS, DEBRIS, ETC. AND DISPOSE OFF SITE THOSE MATERIALS NOT SUITABLE FOR EMBANKMENT AND TOPSOIL. CLEAN STRIPPINGS AND TOPSOIL MAY BE STOCKPILED ON SITE FOR REUSE IN A LOCATION SPECIFIED BY THE OWNER.
9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE STABILIZATION, ALL DISTURBED AREAS SHALL BE REVEGETATED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND TPDES/SWPPP REQUIREMENTS. REFERENCE THE LANDSCAPE ARCHITECT'S PLAN, IF APPLICABLE.
10. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS (USE OF SILT FENCES. ETC.) TO KEEP DRAINAGE AND SILT FROM WASHING ONTO ADJACENT PROPERTY, STREETS, OR DRAINAGE WAYS. CONTRACTOR SHALL IMMEDIATELY REMOVE SILT/DEBRIS WHICH WASHES OFFSITE OR INTO EXISTING STORM DRAIN SYSTEMS (SEE SWPPP PLANS & TPDES BOOK).
11. THE CONTRACTOR SHALL OBTAIN GRADES SHOWN HEREON WITHIN +/- ONE-TENTH (0.10) FOOT.
12. IN PROPOSED PAVING AREAS. STREET DESIGN PLANS SHALL CONTROL ALL EARTHEN SLOPES SHALL BE A MAXIMUM OF 3:1 AND A MINIMUM OF 1.0% UNLESS OTHERWISE SHOWN.
13. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING SITE AND PROPOSED IMPROVEMENTS.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL, OR BETTER, CONDITION ANY DAMAGE DONE TO EXISTING TREES, BUILDINGS, UTILITIES, FENCES, PAVEMENT, CURBS, OR DRIVEWAYS (NO SEPARATE PAY ITEMS).
15. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN WORKING NEAR UTILITIES. GAS LINES, SEWER, OR EXISTING APPURTENANCES. PRIOR TO PERFORMING ANY EXCAVATION, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND ASSURE HIMSELF THAT ALL UTILITIES HAVE BEEN ADEQUATELY LOCATED AND IDENTIFIED. THE ENGINEER SHALL BE NOTIFIED IF ANY UTILITY CONFLICTS ARE DISCOVERED.
16. UTILITIES SHOWN ON THE PLANS ARE FROM INFORMATION SOURCES AVAILABLE AT THE TIME OF DESIGN BUT MAY NOT REPRESENT ALL EXISTING UTILITIES ON SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION AND 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. WETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR, AT HIS OWN EXPENSE.
17. POSITIVE DRAINAGE SHALL BE MAINTAINED THROUGHOUT THE SCOPE OF THE PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW ANY PONDING OF WATER.
18. FOR FILL PLACEMENT ON HILL SIDES OR STEEP SLOPE AREAS, THE CONTRACTOR SHALL REFERENCE THE PROJECT SPECIFICATIONS AND GEOTECHNICAL REPORT FOR SPECIAL INSTRUCTIONS REGARDING BENCHING.
19. NO WORK SHALL BE PERFORMED IN A PUBLIC RIGHT-OF-WAY WITHOUT A PERMIT.
20. STRIPPING OF VEGETATION FROM PROJECT SITES SHALL BE PHASED SO AS TO EXPOSE THE MINIMUM AMOUNT OF AREA TO SOIL EROSION FOR THE SHORTEST POSSIBLE PERIOD OF TIME PER THE NEW BRAUNFELS DRAINAGE AND EROSION CONTROL DESIGN MANUAL SEC.12.2(N).

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

VERAMENDI PRECINCT 23 UNIT 1

GRADING PLAN

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/1/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Grading Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.4

FOR PERMIT

K:\SA3856.43A Properties\2405 23-1\26 Site Development Plan\DWG Sheets\sh_Grading Plan.dwg
Plotted: Jul. 07, 25 - 17:26
Last Modified: Jul. 07, 25 - 17:26
Xref Path: ..\..\..\

GENERAL NOTES:

1. ALL HANDICAP RAMPS TO BE TYPE III UNLESS OTHERWISE NOTED, REFER TO SHEET 6.13.
2. ALL ELEVATIONS ARE TOP OF CURB UNLESS OTHERWISE NOTED.
3. WHERE SIDEWALK IS SEPARATED FROM THE CURB, THE SEPARATION DISTANCE SHALL BE A MINIMUM 6' BETWEEN THE BACK OF CURB AND EDGE OF SIDEWALK.
4. REFER TO SHEETS 6.13 & 6.14 FOR STREET AND PAVEMENT SECTION DETAIL, CONCRETE CURB DETAIL, AND SIDEWALK DETAIL.
5. CONTRACTOR TO FIELD VERIFY ALL MATCH EXISTING ELEVATIONS, SEWER MANHOLE INVERTS, STORM DRAIN INVERTS, AND ALL OTHER UTILITIES PRIOR TO UTILITY WORK AND NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
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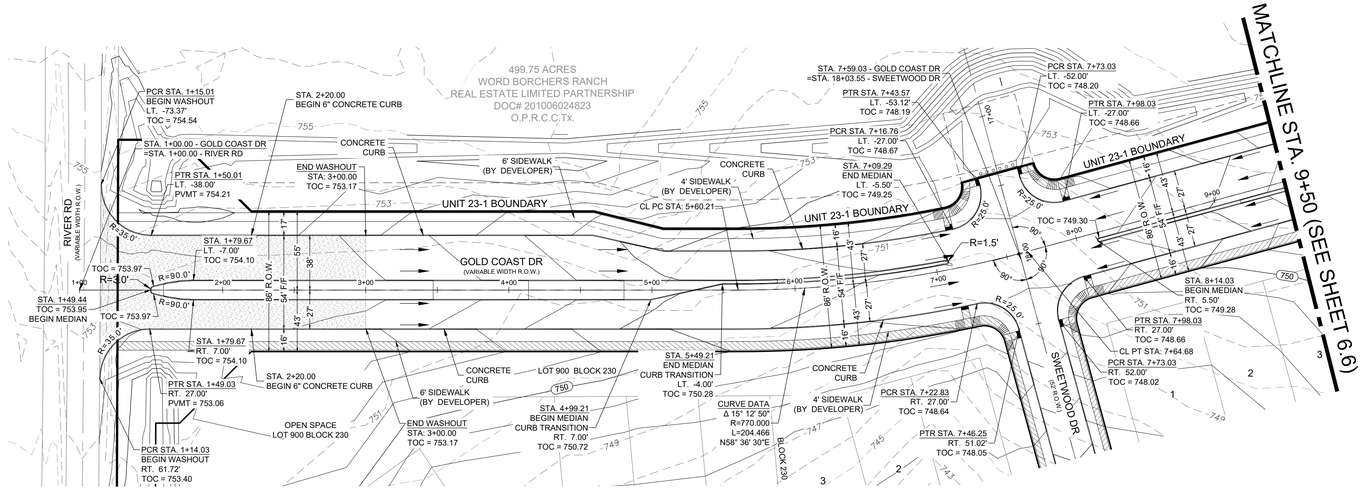
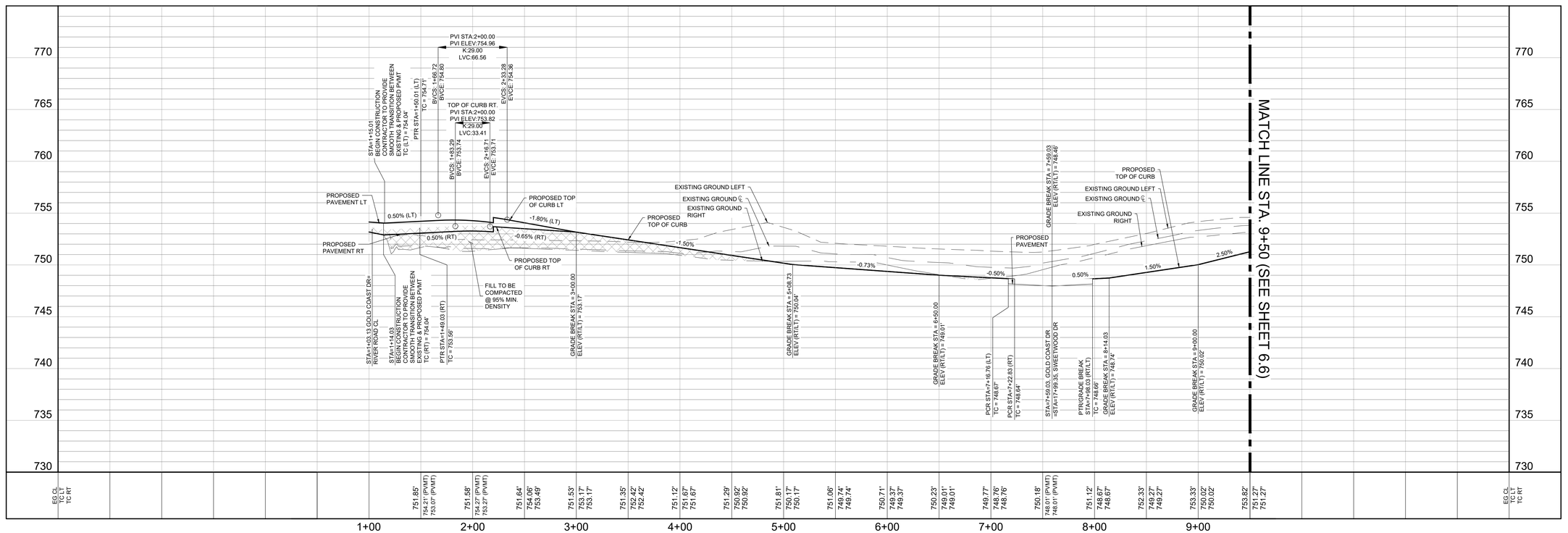
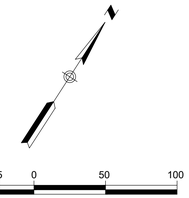
9. VERTICAL CURVE DESIGN SPEED ARE IN COMPLIANCE WITH THE APPROVED DEVELOPMENT CODE TABLE 13-2 FOR LOCAL A (25 MPH) AND MINOR COLLECTOR (40MPH).



GOLD COAST DR STA.1+00 TO STA. 9+50





HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TC	TOP OF CURB
ELEV	PAVEMENT ELEVATION

VERAMENDI PRECINCT 23 UNIT 1

GOLD COAST DR PLAN & PROFILE
STA.1+00 TO STA. 9+50

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/1/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\6 - Sheets\Plat_Gold Coast Dr.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
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San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.5

FOR PERMIT

P:\LJA3856_KSA Properties\2405 23-1\426 Site Development Plans\CAD\~Sheets\ph_Sheet P&P_Gold Coast Dr.dwg
User Name: ...ua_ap_ap
Last Modified: Jul. 07, 25 - 20:59
Full Plot: Jul. 07, 25 - 20:59

GENERAL NOTES:

1. ALL HANDICAP RAMPS TO BE TYPE III UNLESS OTHERWISE NOTED, REFER TO SHEET 32.
2. ALL ELEVATIONS ARE TOP OF CURB UNLESS OTHERWISE NOTED.
3. WHERE SIDEWALK IS SEPARATED FROM THE CURB, THE SEPARATION DISTANCE SHALL BE A MINIMUM 6' BETWEEN THE BACK OF CURB AND EDGE OF SIDEWALK.
4. REFER TO SHEETS 32 & 33 FOR STREET AND PAVEMENT SECTION DETAIL, CONCRETE CURB DETAIL, AND SIDEWALK DETAIL.
5. CONTRACTOR TO FIELD VERIFY ALL MATCH EXISTING ELEVATIONS, SEWER MANHOLE INVERTS, STORM DRAIN INVERTS, AND ALL OTHER UTILITIES PRIOR TO UTILITY WORK AND NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
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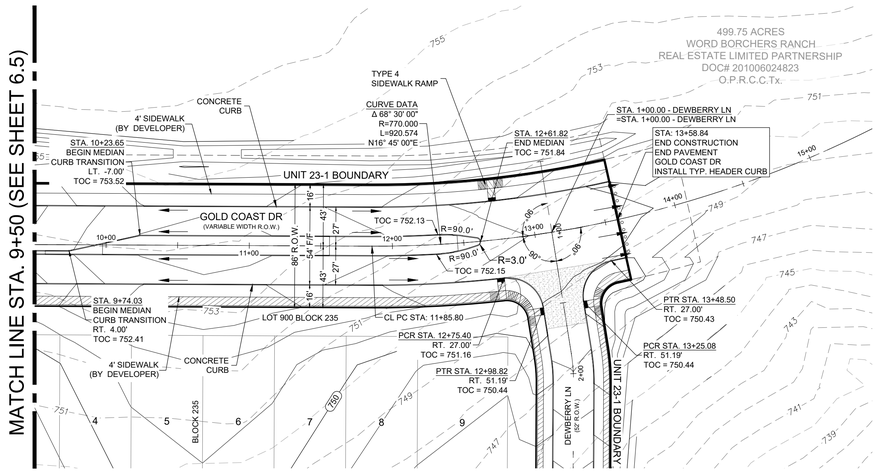
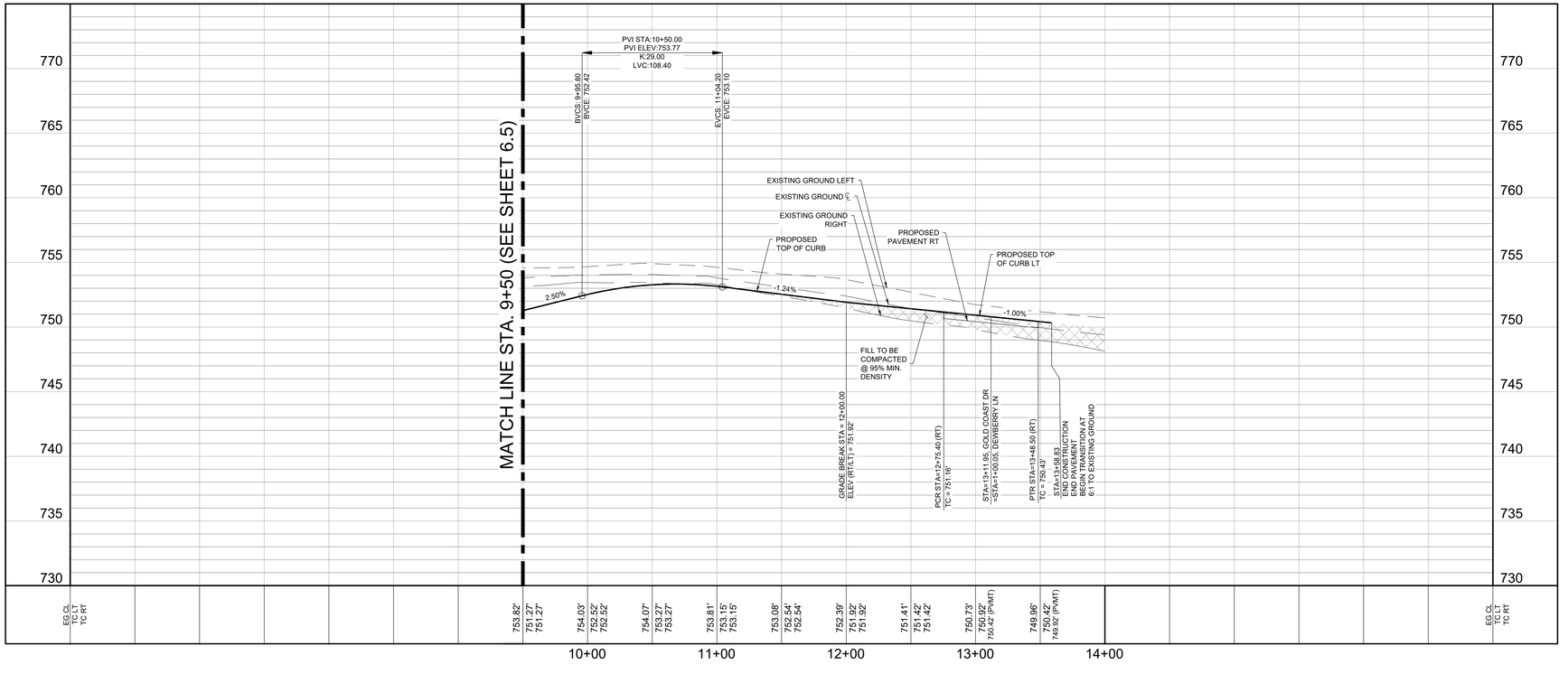
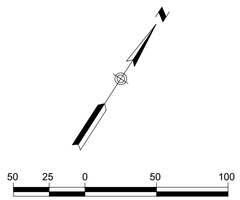


GOLD COAST DR STA. 9+50 TO STA. 13+59





HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TC	TOP OF CURB
ELEV	PAVEMENT ELEVATION

VERAMENDI PRECINCT 23 UNIT 1

GOLD COAST DR PLAN & PROFILE
STA. 9+50 TO STA. 13+59

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/1/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\6_Sheets\P&P_Gold Coast Dr.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **6.6**

FOR PERMIT

P:\SA3856_KSA Properties\2405 23-1\426 Site Development Plans\CAD\Sheets\Lift_Sheet P&P_Gold Coast Dr.dwg
Xref Name(s):
Last Modified: Jul. 07, 25 - 20:59
Last Plotted: Jul. 07, 25 - 20:59 by HEW

GENERAL NOTES:

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5. CONTRACTOR TO FIELD VERIFY ALL MATCH EXISTING ELEVATIONS, SEWER MANHOLE INVERTS, STORM DRAIN INVERTS, AND ALL OTHER UTILITIES PRIOR TO UTILITY WORK AND NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
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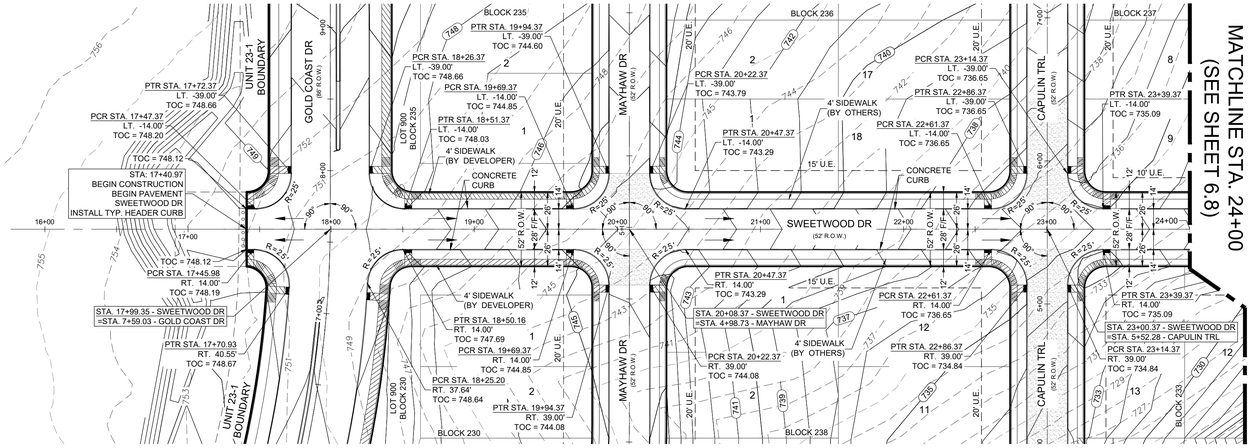
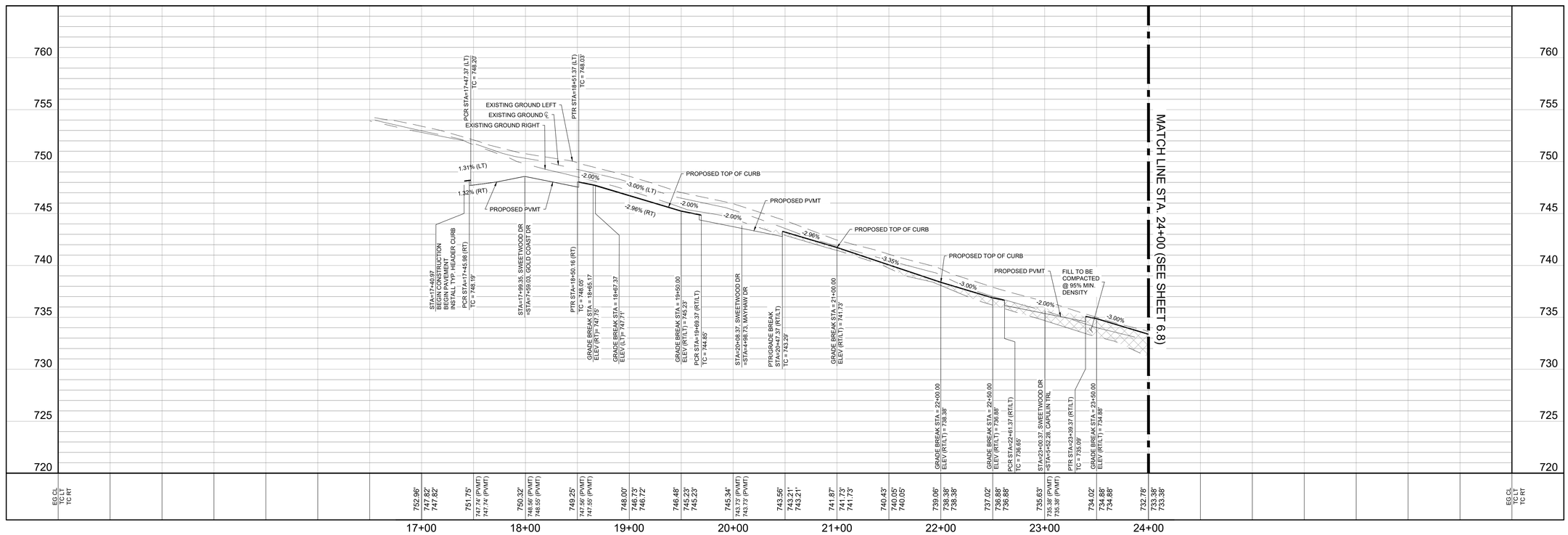
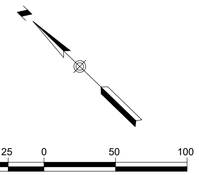


SWEETWOOD DR STA. 17+00 TO STA. 24+00



FOR PERMIT



HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TOC	TOP OF CURB
ELEV	PAVEMENT ELEVATION

VERAMENDI PRECINCT 23 UNIT 1

SWEETWOOD DR PLAN & PROFILE STA. 17+00 TO STA. 24+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sh_Street P&P_River Ash Dr.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
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TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.7

K:\SA3856.405 Properties\2405 23-71\426 Site Development Plans\DWG-Sheets\sh_Street P&P_River Ash Dr.dwg
User: nicholas.gower
Last Modified: Jul. 07, 25 - 21:07
Last Plotted: Jul. 07, 25 - 14:13

GENERAL NOTES:

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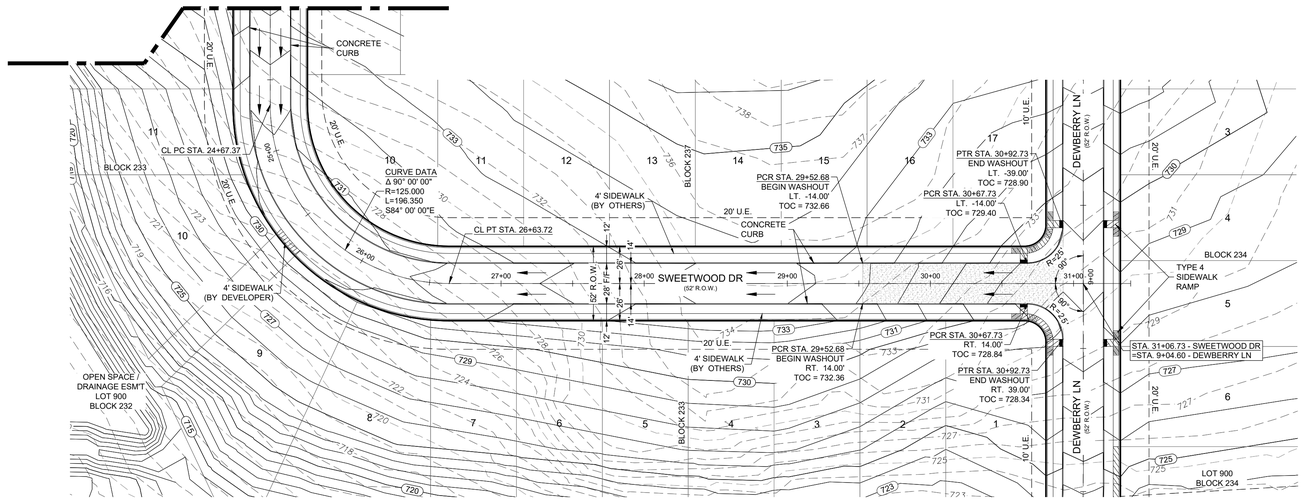
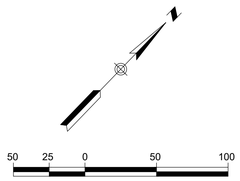
9. VERTICAL CURVE DESIGN SPEED ARE IN COMPLIANCE WITH THE APPROVED DEVELOPMENT CODE TABLE 13-2 FOR LOCAL A (25 MPH) AND MINOR COLLECTOR (40MPH).

MATCHLINE STA. 24+00 (SEE SHEET 6.7)



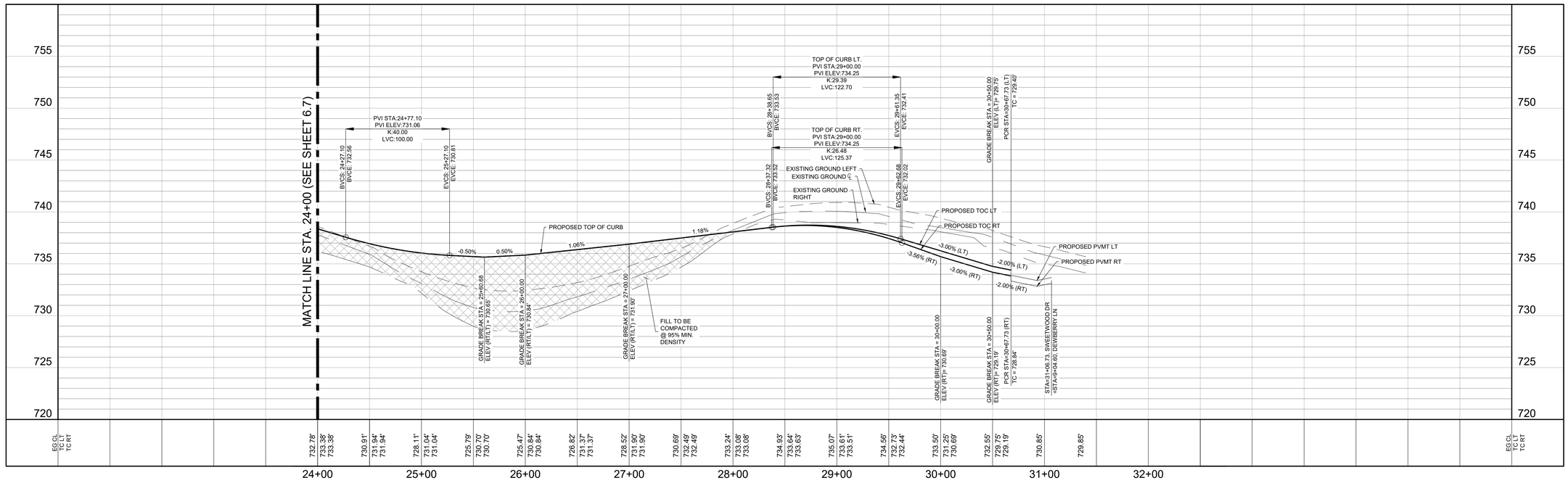


HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TOC	TOP OF CURB
ELEV	PAVEMENT ELEVATION

SWEETWOOD DR STA. 24+00 TO STA. END



REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 6/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 6_Street P&P - River Ash Dr.dwg

NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **6.8**

VERAMENDI PRECINCT 23 UNIT 1

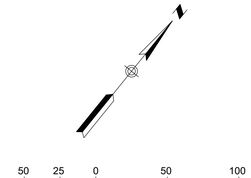
SWEETWOOD DR PLAN & PROFILE STA. 24+00 TO STA. END

FOR PERMIT

P:\LJA3856_KSA Properties\CAD\5 23-1\425 Site Development Plans\GMD-Sheets\Left_Street P&P_River Ash Dr.dwg
Last Saved By: ngower
Last Modified: Jul. 07, 25 - 21:07
Full Path: P:\LJA3856_KSA Properties\CAD\5 23-1\425 Site Development Plans\GMD-Sheets\Left_Street P&P_River Ash Dr.dwg

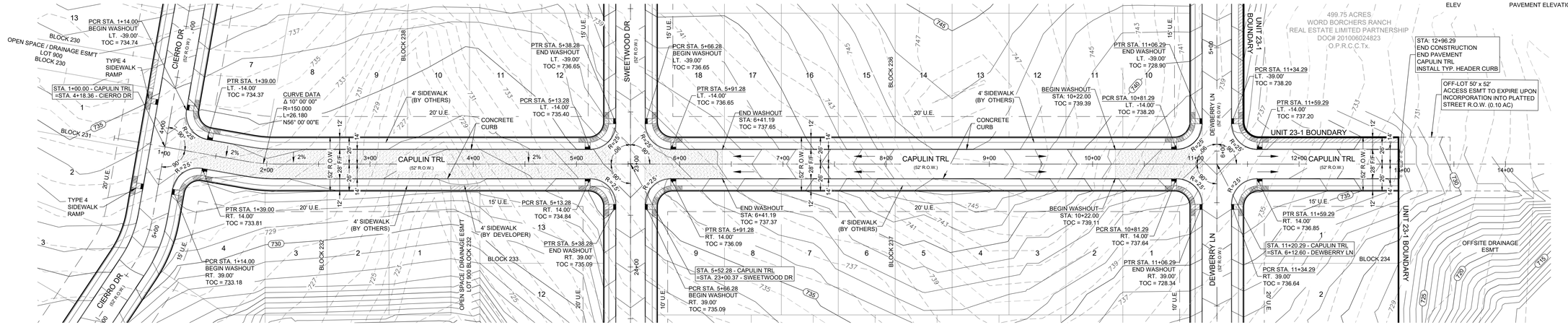
GENERAL NOTES:

1. ALL HANDICAP RAMPS TO BE TYPE III UNLESS OTHERWISE NOTED, REFER TO SHEET 6.13.
2. ALL ELEVATIONS ARE TOP OF CURB UNLESS OTHERWISE NOTED.
3. WHERE SIDEWALK IS SEPARATED FROM THE CURB, THE SEPARATION DISTANCE SHALL BE A MINIMUM 6' BETWEEN THE BACK OF CURB AND EDGE OF SIDEWALK.
4. REFER TO SHEETS 6.13 & 6.14 FOR STREET AND PAVEMENT SECTION DETAIL, CONCRETE CURB DETAIL, AND SIDEWALK DETAIL.
5. CONTRACTOR TO FIELD VERIFY ALL MATCH EXISTING ELEVATIONS, SEWER MANHOLE INVERTS, STORM DRAIN INVERTS, AND ALL OTHER UTILITIES PRIOR TO UTILITY WORK AND NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
6. CONTRACTOR IS TO MATCH EXISTING PAVEMENT, SIDEWALK, AND CURB ELEVATIONS.
7. NO GRADING OR OTHER CONSTRUCTION IS PERMITTED OUTSIDE OF LIMITS OF CONSTRUCTION.
8. SIDEWALK INFRASTRUCTURE SHALL BE INSTALLED ALONG THE STREET FRONT OF ALL LOTS AT THE TIME OF LOT IMPROVEMENT. FOR LOTS WHERE NO BUILDING IMPROVEMENT IS PROPOSED, ALL SIDEWALKS AND PEDESTRIAN CROSSING RAMPS ARE REQUIRED TO BE CONSTRUCTED WITH STREET CONSTRUCTION.
9. VERTICAL CURVE DESIGN SPEED ARE IN COMPLIANCE WITH THE APPROVED DEVELOPMENT CODE TABLE 13-2 FOR LOCAL A (25 MPH) AND MINOR COLLECTOR (40MPH).

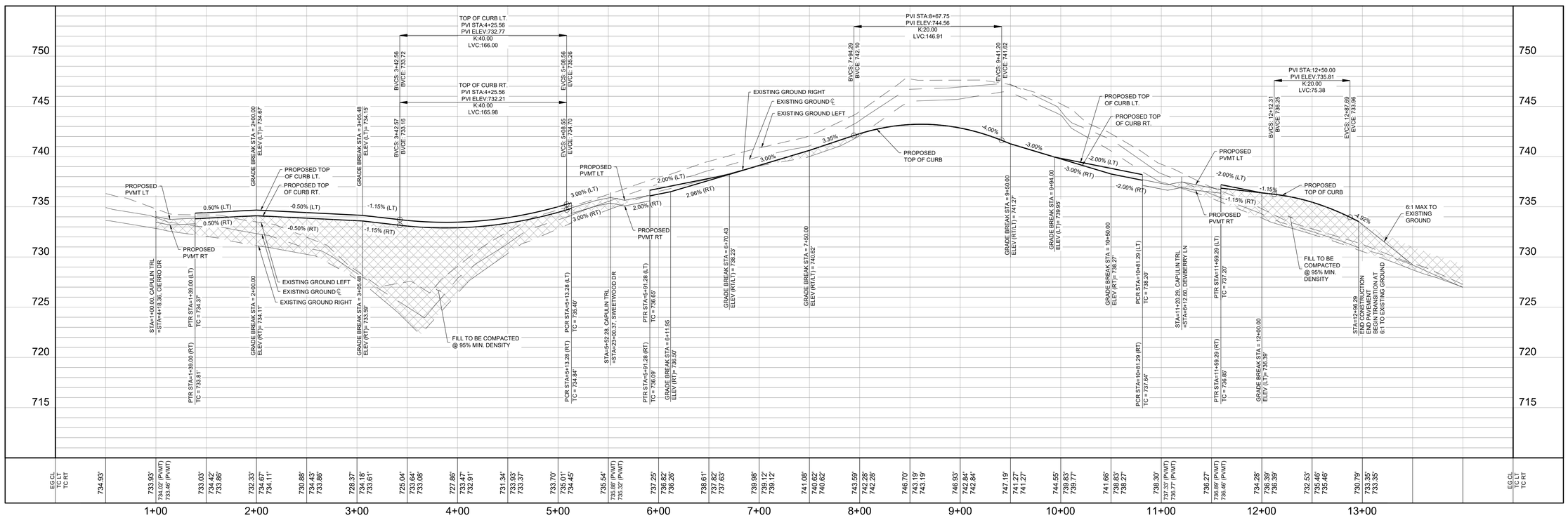


LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TC	TOP OF CURB
ELEV	PAVEMENT ELEVATION



CAPULIN TRAIL STA. 1+00 TO STA. 12+96



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

CAPULIN TRAIL PLAN & PROFILE
STA. 1+00 TO STA. 12+96

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 6_Street PMP_Capulin Trail.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

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9830 Colonnade Blvd
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LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.9

K:\SAT\3856.KSA Properties\2405.23-1\426 Site Development Plans\CAD\Sheets\Lift_Station PMP_Capulin Trail.dwg
Last Modified: Jul. 07, 25 - 20:55
Last Modified By: ...

GENERAL NOTES:

1. ALL HANDICAP RAMPS TO BE TYPE III UNLESS OTHERWISE NOTED, REFER TO SHEET 32.
2. ALL ELEVATIONS ARE TOP OF CURB UNLESS OTHERWISE NOTED.
3. WHERE SIDEWALK IS SEPARATED FROM THE CURB, THE SEPARATION DISTANCE SHALL BE A MINIMUM 6' BETWEEN THE BACK OF CURB AND EDGE OF SIDEWALK.
4. REFER TO SHEETS 32 & 33 FOR STREET AND PAVEMENT SECTION DETAIL, CONCRETE CURB DETAIL, AND SIDEWALK DETAIL.
5. CONTRACTOR TO FIELD VERIFY ALL MATCH EXISTING ELEVATIONS, SEWER MANHOLE INVERTS, STORM DRAIN INVERTS, AND ALL OTHER UTILITIES PRIOR TO UTILITY WORK AND NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES.
6. CONTRACTOR IS TO MATCH EXISTING PAVEMENT, SIDEWALK, AND CURB ELEVATIONS.
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8. SIDEWALK INFRASTRUCTURE SHALL BE INSTALLED ALONG THE STREET FRONT OF ALL LOTS AT THE TIME OF LOT IMPROVEMENT. FOR LOTS WHERE NO BUILDING IMPROVEMENT IS PROPOSED, ALL SIDEWALKS AND PEDESTRIAN CROSSING RAMPS ARE REQUIRED TO BE CONSTRUCTED WITH STREET CONSTRUCTION.
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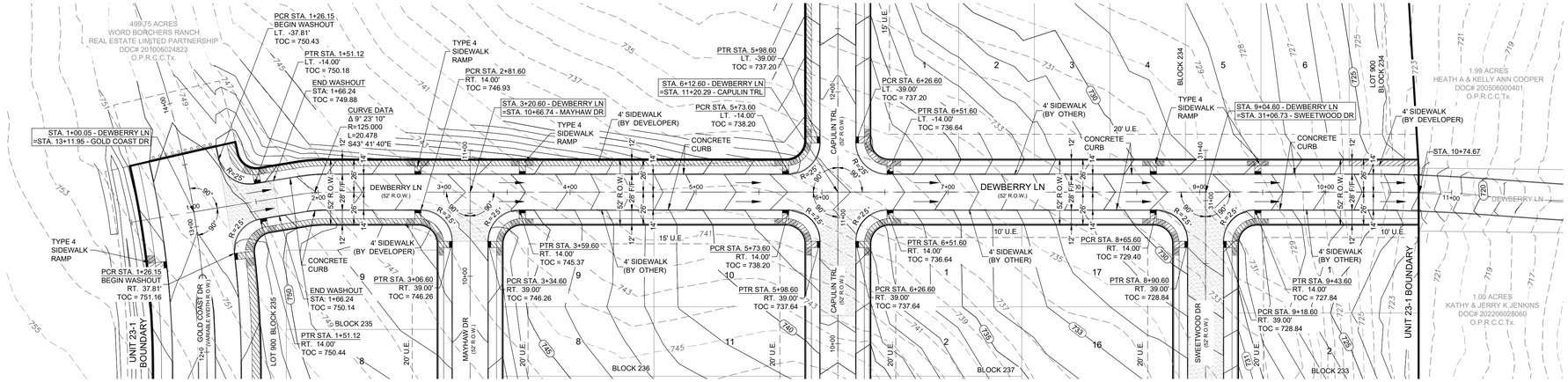
50 25 0 50 100

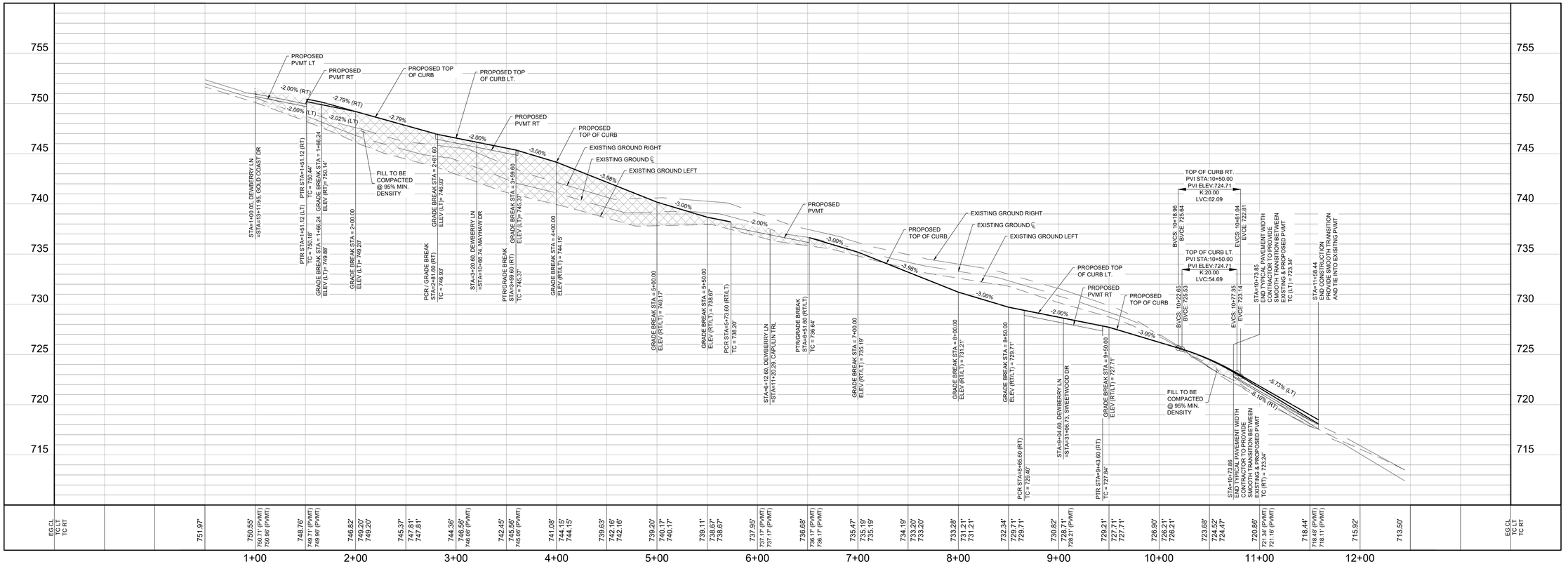
HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TC	TOP OF CURB
ELEV	PAVEMENT ELEVATION



DEWBERRY LN STA. 1+00 TO STA. 11+58



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

DEWBERRY LN PLAN & PROFILE
STA. 1+00 TO STA. 11+58

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 4/22/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 30_Street P&P_Dewberry Ln.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
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07/08/2025

LJA Engineering, Inc.
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Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.10

N:\SA3856.KSA Properties\04\03 23-1\03 Site Development Plans\03-Sheets\sh_Street P&P_Dewberry Ln.dwg
Mon, 28 Apr 2025 - 7:47am
Last Modified: Jul. 07, 25 - 21:03
Plot Scale: 1" = 50' 1" = 5' Arch D

GENERAL NOTES:

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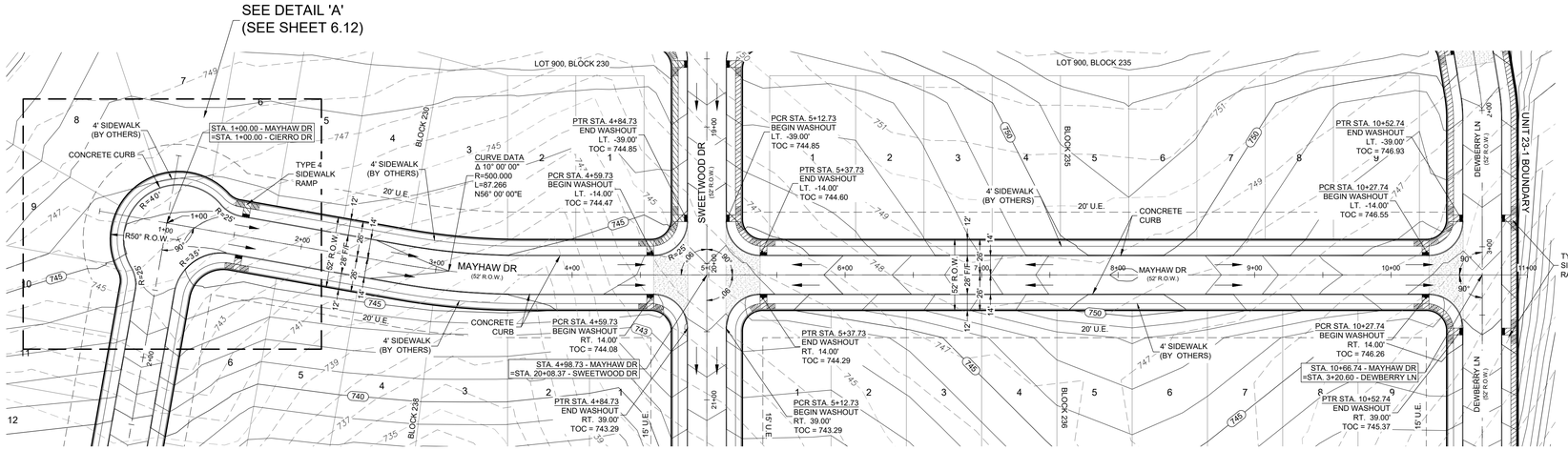
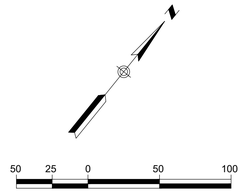
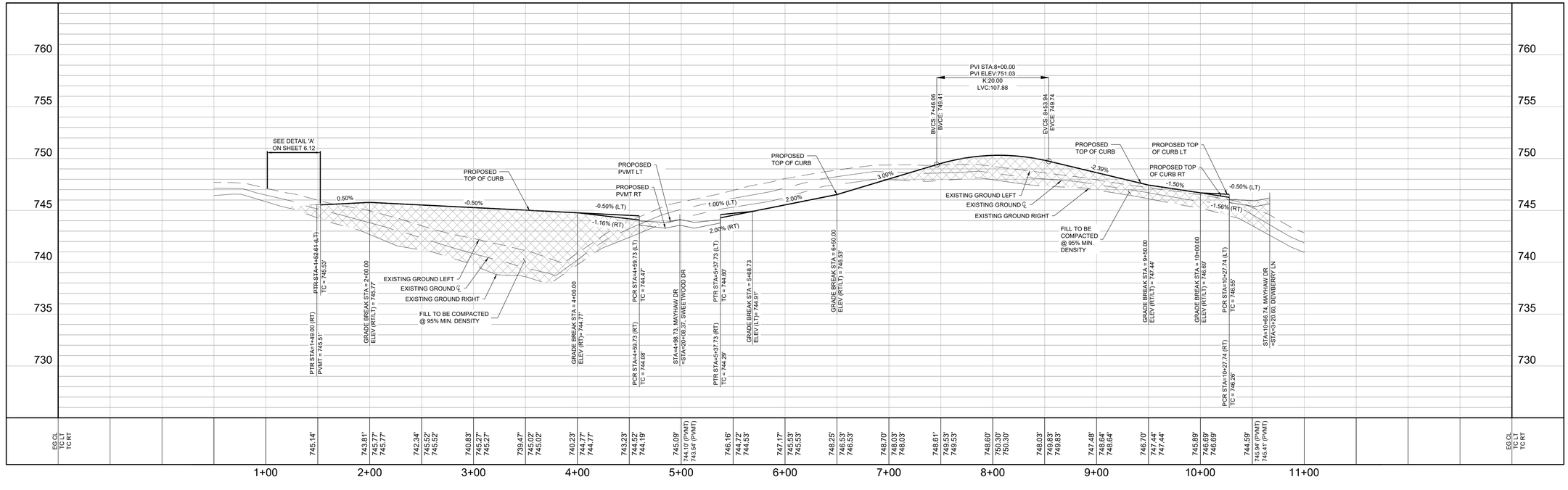




LEGEND

- 800 — PROPOSED CONTOUR
- PROPOSED STREET GRADE
- EXISTING GROUND LEFT
- EXISTING GROUND CENTERLINE
- EXISTING GROUND RIGHT
- SIDEWALK (OTHER'S RESPONSIBILITY)
- SIDEWALK (DEVELOPER'S RESPONSIBILITY)
- U.E. — UTILITY EASEMENT
- ESM'T. — EASEMENT
- LT. — LEFT
- RT. — RIGHT
- WASHOUT CROWN
- WASHOUT FLOW ARROW
- EG CL — EXISTING GRADE CENTER LINE
- TC — TOP OF CURB
- ELEV — PAVEMENT ELEVATION

MAYHAW DR STA. 1+00 TO STA. 10+67



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

MAYHAW DR PLAN & PROFILE
STA. 1+00 TO STA. 10+67

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/22/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\6_Sheet Files\P_Mayhaw Dr.dwg

NICHOLAS GOWER
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STATE OF TEXAS
07/08/2025

LJA Engineering, Inc.
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Suite 300
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Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.11

K:\SA3856_KSA Properties\2405 23-1\25 Site Development Plans\CAD\~Sheets\ph_Sheet P&P_Mayhaw Dr.dwg
Last Modified: Jul. 07, 25 - 21:04
Last Plotted: Jul. 07, 25 - 21:04 by BR

GENERAL NOTES:

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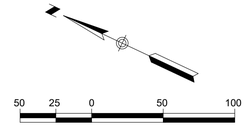
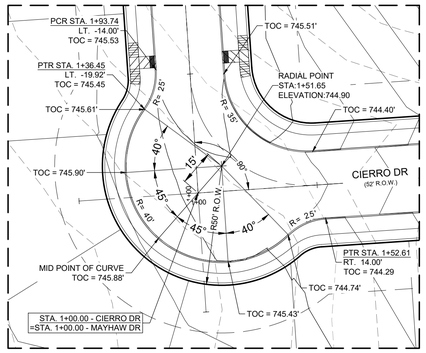
LEGEND



HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

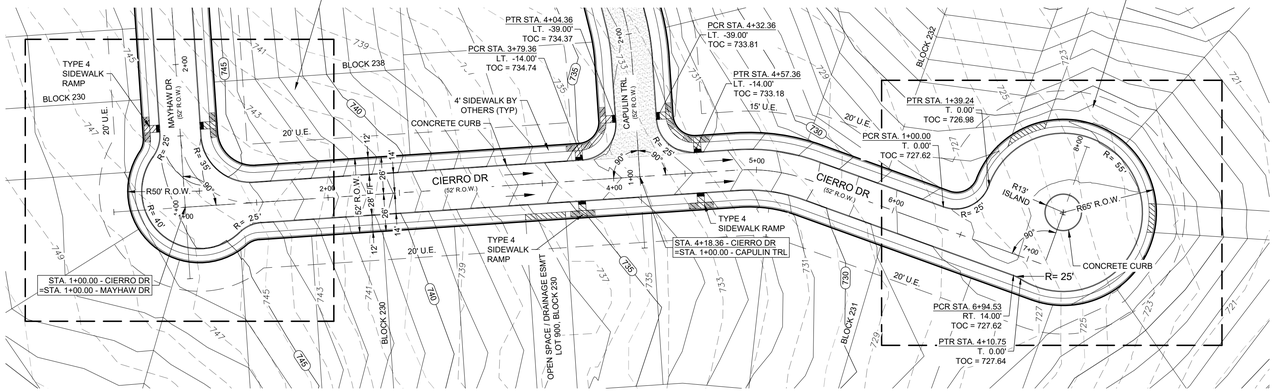
800	PROPOSED CONTOUR
	PROPOSED STREET GRADE
	EXISTING GROUND LEFT
	EXISTING GROUND CENTERLINE
	EXISTING GROUND RIGHT
	SIDEWALK (OTHER'S RESPONSIBILITY)
	SIDEWALK (DEVELOPER'S RESPONSIBILITY)
U.E.	UTILITY EASEMENT
ESM'T.	EASEMENT
LT.	LEFT
RT.	RIGHT
	WASHOUT CROWN
	WASHOUT FLOW ARROW
EG CL	EXISTING GRADE CENTER LINE
TC	TOP OF CURB
ELEV	PAVEMENT ELEVATION

DETAIL 'A'
(SCALE: 1" = 30')

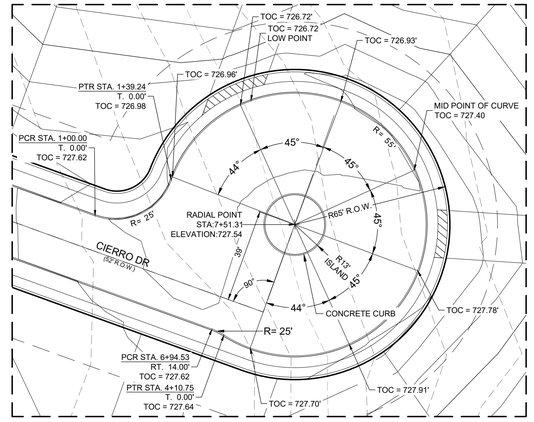


SEE DETAIL 'A' (THIS SHEET)

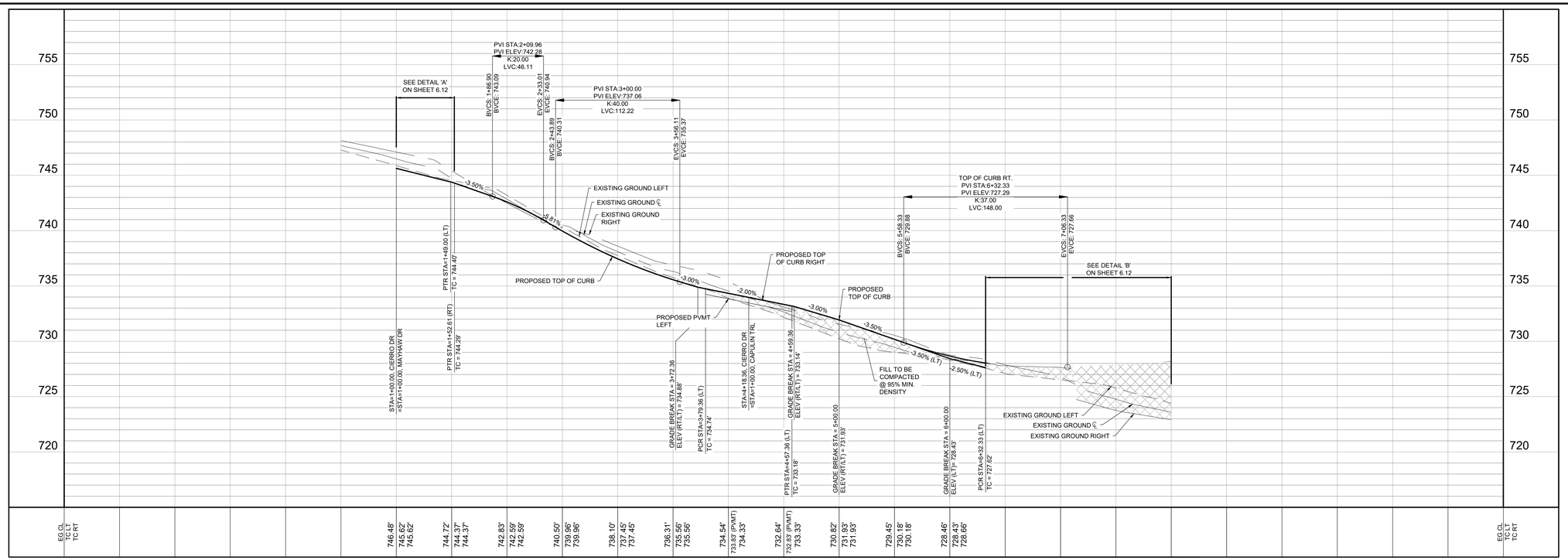
SEE DETAIL 'B' (THIS SHEET)



DETAIL 'B'
(SCALE: 1" = 30')



CIERRO DR STA. 1+00 TO END



VERAMENDI PRECINCT 23 UNIT 1
CIERRO DR PLAN & PROFILE
STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/7/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PGF
DRAWING NAME: 06_Sheet P&P_Cierro Dr.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
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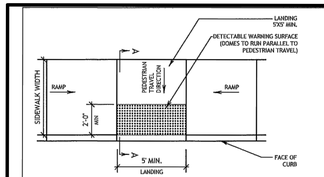
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

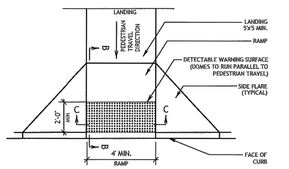
SHEET NO. 6.12

FOR PERMIT

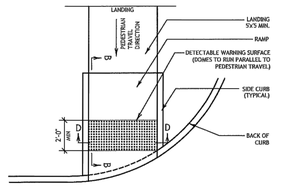
K:\SA3856.405 Properties\2405 23-11\405 Site Development Plans\DWG-Sheets\sh_Sheet P&P_Cierro Dr.dwg
Xrefs: None
Last Modified: Jul. 07, 25 - 20:54
Last Plotted: Jul. 08, 25 - 08:48



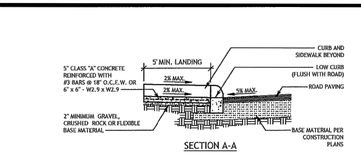
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING FOR PARALLEL CURB RAMP.



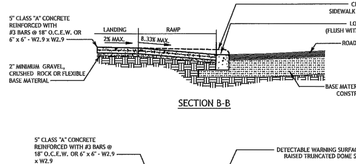
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE FOR PERPENDICULAR CURB RAMP.



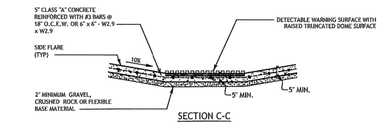
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN FOR DIRECTIONAL CURB RAMP.



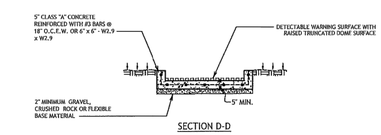
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

CURB RAMP NOTES

1. ALL SLOPES ARE MAXIMUM ALLOWABLE, THE LEAST POSSIBLE SLOPE THAT WILL STILL DRAIN PROPERLY SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED.
2. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF CURB RAMPS ARE TO BE SHOWN ON THE CONSTRUCTION PLANS. ALL ACCESSIBLE WALK WAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS SET FORTH IN THE AMERICAN'S WITH DISABILITIES ACT (ADA) AND TEXAS ACCESSIBILITY STANDARDS (TAS). CITY ENGINEER OR BUILDING OFFICIAL MAY ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
3. THE MINIMUM STANDARD SIDEWALKS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 118-49 OF THE NEW BRAUNFELS CODE OF ORDINANCES.
4. ALL LANDINGS WHERE REQUIRED SHALL BE 5'X 5' (60"X60") MINIMUM WITH A MAXIMUM 2% SLOPE IN ANY DIRECTION.
5. RAMP LENGTHS SHALL BE SUFFICIENT TO MAINTAIN A MAXIMUM SLOPE OF 8.33% (1Y:12G), MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2% (1V:50H).
6. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY, ANY SIDEWALK CONSTRUCTION THAT DEVIATES FROM THE GRADE OF THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS, AND LANDINGS IN ACCORDANCE WITH CURRENT ADA AND TAS REQUIREMENTS.
7. PROVIDE FLARED RAMP SIDES WITH A MAXIMUM SLOPE OF 10% (1Y:10H) MEASURED ALONG THE CURB LINE. CURB RETURNS MAY BE USED IN-LIEU OF SIDE FLARES IN AREAS NOT NORMALLY WALKED ACROSS BY PEDESTRIANS, BECAUSE THE ADJACENT SURFACE IS VEGETATION OR OTHER NON-WALKING SURFACE OR WHERE THE SIDE APPROACH IS SUBSTANTIALLY OBSTRUCTED.
8. MANEUVERING SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X 4' (48"X48") WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
9. CROSSWALK DIMENSIONS, CROSSWALK MARRINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL BE ALIGNED WITH THEORETICAL CROSSWALKS, OR AS DIRECTED BY THE CITY ENGINEER OR BUILDING OFFICIAL.
10. EXISTING FEATURES THAT COMPLY WITH CURRENT TAS REQUIREMENTS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.
11. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. PROVIDE CURB RAMPS WHEREVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
12. SEPARATE CURB RAMP AND LANDINGS FROM ADJACENT SIDEWALK AND ANY OTHER ELEMENTS WITH PRE-MOLD OR BOARD JOINT OF 1/2" UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER OR BUILDING OFFICIAL.
13. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
14. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE SHALL BE DEFINED AS THE ALGEBRAIC DIFFERENCE OF THE ADJACENT SURFACE SLOPES. IN THE CASE OF A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.67% (I.E. 8.33-(-2.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
15. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%, A LEVELING STRIP, 2 FEET IN LENGTH, SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
16. ADA RAMP SHALL BE CONSTRUCTED WITH 5" CLASS "A" CONCRETE WITH 2" MINIMUM GRAVEL,CRUSHED ROCK OR FLEXIBLE BASE MATERIAL. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6"x6" - W2.9 X W2.9 WIRE MESH.
17. THE EXTENTS OF ADA COMPLIANCE IN ALTERATIONS SHALL BE WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT AND AS DETERMINED BY THE CITY BUILDING OFFICIAL.

DETECTABLE WARNING NOTES

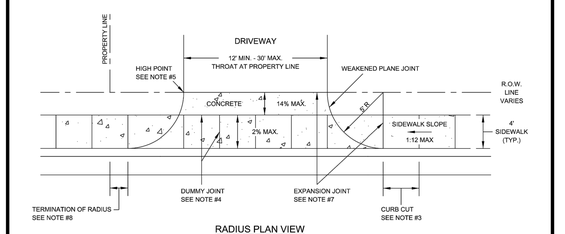
1. CURB RAMPS OR LANDINGS ABUTTING THE CROSSWALK MUST HAVE A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH SECTION 705 OF THE TEXAS ACCESSIBILITY STANDARDS (TAS). THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES, TURNISH DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
2. DETECTABLE WARNING SURFACES MUST BE SLIP RESISTANT AND NOT ALLOW WATER TO ACCUMULATE.
3. ALIGN TRUNCATED DOMES IN THE DIRECTION OF PEDESTRIAN TRAVEL WHEN ENTERING THE STREET.
4. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
5. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS AT THE BACK OF CURB. ALIGN THE ROWS OF DOMES TO BE PERPENDICULAR TO THE GRADE BREAK BETWEEN THE RAMP RUN AND THE STREET. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.
6. DETECTABLE WARNING MATERIALS MUST MEET TXDOT DEPARTMENTAL MATERIALS SPECIFICATION DMS 4350 AND BE LISTED ON THE MATERIAL PRODUCER LIST. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
7. DETECTABLE WARNING PAVERS SHALL NOT BE PERMITTED WITHOUT THE APPROVAL BY THE PUBLIC WORKS DEPARTMENT.

Use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the City of New Braunfels for any purpose whatsoever.

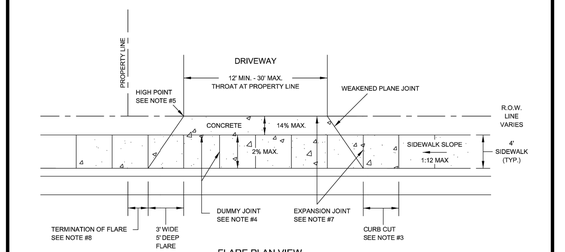
City of New Braunfels
ENGINEERING DIVISION
550 LANDA STREET
NEW BRAUNFELS, TEXAS 78130
PHONE: 830 221 4020
FAX: 830 626 3600

CURB RAMP STANDARDS		
APPROVED DATE: 05/18/2017	DWG. NO.: ST-019	SCALE: AS NOTED
DRAWN BY: RC	CONTACT: GF	SHEET: 1 OF 1

DRIVEWAY APRON
(RESIDENTIAL - ONE OR TWO FAMILY)



RADIUS PLAN VIEW

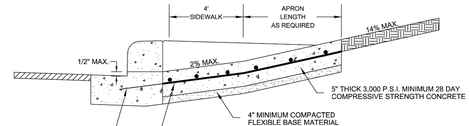


FLARE PLAN VIEW

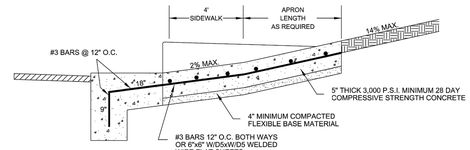
DATE APPROVED: 04/2016	DWG. NO: ST-014.1	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 2	
FILENAME: DRIVEWAY (RESIDENTIAL - ONE OR TWO FAMILY)		

City of New Braunfels ENGINEERING DEPARTMENT

DRIVEWAY APRON
(RESIDENTIAL - ONE OR TWO FAMILY)



STRUCTURAL SECTION



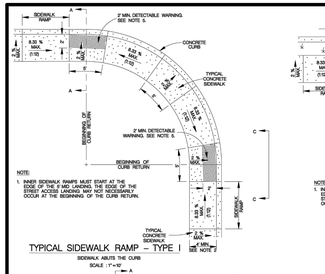
NO EXISTING CURB STRUCTURAL SECTION

NOTES:

1. WHERE GUTTER DOES NOT EXIST DRIVEWAY APRON SHALL EXTEND TO EDGE OF ASPHALT AND SHALL HAVE A MINIMUM 6" WIDE 1' DEEP GRADE BEAM MONOLITHIC AND REINFORCED SIMILAR TO APRON.
2. PLACEMENT OF SIDEWALK SHOWN IS TYPICAL; HOWEVER, ALTERNATIVE SIDEWALK PLACEMENT COMMON TO DRIVEWAY APRON WILL BE CONSIDERED PROVIDED CROSS SLOPE OF SIDEWALK IS NO GREATER THAN 2%.
3. CURB CUT LENGTH NO GREATER THAN AS REQUIRED TO MATCH SLOPE OF ADJACENT SIDEWALK.
4. DUMMY JOINTS TO BE PROVIDED AT MINIMUM 4-FT. INTERVALS PERPENDICULAR TO THE CURB LINE WITHIN THE SIDEWALK AREA AND PARALLEL TO THE SIDEWALK AREA.
5. PROVIDE A MINIMUM 7" HIGH POINT. HIGH POINT HEIGHT SHALL BE MEASURED FROM THE GUTTER FLOW LINE TO THE DRIVEWAY APRON. NOTE HIGH POINT MAY OCCUR OUTSIDE OF ROW.
6. DRIVEWAY THROAT TRANSITION MAY OCCUR OUTSIDE OF ROW.
7. PROVIDE EXPANSION JOINTS AT ALL SIDEWALK AND DRIVEWAY THROAT JOINTS. EXPANSION JOINTS SHALL BE PLACED USING 1/2" ASPHALTIC MATERIAL WITH 1/2" DOWELS 16" O.C.
8. THE TANGENT POINT OF THE DRIVEWAY CURB RETURN AT THE PUBLIC ROADWAY LINE OR FLARE SHALL BE A MINIMUM DISTANCE OF 1' OFF THE PROPERTY PROJECTED PERPENDICULAR TO THE STREET CENTERLINE, EXCEPT SINGLE FAMILY OR ZERO LOT LINE LOTS. ON SINGLE FAMILY ZERO LOT LINE LOTS WHERE THE DRIVE IS ON THE ZERO LOT LINE, THE TANGENT POINT OR FLARE SHALL BE NO GREATER THAN 3' BEYOND THE ADJOINING PROPERTY LINE PROJECTED PERPENDICULAR TO THE STREET CENTERLINE.

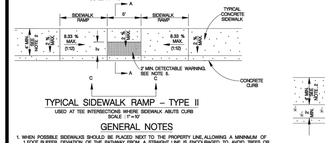
DATE APPROVED: 04/2016	DWG. NO: ST-014.2	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 2 OF 2	
FILENAME: DRIVEWAY (RESIDENTIAL - ONE OR TWO FAMILY)		

City of New Braunfels ENGINEERING DEPARTMENT



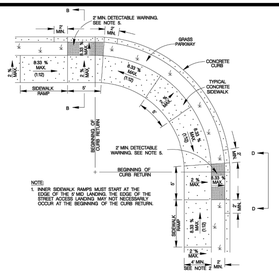
TYPICAL SIDEWALK RAMP – TYPE I

SIDEWALK ABUTS THE CURB
SCALE : 1"=10'



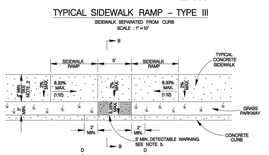
TYPICAL SIDEWALK RAMP – TYPE II

USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB
SCALE : 1"=10'



TYPICAL SIDEWALK RAMP – TYPE III

SIDEWALK SEPARATED FROM CURB
SCALE : 1"=10'

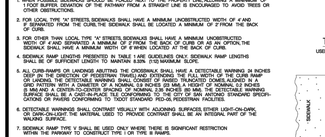


TYPICAL SIDEWALK RAMP – TYPE IV

USED AT TEE INTERSECTIONS WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=10'

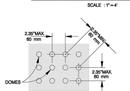
GENERAL NOTES

1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 1 FOOT BUFFER. DEVIATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND BE SEPARATED FROM THE CURB.THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 7' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 6' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR AS AN OPTION,THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 8' WHEN LOCATED AT THE BACK OF CURB.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING IN INCHES OF 24" IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING. THE DETECTABLE WARNING SHALL CONSIST OF RAISED TRUNCATED DOMES ALIGNED IN A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM) A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 MM). THE DETECTABLE WARNING SURFACE SHALL BE A CAST-IN-PLACE TILE CONFORMING TO THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS OR PAVERS CONFORMING TO TXDOT STANDARD FED-SL PEDESTRIAN FACILITIES.
6. DETECTABLE WARNING SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES,EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS INSIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 – CONCRETE CURB,GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "502 – CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" - W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY.ANY SIDEWALK CONSTRUCTION THAT DEVIATES FROM THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS,HANDRAILS AND RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2%. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE SHALL BE DEFINED AS THE ALGEBRAIC DIFFERENCE OF THE ADJACENT SURFACE SLOPES. IN THE CASE OF A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE,THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.67% (I.E. 8.33-(-2.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%,A LEVELING STRIP,2 FEET IN LENGTH,SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS,BOUNDARIES OR SCOPE OF A PLANNED PROJECT.



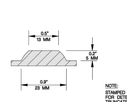
DETECTABLE WARNING SURFACE

SCALE : 1"=4'



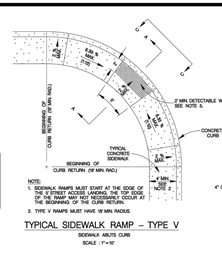
PLAN DETAIL

NO SCALE



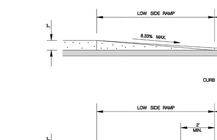
DOME SECTION

NO SCALE



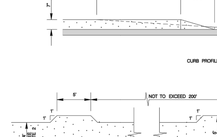
TYPICAL SIDEWALK RAMP – TYPE V

SIDEWALK ABUTS CURB
SCALE : 1"=10'



SECTION C–C

CURB PROFILE WHERE SIDEWALK ABUTS CURB
SCALE : 1"=4'



SECTION D–D

CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=4'

SIDEWALK PASSING SPACE

SCALE : 1"=10'

TABLE 1 (SEE NOTE 4)		
GUTTER SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-0"	7'-0"
2%	5'-0"	8'-4"
3%	4'-4"	10'-0"
4%	4'-0"	12'-4"
5%	3'-10"	16'-8"

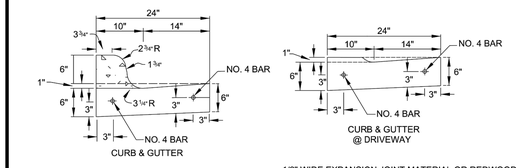
MAY 2009

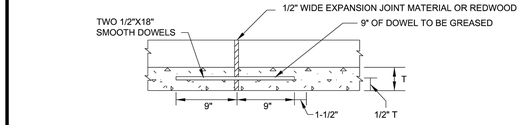
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

% SUBMITTAL	PROJECT NO.:	DATE:
DRAWN BY: A.MIGUEZ, DSGN. BY:	CHKD. BY: R.S.HOSSEINI, P.E.	SHEET NO.: OF:

CURB AND GUTTER





LONGITUDINAL SECTION THRU CURB AND GUTTER
SHOWING TYPICAL EXPANSION JOINT DETAILS.
REINFORCING STEEL SHALL NOT CROSS EXPANSION JOINTS.
STEEL SHALL BE TERMINATED 3" (+ OR -) 1" FROM FACE OF THE JOINT.

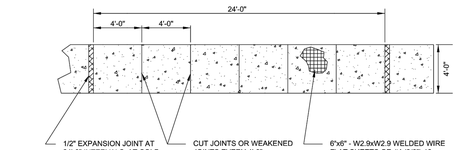
NOTES:

1. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 18".
2. CURB AND GUTTER SHALL HAVE FORMED TOOLED OR SAWED CONTRACTION JOINTS AT ± 10'. THE DEPTH OF THESE JOINTS SHALL BE SUFFICIENT TO ENSURE CRACKING AT THE JOINTS.
3. CURB OR CURB AND GUTTER SHALL HAVE EXPANSION JOINTS AT POINTS OF CURVATURE, AT INTERVALS NO GREATER THAN 100' AND AT ALL ADJACENT STRUCTURES.
4. UNLESS OTHERWISE SHOWN, TRANSITIONS BETWEEN CURBS OR CURBS AND GUTTER OF DIFFERING CROSS SECTION SHALL BE ACCOMPLISHED OVER A 10' LENGTH OR AS APPROVED BY THE CITY ENGINEER.
5. ALL CONCRETE TO BE CLASS "A" 3000 PSI CONCRETE.
6. ALL EXPOSED CONCRETE SURFACES TO BE BRUSHED SMOOTH AND UNIFORM.

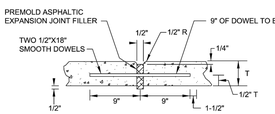
DATE APPROVED: 07/2008	DWG. NO: ST-013	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 1	
FILENAME: CURB & GUTTER		

City of New Braunfels ENGINEERING DEPARTMENT

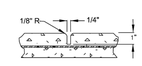
SIDEWALK
(RESIDENTIAL)



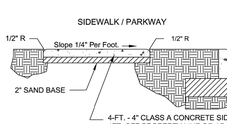
PLAN VIEW



EXPANSION JOINT



WEAKENED PLANE JOINT



TYPICAL SECTION

NOTES:

1. EXPANSION JOINTS ARE TO BE USED BETWEEN CONCRETE DRIVEWAY AND SIDEWALK.
2. SCORED JOINTS DENOTE SIDEWALK ACROSS THE DRIVEWAY AND ARE TO BE PLACED AT LEAST 1/3 rd. THROUGH THE SLAB THICKNESS.
3. ALL SIDEWALK AND DRIVEWAY CONSTRUCTION SHALL MEET A.D.A. SPECIFICATIONS.

DATE APPROVED: 07/2008	DWG. NO: ST-016	SCALE: N.T.S.
DRAWN BY: RAS	SHEET: 1 OF 1	
FILENAME: SIDEWALK (RESIDENTIAL)		

City of New Braunfels ENGINEERING DEPARTMENT

VERAMENDI PRECINCT 23 UNIT 1

STREET DETAILS (SHEET 1 OF 2)

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 6/10/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: st-_Sheet Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

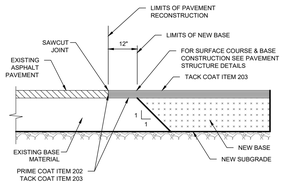
LJA Engineering, Inc.
9830 Colonade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.13

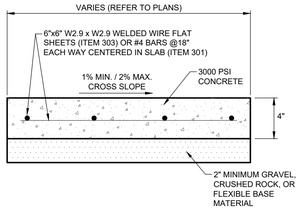
FOR PERMIT

K:\SA3856.405 - ADA Properties\2405 23-1\Y4\05 Site Development Plans\DWG-Sheets\st-_Sheet Details.dwg
Last Modified: Jun 23, 25 - 21:10
Last Modified by: ...



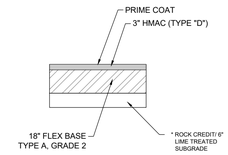
PAVEMENT TIE-IN DETAIL

N.T.S.



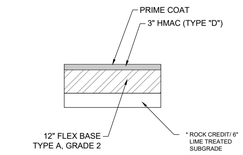
SIDEWALK DETAIL

N.T.S.



GOLD COAST DR SECTION

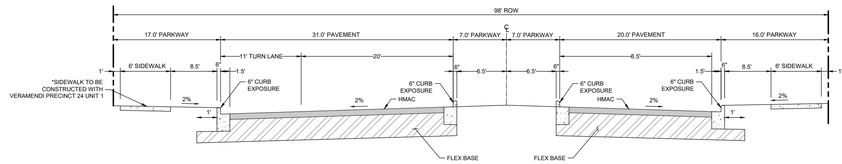
N.T.S.



LOCAL A SECTION

N.T.S.

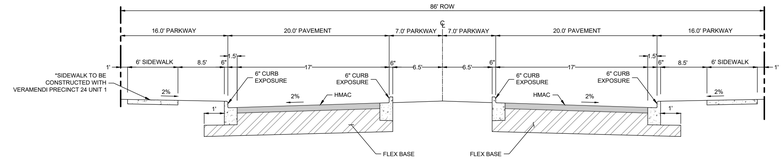
* REFER TO GEOTECHNICAL ENGINEERING STUDY PREPARED ON 12/09/2024 PROJECT NO. ANA24-043-00 FOR SUBGRADE OPTIONS. IF FILL GRADING IS COMPLETED UTILIZING SELECT FILL IN ACCORDANCE WITH THE SELECT FILL SECTION OF THE REPORT, OR IF NATIVE, INTACT ROCK IS EXPOSED PRIOR TO FILL PLACEMENT (IF NECESSARY), THE LIME TREATED SUBGRADE MAY BE ELIMINATED FROM THE PAVEMENT SECTION AND THE ROCK SUBGRADE MAY BE UTILIZED



GOLD COAST DR CROSS SECTION

N.T.S.

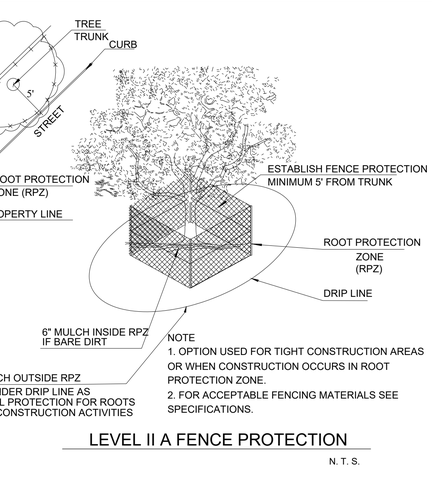
COLLECTOR
NEIGHBORHOOD CENTER, RESORT, NEIGHBORHOOD (MIXED DENSITY)
RESIDENTIAL AND PARK PLANNING AREAS



GOLD COAST DR CROSS SECTION

N.T.S.

COLLECTOR
NEIGHBORHOOD CENTER, RESORT, NEIGHBORHOOD (MIXED DENSITY)
RESIDENTIAL AND PARK PLANNING AREAS



NOTE: DO NOT CUT FROM D to E.

A. FIRST CUT - TO PREVENT THE BARK FROM BEING PEELED WHEN THE BRANCH FALLS.

B. SECOND CUT - TO REDUCE THE WEIGHT OF BRANCH.

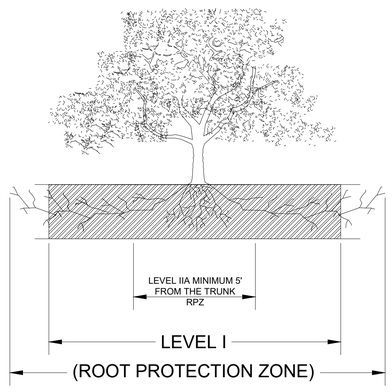
C. FINAL CUT - ALLOW FOR HEALING COLLAR BUT NO STUBS

D. BRANCH RIDGES - INDENT PROPERLY BRANCH RIDGES WHICH ARE SITE FOR DECAY.

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

1.4 BRANCH PRUNING DETAIL

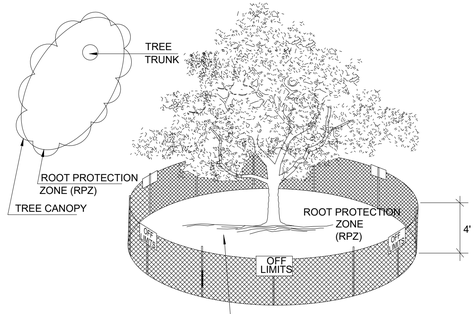
N. T. S.



ELEVATION

N. T. S.

ROOT PROTECTION ZONE-THE ROOT PROTECTION ZONE IS A CIRCULAR AREA AROUND A TREE THAT IS BASED ON THE DIAMETER OF THE TREE. EACH 1 INCH DIAMETER OF THE TREE EQUALS 1 FOOT RADIUS FOR ROOT PROTECTION ZONE.

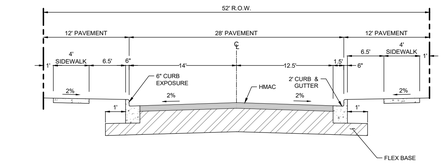


NOTE:

1. THE FENCING SHOWN ABOVE IS DIAGRAMATIC ONLY AND WILL CONFORM TO THE DRIP LINE AND LIMITED TO PROJECT BOUNDARY.
2. FOR ACCEPTABLE FENCING MATERIALS SEE SPECIFICATIONS.

LEVEL I & FENCE PROTECTION

N. T. S.



LOCAL A TYPICAL STREET SECTION

N.T.S.

LOCAL STREET WITH INFORMAL ON-STREET PARKING NEIGHBORHOOD CENTER, RESORT, NEIGHBORHOOD (MIXED DENSITY) RESIDENTIAL AND PARK PLANNING AREAS

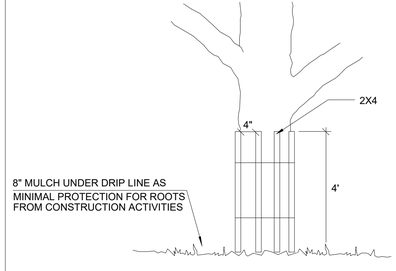
(SWEETWOOD DR)
(CIERRO DR)
(DEWBERRY LN)
(MAYHAW DR)
(CAPULIN TRL)

NOTE

1. OPTION USED FOR TIGHT CONSTRUCTION AREAS OR WHEN CONSTRUCTION OCCURS IN ROOT PROTECTION ZONE.
2. FOR ACCEPTABLE FENCING MATERIALS SEE SPECIFICATIONS.

LEVEL II A FENCE PROTECTION

N. T. S.



NOTE

WRAP TREE TRUNK WITH 2"X4" STUDS AND ROPE OR BAND IN PLACE AS NEEDED TO PROTECT TREES IN WORK AREAS.

1.1.4 LEVEL II B FENCE PROTECTION

N. T. S.

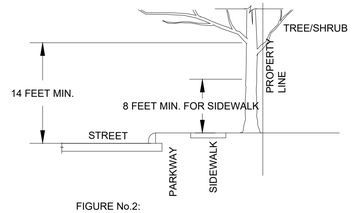


FIGURE No.2:

A MINIMUM BRANCH CLEARANCE OF 14 FEET ABOVE STREET ELEVATION MUST BE MAINTAINED FROM THE PROPERTY LINE TO THE CURB LINE AS PRESCRIBED BY PROJECT MANAGER.

BRANCH CLEARANCE DETAIL

N. T. S.

VERAMENDI PRECINCT 23 UNIT 1

STREET DETAILS (SHEET 2 OF 2)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/10/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: 99_Street Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

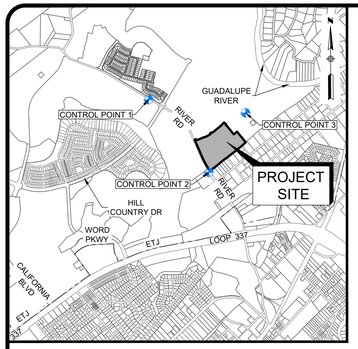
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.14

FOR PERMIT

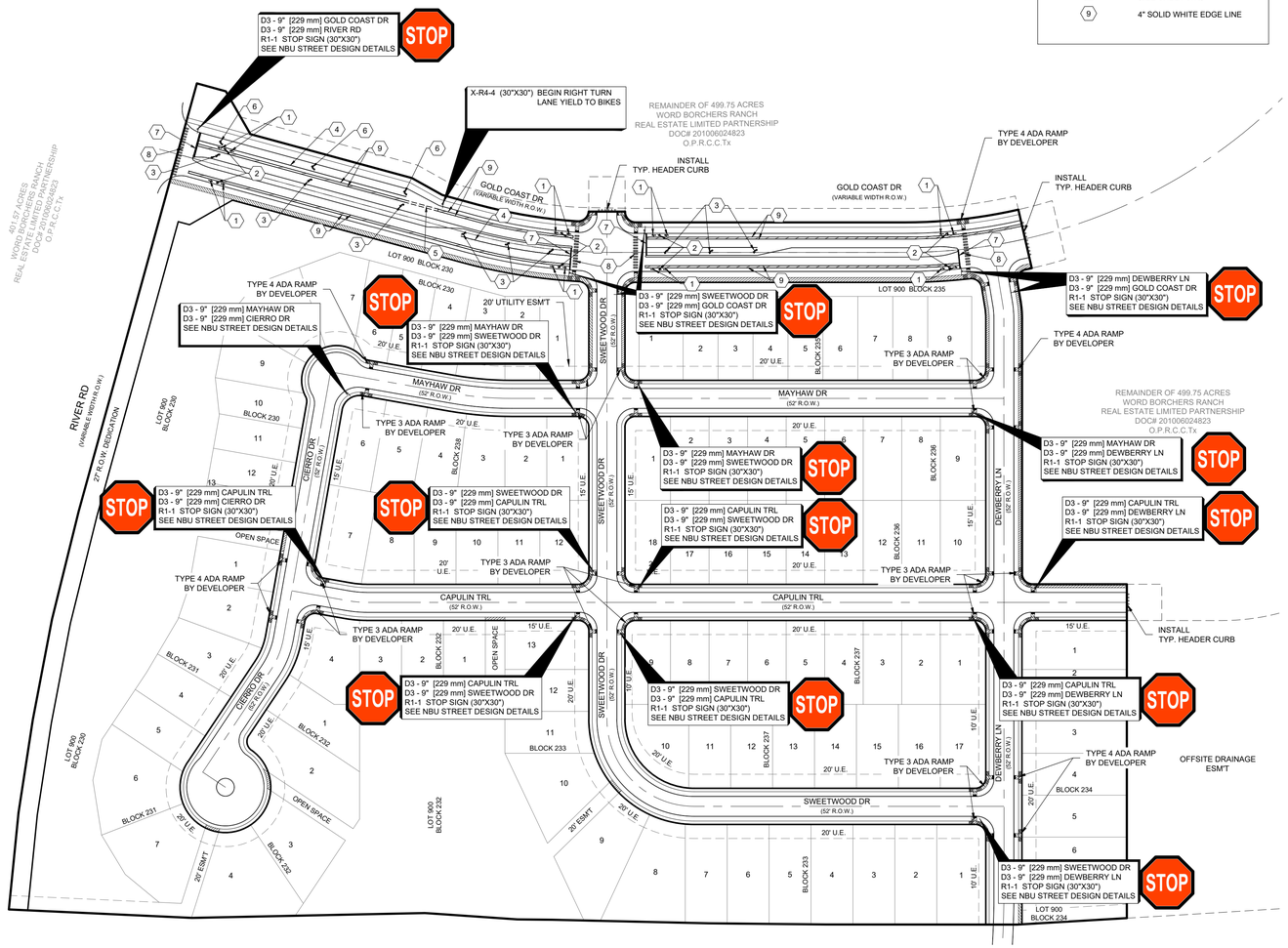
K:\LJA3856_ASA Properties\2405 23-1\426 Site Development Plans\DWG\-Sheets\Lot_Street Details.dwg
Plotted: 7/8/2025 - 10:09:39 AM
Last Modified: Jun 23, 25 - 21:10
Xref Dependencies: xx, xx, xx, xx, xx



LOCATION MAP
N.T.S.

SIGNAGE NOTES:

1. UNDERGROUND UTILITIES EXIST WITHIN THE PROJECT. CONTRACTOR SHALL HAVE THE UTILITIES MARKED PRIOR TO INSTALLATION OF THE SIGN POST. SIGN LOCATIONS ILLUSTRATED ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE SIGNS TO AVOID UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES BEFORE COMMENCING WORK.
2. IN ACCORDANCE WITH THE UNDERGROUND FACILITY DAMAGE PREVENTION ACT THE TELEPHONE NUMBER FOR A UTILITY LOCATOR IS 1-800-545-6005. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR UTILITY LOCATORS, AS NEEDED.
3. WHEN PREPARING HOLES FOR POSTS, CARE SHALL BE TAKEN SO AS NOT TO RUPTURE EXISTING DRAINAGE STRUCTURES, SPRINKLER SYSTEMS, TELECOMMUNICATIONS FACILITIES, ELECTRICAL CONDUITS AND PUBLIC UTILITIES.
4. ALL SIGNS SHALL COMPLY WITH THE SIGN DESIGNS PRESENTED IN STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS OR THE MILLENNIUM STANDARD HIGHWAY SIGN DESIGNS, IF A MILLENNIUM SIGN IS SPECIFIED ON THE PLANS.
5. SIGN LOCATIONS ILLUSTRATED ON THE PLANS ARE APPROXIMATE. SIGNS SHALL BE LOCATED IN THE FIELD TO PROVIDE APPROPRIATE FUNCTIONALITY. SIGN LOCATIONS SHALL COMPLY WITH GUIDELINES AND REQUIREMENTS PRESENTED IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
6. CONTRACTOR SHALL FURNISH AND MAINTAIN ALL TRAFFIC CONTROL DEVICES, LIGHTING, OR WARNING DEVICES REQUIRED TO COMPLETE THE WORK. ALL CONSTRUCTION SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7. MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, UN-DEPRECIATED STOCK. ALL EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE ON THE PLANS.
8. ALL SIGNS WITH A WHITE BACKGROUND SHALL BE FABRICATED WITH ENGINEER GRADE REFLECTIVE SHEETING (TXDOT TYPE A). ALL SIGNS WITH NON-WHITE BACKGROUNDS SHALL BE FABRICATED WITH HIGH SPECIFIC INTENSITY REFLECTIVE SHEETING (ALL TYPE C TXDOT TSP-(4)-08).
9. CONTRACTING SHALL BE RESPONSIBLE FOR RESTORING TO ORIGINAL CONDITION, OR BETTER, ANY DAMAGE DONE TO EXISTING BUILDINGS, RETAINING WALLS, UTILITIES, FENCES, PAVEMENT, CURBS OR DRIVEWAYS (NO SEPARATE PAY ITEM). CONTRACTOR SHALL RESTORE THE CONSTRUCTION AREA TO ORIGINAL CONDITION, OR BETTER, PRIOR TO FINAL INSPECTION.
10. ANY CONFLICT BETWEEN ANY DEFINITION, MATERIAL SPECIFICATION, CONSTRUCTION SPECIFICATION, MEASUREMENT AND PAYMENT PROCEDURE. ETC., SHOWN IN THIS PLAN SET AND ANY TEXAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS SHALL BE RESOLVED ONLY BY THE ENGINEER AND THE ENGINEER'S DECISION SHALL BE FINAL AND BINDING.
11. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AS PER TXDOT ITEM NO. 666.
12. COMAL COUNTY WILL INSTALL COUNTY ROAD SIGNS AND INVOICE THE OWNER. THE CONTRACTOR IS TO INSTALL PAVEMENT MARKINGS. ALL ROAD SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED ENGINEERING PLANS. THE COUNTY WILL INSPECT ALL SIGNS AT FINAL INSPECTION.
13. THE CONTRACTOR SHALL INSTALL ALL PAVEMENT MARKINGS IN ACCORDANCE WITH APPROVED ENGINEERING PLANS. THE CONTRACTOR SHALL NOTIFY THE COUNTY AT LEAST 24 HOUR PRIOR TO THE INSTALLATION OF ALL SEALER AND FINAL MARKINGS. THE COUNTY WILL INSPECT ALL MARKINGS AT FINAL APPLICATION.



LEGEND

	SIDE WALK BY DEVELOPER
1	BIKE LANE ARROW (SEE SHEET 6.18)
2	BIKE LANE SYMBOL (SEE SHEET 6.18)
3	LEFT WHITE ARROW
4	8"SOLID WHITE LINE WITH TYPE I-C REFL. MARKERS AT 20' O.C.
5	4" BROKEN WHITE LINE
6	RIGHT WHITE ARROW
7	24" WHITE STOP BAR
8	TYPICAL CROSSWALK (SEE SHEET 6.18)
9	4" SOLID WHITE EDGE LINE

100 50 0 100 200

SCALE IN FEET
SCALE: 1" = 100'

SIDEWALK NOTES:

1. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE HOME BUILDER PER CITY STANDARDS AT THE TIME OF BUILDING CONSTRUCTION ALONG:
   A. SWEETWOOD DR
   B. DEWBERRY LN
   C. CIERRO DR
   D. MAYHAW DR
   E. CAPULIN TRL
2. FOUR (4) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG:
   A. SWEETWOOD DR - LOT 900, BLOCK 230; LOT 900, BLOCK 233; LOT 900, BLOCK 235.
   B. DEWBERRY LN - LOT 900, BLOCK 235; NE SIDE OF ROW ALONG PROPERTY BOUNDRY.
   C. CIERRO DR. - LOT 900, BLOCK 230; LOT 900, BLOCK 231; LOT 900, BLOCK 232.
   D. CAPULIN TRL. - LOT 900, BLOCK 232; LOT 900, BLOCK 234; NW SIDE OF ROW ALONG PROPERTY BOUNDRY.
3. SIDEWALK INFRASTRUCTURE SHALL BE INSTALLED ALONG THE STREET FRONT OF ALL LOTS AT THE TIME OF LOT IMPROVEMENT. FOR LOTS WHERE NO BUILDING IMPROVEMENT IS PROPOSED, ALL SIDEWALKS AND PEDESTRIAN CROSSING RAMPS ARE REQUIRED TO BE CONSTRUCTED WITH STREET CONSTRUCTION.
4. SEE SHEET 6.13 FOR WHEEL CHAIR RAMP STANDARDS.
5. SIX (6) FOOT WIDE SIDEWALK WILL BE CONSTRUCTED BY THE DEVELOPER PER CITY STANDARDS AT THE TIME OF SUBDIVISION STREET CONSTRUCTION ALONG:
   A. GOLD COAST DR - LOT 900 BLOCK 235; LOT 900 BLOCK 230.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

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 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.

VERAMENDI PRECINCT 23 UNIT 1

SIGNAGE LAYOUT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_SignageLayout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

SHEET NO.
6.15

FOR PERMIT

K:\SA3856 - EDA Properties\2405 23-1\430 Site Development Plans\2405-Sheets\sh_SignageLayout.dwg
Last Modified: Jul 08, 25 - 17:39
Last Modified By: Hunter Wilson

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

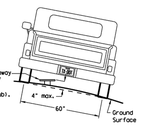
Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- SBO = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
- UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
- WS = Wedge Anchor Steel - (see SMD(TWT))
- WP = Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Post" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
- IF REQUIRED
- (TEXT or ZEXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT)))
- BW = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 #/ft W/G Channel (see SMD(SLIP-1) to (SLIP-3))
- EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

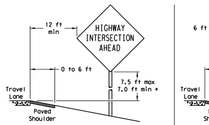
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel pads).

SIGN LOCATION

PAVED SHOULDERS



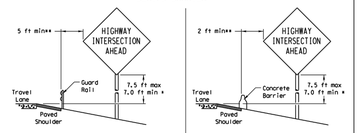
LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER

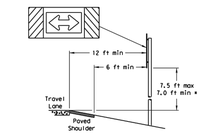


BEHIND GUARDRAIL

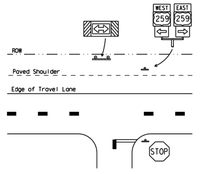
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



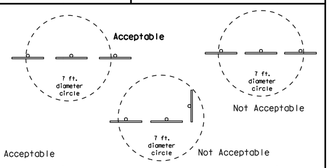
- Signs shall be mounted using the following condition that results in the greatest sign elevation:
  - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

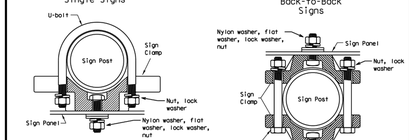
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/trafftc.htm

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL



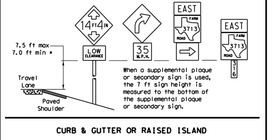
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

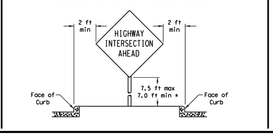
Sign clamps may be either the specific size clamp or the universal clamp.

Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

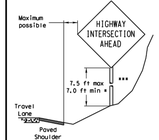
SIGNS WITH PLAQUES



CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (when 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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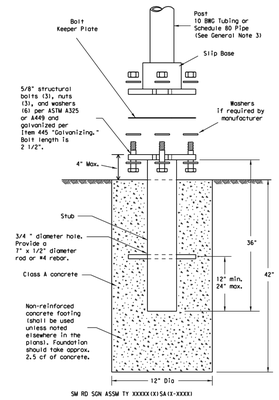
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

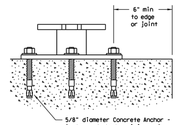
1. Slip base shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
   http://www.txdot.gov/publications/trafftc.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, gas-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the traveltway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the traveltway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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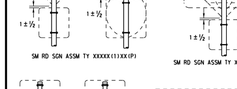
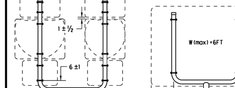
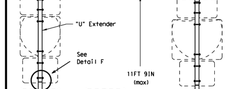
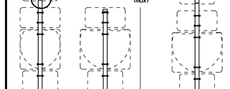
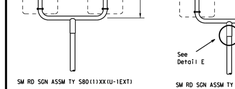
26B

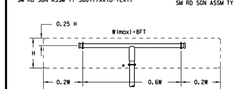




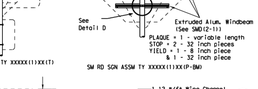


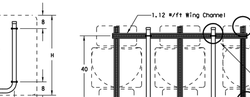


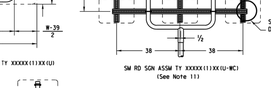


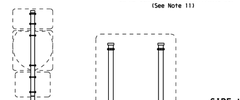


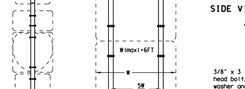
All dimensions are in english unless detailed otherwise.

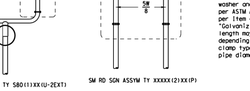


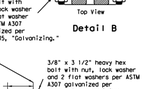


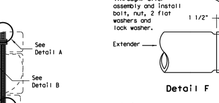




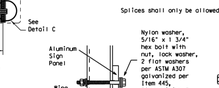


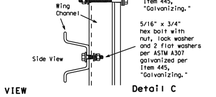






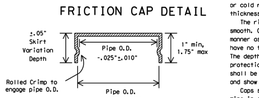
Splices shall only be allowed behind the sign substrate.





REQUIRED SUPPORT	
SIGN DESCRIPTION	SUPPORT
Regulatory: 48-Inch STOP sign (R1-1)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 60-Inch YIELD sign (R1-2)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 48x16-Inch ONE-WAY sign (R6-1)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 36x48, 48x36, and 48x48-Inch signs	TY 10BWG(11)XX(T)
Regulatory: 48x60-Inch signs	TY SB0(11)XX(T)
Regulatory: 48x48-Inch signs (diamond or square)	TY 10BWG(11)XX(T)
Regulatory: 48x60-Inch signs	TY SB0(11)XX(T)
Regulatory: 48-Inch Advance School X-ing sign (S1-1)	TY 10BWG(11)XX(T)
Regulatory: 48-Inch School X-ing sign (S2-1)	TY 10BWG(11)XX(T)
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(11)XX(T)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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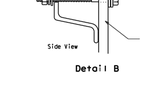
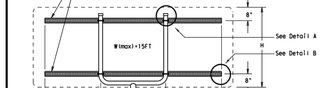
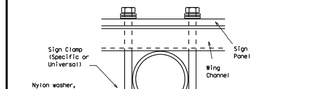


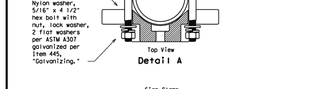
Splices shall only be allowed behind the sign substrate.

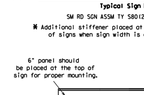


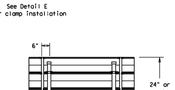
Typical Sign Mount
SM RD SGN ASSM TY SB0(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.









GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA
   10 BWG 1 16 SF
   10 BWG 2 32 SF
   Sch. 80 1 32 SF
   Sch. 80 2 64 SF
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons other than those mentioned in the loading criteria in the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

GENERAL NOTES:

1. SIGN SUPPORT # OF POSTS MAX. SIGN AREA
   10 BWG 1 16 SF
   10 BWG 2 32 SF
   Sch. 80 1 32 SF
   Sch. 80 2 64 SF
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10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT	
SIGN DESCRIPTION	SUPPORT
Regulatory: 48-Inch STOP sign (R1-1)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 60-Inch YIELD sign (R1-2)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 48x16-Inch ONE-WAY sign (R6-1)	TY 10BWG(11)XX(T) TY 10BWG(11)XX(P-BW)
Regulatory: 36x48, 48x36, and 48x48-Inch signs	TY 10BWG(11)XX(T)
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Regulatory: 48x48-Inch signs (diamond or square)	TY 10BWG(11)XX(T)
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Regulatory: 48-Inch Advance School X-ing sign (S1-1)	TY 10BWG(11)XX(T)
Regulatory: 48-Inch School X-ing sign (S2-1)	TY 10BWG(11)XX(T)
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(11)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

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26D

VERAMENDI PRECINCT 23 UNIT 1

SIGNAGE DETAILS (SHEET 1 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 1/31/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Signage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 6.16

FOR PERMIT

K:\SJ\SDC_LJA Properties\2405 23-01 (43) Site Development Plans\GMD-Sheets\sh_Signage Details.dwg
By: Nicholas Gower
Last Modified: Jan. 10, 25 - 16:05
Last Plotted: Jan. 10, 25 - 16:05 by

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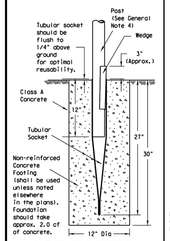
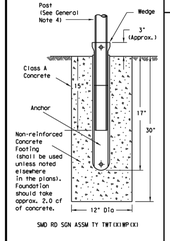
Wedge Anchor Steel System



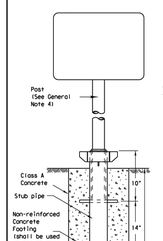
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

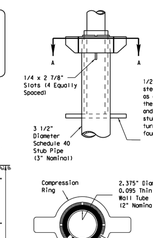


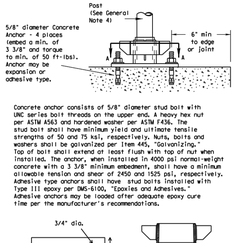
SMD RD SGN ASSM TY TWT(X)HP(X)

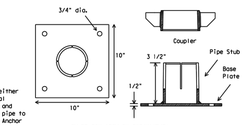
Universal Anchor System with Thin-Walled Tubing Post



SM RD SGN ASSM TY TWT(X)UA(P)







SM RD SGN ASSM TY TWT(X)UB(P)

Plastic Insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210, for precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/trraffic.htm

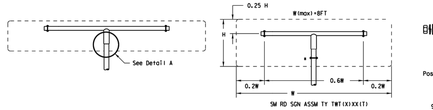
WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

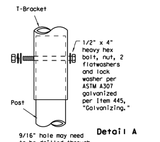
1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



SM RD SGN ASSM TY TWT(X)XX(T)

(+ - See General Note 6)



Detail A

NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

Texas Department of Transportation
Traffic Operations Division

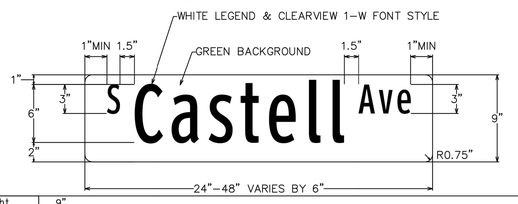
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

©TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

26E

STREET SIGN DETAIL - GROUND MOUNT



Height	9"
Length	24" min 48" max 6" increments in length
Thickness	0.080"
Substrate	Flat aluminum sheeting with ¾" radius circular fillets at corners conforming to the requirements of ASTM B 209, Alloys 6061—T—6, or 5052—H36.
Sign Face Materials	Green film over High Intensity Prismatic sheeting
Legend	Legends shall be Clearview 1—W font style. Reduced spacing between the letters or words should not be used as a means of reducing the overall size of a street name sign unless approved by the City Traffic Engineer.
Color	White legend on green background

Notes:

1. Street name signs shall be double sided when center mounted on top of sign post. Only one street name sign should be installed on top of sign post with STOP or YIELD sign.
2. When two sets of street name signs are required (e.g. at "T" intersections), one double-sided street name sign shall be mounted on sign post. The sign assembly shall meet minimum height requirements as required in the Texas Manual on Uniform Traffic Control Devices (TMUTCD). When required, DEAD END (W14-1a) or NO OUTLET (W14-2a) signs shall also be mounted on the sign post.
3. Street name signs greater than 36" long and center mounted on top of sign post shall be mounted on post top bracket with 12" slot. All other street name signs center mounted on top of sign post shall be mounted on post top bracket with 5 ¼" slot.
4. Street name signs mounted on sign post shall be mounted with double-sided round pole brackets. Two holes should be punched in the center of the 9" street name sign blank 1" from edge of the blank with 7"spacing between holes.
5. The lettering for names of streets shall be composed of a combination of lower-case letters with initial upper-case letters. Acceptable abbreviations per TMUTCD may be used except for the street name itself.
6. Red background (red film over High Intensity Prismatic) should be used for private street name signs.

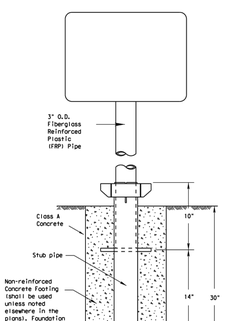
Street Sign Detail - Ground Mount			
ISSUE DATE:	February 2013	DWG. NO: ST-024	SCALE: N.T.S.
DRAWN BY: RAS		CONTACT: GF	SHEET: 1 OF 1

City of New Braunfels

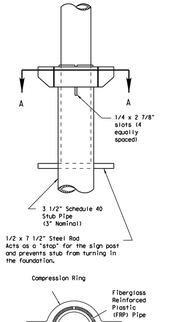
ENGINEERING DIVISION
424 S. CASTELL AVE.
NEW BRAUNFELS, TEXAS 78130
PHONE: 830.221.4020
FAX: 830.626.3600

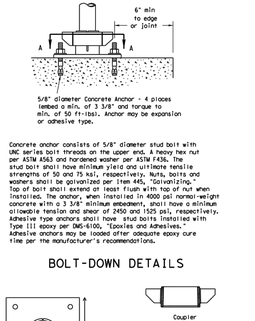
P:\2010 ENGINEERING-AUTOCAD\DETAILS\NB-PUBLIC WORKS DETAILS\NB-UNAPPROVED DETAILS-2013\ST-2013.024 STREET SIGN DETAIL - GROUND MOUNT.DWG

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post

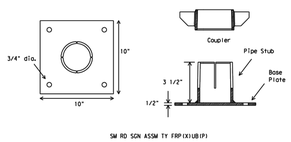


SM RD SGN ASSM TY FRP(X)UA(P)





BOLT-DOWN DETAILS



SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/trraffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.03", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division.
   Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

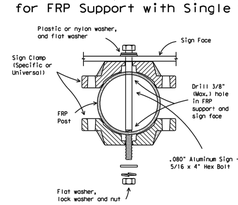
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

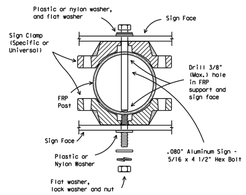
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

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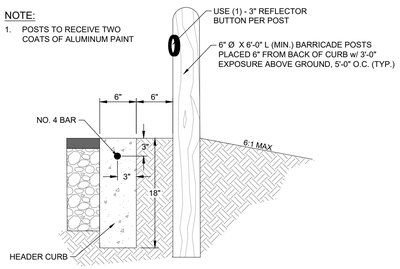
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

26F

NOTE:

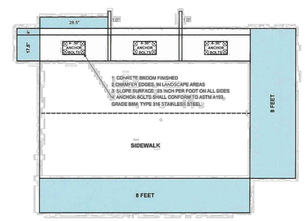
1. POSTS TO RECEIVE TWO COATS OF ALUMINUM PAINT



HEADER CURB & BARRICADE POST DETAIL

N.T.S. N.T.S.

UNITED STATES POSTAL SERVICE



1 CBU IF DEEP X 4' WIDE TO INCLUDE SIDEWALK
2 CBU'S IF DEEP X 4' WIDE TO INCLUDE SIDEWALK
3 CBU'S IF DEEP X 5' WIDE TO INCLUDE SIDEWALK
4 CBU'S IF DEEP X 11' WIDE TO INCLUDE SIDEWALK

VERAMENDI PRECINCT 23 UNIT 1

SIGNAGE DETAILS (SHEET 2 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 1/31/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_Signage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

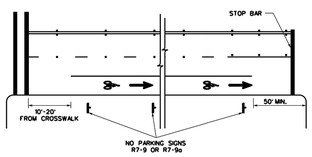
JOB NUMBER: SA3856.2405

SHEET NO. 6.17

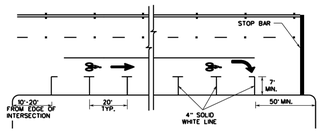
FOR PERMIT

P:\LJA3856 ASA Properties\2400 23-1\426 Site Development Plans\CAD\Sheets\sh_Signage Details.dwg
Xref Name: ...
Last Modified: Jun. 10, 25 - 16:03
Last Plotted: Jun. 10, 25 - 16:03

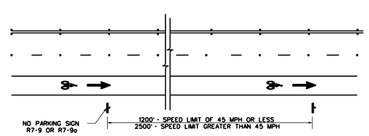
NO PARKING ALONG BICYCLE LANE



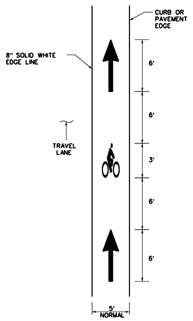
PARKING ALONG BICYCLE LANE



ROADWAYS WITH FEW INTERSECTIONS

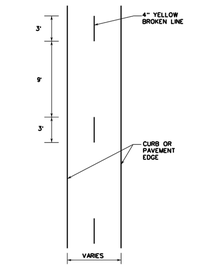


ADJACENT TO TRAVEL LANE

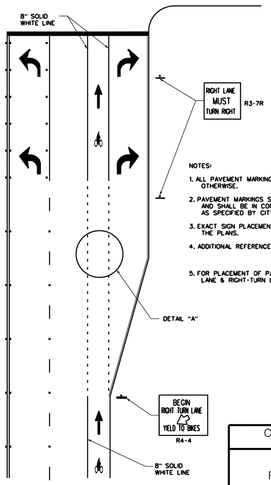


SHARED USE PATH

(SEPERATE FROM ROADWAY WITH NO MOTORIZED TRAFFIC)



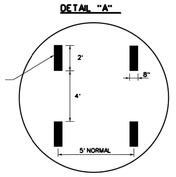
RIGHT-TURN LANE AT INTERSECTION

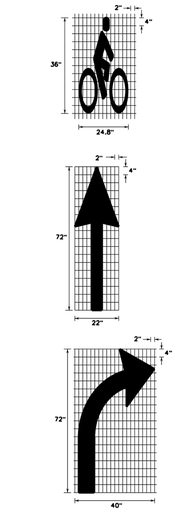


NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE WHITE EXCEPT WHEN NOTED OTHERWISE.
2. PAVEMENT MARKINGS SHALL BE OF THE MATERIALS SPECIFIED AND SHALL BE IN CONFORMANCE WITH MATERIAL SPECIFICATIONS AS SPECIFIED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS.
3. EXACT SIGN PLACEMENT AND DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.
4. ADDITIONAL REFERENCES: TMUTCD
   GUIDE FOR THE DEVELOPMENT OF BICYCLES FACILITIES, AASHTO, 1991.
5. FOR PLACEMENT OF PAVEMENT ARROWS AND WORDS SEE LEFT-TURN LANE & RIGHT-TURN LANE DESIGN WORKSHEET.

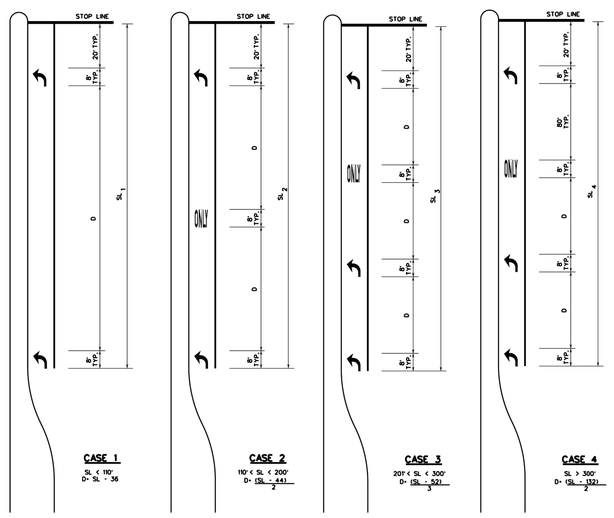
DETAIL "A"





SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
BICYCLE LANE PAVEMENT MARKINGS
SHEET 8 OF 18

% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET NO.



CASE 1
SL < 110'
D= SL ÷ 36

CASE 2
110' < SL < 200'
D= (SL - 44) / 2

CASE 3
200' < SL < 300'
D= (SL - 52) / 3

CASE 4
SL > 300'
D= (SL - 132) / 2

KEY:

SL - STORAGE LENGTH (FEET)

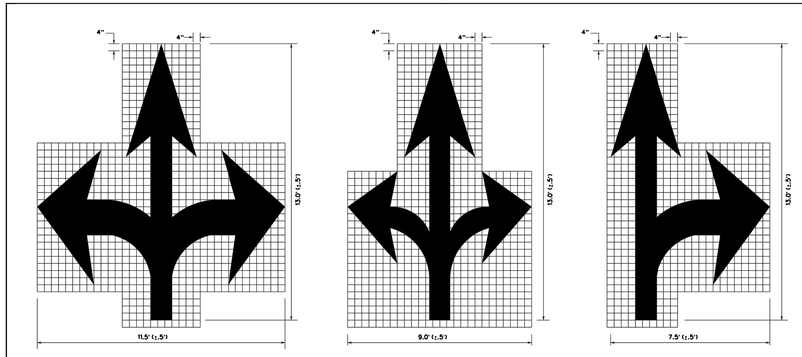
D - DISTANCE BETWEEN ARROWS AND LEGENDS (FEET)

GENERAL NOTES:

1. THESE DETAILS ALSO APPLY TO RIGHT-TURN LANES.
2. FOR DUAL-TURN LANES, DIMENSIONS SHALL BE THE SAME FOR EACH LANE.
3. SL DIMENSION IS FROM STOP LINE TO END OF TURN LANE, WHICH DOES NOT INCLUDE TAPER LENGTH.
4. PAVEMENT ARROWS AND "ONLY" LEGEND MARKINGS ARE TYPICALLY USED AT SIGNALIZED INTERSECTIONS AND AT UNSIGNALIZED INTERSECTIONS WHERE A DEMONSTRATED NEED EXISTS.
5. MINIMUM SL= 110', SL MAY BE LESS THAN 110 FEET AS DIRECTED BY THE CITY TRAFFIC ENGINEER.

SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET
SHEET 17 OF 18

% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET NO.



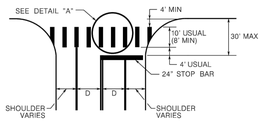
NOTES:

1. MINIMUM 8 FOOT WHITE MARKINGS SHALL BE USED, UNLESS OTHERWISE NOTED. IF MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD BE PLACED WITH FIRST WORD NEAREST THE DRIVER.
2. THESE DETAILS ARE STANDARD SIZE FOR NORMAL INSTALLATION. SIZES MAY BE REDUCED APPROXIMATELY ONE-THIRD DEPENDING ON CONDITIONS.
3. THE LONGITUDINAL SPACE BETWEEN MARKINGS SHOULD BE 30 FEET.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:
   A. REGULATORY
      STOP
      RIGHT (LEFT) TURN ONLY
      25 MPH
      SYMBOL ARROWS
   B. WARNING
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X-ING
      PED X-ING
      R X R (SEE RCPM DETAIL)
      OTHER WORDS OR SYMBOLS MAY BE NECESSARY UNDER CERTAIN CONDITIONS
5. UNCONTROLLED USE OF PAVEMENT MARKINGS CAN RESULT IN DRIVER CONFUSION. WORD AND SYMBOL MARKINGS SHOULD BE NO MORE THAN THREE LINES.
6. THE WORD "STOP" SHALL NOT BE USED ON THE PAVEMENT UNLESS ACCOMPANIED BY A STOP LINE AND STOP SIGN. THE WORD "STOP" SHALL NOT BE PLACED ON THE PAVEMENT IN ADVANCE TO A STOP LINE, UNLESS EVERY VEHICLE IS REQUIRED TO STOP AT ALL TIMES.
7. PAVEMENT MARKINGS SHOULD GENERALLY BE NO MORE THAN ONE LANE IN WIDTH, WITH SCHOOL MESSAGES BEING THE EXCEPTION. FOR DETAILS OF SCHOOL AND SCHOOL CROSSING PAVEMENT MARKINGS, REFER TO PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. SPACING BETWEEN LETTERS SHOULD BE APPROXIMATELY 4 INCHES. THE WIDTH OF LETTERS MAY VARY DEPENDING ON THE WIDTH OF THE TRAVEL LANES.
9. LANE-USE ARROW MARKINGS MAY BE USED TO CONVEY EITHER GUIDANCE OR MANDATORY MESSAGES. ARROWS USED TO CONVEY A MANDATORY MOVEMENT MUST BE ACCOMPANIED BY STANDARD SIGNS AND THE PAVEMENT MARKING WORD "ONLY".
10. PAVEMENT MARKINGS ARE TO BE LOCATED AS SPECIFIED ELSEWHERE IN THE PLANS.

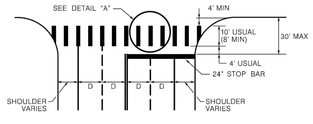
SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
STANDARD PAVEMENT MARKINGS (ARROWS)
SHEET 3 OF 18

% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET NO.

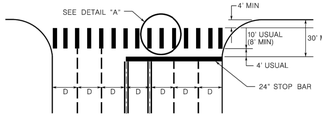
TWO LANES WITH SHOULDERS



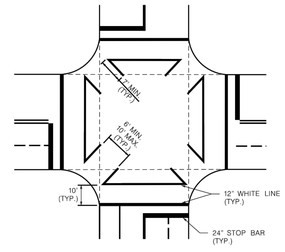
FOUR LANES WITH SHOULDERS



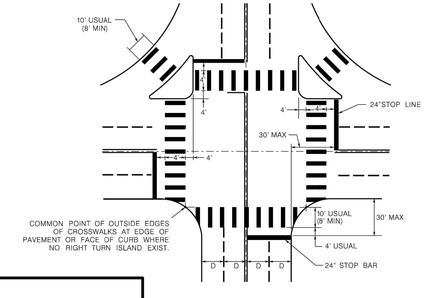
MULTI - LANES



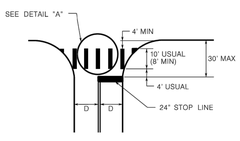
EXCLUSIVE PEDESTRIAN PHASE



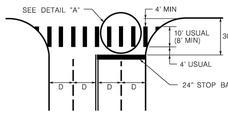
INTERSECTION WITH RIGHT-TURN ISLANDS



TWO LANES



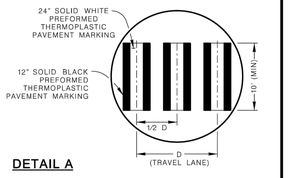
FOUR LANES



HIGH CONTRAST CROSSWALK

NOTES:

1) CROSSWALKS AND STOP BARS SHALL BE WHITE.
2) "D" IS EQUAL TO THE WIDTH OF TRAVEL LANE.
3) PREFORMED THERMOPLASTIC SHALL BE USED FOR ALL CROSSWALK PAVEMENT MARKINGS.
4) PREFORMED THERMOPLASTIC MATERIAL SHALL BE SUPPLIED BY A MANUFACTURER LISTED ON TxDOT'S MATERIAL PRODUCER LIST (MPL).



DETAIL A

GENERAL NOTES:

1) CROSSWALKS AND STOP BARS SHALL BE WHITE.
2) "D" IS EQUAL TO THE WIDTH OF TRAVEL LANE.
3) PREFORMED THERMOPLASTIC SHALL BE USED FOR ALL CROSSWALK PAVEMENT MARKINGS.
4) PREFORMED THERMOPLASTIC MATERIAL SHALL BE SUPPLIED BY A MANUFACTURER LISTED ON TxDOT'S MATERIAL PRODUCER LIST (MPL).

JULY 2017
CITY OF SAN ANTONIO
TRANSPORTATION & CAPITAL IMPROVEMENTS DEPARTMENT
TRANSPORTATION SERVICES CONSTRUCTION STANDARDS
TYPICAL CROSSWALK DETAILS

% SUBMITTAL	PROJECT NO.:	DATE: 7.25.17
DRWN. BY: LAN	RVSD. BY: AF	CHKD. BY: GE, PE	SHEET NO.: 1 OF 1

VERAMENDI PRECINCT 23 UNIT 1

SIGNAGE DETAILS (SHEET 3 OF 3)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 1/31/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: xx_Signage Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

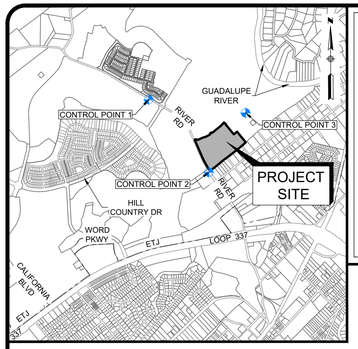
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

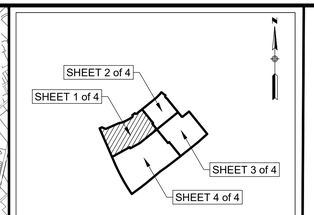
SHEET NO.
6.18

FOR PERMIT

K:\SA3856.KDA Properties\2405 23-11\426 Site Development Plans\0960-Sheets\xx_Signage Details.dwg
Xref: 0960-Xref
Last Modified: Jun 10, 25 - 16:05
By: DanPlace, w 08:30 - 16:05



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

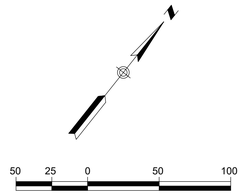
JOINT RESTRAINT TABLE

JOINT (TYPE)	PIPE MATERIAL	PIPE SIZE	RESTRAINT DISTANCE	LENGTH ALONG RUN
11.25°BEND	PVC	8"	3'	NA
22.5°BEND	PVC	8"	5'	NA
45°BEND	PVC	8"	10'	NA
TEE	PVC	8"x8"x8"	36'	5'
VERTICAL OFFSET SYSTEM RETURN	DI	8"	4' LOWER BENDS 21' UPPER BENDS	NA
GATE VALVE	PVC	8"	NA	NA

JOINT RESTRAINT NOTE:
CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOIN RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL ENSURE THAT ALL TEE'S, BEND'S, VALVE'S, ETC. HAVE A MINIMUM OF 5' OF PIPE WITH NO JOINTS AT EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY THE DEVELOPER'S ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE JOINT RESTRAINTS WITH THE DEVELOPER'S ENGINEER.

RESTRAINT LENGTH VALUES:

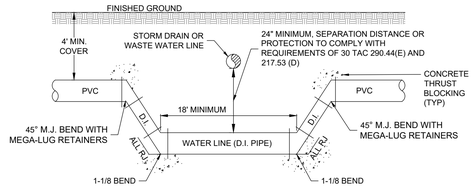
PROGRAM: ***EBAA IRON SALES INC.***
SOIL TYPE: ***CL***
SAFETY FACTOR: ***1.5***
TRENCH TYPE: ***5***
DEPTH OF BURY: ***4 FT.***
TEST PRESSURE: ***200 PSI***



SCALE IN FEET
SCALE: 1"=50'

LEGEND

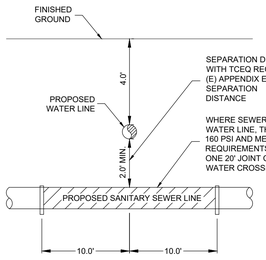
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
	GV	WATER METER / GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
		OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



TYPICAL WATER CROSSING DETAIL B
NTS

NOTES:

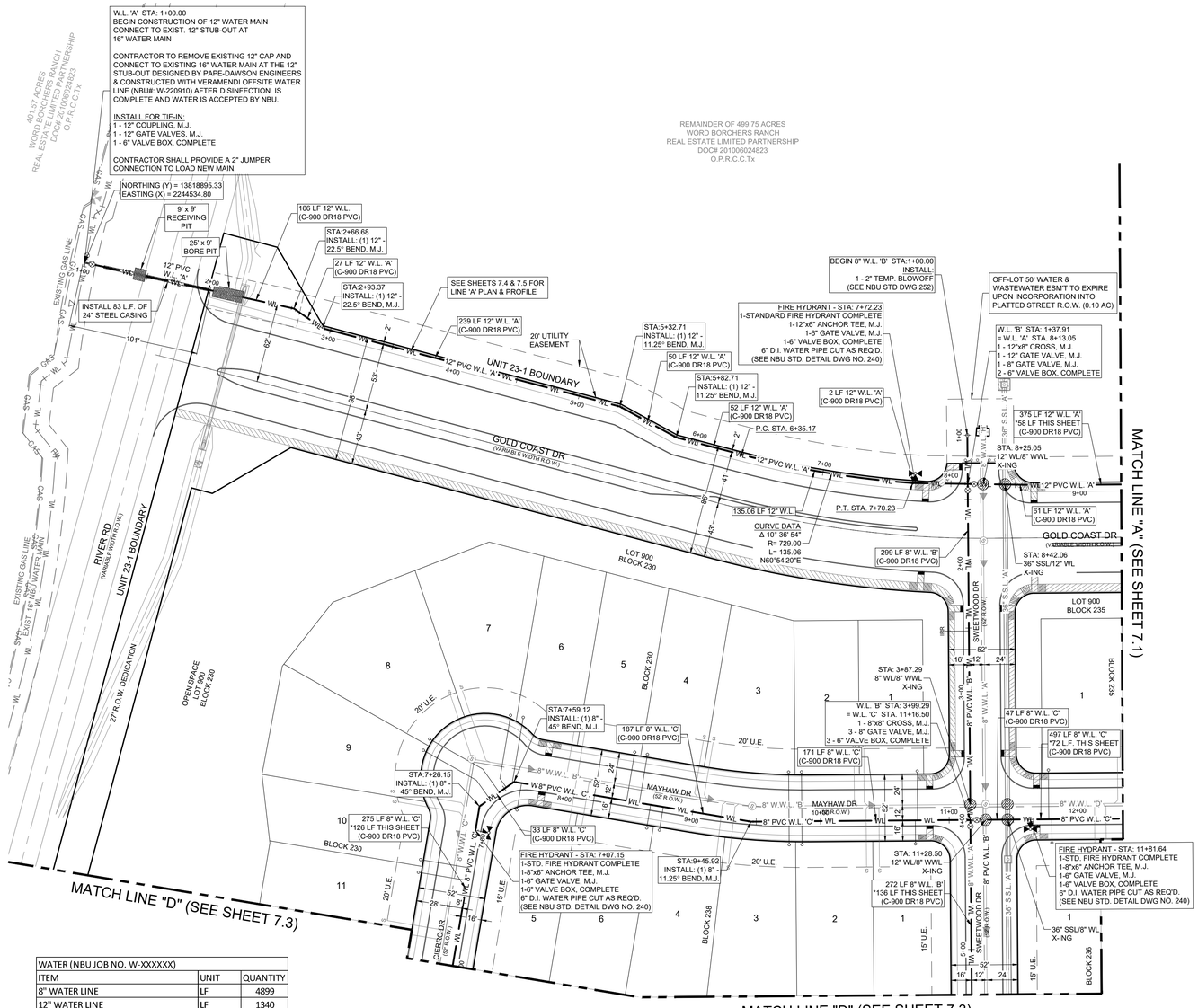
1. 18' MINIMUM WATER PIPE SEGMENT TO BE CENTERED UNDER WASTEWATER LINE.
2. WASTEWATER PIPE WITHIN NINE FEET OF WATER PIPE ON EITHER SIDE SHALL BE CONSTRUCTED USING AT LEAST 150 PSI PRESSURE RATED PIPE.
3. STEEL CASING TO BE USED UNDER STORM DRAIN.
4. ALL AMENITY CENTERS SHALL HAVE R/P BACKFLOW PREVENTION ASSEMBLY CALLED OUT AND DETAILED ON DOMESTIC SERVICES



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

NOTES:

1. ALL IRRIGATION SERVICES WITHIN RESIDENTIAL AREAS SHALL HAVE A REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (R/P) INSTALLED PRIOR TO PLACEMENT OF METER. ALL NEW FACILITIES ARE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE LATEST NBU BACKFLOW POLICY.
2. ALL GATE VALVES 16" AND SMALLER SHALL BE RESILIENT SEATED GATE VALVES.
3. FOR PAVEMENT DESIGN SEE GEOTECHNICAL ENGINEERING REPORT.
4. MINIMUM DEPTH OF COVER FOR WATER LINES SHALL BE 48".
5. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION



WATER (NBU JOB NO. W-XXXXXX)		
ITEM	UNIT	QUANTITY
8" WATER LINE	LF	4899
12" WATER LINE	LF	1340
1" SINGLE SERVICE & 5/8" METER	EA	103
1" IRRIGATION SERVICE & 3/4" METER	EA	1
LUEs	EA	103
FIRE HYDRANT	EA	12
6" GATE VALVE	EA	12
8" GATE VALVE	EA	16
12" GATE VALVE	EA	3

NBU PRESSURE ZONE:

1. PROPOSED WATER MAIN IS WITHIN NBU PRESSURE ZONE 4.

NEW BRAUNFELS UTILITIES

1. R/P BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED WITH IRRIGATION METERS.
2. 1-INCH SERVICE LINES SHALL BE CONSTRUCTED OF TYPE K ANNEALED SEAMLESS COPPER TUBING MEETING THE REQUIREMENTS OF ASTM B88. AWWA C901 SDR9 COPPER TUBING SIZE HDPE MAY BE USED FOR 1-INCH SERVICE LINES WITH SPECIAL APPROVAL FROM NBU ONLY.
3. 2-INCH SERVICE LINES SHALL BE AWWA C901 SDR9 CTS HDPE. ALL COPPER AND HDPE TUBING MUST BE NSF 61 CERTIFIED.
4. CONTRACTORS SHALL INSTALL LINE STOPPERS AT THEIR COST FOR AN OUTAGE DURING CONSTRUCTION IF SYSTEM VALVES ARE NOT AVAILABLE OR THE EXISTING VALVES DO NOT FUNCTION. LINE STOPPERS WILL BE REQUIRED BASED ON THE FOLLOWING CRITERIA:
   a. IF THE NUMBER OF RESIDENTIAL CUSTOMERS AFFECTED IS GREATER THAN 20 AND EXPECTED TO LAST MORE THAN 4 HOURS.
   b. IF ANY COMMERCIAL CUSTOMERS ARE AFFECTED BY THE OUTAGE THEN THE USE OF LINE STOPPERS WILL BE DETERMINED ON A CASE BY CASE BASIS.
   c. IF ANY CRITICAL CARE CUSTOMERS ARE AFFECTED BY THE OUTAGE THEN THE USE OF LINE STOPPERS WILL BE DETERMINED ON A CASE BY CASE BASIS.
   d. SYSTEM CONDITIONS MAY REQUIRE A LINE STOPPER AND MAY NOT BE KNOWN UNTIL CONSTRUCTION COMMENCES.

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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

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 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.

VERAMENDI PRECINCT 23 UNIT 1

WATER LAYOUT (SHEET 1 OF 4)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/21/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\07_Water Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

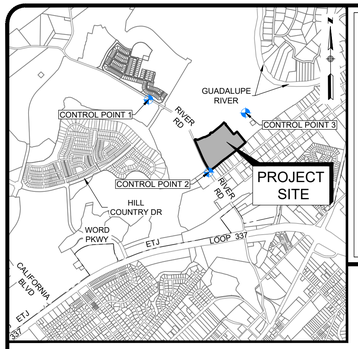
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

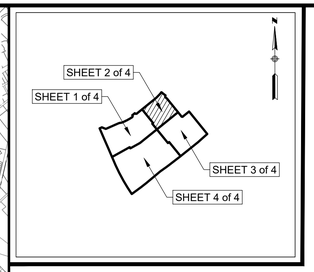
SHEET NO. **7.0**

K:\SAN\3856.IGA Property\2405 23-1\426 Site Development Plans\GWE-Sheets\de_Water Layout.dwg
Plotted: Jul. 07, 25 - 17:29
Last Modified: Jul. 07, 25 - 17:29
By: Benjamin Jones

FOR PERMIT



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

JOINT RESTRAINT TABLE

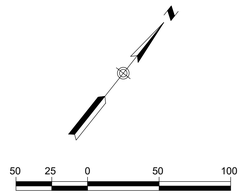
JOINT (TYPE)	PIPE MATERIAL	PIPE SIZE	RESTRAINT DISTANCE	LENGTH ALONG RUN
11.25°BEND	PVC	8"	3'	NA
22.5°BEND	PVC	8"	5'	NA
45°BEND	PVC	8"	10'	NA
TEE	PVC	8"x8"x8"	36'	5'
VERTICAL OFFSET SYSTEM RETURN	DI	8"	4' LOWER BENDS 21' UPPER BENDS	NA
GATE VALVE	PVC	8"	NA	NA

JOINT RESTRAINT NOTE:

CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOIN RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL ENSURE THAT ALL TEE'S, BEND'S, VALVE'S, ETC. HAVE A MINIMUM OF 5' OF PIPE WITH NO JOINTS AT EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY THE DEVELOPER'S ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE JOINT RESTRAINTS WITH THE DEVELOPER'S ENGINEER.

RESTRAINT LENGTH VALUES:

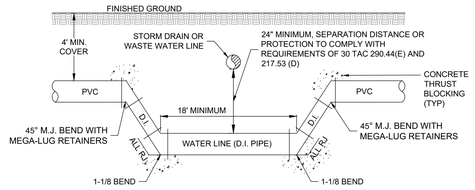
PROGRAM: ***EBAA IRON SALES INC.***
SOIL TYPE: ***CL***
SAFETY FACTOR: ***1.5***
TRENCH TYPE: ***5***
DEPTH OF BURY: ***4 FT.***
TEST PRESSURE: ***200 PSI***



SCALE IN FEET
SCALE: 1"=50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
		OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESMT.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



TYPICAL WATER CROSSING DETAIL B
NTS

NOTES:

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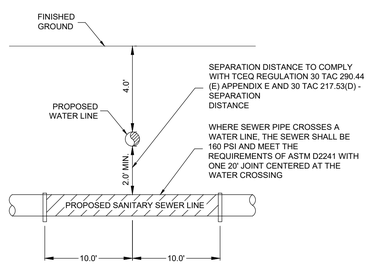

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

NOTES:

1. ALL IRRIGATION SERVICES WITHIN RESIDENTIAL AREAS SHALL HAVE A REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (R/P) INSTALLED PRIOR TO PLACEMENT OF METER. ALL NEW FACILITIES ARE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE LATEST NBU BACKFLOW POLICY.
2. ALL GATE VALVES 16" AND SMALLER SHALL BE RESILIENT SEATED GATE VALVES.
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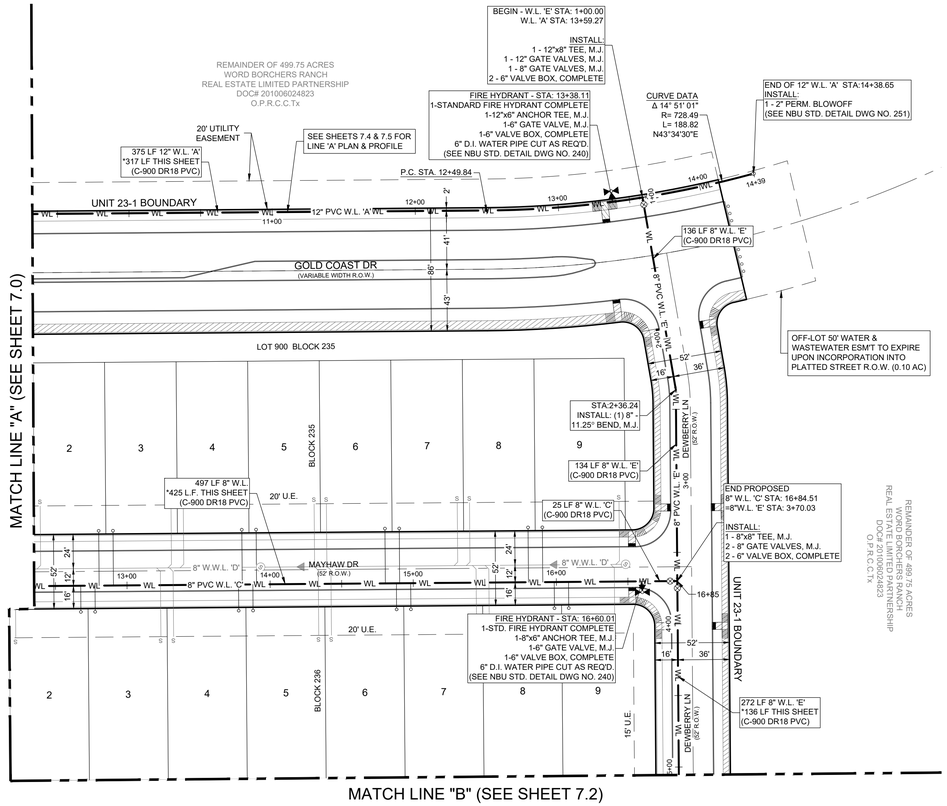
4. MINIMUM DEPTH OF COVER FOR WATER LINES SHALL BE 48".
5. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION



NBU PRESSURE ZONE:

1. PROPOSED WATER MAIN IS WITHIN NBU PRESSURE ZONE 4.

NEW BRAUNFELS UTILITIES

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3. 2-INCH SERVICE LINES SHALL BE AWWA C901 SDR9 CTS HDPE. ALL COPPER AND HDPE TUBING MUST BE NSF 61 CERTIFIED.
4. CONTRACTORS SHALL INSTALL LINE STOPPERS AT THEIR COST FOR AN OUTAGE DURING CONSTRUCTION IF SYSTEM VALVES ARE NOT AVAILABLE OR THE EXISTING VALVES DO NOT FUNCTION. LINE STOPPERS WILL BE REQUIRED BASED ON THE FOLLOWING CRITERIA:
   a. IF THE NUMBER OF RESIDENTIAL CUSTOMERS AFFECTED IS GREATER THAN 20 AND EXPECTED TO LAST MORE THAN 4 HOURS.
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3. THIS PROJECT INCLUDES UTILITY INSTALLATIONS GREATER THAN 5-FEET IN DEPTH. DEEP TRENCHES POSE COMPACTION TESTING AN 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:
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

WATER (NBU JOB NO. W-XXXXXX)		
ITEM	UNIT	QUANTITY
8" WATER LINE	LF	4899
12" WATER LINE	LF	1340
1" SINGLE SERVICE & 5/8" METER	EA	103
1" IRRIGATION SERVICE & 3/4" METER	EA	1
LUEs	EA	103
FIRE HYDRANT	EA	12
6" GATE VALVE	EA	12
8" GATE VALVE	EA	16
12" GATE VALVE	EA	3

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WATER LAYOUT (SHEET 2 OF 4)

NO.	DESCRIPTION	BY	DATE

DATE: 6/21/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: s:\...\Water Layout.dwg

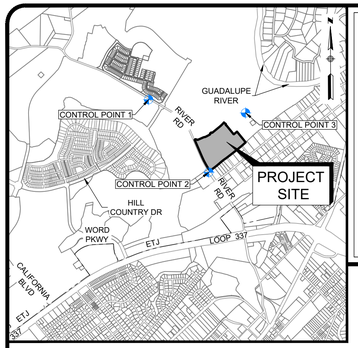
STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

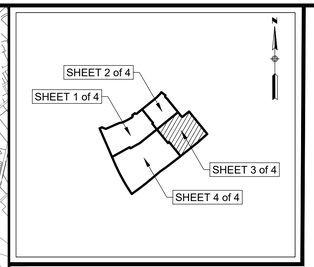
JOB NUMBER: SA3856.2405

SHEET NO. 7.1

K:\SA3856.KSA Properties\2405 23-1\026 Site Development Plan\DWG Sheets\sh_Water Layout.dwg
Plot: Aug 07, 2025 - 17:29
Last Modified: Jul. 07, 25 - 17:29
Xref Modified: Jul. 07, 25 - 17:29



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

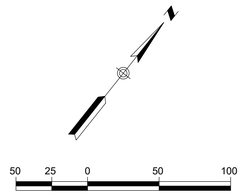
JOINT RESTRAINT TABLE

JOINT (TYPE)	PIPE MATERIAL	PIPE SIZE	RESTRAINT DISTANCE	LENGTH ALONG RUN
11.25°BEND	PVC	8"	3'	NA
22.5°BEND	PVC	8"	5'	NA
45°BEND	PVC	8"	10'	NA
TEE	PVC	8"x8"x8"	36'	5'
VERTICAL OFFSET SYSTEM RETURN	DI	8"	4' LOWER BENDS 21' UPPER BENDS	NA
GATE VALVE	PVC	8"	NA	NA

JOINT RESTRAINT NOTE:
CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOIN RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL ENSURE THAT ALL TEE'S, BEND'S, VALVE'S, ETC. HAVE A MINIMUM OF 5' OF PIPE WITH NO JOINTS AT EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY THE DEVELOPER'S ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE JOINT RESTRAINTS WITH THE DEVELOPER'S ENGINEER.

RESTRAINT LENGTH VALUES:

PROGRAM: ***EBAA IRON SALES INC.***
SOIL TYPE: ***CL***
SAFETY FACTOR: ***1.5***
TRENCH TYPE: ***5***
DEPTH OF BURY: ***4 FT.***
TEST PRESSURE: ***200 PSI***



SCALE IN FEET
SCALE: 1"=50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
		OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESMT.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
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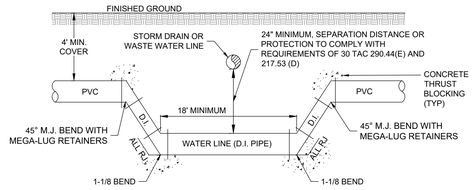

TYPICAL WATER CROSSING DETAIL B
NTS

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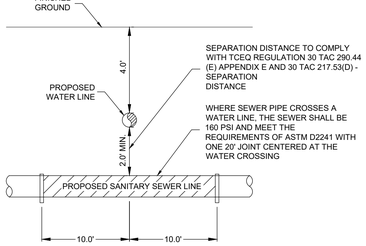

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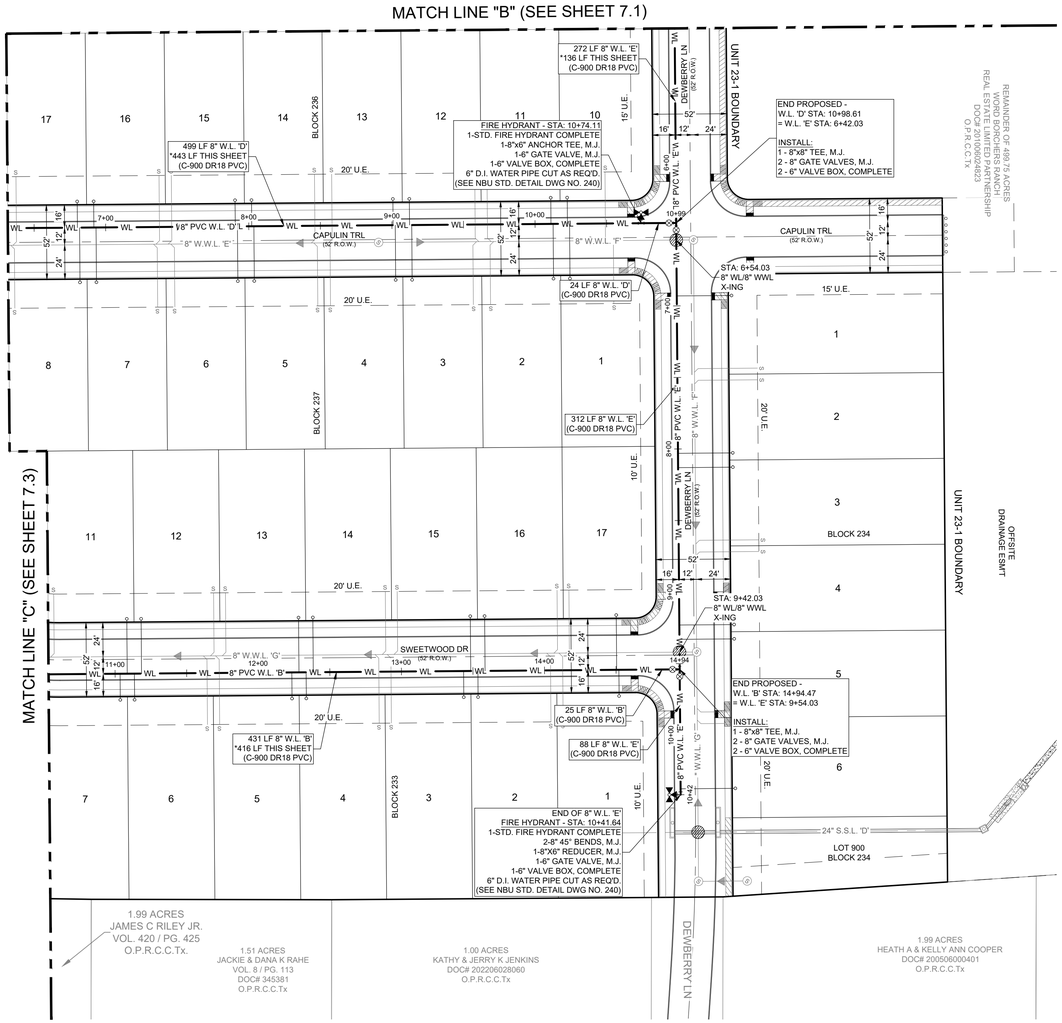

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811 Know what's below. Call before you dig.

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WATER LAYOUT (SHEET 3 OF 4)

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/21/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: s:\...\Water Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

SHEET NO.
7.2

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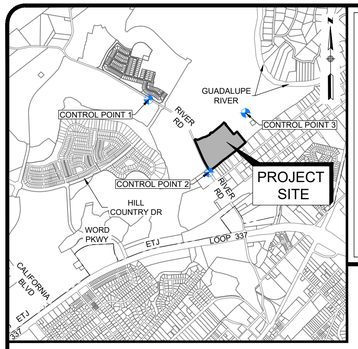
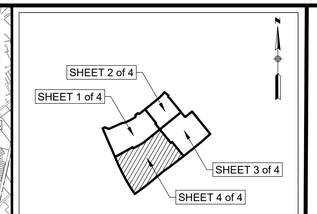
Plotted: Jul 07, 25 - 17:29
Last Modified: Jul 07, 25 - 16:58
LJA Surveying, Inc.



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

JOINT RESTRAINT TABLE

JOINT (TYPE)	PIPE MATERIAL	PIPE SIZE	RESTRAINT DISTANCE	LENGTH ALONG RUN
11.25°BEND	PVC	8"	3'	NA
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VERTICAL OFFSET SYSTEM RETURN	DI	8"	4' LOWER BENDS 21' UPPER BENDS	NA
GATE VALVE	PVC	8"	NA	NA

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RESTRAINT LENGTH VALUES:

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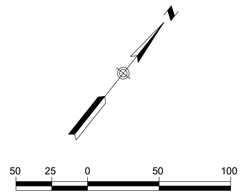
SOIL TYPE: ***CL***
SAFETY FACTOR: ***1.5***
TRENCH TYPE: ***5***
DEPTH OF BURY: ***4 FT.***
TEST PRESSURE: ***200 PSI***



SCALE IN FEET
SCALE: 1"=50'

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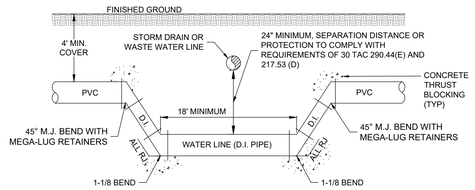
LUEs	EA	103
FIRE HYDRANT	EA	12
6" GATE VALVE	EA	12
8" GATE VALVE	EA	16
12" GATE VALVE	EA	3

LEGEND

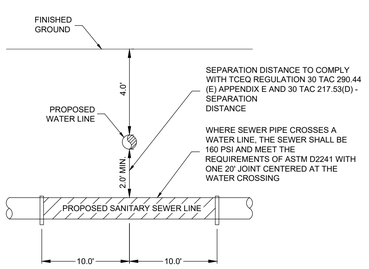
PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
		OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



TYPICAL WATER CROSSING DETAIL B
NTS

NOTES:

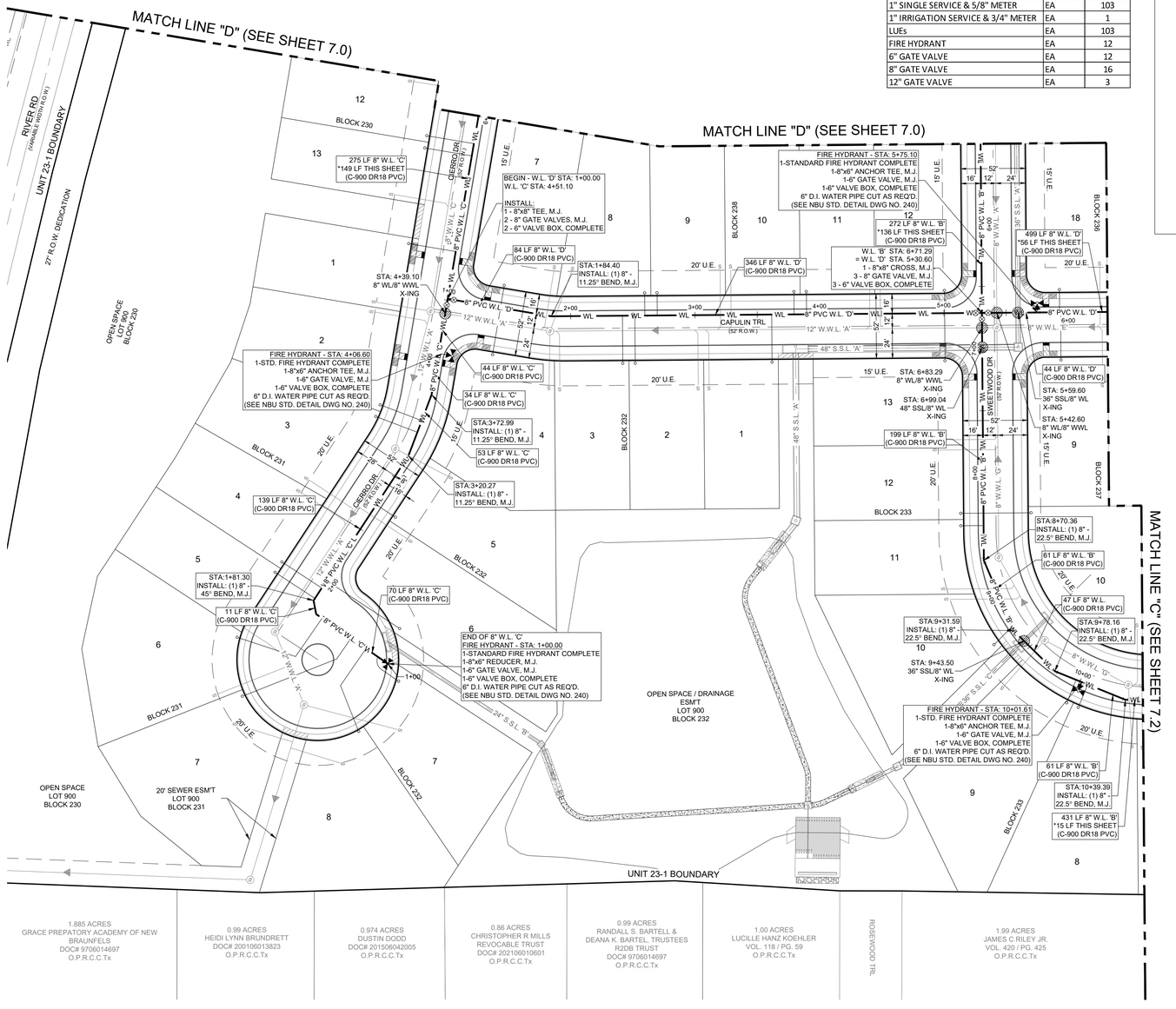
1. 18' MINIMUM WATER PIPE SEGMENT TO BE CENTERED UNDER WASTEWATER LINE.
2. WASTEWATER PIPE WITHIN NINE FEET OF WATER PIPE ON EITHER SIDE SHALL BE CONSTRUCTED USING AT LEAST 150 PSI PRESSURE RATED PIPE.
3. STEEL CASING TO BE USED UNDER STORM DRAIN.
4. ALL AMENITY CENTERS SHALL HAVE R/P BACKFLOW PREVENTION ASSEMBLY CALLED OUT AND DETAILED ON DOMESTIC SERVICES



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

NOTES:

1. ALL IRRIGATION SERVICES WITHIN RESIDENTIAL AREAS SHALL HAVE A REDUCED PRESSURE BACKFLOW PREVENTION ASSEMBLY (R/P) INSTALLED PRIOR TO PLACEMENT OF METER. ALL NEW FACILITIES ARE REQUIRED TO COMPLY WITH THE REQUIREMENTS OF THE LATEST NBU BACKFLOW POLICY.
2. ALL GATE VALVES 16" AND SMALLER SHALL BE RESILIENT SEATED GATE VALVES.
3. FOR PAVEMENT DESIGN SEE GEOTECHNICAL ENGINEERING REPORT.
4. MINIMUM DEPTH OF COVER FOR WATER LINES SHALL BE 48".
5. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION



NBU PRESSURE ZONE:

1. PROPOSED WATER MAIN IS WITHIN NBU PRESSURE ZONE 4.

NEW BRAUNFELS UTILITIES

1. R/P BACKFLOW PREVENTION ASSEMBLY TO BE INSTALLED WITH IRRIGATION METERS.
2. 1-INCH SERVICE LINES SHALL BE CONSTRUCTED OF TYPE K ANNEALED SEAMLESS COPPER TUBING MEETING THE REQUIREMENTS OF ASTM B88. AWWA C901 SDR9 COPPER TUBING SIZE HDPE MAY BE USED FOR 1-INCH SERVICE LINES WITH SPECIAL APPROVAL FROM NBU ONLY.
3. 2-INCH SERVICE LINES SHALL BE AWWA C901 SDR9 CTS HDPE. ALL COPPER AND HDPE TUBING MUST BE NSF 61 CERTIFIED.
4. CONTRACTORS SHALL INSTALL LINE STOPPERS AT THEIR COST FOR AN OUTAGE DURING CONSTRUCTION IF SYSTEM VALVES ARE NOT AVAILABLE OR THE EXISTING VALVES DO NOT FUNCTION. LINE STOPPERS WILL BE REQUIRED BASED ON THE FOLLOWING CRITERIA:
   a. IF THE NUMBER OF RESIDENTIAL CUSTOMERS AFFECTED IS GREATER THAN 20 AND EXPECTED TO LAST MORE THAN 4 HOURS.
   b. IF ANY COMMERCIAL CUSTOMERS ARE AFFECTED BY THE OUTAGE THEN THE USE OF LINE STOPPERS WILL BE DETERMINED ON A CASE BY CASE BASIS.
   c. IF ANY CRITICAL CARE CUSTOMERS ARE AFFECTED BY THE OUTAGE THEN THE USE OF LINE STOPPERS WILL BE DETERMINED ON A CASE BY CASE BASIS.
   d. SYSTEM CONDITIONS MAY REQUIRE A LINE STOPPER AND MAY NOT BE KNOWN UNTIL CONSTRUCTION COMMENCES.

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 AN 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 TESTED FOR DENSITY AND MOISTURE IN ACCORDANCE TEX-113-E, TEX-114-E, TEX-115-E. THE NUMBER AND LOCATION OF REQUIRED TESTS SHALL BE DETERMINED 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 BRAUNELS 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.

CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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 EMPLYOEE 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.

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

VERAMENDI PRECINCT 23 UNIT 1

WATER LAYOUT (SHEET 4 OF 4)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/21/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGP
DRAWING NAME: ...\Water Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **7.3**

FOR PERMIT

K:\SA3856 JGA Properties\2405 23-1 (145 Site Development Plans\GIS\C-Sheets\ub_Water Layout.dwg
Xref Nodes:
Last Modified: Jul. 07, 25 - 17:29
By: Heather Wood
Layout: Water Layout
Plotted: Jul. 08, 25 - 10:50 AM

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4. UTILITY TRENCH COMPACTION:

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NEW BRAUNFELS UTILITIES

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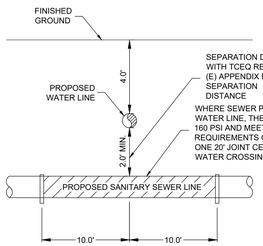
NBU PRESSURE ZONE:

1. PROPOSED WATER MAIN IS WITHIN NBU PRESSURE ZONE 4.



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

NOTES:

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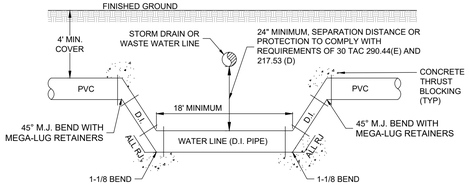

TYPICAL WATER CROSSING DETAIL B
NTS

NOTES:

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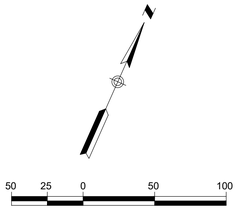
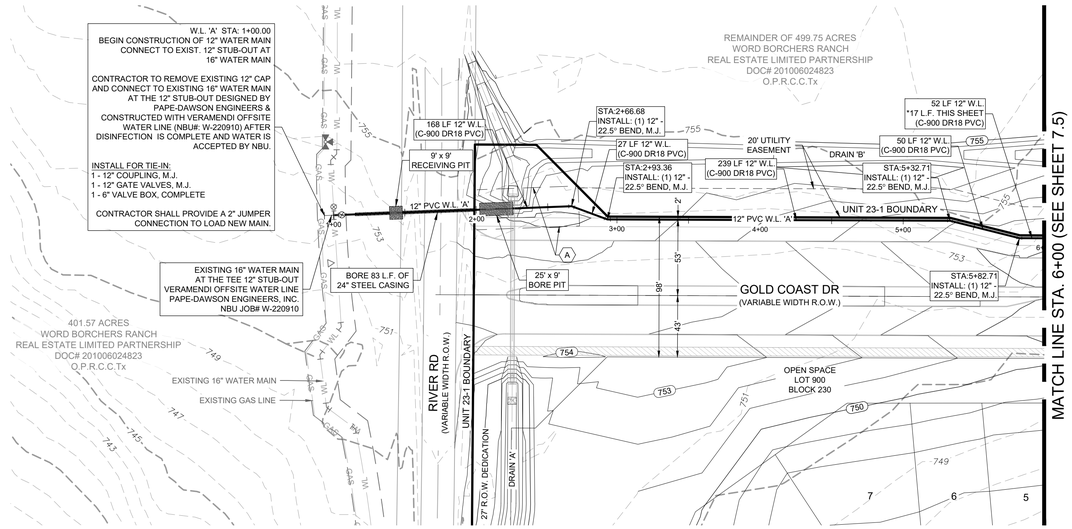
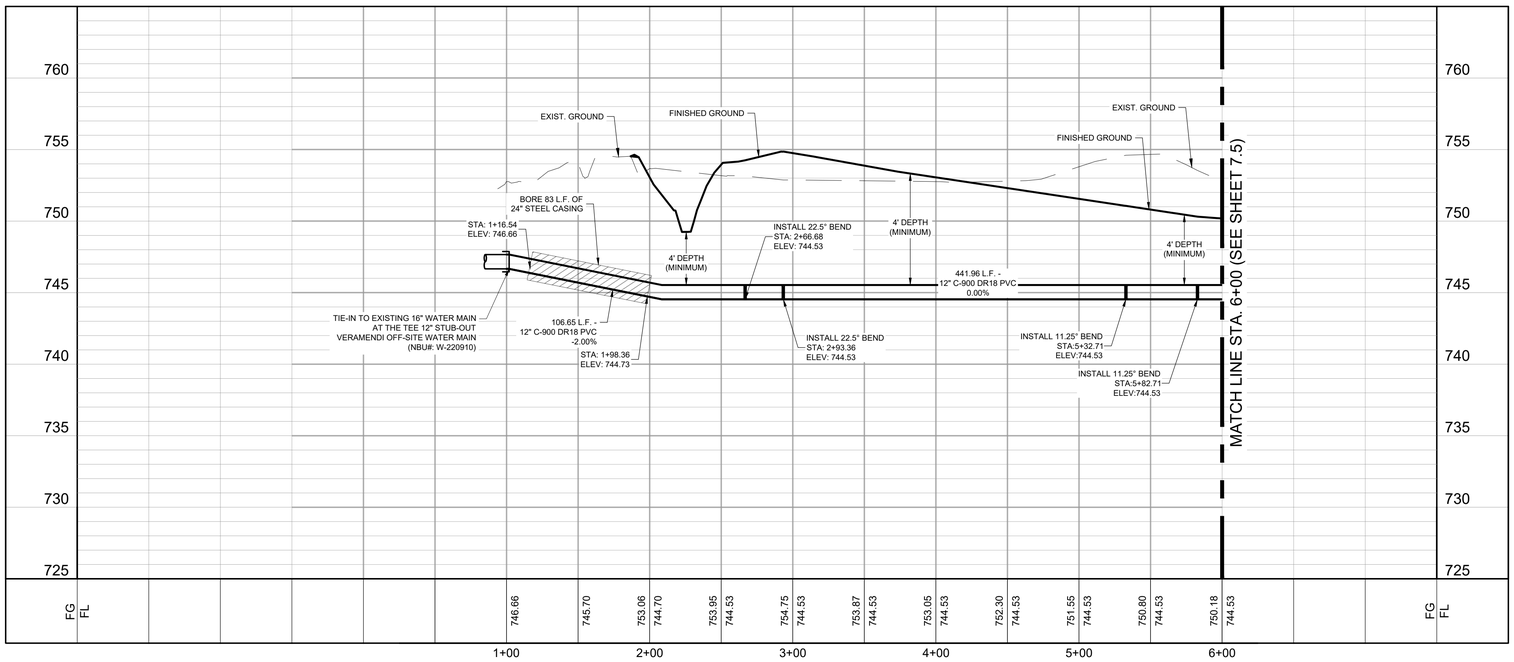
(A) VARIABLE WIDTH IREVOCABLE UTILITY & ACCESS ESM'T (5.435 ACRES)

WATER (NBU JOB NO. W-263129)		
ITEM	UNIT	QUANTITY
8" WATER LINE	LF	4899
12" WATER LINE	LF	1340
1" SINGLE SERVICE & 5/8" METER	EA	103
1" IRRIGATION SERVICE & 3/4" METER	EA	1
LUEs	EA	103
FIRE HYDRANT	EA	12
6" GATE VALVE	EA	12
8" GATE VALVE	EA	16
12" GATE VALVE	EA	3





WATER LINE 'A' GOLD COAST DR STA: 1+00 TO 6+00



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

CAUTION:

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VERAMENDI PRECINCT 23 UNIT 1
WATER LINE 'A' GOLD COAST DR PLAN & PROFILE
STA: 1+00 TO 6+00

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sh_Water Plan_Gold Coast Dr.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 7.4

FOR PERMIT

K:\SAN\SA Properties\3405.23-1405 Site Development Plans\DWG\Sheets\sh_Water P&P_Gold Coast Dr.dwg
User: jgomez
Last Modified: Jul 07, 25 - 10:20
Xref Scale Factor: 1
Plot Scale: 1in = 20' Plot: 11x17

VERAMENDI PRECINCT 23 UNIT 1
WATER LINE 'A' GOLD COAST DR PLAN & PROFILE
STA: 6+00 TO END

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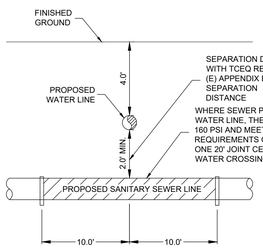
NBU PRESSURE ZONE:

1. PROPOSED WATER MAIN IS WITHIN NBU PRESSURE ZONE 4.



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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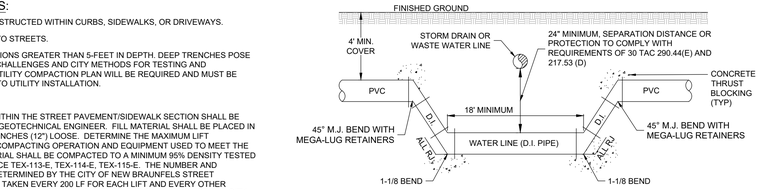

TYPICAL WATER CROSSING DETAIL B
NTS

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

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
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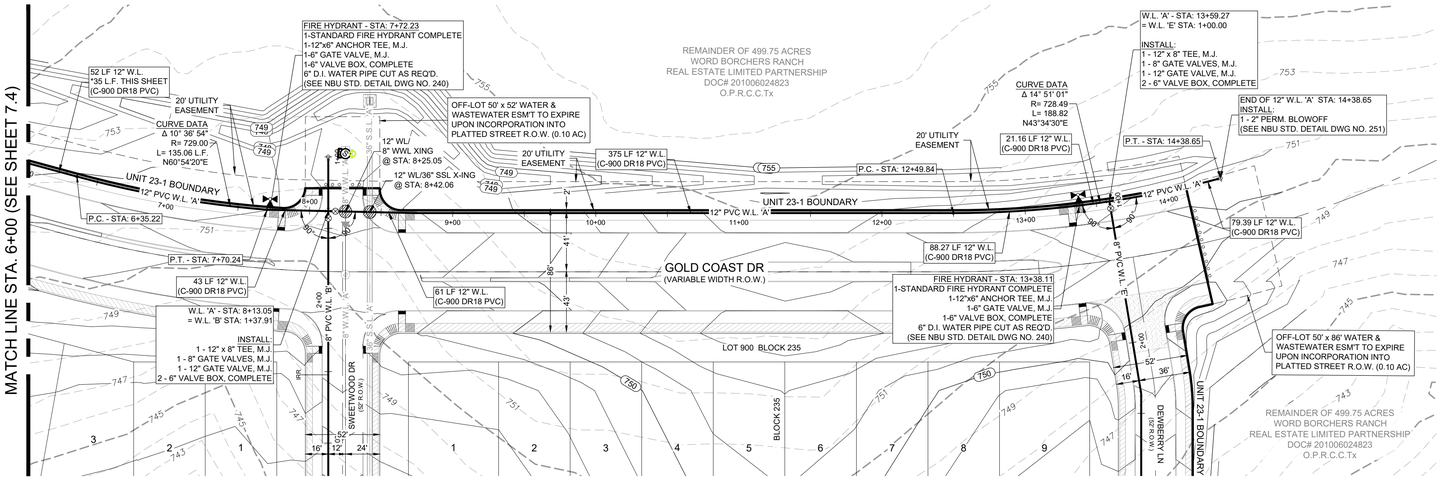

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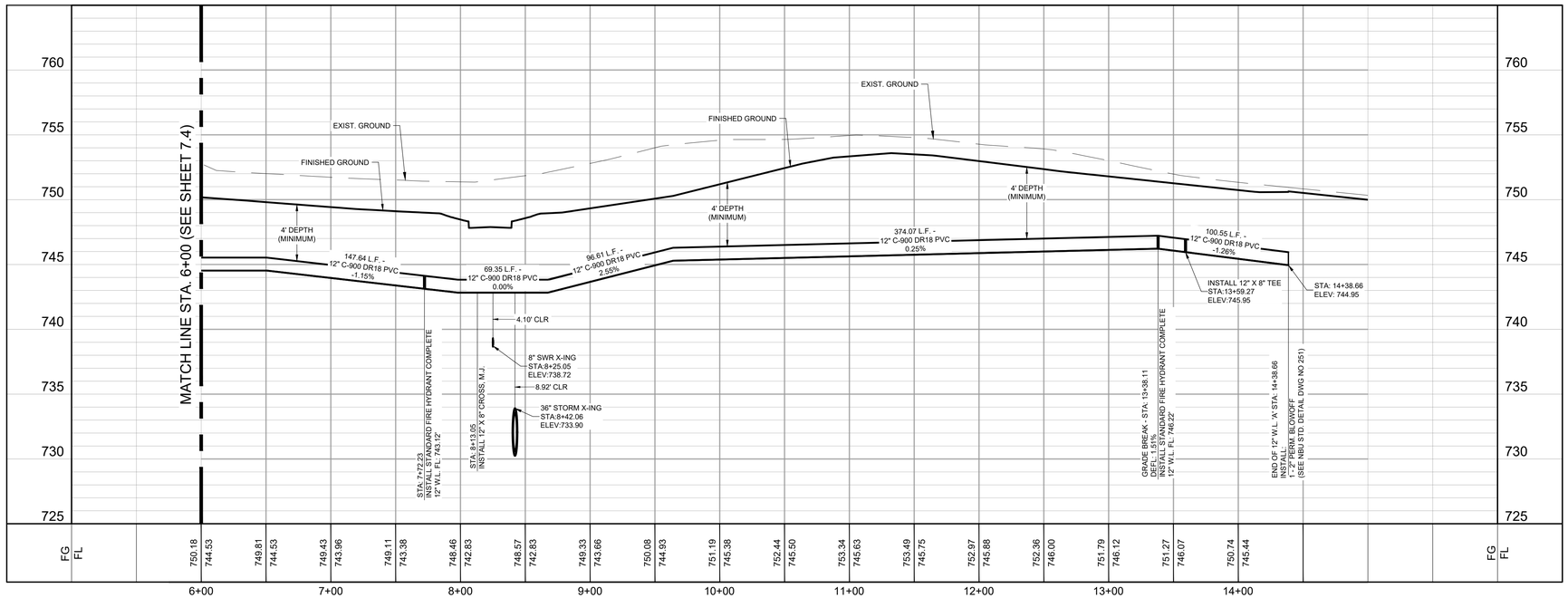
CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

WATER LINE 'A' GOLD COAST DR STA: 6+00 TO END



FOR PERMIT

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sh_Water P&P_Gold Coast Dr.dwg

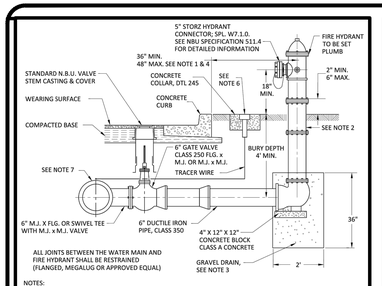
STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 7.5

K:\SA3856.KEA Properties\2405 23-1428 Site Development Plans\SWS\Sheets\sh_Water P&P_Gold Coast Dr.dwg
User: ngower
Last Modified: Jul 07, 25 - 16:20
Pw:\\dwr\Pw_ac\SA3856.KEA.acpc

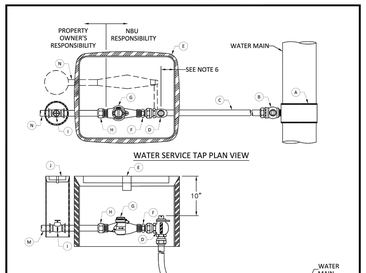


NOTES:

1. DIMENSIONS SHOWN ARE APPLICABLE FOR HYDRANTS INSTALLED BETWEEN CURB AND SIDEWALK. WHERE SIDEWALK ABUTS CURB, IN PUBLIC OR COMMERCIAL AREAS, THE OFFSET FROM BACK OF CURB SHALL BE 6' TO 9'. HYDRANTS ARE NOT TO BE PLACED IN SIDEWALK AREAS. SEE NEW BRAUNFELS UTILITIES STANDARD SPECIFICATIONS FOR LOCATION OF HYDRANT.
2. FOR BURY DEPTHS GREATER THAN 5', ONE BARREL EXTENSION NOT EXCEEDING 2' LENGTH SHALL BE INSTALLED DIRECTLY BELOW THE FIRE HYDRANT. NO MORE THAN ONE EXTENSION IS PERMITTED.
3. CRUSHED STONE OR GRAVEL SHALL BE PLACED AROUND THE BOTTOM OF THE HYDRANT FOR A RADIUS OF AT LEAST 12" AND EXTEND AT LEAST 12" ABOVE THE OUTLET. DO NOT BLOCK DRAIN HOLES.
4. PROVIDE MINIMUM CLEARANCE TO OBSTRUCTIONS AROUND FIRE HYDRANT PER NBU STANDARD DETAIL 242.
5. FIRE HYDRANTS SHALL MEET THE REQUIREMENTS OF NBU SPL W7.0.0.
6. TEST STATION SHALL MEET THE REQUIREMENTS OF NBU SPL W18.1.0. MAX DISTANCE BETWEEN TEST KITS SHALL BE 600 LF. CONCRETE COLLAR SHALL HAVE 1" MINIMUM CLEARANCE TO FIRE HYDRANT ASSEMBLY.
7. PROVIDE THRUST RESTRAINT OF WATER MAIN IN BOTH DIRECTIONS FROM TEE. RESTRAINT LENGTH SHALL BE PER THRUST RESTRAINT CALCULATIONS WITH SAFETY FACTOR NOT LESS THAN 1.5.

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 240

STANDARD FIRE HYDRANT INSTALLATION WITH 5" STORZ CONNECTOR



NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 2 | DRAWING NO. 202

STANDARD INSTALLATION DETAIL FOR 5/8" & 1" METER

MATERIALS LIST:

A. 1" SERVICE CLAMP
B. 1" CORPORATION STOP
C. 1" TYPE "K" COPPER WATER SERVICE PIPE
D. 1" X 1" ANGLE METER
E. METER BOX AND LID - PER SPL W-11.0

MATERIALS TO BE INSTALLED BY PLUMBER:

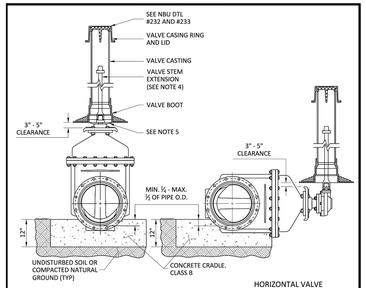
F. BRASS METER BUSHING - SIZE AS REQUIRED TO CONNECT ANGLE METER STOP TO METER. A 1" X 3/4" METER BUSHING IS REQUIRED AT THE ANGLE STOP FOR ALL 5/8" METERS.
G. WATER METER PURCHASED FROM NBU
H. BRASS WATER METER COUPLING MAKE IPT x SWIVEL COUPLING NUT
I. PROPERTY OWNER'S CUT OFF VALVE - 1" BRASS GATE VALVE
J. PROPERTY OWNER'S CUT OFF VALVE BOX AND LID - NDS #D109-G
K. TEMPORARY METER SPACER (REQUIRED TO ASSURE METER WILL FIT APPROPRIATELY)
L. 1" WOODEN DOWEL (SHOW ADDRESS ON DOWEL USING WATERPROOF MARKER)
M. 1" PIPE MEETING CITY OF NEW BRAUNFELS PLUMBING CODE REQUIREMENTS
N. FUTURE IRRIGATION CONNECTION (SEE NOTE 8)

NOTES:

1. SERVICE PIPE SHALL BE ANNEALED SEAMLESS TYPE "K" COPPER TUBING MEETING THE CURRENT ASTM B88 STANDARD WITH NO SWEAT OR SOLDERED JOINTS. PIPE SHALL BE PLACED IN A STRAIGHT HORIZONTAL ALIGNMENT AND ALLOWED TO RELAX AND "SNAKE" LOOSELY IN THE TRENCH.
2. SERVICE SADDLE SHALL BE WRAPPED COMPLETELY WITH 8 MIL POLYETHYLENE FILM.
3. TOP OF BOXES MUST BE 2" ABOVE GROUND OR FLUSH WITH PAVEMENT SURFACE.
4. BEDDING AND BACKFILL FOR ALL PIPING, TUBING, AND APPURTENANCES SHALL BE PER NBU SPECIFICATIONS.
5. METER BOX LOCATIONS SHALL BE AS PER DETAILS 402 THROUGH 409, UTILITY LAYOUTS. METER BOXES SHALL NOT BE PLACED IN SIDEWALKS, DRIVEWAYS, OR VEHICULAR TRAFFIC AREAS.
6. ANGLE STOP TO BE PLACED A MAXIMUM OF 4" FROM BACK OF BOX THAT FACES CURB. TOP OF ANGLE STOP SHOULD BE A MINIMUM OF 10" FROM THE TOP OF METER BOX.
7. METER SIZES TO BE SHOWN ON PLANS.
8. APPROPRIATE BACKFLOW PREVENTION ASSEMBLY REQUIRED AS DETERMINED BY NBU WATER PROTECTION SPECIALIST. BACKFLOW PREVENTION ASSEMBLY SHALL BE LOCATED AS CLOSE AS POSSIBLE TO THE NBU IRRIGATION WATER METER WITH NO TEES OR CONNECTION BETWEEN THE TWO. CONTACT A WATER PROTECTION SPECIALIST AT BACKFLOW@NBUTEXAS.COM.

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 2 OF 2 | DRAWING NO. 202

STANDARD INSTALLATION DETAIL FOR 5/8" & 1" METER



VERTICAL VALVE

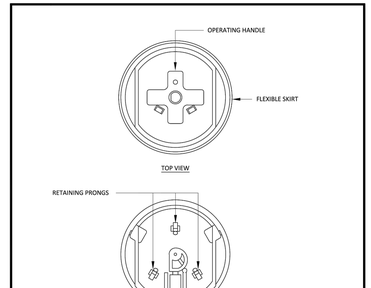
HORIZONTAL VALVE
USE ONLY WHEN SPECIFIED IN DRAWINGS AND WITH NBU STAFF APPROVAL

NOTES:

1. WELD SOCKET 2' 3"X 2" DEEP TO 1" SCH, 40 CARBON STEEL ROUND STEM EXTENSION, FITTED ON OPERATING NUT. [SCH.80 FOR LENGTHS OVER 10'.]
2. VALVE CASTING SHALL BE 6" DI PIPE WITH BELL OR COLLAR CENTERED OVER VALVE BOOT.
3. NUT AT TOP OF VALVE EXTENSION ROD SHALL BE SQUARE 2" LONG WELDED TO TOP OF ROD.
4. VALVE STEM EXTENSIONS ARE REQUIRED ON ALL VALVES THAT EXCEED 3' DEEP FROM FINISHED GRADE. VALVE EXTENSIONS SHALL BE PLACED SUCH THAT THE EXTENSION NUT IS BETWEEN 12" AND 18" FROM FINISHED GRADE.
5. TRUMBULL VALVE BOX ALIGNMENT DEVICE OR APPROVED EQUAL.

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 230

TYPICAL GATE VALVE

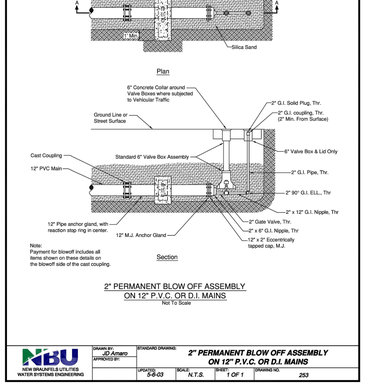


NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 234

DEBRIS CAP INSTALLATION

NBU Water Notes

1. The point of delivery for an owned and maintained water line is typically the domestic or irrigation water meter, fire line up to the containment backflow device, or hydrant meter or as determined by NBU.
2. Water infrastructure must be constructed in accordance with the NBU Water Connection Policy.
3. All water mains shall be constructed of AWWA C900 DR 14 PVC, AWWA C900 DR 18 PVC or minimum CL 250 Ductile Iron Pipe.
4. All residential water services shall be single services constructed of 1-inch ASTM B88 Type K Copper tubing. 1-inch AWWA C901 SDR9 CTS polyethylene tubing may be permitted with special approval from NBU only.
5. All 2-inch service lines shall be constructed of AWWA C901 SDR9 CTS polyethylene tubing.
6. Water mains shall have a minimum of 48 inches of cover to finished grade. Concrete encasement will be required if minimum cover cannot be met.
7. Pipe bedding of water lines shall be compliant with NBU specification No. 120, "Utility Trenching and Backfill".
8. Contractor shall install line stoppers at their cost for an outage during construction if system valves are not available or the existing valves do not function. Line stoppers will be required based on the following criteria:
   a. If the number of residential customers affected is greater than 20 and expected to last more than 4 hours.
   b. If any commercial customers are affected by the outage then the use of line stoppers will be determined on a case by case basis.
   c. If any critical care customers are affected by the outage then the use of line stoppers will be determined on a case by case basis.
   d. System conditions may require a line stopper and may not be known until construction commences.
9. Contractor will keep the area on top of, around, and within the water meter box free of all objects and debris.
10. Placement of meter boxes or vaults in sidewalks, driveways, drive aisles, parking areas, or other areas exposed to vehicular traffic is not permitted. Any meter boxes or vaults set in these areas will be relocated at the contractor's and/or developer's expense.
11. Meter boxes or vaults must be set at proposed grade. Any meter boxes that are not set at the final grade will be adjusted at contractor's and/or developer's expense.
12. Meter boxes for 5/8-inch and 1-inch meters must be DFW Plastics DFW38C-14-AF1MP.
13. Meter boxes for 1.5" meters must be DFW Plastics DFW65C-14-AF1MP.
14. Meter boxes for 2" meters must be DFW Plastics DFW1730F-12-AF1MP.
15. Thrust blocks are not permitted without special approval. Joints must be restrained with restraining systems approved by NBU and restraint length shall be submitted to NBU at the time of plan submittal.
16. Contractor shall install tracer wire on top of non-ferrous water mains in accordance with NBU specifications. Tracer wire should run from valve to valve and exit at a tracer wire access point. The tracer wire should be attached to the top of the pipe using tape. Excess wire should be coiled within the tracer wire access point riser.
17. Contractor shall coordinate with the assigned water/wastewater inspector for completion of the Field Acceptance Checklist. All testing and acceptance shall conform to NBU Specifications, including but not limited to:
    a. Bacteriological Testing
    b. Hydrostatic Testing (performed valve to valve)
18. The NBU water system shall be protected from hazards with appropriate backflow prevention assemblies installed on all irrigation systems, fire suppression systems and multi-unit complexes along with multi-level properties on the domestic meter containment. NBU can assist with the decision on appropriate backflow assemblies on a case-by-case basis. Contact NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com
19. All backflow prevention assemblies shall be tested upon installation and reports sent to NBU via the online tracking system. Contact an NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com
20. All residential and commercial properties shall have a Customer Service Inspection certificate (CSI Inspection) completed upon completion of the building or home structure. Contact an NBU backflow prevention specialist for more details. Email questions to crossconnection@nbutexas.com

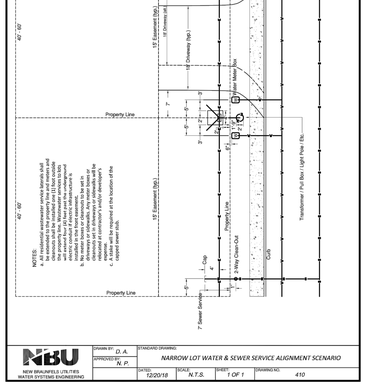


NOTES:

1. DEBRIS CAP SHALL BE INSTALLED AS CLOSE UNDER THE CAST IRON COVER WITHOUT INTERFERING WITH COVER OPERATION.
2. FLEXIBLE SKIRT SHALL BE TRIMMED TO PROVIDE A SMOOTH CONTACT WITH THE INTERIOR DIAMETER OF THE PIPE.
3. DEBRIS CAP SHALL MEET THE REQUIREMENTS OF NBU SPL W20.1.0.

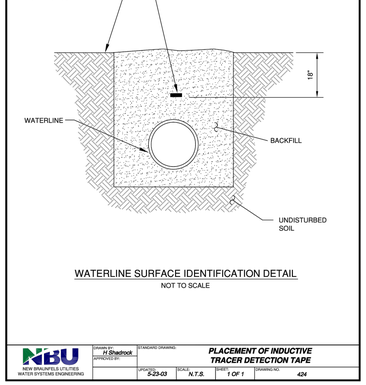
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 2 OF 2 | DRAWING NO. 234

DEBRIS CAP INSTALLATION



NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: D. A. | APPROVED BY: N. P. | STANDARD DRAWING: | DATED: 12/20/18 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 410

SERVICE TAP: METER BOX PLACEMENT BETWEEN: SIDEWALK AND CURB



ELEVATION
2" BLOW OFF ASSEMBLY ON 12" P.V.C. OR D.I. MAINS

ELEVATION
2" BLOW OFF ASSEMBLY ON 8" P.V.C. OR D.I. MAINS

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: A. WILLARD | STANDARD DRAWING: | UPDATED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 251

2" BLOW OFF ASSEMBLY ON 8" & 12" P.V.C. OR D.I. MAINS

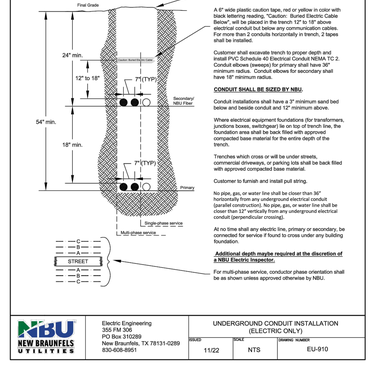
CARRIER PIPE (DIAMETER)	ENCASEMENT PIPE MIN. DIAMETER	MINIMUM ENCASEMENT PIPE THICKNESS (INCHES)
6"	16"	1/4 0.2500
8"	18"	1/4 0.2500
12"	24"	3/8 0.3750
16"	30"	7/16 0.4375
20"	36"	1/2 0.5000
24"	42"	1/2 0.5000
30"	48"	1/2 0.5000

NOTES:

1. CASING SPACER CONFIGURATION AND SPACING SHALL BE AS SHOWN ON MANUFACTURER'S DRAWINGS FOR SPECIFIC WORK; THESE MUST BE ACCEPTABLE TO NEW BRAUNFELS UTILITIES.
2. CASING SPACERS SHALL BE AS APPROVED ON NBU STANDARD PRODUCTS LIST ITEM W17.0.0.
3. ALL WATER MAIN AND FORCE MAIN CARRIER PIPE JOINTS INSIDE ENCASEMENT MUST BE RESTRAINED WITH APPROVED JOINT RESTRAINTS PER NBU SPL W9.2.0.
4. PROPOSED ENCASEMENT DIAMETERS SHALL BE AS SHOWN ON THE CONSTRUCTION PLANS, BUT IN NO CASE SHALL THE ENCASEMENT DIAMETER BE LESS THAN SHOWN IN THE TABLE ABOVE. CASING PIPE SHALL BE SIZED PER PROJECT CONDITIONS, CARRIER PIPE MATERIAL, AND JOINT RESTRAINT SYSTEM.

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: EWL | APPROVED BY: H Shadrock | STANDARD DRAWING: | ISSUED: 2/1/24 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 420

ENCASEMENT DETAIL WITH CASING SPACERS



2" TEMPORARY BLOW OFF ASSEMBLY ON 8" P.V.C. OR D.I. MAINS

Not To Scale

NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: JD Amaro | APPROVED BY: | STANDARD DRAWING: | UPDATED: 5-8-03 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 252

2" TEMPORARY BLOW OFF ASSEMBLY ON 8" P.V.C. OR D.I. MAINS

Note:
Payment for blowoff includes all items shown on these details on the blowoff side of the cast coupling.

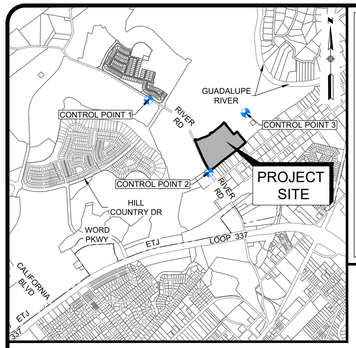
2" PERMANENT BLOW OFF ASSEMBLY ON 12" P.V.C. OR D.I. MAINS

Not To Scale

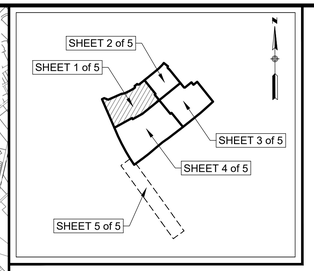
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING | DRAWN BY: JD Amaro | APPROVED BY: | STANDARD DRAWING: | UPDATED: 5-8-03 | SCALE: N.T.S. | SHEET: 1 OF 1 | DRAWING NO. 253

2" PERMANENT BLOW OFF ASSEMBLY ON 12" P.V.C. OR D.I. MAINS

Property Line
40' - 60'
15' Easement (typ)
3' Chimney (typ)
10' Chimney (typ)
Water Meter
7'
6'
4'
3' Sewer Service
4" Drain
2" Drain
4" Drain
2" Drain
4" Drain
2" Drain



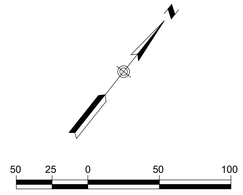
LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

HORIZONTAL AND VERTICAL CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	FULL DESCRIPTION
1	13,818,446.35	2,242,690.14	738.93'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
2	13,819,854.81	2,245,002.60	732.78'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
3	13,817,983.33	2,246,074.64	736.64'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"

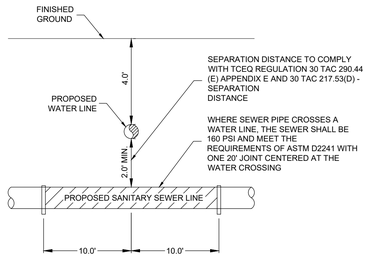


SCALE IN FEET
SCALE 1" = 50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

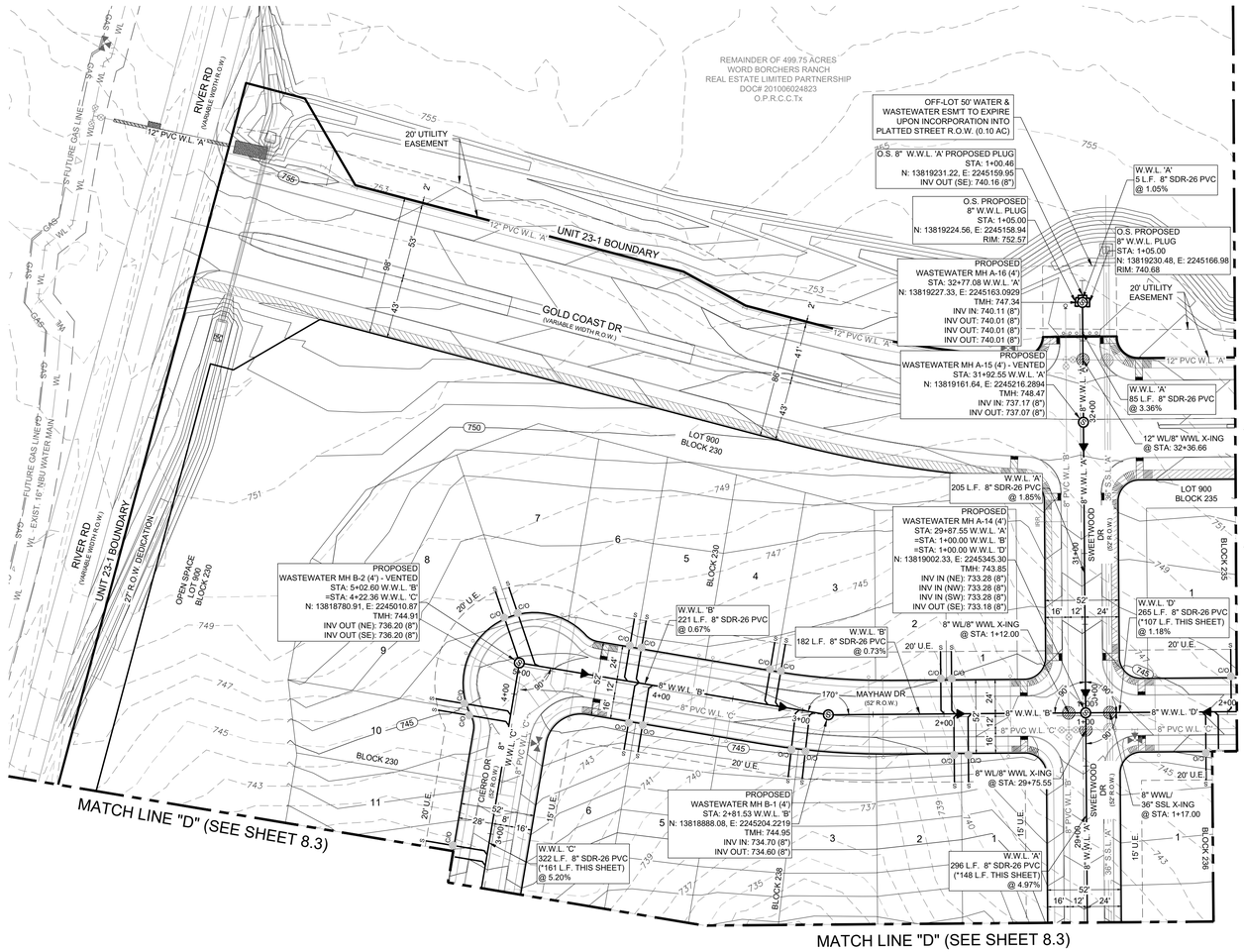
WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
12" SANITARY SEWER PIPE	LF	2592
8" SANITARY SEWER PIPE	LF	3824
6" WASTEWATER SERVICE	EA	103
LUEs	EA	103
48" MANHOLE	EA	21



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

NOTES:

1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PRE TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
7. 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).
8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLES MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH A CORROSION RESISTANT MATERIAL.



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CAUTION: CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (1 OF 5)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 80_Wastewater_Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.0**

FOR PERMIT

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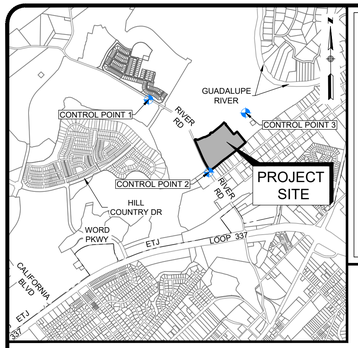
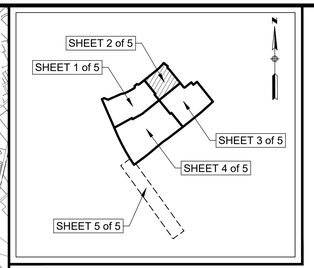
User: ngower
Last Modified: Jul 07, 25 - 17:38
Xref Dependencies: Jul 07, 25 - 14:43



LOCATION MAP
N.T.S.



SHEET INDEX
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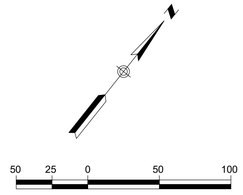

SCALE IN FEET
SCALE 1" = 50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
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WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
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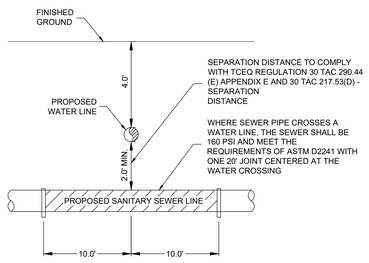

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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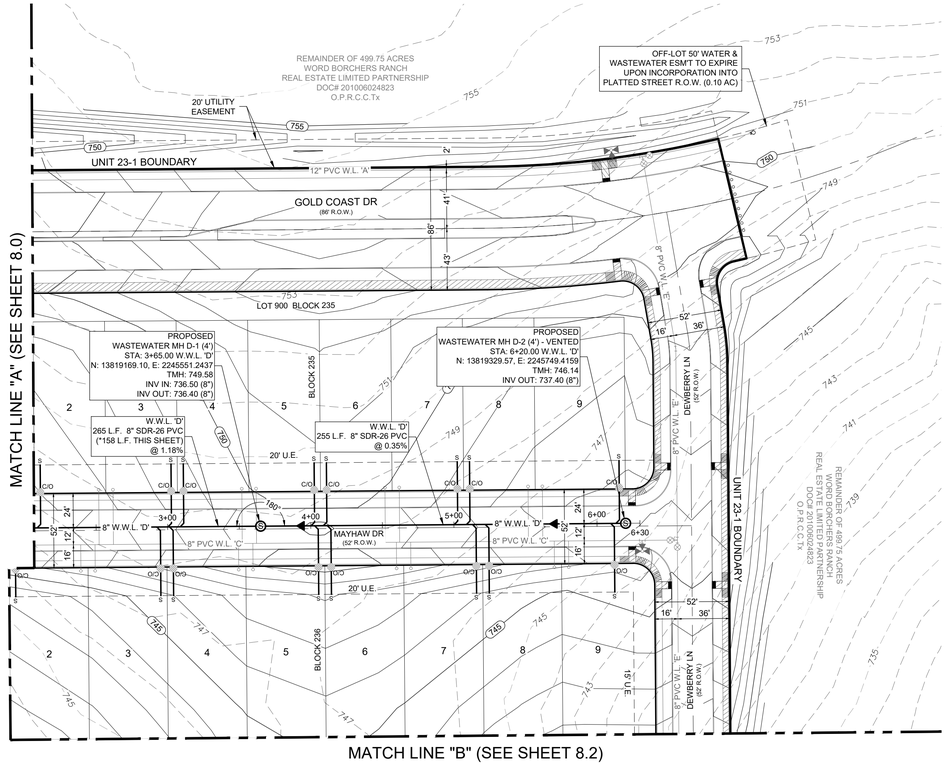

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (2 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sht_WastewaterLayout.dwng

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.1

FOR PERMIT

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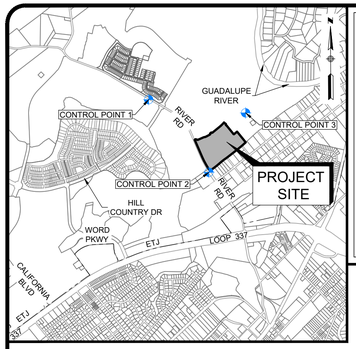
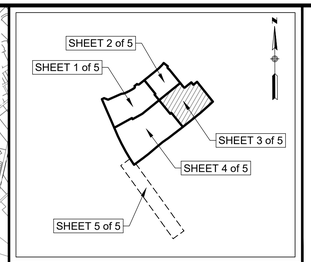
User: ngower
Last Modified: Jul 07 25 - 17:38
Plot Date/Time: Jul 08 25 - 08:13



LOCATION MAP
N.T.S.



SHEET INDEX
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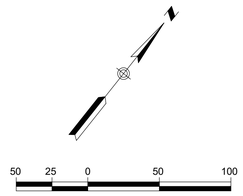

SCALE IN FEET
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LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
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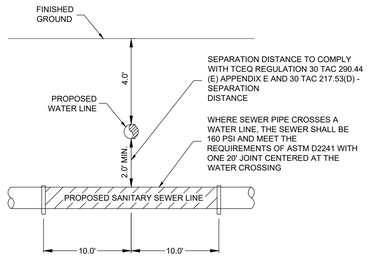

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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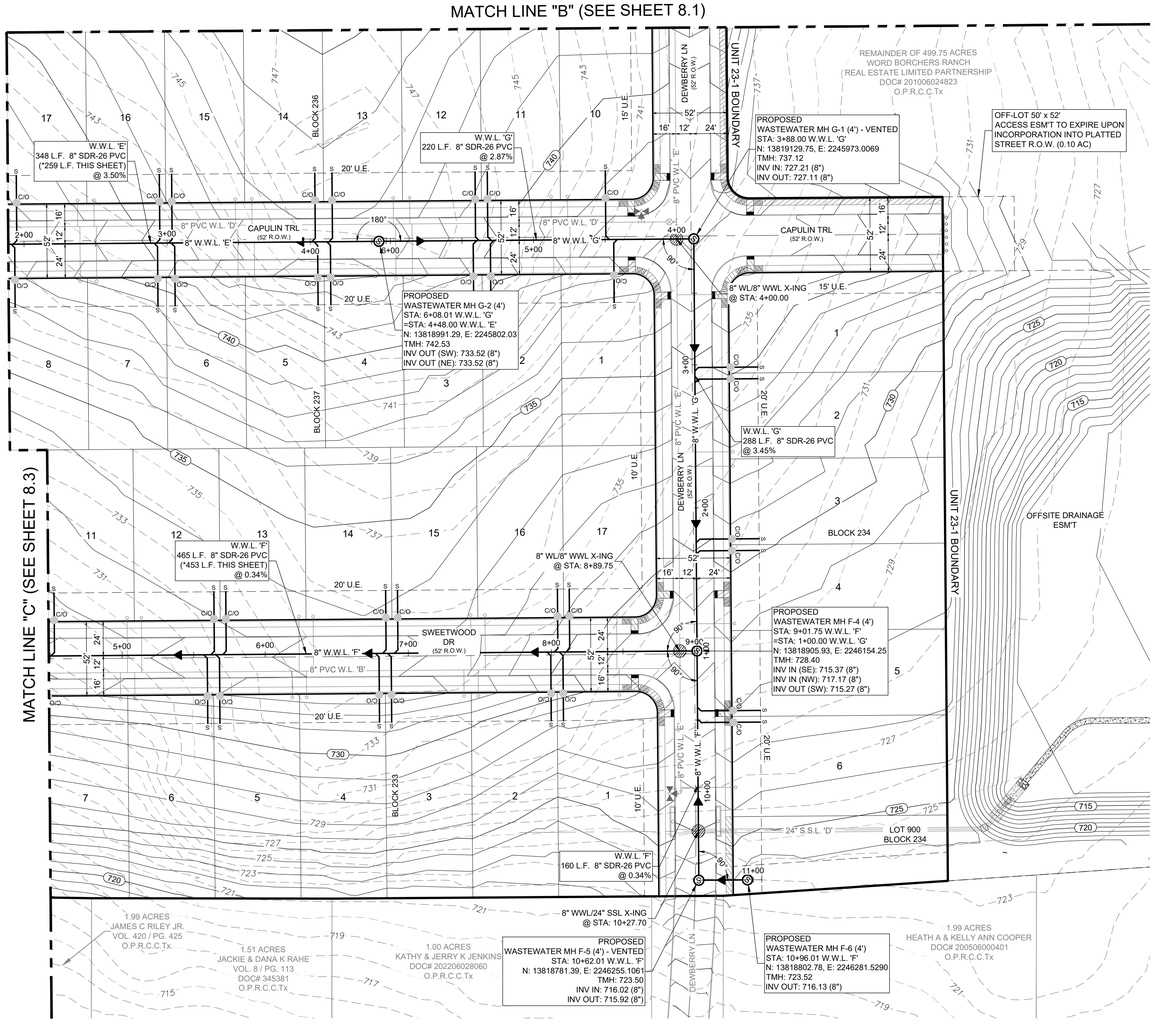
MATCH LINE "B" (SEE SHEET 8.1)



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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (3 OF 5)

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sht_Wastewater_layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.2

FOR PERMIT

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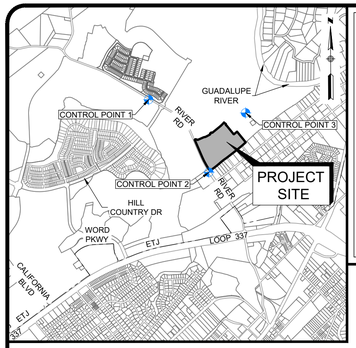
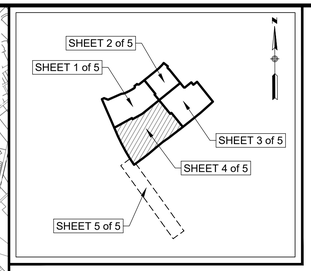
User: hgower
Last Modified: Jul. 07, 25 - 17:38
Plot Modified: Jul. 08, 25 - 11:13



LOCATION MAP
N.T.S.



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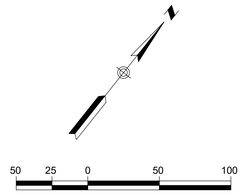

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LEGEND

PROPOSED	EXISTING	
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WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
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		WATER VALVE
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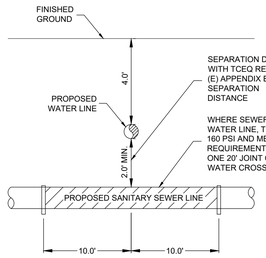

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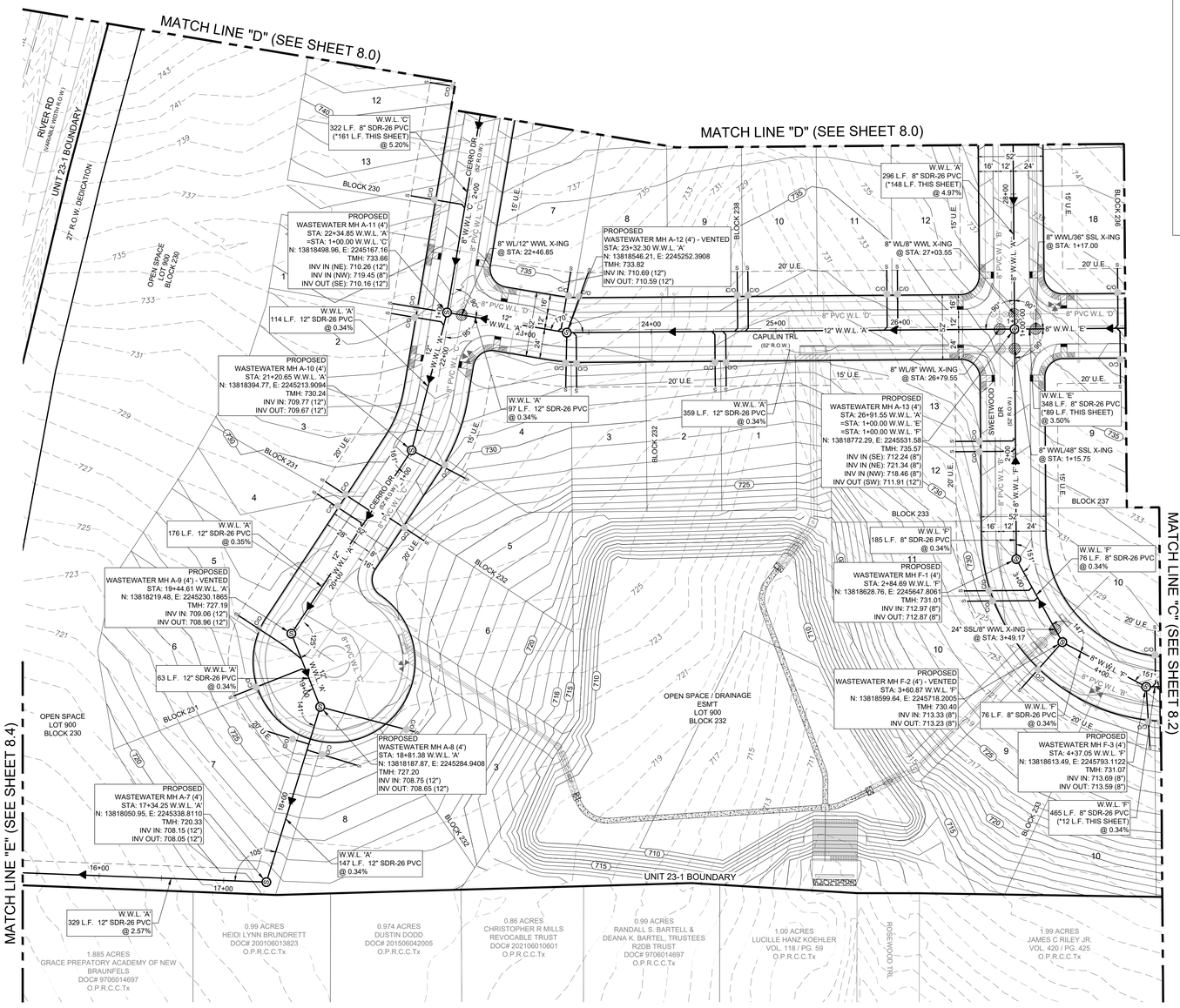

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (4 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE:	7/8/2025
DESIGNED BY:	NG
DRAWN BY:	HEW
CHECKED BY:	PGF
DRAWING NAME:	s:\c_d\wastewater_layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.3

FOR PERMIT

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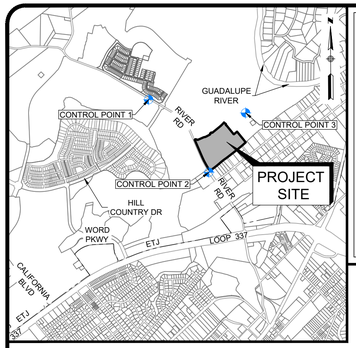
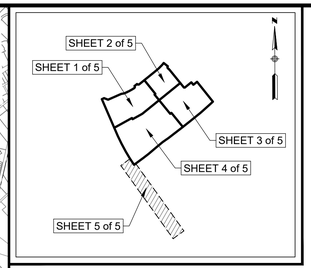
User: tgower
Last Modified: Jul. 07, 25 - 17:28
Plotted/Saved: Jul. 08, 25 - 14:13:20

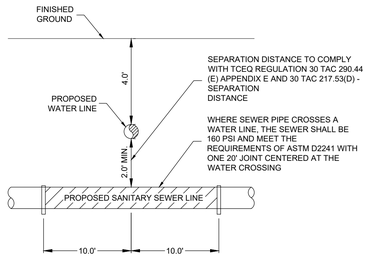


LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
12" SANITARY SEWER PIPE	LF	2592
8" SANITARY SEWER PIPE	LF	3824
6" WASTEWATER SERVICE	EA	103
LUEs	EA	103
48" MANHOLE	EA	21



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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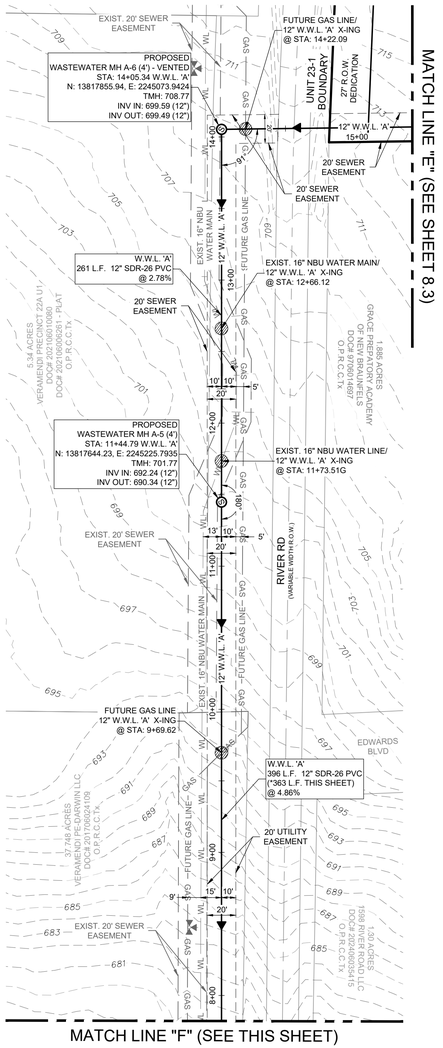
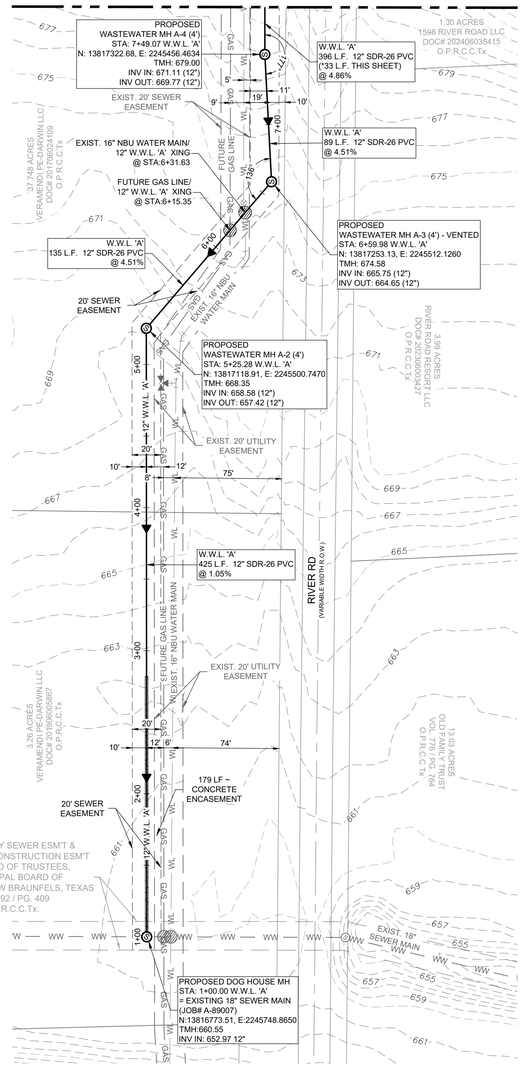
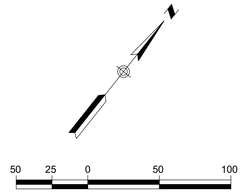
HORIZONTAL AND VERTICAL CONTROL POINTS				
POINT #	NORTHING	EASTING	ELEVATION	FULL DESCRIPTION
1	13,818,446.35	2,242,690.14	738.93'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
2	13,819,854.81	2,245,002.60	732.78'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
3	13,817,983.33	2,246,074.64	736.64'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"



MATCH LINE "F" (SEE THIS SHEET)





LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (5 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 08_Wastewater_Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.4**

FOR PERMIT

K:\SA3856 (LJA Properties\3405 23-1426 Site Development Plans\DWG\Sheets\8_Wastewater_Layout.dwg
User: jgomez
Last Modified: Jul 07, 25 - 17:35
Xref Attached: Jul 26, 24 - 14:10:39

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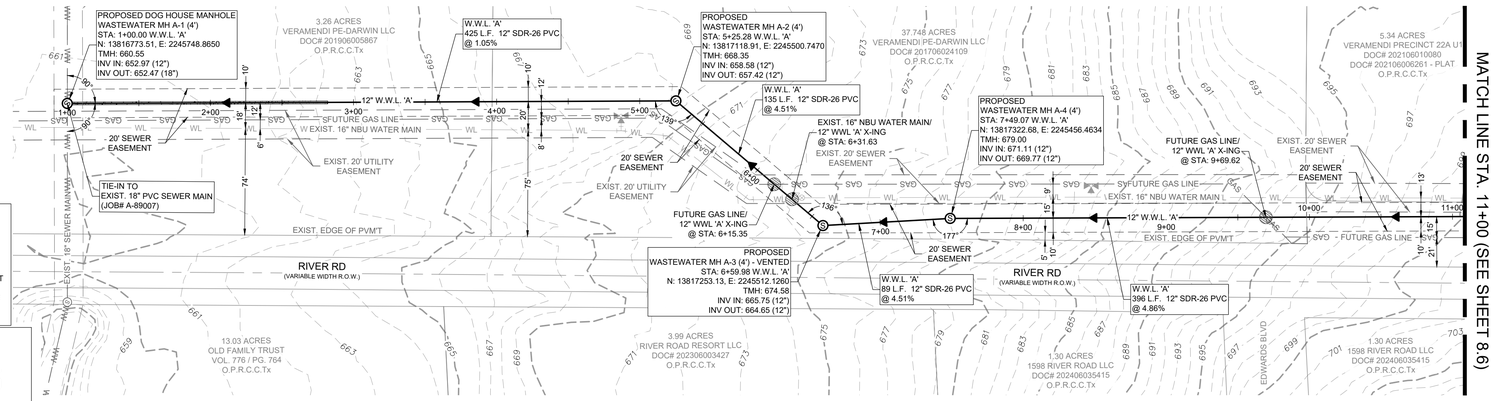

WASTEWATER LINE 'A' STA. 1+00 TO STA. 11+00

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
	GV	WATER METER / GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
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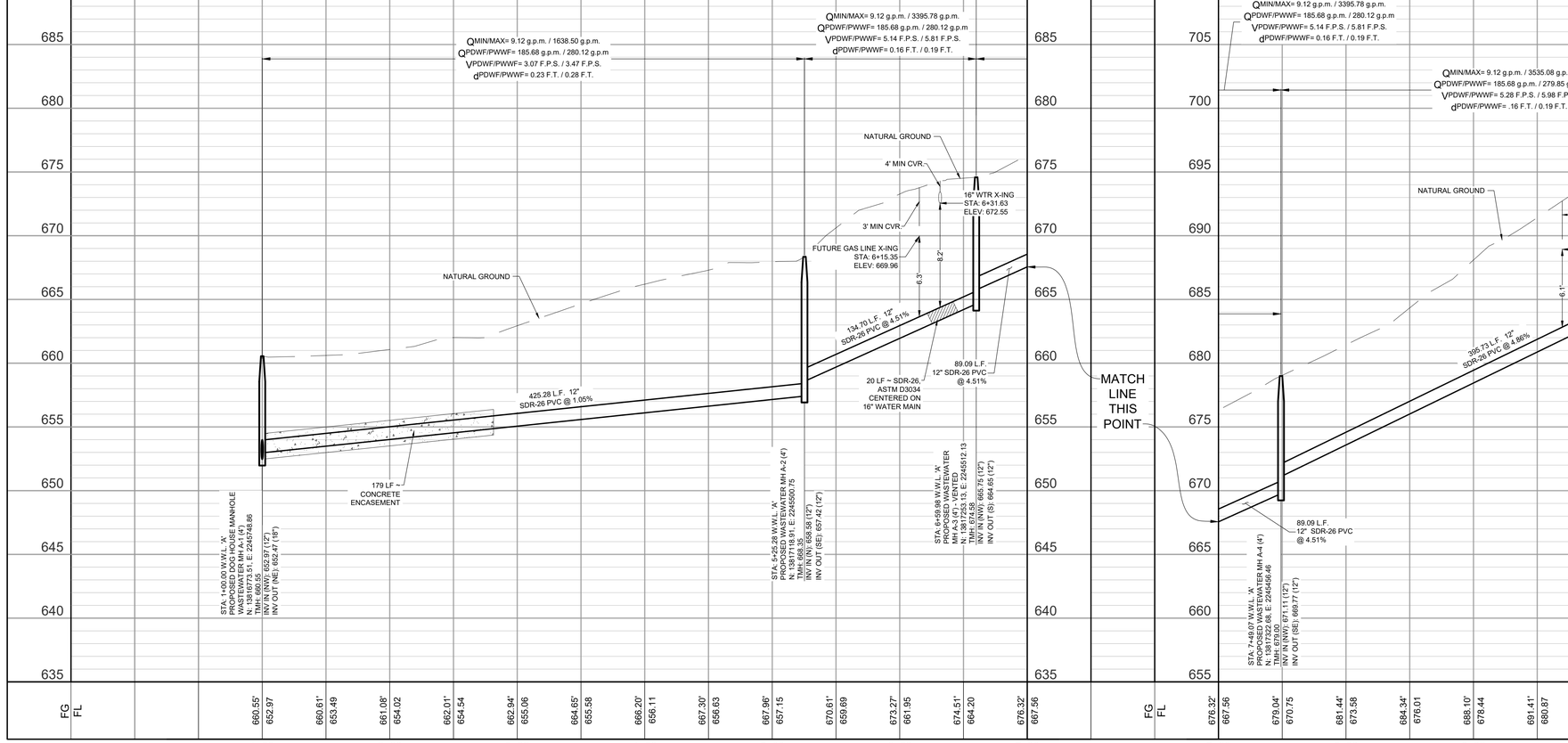

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 1+00 TO STA. 11+00

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: s:\...\WW_1A P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
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San Antonio, Texas 78230
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LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.5

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User: jogorman
Last Modified: Jun. 14, 25 - 20:28
Last Saved: Jul. 08, 25 - 14:14:47

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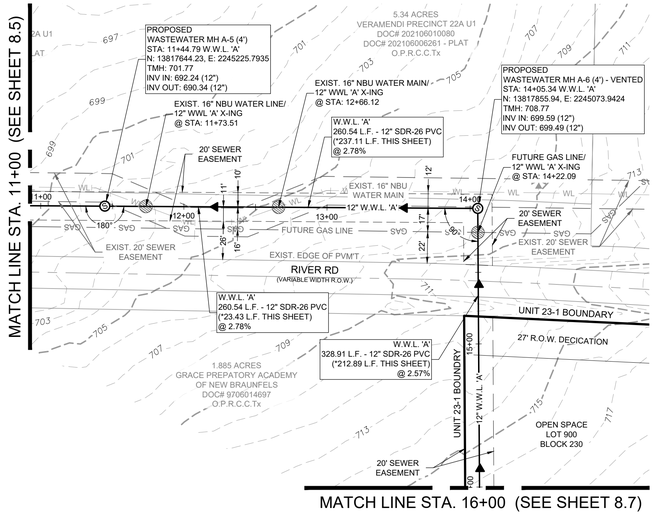
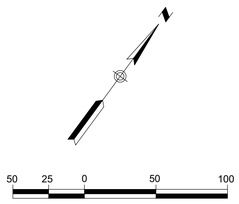


WASTEWATER LINE 'A' STA. 11+00 TO STA. 16+00



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
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OHE	OHE	OVERHEAD ELECTRIC
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	U.E.	UTILITY EASEMENT
	VOL	VOLUME
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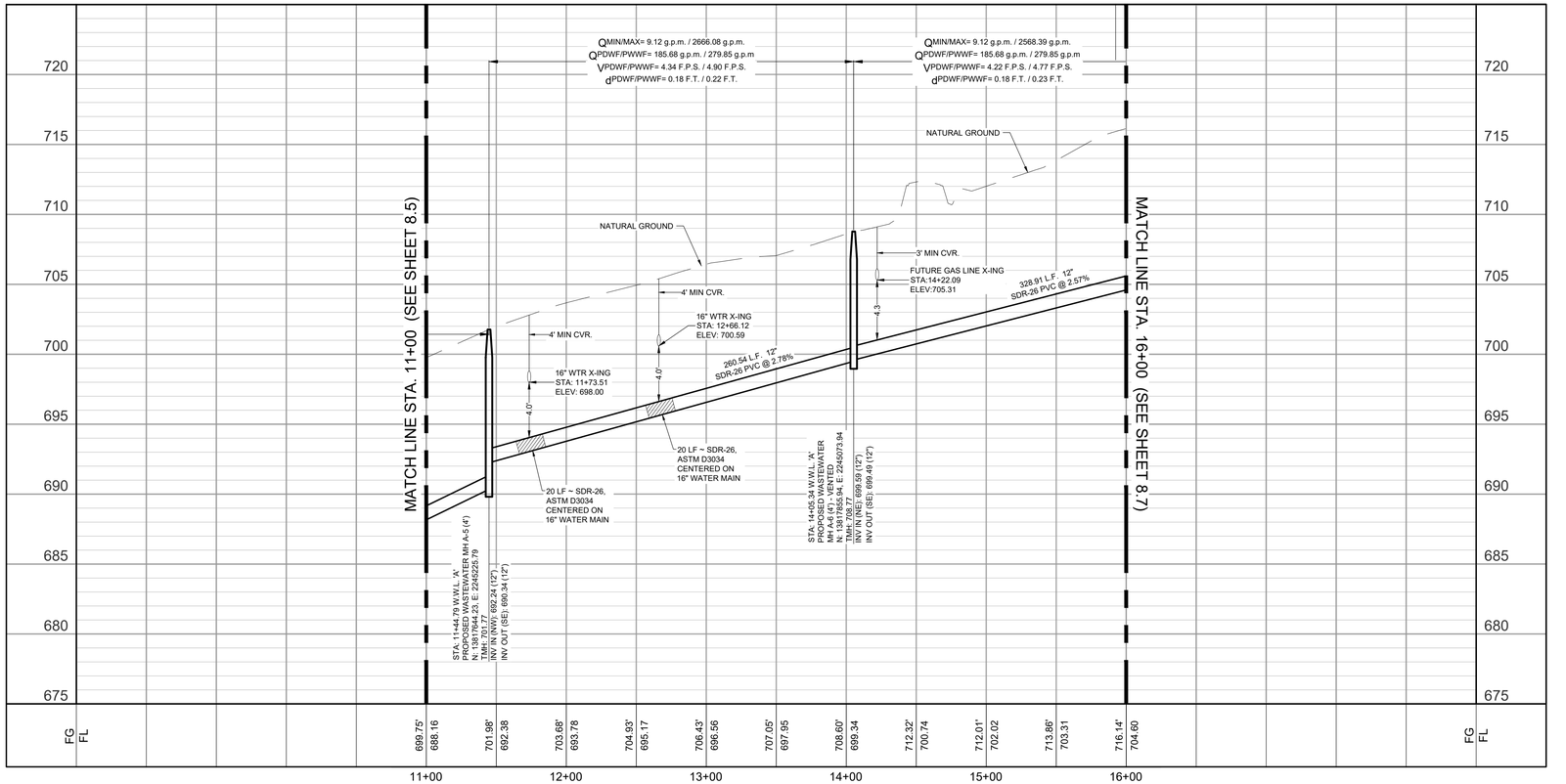

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sh_LWWL 'A' P&P.dwg

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NICHOLAS GOWER
139260
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07/08/2025

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TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.6**

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 11+00 TO STA. 16+00

K:\SA3856.ASA Properties\2405.23-1429 Site Development Plans\DWG\Sheetset, WWL 'A' P&P.dwg
User: ngower
Last Modified: Jun. 14, 25 - 20:38
Plotted on: Jul. 08, 25 - 14:14:46

GENERAL NOTES:

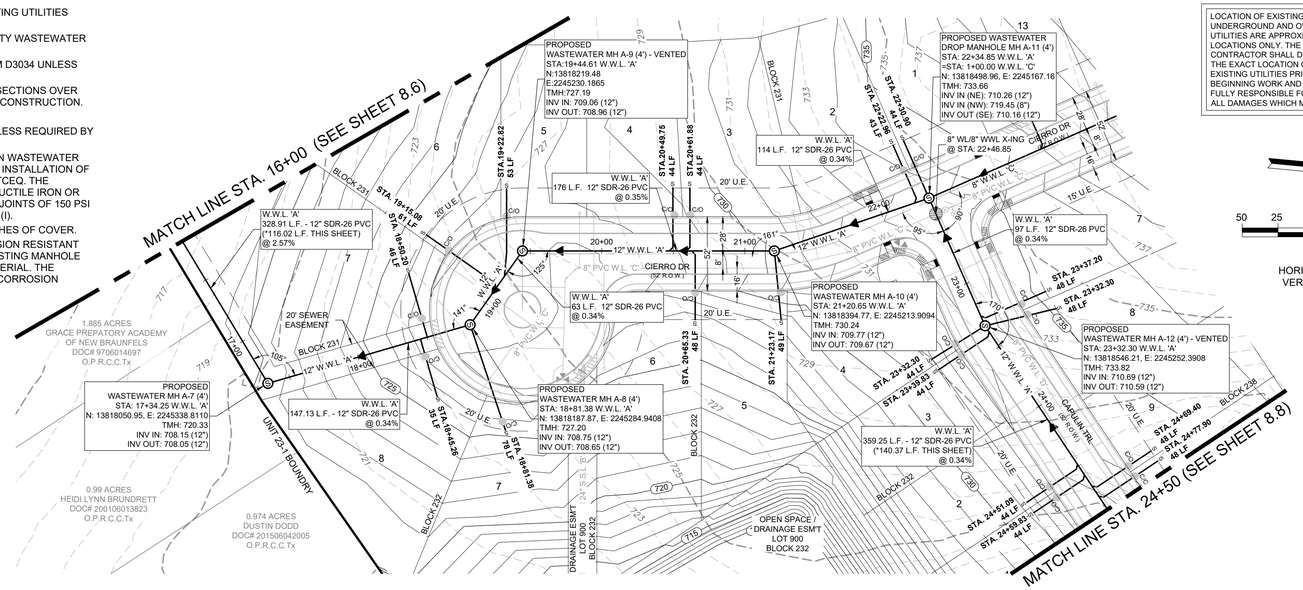
1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PRE TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
7. 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).
8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLE MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH CORROSION RESISTANT MATERIAL.

CAUTION:

CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.



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

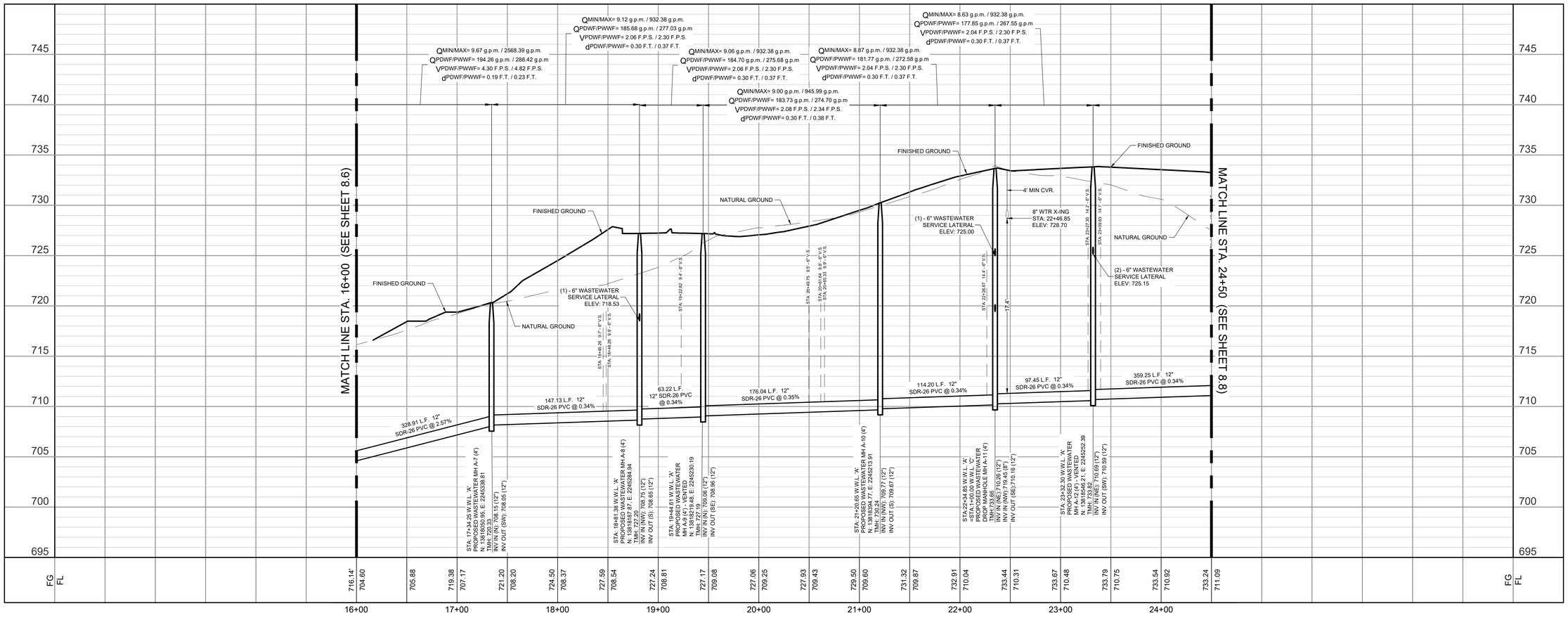
50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

WASTEWATER LINE 'A' STA. 16+00 TO STA. 24+50



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 16+00 TO STA. 24+50

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: 99_LWWL 'A' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.7

K:\SA3856 ABA Properties\Ant\99 23-1420 Site Development Plans\DWG\Sheets\99_VWL 'A' P&P.dwg
Last Modified: Jun 14, 25 - 23:38
Xref Name(s): Jul 08, 25 - 14:43
User: rgoyer

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
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CAUTION:

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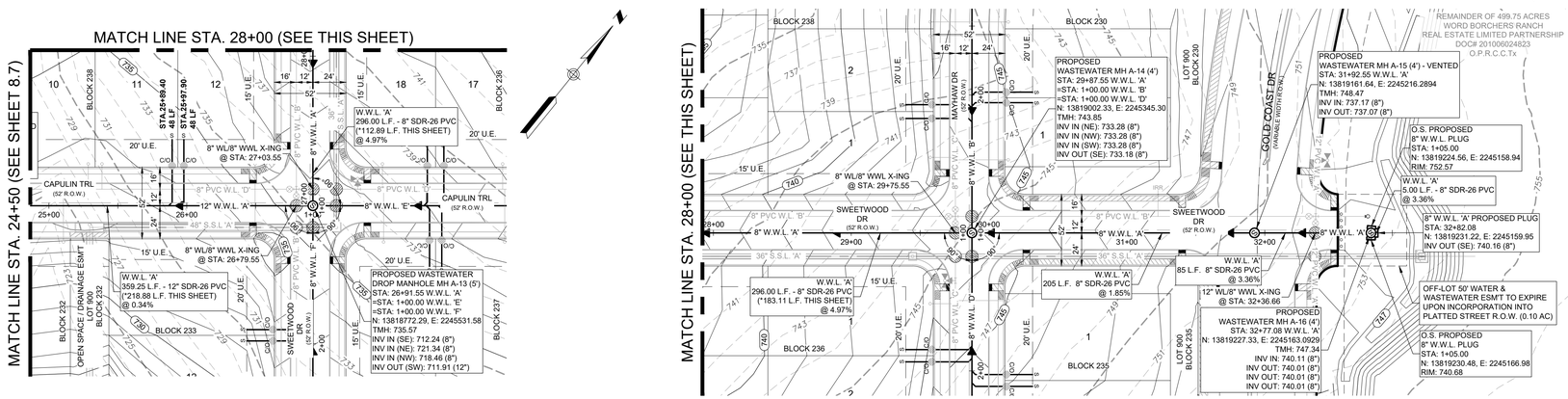
50 25 0 50 100

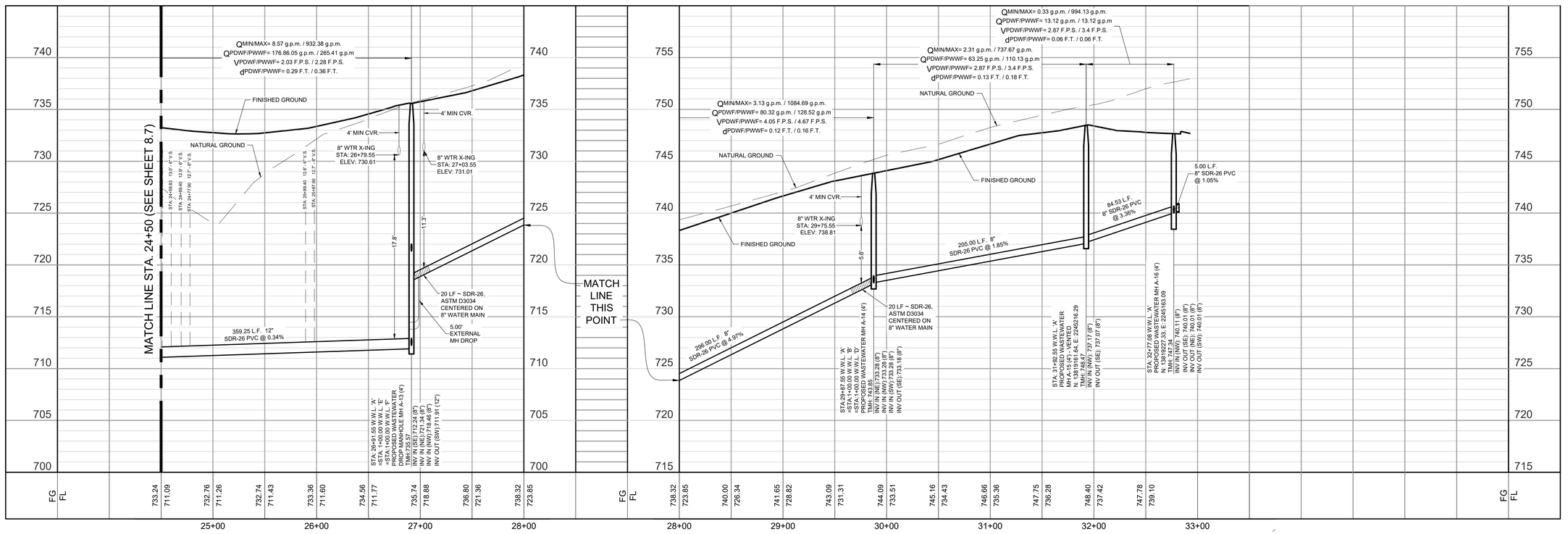
HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



WASTEWATER LINE 'A' STA. 24+50 TO END



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 24+50 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

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

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 8X_WWL_A' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.8

K:\SA3856 ASA Properties\2405 23-1426 Site Development Plans\DWG\Sheets\8x_WWL_A'P&P.dwg
User: hgower
Last Modified: Jun. 14, 25 - 20:38
Plotted/Saved: Jul. 08, 25 - 14:11:16

GENERAL NOTES:

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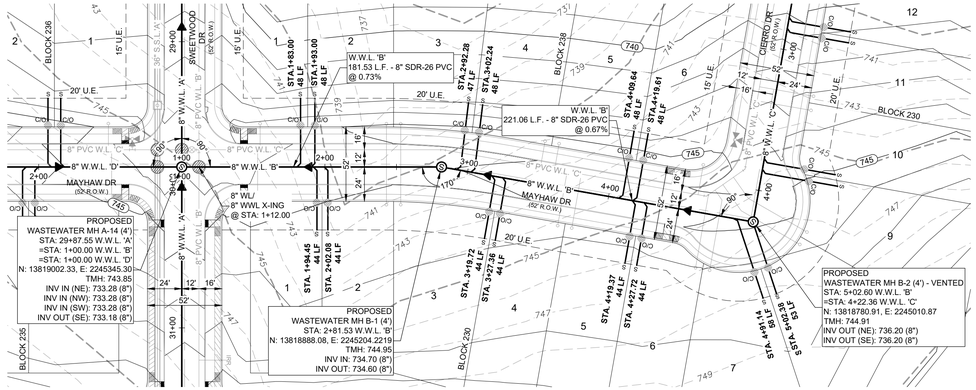

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LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
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		STREET LIGHT (100 WATT LED)
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OHE	OHE	OVERHEAD ELECTRIC
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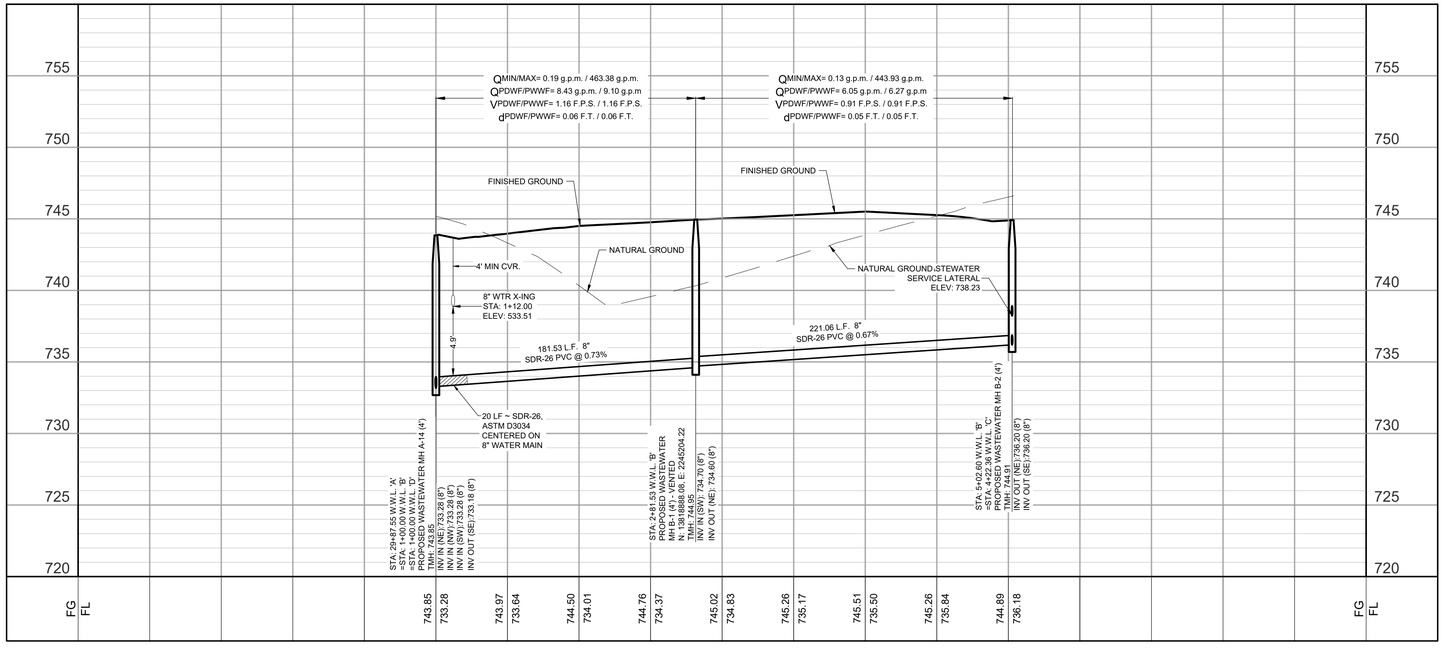
WASTEWATER LINE 'B' STA. 1+00 TO END



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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'B' PLAN & PROFILE
STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/3/25
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ss_LWWL 'B' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.9**

FOR PERMIT

P:\LJA3856 - KSA Properties\2405 23-1\425 Site Development Plans\CAD\Sheets\ph_LWWL 'B' P&P.dwg
Last Modified: Jun 09, 25 - 13:07
Last Plotted: Jun 09, 25 - 13:07

TRENCH EXCAVATION SAFETY PROTECTION

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50 25 0 50 100

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S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
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	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
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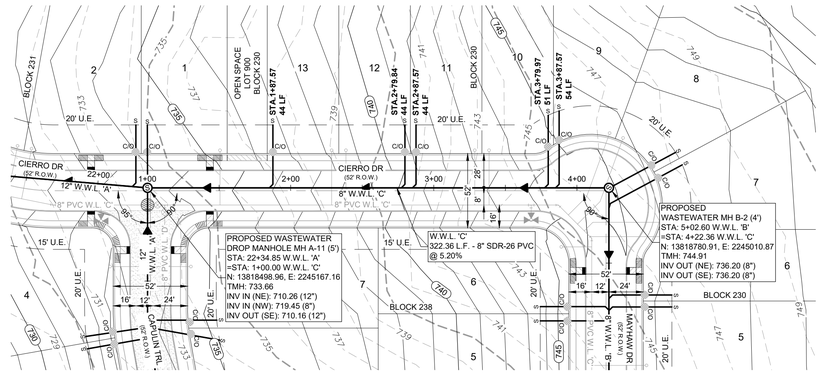

WASTEWATER LINE 'C' STA. 1+00 TO END

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'C' PLAN & PROFILE STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/3/25
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: s:\...\WL 'C' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.10

FOR PERMIT

K:\SA3856.GSA Properties\2405 23-1\426 Site Development Plans\GWE~Sheets\sh_WWL 'C' P&P.dwg
User: nicholas.gower
Last Modified: Jun. 10, 25 - 15:17
Layout: Plan&Prof Jul. 08, 25 - 10:30:44

GENERAL NOTES:

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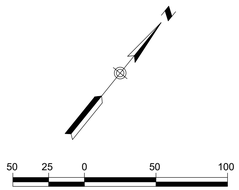

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
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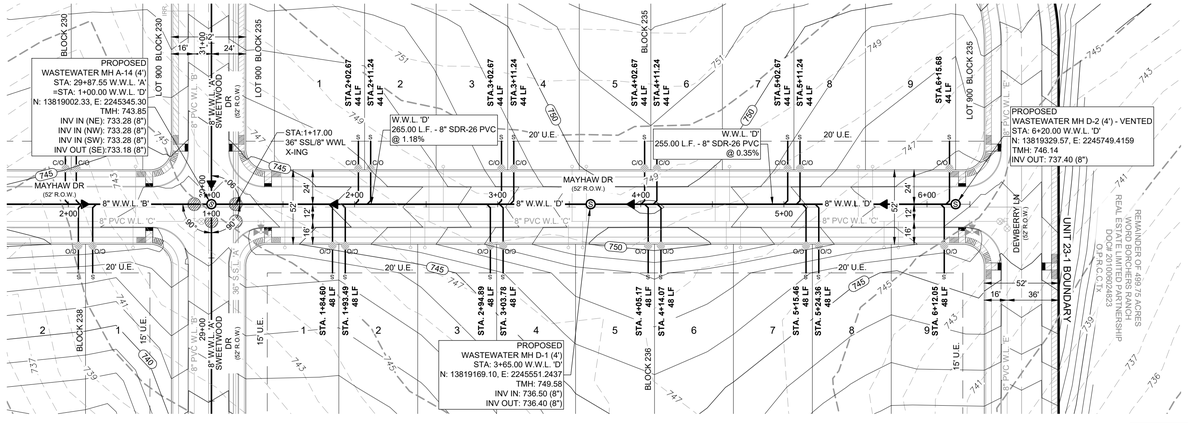

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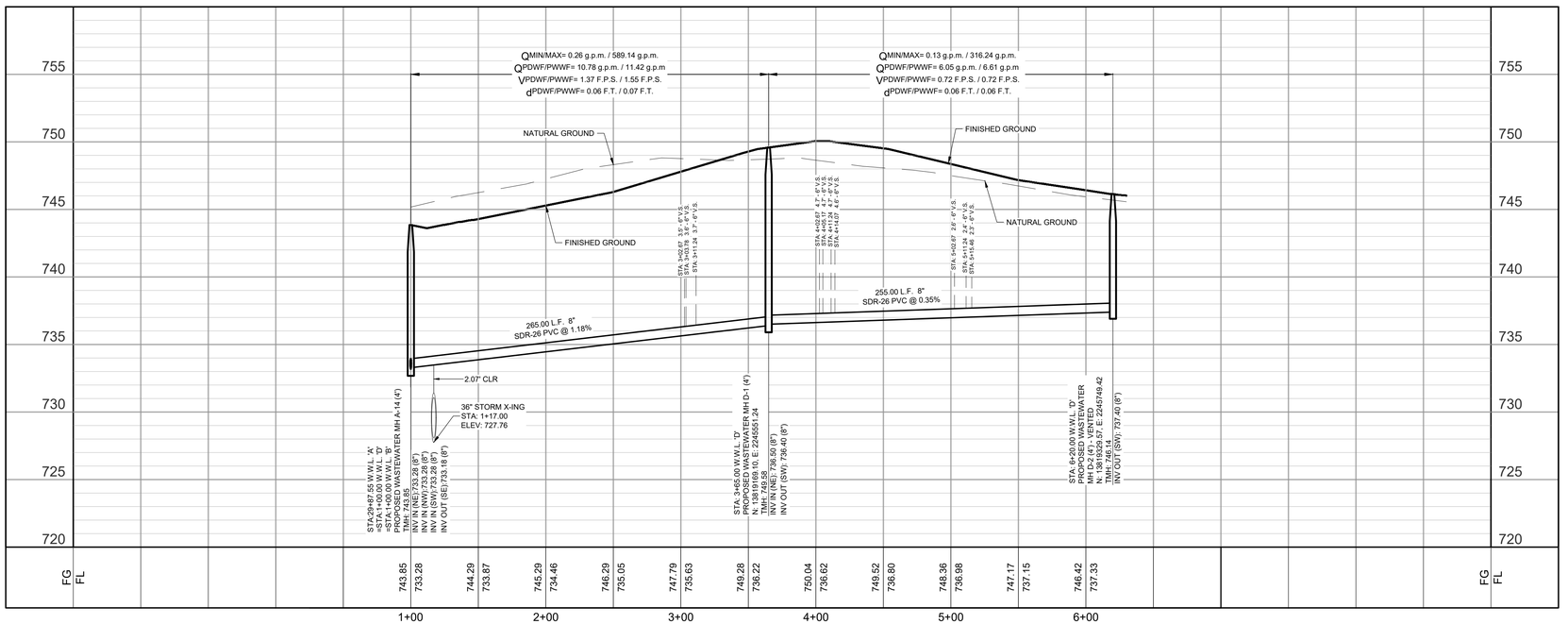
WASTEWATERLINE 'D' 1+00 TO END



VERAMENDI PRECINCT 23 UNIT 1

WASTEWATERLINE 'D' PLAN & PROFILE
1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 3/17/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 8b_WWL 'D' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.11

FOR PERMIT

K:\SA3856_KSA Properties\2405 23-1\425 Site Development Plans\CAD\~Sheets\sh_WWL 'D' P&P.dwg
Xref Name: ...
Last Modified: Jun 10, 25 - 15:19
Last Plotted: Jul 07, 25 - 14:52:34

GENERAL NOTES:

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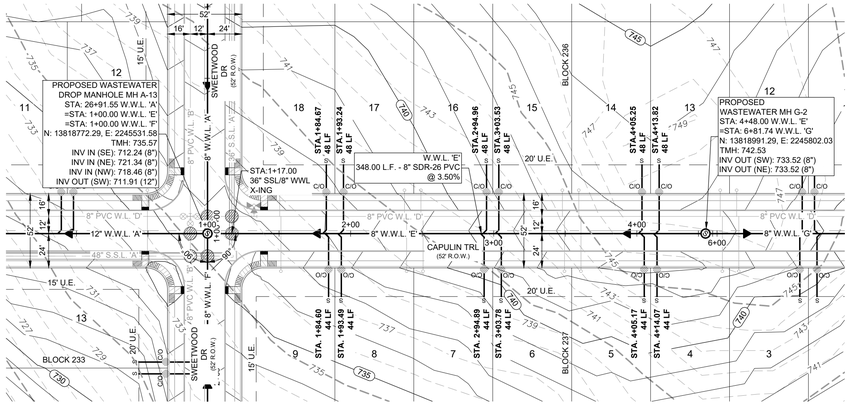
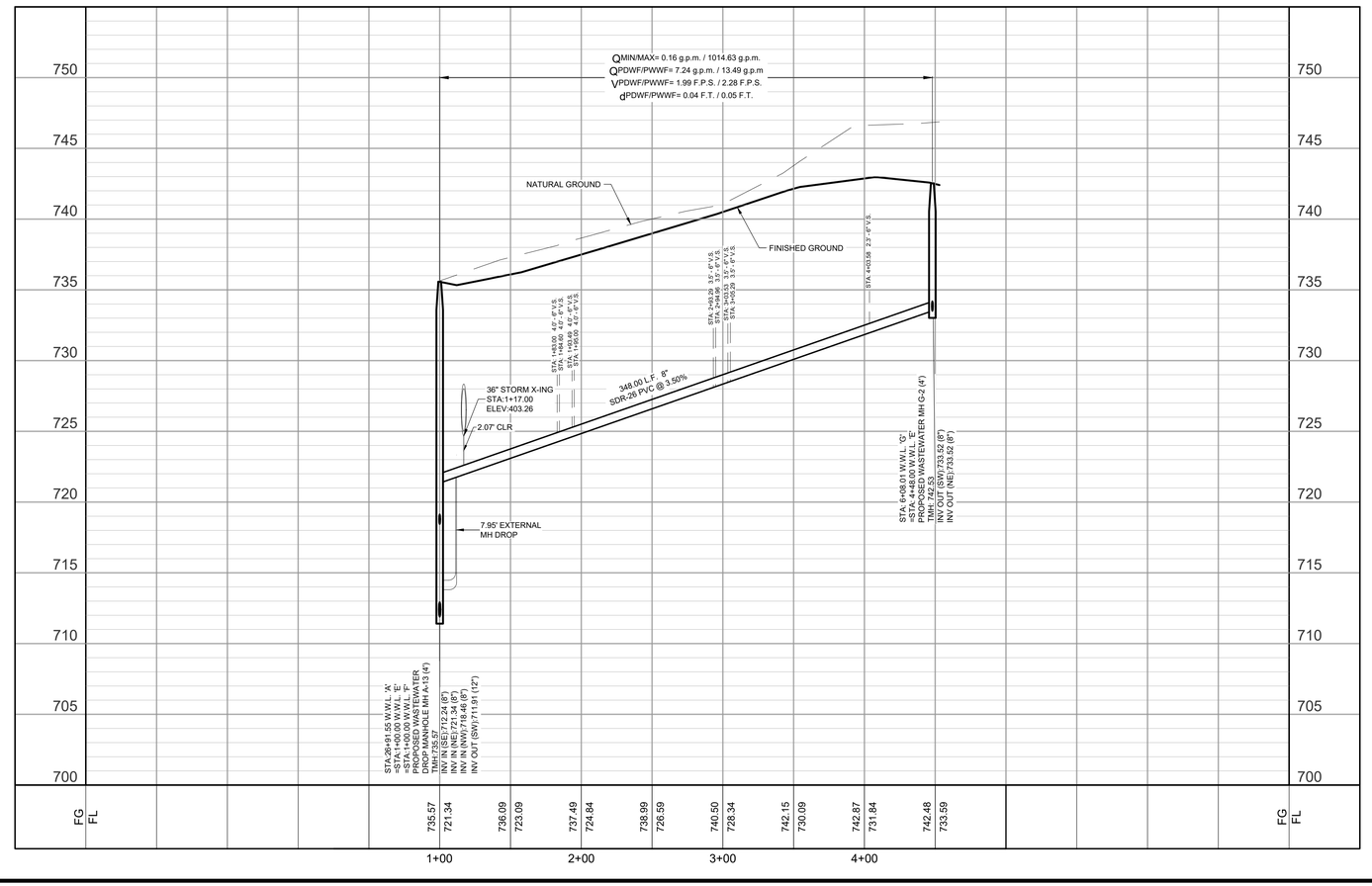


WASTEWATER LINE 'E' STA. 1+00 TO END



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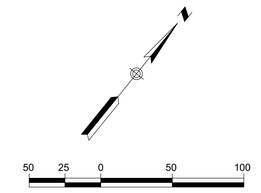

HORIZONTAL SCALE 1" = 50'
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LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
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GAS	GAS	GAS LINE
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		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'E' PLAN & PROFILE
STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/3/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\01_WWL 'E' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.12

FOR PERMIT

I:\SA3856 -KSA Properties\2405 23-1\426 Site Development Plans\GWC-Sheets\dn_WWL 'E' P&P.dwg
User: ngower
Last Modified: Jun. 10, 25 - 15:22
Xref Dep/Files: Jun. 06, 25 - 10:57:13

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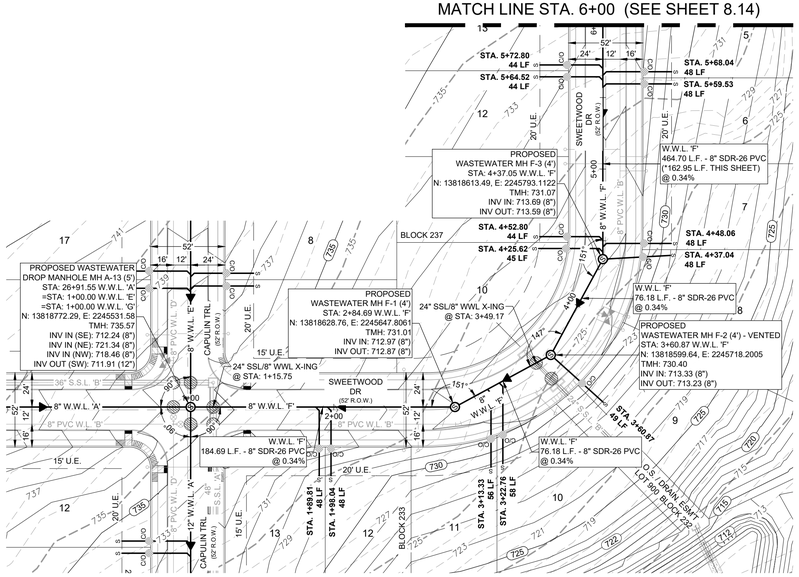
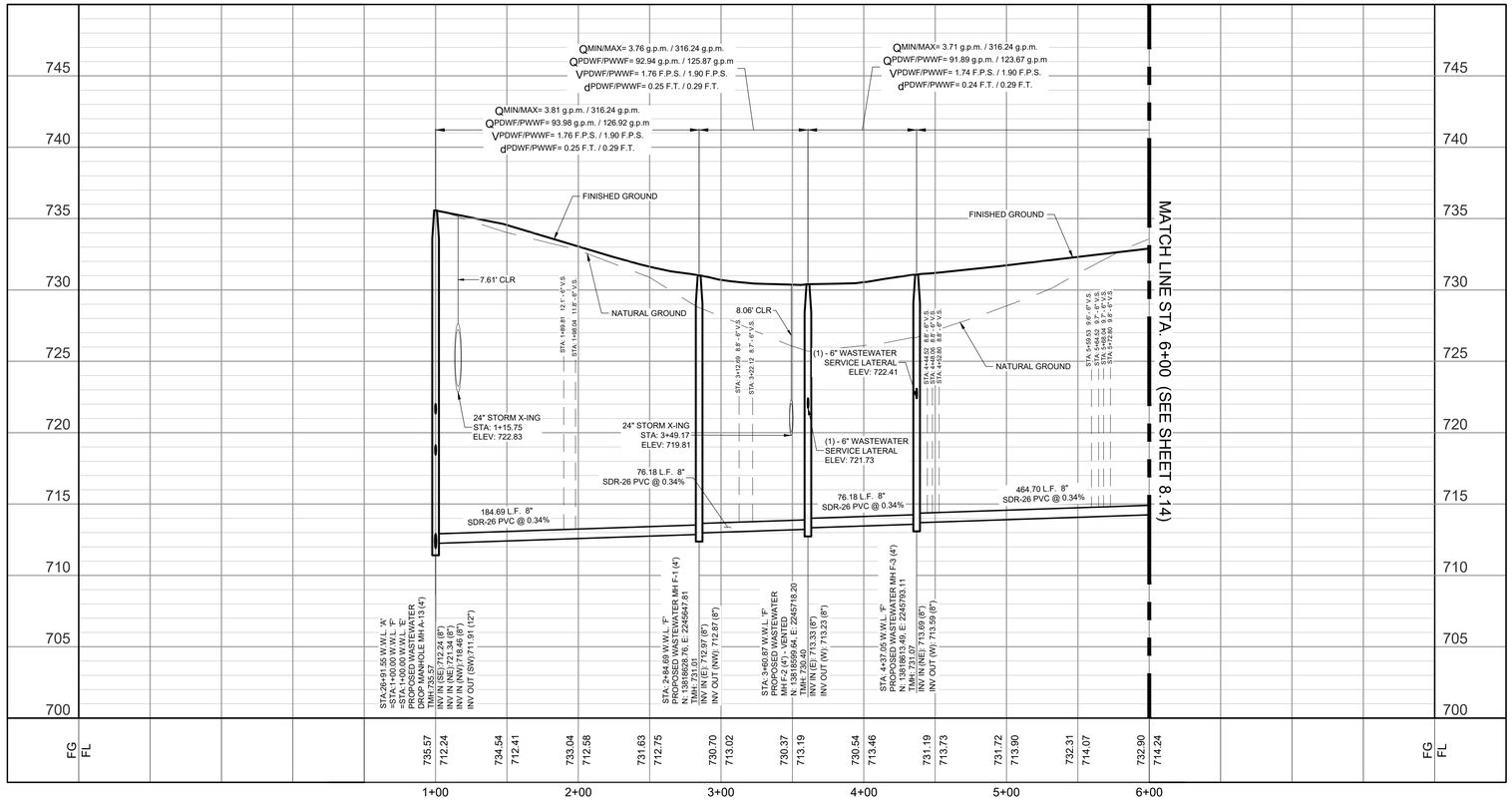


WASTEWATER LINE 'F' STA. 1+00 TO 6+00



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50 25 0 50 100

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VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
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		WATER METER
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GAS	GAS	GAS LINE
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	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
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	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'F' PLAN & PROFILE
STA. 1+00 TO 6+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/9/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sht_WWL_F P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.13

FOR PERMIT

K:\SA3856.ISA Properties\2405 23-01(45) Site Development Plans\GWC-Sheets\sh_WWL_1" P&P.dwg
Plotted: Jun. 10, 25 - 15:32
Last Modified: Jun. 10, 25 - 15:32
By: Nicholas Gower

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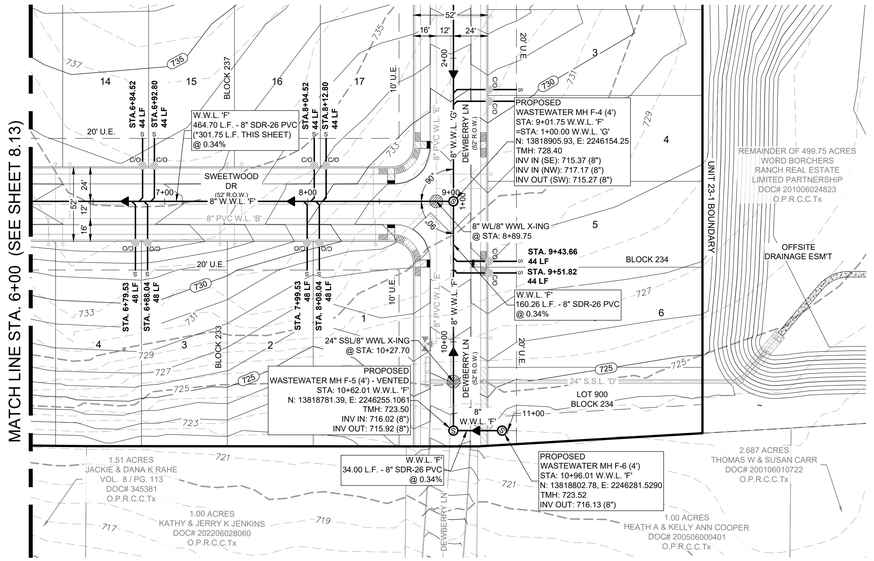

WASTEWATER LINE 'F' STA. 6+00 TO END

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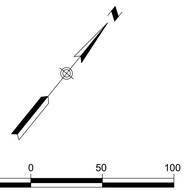

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LEGEND

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		WATER VALVE
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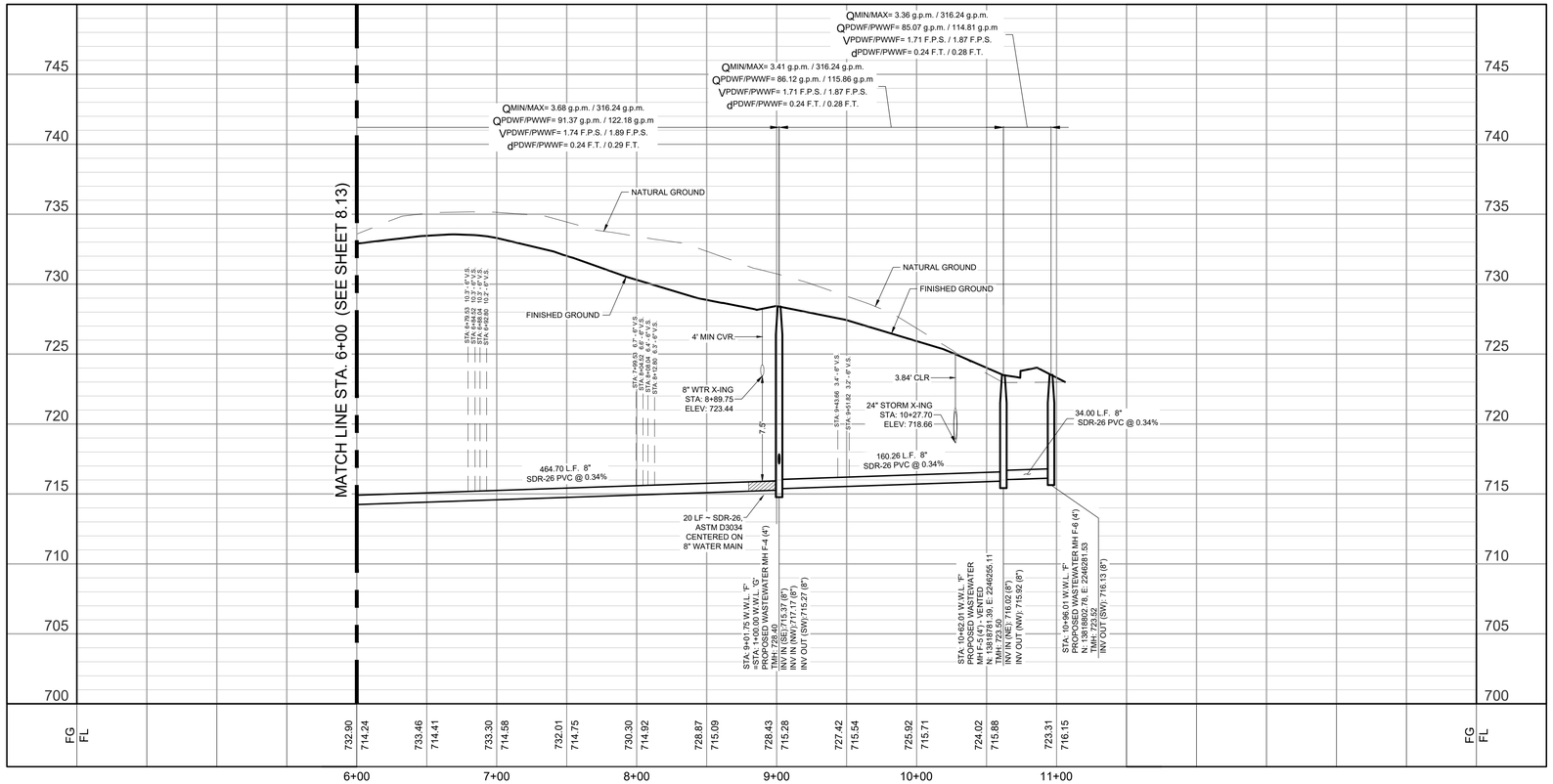
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'F' PLAN & PROFILE
STA. 6+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/9/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sht_WWL_F' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.14

K:\SA3856 IGA Properties\2405 23-1 (145 Site Development Plans\GWC-Sheets\sh_WWL_1" P&P.dwg
Xrefs: None
Last Modified: Jun. 10, 25 - 15:32
Last Plotted: Jul. 08, 25 - 10:50

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PER TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
7. 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).
8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLE MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH CORROSION RESISTANT MATERIAL.

CAUTION:

CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

TRENCH EXCAVATION SAFETY PROTECTION

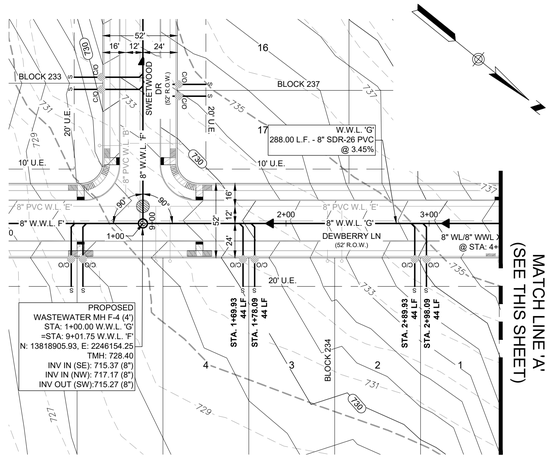
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S 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.

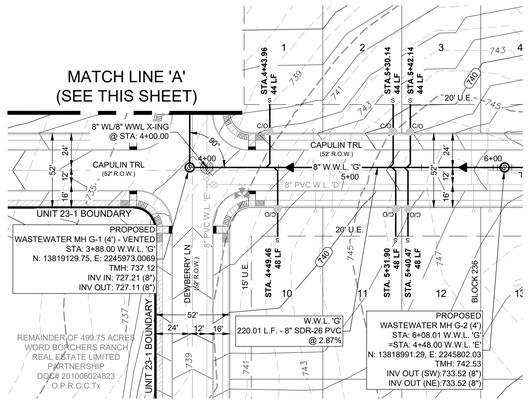
50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

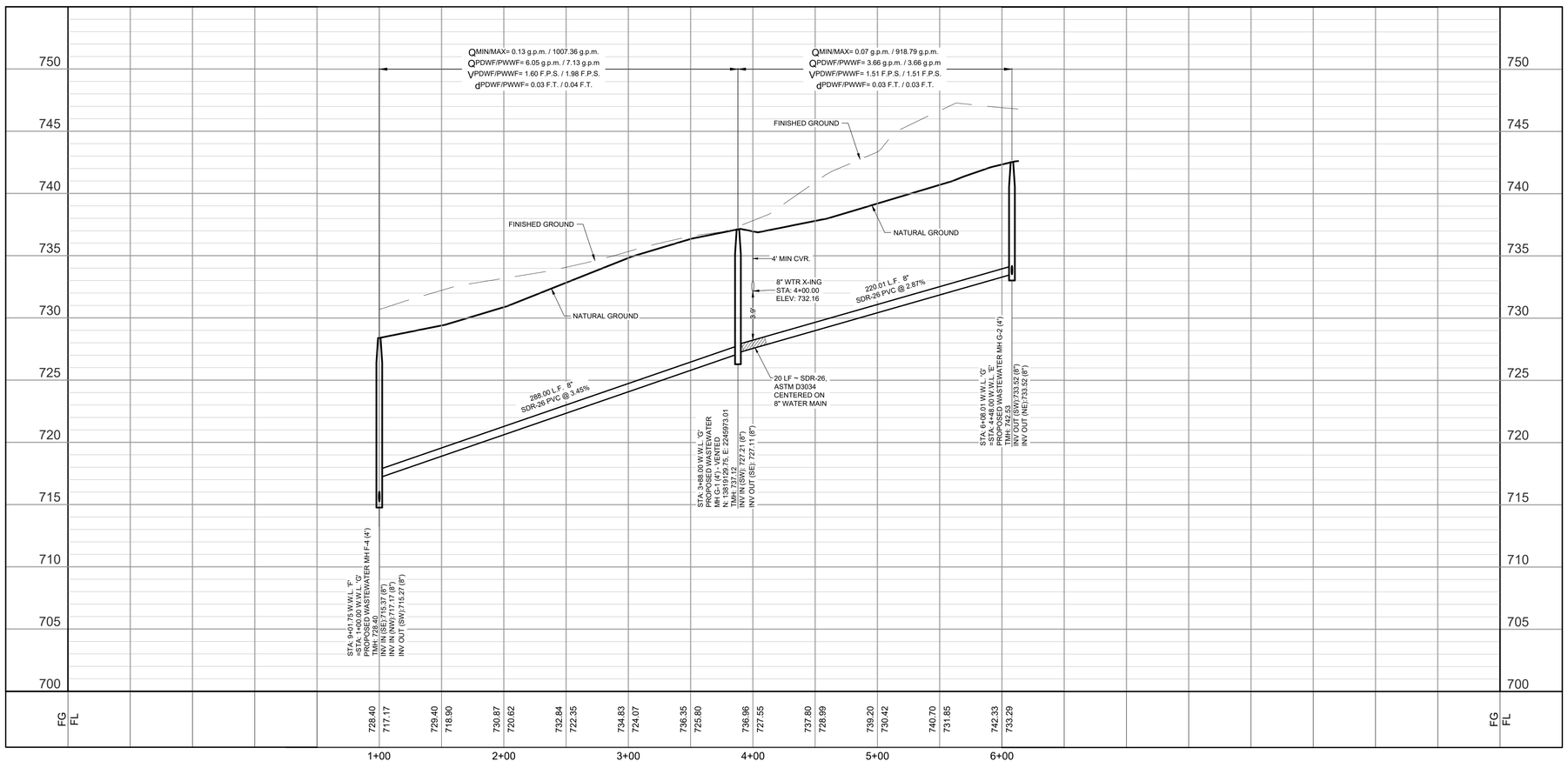
LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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





WASTEWATER LINE 'G' STA. 1+00 TO END



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
C/O S	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'G' PLAN & PROFILE
STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/3/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sh_UWL 'G' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

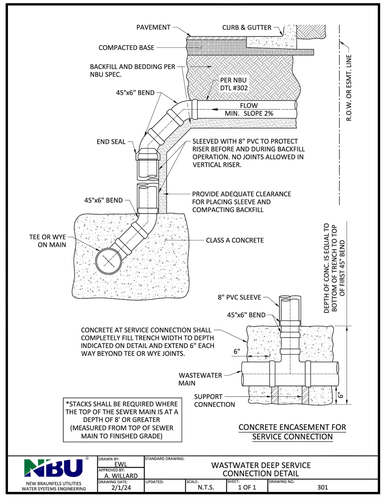
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.15

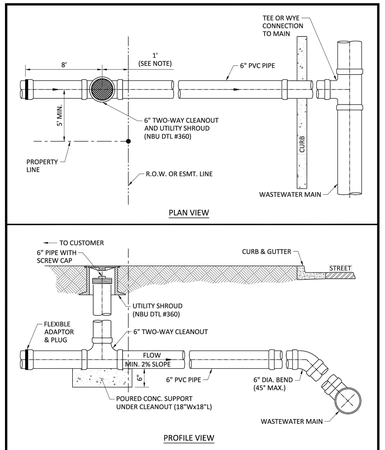
FOR PERMIT

N:\SA3856.ASA Properties\VJA05 23-1\VJ26 Site Development Plans\UWG-Sheets\sh_#WL 'G' P&P.dwg
User Name: ...
Last Modified: Jun. 10, 25 - 10:37
Plot Date/Time: Jun. 10, 25 - 10:37:40



CONCRETE ENCASEMENT FOR SERVICE CONNECTION

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	WASTWATER DEEP SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 301



PLAN VIEW

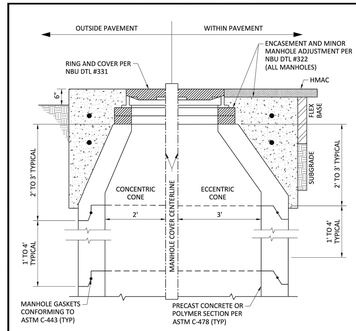
PROFILE VIEW

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SINGLE WASTWATER SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 2	DRAWING NO.: 302

NOTES:

1. UTILITY CONTRACTOR, DURING SUBDIVISION CONSTRUCTION, SHALL INSTALL WASTEWATER CONNECTION TO MAIN, 6" STUB WITH 6" SERVICE BRANCH WITH 2-WAY CLEANOUT, CONCRETE SUPPORT (MIN. 18"Wx18"Lx6"H), RISER FOR CLEAN OUT (CAPPED), UTILITY SHROUD, 7' EXTENSION, AND PLUG. ALL WASTEWATER PIPING SHALL HAVE ELASTOMERIC GASKET TYPE JOINTS AND SHALL SLOPE DOWNWARD TO MAIN AT A MINIMUM 2% SLOPE, ¼" PER FOOT, MINIMUM TO 45° MAXIMUM. DEPTH OF SERVICE STUB AT PROPERTY LINE WILL BE SHOWN ON PLANS BY ENGINEER OR DESIGNATED REPRESENTATIVE IF GREATER THAN 6', OTHERWISE, THE INSTALLED DEPTH WILL TYPICALLY BE 4' TO 6'. IF WASTEWATER SERVICE LINE TO MAIN REQUIRES DEFLECTION EXCEEDING 45°, REFER TO DETAIL 301. ALL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH INFORMATION SHOWN ON APPLICABLE STANDARD DRAWINGS AND WILL BE INSPECTED BY NBU CONSTRUCTION INSPECTION PERSONNEL.
2. CUSTOMER SHALL REMOVE PLUG, INSTALL 4" WASTEWATER LINE [EXTEND 4" PIPE 6" MINIMUM INTO 6" PIPE AND JOINT WITH FLEXIBLE ADAPTOR]. IF WASTEWATER WILL NOT SATISFACTORILY FLOW BY GRAVITY TO SEWER MAIN ADJACENT TO PROPERTY, PUMP EQUIPMENT MUST BE PROVIDED BY THE CUSTOMER AS PART OF CUSTOMER'S WASTEWATER SYSTEM.
3. CUSTOMER IS RESPONSIBLE FOR PIPING SYSTEM UNTIL WASTEWATER IS CONNECTED. ANY MISSING OR DAMAGED PARTS SHALL BE REINSTALLED BY CUSTOMER WHO SHALL GUARANTEE, FOR A PERIOD OF TWO (2) YEARS FROM DATE OF FINAL ACCEPTANCE, THAT CONNECTIONS TO NBU SYSTEMS ARE FREE FROM DEFECTS IN WORKMANSHIP OR MATERIALS. CUSTOMER MUST ENSURE THAT 2-WAY CLEANOUTS REMAIN CLEAR OF SIDEWALKS AND OTHER OBSTRUCTIONS.
4. NBU ACTIVITY IS LIMITED TO INSPECTION OF CONNECTIONS TO NBU'S WASTEWATER SYSTEM. NBU'S MAINTENANCE RESPONSIBILITY ENDS AT THE CUSTOMER'S WASTEWATER CONNECTION TO THE 2-WAY CLEANOUT OR THE PROPERTY LINE, WHICHEVER IS CLOSER TO WASTEWATER MAIN.
5. PIPING IN STREET RIGHT-OF-WAY AND IN EASEMENT AREA SHALL BE BEDDED IN GRANULAR MATERIALS AND BACKFILLED AS REQUIRED BY NBU STANDARD SPECIFICATIONS. SERVICE LINES IN THESE AREAS SHALL HAVE A MINIMUM COVER BELOW FINAL STREET GRADE OF 42"; ANY EXCEPTION MUST BE SPECIFICALLY APPROVED BY NBU WATER ENGINEERING.

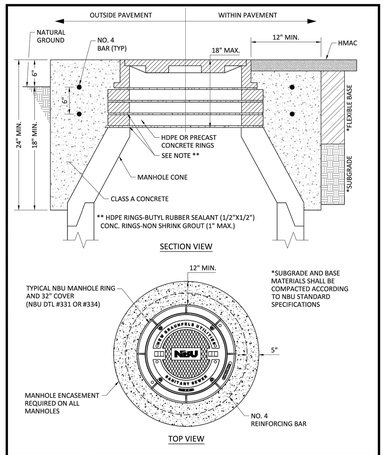
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SINGLE WASTWATER SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 2 OF 2	DRAWING NO.: 302



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.

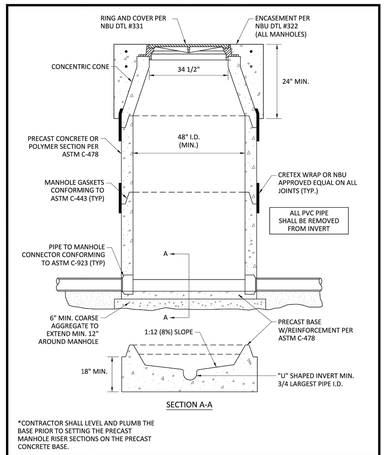
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MAJOR MANHOLE ADJUSTMENT	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 321



SECTION VIEW

TOP VIEW

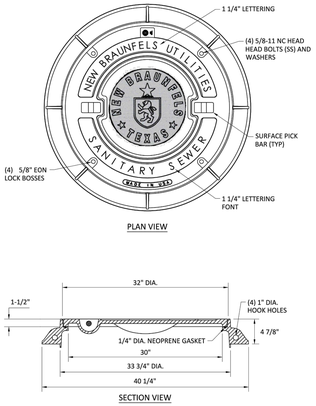
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 322



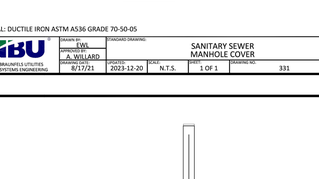
SECTION A-A

*CONTRACTOR SHALL LEVEL AND PLUMB THE BASE PRIOR TO SETTING THE PRECAST MANHOLE RISER SECTIONS ON THE PRECAST CONCRETE BASE.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	WASTEWATER MANHOLE ON PRECAST BASE	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 328



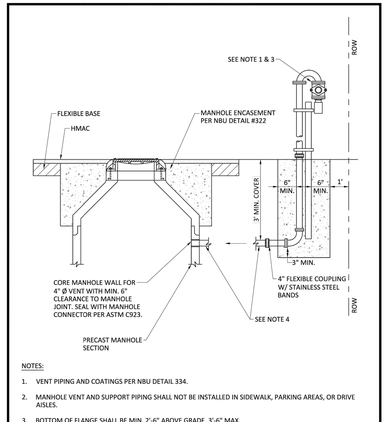
PLAN VIEW



SECTION VIEW

MATERIAL: DUCTILE IRON ASTM A536 GRADE 70-50-05

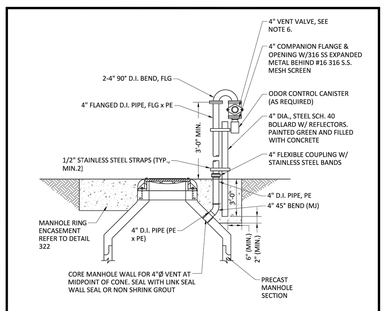
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SANITARY SEWER MANHOLE COVER	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 8/17/21	UPDATED: 2023-12-20	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 331



NOTES:

1. VENT PIPING AND COATINGS PER NBU DETAIL 334.
2. MANHOLE VENT AND SUPPORT PIPING SHALL NOT BE INSTALLED IN SIDEWALK, PARKING AREAS, OR DRIVE AISLES.
3. BOTTOM OF FLANGE SHALL BE MIN. 2'-6" ABOVE GRADE, 3'-6" MAX.
4. VENT PIPING FROM MANHOLE TO 90 DEG. VERTICAL BEND MUST BE LAID TO DRAIN TO THE MANHOLE AT MIN. 2% SLOPE.

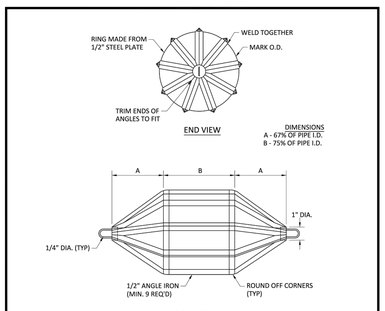
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MANHOLE VENT PAVED AREAS	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 333



NOTES:

1. ALL BOLTS AND HARDWARE TO BE 316 STAINLESS STEEL.
2. DUCTILE IRON PIPE AND FITTINGS TO HAVE FACTORY APPLIED PROTECTO 401 EPOXY INTERIOR COATING.
3. EXTERIOR OF DUCTILE IRON PIPES AND FITTINGS TO BE FACTORY COATED WITH FACTORY APPLIED PRIME COAT AND SURFACE COAT OF GREEN FUSION BONDED EPOXY.
4. CONTRACTOR TO FIELD COAT WITH PENETRATING EPOXY PRE-PRIMER AND HIGH SOLIDS EPOXY SILOXANE PER NBU SPECIFICATION 530.
5. PROVIDE ODOR CONTROL CANISTERS ON VENTS WHERE INDICATED ON THE PLANS.
6. BOTTOM OF COMPANION FLANGE MUST BE 1' ABOVE THE FEMA BASE FLOOD ELEVATION (BFE), MAXIMUM HEIGHT ABOVE GRADE OF 6'. INSTALL WAGER 1700 VENT VALVE, OR APPROVED EQUAL, WHERE BFE IS MORE THAN 18" ABOVE PROPOSED GRADE.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MANHOLE VENT NON-PAVED AREAS	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 334



END VIEW

DIMENSIONS
A - 67% OF PIPE I.D.
B - 75% OF PIPE I.D.

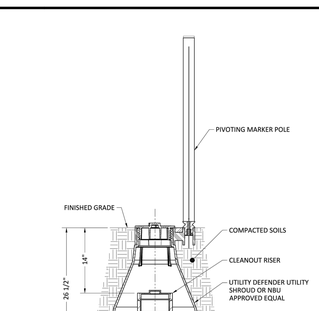
SIDE OR TOP VIEW

MANDREL REQUIREMENTS:

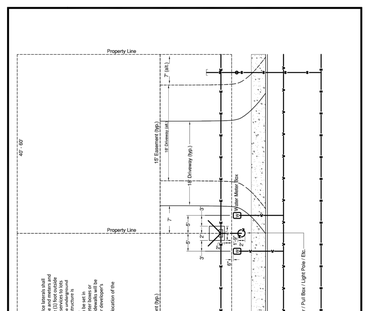
1. O.D. NOT LESS THAN 95% OF THE I.D. OF THE PIPE, AS SPECIFIED BY THE APPLICABLE ASTM, AWWA, UNI-BELL OR ANSI STANDARD.
2. ABLE TO WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
3. ODD NUMBER OF RUNNERS OR LEGS.

*THIS INFORMATION IS PROVIDED AS A REFERENCE. ALL DEFLECTION TESTING SHALL BE DONE IN ACCORDANCE WITH TCEQ CHAPTER 217.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	GO, NO GO DEFLECTION TESTING MANDREL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 350



NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	UTILITY SHROUD FOR SEWER CLEANOUT ASSEMBLY	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 360


Property Line
40' 60'
1.5" Electrical Conduit
1.5" Telephone Conduit
1.5" Drainage Pipe
Property Line
3'
3'
6'
7'
6'
Property Line
NOTE:
a. Electrical, telephone and drainage services shall be constructed in the property line and underground as shown on the plan. Any deviation from the property line, Wastewater services to lots shall be constructed in the property line and shall be installed in the front easement.
b. Wastewater service to lots without a driveway or sidewalks, any meter, boxes or appurtenances shall be placed in the property line unless approved by the inspector.
c. Contractor shall be held responsible for the location of the clean out and sewer stub.
4" PVC SCH 40
4" PVC SCH 40
Transformer / Pull Box / Light Pole / Etc.
Property Line
4" PVC SCH 40
4" PVC SCH 40
4" PVC SCH 40

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 __ of __.

   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 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

NBU Wastewater Notes

1. The point of delivery for an NBU owned and maintained wastewater line is typically the cleanout, property line, or edge of easement or as determined by NBU.
2. The contractor shall maintain service to the existing wastewater system at all times during construction.
3. All new wastewater mains and fittings shall be minimum 8-inch diameter (ASTM D-3034 SDR-26 PVC).
4. All residential wastewater service laterals shall be extended four (4) feet into the Public Utility Easement and a cleanout installed at the ROW line per NBU Standard Details. Services to lots will extend four (4) feet past the underground electric conduit if electric is installed in the front easement.
5. All sewer cleanouts that lead to NBU mains shall be installed with a protective utility shroud and pivoting marker pole during time of construction.
6. Pipe bedding of wastewater lines shall be compliant with NBU specification No. 120, "Utility Trenching and Backfill".
7. Wastewater mains shall have a minimum of 48 inches of cover to finished grade and wastewater laterals must have a minimum of 36 inches of cover to finished grade. Concrete encasement will be required if minimum cover cannot be met.
8. All gravity wastewater pipes shall have gasketed, compression or fused joints per 30 TAC §217.53 (c) (2).
9. For wastewater lines less than 24 inches 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-inch, 12-inch maximum lifts shall be used.
10. All manholes shall be water-tight, either monolithic, cast-in-place concrete structures or prefabricated manholes specifically approved by NBU. Polymer concrete is required for manholes on mains 18-inch diameter and larger, at force main discharge points, or at drop manholes with high corrosion potential.
11. Manholes shall have bolted water-tight rings and covers. In non-paved areas, a manhole marker assembly shall be installed on the manhole cover.
12. Manhole vents shall be installed at intervals no greater than 1500 feet.
13. All manholes shall be constructed so that the top of the ring is six inches (6") above surrounding ground in non-paved areas. In paved areas, the manhole ring shall be flush with pavement.
14. All new manholes, unless approved by NBU, shall have covers with 32-inch openings.
15. Wastewater pipe connections to pre-cast manholes will be compression joints or mechanical "boot type" joint as approved by NBU.
16. Existing manholes shall be lined, coated, or replaced with a corrosion resistant material if a new connection is made by a main or lateral.
17. Wastewater mains shall be tested from manhole to manhole.
18. 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.
19. NBU Inspector to be present for all wastewater lines to be installed at depths of 15 feet or greater from final grade.
20. 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 requirements. The wastewater line shall be constructed of ASTM D2241 PVC or AWWA C900 PVC with pressure rating of 150 psi and shall be in accordance with 30 TAC §217.53 (d) (3) (A) (i).
21. Contractor shall coordinate with the assigned water/wastewater inspector for completion of the Field Acceptance Checklist. No testing will be performed prior to 30 days from complete installation. All testing and acceptance shall conform to NBU Specifications be completed in the following order:
    a. Pipe Deflection Test (Mandrel Test)
    b. Pipe Low Pressure Air Test
    c. Manhole Vacuum Test
    d. Manhole Protective Coating Test
    e. CCTV Inspection (within 72 hours of cleaning and flushing)
22. 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.

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.
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.

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER DETAILS (SHEET 2 OF 2)

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 6/6/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: PF
DRAWING NAME: sh_Wastewater Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

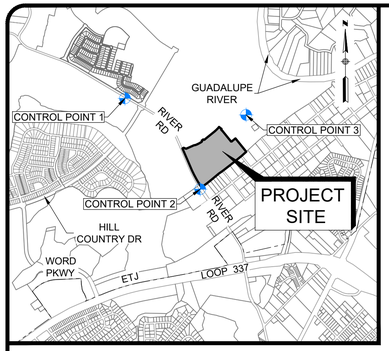
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.17

FOR PERMIT

K:\SA3856.ASA Properties\2405 23-1(4)\5 Site Development Plans\DWG-Sheets\sh_Wastewater Details.dwg
Xref Name: ...
Last Modified: Jun. 06, 25 - 14:42
Last Plotted: Jul. 08, 25 - 14:36 AM



LOCATION MAP
N.T.S.

SEDIMENTATION AND EROSION CONTROLS

A. SILT FENCE

1. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR YBAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FT'; AND BRINDELL HARDNESS EXCEEDING 140.
2. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
3. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1- FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES,THE MAXIMUM SPACING SHOULD BE 6 FEET.
4. LAY OUT FENCING DOWN-SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS ¼ ACRE/100 FEET OF FENCE.
5. 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.
6. 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.
7. 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.
8. INSPECT ALL FENDING WEEKLY, AND AFTER ANY RAINFALL. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES. REPLACE ANY TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

B. TRIANGULAR SEDIMENT FILTER DIKE

1. THE DIKE STRUCTURE SHALL BE CONSTRUCTED OF 6" X 6", 6 GAUGE WELDED WIRE MESH, 18 INCHES PER SIDE, AND WRAPPED WITH GEOTEXTILE FABRIC THE SAME COMPOSITION AS THAT USED FOR SILT FENCES.
2. FILTER FABRIC SHOULD LAP OVER ENDS SIX (6) INCHES TO COVER DIKE TO DIKE JUNCTION; EACH JUNCTION SHOULD BE SECURED BY SHOAT RINGS.
3. POSITION DIKE PARALLEL TO THE CONTOURS, WITH THE END OF EACH SECTION CLOSELY ABUTTING THE ADJACENT SECTIONS.
4. FASTENING - THE FABRIC SKIRT MAY BE TOED- IN WITH 6 INCHES OF COMPACTED MATERIAL, OR 12 INCHES OF THE FABRIC SKIRT SHOULD EXTEND UPHILL AND BE SECURED WITH A MINIMUM OF 3 INCHES OF OPEN GRADED ROCK, OR WITH STAPLES OR NAILS. IF THESE TWO OPTIONS ARE NOT FEASIBLE THE DIKE STRUCTURE MAY BE TRENCHED IN 4 INCNS.
5. TRIANGULAR SEDIMENT FILTER DIKES SHOULD BE INSTALLED ACROSS EXPOSED SLOPES DURING CONSTRUCTION WITH ENDS OF THE DIKE TIED INTO EXISTING GRADES TO PREVENT FAILURE AND SHOULD INTERCEPT NO MORE THAN ONE ACRE OF RUNOFF.
6. WHEN MOVED TO ALLOW VEHICULAR ACCESS, THE DIKES SHOULD BE REINSTALLED AS SOON AS POSSIBLE, BUT ALWAYS AT THE END OF THE WORKDAY.
7. INSPECTION SHOULD BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR. INSPECT AND REALIGN DIKES AS NEEDED TO PREVENT GAPS BETWEEN SECTIONS.
8. ACCUMULATED SILT SHOULD BE REMOVED AFTER EACH RAINFALL, AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.

C. TEMPORARY CONSTRUCTION ENTRANCE/EXIT

1. AGGREGATE SIZE - 4 TO 8 INCHES WASHED, COARSE STONE.
2. LENGTH - AT LEAST 50 FEET.
3. THICKNESS - MINIMUM 8 INCHES.
4. WIDTH - MINIMUM WIDTH SHALL BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.
5. WASHING - WHEN NECESSARY, IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM 4 INCH DIAMETER WASHED STONE OR COMMERCIAL RACK SHALL BE INSTALLED WHICH DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE - IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%, CONSTRUCT A RIDGE 6 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. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.
8. FABRIC - PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.

D. INTERCEPTOR SWALE

1. MAXIMUM DEPTH OF FLOW IN THE SWALE SHALL BE 1 FOOT.
2. THE MINIMUM BOTTOM WIDTH OF THE SWALE SHALL BE 2 FEET.
3. SIDE SLOPES OF THE SWALE SHALL BE 3:1 OR FLATTER.
4. MINIMUM DESIGN CHANNEL FREEBOARD SHALL BE 6 INCHES
5. SWALES MUST MAINTAIN POSITIVE GRADE TO AN ACCEPTABLE OUTLET.
6. INTERCEPTOR SWALES MUST BE STABILIZED IMMEDIATELY UPON EXCAVATION SO AS NOT TO CONTRIBUTE TO THE EROSION PROBLEM THEY ARE ADDRESSING.
7. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS AND OTHER MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
8. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE DISPOSED OF IN AN APPROPRIATE SPOILS SITE.
9. INSPECTION MUST BE MADE AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY DAMAGE TO THE CHANNEL OR TO CLEAR DEBRIS OR OTHER OBSTRUCTIONS SO AS NOT TO DIMINISH FLOW CAPACITY. DAMAGES WHICH RESULT FROM NORMAL CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT THE END OF EACH WORK DAY.

E. ROCK BERMS

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 (FIGURE 1-28), 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. 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.
6. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
7. 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.
8. REPAIR ANY LOOSE WIRE SHEATHING. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
9. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

F. SANDBAG BERMS

1. THE BAG LENGTH SHOULD BE 24 TO 30 INCHES, WIDTH SHOULD BE 16 TO 18 INCHES AND THICKNESS SHOULD BE 6 TO 8 INCHES. (3) SANDBAGS SHOULD BE FILLED WITH COARSE GRADE SAND, FREE FROM DELETERIOUS MATERIAL.ALL SAND SHOULD PASS THROUGH A NO. 10 SIEVE. THE FILLED BAG SHOULD HAVE AN APPROXIMATE WEIGHT OF 40 POUNDS.
2. THE BERM SHOULD BE A MINIMUM HEIGHT OF 18 INCHES, MEASURED FROM THE TOP OF THE EXISTING GROUND AT THE UPSLOPE TOE TO THE TOP OF THE BERM.
3. THE BERM SHOULD BE SIZED AS SHOWN IN THE PLANS BUT SHOULD HAVE A MINIMUM WIDTH OF 48 INCHES MEASURED AT THE BOTTOM OF THE BERM AND 16 INCHES MEASURED AT THE TOP OF THE BERM.
4. RUNOFF WATER SHOULD FLOW OVER THE TOPS OF THE SANDBAGS OR THROUGH 4-INCH DIAMETER PVC PIPES EMBEDDED BELOW THE TOP LAYER OF BAGS AS SHOWN.
5. SANDBAGS SHOULD BE STACKED IN AT LEAST THREE ROWS ABUTTING EACH OTHER, AND IN STAGGERED ARRANGEMENT.
6. THE BASE OF THE BERM SHOULD HAVE AT LEAST 3 SANDBAGS. THESE CAN BE REDUCED TO 2 AND 1 BAG IN THE SECOND AND THIRD ROWS RESPECTIVELY. FOR EACH ADDITIONAL 6 INCHES OF HEIGHT, AN ADDITIONAL SANDBAG MUST BE ADDED TO EACH ROW WIDTH.
7. THE SAND BAG BERM SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN. THE SANDBAGS SHOULD BE RESHAPED OR REPLACED AS NEEDED DURING INSPECTION.
8. WHEN THE SILT REACHES 6 INCHES, THE ACCUMULATED SILT SHOULD BE REMOVED AND DISPOSED OF AT AN APPROVED SITE IN A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.

F. STONE OUTLET SEDIMENT TRAP

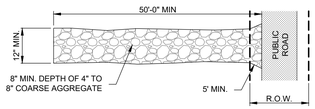
1. ALL AGGREGATE SHOULD BE AT LEAST 3 INCHES IN DIAMETER AND SHOULD NOT EXCEED A VOLUME OF 0.5 CUBIC FOOT.
2. EARTH EMBANKMENT: PLACE FILL MATERIAL IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH. BEFORE COMPACTION, MOISTEN OR AERATE EACH LAYER AS NECESSARY TO PROVIDE THE OPTIMUM MOISTURE CONTENT OF THE MATERIAL. COMPACT EACH LAYER TO 95 PERCENT STANDARD PROCTOR DENSITY. DO NOT PLACE MATERIAL ON SURFACES THAT ARE MUDDY OR FROZEN. SIDE SLOPES FOR THE EMBANKMENT ARE TO BE 3:1. THE MINIMUM WIDTH OF THE EMBANKMENT SHOULD BE 3 FEET.
3. A GAP IS TO BE LEFT IN THE EMBANKMENT IN THE LOCATION WHERE THE NATURAL CONFLUENCE OF RUNOFF CROSSES THE EMBANKMENT LINE. THE GAP IS TO HAVE A WIDTH IN FEET EQUAL TO 6 TIMES THE DRAINAGE AREA IN ACRES.
4. GEOTEXTILE COVERED ROCK CORE: A CORE OF FILTER STONE HAVING A MINIMUM HEIGHT OF 1.5 FEET AND A MINIMUM WIDTH AT THE BASE OF 3 FEET SHOULD BE PLACED ACROSS THE OPENING OF THE EARTH EMBANKMENT AND SHOULD BE COVERED BY GEOTEXTILE FABRIC WHICH SHOULD EXTEND A MINIMUM DISTANCE OF 2 FEET IN EITHER DIRECTION FROM THE BASE OF THE FILTER STONE CORE.
5. FILTER STONE EMBANKMENT: FILTER STONE SHOULD BE PLACED OVER THE GEOTEXTILE AND IS TO HAVE A SIDE SLOPE WHICH MATCHES THAT OF THE EARTH EMBANKMENT OF 3:1 AND SHOULD COVER THE GEOTEXTILE/ROCK CORE A MINIMUM OF 6INCHES WHEN INSTALLATION IS COMPLETE. THE CREST OF THE OUTLET SHOULD BE AT LEAST 1 FOOT BELOW THE TOP OF THE EMBANKMENT.
6. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
7. TRASH AND OTHER DEBRIS SHOULD BE REMOVED AFTER EACH RAINFALL TO PREVENT CLOGGING OF THE OUTLET STRUCTURE. SEDIMENT SHOULD BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO HALF OF THE DESIGN DEPTH OF THE TRAP.

A. SEDIMENT BASINS

1. THE DRAINAGE AREA FOR A SEDIMENT BASIN SHALL BE LESS THAN 100 ACRES.
2. THE BASIN SHOULD INCLUDE A PERMANENT STAKE TO INDICATE THE SEDIMENT LEVEL IN THE POOL AND MARKED TO INDICATE WHEN THE SEDIMENT OCCUPIES 50% OF THE BASIN VOLUME (NOT THE TOP OF THE STAKE). SEDIMENT SHALL BE REMOVED WHEN SEDIMENT REACHES 50% STORAGE CAPACITY.
3. PLACE FILL MATERIAL IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH. BEFORE COMPACTION, MOISTEN OR AERATE EACH LAYER AS NECESSARY TO PROVIDE THE OPTIMUM MOISTURE CONTENT OF THE MATERIAL. COMPACT EACH LAYER TO 95 PERCENT STANDARD PROCTOR DENSITY. DO NOT PLACE MATERIAL ON SURFACES THAT ARE MUDDY OR FROZEN. SIDE SLOPES FOR THE EMBANKMENT SHOULD BE 3:1 (H:V). MINIMUM WIDTH OF THE EMBANKMENT AT THE TOP SHALL BE 8 FEET.
4. AN EMERGENCY SPILLWAY SHOULD BE INSTALLED ADJACENT TO THE EMBANKMENT ON UNDISTURBED SOIL AND SHOULD BE SIZED TO CARRY THE FULL AMOUNT OF FLOW GENERATED BYA 10-YEAR, 3-HOUR STORM WITH 1 FOOT OF FREEBOARD LESS THE AMOUNT WHICH CAN BE CARRIED BY THE PRINCIPAL OUTLET CONTROL DEVICE. THE EMERGENCY SPILLWAY SHOULD BE LINED WITH RIPRAP AS SHOULD THE SWALE LEADING FROM THE SPILLWAY TO THE NORMAL WATERCOURSE AT THE BASE OF THE EMBANKMENT.
5. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.TRASH AND OTHER DEBRIS SHOULD BE REMOVED AFTER EACH RAINFALL TO PREVENT CLOGGING OF THE OUTLET STRUCTURE.
6. ACCUMULATED SILT SHOULD BE REMOVED AND THE BASIN SHOULD BE RE-GRADED TO ITS ORIGINAL DIMENSIONS AT SUCH POINT THAT THE CAPACITY OF THE IMPOUNDMENT HAS BEEN REDUCED TO 75% OF ITS ORIGINAL STORAGE CAPACITY.

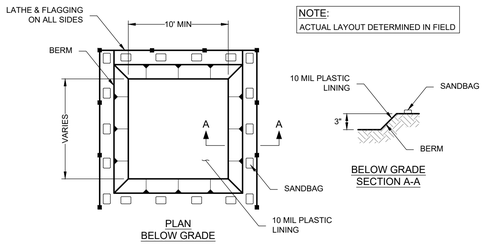
ADDITIONAL NOTES:

1. UPON COMPLETION OF CONSTRUCTION ALL DISTURBED AREAS SHALL BE REVEGETATED TO 70% OF EXISTING CONDITIONS
   IN ACCORDANCE WITH THE SWPPP AND TPDES REQUIREMENTS.
2. THIS SITE IS NOT LOCATED ADJACENT TO ANY SURFACE WATERS.
3. THIS SITE WILL NOT HAVE ANY LOCATIONS WHERE STORM WATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY.



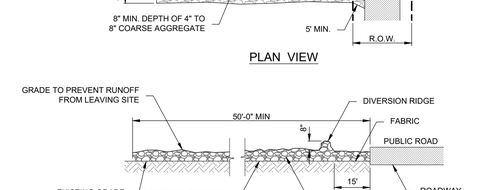
01 STABILIZED CONSTRUCTION EXIT

N.T.S.



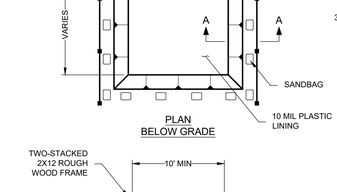
02 CONCRETE WASHOUT AREA

N.T.S.



03 SILT FENCE

N.T.S.

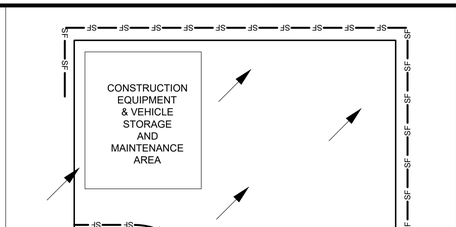


NOTES:

1. USE ONLY OPEN GRADED ROCK 4-8 INCH DIAMETER FOR STREAMFLOW CONDITION; USE OPEN GRADED ROCK 3-5 INCHES DIAMETER FOR OTHER CONDITIONS.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1 INCH OPENINGS AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE - WOVEN WIRE SHEATHING, SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED, DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO ONE-THIRD THE HEIGHT OF THE BERM OR ONE FOOT, WHICHEVER IS LESS, THE SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CREATE A SILTATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS; SILT SHALL BE REMOVED WHEN ACCUMULATION REACHES 6 INCHES.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

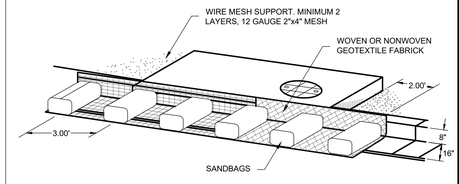
05 ROCK BERM

N.T.S.



CONSTRUCTION STAGING AREA

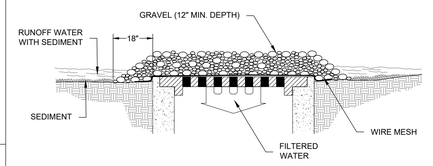
N.T.S.



CURB INLET PROTECTION

NOTES:

1. WHEN A SANDBAG IS FILLED WITH MATERIAL, THE OPEN END OF THE SANDBAG SHOULD BE STAPLED OR TIED WITH NYLON OR POLY CHORD.
2. INLET PROTECTION SHALL BE PLACED OVER THE MOUTH OF THE INLET WITH A 2 FOOT OVERLAP ON EITHER SIDE.
3. THE FABRIC COVER AND SHALL BE A CONTINUOUS WRAPPING OF GEOTEXTILE.
4. THE SKIRT SHALL BE WEIGHTED WITH ONE 18"x24"x6" SANDBAG EVERY 3 FEET.
5. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF FOUR INCHES, AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.
7. AFTER THE DEVELOPMENT SITE IS COMPLETELY STABILIZED, THE DIKES AND ANY REMAINING SILT SHALL BE REMOVED. SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.



GRATE INLET PROTECTION

NOTES:

1. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. WIRE MESH WITH ½ INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
2. COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED ABOVE. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
3. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS IT'S FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.

04 INLET PROTECTION

N.T.S.

VERAMENDI PRECINCT 23 UNIT 1

STORMWATER POLUTION PROTECTION PLAN DETAILS

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 1/22/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh_SWPPP Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

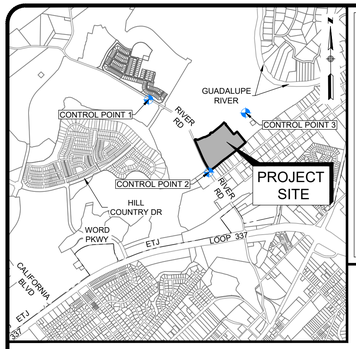
JOB NUMBER: SA3856.2405

SHEET NO.

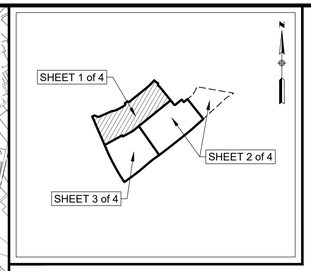
9.1

FOR PERMIT

K:\SA3856_ASA Properties\2405 23-71426 Site Development Plans\DWG-Sheets\sh_SWPPP Details.dwg
Xrefs Attached: None
Last Modified: Mon, 06, 25 - 21:19
Last Plotted: Mon, 06, 25 - 14:39:26



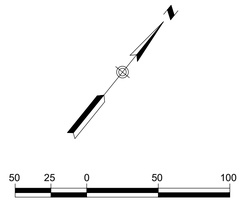
LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

NOTES:

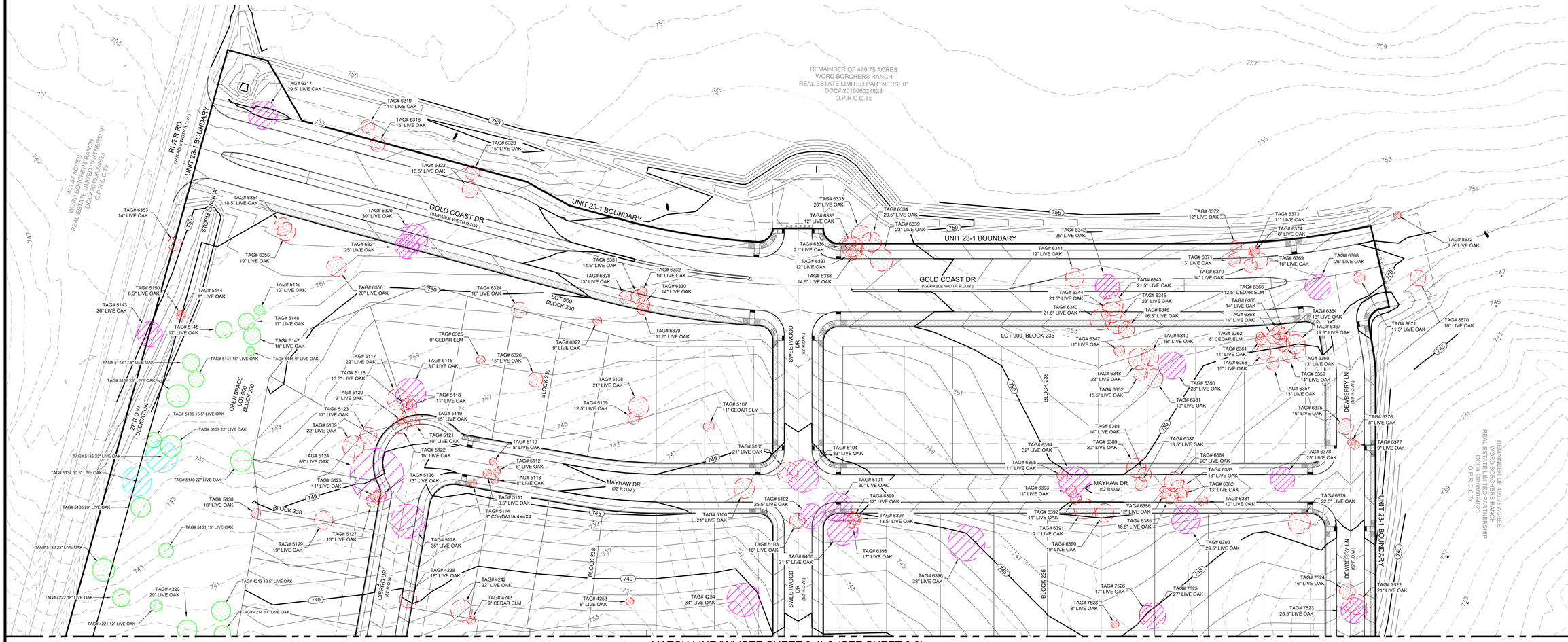
1. ALL TREE PROTECTION FENCING SHALL CONSIST OF LEVEL I FENCING PROTECTION UNLESS OTHERWISE NOTED.
2. NO CONSTRUCTION SHALL OCCUR WITHIN THE ONE HALF (½) ROOT PROTECTION ZONE.
3. REFER TO SHEET 9.6 FOR PROTECTION DETAILS



SCALE IN FEET
SCALE: 1"=50'

LEGEND

- 800 — EXISTING CONTOUR
- 800 — PROPOSED CONTOUR
- UNIT 1 BOUNDARY
- LIMITS OF POTENTIAL WALLS
- TP — TREE PROTECTION FENCING
- TREE SIGNIFICANT (PRESERVE)
- TREE SIGNIFICANT (REMOVE)
- TREE HERITAGE (PRESERVE)
- TREE HERITAGE (REMOVE)



MATCH LINE "A" (SEE SHEET 9.4) & (SEE SHEET 9.3)

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

TREE PRESERVATION PLAN (SHEET 1 OF 4)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/5/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: 9B_Tree Preservation Plan.dwg

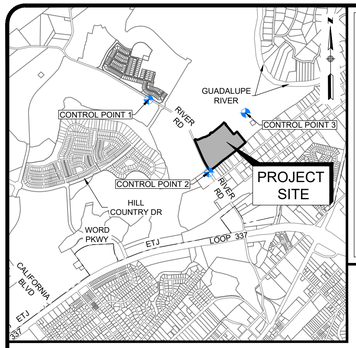
STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

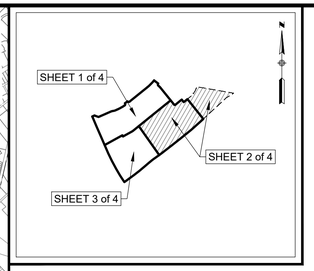
JOB NUMBER:
SA3856.2405

SHEET NO.
9.2

K:\SA3856_EA_Properties\2405_23-1\426_Site Development Plans\2Mid-Sheets\9A_Tree Preservation Plan.dwg
Xrefs: None
Last Modified: Jun. 30, 25 - 15:44
Last Plotted: Jun. 30, 25 - 15:45



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

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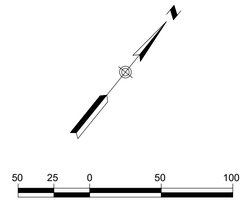
2. NO CONSTRUCTION SHALL OCCUR WITHIN THE ONE HALF (½) ROOT PROTECTION ZONE.
3. REFER TO SHEET 9.6 FOR PROTECTION DETAILS

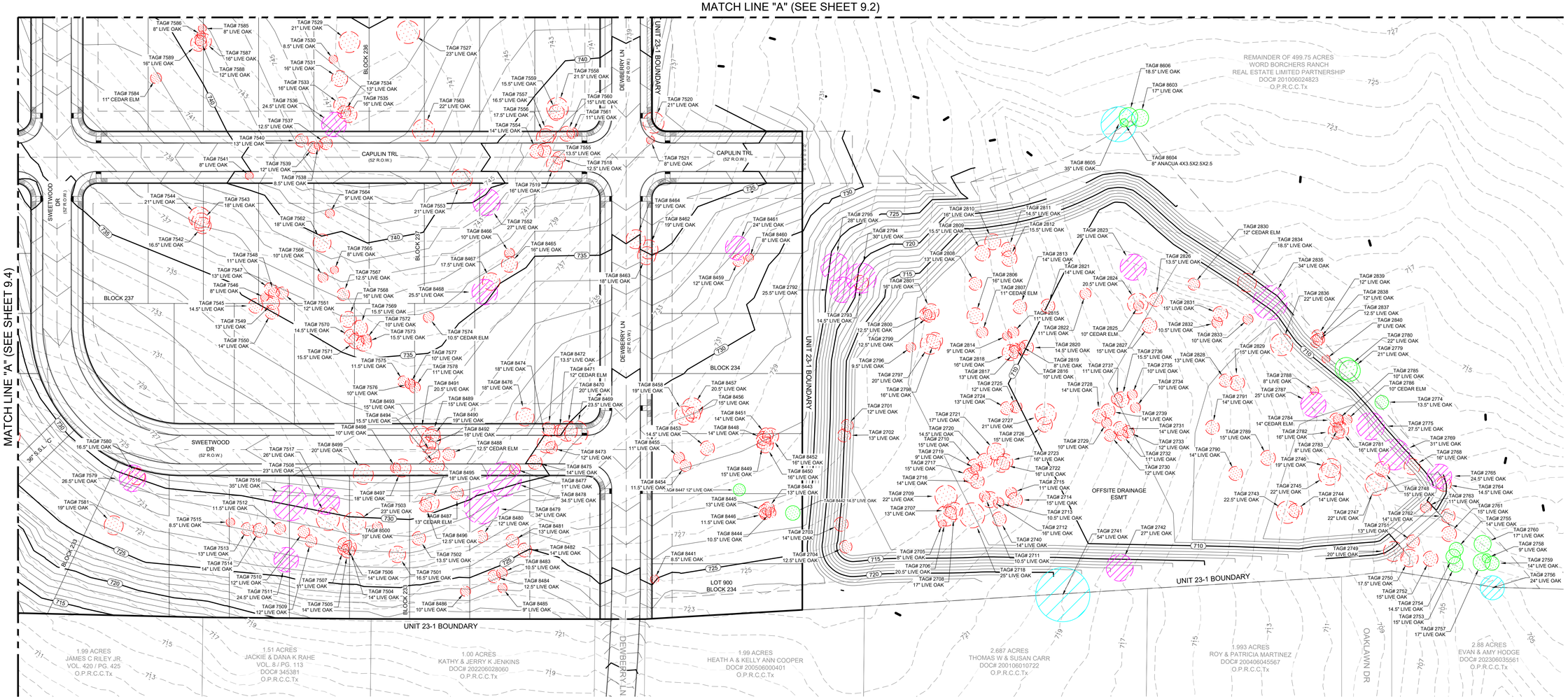


SCALE IN FEET
SCALE: 1"=50'

LEGEND

- 800 — EXISTING CONTOUR
- 800 — PROPOSED CONTOUR
- UNIT 1 BOUNDARY
- LIMITS OF POTENTIAL WALLS
- TP — TREE PROTECTION FENCING
- TREE SIGNIFICANT (PRESERVE)
- TREE SIGNIFICANT (REMOVE)
- TREE HERITAGE (PRESERVE)
- TREE HERITAGE (REMOVE)

MATCH LINE "A" (SEE SHEET 9.2)



VERAMENDI PRECINCT 23 UNIT 1

TREE PRESERVATION PLAN (SHEET 2 OF 4)

NO.	BY	DATE

REVISIONS
DESCRIPTION

DATE: 4/5/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sh - Tree Preservation Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.533.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

SHEET NO.
9.3

FOR PERMIT

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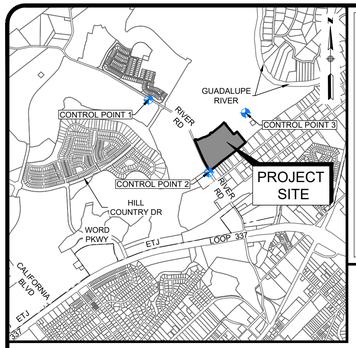
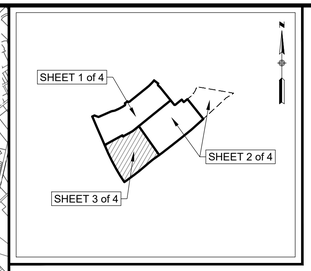
Xrefs: None
Last Modified: Jun. 30, 25 - 15:44
By: HerDiaz



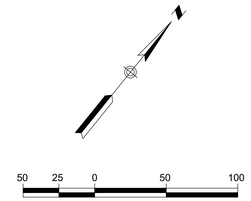
LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

NOTES:

1. ALL TREE PROTECTION FENCING SHALL CONSIST OF LEVEL I FENCING PROTECTION UNLESS OTHERWISE NOTED.
2. NO CONSTRUCTION SHALL OCCUR WITHIN THE ONE HALF (½) ROOT PROTECTION ZONE.
3. REFER TO SHEET 9.6 FOR PROTECTION DETAILS

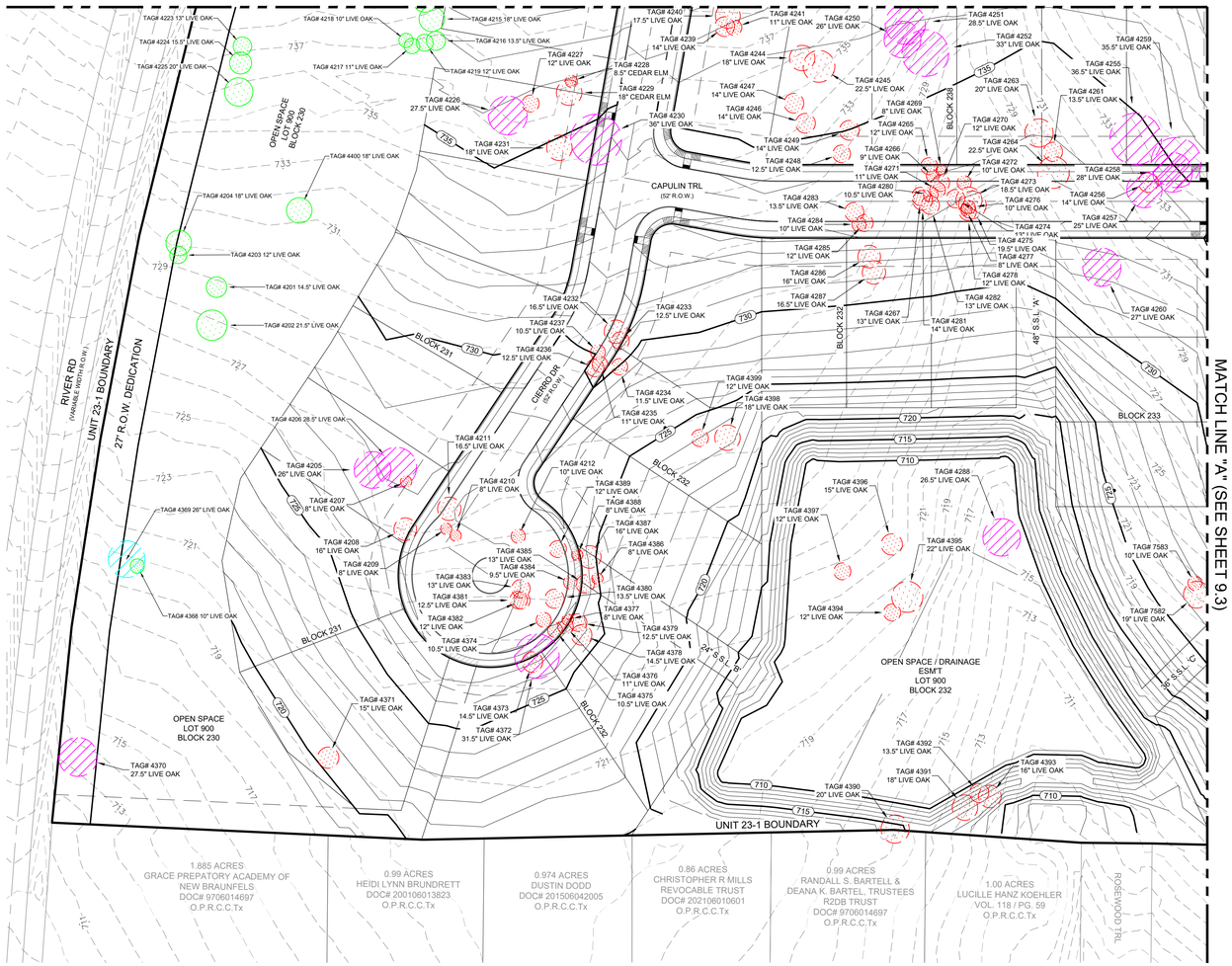


SCALE IN FEET
SCALE: 1"=50'

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- UNIT 1 BOUNDARY
- LIMITS OF POTENTIAL WALLS
- TREE PROTECTION FENCING
- TREE SIGNIFICANT (PRESERVE)
- TREE SIGNIFICANT (REMOVE)
- TREE HERITAGE (PRESERVE)
- TREE HERITAGE (REMOVE)

MATCH LINE "A" (SEE SHEET 9.2)



VERAMENDI PRECINCT 23 UNIT 1

TREE PRESERVATION PLAN (SHEET 3 OF 4)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/5/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: 3b_Tree Preservation Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER:
SA3856.2405

SHEET NO.
9.4

FOR PERMIT

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Xrefs: None
Last Modified: Jun. 30, 25 - 15:44
Last Plotted: Jul. 08, 25 - 10:31:5

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
4201	14.5" LIVE OAK			14.5	
4202	21.5" LIVE OAK			21.5	
4203	12" LIVE OAK			12	
4204	18" LIVE OAK			18	
4205	26" LIVE OAK		26		
4206	28.5" LIVE OAK		28.5		
4207	8" LIVE OAK	8			
4208	16" LIVE OAK	16			
4209	8" LIVE OAK	8			
4210	8" LIVE OAK	8			
4211	16.5" LIVE OAK	16.5			
4212	10" LIVE OAK	10			
4213	19.5" LIVE OAK			19.5	
4214	17" LIVE OAK			17	
4215	18" LIVE OAK			18	
4216	13.5" LIVE OAK			13.5	
4220	20" LIVE OAK			20	
4221	12" LIVE OAK			12	
4222	18" LIVE OAK			18	
4223	13" LIVE OAK			13	
4224	15.5" LIVE OAK			15.5	
4225	20" LIVE OAK			20	
4226	27.5" LIVE OAK		27.5		
4227	12" LIVE OAK	12			
4228	8.5" CEDAR ELM	8.5			
4229	18" CEDAR ELM	18			
4230	36" LIVE OAK		36		
4231	18" LIVE OAK	18			
4232	16.5" LIVE OAK	16.5			
4233	12.5" LIVE OAK	12.5			
4234	11.5" LIVE OAK	11.5			
4235	11" LIVE OAK	11			
4236	12.5" LIVE OAK	12.5			
4237	10.5" LIVE OAK	10.5			
4238	18" LIVE OAK	18			
4239	14" LIVE OAK	14			
4240	17.5" LIVE OAK	17.5			
4241	11" LIVE OAK	11			
4242	22" LIVE OAK	22			
4243	9" CEDAR ELM	9			
4244	18" LIVE OAK	18			
4245	22.5" LIVE OAK	22.5			
4246	14" LIVE OAK	14			
4247	14" LIVE OAK	14			
4248	12.5" LIVE OAK	12.5			
4249	14" LIVE OAK	14			
4250	26" LIVE OAK		26		
4251	28.5" LIVE OAK		28.5		
4252	33" LIVE OAK		33		
4253	8" LIVE OAK	8			
4254	34" LIVE OAK		34		
4255	36.5" LIVE OAK		36.5		
4256	14" LIVE OAK	14			
4257	25" LIVE OAK		25		
4258	28" LIVE OAK		28		
4259	35.5" LIVE OAK		35.5		
4260	27" LIVE OAK		27		
4261	13.5" LIVE OAK	13.5			
4263	20" LIVE OAK	20			
4264	22.5" LIVE OAK	22.5			
4265	12" LIVE OAK	12			
4266	9" LIVE OAK	9			
4267	13" LIVE OAK	13			
4269	8" LIVE OAK	8			
4270	12" LIVE OAK	12			
4271	11" LIVE OAK	11			
4272	10" LIVE OAK	10			
4273	18.5" LIVE OAK	18.5			
4274	13" LIVE OAK	13			
4275	19.5" LIVE OAK	19.5			
4276	10" LIVE OAK	10			
4277	8" LIVE OAK	8			
4278	12" LIVE OAK	12			
4280	10.5" LIVE OAK	10.5			
4281	14" LIVE OAK	14			
4282	13" LIVE OAK	13			
4283	13.5" LIVE OAK	13.5			
4284	10" LIVE OAK	10			
4285	12" LIVE OAK	12			
4286	16" LIVE OAK	16			
4287	16.5" LIVE OAK	16.5			
4288	26.5" LIVE OAK		26.5		
4368	10" LIVE OAK			10	
4369	26" LIVE OAK				26
4370	27.5" LIVE OAK		27.5		
4371	15" LIVE OAK	15			
4372	31.5" LIVE OAK		31.5		
4373	14.5" LIVE OAK	14.5			
4374	10.5" LIVE OAK	10.5			
4375	10.5" LIVE OAK	10.5			
4376	11" LIVE OAK	11			
4377	8" LIVE OAK	8			
4378	14.5" LIVE OAK	14.5			

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
4379	12.5" LIVE OAK	12.5			
4380	13.5" LIVE OAK	13.5			
4381	12.5" LIVE OAK	12.5			
4382	12" LIVE OAK	12			
4383	13" LIVE OAK	13			
4384	9.5" LIVE OAK	9.5			
4385	13" LIVE OAK	13			
4386	8" LIVE OAK	8			
4387	16" LIVE OAK	16			
4388	8" LIVE OAK	8			
4389	12" LIVE OAK	12			
4390	20" LIVE OAK	20			
4391	18" LIVE OAK	18			
4392	13.5" LIVE OAK	13.5			
4393	16" LIVE OAK	16			
4394	12" LIVE OAK	12			
4395	22" LIVE OAK	22			
4396	15" LIVE OAK	15			
4397	12" LIVE OAK	12			
4398	18" LIVE OAK	18			
4399	12" LIVE OAK	12			
4400	18" LIVE OAK			18	
5101	30" LIVE OAK		30		
5102	25.5" LIVE OAK		25.5		
5103	16" LIVE OAK	16			
5104	33" LIVE OAK		33		
5105	21" LIVE OAK	21			
5106	21" LIVE OAK	21			
5107	11" CEDAR ELM	11			
5108	21" LIVE OAK	21			
5109	12.5" LIVE OAK	12.5			
5110	8" LIVE OAK	8			
5111	8.5" LIVE OAK	8.5			
5112	8" LIVE OAK	8			
5113	8" LIVE OAK	8			
5114	8" CONDALIA 4X4X4	8			
5115	31" LIVE OAK		31		
5116	13.5" LIVE OAK	13.5			
5117	22" LIVE OAK	22			
5118	11" LIVE OAK	11			
5119	15" LIVE OAK	15			
5120	9" LIVE OAK	9			
5121	10" LIVE OAK	10			
5122	16" LIVE OAK	16			
5123	17" LIVE OAK	17			
5124	55" LIVE OAK		55		
5125	11" LIVE OAK	11			
5126	13" LIVE OAK	13			
5127	13" LIVE OAK	13			
5128	35" LIVE OAK		35		
5129	19" LIVE OAK	19			
5130	10" LIVE OAK	10			
5131	15" LIVE OAK			15	
5132	23" LIVE OAK			23	
5133	20" LIVE OAK			20	
5134	30.5" LIVE OAK				30.5
5135	33" LIVE OAK				33
5136	15.5" LIVE OAK			15.5	
5137	22" LIVE OAK			22	
5138	23" LIVE OAK			23	
5139	22" LIVE OAK	22			
5140	22" LIVE OAK			22	
5141	16" LIVE OAK			16	
5142	17.5" LIVE OAK			17.5	
5143	26" LIVE OAK		26		
5144	9" LIVE OAK	9			
5145	17" LIVE OAK			17	
5146	9" LIVE OAK			9	
5147	18" LIVE OAK			18	
5148	17" LIVE OAK			17	
5149	10" LIVE OAK			10	
5150	6.5" LIVE OAK	6.5			
6317	29.5" LIVE OAK		29.5		
6318	15" LIVE OAK	15			
6319	14" LIVE OAK	14			
6320	30" LIVE OAK		30		
6321	25" LIVE OAK		25		
6322	16.5" LIVE OAK	16.5			
6323	15" LIVE OAK	15			
6324	16" LIVE OAK	16			
6325	9" CEDAR ELM	9			
6326	15" LIVE OAK	15			
6327	9" LIVE OAK	9			
6328	13" LIVE OAK	13			
6329	11.5" LIVE OAK	11.5			
6330	14" LIVE OAK	14			
6331	14.5" LIVE OAK	14.5			
6332	10" LIVE OAK	10			
6333	20" LIVE OAK	20			
6334	20.5" LIVE OAK	20.5			
6335	12" LIVE OAK	12			
6336	21" LIVE OAK	21			
6337	12" LIVE OAK	12			
6338	14.5" LIVE OAK	14.5			
6339	23" LIVE OAK	23			
6340	21.5" LIVE OAK	21.5			

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
6341	19" LIVE OAK	19			
6342	25" LIVE OAK		25		
6343	21.5" LIVE OAK	21.5			
6344	21.5" LIVE OAK	21.5			
6345	23" LIVE OAK	23			
6346	16.5" LIVE OAK	16.5			
6347	11" LIVE OAK	11			
6348	22" LIVE OAK	22			
6349	18" LIVE OAK	18			
6350	28" LIVE OAK		28		
6351	19" LIVE OAK	19			
6352	15.5" LIVE OAK	15.5			
6353	14" LIVE OAK	14			
6354	18.5" LIVE OAK	18.5			
6355	19" LIVE OAK	19			
6356	20" LIVE OAK	20			
6357	13" LIVE OAK	13			
6358	15" LIVE OAK	15			
6359	14" LIVE OAK	14			
6360	13" LIVE OAK	13			
6361	11" LIVE OAK	11			
6362	8" CEDAR ELM	8			
6363	14" LIVE OAK	14			
6364	13" LIVE OAK	13			
6365	14" LIVE OAK	14			
6366	12.5" CEDAR ELM	12.5			
6367	19.5" LIVE OAK	19.5			
6368	26" LIVE OAK		26		
6369	16" LIVE OAK	16			
6370	14" LIVE OAK	14			
6371	13" LIVE OAK	13			
6372	12" LIVE OAK	12			
6373	11" LIVE OAK	11			
6374	8" LIVE OAK	8			
6375	16" LIVE OAK	16			
6376	8" LIVE OAK	8			
6377	9" LIVE OAK	9			
6378	25" LIVE OAK		25		
6379	22.5" LIVE OAK	22.5			
6380	29.5" LIVE OAK		29.5		
6381	10" LIVE OAK	10			
6382	13" LIVE OAK	13			
6383	18" LIVE OAK	18			
6384	20" LIVE OAK	20			
6385	16.5" LIVE OAK	16.5			
6386	12" LIVE OAK	12			
6387	13.5" LIVE OAK	13.5			
6388	14" LIVE OAK	14			
6389	20" LIVE OAK	20			
6390	19" LIVE OAK	19			
6391	21" LIVE OAK	21			
6392	11" LIVE OAK	11			
6393	11" LIVE OAK	11			
6394	32" LIVE OAK		32		
6395	11" LIVE OAK	11			
6396	38" LIVE OAK		38		
6397	13.5" LIVE OAK	13.5			
6398	17" LIVE OAK	17			
6399	12" LIVE OAK	12			
6400	31.5" LIVE OAK		31.5		
7501	16.5" LIVE OAK	16.5			
7502	13.5" LIVE OAK	13.5			
7503	23" LIVE OAK	23			
7504	14" LIVE OAK	14			
7505	14" LIVE OAK	14			
7506	14" LIVE OAK	14			
7507	11" LIVE OAK	11			
7508	23" LIVE OAK	23			
7509	12" LIVE OAK	12			
7510	12" LIVE OAK	12			
7511	24.5" LIVE OAK		24.5		
7512	11.5" LIVE OAK	11.5			
7513	13" LIVE OAK	13			
7514	14" LIVE OAK	14			
7515	8.5" LIVE OAK	8.5			
7516	35" LIVE OAK		35		
7517	26" LIVE OAK		26		
7518	12.5" LIVE OAK	12.5			
7519	16" LIVE OAK	16			
7520	21" LIVE OAK	21			
7521	8" LIVE OAK	8			
7522	21" LIVE OAK	21			
7523	26.5" LIVE OAK		26.5		
7524	16" LIVE OAK	16			
7525	27" LIVE OAK		27		
7526	17" LIVE OAK	17			
7527	23" LIVE OAK	23			
7528	8" LIVE OAK	8			
7529	21" LIVE OAK	21			
7530	8.5" LIVE OAK	8.5			
7531	16" LIVE OAK	16			
7533	16" LIVE OAK	16			
7534	13" LIVE OAK	13			
7535	16" LIVE OAK	16			
7536	24.5" LIVE OAK		24.5		

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
7537	12.5" LIVE OAK	12.5			
7538	8.5" LIVE OAK	8.5			
7539	12" LIVE OAK	12			
7540	13" LIVE OAK	13			
7541	8" LIVE OAK	8			
7542	16.5" LIVE OAK	16.5			
7543	18" LIVE OAK	18			
7544	21" LIVE OAK	21			
7545	14.5" LIVE OAK	14.5			
7546	8" LIVE OAK	8			
7547	13" LIVE OAK	13			
7548	11" LIVE OAK	11			
7549	13" LIVE OAK	13			
7550	14" LIVE OAK	14			
7551	12" LIVE OAK	12			
7552	27" LIVE OAK		27		
7553	21" LIVE OAK	21			
7554	14" LIVE OAK	14			
7555	13.5" LIVE OAK	13.5			
7556	17.5" LIVE OAK	17.5			
7557	16.5" LIVE OAK	16.5			
7558	21.5" LIVE OAK	21.5			
7559	15.5" LIVE OAK	15.5			
7560	15" LIVE OAK	15			
7561	11" LIVE OAK	11			
7562	18" LIVE OAK	18			
7563	22" LIVE OAK	22			
7564	9" LIVE OAK	9			
7565	8" LIVE OAK	8			
7566	10" LIVE OAK	10			
7567	12.5" LIVE OAK	12.5			
7568	16" LIVE OAK	16			
7569	15.5" LIVE OAK	15.5			
7570	14.5" LIVE OAK	14.5			
7571	15.5" LIVE OAK	15.5			
7572	10" LIVE OAK	10			
7573	15.5" LIVE OAK	15.5			
7574	10.5" CEDAR ELM	10.5			
7575	11.5" LIVE OAK	11.5			
7576	10" LIVE OAK	10			
7577	10" LIVE OAK	10			
7578	11" LIVE OAK	11			
7579	26.5" LIVE OAK		26.5		
7580	16.5" LIVE OAK	16.5			
7581	19" LIVE OAK	19			
7582	19" LIVE OAK	19			
7583	10" LIVE OAK	10			
7584	11" CEDAR ELM	11			
7585	8" LIVE OAK	8			
7586	8" LIVE OAK	8			
7587	16" LIVE OAK	16			
7588	12" LIVE OAK	12			
7589	16" LIVE OAK	16			
8441	8.5" LIVE OAK	8.5			
8442	14.5" LIVE OAK			14.5	
8443	13" LIVE OAK	13			
8444	10.5" LIVE OAK	10.5			
8445	13" LIVE OAK	13			
8446	11.5" LIVE OAK	11.5			
8447	12" LIVE OAK			12	
8448	14" LIVE OAK	14			
8449	15" LIVE OAK	15			
8450	16" LIVE OAK	16			
8451	14" LIVE OAK	14			
8452	16" LIVE OAK	16			
8453	14.5" LIVE OAK	14.5			
8454	11.5" LIVE OAK	11.5			
8455	11" LIVE OAK	11			
8456	15" LIVE OAK	15			
8457	20.5" LIVE OAK	20.5			
8458	19" LIVE OAK	19			
8459	12" LIVE OAK	12			
8460	8" LIVE OAK	8			
8461	24" LIVE OAK		24		
8462	19" LIVE OAK	19			
8463	18" LIVE OAK	18			
8464	19" LIVE OAK	19			
8465	16" LIVE OAK	16			
8466	10" LIVE OAK	10			
8467	17.5" LIVE OAK	17.5			
8468	25.5" LIVE OAK		25.5		
8469	23.5" LIVE OAK	23.5			
8470	20" LIVE OAK	20			
8471	12" CEDAR ELM	12			
8472	13.5" LIVE OAK	13.5			
8473	12" LIVE OAK	12			
8474	18" LIVE OAK	18			
8475	14" LIVE OAK	14			
8476	18" LIVE OAK	18			
8477	11" LIVE OAK	11			
8478	34.5" LIVE OAK		34.5		
8479	34" LIVE OAK		34		
8480	12" LIVE OAK	12			
8481	13" LIVE OAK	13			
8482	14" LIVE OAK	14			

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
8483	10.5" LIVE OAK	10.5			
8484	12.5" LIVE OAK	12.5			
8485	9" LIVE OAK	9			
8486	10" LIVE OAK	10			
8487	13" CEDAR ELM	13			
8488	12.5" CEDAR ELM	12.5			
8489	15" LIVE OAK	15			
8490	19" LIVE OAK	19			
8491	20.5" LIVE OAK	20.5			
8492	16" LIVE OAK	16			
8493	15" LIVE OAK	15			
8494	15.5" LIVE OAK	15.5			
8495	18" LIVE OAK	18			
8496	12.5" LIVE OAK	12.5			
8497	18" LIVE OAK	18			
8498	10" LIVE OAK	10			
8499	20" LIVE OAK	20			
8500	10" LIVE OAK	10			
2701	12" LIVE OAK	12			
2702	13" LIVE OAK	13			
2703	14" LIVE OAK	14			
2704	12.5" LIVE OAK	12.5			
2705	8" LIVE OAK	8			
2706	20.5" LIVE OAK	20.5			
2707	13" LIVE OAK	13			
2708	17" LIVE OAK	17			
2709	22" LIVE OAK	22			
2710	15" LIVE OAK	15			
2711	10.5" LIVE OAK	10.5			
2712	16" LIVE OAK	16			
2713	10.5" LIVE OAK	10.5			
2714	15" LIVE OAK	15			
2715	11" LIVE OAK	11			
2716	14" LIVE OAK	14			
2717	15" LIVE OAK	15			
2718	25" LIVE OAK		25		
2719	9" LIVE OAK	9			
2720	14.5" LIVE OAK	14.5			
2721	17" LIVE OAK	17			
2722	16" LIVE OAK	16			
2723	16" LIVE OAK	16			
2724	13" LIVE OAK	13			
2725	12" LIVE OAK	12			
2726	15" LIVE OAK	15			
2727	21" LIVE OAK	21			
2728	14" LIVE OAK	14			
2729	10" LIVE OAK	10			
2730	12" LIVE OAK	12			
2731	14" LIVE OAK	14			
2732	11" LIVE OAK	11			
2733	12" LIVE OAK	12			
2734	10" LIVE OAK	10			
2735	10" LIVE OAK	10			
2736	15.5" LIVE OAK	15.5			
2737	11" LIVE OAK	11			
2739	14" LIVE OAK	14			
2740	14" LIVE OAK	14			
2741	54" LIVE OAK				54
2742	27" LIVE OAK		27		
2743	22.5" LIVE OAK	22.5			
2744	14" LIVE OAK	14			
2745	22" LIVE OAK	22			
2746	19" LIVE OAK	19			
2747	22" LIVE OAK	22			
2748	15" LIVE OAK	15			
2749	20" LIVE OAK	20			
2750	17.5" LIVE OAK	17.5			
2751	13" LIVE OAK	13			
2752	15" LIVE OAK	15			
2753	15" LIVE OAK			15	
2754	14.5" LIVE OAK			14.5	
2755	14" LIVE OAK			14	
2756	24" LIVE OAK				24
2757	17" LIVE OAK			17	
2758	9" LIVE OAK			9	
2759	14" LIVE OAK			14	
2760	17" LIVE OAK			17	
2761	15" LIVE OAK	15			
2762	14" LIVE OAK	14			
2763	11" LIVE OAK	11			
2764	14.5" LIVE OAK	14.5			
2765	24.5" LIVE OAK		24.5		
2768	16" LIVE OAK	16			
2769	31" LIVE OAK		31		
2774	13.5" LIVE OAK			13.5	
2775	27.5" LIVE OAK		27.5		
2779	21" LIVE OAK			21	
2780	22" LIVE OAK			22	
2781	16" LIVE OAK	16			
2782	16" LIVE OAK	16			
2783	8" LIVE OAK	8			
2784	14" CEDAR ELM	14			
2785	10" LIVE OAK	10			
2786	10" CEDAR ELM	10			
2787	25" LIVE OAK		25		

Tree Inventory Worksheet to Determine Preservation and Canopy Shade Coverage

Tag #	Size	Tree Removed 8"-23.9"	Tree Removed >24"	Tree Preserved 8"-23.9"	Tree Preserved >24"
2788	8" LIVE OAK	8			
2789	15" LIVE OAK	15			
2790	14" LIVE OAK	14			
2791	14" LIVE OAK	14			
2792	25.5" LIVE OAK		25.5		
2793	14.5" LIVE OAK	14.5			
2794	30" LIVE OAK		30		
2795	28" LIVE OAK		28		
2796	9.5" LIVE OAK	9.5			
2797	20" LIVE OAK	20			
2798	16" LIVE OAK	16			
2799	12.5" LIVE OAK	12.5			
2800	12.5" LIVE OAK	12.5			
2801	16" LIVE OAK	16			
2806	16" LIVE OAK	16			
2807	11" CEDAR ELM	11			
2808	13" LIVE OAK	13			
2809	15.5" LIVE OAK	15.5			
2810	16" LIVE OAK	16			
2811	14.5" LIVE OAK	14.5			
2812	15.5" LIVE OAK	15.5			
2813	14" LIVE OAK	14			
2814	9" LIVE OAK	9			
2815	11" LIVE OAK	11			
2816	10" LIVE OAK	10			
2817	13" LIVE OAK	13			
2818	16" LIVE OAK	16			
2819	8" LIVE OAK	8			
2820	14.5" LIVE OAK	14.5			
2821	14" LIVE OAK	14			
2822	11" LIVE OAK	11			
2823	26" LIVE OAK		26		
2824	20.5" LIVE OAK	20.5			
2825	10" CEDAR ELM	10			
2826	13.5" LIVE OAK	13.5			
2827	15" LIVE OAK	15			
2828	13" LIVE OAK	13			
2829	15" LIVE OAK	15			
2830	12" CEDAR ELM	12			
2831	15" LIVE OAK	15			
2832	10.5" LIVE OAK	10.5			
2833	10" LIVE OAK	10			
2834	18.5" LIVE OAK	18.5			
2835	34" LIVE OAK		34		
2836	22" LIVE OAK	22			
2837	12.5" LIVE OAK	12.5			
2838	12" LIVE OAK	12			
2839	12" LIVE OAK	12			
2840	8" LIVE OAK	8			
8603	17" LIVE OAK			17	
8604	8" ANACUA 4X3.5X2.5X2.5			8	
8605	35" LIVE OAK				35
8606	18.5" LIVE OAK			18.5	
8670	16" LIVE OAK	16			
8671	11.5" LIVE OAK	11.5			
8672	7.5" LIVE OAK	7.5			
Subtotal Inches		**5942.5**	**1670.5**	**765.5**	**202.5**
Preservation Credit					
Mitigation Rates		**5942.5**	**5011.5**		
Total Mitigation Needed		**9986**			

VERAMENDI PRECINCT 23 UNIT 1

TREE PRESERVATION PLAN (SHEET 4 OF 4)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/5/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: 9X_Tree Preservation Plan.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

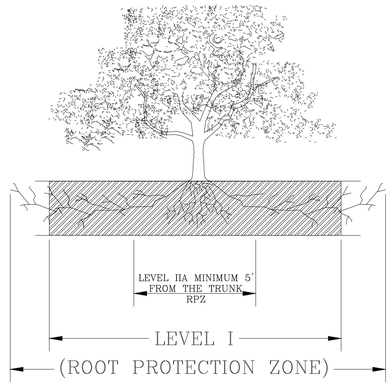
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **9.5**

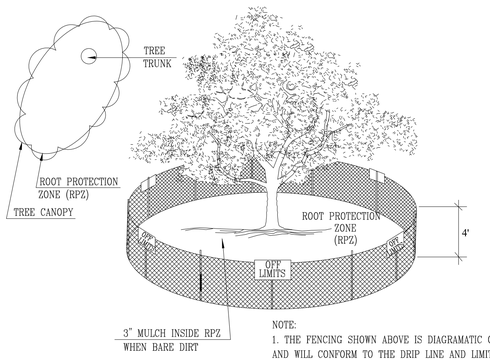
K:\SA3856.ASA Properties\2405 23-1\430 Site Development Plans\GWC-Sheets\9x_Tree Preservation Plan.dwg
User: ngower
Last Modified: Jun. 30, 25 - 15:44
Last Plotted: Jul. 08, 25 - 10:31

FOR PERMIT



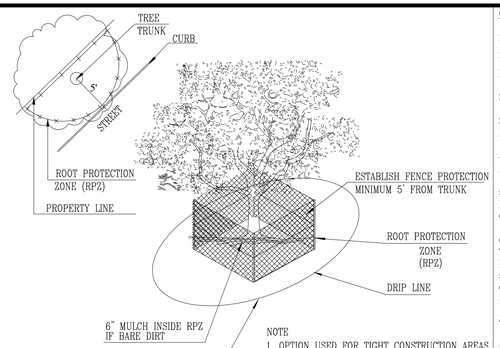
1.1.1 ELEVATION
N. T. S.

ROOT PROTECTION ZONE–THE ROOT PROTECTION ZONE IS A CIRCULAR AREA AROUND A TREE THAT IS BASED ON THE DIAMETER OF THE TREE. EACH 1 INCH DIAMETER OF THE TREE EQUALS 1 FOOT RADIUS FOR ROOT PROTECTION ZONE.



NOTE:
1. THE FENCING SHOWN ABOVE IS DIAGRAMATIC ONLY AND WILL CONFORM TO THE DRIP LINE AND LIMITED TO PROJECT BOUNDARY.
2. FOR ACCEPTABLE FENCING MATERIALS SEE SPECIFICATIONS.

1.1.2 LEVEL I & FENCE PROTECTION
N. T. S.



NOTE
1. OPTION USED FOR TIGHT CONSTRUCTION AREAS OR WHEN CONSTRUCTION OCCURS IN ROOT PROTECTION ZONE.
2. FOR ACCEPTABLE FENCING MATERIALS SEE SPECIFICATIONS.

1.1.3 LEVEL II A FENCE PROTECTION
N. T. S.

GENERAL NOTES

1. ALL THE TREES WITH A DIAMETER GREATER THAN 3 INCHES AFFECTED BY CONSTRUCTION SHALL HAVE THE LIMBS AND ROOTS TRIMMED AND PRUNED ACCORDING TO ITEM No. 802. TREE PRUNING, SOIL AMENDING AND FERTILIZATION, UNLESS SPECIFIED, TREES SHALL RECEIVE LEVEL 1 PROTECTION AS PER ITEM No. 802. TREES TO RECEIVE LEVEL 2 A PROTECTION AS PER ITEM No. 802 ARE IDENTIFIED ON THE TREE PROTECTION PLAN.

2. ALL TREES SHALL REMAIN UNLESS NOTED ON THE PLANS.

3. NO SITE PREPARATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED.

4. TREE PROTECTION FENCING SHALL BE REQUIRED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION.

5. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN THREE INCHES IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR.

6. THE ROOT PROTECTION ZONE IS THAT AREA SURROUNDING A TREE, AS MEASURED BY A RADIUS FROM THE TREE TRUNK, IN WHICH NO EQUIPMENT, VEHICLES OR MATERIALS MAY OPERATE OR BE STORED. THE REQUIRED RADIUS LENGTH IS 1 FOOT PER DIAMETER INCH OF THE TREE. FOR EXAMPLE, A 10-INCH DIAMETER TREE WOULD HAVE A 5-FOOT RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES THAT ARE IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. LIVE OAK WOUNDS SHALL BE PAINTED OVER, WITHIN 20 MINUTES TO PREVENT OAK WILT.

7. ACCESS TO FENCED AREAS WILL BE PERMITTED ONLY WITH THE APPROVAL OF THE ENGINEER OR CITY INSPECTOR.

8. GRADING, IF REQUIRED, SHALL BE LIMITED TO A 3 INCH CUT OR FILL WITHIN THE FENCED ROOT ZONE AREAS.

9. TREES, SHRUBS OR BUSHES TO BE CLEARED FROM PROTECTED ROOT ZONE AREAS SHALL BE REMOVED BY HAND AS DIRECTED BY THE PROJECT MANAGER OR CITY INSPECTOR.

10. TREES DAMAGED OR LOST DUE TO CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED TO THE ENGINEER'S SATISFACTION.

11. EXPOSED ROOTS SHALL BE COVERED AT THE END OF EACH DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH OR WET BURLAP.

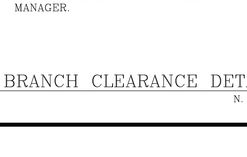
12. ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST PRIOR TO ITS REMOVAL.

NOTE
WRAP TREE TRUNK WITH 2"X4" STUDS AND ROPE OR BAND IN PLACE AS NEEDED TO PROTECT TREES IN WORK AREAS.

1.1.4 LEVEL II B FENCE PROTECTION
N. T. S.

TREES THAT ARE MARKED TO BE PRESERVED ON A SITE PLAN AND FOR WHICH UTILITIES MUST PASS TROUGH THEIR ROOT PROTECTION ZONES MAY REQUIRE TUNNELING AS OPPOSED TO OPEN TRENCHES. THE DECISION TO TUNNEL WILL BE DETERMINED ON A CASE BY CASE BASIS BY THE ENGINEER.

TUNNELS SHALL BE DUG THROUGH THE ROOT PROTECTION ZONE IN ORDER TO MINIMIZE ROOT DAMAGE.



TUNNEL TO MINIMIZE ROOT DAMAGE (TOP) AS OPPOSED TO SURFACE-DUG TRENCHES IN ROOT PROTECTION ZONE WHEN THE 5' MINIMUM DISTANCE FROM TRUNK CAN NOT BE ACHIEVED.

OPEN TRENCHING MAY BE USED IF EXPOSED TREE ROOTS DO NOT EXCEED 3" OR ROOTS CAN BE BENT BACK.

1.2 BORING THRU TREE ROOT ZONE
N. T. S.

NOTE:

A" REMOVE BULKY TREE PARTS "SHRED" AND/OR HAUL SEPARATELY.

"B" BEGIN EXCAVATION APPROX. 8' FROM THE TRUNK – CUT THRU ANCHOR ROOTS AT AN ANGLE – 3' TO 4' DEEP

"C" USING TREE TRUNK AS A LEVER PUSH AT POINT "E" TO REMOVE TREE BOLE AND LARGE FEEDER ROOTS (4" TO 10" IN DIAM.)

"D" BACKFILL HOLE AND CLEAN UP.

1.3 TREE REMOVAL DIAGRAM
N. T. S.

NOTE: DO NOT CUT FROM D to E.

A. FIRST CUT – TO PREVENT THE BARK FROM BEING PEELED WHEN THE BRANCH FALLS.
B. SECOND CUT – TO REDUCE THE WEIGHT OF BRANCH.
C. FINAL CUT – ALLOW FOR HEALING COLLAR BUT NO STUBS
D. BRANCH RIDGES – INDENT PROPERLY BRANCH RIDGES WHICH ARE SITE FOR DECAY.

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

1.4 BRANCH PRUNING DETAIL
N. T. S.

FIGURE No.2:

A MINIMUM BRANCH CLEARANCE OF 14 FEET ABOVE STREET ELEVATION MUST BE MAINTAINED FROM THE PROPERTY LINE TO THE CURB LINE AS PRESCRIBED BY PROJECT MANAGER.

1.5 BRANCH CLEARANCE DETAIL
N. T. S.

1.6 NEW TREE PLANTING DETAIL
N. T. S.

VERAMENDI PRECINCT 23 UNIT 1

TREE PRESERVATION PLAN DETAILS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 3/18/2025
DESIGNED BY: NG
DRAWN BY: HW
CHECKED BY: PF
DRAWING NAME: sa_tree Preservation Plan Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 9.6

FOR PERMIT

P:\LJA3856 ASA Properties\2405 23-1\425 Site Development Plans\DWG-Sheets\sh_Tree Preservation Plan Details.dwg
Xref Name:
Last Modified: Mar 18, 25 - 21:05
Plot Time/Scale: Jul 08, 25 - 14:41:49

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: Nicholas Gower, PE

Date: 7/8/2025

Signature of Customer/Agent:

Regulated Entity Name: Veramendi Precinct 23 Unit 1

Project Information

Potential Sources of Contamination

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

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

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

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

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

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

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

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

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

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

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

Sequence of Construction

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

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

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

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

- [X] A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
- [X] A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
- [X] A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
- [X] A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

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

   - [ ] **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
   - [X] There will be no temporary sealing of naturally-occurring sensitive features on the site.

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

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

    - [X] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
    - [ ] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
    - [ ] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
    - [ ] There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

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

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

    ☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

18. [X] 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. [X] Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

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

21. [X] 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. [X] 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.

Temporary Stormwater Section

Attachment A – Spill Response Actions

Spill Prevention and Control

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

The following steps will help reduce the storm water impacts of leaks and spills:

Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.

(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.

(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).

(4) Establish a continuing education program to indoctrinate new employees.

(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

(2) Store hazardous materials and wastes in covered containers and protect from vandalism.

(3) Place a stockpile of spill cleanup materials where it will be readily accessible.

(4) Train employees in spill prevention and cleanup.

(5) Designate responsible individuals to oversee and enforce control measures.

(6) Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise cleanup activities.

(7) Do not bury or wash spills with water.

(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.

(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.

(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.

(2) Use absorbent materials on small spills rather than hosing down or burying the spill.

(3) Absorbent materials should be promptly removed and disposed of properly.

(4) Follow the practice below for a minor spill:
   a) Contain the spread of the spill.
   b) Recover spilled materials.
   c) Clean the contaminated area and properly dispose of contaminated materials.

Semi-significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.

(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

(3) Notification should first be made by telephone and followed up with a written report.

(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at:
http://www.tnrcc.state.tx.us/enforcement/emergency_response.html.

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately.

(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

(5) Place drip pans or absorbent materials under paving equipment when not in use.

(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.

(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

(8) Oil filters disposed of in trashcans or dumpsters can leak 03 and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.

(9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you & think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Discourage “topping off” of fuel tanks.

(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

Spill Response Actions

In the event that a spill of hydrocarbons or hazardous substances does occur, the contractor shall be required to maintain a sufficient stockpile of sand material in the staging area. This sand material shall be used to immediately isolate and provide containment of the spill by constructing dikes. Furthermore, this sand material shall act as an absorbent material that can be disposed of offsite and out of the Recharge Zone during clean-up operations. The contractor, in the event of a spill, shall also notify the owner who shall contact TCEQ. All contaminated soils resulting from an accidental release will be required to be removed and disposed of in accordance with all local, state and federal regulations.

Attachment B – Potential Sources Contamination

Potential Source	Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.
Preventive Measure	Vehicle maintenance, when possible, will be performed within a construction staging area specified by the General Contractor.
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	Stormwater contamination from excess application of fertilizers, herbicides and pesticides.
Preventive Measure	Fertilizers, herbicides and pesticides will be applied only when necessary and in accordance with manufacturer's directions.

Potential Source	Soil and mud from construction vehicle tires as they leave the site.
Preventive Measure	A temporary construction entrance/exit shall be utilized as vehicles leave the site. Any soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.
Potential Source	Sediment from soil, sand, gravel and excavated materials stockpiled on site.
Preventive Measure	Silt fence shall be installed on the down gradient side of all stockpiled materials. Reinforced rock berms shall be installed at all downstream discharge locations.
Potential Source	Portable toilet spill.
Preventive Measure	Toilets on the site will be emptied on a regular basis by the contracted toilet company.

Attachment C – Sequence of Major Activities

The sequence of major activities which disturb soil during construction on this site will be divided into stages. The first stage is site preparation that will include clearing and grubbing of vegetation, where applicable. This will disturb approximately 1.80 acres. The second is construction that will include installation of utilities, construction of the water quality basin and the proposed buildings, parking lot, landscaping and site cleanup. This will disturb approximately 1.80 acres.

Sequence Item	Description
1.	**Install TBMP's as required. (Silt Fence, etc.)**
2.	**Clearing of Disturbed Areas**
3.	**Grading of Disturbed Areas**
4.	**Construction of Permanent BMP's /Storm Drains**
5.	**Complete Construction**
6.	**Soil Stabilization and/or re-vegetation**
7.	**Clean site**
8.	**Remove TBMP's**

Attachment D – Temporary Best Management Practices and Measures

1. Temporary Construction Entrance/Exit – A stabilized pad of crushed stone located at any point where traffic will be entering or leaving the construction site from a public R.O.W., street, alley, sidewalk or parking area. It shall be a minimum of 50 feet long, 12 feet wide and 8 inches thick. The rock shall be 4" to 8" in size.

2. Silt Fence – A barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. Silt fences shall be installed on the down gradient side of the proposed areas to be disturbed that have a drainage area of ¼ acres per 100 feet of fence.

3. Rock Berms – A sediment trap consisting of 3" to 5" diameter rock wrapped in a woven wire sheathing. The berm shall have a minimum height of 36" and a minimum top width of 2 feet. A rock berm shall be placed at locations of the concentrated flows where the drainage area is between 2 and 5 acres.

4. Inlet Protection – Placed around inlets to catch and stop sediment from entering the storm drain system before filtration system are in place.

5. Concrete Washout Pit – Designed to trap and store waste from concrete and similar activities. This allows for safe storage and removal from the site by not allowing contaminants to enter the storm water. Contaminants can be kept in a location that will not allow storm water to mix and flow off the site.

Sequence of installation during construction process

1. The Temporary Construction Entrance/Exit (Item 1) shall be installed prior to disturbing any soil except at the location of the Temporary Construction Entrance/Exit. It shall stay in place and be maintained until the end of the infrastructure construction.

2. Silt fence (Item 2) shall be installed along the western boundary of the site prior to any disturbance of the site

3. Rock berms (Item 4) shall be installed around the perimeter of the project at natural low points following rough grading of the site and shall be removed once grading to the on-site stormwater drainage system with bagged gravel inlet filters in sump is complete. Rock berms will also be utilized at the outlet of the pond while it is being constructed.

The TBMPs and measures utilized for the proposed project to prevent pollution of storm water, groundwater, and surface water during the construction phase are the following:

1. Temporary Construction Entrance/Exit
2. Silt Fence
3. Concrete Washout Pit
4. Rock Berm
5. Inlet Protection

Attachment D – Temporary Best Management Practices and Measures

Stormwater originating from upgradient.

- Stormwater originating from upgradient from the east site of the property will be routed around the site by proposed grading.

Stormwater originating from onsite.

- Stormwater originating from onsite will be maintained by the proposed TMBPs (Silt fence, rock berms, etc.) to stay within the project limits and treated by the proposed PBMP.

Prevent stormwater from entering surface water, sensitive features and aquifer.

- No stormwater is expected to enter any surface water, sensitive feature or directly to the aquifer.

Will maintain flow to naturally occurring sensitive features.

- No naturally occurring sensitive features are documented on the geological assessment table.

1.4.2 Temporary Construction Entrance/Exit

The purpose of a temporary gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. This practice should be used at all points of construction ingress and egress. Schematic diagrams of a construction entrance/exit are shown in Figure 1-24 and Figure 1-25.

Excessive amounts of mud can also present a safety hazard to roadway users. To minimize the amount of sediment loss to nearby roads, access to the construction site should be limited to as few points as possible and vegetation around the perimeter should be protected were access is not necessary. A rock stabilized construction entrance should be used at all designated access points.

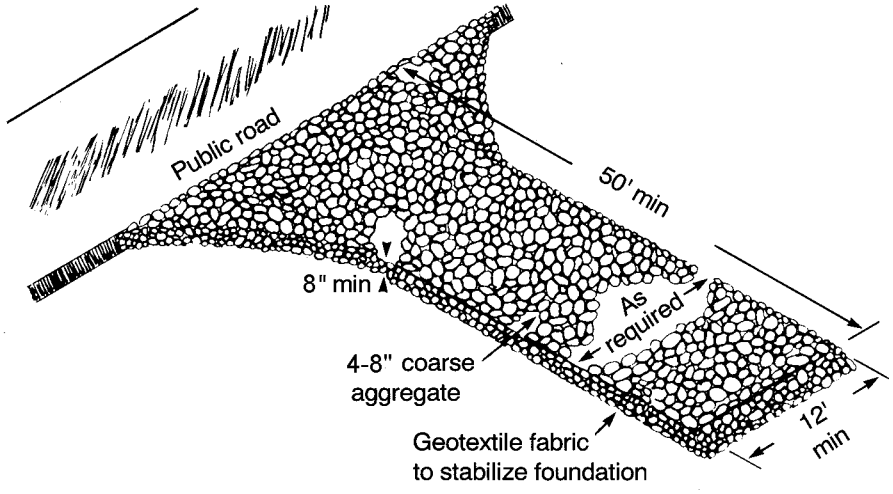


Figure 1-24 Schematic of Temporary Construction Entrance/Exit (after NC, 1993)

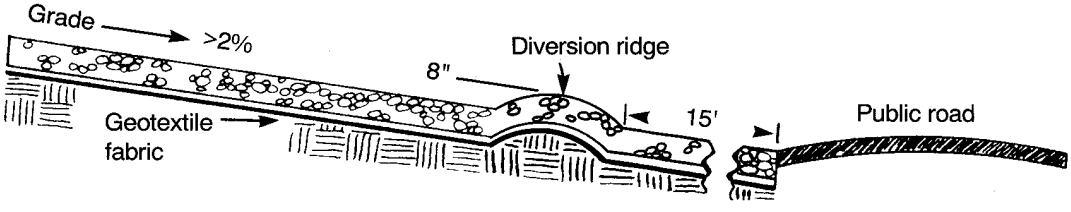


Figure 1-25 Cross-section of a Construction Entrance/Exit (NC, 1993)

Materials:

(1) The aggregate should consist of 4 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/yd^2, a mullen burst rating of 140 lb/in^2, 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 rack should be included in the plans. Divert wastewater to a sediment trap or basin.

Installation: (North Carolina, 1993)

(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 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 edge.

(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.

1.4.3 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. A schematic illustration of a silt fence is shown in Figure 1-26.

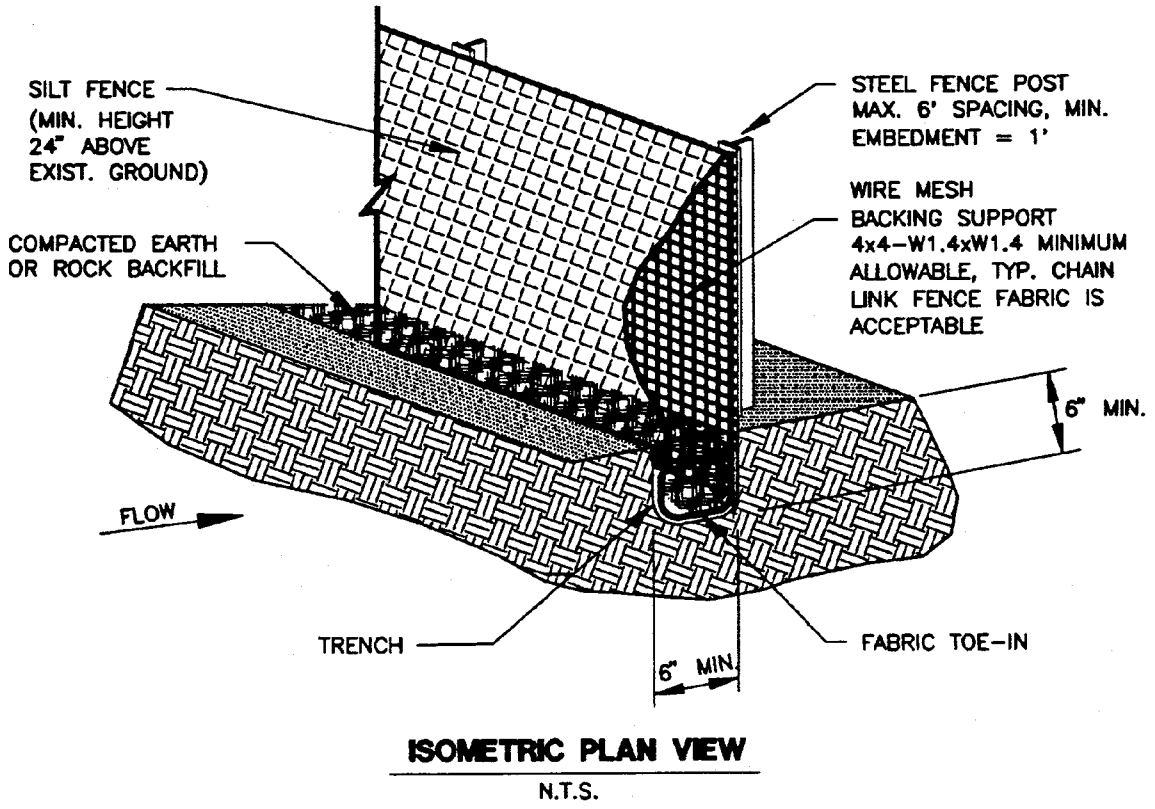


Figure 1-26 Schematic of a Silt Fence Installation (NCTCOG, 1993b)

The purpose of a silt fence is to intercept and detain water-borne 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 width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in^2, ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 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 nominal weight 1.25 lb/ft^2, and Brindell hardness exceeding 140.

(3) Woven wire backing to support the fabric should be galvanized 2" x 4" welded wire, 12 gauge minimum.

Installation:

(1) Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1-foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.

(2) Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is ¼ acre/100 feet of fence.

(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 any rainfall.

(2) Remove sediment when buildup reaches 6 inches.

(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.

(4) Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.

(5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

1.4.5 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.

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- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- 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 (Figure 1-28), 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.

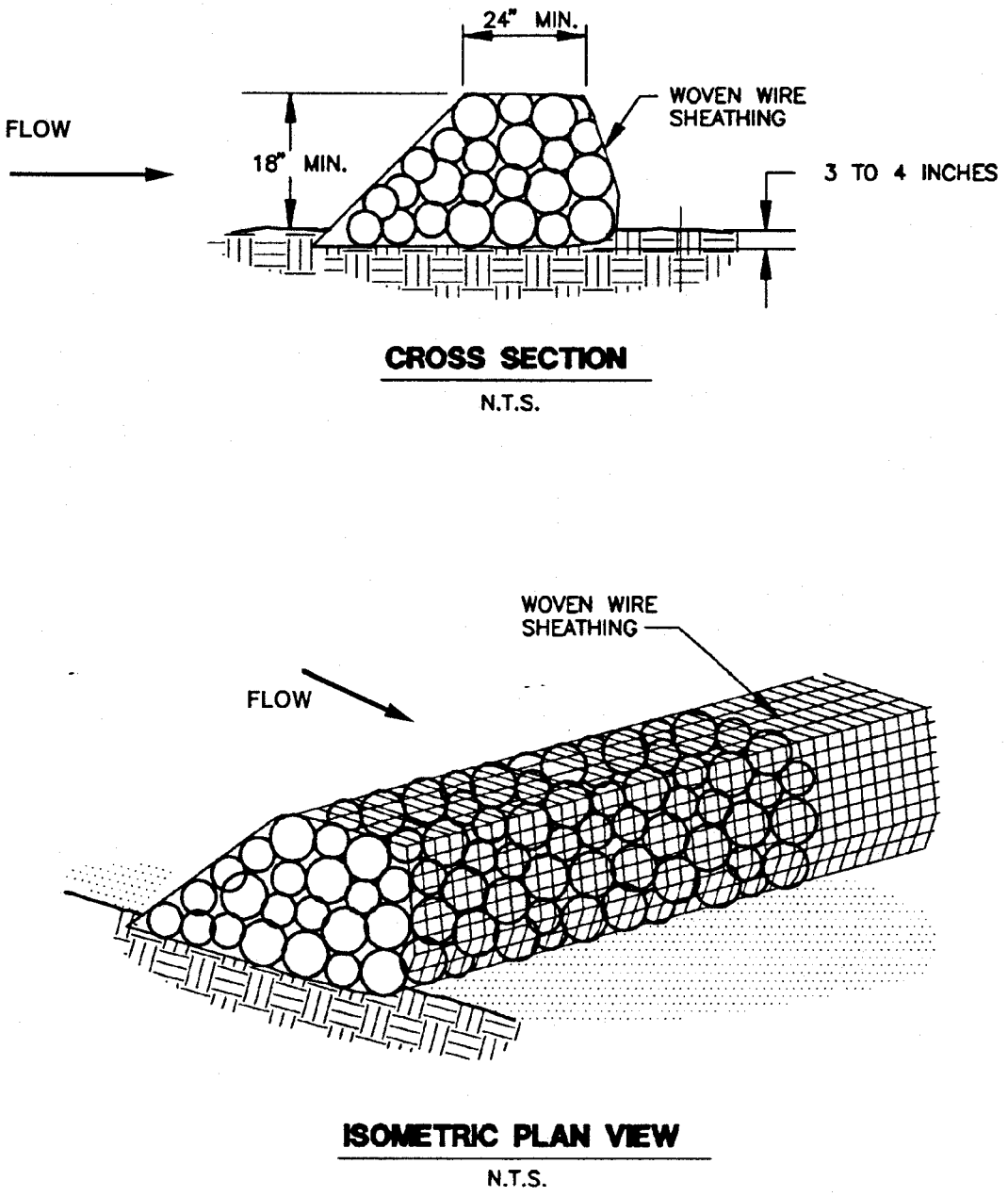


Figure 1-28 Schematic Diagram of a Rock Berm (NCTCOG, 1993)

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)

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.

1.4.18 Concrete Washout Areas

The purpose of concrete washout areas is to prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employees and subcontractors.

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated areas.

For onsite washout:

- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Below grade concrete washout facilities are typical. These consist of a lined excavation sufficiently large to hold expected volume of washout material. Above grade facilities are used if excavation is not practical. Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this section, with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. 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.

When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

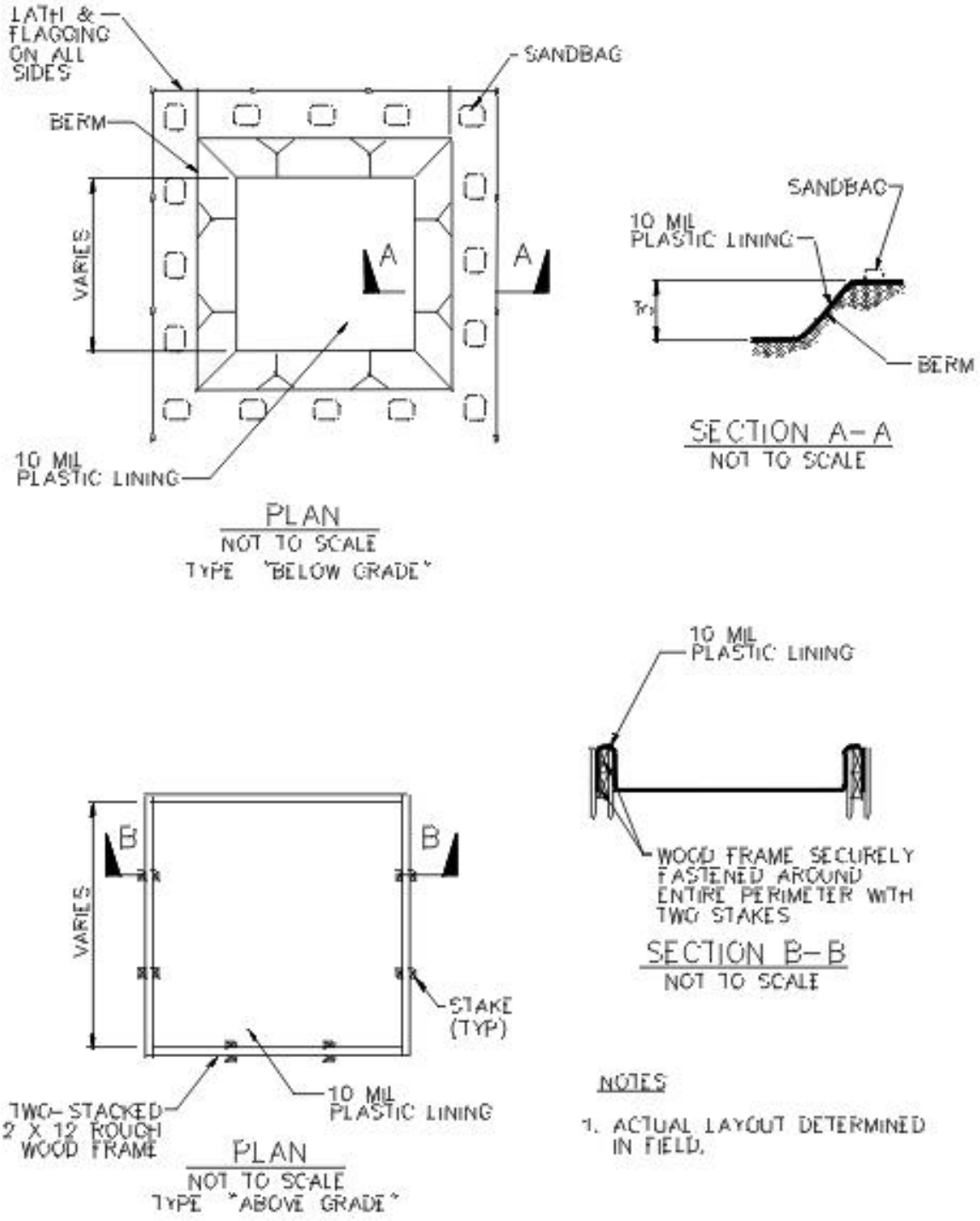


Figure 1-43 Schematics of Concrete Washout Areas

1.4.11 Inlet Protection

Storm sewers that are made operational prior to stabilization of the associated drainage areas can convey large amounts of sediment to natural drainage ways. In case of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets. The following guidelines for inlet protection are based primarily on recommendations by the Virginia Dept. of Conservation and Recreation (1992) and the North Central Texas Council of Governments (NCTCOG, 1993b).

In developments for which drainage is to be conveyed by underground storm sewers (i.e., streets with curbs and gutters), all inlets that may receive storm runoff from disturbed areas should be protected. Temporary inlet protection is a series of different measures that provide protection against silt transport or accumulation in storm sewer systems. This clogging can greatly reduce or completely stop the flow in the pipes. The different measures are used for different site conditions and inlet types.

Care should be taken when choosing a specific type of inlet protection. Field experience has shown that inlet protection that causes excessive ponding in an area of high construction activity may become so inconvenient that it is removed or bypassed, thus transmitting sediment-laden flows unchecked. In such situations, a structure with an adequate overflow mechanism should be utilized.

It should also be noted that inlet protection devices are designed to be installed on construction sites and not on streets and roads open to the public. When used on public streets these devices will cause ponding of runoff, which can cause minor flooding and can present a traffic hazard. An example of appropriate siting would be a new subdivision where the storm drain system is installed before the area is stabilized and the streets open to the general public. When construction occurs adjacent to active streets, the sediment should be controlled on site and not on public thoroughfares. Occasionally, roadwork or utility installation will occur on public roads. In these cases, inlet protection is an appropriate temporary BMP.

The following inlet protection devices are for drainage areas of one acre or less. Runoff from larger disturbed areas should be routed to a temporary sediment trap or basin.

Filter barrier protection using silt fence is appropriate when the drainage area is less than one acre and the basin slope is less than five percent. This type of protection is not applicable in paved areas.

Block and gravel protection is used when flows exceed 0.5 cubic feet per second and it is necessary to allow for overtopping to prevent flooding. This form of protection is also useful for curb type inlets as it works well in paved areas.

Wire mesh and gravel protection is used when flows exceed 0.5 cubic feet per second and construction traffic may occur over the inlet. This form of protection may be used with both curb and drop inlets.

Excavated impoundment protection around a drop inlet may be used for protection against sediment entering a storm drain inlet. With this method, it is necessary to install weep holes to allow the impoundment to drain completely. If this measure is implemented, the impoundment should be sized such that the volume of excavation is 3,600 cubic feet per acre (equivalent to 1 inch of runoff) of disturbed area entering the inlet.

Materials:

(1) Filter fabric should be a nylon reinforced polypropylene fabric which meets the following minimum criteria: Tensile Strength, 90 lbs.; Puncture Rating, 60 lbs.; Mullen Burst Rating, 280 psi; Apparent Opening Size, U.S. Sieve No. 70.

(2) Posts for fabric should be 2" x 4" pressure treated wood stakes or galvanized steel, tubular in cross-section or they may be standard fence "T" posts.

(3) Concrete blocks should be standard 8" x 8" x 16" concrete masonry units.

(4) Wire mesh should be standard hardware cloth or comparable wire mesh with an opening size not to exceed 1/2 inch.

Guidelines for installation:

Silt Fence Drop Inlet Protection

(1) Silt fence should conform to the specifications listed above and should be cut from a continuous roll to avoid joints.

(2) For stakes, use 2 x 4-inch wood or equivalent metal with a minimum length of 3 feet.

(3) Space stakes evenly around the perimeter of the inlet a maximum of 3 feet apart, and securely drive them into the ground, approximately 18 inches deep (Figure 1-33).

(4) To provide needed stability to the installation, a frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1½ feet above the drop inlet crest should be provided.

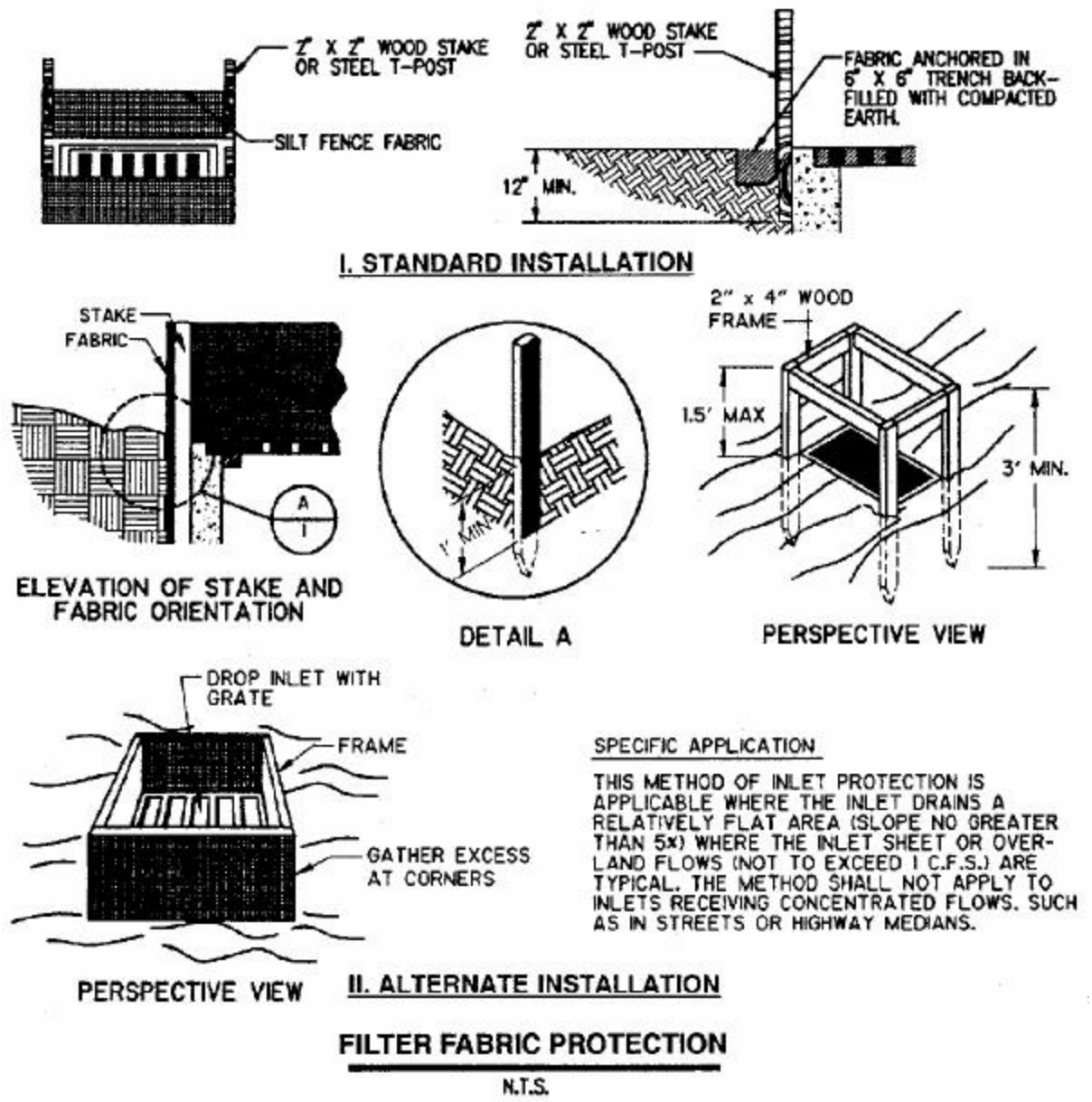


Figure 1-33 Filter Fabric Inlet Protection (NCTCOG, 1993)

(5) Place the bottom 12 inches of the fabric in a trench and backfill the trench with 12 inches of compacted soil.

(6) Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.

(7) It may be necessary to build a temporary dike on the down slope side of the structure to prevent bypass flow.

If the drop inlet is above the finished grade, the grate may be completely covered with filter fabric. The fabric should be securely attached to the entire perimeter of the inlet using 1"x 2" wood strips and appropriate fasteners.

Gravel and Wire Mesh Drop Inlet Sediment Filter

(1) Wire mesh should be laid over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Wire mesh with 1/2-inch openings should be used. If more than one strip of mesh is necessary, the strips should be overlapped (see Figure 1-34).

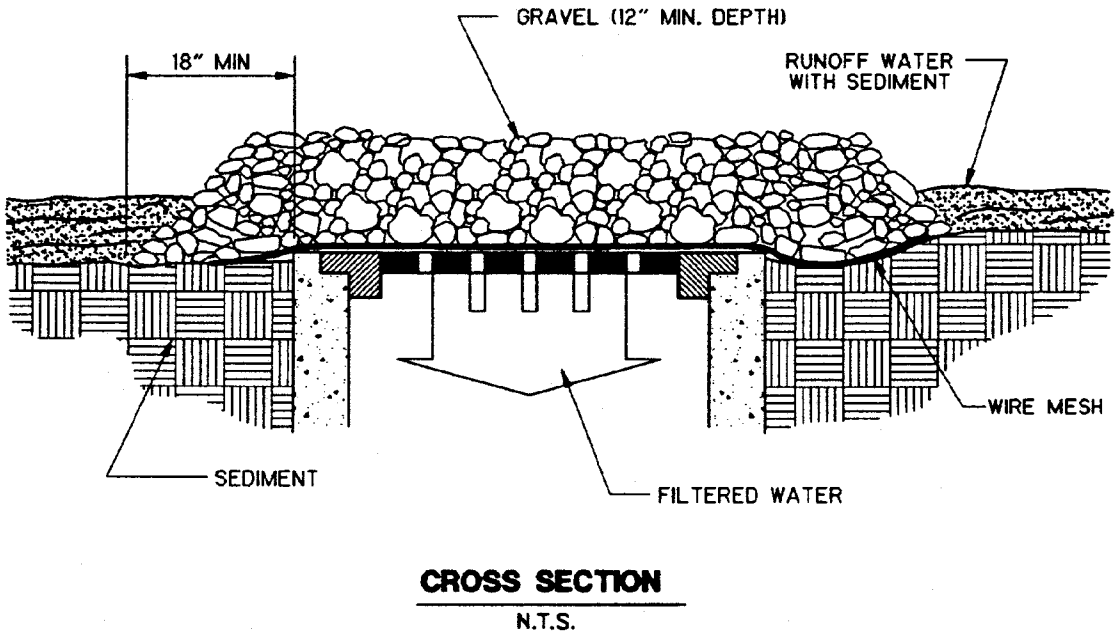


Figure 1-34 Wire Mesh and Gravel Inlet Protection (NCTCOG, 1993)

(2) Coarse aggregate should be placed over the wire mesh as indicated in Figure 1-34. The depth of stone should be at least 12 inches over the entire inlet opening. The stone should extend beyond the inlet opening at least 18 inches on all sides.

(3) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet, cleaned and/or replaced.

Note: This filtering device has no overflow mechanism; therefore, ponding is likely especially if sediment is not removed regularly. This type of device should never be used where overflow may endanger an exposed fill slope. Consideration should also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, adjacent property, etc.

Block and Gravel Drop Inlet Sediment Filter

(1) Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending on design needs, by stacking combinations of 4-inch, 8-inch and 12-inch wide blocks. The barrier of blocks should be between 12 and 24 inches high.

(2) Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.

(3) Stone should be piled against the wire to the top of the block barrier, as shown in Figure 1-35.

(4) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and replaced.

Block and Gravel Curb Inlet Sediment Filter

(1) Two concrete blocks should be placed on their sides abutting the curb at either side of the inlet opening.

(2) A 2-inch x 4-inch stud should be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.

(3) Concrete blocks should be placed on their sides across the front of the inlet and abutting the spacer blocks as depicted in Figure 1-35.

(4) Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.

(5) Coarse aggregate should be piled against the wire to the top of the barrier as shown in Figure 1-35.

(6) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and/or replaced.

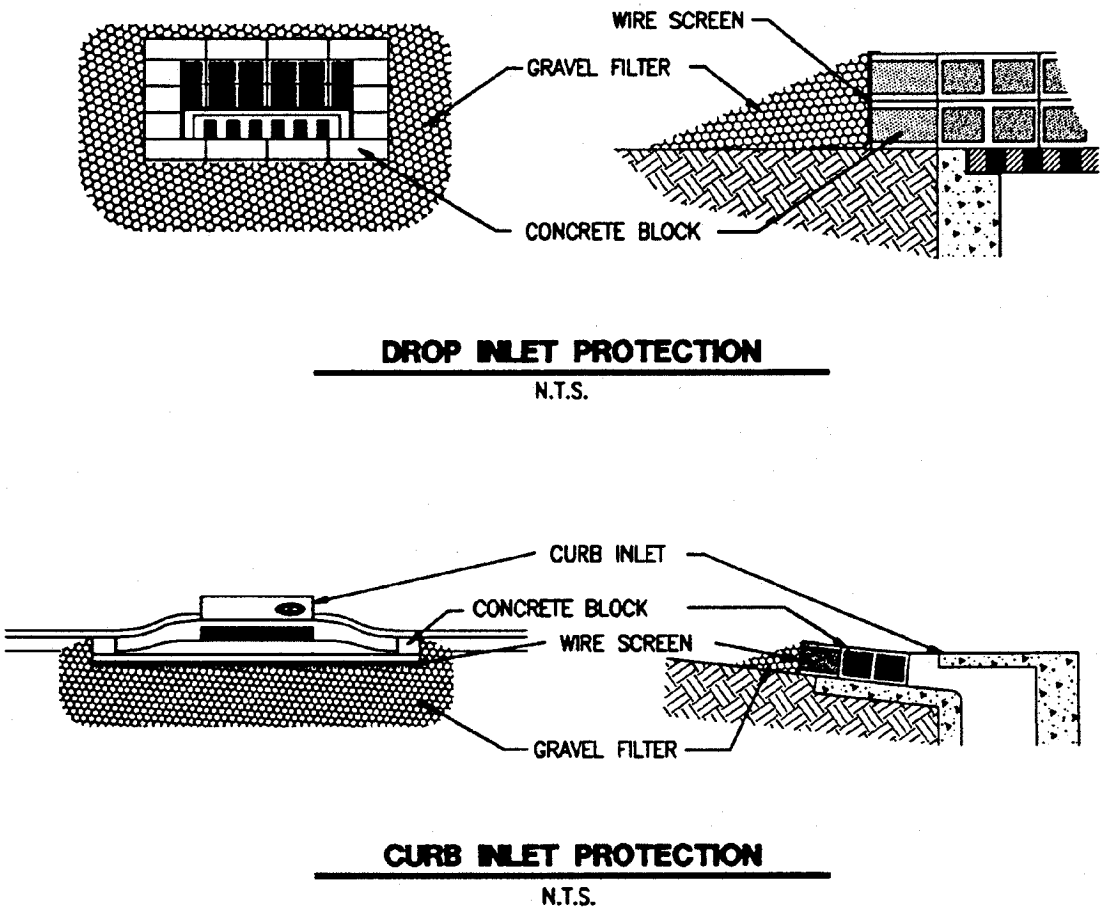


Figure 1-35 Block and Gravel Inlet Protection (NCTCOG, 1993)

Excavated Drop Inlet Sediment Trap

(1) The excavated trap should be sized to provide a minimum storage capacity calculated at 3,600 cubic feet per acre of drainage area. A trap should be no less than 1-foot nor more than 2 feet deep measured from the top of the inlet structure. Side slopes should not be steeper than 2:1 (see Figure 1-36).

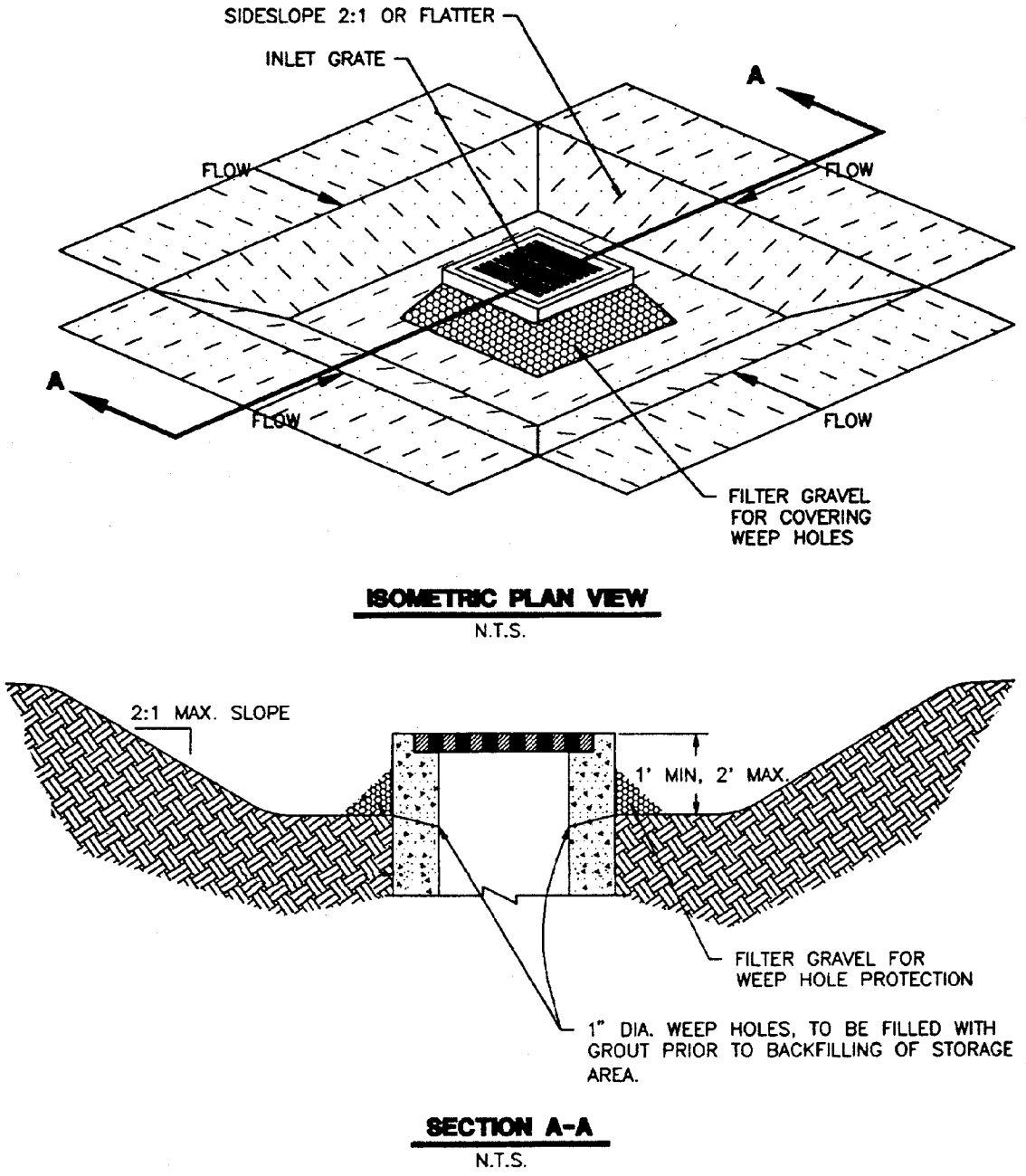


Figure 1-36 Excavated Inlet Protection (NCTCOG, 1993)

(2) The slope of the basin may vary to fit the drainage area and terrain. Observations must be made to check trap efficiency and modifications should be made as necessary to ensure satisfactory trapping of sediment. Where an inlet is located so as to receive concentrated flows, such as in a highway median, it is recommended that the basin have a rectangular shape in a 2:1 (length/width) ratio, with the length oriented in the direction of the flow.

(3) Sediment should be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Removed sediment should be deposited in a suitable area and in a manner such that it will not erode.

Curb Inlet Protection with 2-inch x 4-inch Wooden Weir

(1) Attach a continuous piece of wire mesh (30-inch minimum width x inlet throat length plus 4 feet) to the 2-inch x 4-inch wooden weir (with a total length of throat length plus 2 feet) as shown in Figure 1-37. Wood should be "construction grade" lumber.

(2) Place a piece of approved filter cloth of the same dimensions as the wire mesh over the wire mesh and securely attach to the 2-inch x 4-inch weir.

(3) Securely nail the 2-inch x 4-inch weir to the 9-inch long vertical spacers which are to be located between the weir and inlet face at a maximum 6-foot spacing.

(4) Place the assembly against the inlet throat and nail 2-foot (minimum) lengths of 2-inch x 4-inch board to the top of the weir at spacer locations. These 2-inch x 4-inch anchors should extend across the inlet tops and be held in place by sandbags or alternate weight.

(5) The assembly should be placed so that the end spacers are a minimum 1 foot beyond both ends of the throat opening.

(6) Form the wire mesh and filter cloth to the concrete gutter and against the face of curb on both sides of the inlet. Place coarse aggregate over the wire mesh and filter fabric in such a manner as to prevent water from entering the inlet under or around the filter cloth.

(7) This type of protection should be inspected frequently and the filter cloth and stone replaced when clogged with sediment.

(8) Assure that storm flow does not bypass inlet by installing temporary earth or asphalt dikes directing flow into inlet.

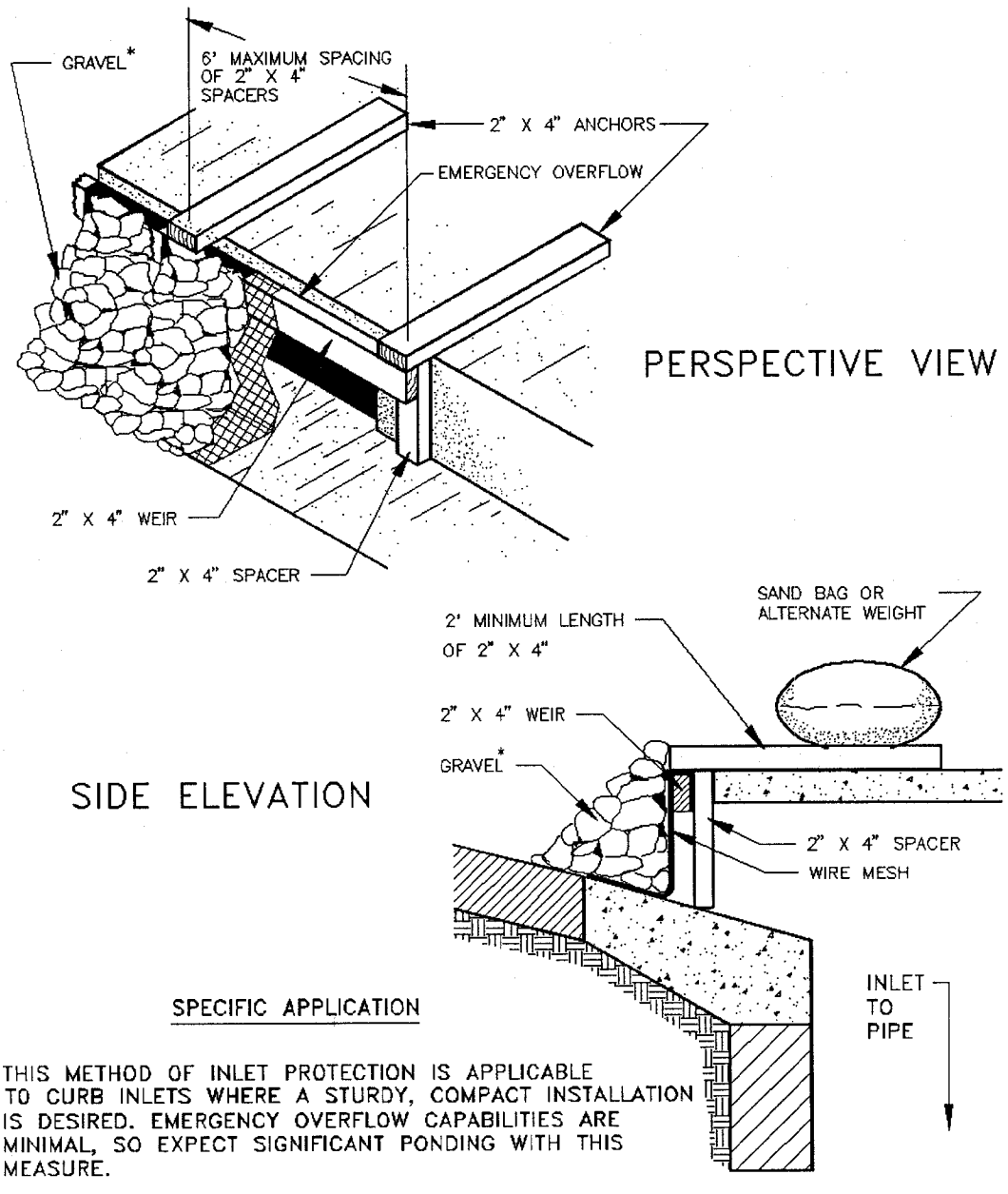


Figure 1-37 Wooden Weir Curb Inlet Protection (VA Dept of Conservation, 1992)

Common Trouble Points:

(1) Gaps between the inlet protection and the curb (flows bypass around side of filter).

(2) Filter fabric skirt not anchored to pavement (flows pass under filter).

Bagged Gravel Inlet Filter

Sandbags filled with pea gravel can also be used to construct a sediment barrier around curb and drain inlets. The sandbags should be filled with washed pea gravel and stacked to form a continuous barrier about 1 foot high around the inlets. The bags should be tightly abutted against each other to prevent runoff from flowing between the bags. This measure should be installed as shown in Figure 1-38.

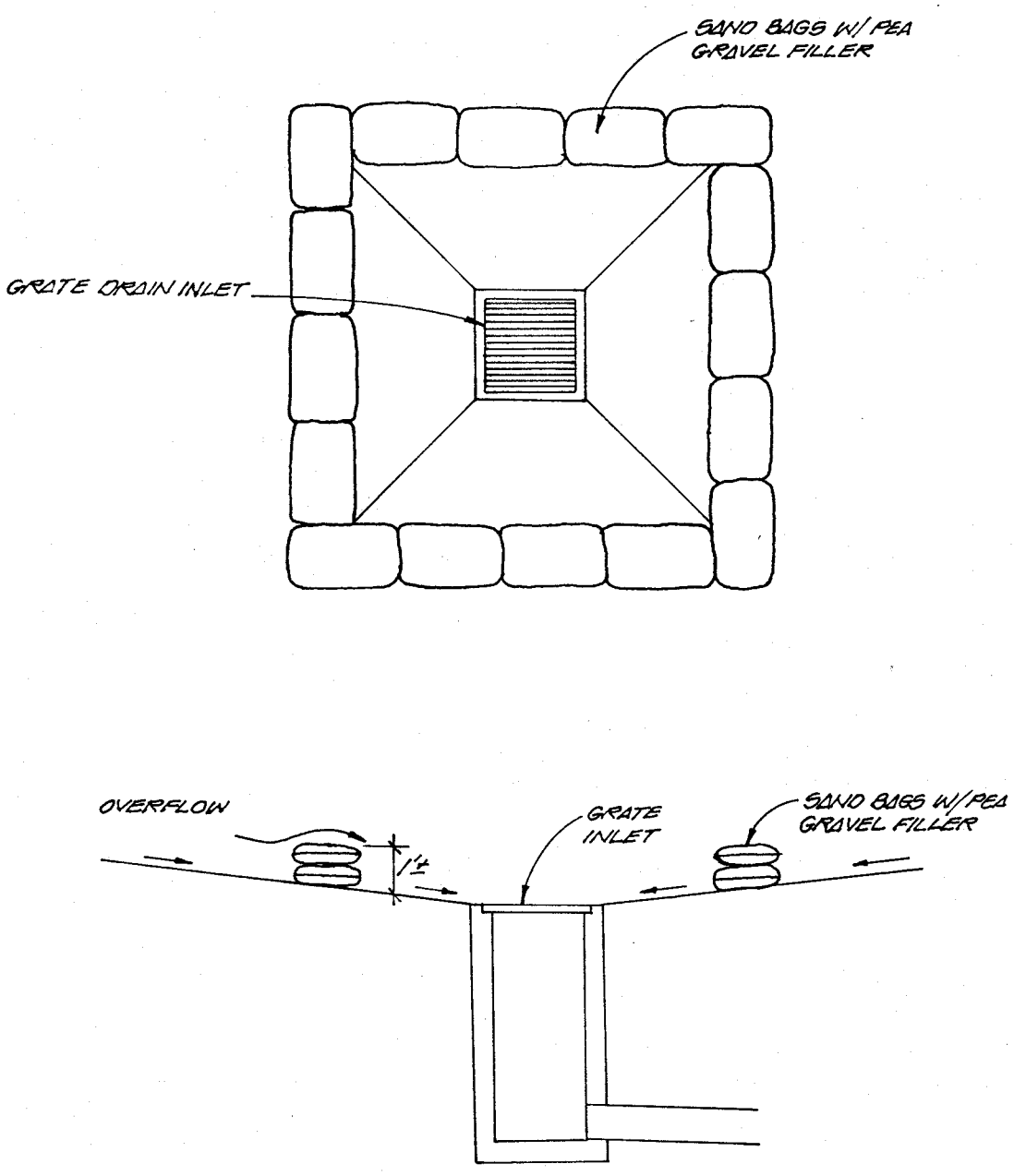


Figure 1-38 Diagram of Bagged Gravel Grate Inlet Protection (Pape-Dawson)

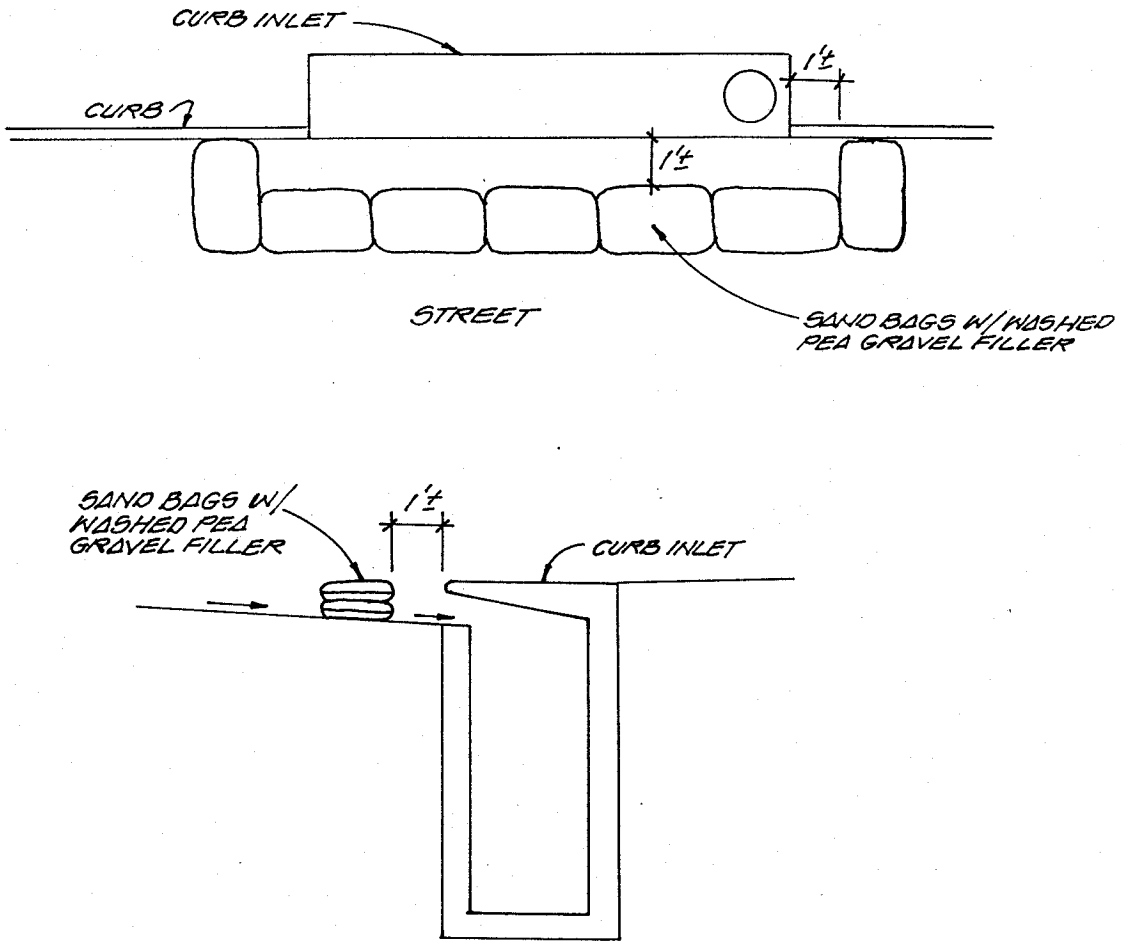


Figure 1-39 Diagram of Bagged Gravel Curb Inlet Protection (Pape-Dawson).

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.

Attachment E – Request to Temporarily Seal a Feature

No sensitive features will be sealed in this project site.

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 WPAP SITE PLAN
- Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on WPAP SITE PLAN

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 WPAP SITE PLAN

Attachment G – Drainage Area Map

See Sheet WPAP Drainage Area Map attached at the end of these attachments.

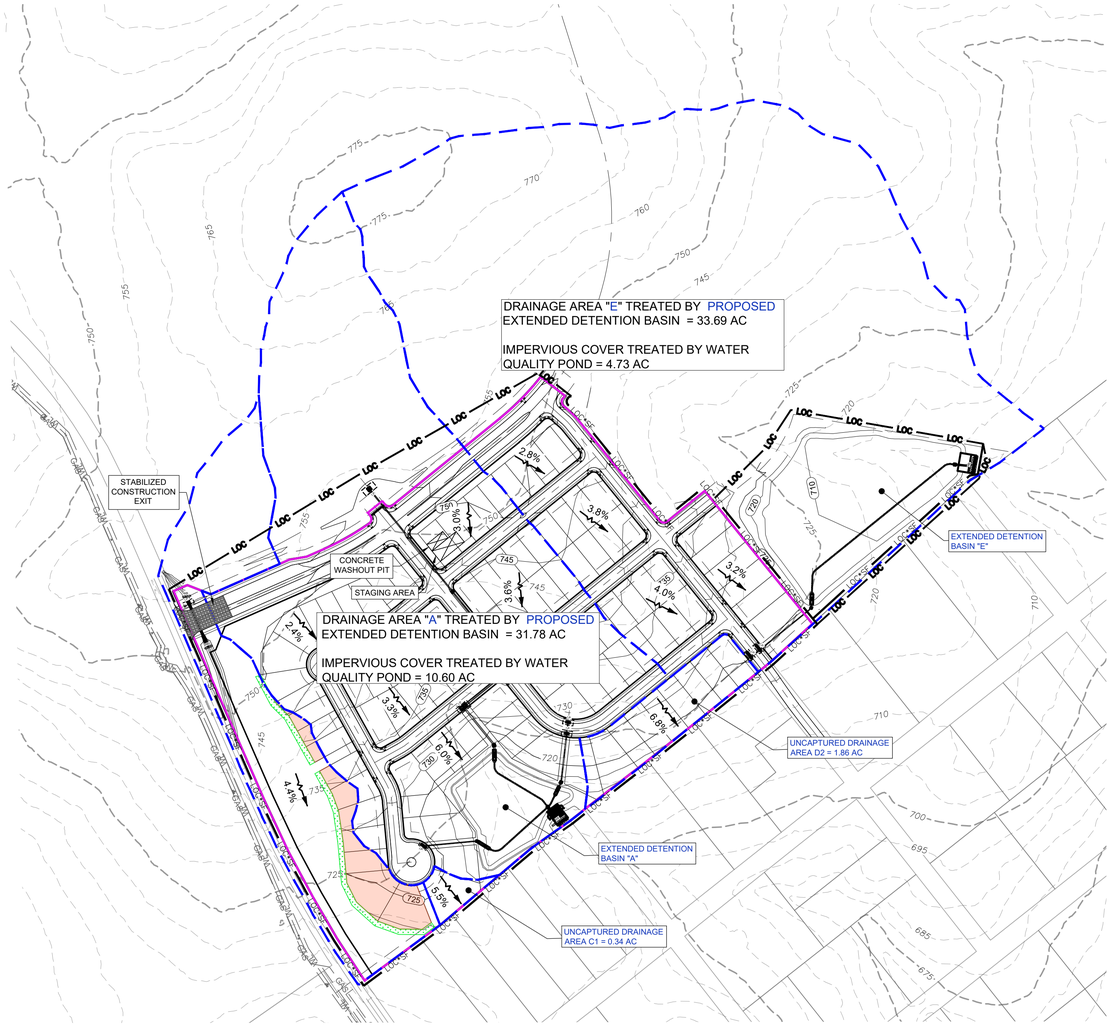
Attachment H – Temporary Sediment Pond(s) Plans and Calculations

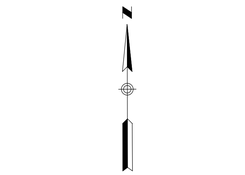
No Temporary Sediment Pond will be utilized with this project.

Attachment I – Inspection and Maintenance for TBMPs

Inspections

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event greater than 0.5 inches of rainfall. 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 date o the inspection. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.





SCALE IN FEET

SCALE: 1"=200'

LEGEND

- 740 — EXISTING CONTOUR
- 740 — PROPOSED CONTOUR
- XXX — FLOW ARROWS
- ROCK BERM
- TEMP. SPOILS & STORAGE AREA
- CONCRETE TRUCK WASHOUT PIT
- CONSTRUCTION ENTRANCE
- LOC*SF — LIMITS OF CONSTRUCTION/ SILT FENCE
- INLET PROTECTION
- PROPOSED ENGINEERED FILTER TRIPS
- DRAINAGE AREA TREATED BY PROPOSED BATCH DETENTION PONDS
- DRAINAGE AREA TREATED BY PROPOSED ENGINEERED FILTER STRIPS
- PROPERTY BOUNDARY

VERAMENDI PRECINCT 23 UNIT 1

WPAP DRAINAGE MAP EXHIBIT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: TM
DRAWN BY: TM
CHECKED BY: NG
DRAWING NAME: W1.1_Drainage Area_23-1.dwg

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. W1.1

FOR PERMIT

K:\SA3856.405 Properties\2405 23-1\401 WPAP\05_Temporary Stormwater Section_Form 0602\W1_Drainage Area_23-1.dwg
Xrefs: None
Last Modified: Jul 09, 25 - 21:12
Last Modified By: mk_ng - 14:14:45

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, and (6) concrete truck rinse-out pit for signs of potential failure. Deficiencies noted during the inspection will be corrected and documented within seven (7) calendar days following the inspection or before the next anticipated storm event if practicable.

Pollution Prevention Measure	Inspected	Corrective Action	
		Description	Date Completed
General			
Revegetation			
Erosion/Sediment Controls			
Vehicle Exits			
Material Areas			
Equipment Areas			
Concrete Rinse			
Construction Debris			
Trash Receptacles			
Infrastructure			
Roadway Clearing			
Utility Clearing			
Roadway Grading			
Utility Construction			
Drainage Construction			
Roadway Base			
Roadway Surfaces			
Site Cleanups			
Building			
Clearing for Building			
Foundation Grading			
Utility Construction			
Foundation Construction			
Building Construction			
Site Grading			
Site Cleanup			

**Indicate N/A where measure does not apply.*

By my signature below, I certify that all items are acceptable and the project site is in compliance with SWPPP.

Inspector's Name _____ Inspector's Signature _____

_____ _____

Name of Owner/Operator (Firm) Date

Note: Inspector is to attach a brief statement of his qualifications to this report.

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity	Date

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

Construction Activity	Date

Date when stabilization measures are initiated:

Stabilization Activity	Date

Attachment I (con't) – Inspection and Maintenance for TBMPs

Temporary Sediment Control Fences

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

Rock Berm/High Service Rock Berm

1. Inspections should be made weekly and after each rainfall by the responsible party.
2. Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt of in an approved manner.
3. Repair any loose wire sheathing.
4. The berm should be reshaped as needed during inspection.
5. The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
6. The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance and Exits

1. The entrance should be maintained in a condition, which will prevent tracking or following 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 on to public rights-of-ways 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 ant storm drain, ditch, or water course by using approved methods.

Bagged Gravel Inlet Filters

1. Inspections 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 reached a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not eride.
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.

Temporary Sedimentation Basin

1. Inspection should be made weekly and after each rainfall. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Repair should be made promptly as needed by contractor.
2. Trash and other debris should be removed after each rainfall to prevent clogging out fo the outlet structure.
3. Accumulated silt should be removed and the basin should be re-graded to its original dimensions at such point that the capacity of the impoundment has been reduced to 75% of its original storage capacity.
4. The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.

Documentation Procedures

1. A copy of the inspection report is located on the following page.
2. The inspection report must be maintained on site at all times.
3. The inspection report is incorporated as part of the WPAP. The contractor is responsible for completing and updating the form in compliance with TCEQ rules.

Attachment J – Schedule of Interim and Permanent Soil Stabilization

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing only 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.

Permanent Stormwater Section

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Nicholas Gower, PE

Date: 7/8/2025

Signature of Customer/Agent

Nicholas Gower

Regulated Entity Name: Veramendi Precinct 23 Unit 1

Permanent Best Management Practices (BMPs)

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

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

   [ ] N/A

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

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

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

☐ N/A

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

   ☐ N/A

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

   ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.
   ☒ The site will be used for low density single-family residential development but has more than 20% impervious cover.
   ☐ The site will not be used for low density single-family residential development.

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

   ☐ **Attachment A - 20% or Less Impervious Cover Waiver**. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
   ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
   ☒ The site will not be used for multi-family residential developments, schools, or small business sites.

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

- [X] A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
- [ ] No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
- [ ] Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

7. [X] **Attachment C - BMPs for On-site Stormwater**.

   - [X] A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
   - [ ] Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

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

   - [ ] N/A

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

   - [X] The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
   - [ ] **Attachment E - Request to Seal Features**. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.

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

    - [X] Design calculations (TSS removal calculations)
    - [X] TCEQ construction notes
    - [X] All geologic features
    - [X] All proposed structural BMP(s) plans and specifications

    - [ ] N/A

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

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

    [ ] N/A

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

    [X] N/A

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

    [ ] N/A

Responsibility for Maintenance of Permanent BMP(s)

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

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

    [ ] N/A

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

    [ ] N/A

Attachment A – 20% or Less Impervious Cover Waiver

No impervious cover waiver is being requested with this project.

Attachment B – BMP for Upgradient Stormwater

No treatment of this upgradient area is necessary.

Attachment C – BMP for On-Site Stormwater

In keeping with the TCEQ rules, this development will employ Batch detention basins and vegetative filter strips.

1) The onsite batch detention basin is proposed to be built on the development as a permanent BMP. This detention basin will be treating 10.60 acres of impervious cover. The offsite batch detention basin is proposed to be built as a permanent BMP. This detention basin will be treating 4.77 acres of impervious cover. The 2 batch detention basins will treat a total of 15.37 acres of impervious cover.
2) Vegetated Filter Strips would be used to treat a total of 0.48 ac of impervious cover.

All site BMPs were designed to remove at least 80% of the increased (TSS) in accordance with TCEQ's.

Attachment D – BMP for Surface Streams

This project will protect the natural drainage course by constructing the Batch detention ponds discussed above and shown on the plans to filter pollutants from the captured first flush. The sedimentation/filtration basin proposed has been designed in accordance with TCEQ's TGM RG-348 (2005) which indicates a minimum of 80% of the increased TSS load from the site as a whole must be removed.

Attachment E – Request to Seal Features

There are no naturally occurring sensitive features located within the boundaries of the site.

Attachment F – Construction Plans

See attached plans.

ATTACHMENT "G" – Inspection, Maintenance, Repair and Retrofit Plan

PROJECT NAME Veramendi Precinct 23 Unit 1

ADDRESS 2400 LF North of the Intersection between Loop 337 & River Rd

CITY, STATE ZIP New Braunfels, Texas

EXTENDED DETENTION BASINS

Extended detention basins have moderate to high maintenance requirements, Depending on the extent to which future maintenance needs are anticipated during the design stage. Responsibilities for both routine and nonroutine maintenance tasks need to be clearly understood and enforced. If regular maintenance and inspections are not undertaken, the basin will not achieve its intended purposes.

There are many factors that may affect the basin's operation and that should be periodically checked. These factors can include mowing, control of pond vegetation, removal of accumulated bottom sediments, removal of debris from all inflow and outflow structures, unclogging of orifice perforations, and the upkeep of all physical structures that are within the detention pond area. One should conduct periodic inspections and after each significant storm. Remove floatables and correct erosion problems in the pond slopes and bottom. Pay particular attention to the outlet control perforations for signs of clogging. If the orifices are clogged, remove sediment and other debris. The generic aspects that must be considered in the maintenance plan for a detention facility are as follows:

Inspections. Basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the pond is meeting the target detention times. In particular, the extended detention control device should be regularly inspected for evidence of clogging, or conversely, for too rapid a release. If the design drawdown times are exceeded by more than 24 hours, then repairs should be scheduled immediately. The upper stage pilot channel, if any, and its flow path to the lower stage should be checked for erosion problems. During each inspection, erosion areas inside and downstream of the BMP should be identified and repaired or revegetated immediately.

Mowing. The upper stage, side slopes, embankment, and emergency spillway of an extended detention basin must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around basins should be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing of grass is performed, a mulching mower should be used, or grass clippings should be caught and removed.

Debris and Litter Removal. Debris and litter will accumulate near the extended detention control device and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the control device or riser.

Erosion Control. The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems. Similarly, the channel connecting an upper stage with a lower stage may periodically need to be replaced or repaired.

Structural Repairs and Replacement. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. These repairs should include patching of cracked concrete, sealing of voids, and removal of vegetation from cracks and joints. The various inlet/outlet and riser works in a basin will eventually deteriorate and must be replaced. Public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, whereas reinforced concrete barrels and risers may last from 50 to 75 yr.

Nuisance Control. Standing water (not desired in a extended detention basin) or soggy conditions within the lower stage of the basin can create nuisance conditions for nearby residents. Odors, mosquitoes, weeds, and litter are all occasionally perceived to be problems. Most of these problems are generally a sign that regular inspections and maintenance are not being performed (e.g., mowing, debris removal, clearing the outlet control device).

Sediment Removal. When properly designed, dry extended detention basins will accumulate quantities of sediment over time. Sediment accumulation is a serious maintenance concern in extended detention dry ponds for several reasons. First, the sediment gradually reduces available stormwater management storage capacity within the basin. Second, unlike wet extended detention basins (which have a permanent pool to conceal deposited sediments), sediment accumulation can make dry extended detention basins very unsightly. Third, and perhaps most importantly, sediment tends to accumulate around the control device. Sediment deposition increases the risk that the orifice will become clogged, and gradually reduces storage capacity reserved for pollutant removal. Sediment can also be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams. For these reasons, accumulated sediment needs to be removed from the lower stage when sediment buildup fills 20% of the volume of the basin or at least every 10 years.

VEGETATIVE FILTER STRIPS

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

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

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

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

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

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

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

Responsible Party for Maintenance	Veramendi PE - Gold Coast, LLC
Address	2168 Oak Run Parkway, Suite 101
City, State Zip	New Braunfels, Texas 78132
Telephone Number	(830)643-5633
Signature of Responsible Party	
Print name of Responsible Party	Garrett Mechler

Permanent Stormwater Section Attachment "G" continued
Sample Maintenance Table

ITEM #	DATE	DESCRIPTION OF ACTION(S) TAKEN	INITIALS

Attachment H – Pilot-Scale Field Testing Plan

The TCEQ's TGM was used to design the BMP's for this project.

Attachment I– Measures for Minimizing Surface Stream Contamination

Any points where discharge from this site is concentrated and erosive velocities exist will include appropriately sized energy dissipaters to reduce velocities to non-erosive levels.

Owner Authorization Form

Edwards Aquifer Protection Program

Instructions

Complete the following form by adding the requested information in the fields below. The form must be notarized for it to be considered complete. Attach it to other programmatic submittals required by 30 Texas Administrative Code (30 TAC), Chapter 213, and provide it to TCEQ's Edwards Aquifer Protection Program (EAPP) as part of your application.

If you have questions on how to fill out this form or about EAPP, please contact us by phone at 512-339-2929 or by e-mail at eapp@tceq.texas.gov.

Landowner Authorization

I, Dean Word of Word-Borchers Ranch Real Estate Limited Partnership

am the owner of the property located at:

33.95-acres of land, out of the 499.75-acre tract of land described in document no. 202206035304 in the official public record of Comal County, Texas in the Juan Martin Veramendi No. 2, Abstract 3, Comal County, Texas.

and am duly authorized in accordance with 30 TAC 213.4(c)(2) and 213.4(d)(1), or 30 TAC 213.23(c)(2) and 213.23(d), relating to the right to submit an application, signatory authority, and proof of authorized signatory.

I do hereby authorize Garrett Mechler
To conduct construction of single family residential development including but not limited to streets, drainage, water, wastewater, sidewalks, dry utilities, water quality bmps and other site improvements .
At 2400 LF north of the intersection between Loop 337 and River Road

Landowner Acknowledgement

I understand that Word-Borchers Ranch Real Estate Limited Partnership

Is ultimately responsible for the compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation even if the responsibility for compliance and the right to possess and control the property referenced in the application has been contractually assumed by another legal entity. I further understand that any failure to comply with any condition of the executive director's approval is a violation and subject to administrative rule or orders and penalties as provided under 30 TAC 213.10, relating to enforcement. Such violations may also be subject to civil penalties.

Landowner Signature

T. Dean Word

Landowner Signature

7/1/2025

Date

THE STATE § OF TEXAS

County § of Comal

BEFORE ME, the undersigned authority, on this day personally appeared

Timothy Dean Word III

known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 1 day of July 2025

NOTARY PUBLIC

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

Alex Hardeman

MY COMMISSION EXPIRES: Date 5/20/2028

Optional Attachments

Select All that apply:

☐ Lease Agreement

☐ Signed Contract

☐ Deed Restricted Easement

☐ Other legally binding documents

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

Co-CEO,
Title - Owner/President/Other

of VERAMENDI PE-GOLD COAST, LLC,
Corporation/Partnership/Entity Name

have authorized Nicholas Gower
Print Name of Agent/Engineer

of LJA Engineering
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

6/23/2025
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 23 day of June, 2025

NOTARY PUBLIC

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Veramendi Precinct 23 Unit 1

Regulated Entity Location: 2400 LF North of the Intersection between Loop 337 & River Rd

Name of Customer: Veramendi PE - Gold Coast LLC

Contact Person: Garrett Mechler Phone: 830 643 5633

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	39.29 Acres	$ 4,000
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 6/23/2025

Application Fee Schedule

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing 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-Gold Coast, 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)*
0804261133	32081307095		

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ 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 ☐ Other:
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address: 2168 Oak Run Parkway, Ste 101

City	New Braunefls	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)*

(830) 643-5633		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ 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 Core 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 Precinct 23-1

23. Street Address of the Regulated Entity: *(No PO Boxes)*							
City		**State**		**ZIP**		**ZIP + 4**	
24. County							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	2400 LF north of the intersection between Loop 337 and River Rd				
26. Nearest City			**State**	**Nearest ZIP Code**	
New Braunfels			TX	78130	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	29.7383		**28. Longitude (W) In Decimal:**	98.12344	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	44	18	98	7	46

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)
1521			

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

single family houses

34. Mailing Address:							
City		**State**		**ZIP**		**ZIP + 4**	
35. E-Mail Address:							

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
( ) -		( ) -

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.

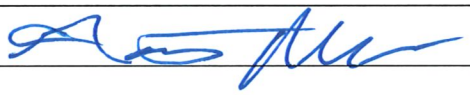
☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	LJA Engineering	41. Title:	Engineer
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(210) 503-2700		( ) -	ngower@lja.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:	ASA Properties	**Job Title:**	Co-CEO
Name *(In Print):*	Garrett Mechler	**Phone:**	(830)643-5633
Signature:		**Date:**	6/23/2025

SEWAGE COLLECTION SYSTEM PLAN

FOR

VERAMENDI PRECINCTS 23-1

JULY 8, 2025

Prepared For:
Veramendi PE-GOLD COAST LLC
2168 Oak Run Parkway, Ste101
New Braunfels, TX, 78132

Prepared By:

LJA ENGINEERING, INC.
TBPE Firm Registration No. F-1386
9830 Colonnade Blvd Ste 300
San Antonio, Texas 78256
Phone (210) 503-2700

LJA FILE NO. SA3856-2405

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 Precinct 23-1						**2. Regulated Entity No.:**			
3. Customer Name: Veramendi PE-Gold Coast 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):**			39.29 ac
9. Application Fee:	3,202.50		**10. Permanent BMP(s):**					Detention Pond & Vegetative Filter Strips	
11. SCS (Linear Ft.):	6,405.00		**12. AST/UST (No. Tanks):**						
13. County:	Comal		**14. Watershed:**					Comal River-Guadalupe River	

Application Distribution

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

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

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

Austin Region			
County:	**Hays**	**Travis**	**Williamson**
Original (1 req.)	__	__	__
Region (1 req.)	__	__	__
County(ies)	__	__	__
Groundwater Conservation District(s)	__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.)	__	X	__	__	__
Region (1 req.)	__	X	__	__	__
County(ies)	__	X	__	__	__
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	X__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.
Nicholas Gower, PE.
Print Name of Customer/Authorized Agent
[signature] 7/29/2025
Signature of Customer/Authorized Agent Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Nicholas Gower, PE

Date: 07/29/2025

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Veramendi Precincts 23-1
2. County: Comal
3. Stream Basin: Blieders Creek
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:

   [X] Recharge Zone
   [ ] Transition Zone

6. Plan Type:

   [ ] WPAP
   [X] SCS
   [ ] Modification
   [ ] AST
   [ ] UST
   [ ] Exception Request

7. Customer (Applicant):

Contact Person: Garrett Mechler
Entity: Veramendi PE-Gold Coast, LLC
Mailing Address: 2168 Oak Run Parkway, Suite 101
City, State: New Braunfels, TX Zip: 78132
Telephone: (830)643-5633 FAX: _____
Email Address: garrett.mechler@asaproperties.us.com

8. Agent/Representative (If any):

Contact Person: Nicholas Gower, PE.
Entity: LJA Engineering, LLC
Mailing Address: 9830 Colonnade Blvd Ste 300
City, State: San Antonio, TX Zip: 78230
Telephone: 210-503-2700 FAX: _____
Email Address: ngower@lja.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.

2400 LF north of the intersection between Loop 337 and River Rd

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: End of Day Aug. 20

14. [X] **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:

- [X] Area of the site
- [X] Offsite areas
- [X] Impervious cover
- [X] Permanent BMP(s)
- [X] Proposed site use
- [X] Site history
- [X] Previous development
- N/A [ ] 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)
- [X] Undeveloped (Undisturbed/Uncleared)
- [ ] Other: _____

Prohibited Activities

16. [X] 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. [X] 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:

- [X] 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. [X] 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)
- [X] San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

20. [X] 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. [X] 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.

VERAMENDI
PRECINCT 23 UNIT-1

CITY OF NEW BRAUNFELS ETJ

LOCATION EXHIBIT

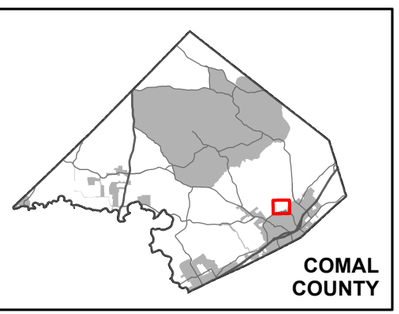
MARCH 2025

LEGEND

PROJECT BOUNDARY

N
W E
S

0 400 800 1,600
FEET



AERIAL PHOTOGRAPH: 2025 NEARMAP

THIS PRODUCT IS FOR INFORMATIONAL PURPOSES AND MAY NOT HAVE BEEN PREPARED FOR OR BE SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES. IT DOES NOT REPRESENT AN ON-THE-GROUND SURVEY AND REPRESENTS ONLY THE APPROXIMATE RELATIVE LOCATION OF PROPERTY BOUNDARIES.

LJA
9830 Colonnade Boulevard, Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.com

Path: K:\SA3856.ASA Properties\2405.23-1\GIS\Veramendi 23-1.aprx

VERAMENDI
PRECINCT 23 UNIT-1

CITY OF NEW BRAUNFELS ETJ

DRAINAGE PATH EXHIBIT

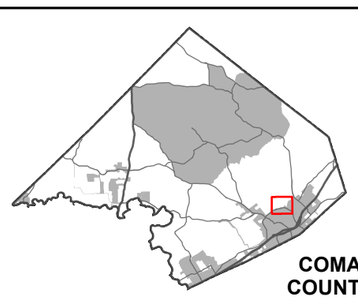
APRIL 2025

LEGEND

- DRAINAGE PATH
- PRECINCT 23 - 1
- EDWARDS AQUIFER RECHARGE ZONE
- EDWARDS AQUIFER TRANSITION ZONE

N
W E
S

0 500 1,000 2,000 FEET



BASEMAP: NEW BRAUNFELS WEST - USGS

THIS PRODUCT IS FOR INFORMATIONAL PURPOSES AND MAY NOT HAVE BEEN PREPARED FOR OR BE SUITABLE FOR LEGAL, ENGINEERING, OR SURVEYING PURPOSES. IT DOES NOT REPRESENT AN ON-THE-GROUND SURVEY AND REPRESENTS ONLY THE APPROXIMATE RELATIVE LOCATION OF PROPERTY BOUNDARIES.

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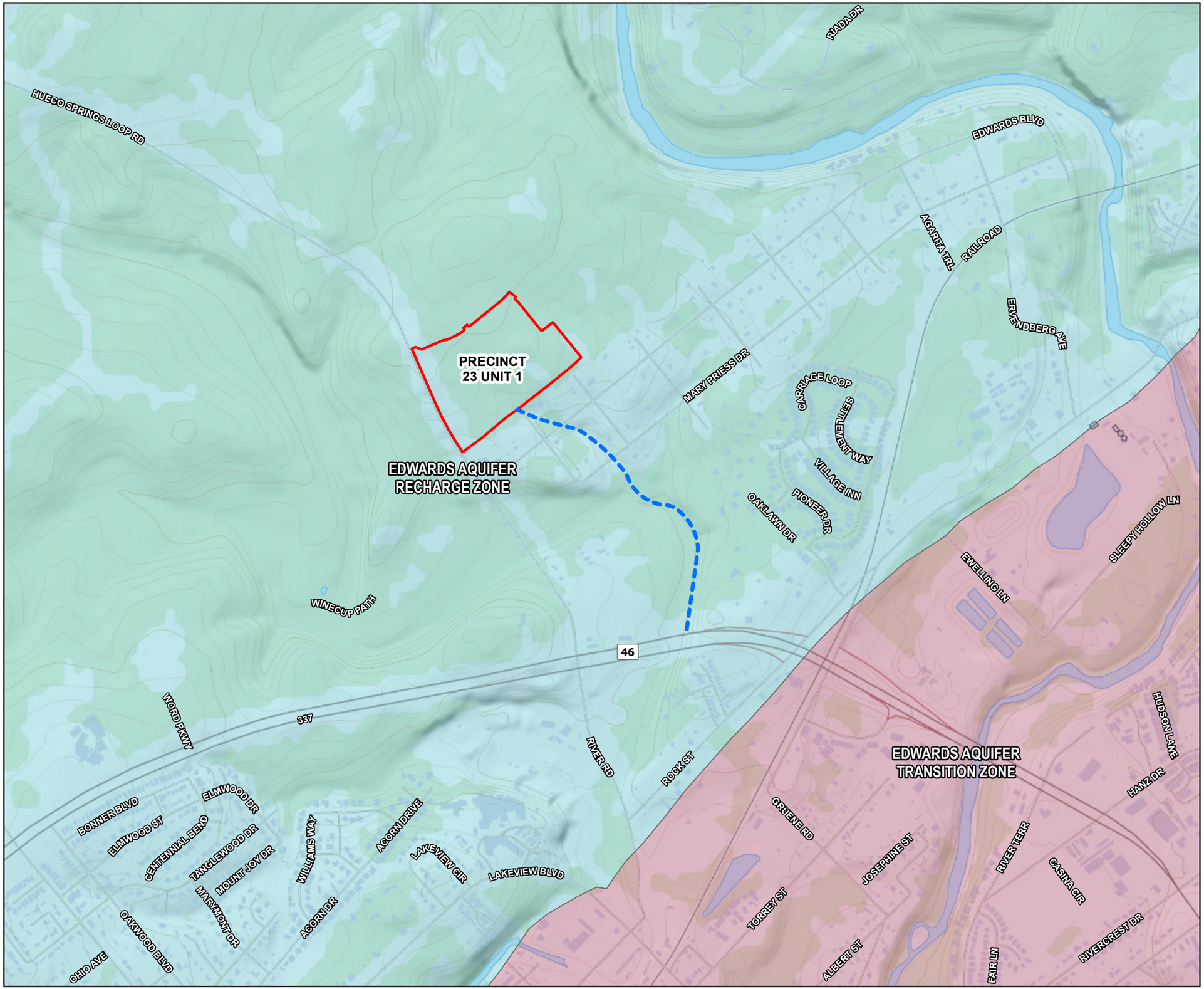

Attachment C – Project Narrative

The proposed site is located 2400 LF North of the intersection between Loop 337 and River Rd in New Braunfels, Texas. Proposed use for the development will be a Residential (single family). The site is in the New Braunfels ETJ. The Veramendi Precinct 23 Unit 1 WPAP will consist of a 33.95-acre tract for single family houses and a 5.34-acre offsite drainage easement. 17.08 acres will be under impervious cover (50.3%). The entire project site is located within the Edwards Aquifer Recharge Zone.

BMP practices are being constructed with this application that will treat future improvements and impervious cover that will be draining to our site. We are treating a total of 15.28 acres of the total impervious cover with two (2) proposed extended detention basins. Also, we are treating a total of 0.6 acres of impervious cover with vegetated filter strips. This project is proposing 6,405 LF of a Sewage Collection System. Temporary best management practice measures to be used are intended to inhibit sediment and suspended solids from leaving the site. By containing the sediment and solids within the site, they will not enter surface streams and/ or sensitive features.

Proposed Conditions

The proposed improvements addressed by this Water Pollution Abatement Plan (WPAP) for proposed conditions are 2 extended detention basins and vegetative filter strips. Our site receives offsite drainage from the north. Drainage area B1 consists of 2.51 acres that will be captured by an earthen drainage channel, which will discharge into drainage area B2. Ultimately, the discharge from drainage area B1 & B2 will flow into an offsite bar ditch to the east of our site, at a flow rate lower than existing conditions. The total impervious cover area for drainage area B1 & B2 is 0.55 acres. There will be vegetative filter strips in drainage area B2. The vegetative filter strips will remove 635 lbs. of TSS.

Offsite flow will also come from drainage area A4, which consists of 7.51 total acres and 0.0 acres of impervious cover. This water will flow into an earthen channel which will flow into a storm pipe system. This storm pipe system will be discharged into proposed detention basin ‘A’. The onsite drainage areas A1-A3 & A5-A7 will also flow into detention basin ‘A’ via streets, storm pipe system, or sheet flow. The total drainage area flowing into detention basin ‘A’ is 27.12 acres which consists of an impervious cover acreage of 10.60 acres. The required TSS treatment for detention basin ‘A’ for proposed conditions is 9,515 lbs. Detention basin ‘A’ is designed to remove 10,266 lbs. of TSS which exceeds the required amount.

There will also be offsite flow that will be captured by offsite detention basin ‘E’, which is located northeast, adjacent to our site. These offsite flows will come from drainage area E1 & E2 which consist of 38.97 acres with an impervious cover of 0.26 acres. Onsite drainage area D1 will also flow into detention basin ‘E’. Drainage area D1 is 5.49 total acres with an impervious cover acreage of 3.6 acres. Overall, the drainage area flowing into detention basin ‘E’ will have consist of 44.46 acres with an impervious cover of 3.86 acres. The required TSS treatment for detention basin ‘E’ for proposed conditions is

3,465 lbs. Detention basin ‘A’ is designed to remove 4,249 lbs. of TSS which exceeds the required amount.

The proposed detention basins have enough treatment capacity for the proposed development and the offsite flow that will be draining to our site.

Ultimate Conditions

The proposed improvements addressed by this Water Pollution Abatement Plan (WPAP) for proposed conditions are 2 extended detention basins and vegetative filter strips. Our site receives offsite drainage from the north. Drainage area B1 consists of 2.40 acres that will be captured by an earthen drainage channel, which will discharge into drainage area B2. Ultimately, the discharge from drainage area B1 & B2 will flow into an offsite bar ditch to the east of our site, at a flow rate lower than existing conditions. The total impervious cover area for drainage area B1 & B2 is 1.57 acres.

Offsite flow will also come from drainage area A4, which consists of 9.62 total acres and 5.89 acres of impervious cover. This water will flow into a storm pipe system. This storm pipe system will be discharged into proposed detention basin ‘A’. The onsite drainage areas A1-A3 & A5-A7 will also flow into detention basin ‘A’ via streets, storm pipe system, or sheet flow. The total drainage area flowing into detention basin ‘A’ is 29.23 acres which consists of an impervious cover acreage of 16.49 acres. The required TSS treatment for detention basin ‘A’ for ultimate conditions is 14,801 lbs. Detention basin ‘A’ is designed to remove 15,780 lbs. of TSS which exceeds the required amount.

There will also be offsite flow that will be captured by offsite detention basin ‘E’, which is located northeast, adjacent to our site. These offsite flows will come from drainage area E1 & E2 which consist of 30.06 acres with an impervious cover of 12.51 acres. Onsite drainage area D1 will also flow into detention basin ‘E’. Drainage area D1 is 5.49 total acres with an impervious cover acreage of 3.6 acres. Overall, the drainage area flowing into detention basin ‘E’ will have consist of 35.55 acres with an impervious cover of 16.11 acres. The required TSS treatment for detention basin ‘E’ for ultimate conditions is 14,460 lbs. Detention basin ‘A’ is designed to remove 15,519 lbs. of TSS which exceeds the required amount.

The proposed detention basins have enough treatment capacity for the proposed development and the offsite flow that will be draining to our site.

The Permanent Pollution Abatement Measures (BMPs) for Veramendi Precinct 23 Unit 1 development will consists of 2 detention basins designed in accordance with the TCEQ Technical Guidance Manual to remove 91% of the increased Total Suspended Solids (TSS) for the proposed improvements.

Potable water and wastewater disposal are provided by the New Braunfels Wastewater Treatment Plant. Wastewater is disposed of by conveyance to the existing treatment center operated by New Braunfels Wastewater Treatment Plant.

GEOLOGIC ASSESSMENT (SCS)

VERAMENDI
PHASE 23-1
+/- 6,405 LINEAR FEET
NEW BRAUNFELS, TEXAS

FROST GEOSCIENCES, INC. PROJECT NO.: FGS-E25161
MAY 19, 2025

Prepared exclusively for

ASA Properties
PO Box 310699
New Braunfels, Texas 78131

Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental

Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental

Frost Geosciences, Inc.
13406 Western Oak
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Fax (210)-372-1318
www.frostgeosciences.com
TBPE Firm Registration # F-9227
TBPG Firm Registration # 50040

May 19, 2025

ASA Properties
PO Box 310699
New Braunfels, Texas 78131

Attn: Mr. Garrett Mechler, P.E.

SUBJECT:
Geologic Assessment (SCS)
for the Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
Veramendi Phase 23-1
+/- 6,405 Linear Feet
New Braunfels, Texas
FGS Project N^{o} FGS-E25161

Dear Mr. Mechler:

Frost GeoSciences, Inc., (FGS) is pleased to submit the enclosed Geologic Assessment 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 Texas Commission on Environmental Quality (TCEQ) "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04).

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.

We appreciate the opportunity to perform these services for ASA Properties. Please contact the undersigned if you have questions regarding this report.

Respectfully submitted,
Frost GeoSciences, Inc.

Ethan Levine
Project Geologist

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

Copies Submitted: (1) Mr. Garrett Mechler, P.E.; ASA Properties
(1) Electronic (pdf) Copy

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APPENDIX A - SITE LOCATION FIGURES
- ***Figure 1: Site Layout***
- ***Figure 2: Street Map***
- ***Figure 3: USGS Topographic Map***
- ***Figure 4: E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map***
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APPENDIX B - SITE PHOTOGRAPHS

APPENDIX C - GEOLOGIC MAP

GEOLOGIC ASSESSMENT

Texas Commission on Environmental Quality

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

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

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

Signature

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

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

Date: May 19, 2025 Fax: (210) 372-1318

Representing: Frost GeoSciences, Inc. #50040 (Name of Company and TBPG or TBPE registration number)

Signature of the Geologist:

Regulated Entity Name: Veramendi Phase 23-1

Project Information

1. Date(s) Geologic Assessment was performed: May 14 and May 16, 2025
2. Type of Project:

☐ WPAP	☐ AST
☒ SCS	☐ UST

3. Location of Project:

☒ Recharge Zone
☐ Transition Zone
☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
CrD	D	0.5-1
RuD	D	1-1.5

Soil Group Definitions (Abbreviated)

A. Soils having a high infiltration rate when thoroughly wetted.
B. Soils having a moderate infiltration rate when thoroughly wetted.
C. Soils having a slow infiltration rate when thoroughly wetted.
D. Soils having a very slow infiltration rate when thoroughly wetted

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

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

8. ☒ **Attachment D – Site Geologic Map(s)**. The Site Geologic Map must be the same scale as the applicant's Site Plan.

   Applicant's Site Plan Scale: 1" = 200'
   Site Geologic Map Scale: 1" = 200'
   Site Soils Map Scale (if more than 1 soil type): 1" = 500'

9. Method of collecting positional data:

   ☒ Global Positioning System (GPS) technology.
   ☒ Other method(s). Please describe method of data collection: 2023 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 SCS Application Section.

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

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

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

Administrative Information

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

STRATIGRAPHIC COLUMN

EXPLANATION OF HYDROSTRATIGRAPHIC UNITS

Group or Formation	Formal and informal member		Hydrologic unit or Informal hydrostratigraphic unit
Taylor Group (Pecan Gap)		Kpg	Upper Confining Unit (UCU)
Austin Group		Ka	
Eagle Ford Group		Kef	
Buda Limestone		Kb	
Del Rio Clay		Kdr	
Georgetown Formation		Kg	I
Person Formation	Cyclic and marine, undivided	Kpcm	II
	Leached and collapsed	Kplc	III
	Regional dense member	Kprd	IV
Kainer Formation	Grainstone	Kkg	V
	Kirschberg evaporite	Kkke	VI
	Dolomitic	Kkd	VII
	Basal nodular	Kkbn	VIII
Glen Rose Limestone	Upper Glen Rose Limestone	Kgrc	Cavernous
		Kgrcb	Camp Bullis
		Kgrue	Upper evaporite
		Kgrf Kgruf	Fossiliferous Upper
		Kgrf Kgrlf	Lower
		Kgrle	Lower evaporite
	Lower Glen Rose Limestone	Kgrb	Bulverde
		Kgrlb	Little Blanco
		Kgrts	Twin Sisters
		Kgrd	Doeppenschmidt
		Kgrr	Rust
		Kgrhc	Honey Creek
Pearsall Formation	Hensell Sand	Kheh	Hensell
	Cow Creek Limestone	Kcccc	Cow Creek
	Hammett Shale	Khah	Hammett

Frost GeoSciences

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Veramendi Phase 23-1 **PROJECT NUMBER:** FGS-E25161

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
No		**Geologic**			**Or**				**Manmade**		**Features**	**Were**		**Observed**		**On**		**The**		**Site**

Datum: NAD 83

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, 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.

Steve Frost, C.P.G., P.G.

Date: May 19, 2025

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

LOCATION

The project site consists of approximately 6,405 linear feet of proposed sanitary sewer line with approximately 5,000 linear feet occurring on-site and approximately 1,400 linear feet occurring off-site along the eastern side of River Road. The project site is located along and east of River Road approximately 0.46 miles north of the intersection of River Road and Highway 337 in New Braunfels, Comal County, Texas. An overall view of the area is shown on copies of the site plan, a street map, the U.S.G.S. Topographic Map, the EAA-Edwards Aquifer Recharge Zone and Contributing Zone Map, the FIRM Map, the U.S. Geological Survey, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, U.S. Geological Survey: Water Resources Investigations Report (WRI) 94-4117 Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, a NRCS Web Soil Survey aerial photograph at a scale of 1"=500', and a 2023 aerial photograph at a scale of 1"=500'. These maps are included as Figures 1 through 9 in Appendix A.

METHODOLOGY

The Geologic Assessment was performed by Steve Frost, C.P.G., P.G., President and Principal Geologist, and Ethan Levine, Project Geologist, with Frost GeoSciences, Inc. Mr. Frost is a Licensed Professional Geoscientist in the State of Texas (License #315).

Frost GeoSciences, Inc. researched the geology of the area north of Word Parkway in New Braunfels, Comal County, Texas. The research included, but was not limited to FEMA flood maps, Edwards Aquifer Recharge Zone Maps, U.S.G.S. 7.5 Minute Quadrangle Maps, the Bureau of Economic Geology-Geologic Atlas of Texas, the U.S. Geological Survey, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle, the U.S.G.S. Water-Resources Investigations Report 94-4117, and the U.S.D.A. Soil Survey of Comal and Hays Counties, Texas.

After reviewing the available information, a field investigation was performed to identify any geologic or man-made Potential Recharge Features (PRFs). A transect spacing of approximately 50 feet, or less depending on vegetation thickness, was used to inspect the project area within a 50 foot boundary of the proposed sewer line. A 2023 aerial photograph, in conjunction with a hand-held Garmin GPS 72H Global Positioning System with an Estimated Potential Error ranging from 10 to 14 feet, was used to navigate around the property and identify the locations of PRFs, as recommended in the "Instructions to Geologists", TCEQ-0585-Instructions (Rev. 10-1-04). The locations of any PRFs noted in the field were marked with blue and white flagging. The flagging is numbered with the same potential recharge feature I.D. # that is used on the Site Geologic Map. The Site Geologic Map, indicating the limits of the project site, and the locations of PRFs and rock outcrops noted on the project site, is included in Appendix C at the end of this report. A copy of a 2023 Aerial Photograph at an approximate scale of 1" = 500' indicating the limits of the project site is included on Figure 9 in Appendix A. The Geologic Assessment Form TCEQ-0585, (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 through 5.

RESEARCH & OBSERVATIONS

7.5 Minute Quadrangle Map Review

According to the U.S.G.S. 7.5 Minute Quadrangle Map, New Braunfels West Quad (1988), the elevation across the project site ranges from 650 to 760 feet above mean sea level. The project site has a total relief of approximately 110 feet. Runoff from the project site flows to the south into an unnamed tributary of Blieders Creek. The southern portion of the project site crosses River Road and proceeds along the western side of River Road. A residential subdivision is located to the adjacent south of the project site. A copy of the U.S.G.S. 7.5 Minute Quadrangle Map indicating the location of the project site is included on Figure 3 in Appendix A.

Recharge/Transition Zone

According to the E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map, New Braunfels West (2014) and the TCEQ website: Edwards Aquifer Viewer – https://tceq.maps.arcgis.com/apps/webappviewer/index.html, the project site is located within the Recharge Zone of the Edwards Aquifer. A copy of the E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map indicating the location of the project site is included on Figure 4 in Appendix A.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Flood Insurance Map, Community Panel Number 48091C0435F, dated September 2, 2009 was reviewed to determine if the project site is located in areas prone to flooding. A review of the above-mentioned Panel No. indicates that the project site is located within "Zone X". According to the Panel Legend, Zone X represents areas determined to be outside the 0.2% annual chance floodplain. An area in the southern portion of the project site associated with Blieders Creek is indicated as "Zone A". According to the map panel legend, Zone A represents areas of the 1% annual chance flood (100-year flood), where no base flood elevations have been determined. A copy of the above referenced FIRM panel indicating the location of the project site is included on Figure 5 in Appendix A.

Soils

According to the United States Department of Agricultural (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Comal and Hays Counties (1984) and the USDA NRCS Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov, the Site is located on the Comfort-Rock outcrop complex, undulating (CrD), the Lewisville silty clay, 1-3% slopes (LeB), the Orif soils, frequently flooded (Or), and the Rumple-Comfort Association (RuD). A copy of the 2022 aerial photo (approximate scale: 1"=500') obtained from the Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov has been included on Figure 6 in Appendix A

- Comfort-Rock outcrop complex, undulating (CrD) consists of shallow, clayey soils and Rock outcrops on the side slopes, hilltops, and ridgetops in the uplands area of the Edwards Plateau. This soil complex is composed of the Comfort extremely stony clay (~49% to ≥95% of the complex), the Rock outcrop (5-36% of the complex), and small amounts of the Rumple, Purves, Eckert, and Real soils. Typically, the surface layer of the Comfort soil is dark brown extremely stony clay about 6 inches thick. Stones and cobbles (some as much as 4' across) cover approximately 45% 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 non-calcareous throughout.

The soil is well drained, surface runoff is slow to medium, permeability is slow, and the available water capacity is very low. Water erosion is a slight hazard. Typically, the Rock outcrop is dolomitic limestone that is barren of soil except in narrow fractures in the rock. Some areas may have as much as 3 inches of soil on top of the outcrop.

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

- Orif soils, frequently flooded (Or) consists of deep, nearly level soils on flood plains of large creeks and rivers. Slopes are convex and on the average are less than 1 percent. They are adjacent to the stream channel. The areas are long and narrow and range from 10 to 350 acres in size. The surface texture is gravelly loam, gravelly loamy sand, gravelly sandy loam, or a very gravelly counterpart. The texture does not vary in a regular pattern. 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. The available water capacity is low. The rooting zone is deep. Water erosion is a severe hazard.

- 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.

Narrative Description of the Site Geology

The project site consists of approximately 6,405 linear feet of proposed sanitary sewer line with approximately 5,000 linear feet occurring on-site and approximately 1,400 linear feet occurring off-site along the eastern side of River Road. Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to be low. No Potential Recharge Features (PRFs) were observed on the project site during the course of the field reconnaissance. The project site is covered by moderately dense stand of vegetative cover with numerous open grassy areas. Site visit photos indicating the condition of the property at the time of the on-site inspection are included in Appendix B. Overall vegetation on the project site

consists of ashe juniper (Juniperus ashei), live oak (Quercus virginiana), and cedar elm (Ulmus crassifolia), with Texas persimmon (Diospyros texana), agarita (Berberis trifoliolata), yucca (Yucca treculeana), and prickly pear cactus (Opuntia lindheimeri). The variations in the vegetative cover on the property are visible in the 2023 aerial photo on Figure 9 in Appendix A. A copy of the site layout indicating the boundary of the project site and the elevations is included on the Site Geologic Map in Appendix C of this report.

According to the U.S. Geological Survey: Water Resources Investigations Report (WRI) 94-4117 Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas and the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle the project site is located on the Cretaceous Person Formation, Leached and Collapsed Members, Undivided (Kep). A copy of the WRI map and the Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle are included on Figures 7 and 8 in Appendix A. A copy of the Stratigraphic Column highlighting the outcropping formations is included on Page 3 of this report.

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

According to the site plan provided by ASA Properties, the surveyed elevations on the project site range from 660 to 756 feet. According to this survey, the total relief on the project site is approximately 96 feet. A copy of the site plan indicating the boundary of the project site and the elevations is included on the Site Plan on Figure 1 in Appendix A and the Site Geologic Map in Appendix C of this report.

BEST MANAGEMENT PRACTICES

Based on a visual inspection of the ground surface, the overall potential for fluid flow from the project site into the Edwards Aquifer appears to range from low to moderate. The potential always exists to encounter solution cavities within the subsurface during excavating activities. Frost GeoSciences, Inc. is of the opinion that it is very important for construction personnel to be informed of the potential to encounter cavities in the subsurface that lack a surface expression. Construction personnel should also be informed of the proper protocol to follow in the event a karst feature is encountered during the development of the project site.

DISCLAIMER

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

This report has been prepared for the exclusive use of ASA Properties. This report is based on available known records, a visual inspection of the project site, and the work generally accepted for a Geologic Assessment for Regulated Activities / Developments on the Edwards Aquifer Recharge / Transition Zone, relating to 30 TAC §213.5(b)(3), effective June 1, 1999.

REFERENCES

1. USGS - 7.5 Minute Topographic Quadrangle of New Braunfels West, 1988

2. E.A.A. Edwards Aquifer Recharge Zone and Contributing Zone Map, New Braunfels West (2014).

3. Official Edwards Aquifer Recharge Zone Map, New Braunfels West, 1988

4. The Texas Commission on Environmental Quality (TCEQ) website: Edwards Aquifer Viewer – https://tceq.maps.arcgis.com/apps/webappviewer/index.html.

5. Clark, A.K., Golab, J.A. and Morris, R.R., 2016, Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366, United States Geological Survey.

6. Collins, Edward, W., 2000, Geologic Map of the New Braunfels 30 X 60 Minute Quadrangle, Bureau of Economic Geology, The University of Texas at Austin, Texas.

7. Stein, W.G. and Ozuna, G.B., 1995, Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Recharge Zone, Comal County, Texas, U.S. Geological Survey Water Resources Investigations 94-4117.

8. Federal Emergency Management Agency, Federal Insurance Administration, National Flood Insurance Program, Flood Insurance Map, Community Panel Number 48091C0435F, dated September 2, 2009

9. United States Department of Agriculture Soil Conservation Service Soil Survey of Comal County 1984

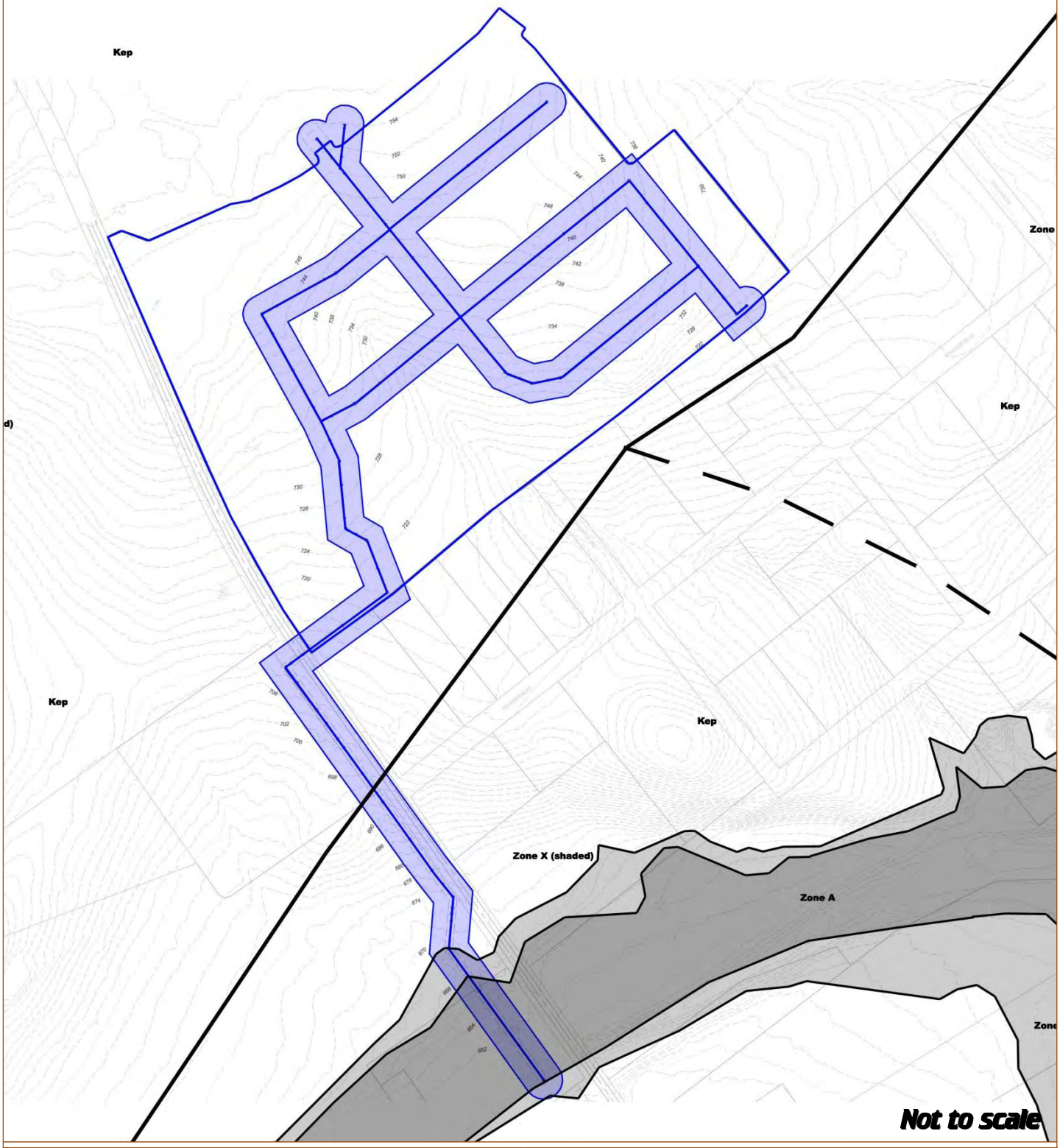
10. USDA NRCS Web Soil Survey (WSS) website: https://websoilsurvey.nrcs.usda.gov (2014)

11. TCEQ-0585-Instructions (Rev. 10-1-04), “Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone”.

APPENDIX A

SITE LOCATION FIGURES

Frost GeoSciences

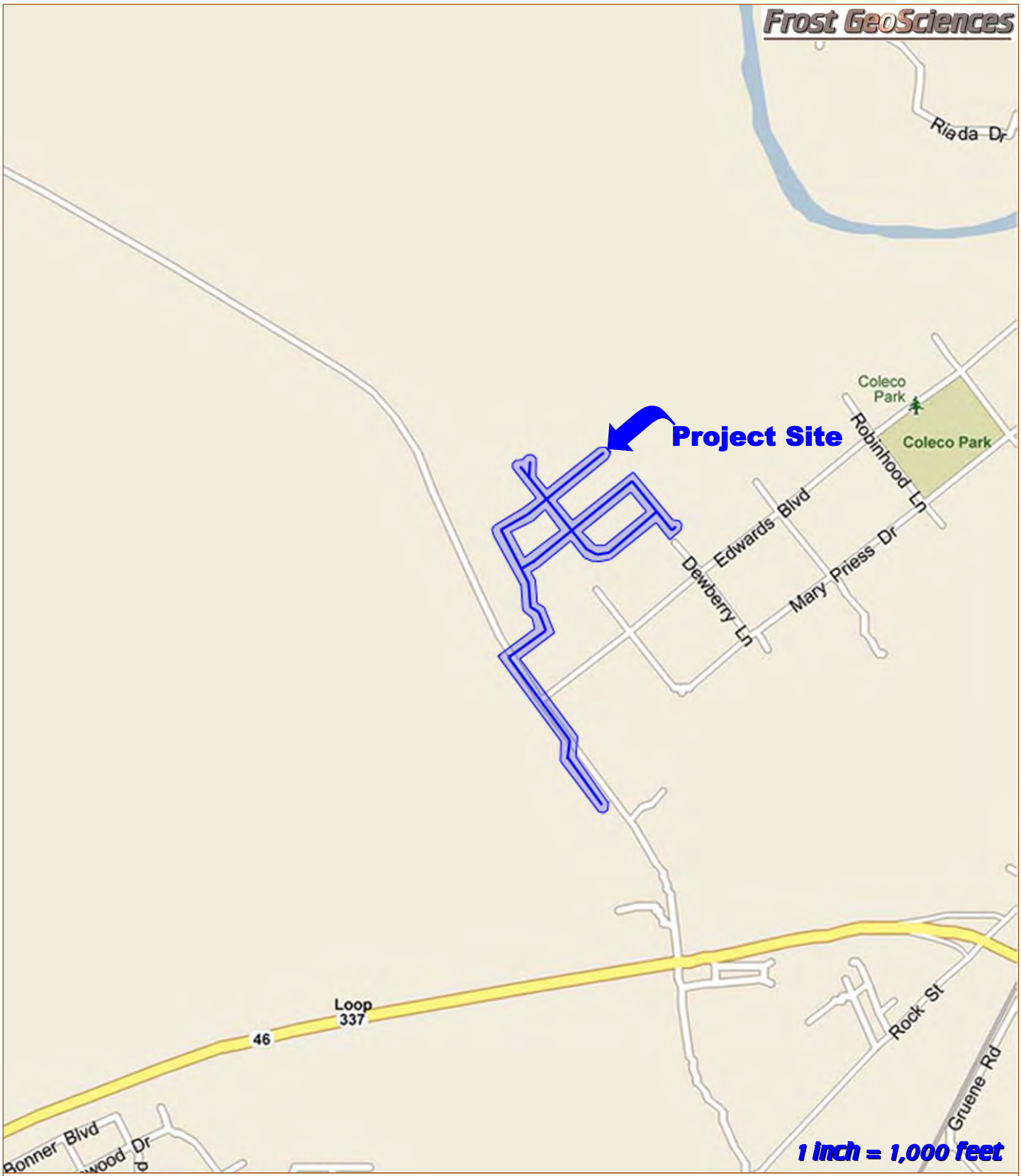


PROJECT NAME:
Geologic Site Assessment (SCS)
for Regulated Activities/Development on the
Edwards Aquifer Recharge/Transition Zone
Veramendi 23-1
Comal County, Texas

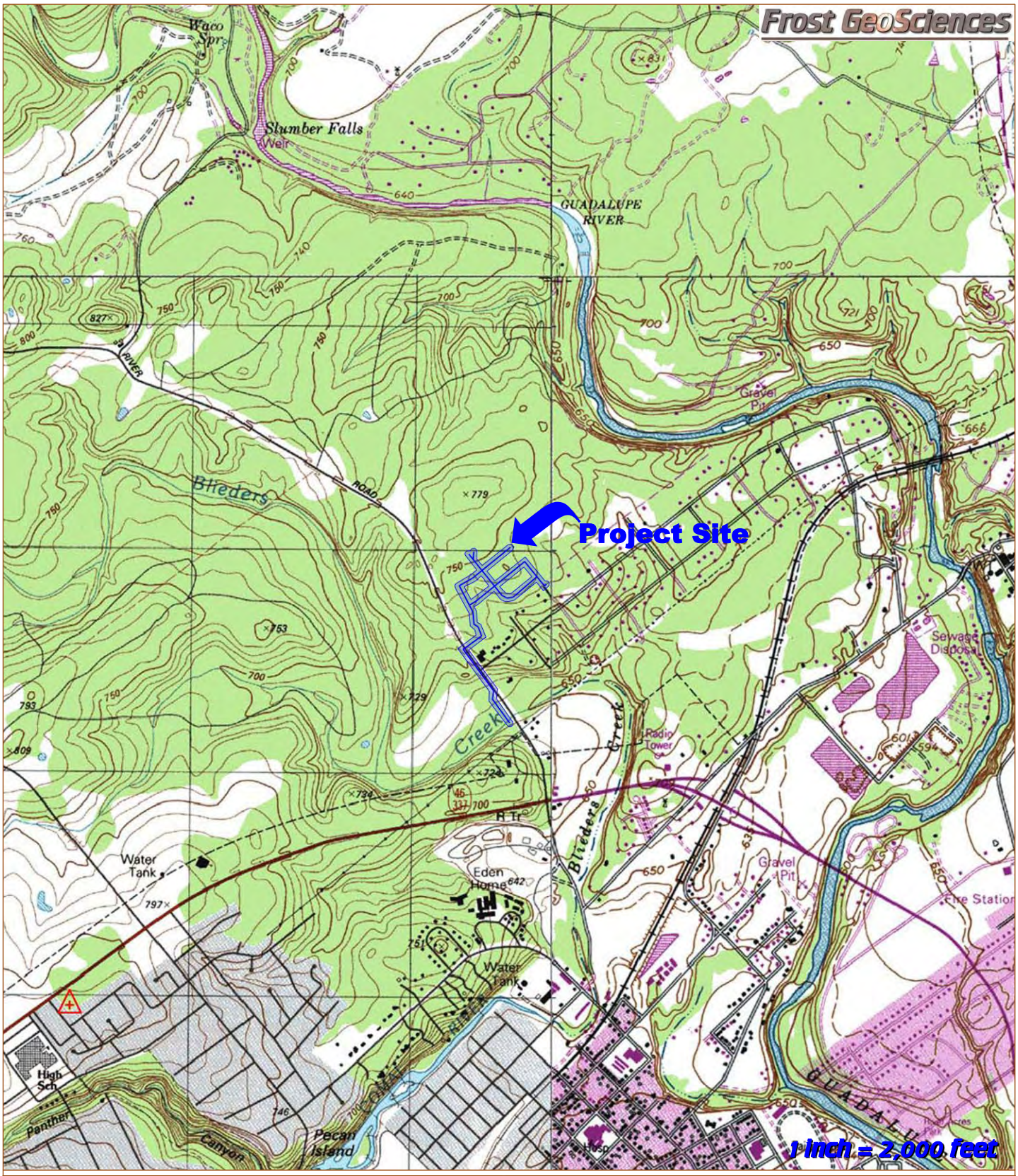
Site Plan

PROJECT No.: FGS-E25159

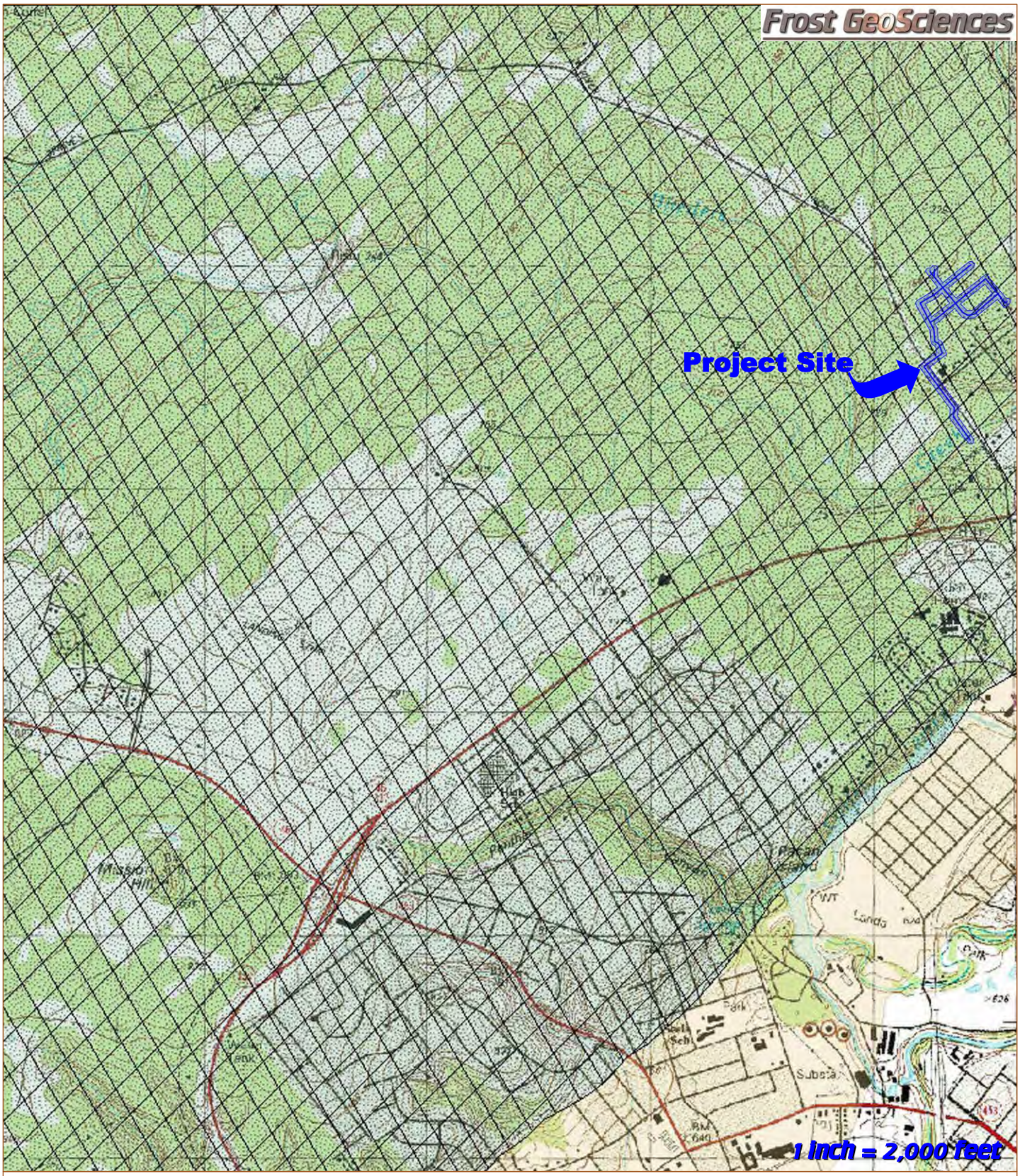
DATE: May 19, 2025



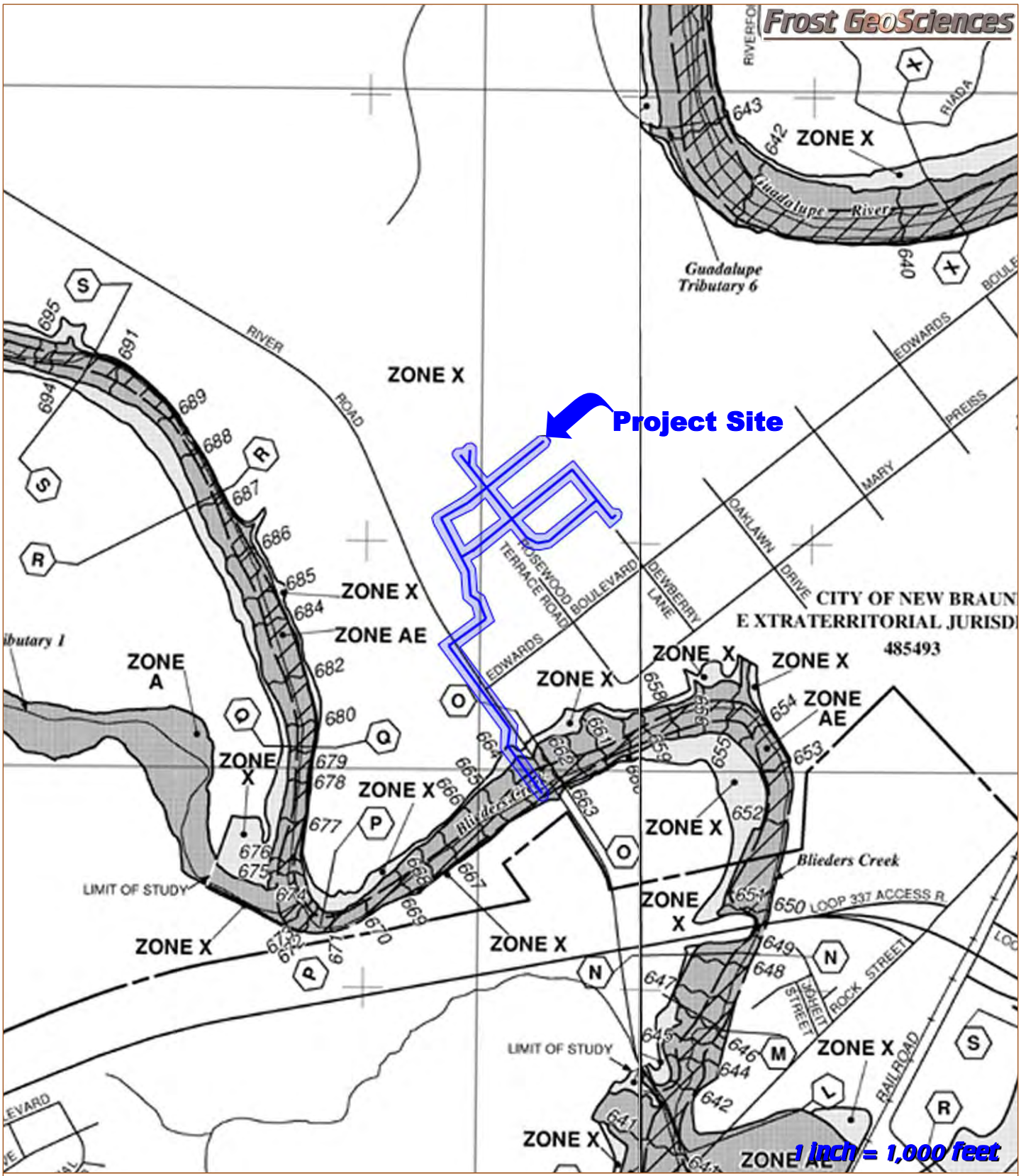
PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	Street Map Microsoft Streets and Trips (2013)
PROJECT No.: FGS-E25159	**DATE:** May 19, 2025



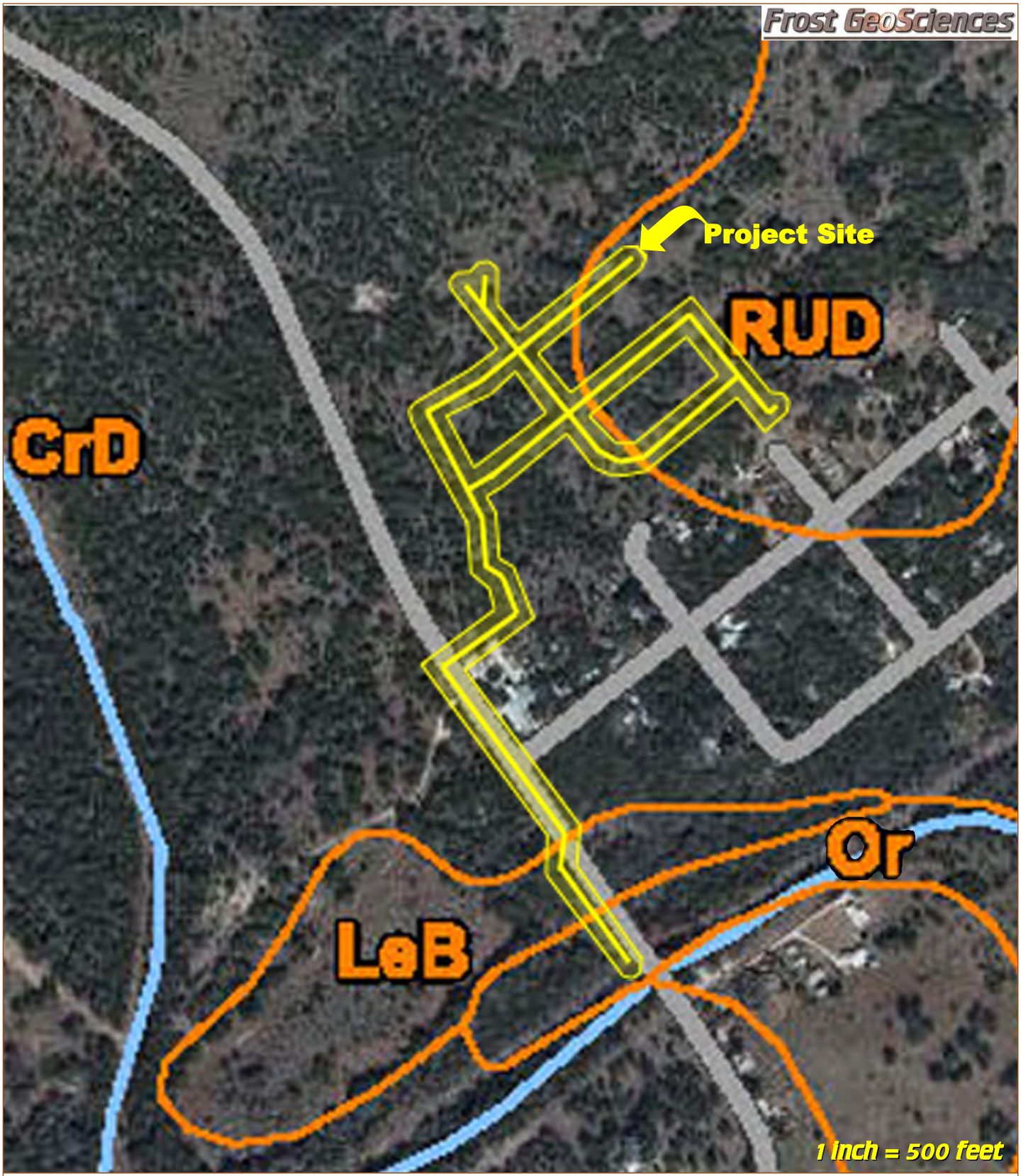
PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	U.S.G.S. 7.5 Minute Quadrangle Map New Braunfels West, TX Sheet (1988)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025



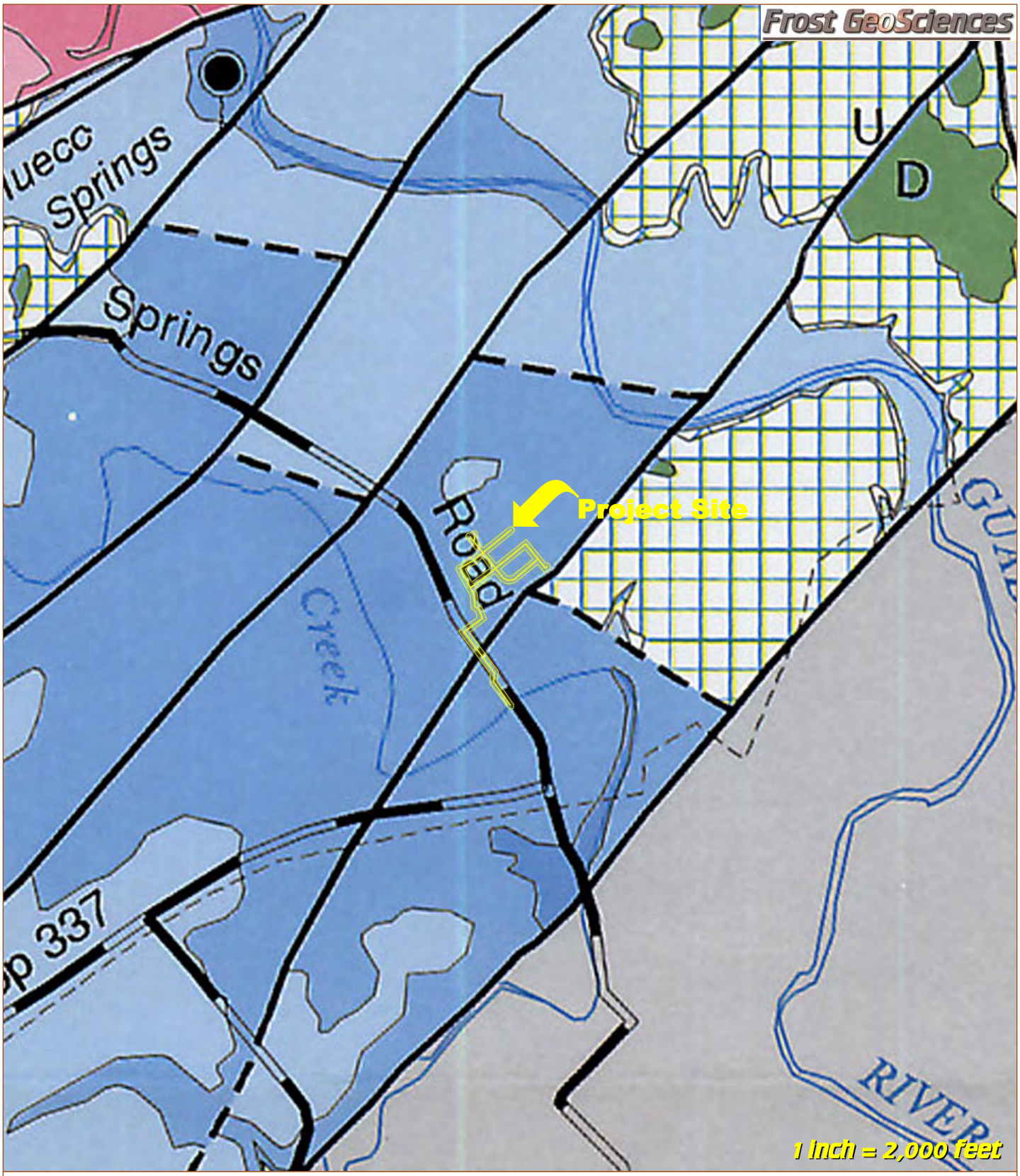
PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	EAA Recharge & Contributing Zone Map New Braunfels West, Texas (2014)
PROJECT No.: FGS-E25159	**DATE:** May 19, 2025



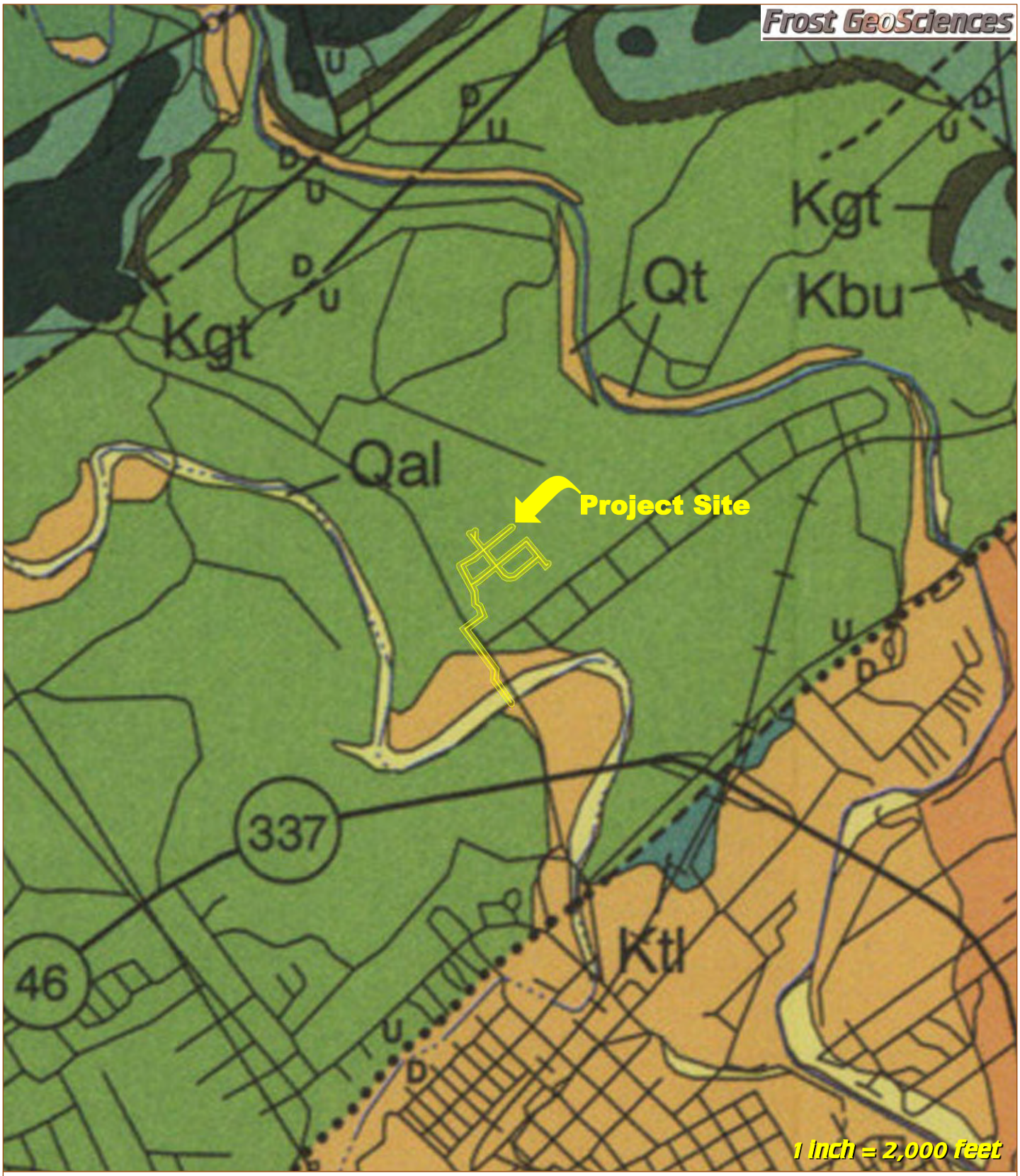
PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	Flood Insurance Rate Map (FIRM) Community Panel # 48091C0435F Revised 9/2/2009
PROJECT No.: FGS-E25159	**DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	Soils Map Comal County Soil Survey NRCS website: websoilsurvey.nrcs.usda.gov
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	United States Geological Survey Water Resource Investigation Map 94-4117 Comal County, Texas (1994)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025



PROJECT NAME: Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Veramendi 23-1 Comal County, Texas	United States Geological Survey Geologic Map of the New Braunfels, Texas 30 X 60 Minute Quadrangle (2000)
	PROJECT No.: FGS-E25159 / **DATE:** May 19, 2025

PROJECT NAME:	2023 Aerial Photograph Google Earth Aerial Imagery	
Geologic Site Assessment (SCS) for Regulated Activities/Development on the Edwards Aquifer Recharge/Transition Zone Comal County, Texas	PROJECT No.: FGS-E25159	DATE: May 19, 2025

APPENDIX B

SITE PHOTOGRAPHS

Photo #1 – View of the eastern portion of the Site.	Photo #2 – Additional view of the eastern portion of the Site.
Photo #3 – Additional view of the eastern portion of the Site.	Photo #4 – View of the east-central portion of the Site.

Photo #5 – Additional view of the east-central portion of the Site.	Photo #6 – Additional view of the east-central portion of the Site.
Photo #7 – View of the northern portion of the Site.	Photo #8 – Additional view of the northern portion of the Site.

Photo #9 – Additional view of the northern portion of the Site.	Photo #10 – View of PRF #S-138.
Photo #11 – View of the central portion of the Site.	Photo #12 – Additional view of the central portion of the Site.

Photo #13 – Additional view of the central portion of the Site.	Photo #14 – View of the central portion of the Site.
Photo #15 – Additional view of the western portion of the Site.	Photo #16 – Additional view of the western portion of the Site.

Photo #17 – Additional view of the western portion of the Site.	Photo #18 – View of the southern portion of the Site.
Photo #19 – Additional view of the southern portion of the Site.	Photo #20 – Additional view of the southern portion of the Site.

Photo #21 – View of ongoing utility construction in the southern portion of the Site.	Photo #22 – Additional view of ongoing utility construction in the southern portion of the Site.
Photo #23 – Additional view of ongoing utility construction in the southern portion of the Site.	Photo #24 – Additional view of ongoing utility construction in the southern portion of the Site.

Photo #25 – Additional view of ongoing utility construction in the southern portion of the Site.	Photo #26 – Additional view of ongoing utility construction in the southern portion of the Site.

APPENDIX C

GEOLOGIC MAP

Location Map

Signature of Texas Licensed Geoscientist
Steve Frost License No. 315

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

Frost GeoSciences
Geotechnical ▪ Construction Materials
Geologic ▪ Environmental
13406 Western Oak ▪ Helotes, Texas 78023
Phone: (210) 372-1315 ▪ Fax: (210) 372-1318

Site Geologic Map

Geologic Site Assessment (SCS)
for Regulated Activities / Development on the
Edwards Aquifer Recharge / Transition Zone
for the

Veramendi
Phase 23-1
+/- 6,405 Linear Feet
New Braunfels, Texas

Frost GeoSciences, Inc. Control # FGS-E25161

Legend

- Potential Recharge Feature (PRF)
- Site Boundary
- Fault
- Floodplain Zone X (shaded)
- Floodplain Zone A

Kep - Cretaceous Person Formation, leached and collapsed

Floodplain Information Obtained From
FIRM: Flood Insurance Rate Map
Comal County, Texas: Panel # 48091C0435F, Revised 9/2/2009

Fault Information Obtained From:
U.S. Geological Survey, Water Resources Investigations Report 94-4117 (1994)
Bureau of Economic Geology, Geologic Map of the New Braunfels, Texas
30 X 60 Minute Quadrangle (2000)
U.S. Geological Survey, Clark (2016) Geologic Framework and Hydrostratigraphy of the Edwards and Trinity Aquifers within Northern Bexar and Comal Counties, Texas, Science Investigations Map 3366

North
NW NE West East SW SE South

Graphic Scale

200 0 100 200 400

(In Feet)

1 inch = 200 feet
Representative Fraction 1:2400

Contour Interval - 2 foot

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 Precincts 23-1

1. [X] **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: Nicholas Gower, PE.
   Entity: LJA Engineering
   Mailing Address: 9830 Colonnade Blvd, Ste 300
   City, State: San Antonio, TX Zip: 78230
   Telephone: 210-503-2700 Fax: _____
   Email Address: ngower@lja.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: Nicholas Gower, PE.
   Texas Licensed Professional Engineer's Number: 139260
   Entity: LJA Engineering
   Mailing Address: 9830 Colonnade Blvd, Ste 300
   City, State: San Antonio, TX Zip: 78230
   Telephone: 210-503-2700 Fax: _____
   Email Address: ngower@lja.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):

   [X] Residential: Number of single-family lots: 103
   [ ] Multi-family: Number of residential units: _____
   [ ] Commercial
   [ ] Industrial
   [ ] Off-site system (not associated with any development)
   [ ] Other: _____

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

   100 % Domestic — 210 gallons/day
   _____% Industrial — _____ gallons/day
   _____% Commingled — _____ gallons/day
   Total gallons/day: 21,630

6. Existing and anticipated infiltration/inflow is _____ gallons/day. This will be addressed by: _____.

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.
   [X] 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	3813	PVC	SDR-26 PVC
12	2592	PVC	SDR-26 PVC

Total Linear Feet: 6405

(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 New Braunfels Utilities (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?*
WWL 'A'	8.5 Of	1+00	Manhole 'A-1'
WWL 'A'	8.5 Of	5+25.28	Manhole 'A-2'
WWL 'A'	8.5 Of	6+59.98	Manhole 'A-3'
WWL 'A'	8.5 Of	7+49.07	Manhole 'A-4'
WWL 'A'	8.6 Of	11+44.79	Manhole 'A-5'
WWL 'A'	8.6 Of	14+05.34	Manhole 'A-6'
WWL 'A'	8.7 Of	17+34.25	Manhole 'A-7'

Line	*Shown on Sheet*	*Station*	*Manhole or Clean-out?*
WWL 'A'	8.7 Of	18+81.38	Manhole 'A-8'
WWL 'A'	8.7 Of	19+44.61	Manhole 'A-9'
WWL 'A'	8.7 Of	21.20.65	Manhole 'A-10'

SEE ATTACHED FOR TABLE 2 CONTINUATION

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" = 50 '.

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:

[X] The entire water distribution system for this project is shown and labeled.
[X] 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.)
[X] 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*
WWL 'A'	8.5 of	1+00 to 3+92
	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.)
[X] 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*
WWL 'A'	8.5 of	1+00 to 2+81.43
	of	to
	of	to
	of	to

24. [X] Legal boundaries of the site are shown.

25. [X] 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. [X] 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*
WWL 'A'	6+31.63	Crossing		8.2
WWL 'A'	11+73.51	Crossing		4.0
WWL 'A'	12+66.12	Crossing		4.0
WWL 'A'	22+46.85	Crossing		17.4
WWL 'A'	26+79.55	Crossing		17.8
WWL 'A'	27+03.55	Crossing		11.3
WWL 'A'	29+75.55	Crossing		5.6

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.
[X] **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*

Line	*Manhole*	*Station*	*Sheet*

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*
WWL 'A'	A-13	26+91.55	8.8
WWL 'C'	A-11	1+00.00	8.10
WWL 'E'	A-13	1+00.00	8.12

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]**	N/A
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	8.0-8.15
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	N/A
Typical trench cross-sections **[Required]**	8.0
Bolted manholes **[Required]**	8.16
Sewer Service lateral standard details **[Required]**	8.16
Clean-out at end of line **[Required, if used]**	8.16
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	N/A
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	8.0
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	8.16

Standard Details	*Shown on Sheet*
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	8.16

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

37. [X] 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: _____

38. [X] 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. [X] Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

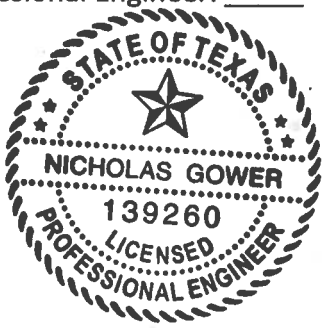
Signature

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: Nicholas, Gower

Date: 12-5-2023

Place engineer's seal here:



Signature of Licensed Professional Engineer:

Nicholas Gower 7/29/2025

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)

Veramendi Precint 23-1				
Table 5 - Water Line Crossings				
Line	**Station or Closest Point**	**Crossing or Parallel**	**Horizontal Separation Distance**	**Vertical Separation Distance**
WWL 'A'	32+36.66	Crossing		3.8
WWL 'B'	1+12.00	Crossing		4.9
WWL 'F'	8+89.75	Crossing		7.5
WWL 'G'	4+00.00	Crossing		3.9

Veramendi Precinct 23-1			
Table 2 - Manholes and Cleanouts			
Line	**Shown on Sheet**	**Station**	**Manhole or Clean-out**
WWL 'A'	8.7	22+34.85	Manhole 'A-11’
WWL 'A'	8.7	23+32.30	Manhole 'A-12'
WWL 'A'	8.8	26+91.55	Manhole 'A-13'
WWL 'A'	8.8	29+87.55	Manhole 'A-14'
WWL 'A'	8.8	31+92.55	Manhole 'A-15'
WWL 'A'	8.8	32+77.08	Manhole 'A-16'
WWL 'B'	8.9	2+81.53	Manhole 'B-1'
WWL 'B'	8.9	5+02.60	Manhole 'B-2'
WWL 'D'	8.11	3+65.00	Manhole 'D-1'
WWL 'D'	8.11	6+20.00	Manhole 'D-2'
WWL 'F'	8.13	2+84.69	Manhole 'F-1’
WWL 'F'	8.13	3+60.87	Manhole 'F-2'
WWL 'F'	8.13	4+37.05	Manhole 'F-3'
WWL 'F'	8.14	9+01.75	Manhole 'F-4'
WWL 'F'	8.14	10+62.01	Manhole 'F-5'
WWL 'F'	8.14	10+96.01	Manhole 'F-6'
WWL 'G'	8.15	3+88.00	Manhole 'G-1'
WWL ‘G’	8.15	6+08.01	Manhole 'G-2'

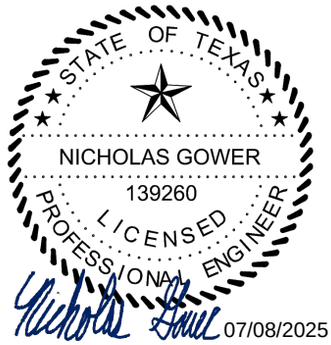
TCEQ Engineering Design Report

(PEPP-SA EDR v4.0)

For

VERAMENDI PRECINCT 23-1

Organized Sewage Collection System Modification



July 2025

Prepared By:
LJA ENGINEERING, INC.
9830 Colonnade Blvd. Ste. 300
San Antonio, TX 78230
TBPE Firm Registration No.: F-1386

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PVC PIPE STANDARDS

The American Society for Testing and Materials (ASTM) also known as ASTM International (Reference: www.astm.org) governs the manufacturing specifications for Polyvinyl Chloride (PVC) pipes, including the dimension ratio and water pressure allowable for use of each pipe, through its D-2241 standard. ASTM D-2241 lists its pipe dimensions and pipe classes using the "SDR" mark up, such as SDR-13.5, SDR-21, SDR-26 and SDR-41. The SDR refers to the standard dimension ratio (SDR) of the outside pipe diameter and the wall thickness. This project specifies the use of SDR-26 PVC pipe, which are to meet the ASTM pressure rating of greater than 150 psi and fall in the size category listed below. ASTM D-2241 standards must be meticulously adhered to by all PVC pipe manufacturers and is recognized as the standard during PVC pressure pipe testing and quality checks. Other in-depth information can be found published in Thermoplastic Pressure Pipe Design and Selection UNI-TR-7, by the Uni-Bell PVC Pipe Association.

SDR 26 Pipe Size Matrix **(Per ASTM D-2241)**			
Size (in)	**O.D. (in)**	**Calc I.D. (in)**	**Thickness (in)**
4	4.5	4.154	0.173
6	6.625	6.115	0.255
8	8.625	7.961	0.332
10	10.75	9.924	0.413
12	12.75	11.77	0.49
16	16	14.77	0.615

PROPOSED TYPE OF PIPE

Type I, Grade I, Polyvinyl Chloride (PVC) Specifications:
Size of Pipe: 12.00 in.

SDR 26 Properties

Pipe Compliance:	ASTM D-2241
Joint Compliance:	ASTM D-3139
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Calculated Inner Diameter (in) = (Outer Diameter - 2t)	11.77
Outer Diameter (inch):	12.750
Wall Thickness (inch):	0.49
Mean Pipe Diameter (in) = (Outer Diameter - Thickness)	12.260
Approximate Trenching Width (feet):	3.06
Minimum Pipe Depth (Cover) used (feet):	**7.00**
Maximum Pipe Depth (Cover) used (feet):	**23.33**

FLOW/CAPACITY ANALYSIS

Proposed Waste Water Usage: **21,630.00 GPD**

Q_{max} (As determined in Attachment A) = 0.033 CFS

$$Q_{full} = \frac{1.486}{n} \times A \times R^{\frac{2}{3}} \times \sqrt{S}$$

A = Cross-Sectional Area, (ft2)	=	0.756
S = Slope, decimal, minimum used	=	0.003
R_h = hydraulic radius	=	0.245

For the Specified Pipe at the Minimum Design Slope, the full flow is

Q_{full} = 1.973 CFS

0.033 < 1.973
Design meets TCEQ Guidelines

MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(l)(2)(A))

Minimum and Maximum Pipe Slopes		
Size of Pipe	Minimum Slope (%)	Maximum Slope (%)
6	0.5	12.35
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
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 pipes larger than 39 inches in diameter, the slope is determined by Manning's formula to maintain a velocity greater than **2.0 feet per second and less than 10.0 feet per second** when flowing full.		

MINIMUM AND MAXIMUM VELOCITY FOR THE PROPOSED SYSTEM:

So, using 12.00 inch PVC Pipe:

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

V = velocity (ft/sec)	=	(solve)
n = Manning's coefficient	=	0.013
Calc. Inner Diameter (in)	=	11.770
A = Cross-Sectional Area, ft^2	=	0.756
Wp = Wetted Perimeter, ft	=	3.081
R_h = hydraulic radius, A/Wp	=	0.245
S = slope (ft/ft)	=	0.003

Minimum Slope Used (%): **0.34**

V_{min} = 2.62 ft/sec

2.62 **>** **2.00** ft/sec

Design meets TCEQ Guidelines

Maximum Slope Used (%): **4.88**

V_{max} = 9.91 ft/sec

9.91 **<** **10.00** ft/sec

Design meets TCEQ Guidelines

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

Soil type-pipe bedding material (Unified Classification System)	E' for Degree of Compaction of Bedding, in pounds per square inch			
	Dumped	Slight <85% Proctor, <40% relative density	Moderate 85%-95% Proctor, 40%-70% relative density	High, >95% Proctor, >70% relative density
(1)	(2)	(3)	(4)	(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	1000
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with more than 25% coarse-grained particles	100	400	1000	2000
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	1000	2000	3000
Crushed Rock	1000	3000	3000	3000
Accuracy in Terms of Percentage Deflection	± 2	± 2	± 1	± 0.5

Taken from: Howard, Amster K. "Soil Reaction for Buried Flexible Pipe"
U.S. Bureau of Reclamation, Denver, CO and the American Society of Civil Engineers.

Modulus of Soil Reaction for the in-situ soil is determined to be = 3000 psi

PIPE BEDDING CLASS

Taken from the American Society for Testing and Material (ASTM) D 2321 and American Association of State Highway and Transportation Officials (AASHTO) M43, and as published on Table 7, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

Pipe Embedment Material						E', psi (kPa) for Degree of Embedment Compaction				
ASTM D 2321*		ASTM D 2487		AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
Class	Description	Notation	Description							
IA	Open-graded, clean manufactured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
IB	Dense-graded, clean manufactured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures; little or no fines							
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel/sand mixtures; little or no fines	57 6 67	85%	12" (0.30 m)	N/R	1000 (6,900)	2000 (13,800)	3000 (20,700)
		GP	Poorly graded gravel, gravel/sand mixtures; little or no fines							
		SW	Well-graded sands, gravelly sands; little or no fines							
		SP	Poorly graded sands, gravelly sands; little or no fines							
III	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	90%	9" (0.20 m)	N/R	N/R	1000 (6,900)	2000 (13,800)
		GC	Clayey gravels, gravel/sand/clay mixtures							
		SM	Silty sands, sand/silt mixtures							
		SC	Clayey sands, sand/clay mixtures							

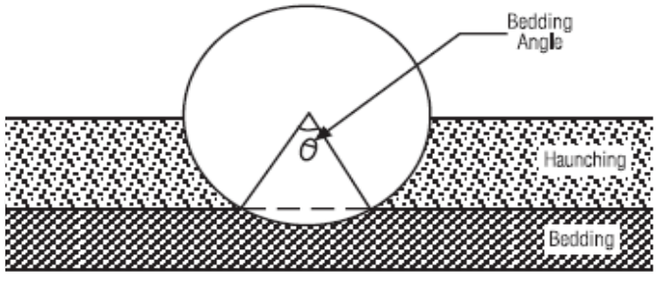
NOTE:

Per TCEQ guidelines, a contractor is allowed to use ASTM D 2321 Bedding Class 1A, 1B, II, or III at no less than 85% percent compaction. To grant the contractor its ability to make the proper judgment of which bedding class to use, the calculations provided in this Engineering Design Report reflect the use of **Bedding Class III, at 85%-95%** compaction, with an E' value of 1000 psi. This provides the "worst case" scenario for the SCS line. All other Bedding Class options will provide an improved value for the zeta factor as well as pipe deflection.

For Bedding Class III, 85%-95% Compaction, E_b **= 1000 psi**

PIPE BEDDING ANGLE

As Published on Figure 8 and Table 5, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pgs 18-19.



Bedding Constant Values

Bedding Angle, degrees	Bedding Constant
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083

LIVE LOAD DETERMINATION

Source: AASHTO H20 and E80 Loads and as Published on Table 4, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 14.

Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²			Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²		
	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 + impact
[2] Simulates 80,000 lb/ft railway load + impact
[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

PRISM LOAD DETERMINATION

Also referred to as the 'dead' load, the prism load is the pressure acting on the pipe by the weight of the soil column above a given section of the pipe. The following prism load columns are industry standards as referenced from Table 3, Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 13.

Table 3
Prism Load Soil Pressure (lbs/in²)

Height of Cover (ft)	Soil Unit Weight (lb/ft³)				
	100	110	120	125	130
1	0.69	0.76	0.83	0.87	0.90
2	1.39	1.53	1.67	1.74	1.81
3	2.08	2.29	2.50	2.60	2.71
4	2.78	3.06	3.33	3.47	3.61
5	3.47	3.82	4.17	4.34	4.51
6	4.17	4.58	5.00	5.21	5.42
7	4.86	5.35	5.83	6.08	6.32
8	5.56	6.11	6.67	6.94	7.22
9	6.25	6.88	7.50	7.81	8.13
10	6.94	7.64	8.33	8.68	9.03
11	7.64	8.40	9.17	9.55	9.93
12	8.33	9.17	10.00	10.42	10.83
13	9.03	9.93	10.83	11.28	11.74
14	9.72	10.69	11.67	12.15	12.64
15	10.42	11.46	12.50	13.02	13.54
16	11.11	12.22	13.33	13.89	14.44
17	11.81	12.99	14.17	14.76	15.35
18	12.50	13.75	15.00	15.63	16.25
19	13.19	14.51	15.83	16.49	17.15
20	13.89	15.28	16.67	17.36	18.06
21	14.58	16.04	17.50	18.23	18.96
22	15.28	16.81	18.33	19.10	19.86
23	15.97	17.57	19.17	19.97	20.76
24	16.67	18.33	20.00	20.83	21.67
25	17.36	19.10	20.83	21.70	22.57
26	18.06	19.86	21.67	22.57	23.47
27	18.75	20.63	22.50	23.44	24.38
28	19.44	21.39	23.33	24.31	25.28
29	20.14	22.15	24.17	25.17	26.18
30	20.83	22.92	25.00	26.04	27.08
31	21.53	23.68	25.83	26.91	27.99
32	22.22	24.44	26.67	27.78	28.89
33	22.92	25.21	27.50	28.65	29.79
34	23.61	25.97	28.33	29.51	30.69
35	24.31	26.74	29.17	30.38	31.60
36	25.00	27.50	30.00	31.25	32.50
37	25.69	28.26	30.83	32.12	33.40
38	26.39	29.03	31.67	32.99	34.31
39	27.08	29.79	32.50	33.85	35.21
40	27.78	30.56	33.33	34.72	36.11
41	28.47	31.32	34.17	35.59	37.01
42	29.17	32.08	35.00	36.46	37.92
43	29.86	32.85	35.83	37.33	38.82
44	30.56	33.61	36.67	38.19	39.72
45	31.25	34.38	37.50	39.06	40.63
46	31.94	35.14	38.33	39.93	41.53
47	32.64	35.90	39.17	40.80	42.43
48	33.33	36.67	40.00	41.67	43.33
49	34.03	37.43	40.83	42.53	44.24
50	34.72	38.19	41.67	43.40	45.14

Note that the Prism Loads are calculated based upon the Marston Theory of Loads, developed by Professor Anson Marston, circa 1913, and is calculated using the formula:

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

This formula determines the earth load on a flexible pipe and is regarded as a conservative approach to determining the dead load placed upon a buried flexible pipe.

At maximum burial depth of 23.33 feet, prism load = 21.06 psi

BUCKLING PRESSURE (ALLOWABLE)

Where:	q_a	=	Allowable buckling pressure (psi)	
	h	=	Height of soil above top of pipe (in) =	279.96 in
	H	=	Depth of burial, feet, from ground surface to top 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, per linear inch of pipe (in^3)	
	t	=	Pipe wall thickness (in)	
	D	=	Mean Pipe Diameter (in) D =	12.260 in

Solving for the Empirical coefficient of elastic support, given by Luscher in 1966, as referenced on Pg 113 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill:

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2} \qquad I = \left(\frac{t^3}{12}\right) = \left(\frac{inches^3}{in_{linear}}\right) =$$

$$B' = \frac{327240}{491085} = 0.666 \qquad I = \frac{0.11765}{12} = 0.0098$$

Using the Allowable Buckling Pressure Equation as shown in Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pg 112, and an initial factor of safety (SF) of 2.5, the Allowable Buckling Pressure is then:

$$q_a = \frac{1}{FS} * \sqrt{32 * R_w * B' * E_b * \left(E * \frac{I}{D^3}\right)}$$

Where,

$$R_W = 1 - 0.33(h_w / h)$$

$$q_a = \frac{1}{2.5}\sqrt{\left[\ 32\ \right]\left[\ 1\ \right]\left[\ 0.666\ \right]\left[\ 1000\ \right]\left[400000\ \frac{0.0098}{1842.77}\right]}$$

$$q_a = \mathbf{85.21}\ \mathbf{psi}$$

BUCKLING PRESSURE (INSTALLED CONDITION)

Where:	q_P	=	Pressure applied to pipe under installed conditions (psi)		
	γ_W	=	Specific Weight of Water = 0.0361 (pci)		
	γ_S	=	Specific Weight of Soil (pcf)		
	W_c	=	Vertical Soil Load on the pipe per unit length (lb/in)		
	L_L	=	Live load as determined from chart		
	hw	=	Height of Groundwater above pipe, typically = 0		
	D	=	Mean Pipe Diameter (in)	D =	12.260 in
	t	=	Pipe Wall Thickness (in)	t =	0.49 in

The Vertical Soil Load can be calculated using Equation 6.6 of Uni-Bell's Handbook of PVC Pipe , Ch VI Superimposed Loads on Buried Pipe, Pg 183

$$W_c = H \times \gamma_s \times (D + t)$$

Where: γ_S = 130 Value taken from:

$$W_C = \left[\ 23.33\ \right]\left[\ 12\ \text{in/ft}\ \right]\left[\ 130.00\ \right]\left[\frac{1\ \text{ft}^3}{1728\ \text{in}^3}\right]\left[\ 12.75\ \right]$$

W_C = 268.54 lb/in

At Max Pipe Depth (H) of 23.33 ft

Using the Equation on Pg 114 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pressure Applied to Pipe under installed conditions at its deepest installed depth (Note, since hw = 0, the Water Buoyancy Factor (Rw) = 1) is calculated to be:

$$q_p = \gamma_w h_w + R_w\left(\frac{W_c}{D+t}\right) + L_L \quad \text{and } L_L = \quad 0 \qquad R_W = 1 - 0.33(h_w / h)$$

$$q_P = \quad 0.0361 \times 0 + 1 \times \left[\frac{268.54}{12.750}\right]$$

$$\boldsymbol{q_P = \quad 21.06 \quad \text{psi}}$$

Note: The pressure applied to the pipe under installed conditions is less than the Allowable Buckling Pressure of the specified pipe, (i.e.. $q_a > q_p$) therefore the design is acceptable for installation.

WALL CRUSHING CALCULATION

Where:	D_o	=	outside pipe diameter, in. =	12.75 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, $in.^2/ft$ =	0.49 $in.^2/ft$
	γ_S	=	specific weight of soil, pcf, =	130 pcf
	H	=	Depth of burial (ft) from ground surface to crown of pipe	

Using the Wall Crushing and Wall Thrust equations, as referenced in Plastic Pipe Design Manual published by Vylon Pipe, Pg 14 the Wall Crushing due to compressive stress can be found using the following:

$$P_c = \frac{T}{A} \quad \text{where T, Thrust, is calculated as} \quad T = \frac{P_y D}{2}$$

Substituting the Thrust equation into the Wall Crushing equation:

$$P_c = \frac{\frac{P_y D}{2}}{A} = \frac{P_y D}{2A}$$

From the Marston Equation determining the Prism Load Calculation (See previous section on Prism Load), substitute the equation for P_y:

$$P_c = \frac{\frac{\gamma_s * H}{144} D}{2A} \quad \text{Rearranging this equation, it becomes:} \quad 2AP_c = \frac{\gamma_s * H}{144} D$$

And simplifies to: $288AP_c = \gamma_s HD$

Note that the Surface Area of the Pipe Wall, A, is per unit length in $inches^2$ per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24AP_c = \gamma_s HD$$

Solving for H, the equation becomes:

$$H = \frac{24 * P_c * A}{\gamma_s * D_o}$$

(Continued on next page)

Using this equation, and converting all units, solve for “height” of the soil column, or in other words, the depth of burial of the PVC pipe:

$$H = \frac{\left[24 \right] \left[4000 \right] \left[0.49 \right]}{130 \times 12.75} = \mathbf{28.38}$$

H = 28.38 feet

Note: The resulting Wall Crushing will occur at a greater depth than the deepest burial depth of the proposed SCS lines, therefore pipe design is acceptable.

DEFLECTION ANALYSIS: LEONHARDT'S ZETA FACTOR

The Leonhardt's Zeta Factor Equation can be calculated using Equation 7.32 of Uni-Bell's Handbook of PVC Pipe , Ch VII Design of Buried PVC Pipe, Pg 268

Where: Do = Pipe Outer Diameter, in = 12.750
B = Trench Width, in, = 36.75 in
E_b = Modulus of soil reaction, bedding material (psi) = 1000
E_n = Modulus of soil reaction for the in-situ soil (psi) = 3000

$$zeta = \frac{1.44}{f + [1.44 - f] \times \left[\frac{E_b}{E'_n}\right]}$$

where,

$$f = \frac{\frac{B}{Do} - 1}{1.154 + 0.444\left[\frac{B}{Do} - 1\right]}$$

$$f = \frac{1.882353}{1.987765} = 0.94697$$

Substituting f into the zeta equation:

$$zeta = \frac{1.44}{[0.947] + [0.493] \times [0.333]}$$

The Leonhardt Zeta factor is then determined as: **1.296**

PIPE STIFFNESS (Figure: 30 TAC §217.53(k)(3))

Using Equation B.1, as directed in 30 TAC §217.53(k)(3), to Calculate the Pipe Stiffness:

$$PS = C \times RSC \times \left(\frac{8.337}{D} \right)$$

Where:	PS	=	Pipe Stiffness, for SDR-26 PVC (psi) =	115	psi
	C	=	Conversion factor = 0.8		
	RSC	=	Ring Stiffness Constant		
	D	=	Mean Pipe Diameter (in), D =	12.260	in

The RSC can be supplied by the manufacturer or calculated by rearranging Equation B.1

$$RSC = \frac{PS}{C \times \left(\frac{8.337}{D} \right)}$$

$$RSC = \frac{115}{0.544013}$$

$$RSC = 211.392$$

PREDICTED PIPE DEFLECTION

Using the Modified Iowa Equation, referenced and published by the Uni-Bell PVC Pipe association and found at http://www.uni-bell.org/faq.html, and Equation 14 of Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association Pgs 17, the predicted pipe deflection can be calculated.

Where:	%ΔY/D	=	Predicted % vertical deflection under load		
	P	=	Prism Load, psi		
	K	=	Bedding angle constant, Assumed to =	0.096	
	W'	=	Live Load, psi, = 0	At max depth (ft) :	23.33
	DR	=	Dimension Ratio= 26		
	E	=	Modulus of tensile elasticity of the pipe material, psi		
	E'	=	Modulus of Soil Reaction (zeta x Eb) =	1295.76	
	D_L	=	Deflection Lag Factor = 1.5		

And using the Modified Iowa Equation:

$$(\%)\frac{\Delta Y}{D} = \frac{(D_L KP + KW')\times 100}{[2E/(3(DR-1)^3)] + 0.061E'}$$

Where, Prism Load, $P = \frac{\gamma_s * H}{144}$

and/or from previous chart, prism load = 21.06 psi

The Predicted Deflection is determined as:

$$(\%)\frac{\Delta Y}{D} = \frac{\left[\left[1.5 \times 2.022\right] + 0\right] \times 100}{\left[\frac{800000}{46875}\right] + \left[0.061 \times 1295.76\right]} = \mathbf{3.16}\ \%$$

NOTE: **3.16 < 5%,** therefore pipe design is acceptable

A deflection lag factor of 1.0 is typical for new pipes. Over the life of the pipe, the pipe will tend to deflect. Therefore, 1.5 is a conservative factor for the 50 year life.

PIPE STRAIN

Pipe strain is also known as the elongation of the pipe over the original length of the pipe. Under normal loading conditions of the PVC pipe, the variable that affects the elongation or straining of the pipe stems from the either the flexure or deflection (i.e.. bending) of the pipe within the bedding material (i.e. increased or excessive pipe deflection causing the pipe to elongate) or hoop stress within the pipe wall. Please note that pipe strain is not generally known to be the limiting performance factor during pipe failure. For this system, pipe deflection is limited to 5% for a SDR 26 pipe. This 5% deflection value is the industry accepted value placing the pipe within its straining limits. Therefore, as the calculated deflection above is shown to be less than 5%, the pipe and bedding class used in this system is within the acceptable straining limits for this pipe.

However, total Pipe strain is calculated as the combination of the before mentioned hoop stress and the maximum strain due to deflection. Both items are calculated below using Equations 15 and 16 found in Deflection: the Pipe/Soil Mechanism, UNI-TR-1-97, Published by the Uni-Bell PVC Pipe Association (Pgs 28-30):

Where:	$\in_h$	=	Maximum Pipe Strain due to Hoop Stress, in/in	
	P	=	Pressure on the pipe (Live + Prism Loads), psi	
	E	=	Modulus of Elasticity of the Pipe, psi	
	t	=	Pipe Wall thickness (in) =	0.49
	D	=	Pipe Diameter, Outer (in) =	12.750

$$\in_h = \frac{PD}{2tE}$$

Using the maximum cover for both live loads and prism loads as well as the previous unit weight of the soil:

$$\in_h = \frac{[\ 0.00\ +\ 21.06\ ] \times 12.750}{2\ \times\ 0.49\ \times\ 400{,}000} = \textbf{6.850E-04}\ \frac{\text{in}}{\text{in}}$$

(*Continued on following page)*

Where:	$\in_f$	=	Maximum Pipe Strain due to Ring Deflection, in/in	
	ΔY	=	Change in vertical pipe diameter under load, in, (numerator in the deflection equation, but in decimal form)	
	t	=	Pipe Wall thickness (in) =	0.49
	D	=	Pipe Diameter, Outer (in) =	12.750
	DR	=	Dimension Ratio, PVC Pipe=	26

$$\in_f = \frac{t}{D}\left[\frac{3\Delta Y / D}{1 - 2\Delta Y / D}\right] = \frac{1}{DR}\left[\frac{3\Delta Y}{D - 2\Delta Y}\right]$$

$$\in_f = \frac{0.490}{12.750} \times \frac{909.792}{12.750 - 606.528} \quad = \quad -0.05888 \frac{\text{in}}{\text{in}}$$

$$\in_{total} = \quad \mathbf{-0.0582} \quad \frac{\text{in}}{\text{in}}$$

TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

These notes are provided in the Construction Documents on **the water detail sheet

a. Pipe Embedment
   1. A rigid pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are A, B, or C, as described in American Society for Testing and Materials (ASTM) C 12, American National Standards Institute (ANSI) A 106.2,Water Environment Federation Manual of Practice No. 9 or American Society of Civil Engineers (ASCE) MOP 37.
   2. A flexible pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are IA, IB, II, or III, as described in ASTM D-2321 or ANSI K65.171.
   3. Debris, large clods, or stones that are greater than six inches in diameter, organic matter, or other unstable materials are prohibited as bedding, haunching, or initial backfill.
   4. Backfill must not disturb the alignment of a collection system pipe.
   5. If trenching encounters significant fracture, fault zones, caves, or solutional modification to the rock strata, an owner must halt construction until an engineer prepares a written report detailing how construction will accommodate these site conditions.

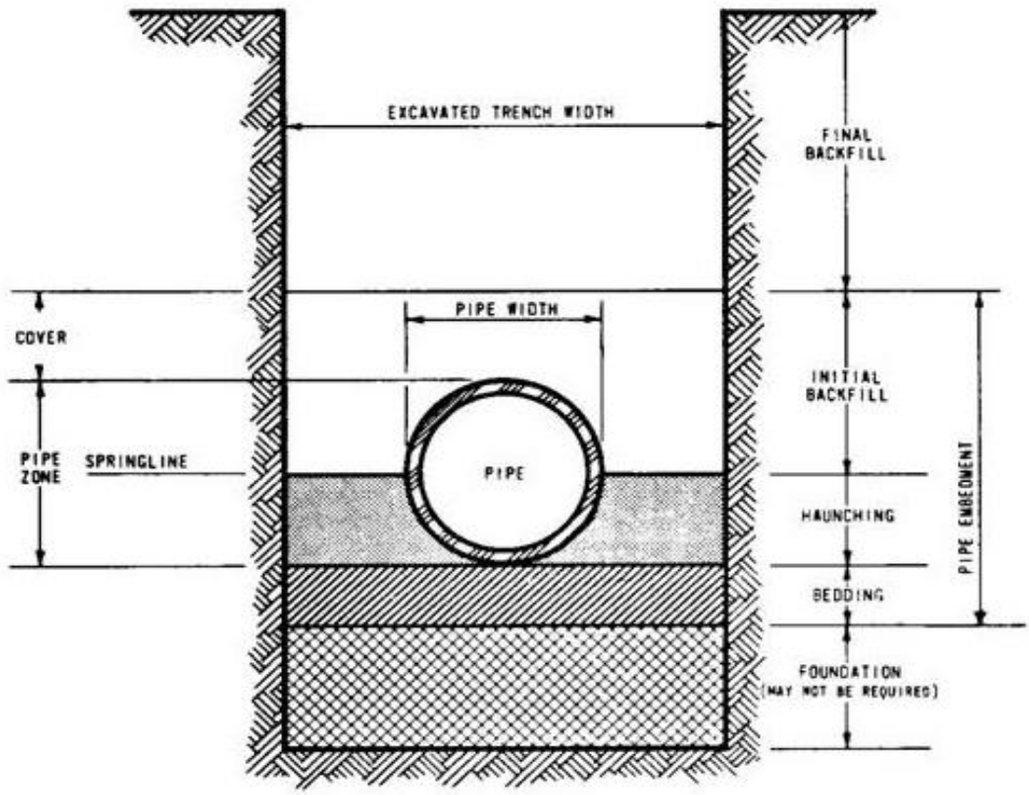
b. Compaction.
   1. Compaction of an embedment envelope must meet the manufacturer's recommendations for the collection system pipe used in a project.
   2. Compaction of an embedment envelope must provide the modulus of soil reaction for the bedding material necessary to ensure a wastewater collection system pipe's structural integrity as required by §217.53 of this title (relating to Pipe Design).
   3. The placement of the backfill above a pipe must not affect the structural integrity of a pipe.

c. Envelope Size.
   1. A minimum clearance of 6.0 inches below and on each side of the bell of all pipes to the trench walls and floor is required.
   2. The embedment material used for haunching and initial backfill must be installed to a minimum depth of 12 inches above the crown of a pipe.

d. Trench Width.

1. The width of a trench must allow a pipe to be laid and jointed properly and must allow the backfill to be placed and compacted as needed.
2. The maximum and minimum trench width needed for safety and a pipe's structural integrity must be included in the report.
3. The width of a trench must be sufficient to properly and safely place and compact haunching materials.
4. The space between a pipe and a trench wall must be wider than the compaction equipment used in the pipe zone.

TRENCH CROSS-SECTION (30 TAC 217.54)



NOTE:

Trenching Details along with 30 TAC 217.54 are annotated in the Construction Documents/Plan Sheets on the water detail sheet

MANHOLE SPECIFICATIONS

30 TAC 217.55 Requirements with design comments:

a. An owner must include manholes in a wastewater collection system at:
   1. All points of change in alignment, grade, or size;
   2. At the intersection of all pipes; and
   3. At the end of all pipes that may be extended at a future date.

b. Manholes placed at the end of a wastewater collection system pipe that may be extended in the future must include pipe stub outs with plugs.

c. A clean-out with watertight plugs may be installed in lieu of a manhole at the end of a wastewater collection system pipe if no extensions are anticipated. **(Clean outs not used in-lieu of manholes)**

d. Cleanout installations must pass all applicable testing requirements outlined for gravity collection pipes in §217.57 of this title (relating to Testing Requirements for Installation of Gravity Collection System Pipes). **(Clean outs not used in lieu of manholes)**

e. A manhole must be made of monolithic, cast-in-place concrete, fiberglass, pre-cast concrete, high-density polyethylene, or equivalent material that provides adequate structural integrity. (**See the Pre-Cast Manhole Details following these construction notes)**

f. The use of bricks to adjust a manhole cover to grade or construct a manhole is prohibited. **(Not Applicable)**

g. Manholes may be spaced no further apart than the distances specified in the following table for a wastewater collection system with straight alignment and uniform grades, unless a variance based on the availability of cleaning equipment that is capable of servicing greater distances is granted by the executive director. **(Manholes are spaced no greater than 500 L.F.)**

Table C.2. - Maximum Manhole Spacing

Pipe Diameter	Maximum Manhole
6-15	500
18-30	800
36-48	1000
54 or larger	2000

h. Tunnels are exempt from manhole spacing requirements because of construction constraints. **(Not applicable)**

i. An intersection of three or more collection pipes must have a manhole. **(Maintained throughout the design of the SCS)**

j. A manhole must not be located in the flow path of a watercourse, or in an area where ponding of surface water is probable. **(Maintained throughout the design of the SCS)**

k. The inside diameter of a manhole must be no less than 48 inches. A manhole diameter must be sufficient to allow personnel and equipment to enter, exit, and work in the manhole and to allow proper joining of the collection system pipes in the manhole wall. **(See Manhole Details following these notes)**

l. Manholes must meet the following requirements for covers, inlets, and bases.

1. Manhole Covers

A. A manhole where personnel entry is anticipated requires at least a 30 inch diameter clear opening. (**Covers to have 32" Openings per NBU Specifications on WW Detail Sheet)**

B. A manhole located within a 100-year flood plain must have a means of preventing inflow. **(Water tight manhole ring & cover detail is shown on WW Detail Sheet)**

C. A manhole cover construction must be constructed of impervious material. **(See WW Detail Sheet)**

D. 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. **(See Manhole Details following these construction notes)**

2. Manhole Inverts

A. The bottom of a manhole must contain a U-shaped channel that is a smooth continuation of the inlet and outlet pipes. **(See WW Detail Sheet)**

B. 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 **(Applicable)**

C. A manhole connected to a pipe at least 15 inches in diameter but not more than 24 inches in diameter must have a channel depth equal to at least three-fourths of the largest pipe's diameter **(Not Applicable)**

D. A manhole connected to a pipe greater than 24 inches in diameter must have a channel depth equal to at least the largest pipe's diameter **(Not applicable for this project)**.

E. A manhole with pipes of different sizes must have the tops of the pipes at the same elevation and flow channels in the invert sloped on an even slope from pipe to pipe. **(Not applicable for this project)**

F. A bench provided above a channel must slope at a minimum of 0.5 inch per foot. **(Self Explanatory)**

G. An invert must be filleted to prevent solids from being deposited if a wastewater collection system pipe enters a manhole higher than 24 inches above a manhole invert. **(See WW Detail Sheet)**

H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. **(Not Applicable)**

m. The inclusion of steps in a manhole is prohibited.

n. Connections. A manhole-pipe connection must use watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. **(See WW Detail Sheets)**

o. Venting. An owner must use an alternate means of venting if manholes are at more than 1,500 foot intervals and gasketed manhole covers are required for more than three manholes in sequence. Vents must meet the following requirements: **(Not Applicable)**

1. Vent design must minimize inflow;
2. Vents must be located above a 100-year flood event elevation; and
3. Tunnels must be vented in compliance with this subsection.

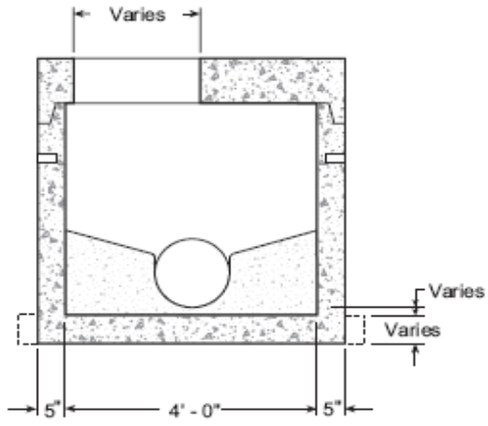
p. Cleanouts. The size of a cleanout must be equal to the size of the wastewater collection system main. **(Not applicable to this project)**

Precast Manhole Information:

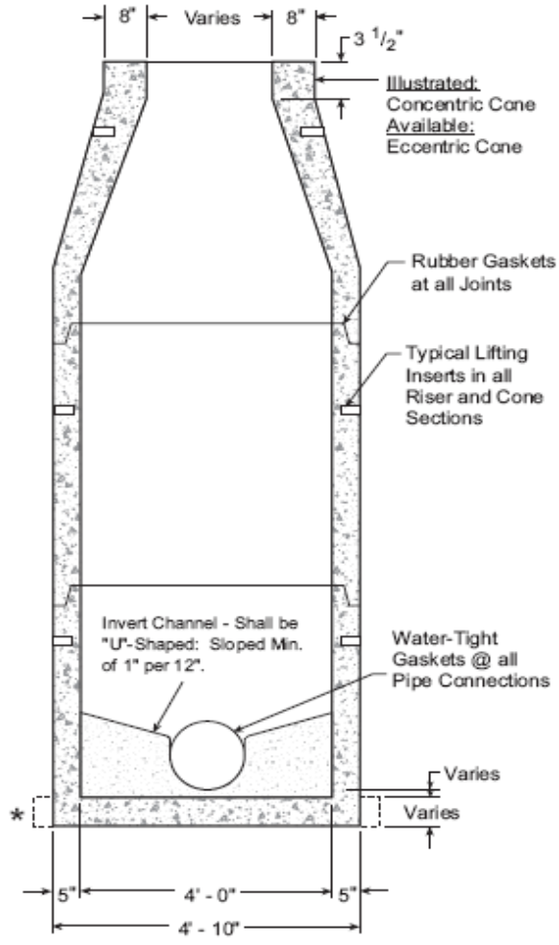
Hanson Pipe and Precast
Hanson Building Products West
300 E John Carpenter Freeway
11th floor
Irving, TX 75062
972.653.5500

San Antonio Metro Area Contact:
210.661.2351
866.426.7661

Precast Manholes



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 weiight of riser and cone sections = 870 lbs. / vt. ft.

* - Extended base is available to meet local requirements.

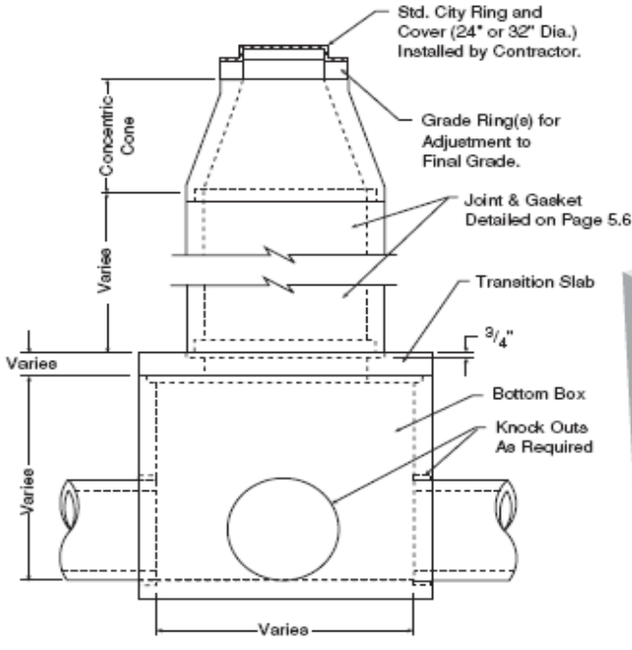
In the event a boot is loose contact your Hanson representative to resolve.

"Manufactured to your specifications."

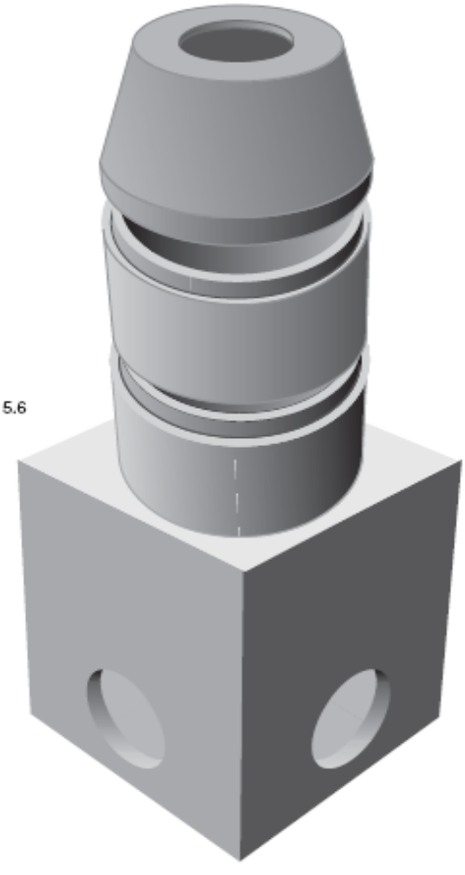
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
4' I.D. Manhole **Regular Base w / Reducing Cone**	All Plants	TX	5.5	07-01-06	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

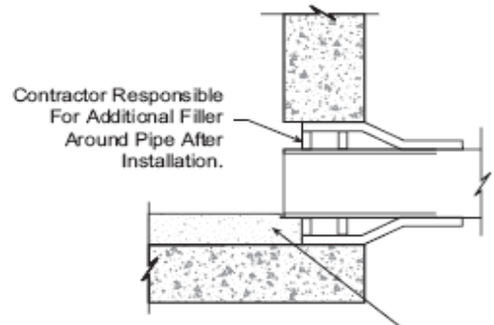
In the event a boot is loose contact your Hanson representative to resolve.

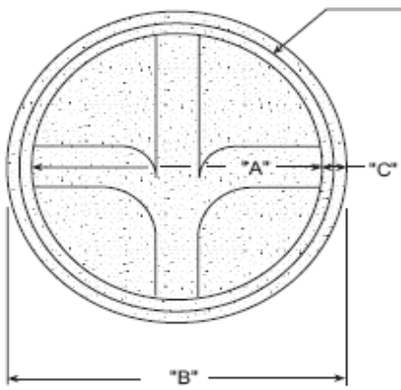
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
Type "C" Manhole	Houston San Antonio	TX	5.11	07-01-06	Hanson

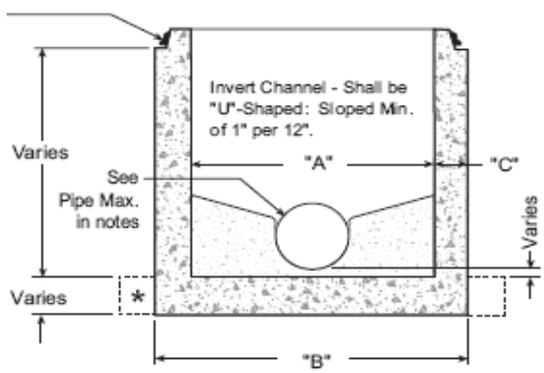
Precast Manholes

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

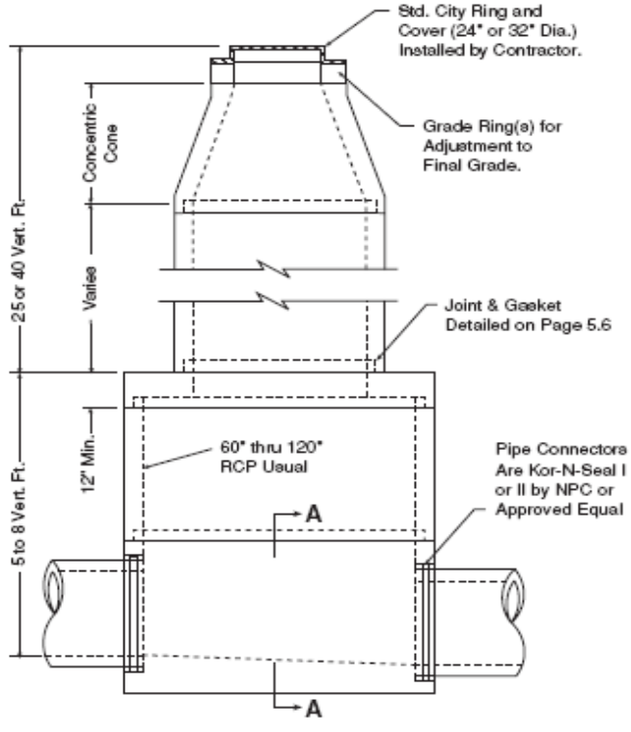
HOLES AS SPECIFIED:
- For 4' I.D. max. diameter = 32"
- For 5' I.D. max. diameter = 40"
- For 6' I.D. max. diameter = 54"

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.

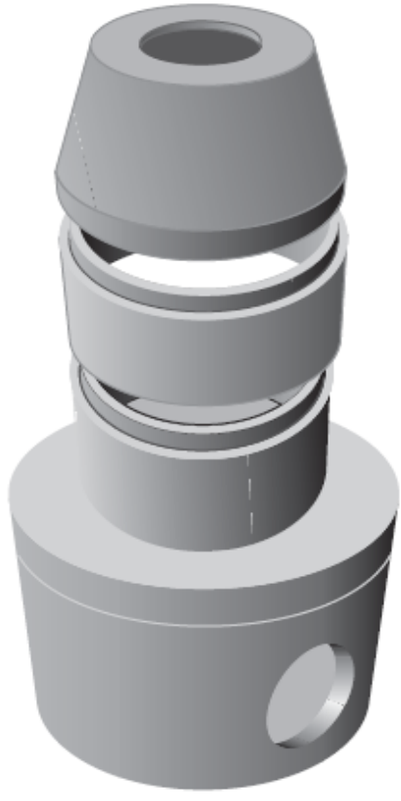
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
Details: 4', 5' & 6' I.D. Precast Regular Manhole Base	All Plants	TX	5.7	07-01-06	Hanson

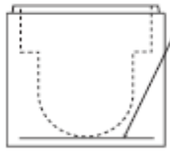
Precast Manholes



w/ Precast Base



Isometric View



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.

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	07-01-06	Hanson

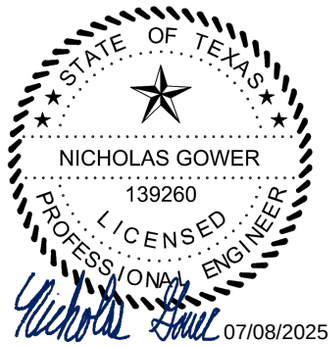
TCEQ Engineering Design Report

(PEPP-SA EDR v4.0)

For

VERAMENDI PRECINCT 23-1

Organized Sewage Collection System Modification



July 2025

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PVC PIPE STANDARDS

The American Society for Testing and Materials (ASTM) also known as ASTM International (Reference: www.astm.org) governs the manufacturing specifications for Polyvinyl Chloride (PVC) pipes, including the dimension ratio and water pressure allowable for use of each pipe, through its D-2241 standard. ASTM D-2241 lists its pipe dimensions and pipe classes using the "SDR" mark up, such as SDR-13.5, SDR-21, SDR-26 and SDR-41. The SDR refers to the standard dimension ratio (SDR) of the outside pipe diameter and the wall thickness. This project specifies the use of SDR-26 PVC pipe, which are to meet the ASTM pressure rating of greater than 150 psi and fall in the size category listed below. ASTM D-2241 standards must be meticulously adhered to by all PVC pipe manufacturers and is recognized as the standard during PVC pressure pipe testing and quality checks. Other in-depth information can be found published in Thermoplastic Pressure Pipe Design and Selection UNI-TR-7, by the Uni-Bell PVC Pipe Association.

SDR 26 Pipe Size Matrix **(Per ASTM D-2241)**			
Size (in)	**O.D. (in)**	**Calc I.D. (in)**	**Thickness (in)**
4	4.5	4.154	0.173
6	6.625	6.115	0.255
8	8.625	7.961	0.332
10	10.75	9.924	0.413
12	12.75	11.77	0.49
16	16	14.77	0.615

PROPOSED TYPE OF PIPE

Type I, Grade I, Polyvinyl Chloride (PVC) Specifications:
Size of Pipe: 8.00 in.

SDR 26 Properties

Pipe Compliance:	ASTM D-2241
Joint Compliance:	ASTM D-3139
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Calculated Inner Diameter (in) = (Outer Diameter - 2t)	7.961
Outer Diameter (inch):	8.625
Wall Thickness (inch):	0.332
Mean Pipe Diameter (in) = (Outer Diameter - Thickness)	8.293
Approximate Trenching Width (feet):	2.72
Minimum Pipe Depth (Cover) used (feet):	**7.00**
Maximum Pipe Depth (Cover) used (feet):	**23.33**

FLOW/CAPACITY ANALYSIS

Proposed Waste Water Usage: **21,630.00 GPD**

Q_{max} (As determined in Attachment A) = 0.033 CFS

$$Q_{full} = \frac{1.486}{n} \times A \times R^{\frac{2}{3}} \times \sqrt{S}$$

A = Cross-Sectional Area, (ft2)	=	0.346
S = Slope, decimal, minimum used	=	0.003
R_h = hydraulic radius	=	0.166

For the Specified Pipe at the Minimum Design Slope, the full flow is

Q_{full} = 0.695 CFS

0.033 < 0.695
Design meets TCEQ Guidelines

MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(l)(2)(A))

Minimum and Maximum Pipe Slopes		
Size of Pipe	Minimum Slope (%)	Maximum Slope (%)
6	0.5	12.35
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
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 pipes larger than 39 inches in diameter, the slope is determined by Manning's formula to maintain a velocity greater than **2.0 feet per second and less than 10.0 feet per second** when flowing full.		

MINIMUM AND MAXIMUM VELOCITY FOR THE PROPOSED SYSTEM:

So, using 8.00 inch PVC Pipe:

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

V = velocity (ft/sec)	=	(solve)
n = Manning's coefficient	=	0.013
Calc. Inner Diameter (in)	=	7.961
A = Cross-Sectional Area, ft^2	=	0.346
Wp = Wetted Perimeter, ft	=	2.084
R_h = hydraulic radius, A/Wp	=	0.166
S = slope (ft/ft)	=	0.003

Minimum Slope Used (%): **0.34**

V_{min} = 2.02 ft/sec

2.02 **>** **2.00** ft/sec

Design meets TCEQ Guidelines

Maximum Slope Used (%): **5.20**

V_{max} = 7.89 ft/sec

7.89 **<** **10.00** ft/sec

Design meets TCEQ Guidelines

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

Soil type-pipe bedding material (Unified Classification System)	E' for Degree of Compaction of Bedding, in pounds per square inch			
	Dumped	Slight <85% Proctor, <40% relative density	Moderate 85%-95% Proctor, 40%-70% relative density	High, >95% Proctor, >70% relative density
(1)	(2)	(3)	(4)	(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	1000
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with more than 25% coarse-grained particles	100	400	1000	2000
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	1000	2000	3000
Crushed Rock	1000	3000	3000	3000
Accuracy in Terms of Percentage Deflection	± 2	± 2	± 1	± 0.5

Taken from: Howard, Amster K. "Soil Reaction for Buried Flexible Pipe"
U.S. Bureau of Reclamation, Denver, CO and the American Society of Civil Engineers.

Modulus of Soil Reaction for the in-situ soil is determined to be = 3000 psi

PIPE BEDDING CLASS

Taken from the American Society for Testing and Material (ASTM) D 2321 and American Association of State Highway and Transportation Officials (AASHTO) M43, and as published on Table 7, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

Pipe Embedment Material						E', psi (kPa) for Degree of Embedment Compaction				
ASTM D 2321*		ASTM D 2487		AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
Class	Description	Notation	Description							
IA	Open-graded, clean manufactured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
IB	Dense-graded, clean manufactured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures; little or no fines							
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel/sand mixtures; little or no fines	57 6 67	85%	12" (0.30 m)	N/R	1000 (6,900)	2000 (13,800)	3000 (20,700)
		GP	Poorly graded gravel, gravel/sand mixtures; little or no fines							
		SW	Well-graded sands, gravelly sands; little or no fines							
		SP	Poorly graded sands, gravelly sands; little or no fines							
III	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	90%	9" (0.20 m)	N/R	N/R	1000 (6,900)	2000 (13,800)
		GC	Clayey gravels, gravel/sand/clay mixtures							
		SM	Silty sands, sand/silt mixtures							
		SC	Clayey sands, sand/clay mixtures							

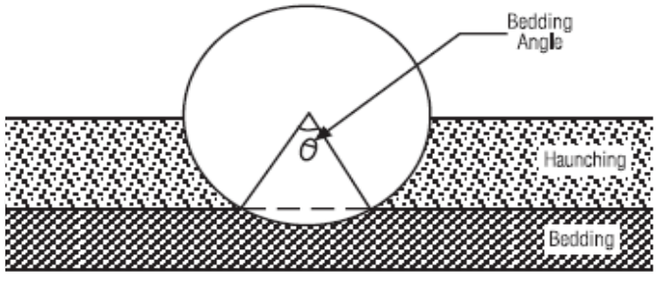
NOTE:

Per TCEQ guidelines, a contractor is allowed to use ASTM D 2321 Bedding Class 1A, 1B, II, or III at no less than 85% percent compaction. To grant the contractor its ability to make the proper judgment of which bedding class to use, the calculations provided in this Engineering Design Report reflect the use of **Bedding Class III, at 85%-95%** compaction, with an E' value of 1000 psi. This provides the "worst case" scenario for the SCS line. All other Bedding Class options will provide an improved value for the zeta factor as well as pipe deflection.

For Bedding Class III, 85%-95% Compaction, E_b **= 1000 psi**

PIPE BEDDING ANGLE

As Published on Figure 8 and Table 5, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pgs 18-19.



Bedding Constant Values

Bedding Angle, degrees	Bedding Constant
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083

LIVE LOAD DETERMINATION

Source: AASHTO H20 and E80 Loads and as Published on Table 4, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 14.

Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²			Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²		
	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 + impact
[2] Simulates 80,000 lb/ft railway load + impact
[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

PRISM LOAD DETERMINATION

Also referred to as the 'dead' load, the prism load is the pressure acting on the pipe by the weight of the soil column above a given section of the pipe. The following prism load columns are industry standards as referenced from Table 3, Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 13.

Table 3
Prism Load Soil Pressure (lbs/in²)

Height of Cover (ft)	Soil Unit Weight (lb/ft³)				
	100	110	120	125	130
1	0.69	0.76	0.83	0.87	0.90
2	1.39	1.53	1.67	1.74	1.81
3	2.08	2.29	2.50	2.60	2.71
4	2.78	3.06	3.33	3.47	3.61
5	3.47	3.82	4.17	4.34	4.51
6	4.17	4.58	5.00	5.21	5.42
7	4.86	5.35	5.83	6.08	6.32
8	5.56	6.11	6.67	6.94	7.22
9	6.25	6.88	7.50	7.81	8.13
10	6.94	7.64	8.33	8.68	9.03
11	7.64	8.40	9.17	9.55	9.93
12	8.33	9.17	10.00	10.42	10.83
13	9.03	9.93	10.83	11.28	11.74
14	9.72	10.69	11.67	12.15	12.64
15	10.42	11.46	12.50	13.02	13.54
16	11.11	12.22	13.33	13.89	14.44
17	11.81	12.99	14.17	14.76	15.35
18	12.50	13.75	15.00	15.63	16.25
19	13.19	14.51	15.83	16.49	17.15
20	13.89	15.28	16.67	17.36	18.06
21	14.58	16.04	17.50	18.23	18.96
22	15.28	16.81	18.33	19.10	19.86
23	15.97	17.57	19.17	19.97	20.76
24	16.67	18.33	20.00	20.83	21.67
25	17.36	19.10	20.83	21.70	22.57
26	18.06	19.86	21.67	22.57	23.47
27	18.75	20.63	22.50	23.44	24.38
28	19.44	21.39	23.33	24.31	25.28
29	20.14	22.15	24.17	25.17	26.18
30	20.83	22.92	25.00	26.04	27.08
31	21.53	23.68	25.83	26.91	27.99
32	22.22	24.44	26.67	27.78	28.89
33	22.92	25.21	27.50	28.65	29.79
34	23.61	25.97	28.33	29.51	30.69
35	24.31	26.74	29.17	30.38	31.60
36	25.00	27.50	30.00	31.25	32.50
37	25.69	28.26	30.83	32.12	33.40
38	26.39	29.03	31.67	32.99	34.31
39	27.08	29.79	32.50	33.85	35.21
40	27.78	30.56	33.33	34.72	36.11
41	28.47	31.32	34.17	35.59	37.01
42	29.17	32.08	35.00	36.46	37.92
43	29.86	32.85	35.83	37.33	38.82
44	30.56	33.61	36.67	38.19	39.72
45	31.25	34.38	37.50	39.06	40.63
46	31.94	35.14	38.33	39.93	41.53
47	32.64	35.90	39.17	40.80	42.43
48	33.33	36.67	40.00	41.67	43.33
49	34.03	37.43	40.83	42.53	44.24
50	34.72	38.19	41.67	43.40	45.14

Note that the Prism Loads are calculated based upon the Marston Theory of Loads, developed by Professor Anson Marston, circa 1913, and is calculated using the formula:

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

This formula determines the earth load on a flexible pipe and is regarded as a conservative approach to determining the dead load placed upon a buried flexible pipe.

At maximum burial depth of 23.33 feet, prism load = 21.06 psi

BUCKLING PRESSURE (ALLOWABLE)

Where:	q_a	=	Allowable buckling pressure (psi)	
	h	=	Height of soil above top of pipe (in) =	279.96 in
	H	=	Depth of burial, feet, from ground surface to top 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, per linear inch of pipe (in^3)	
	t	=	Pipe wall thickness (in)	
	D	=	Mean Pipe Diameter (in) D =	8.293 in

Solving for the Empirical coefficient of elastic support, given by Luscher in 1966, as referenced on Pg 113 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill:

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2} \qquad I = \left(\frac{t^3}{12}\right) = \left(\frac{inches^3}{in_{linear}}\right) =$$

$$B' = \frac{322797}{484299} = 0.667 \qquad I = \frac{0.03659}{12} = 0.0030$$

Using the Allowable Buckling Pressure Equation as shown in Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pg 112, and an initial factor of safety (SF) of 2.5, the Allowable Buckling Pressure is then:

$$q_a = \frac{1}{FS} * \sqrt{32 * R_w * B' * E_b * \left(E * \frac{I}{D^3}\right)}$$

Where,

$$R_W = 1 - 0.33(h_w / h)$$

$$q_a = \frac{1}{2.5}\sqrt{\left[\ 32\ \right]\left[\ 1\ \right]\left[\ 0.667\ \right]\left[\ 1000\ \right]\left[400000\ \frac{0.0030}{570.34}\right]}$$

$$q_a = \mathbf{85.43}\ \mathbf{psi}$$

BUCKLING PRESSURE (INSTALLED CONDITION)

Where:	q_P	=	Pressure applied to pipe under installed conditions (psi)		
	γ_W	=	Specific Weight of Water = 0.0361 (pci)		
	γ_S	=	Specific Weight of Soil (pcf)		
	W_c	=	Vertical Soil Load on the pipe per unit length (lb/in)		
	L_L	=	Live load as determined from chart		
	hw	=	Height of Groundwater above pipe, typically = 0		
	D	=	Mean Pipe Diameter (in)	D =	8.293 in
	t	=	Pipe Wall Thickness (in)	t =	0.332 in

The Vertical Soil Load can be calculated using Equation 6.6 of Uni-Bell's Handbook of PVC Pipe , Ch VI Superimposed Loads on Buried Pipe, Pg 183

$$W_c = H \times \gamma_s \times (D + t)$$

Where: γ_S = 130 Value taken from:

$$W_C = \left[\ 23.33\ \right]\left[\ 12\ \text{in/ft}\ \right]\left[\ 130.00\ \right]\left[\frac{1\ \text{ft}^3}{1728\ \text{in}^3}\right]\left[\ 8.63\ \right]$$

W_C = 181.66 lb/in

At Max Pipe Depth (H) of 23.33 ft

Using the Equation on Pg 114 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pressure Applied to Pipe under installed conditions at its deepest installed depth (Note, since hw = 0, the Water Buoyancy Factor (Rw) = 1) is calculated to be:

$$q_p = \gamma_w h_w + R_w\left(\frac{W_c}{D+t}\right) + L_L \quad \text{and } L_L = \quad 0 \qquad R_W = 1 - 0.33(h_w / h)$$

$$q_P = \quad 0.0361 \times 0 + 1 \times \left[\frac{181.66}{8.625}\right]$$

$$\boldsymbol{q_P = \quad 21.06 \quad \text{psi}}$$

Note: The pressure applied to the pipe under installed conditions is less than the Allowable Buckling Pressure of the specified pipe, (i.e.. $q_a > q_p$) therefore the design is acceptable for installation.

WALL CRUSHING CALCULATION

Where:	D_o	=	outside pipe diameter, in. =	8.625 in
	P_c	=	Compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer.	
	A	=	surface area of the pipe wall, $in.^2/ft$ =	0.332 $in.^2/ft$
	γ_S	=	specific weight of soil, pcf, =	130 pcf
	H	=	Depth of burial (ft) from ground surface to crown of pipe	

Using the Wall Crushing and Wall Thrust equations, as referenced in Plastic Pipe Design Manual published by Vylon Pipe, Pg 14 the Wall Crushing due to compressive stress can be found using the following:

$$P_c = \frac{T}{A} \quad \text{where T, Thrust, is calculated as} \quad T = \frac{P_y D}{2}$$

Substituting the Thrust equation into the Wall Crushing equation:

$$P_c = \frac{\frac{P_y D}{2}}{A} = \frac{P_y D}{2A}$$

From the Marston Equation determining the Prism Load Calculation (See previous section on Prism Load), substitute the equation for P_y:

$$P_c = \frac{\frac{\gamma_s * H}{144} D}{2A} \quad \text{Rearranging this equation, it becomes:} \quad 2AP_c = \frac{\gamma_s * H}{144} D$$

And simplifies to: $288AP_c = \gamma_s HD$

Note that the Surface Area of the Pipe Wall, A, is per unit length in $inches^2$ per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24AP_c = \gamma_s HD$$

Solving for H, the equation becomes:

$$H = \frac{24 * P_c * A}{\gamma_s * D_o}$$

(Continued on next page)

Using this equation, and converting all units, solve for “height” of the soil column, or in other words, the depth of burial of the PVC pipe:

$$H = \frac{\left[24 \right] \left[4000 \right] \left[0.332 \right]}{130 \times 8.625} = \mathbf{28.43}$$

H = 28.43 feet

Note: The resulting Wall Crushing will occur at a greater depth than the deepest burial depth of the proposed SCS lines, therefore pipe design is acceptable.

DEFLECTION ANALYSIS: LEONHARDT'S ZETA FACTOR

The Leonhardt's Zeta Factor Equation can be calculated using Equation 7.32 of Uni-Bell's Handbook of PVC Pipe , Ch VII Design of Buried PVC Pipe, Pg 268

Where: Do = Pipe Outer Diameter, in = 8.625
B = Trench Width, in, = 32.63 in
E_b = Modulus of soil reaction, bedding material (psi) = 1000
E_n = Modulus of soil reaction for the in-situ soil (psi) = 3000

$$zeta = \frac{1.44}{f + [1.44 - f] \times \left[\frac{E_b}{E'_n}\right]}$$

where,

$$f = \frac{\frac{B}{Do} - 1}{1.154 + 0.444\left[\frac{B}{Do} - 1\right]}$$

$$f = \frac{2.782609}{2.387478} = 1.1655$$

Substituting f into the zeta equation:

$$zeta = \frac{1.44}{[1.166] + [0.274] \times [0.333]}$$

The Leonhardt Zeta factor is then determined as: **1.146**

PIPE STIFFNESS (Figure: 30 TAC §217.53(k)(3))

Using Equation B.1, as directed in 30 TAC §217.53(k)(3), to Calculate the Pipe Stiffness:

$$PS = C \times RSC \times \left(\frac{8.337}{D} \right)$$

Where:	PS	=	Pipe Stiffness, for SDR-26 PVC (psi) =	115	psi
	C	=	Conversion factor = 0.8		
	RSC	=	Ring Stiffness Constant		
	D	=	Mean Pipe Diameter (in), D =	8.293	in

The RSC can be supplied by the manufacturer or calculated by rearranging Equation B.1

$$RSC = \frac{PS}{C \times \left(\frac{8.337}{D} \right)}$$

$$RSC = \frac{115}{0.804245}$$

$$RSC = 142.991$$

PREDICTED PIPE DEFLECTION

Using the Modified Iowa Equation, referenced and published by the Uni-Bell PVC Pipe association and found at http://www.uni-bell.org/faq.html, and Equation 14 of Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association Pgs 17, the predicted pipe deflection can be calculated.

Where:	%ΔY/D	=	Predicted % vertical deflection under load		
	P	=	Prism Load, psi		
	K	=	Bedding angle constant, Assumed to =	0.096	
	W'	=	Live Load, psi, = 0	At max depth (ft) :	23.33
	DR	=	Dimension Ratio= 26		
	E	=	Modulus of tensile elasticity of the pipe material, psi		
	E'	=	Modulus of Soil Reaction (zeta x Eb) =	1145.58	
	D_L	=	Deflection Lag Factor = 1.5		

And using the Modified Iowa Equation:

$$(\%)\frac{\Delta Y}{D} = \frac{(D_L KP + KW')\times 100}{[2E/(3(DR-1)^3)] + 0.061E'}$$

Where, Prism Load, $P = \frac{\gamma_s * H}{144}$

and/or from previous chart, prism load = 21.06 psi

The Predicted Deflection is determined as:

$$(\%)\frac{\Delta Y}{D} = \frac{\left[\left[1.5 \times 2.022\right] + 0\right] \times 100}{\left[\frac{800000}{46875}\right] + \left[0.061 \times 1145.58\right]} = \mathbf{3.49}\ \%$$

NOTE: **3.49 < 5%,** therefore pipe design is acceptable

A deflection lag factor of 1.0 is typical for new pipes. Over the life of the pipe, the pipe will tend to deflect. Therefore, 1.5 is a conservative factor for the 50 year life.

PIPE STRAIN

Pipe strain is also known as the elongation of the pipe over the original length of the pipe. Under normal loading conditions of the PVC pipe, the variable that affects the elongation or straining of the pipe stems from the either the flexure or deflection (i.e.. bending) of the pipe within the bedding material (i.e. increased or excessive pipe deflection causing the pipe to elongate) or hoop stress within the pipe wall. Please note that pipe strain is not generally known to be the limiting performance factor during pipe failure. For this system, pipe deflection is limited to 5% for a SDR 26 pipe. This 5% deflection value is the industry accepted value placing the pipe within its straining limits. Therefore, as the calculated deflection above is shown to be less than 5%, the pipe and bedding class used in this system is within the acceptable straining limits for this pipe.

However, total Pipe strain is calculated as the combination of the before mentioned hoop stress and the maximum strain due to deflection. Both items are calculated below using Equations 15 and 16 found in Deflection: the Pipe/Soil Mechanism, UNI-TR-1-97, Published by the Uni-Bell PVC Pipe Association (Pgs 28-30):

Where:	$\in_h$	=	Maximum Pipe Strain due to Hoop Stress, in/in	
	P	=	Pressure on the pipe (Live + Prism Loads), psi	
	E	=	Modulus of Elasticity of the Pipe, psi	
	t	=	Pipe Wall thickness (in) =	0.332
	D	=	Pipe Diameter, Outer (in) =	8.625

$$\in_h = \frac{PD}{2tE}$$

Using the maximum cover for both live loads and prism loads as well as the previous unit weight of the soil:

$$\in_h = \frac{\left[\ 0.00\ +\ 21.06\ \right] \times\ 8.625}{2\ \times\ 0.332\ \times\ 400{,}000} \quad = \quad \textbf{6.839E-04} \quad \frac{\text{in}}{\text{in}}$$

(*Continued on following page)*

Where:	$\in_f$	=	Maximum Pipe Strain due to Ring Deflection, in/in	
	ΔY	=	Change in vertical pipe diameter under load, in, (numerator in the deflection equation, but in decimal form)	
	t	=	Pipe Wall thickness (in) =	0.332
	D	=	Pipe Diameter, Outer (in) =	8.625
	DR	=	Dimension Ratio, PVC Pipe=	26

$$\in_f = \frac{t}{D}\left[\frac{3\Delta Y / D}{1 - 2\Delta Y / D}\right] = \frac{1}{DR}\left[\frac{3\Delta Y}{D - 2\Delta Y}\right]$$

$$\in_f = \frac{0.332}{8.625} \times \frac{909.792}{8.625 - 606.528} \quad = \quad -0.05857 \frac{\text{in}}{\text{in}}$$

$$\in_{total} = \quad \mathbf{-0.0579} \quad \frac{\text{in}}{\text{in}}$$

TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

These notes are provided in the Construction Documents on **the water detail sheet

a. Pipe Embedment
   1. A rigid pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are A, B, or C, as described in American Society for Testing and Materials (ASTM) C 12, American National Standards Institute (ANSI) A 106.2,Water Environment Federation Manual of Practice No. 9 or American Society of Civil Engineers (ASCE) MOP 37.
   2. A flexible pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are IA, IB, II, or III, as described in ASTM D-2321 or ANSI K65.171.
   3. Debris, large clods, or stones that are greater than six inches in diameter, organic matter, or other unstable materials are prohibited as bedding, haunching, or initial backfill.
   4. Backfill must not disturb the alignment of a collection system pipe.
   5. If trenching encounters significant fracture, fault zones, caves, or solutional modification to the rock strata, an owner must halt construction until an engineer prepares a written report detailing how construction will accommodate these site conditions.

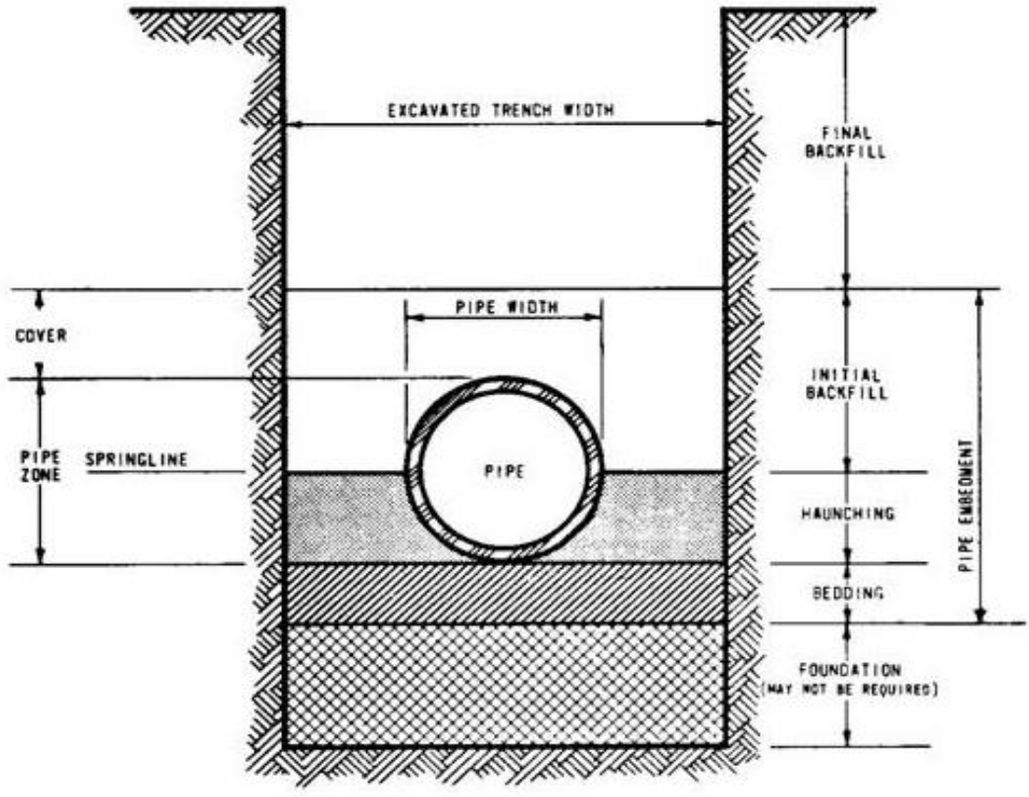
b. Compaction.
   1. Compaction of an embedment envelope must meet the manufacturer's recommendations for the collection system pipe used in a project.
   2. Compaction of an embedment envelope must provide the modulus of soil reaction for the bedding material necessary to ensure a wastewater collection system pipe's structural integrity as required by §217.53 of this title (relating to Pipe Design).
   3. The placement of the backfill above a pipe must not affect the structural integrity of a pipe.

c. Envelope Size.
   1. A minimum clearance of 6.0 inches below and on each side of the bell of all pipes to the trench walls and floor is required.
   2. The embedment material used for haunching and initial backfill must be installed to a minimum depth of 12 inches above the crown of a pipe.

d. Trench Width.

1. The width of a trench must allow a pipe to be laid and jointed properly and must allow the backfill to be placed and compacted as needed.
2. The maximum and minimum trench width needed for safety and a pipe's structural integrity must be included in the report.
3. The width of a trench must be sufficient to properly and safely place and compact haunching materials.
4. The space between a pipe and a trench wall must be wider than the compaction equipment used in the pipe zone.

TRENCH CROSS-SECTION (30 TAC 217.54)



NOTE:

Trenching Details along with 30 TAC 217.54 are annotated in the Construction Documents/Plan Sheets on the water detail sheet

MANHOLE SPECIFICATIONS

30 TAC 217.55 Requirements with design comments:

a. An owner must include manholes in a wastewater collection system at:
   1. All points of change in alignment, grade, or size;
   2. At the intersection of all pipes; and
   3. At the end of all pipes that may be extended at a future date.

b. Manholes placed at the end of a wastewater collection system pipe that may be extended in the future must include pipe stub outs with plugs.

c. A clean-out with watertight plugs may be installed in lieu of a manhole at the end of a wastewater collection system pipe if no extensions are anticipated. **(Clean outs not used in-lieu of manholes)**

d. Cleanout installations must pass all applicable testing requirements outlined for gravity collection pipes in §217.57 of this title (relating to Testing Requirements for Installation of Gravity Collection System Pipes). **(Clean outs not used in lieu of manholes)**

e. A manhole must be made of monolithic, cast-in-place concrete, fiberglass, pre-cast concrete, high-density polyethylene, or equivalent material that provides adequate structural integrity. (**See the Pre-Cast Manhole Details following these construction notes)**

f. The use of bricks to adjust a manhole cover to grade or construct a manhole is prohibited. **(Not Applicable)**

g. Manholes may be spaced no further apart than the distances specified in the following table for a wastewater collection system with straight alignment and uniform grades, unless a variance based on the availability of cleaning equipment that is capable of servicing greater distances is granted by the executive director. **(Manholes are spaced no greater than 500 L.F.)**

Table C.2. - Maximum Manhole Spacing

Pipe Diameter	Maximum Manhole
6-15	500
18-30	800
36-48	1000
54 or larger	2000

h. Tunnels are exempt from manhole spacing requirements because of construction constraints. **(Not applicable)**

i. An intersection of three or more collection pipes must have a manhole. **(Maintained throughout the design of the SCS)**

j. A manhole must not be located in the flow path of a watercourse, or in an area where ponding of surface water is probable. **(Maintained throughout the design of the SCS)**

k. The inside diameter of a manhole must be no less than 48 inches. A manhole diameter must be sufficient to allow personnel and equipment to enter, exit, and work in the manhole and to allow proper joining of the collection system pipes in the manhole wall. **(See Manhole Details following these notes)**

l. Manholes must meet the following requirements for covers, inlets, and bases.

1. Manhole Covers

A. A manhole where personnel entry is anticipated requires at least a 30 inch diameter clear opening. (**Covers to have 32" Openings per NBU Specifications on WW Detail Sheet)**

B. A manhole located within a 100-year flood plain must have a means of preventing inflow. **(Water tight manhole ring & cover detail is shown on WW Detail Sheet)**

C. A manhole cover construction must be constructed of impervious material. **(See WW Detail Sheet)**

D. 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. **(See Manhole Details following these construction notes)**

2. Manhole Inverts

A. The bottom of a manhole must contain a U-shaped channel that is a smooth continuation of the inlet and outlet pipes. **(See WW Detail Sheet)**

B. 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 **(Applicable)**

C. A manhole connected to a pipe at least 15 inches in diameter but not more than 24 inches in diameter must have a channel depth equal to at least three-fourths of the largest pipe's diameter **(Not Applicable)**

D. A manhole connected to a pipe greater than 24 inches in diameter must have a channel depth equal to at least the largest pipe's diameter **(Not applicable for this project)**.

E. A manhole with pipes of different sizes must have the tops of the pipes at the same elevation and flow channels in the invert sloped on an even slope from pipe to pipe. **(Not applicable for this project)**

F. A bench provided above a channel must slope at a minimum of 0.5 inch per foot. **(Self Explanatory)**

G. An invert must be filleted to prevent solids from being deposited if a wastewater collection system pipe enters a manhole higher than 24 inches above a manhole invert. **(See WW Detail Sheet)**

H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. **(Not Applicable)**

m. The inclusion of steps in a manhole is prohibited.

n. Connections. A manhole-pipe connection must use watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. **(See WW Detail Sheets)**

o. Venting. An owner must use an alternate means of venting if manholes are at more than 1,500 foot intervals and gasketed manhole covers are required for more than three manholes in sequence. Vents must meet the following requirements: **(Not Applicable)**

1. Vent design must minimize inflow;
2. Vents must be located above a 100-year flood event elevation; and
3. Tunnels must be vented in compliance with this subsection.

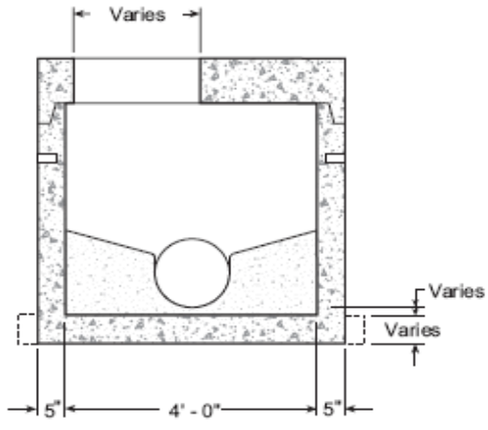
p. Cleanouts. The size of a cleanout must be equal to the size of the wastewater collection system main. **(Not applicable to this project)**

Precast Manhole Information:

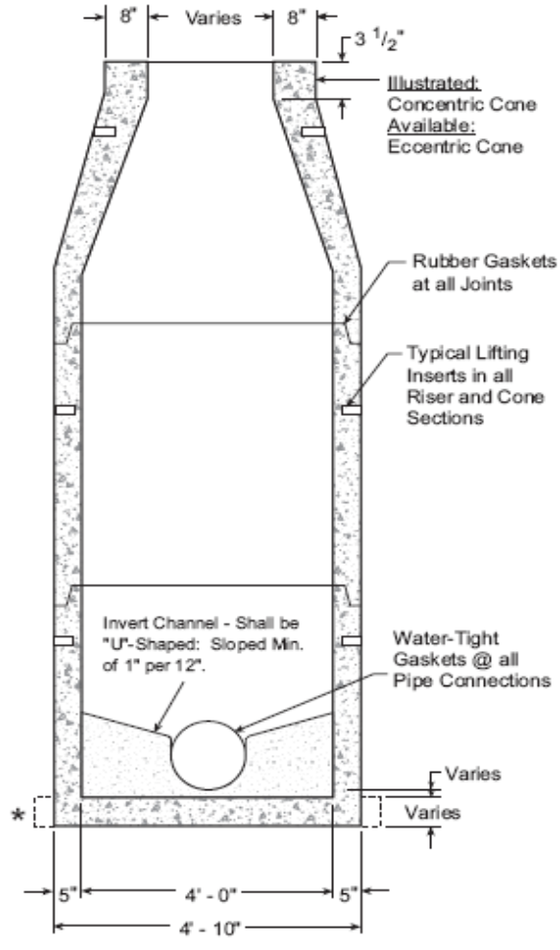
Hanson Pipe and Precast
Hanson Building Products West
300 E John Carpenter Freeway
11th floor
Irving, TX 75062
972.653.5500

San Antonio Metro Area Contact:
210.661.2351
866.426.7661

Precast Manholes



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 weiight of riser and cone sections = 870 lbs. / vt. ft.

* - Extended base is available to meet local requirements.

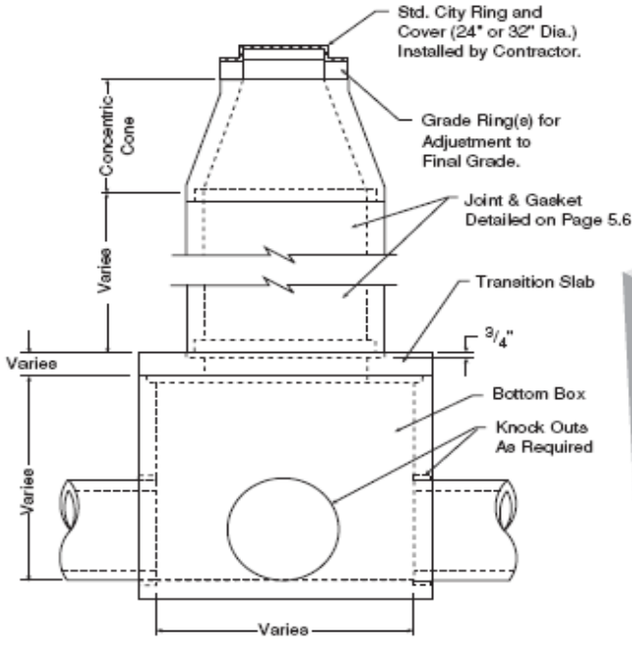
In the event a boot is loose contact your Hanson representative to resolve.

"Manufactured to your specifications."

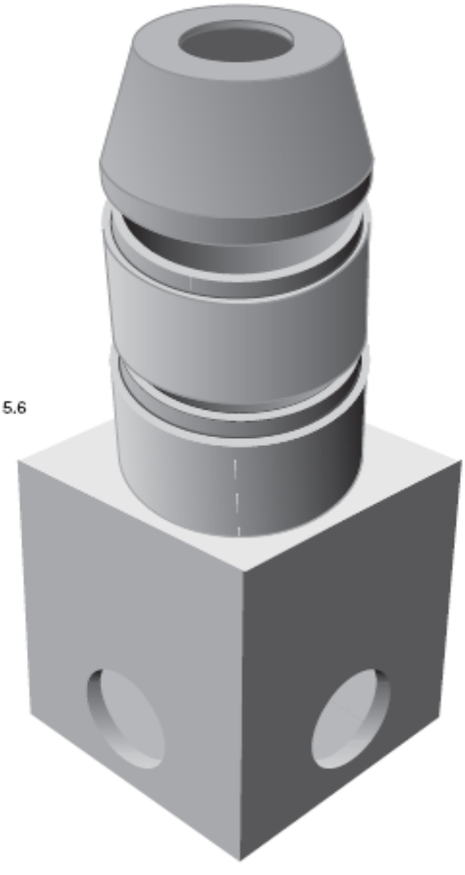
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
4' I.D. Manhole **Regular Base w / Reducing Cone**	All Plants	TX	5.5	07-01-06	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

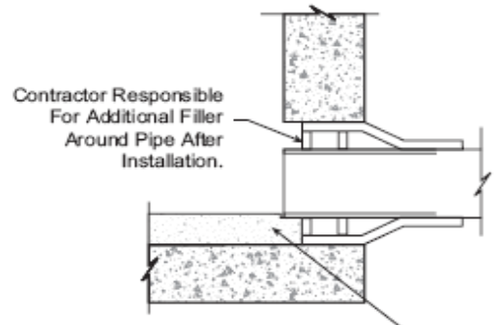
In the event a boot is loose contact your Hanson representative to resolve.

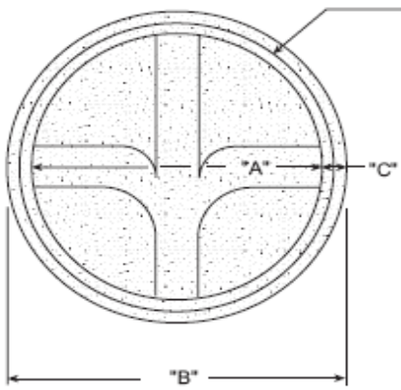
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
Type "C" Manhole	Houston San Antonio	TX	5.11	07-01-06	Hanson

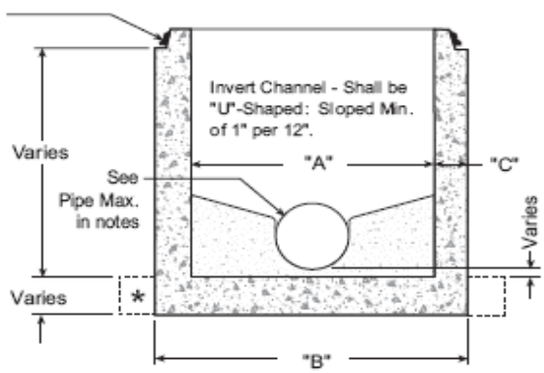
Precast Manholes

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

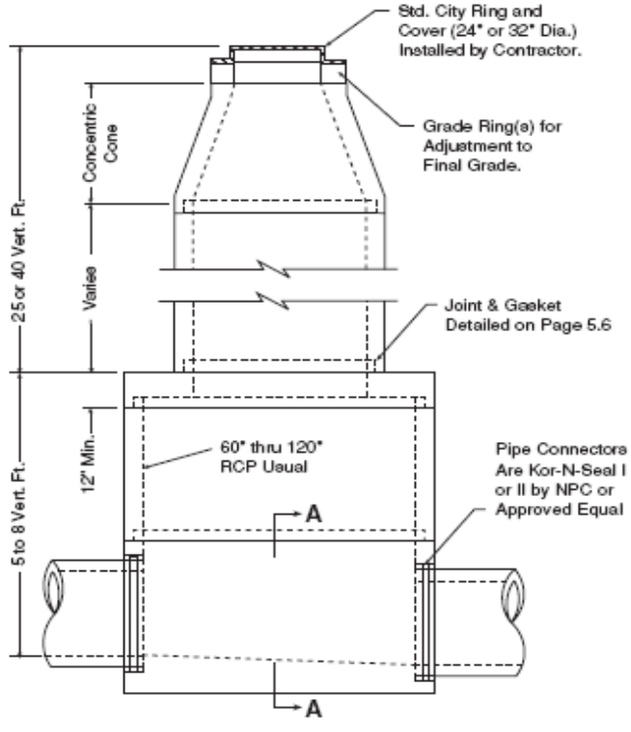
HOLES AS SPECIFIED:
- For 4' I.D. max. diameter = 32"
- For 5' I.D. max. diameter = 40"
- For 6' I.D. max. diameter = 54"

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.

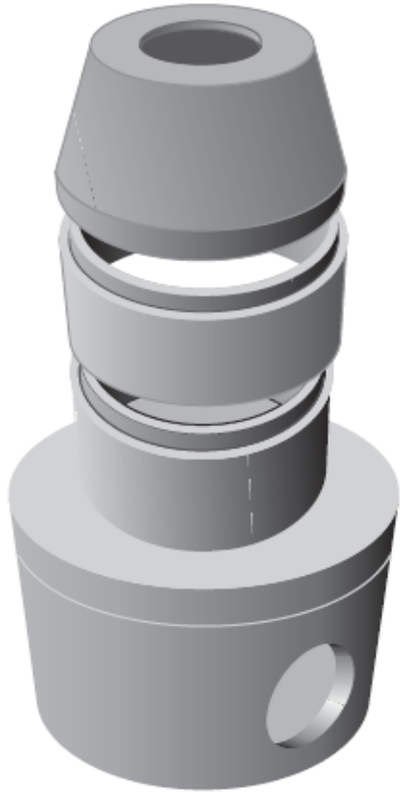
-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION.PAGE	DATE	
Details: 4', 5' & 6' I.D. Precast Regular Manhole Base	All Plants	TX	5.7	07-01-06	Hanson

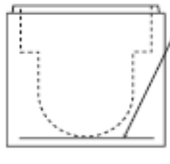
Precast Manholes



w/ Precast Base



Isometric View



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.

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	07-01-06	Hanson

ATTACHMENT A
WASTEWATER / SEWAGE CALCULATIONS

VERAMENDI PRECINCT 23 UNIT 1

CITY OF NEW BRAUNFELS WASTEWATER CALCULATIONS

1 LUE = 210 gpd

AVERAGE DRY WEATHER FLOW
F = 210 X LUEs/1440 gpm

MINIMUM FLOW
$Qmin = [0.2 \times (0.0144 \times F)^{0.198}] \times F$

PEAK FLOW FACTOR
$PFF = [(18+(0.0206 \times F)^{0.5})/(4+(0.0206 \times F)^{0.5})]$

PEAK DRY WEATHER FLOW (gpm)
Qpdwf = PFF X F

INFLOW / INFILTRATION
(I/I) = 750 gal./day/acre = 0.521 gpm

PEAK WET WEATHER FLOW (gpm)
Qpwwf = Qpdwf + I/I

use mannings n=0.013 enter this number

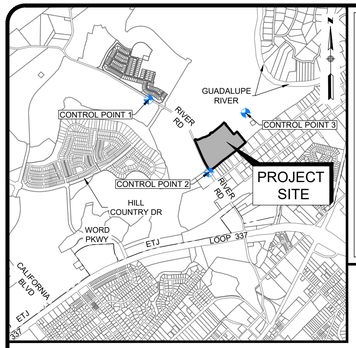
solve for Normal Depth

solve for full flow capacity

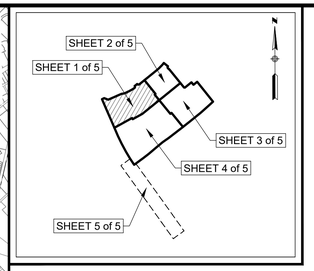
WASTEWATER LINE	STATION FROM	STATION TO	SF LUEs	Total LUEs	AVERAGE DRY WEATHER FLOW F (gpm)	PEAK FLOW FACTOR PFF	PEAK DRY WEATHER FLOW Qpdwf (gpm)	INFLOW / INFLITRATION I/I (gpm)	PEAK WET WEATHER FLOW Qpwwf (gpm)	MINIMUM FLOW Qmin (gpm)	PIPE SIZE (IN)	PIPE SLOPE (%)	PEAK DRY WEATHER FLOW Qpdwf (cfs)	PEAK WET WEATHER FLOW Qpwwf (cfs)	PEAK DRY WEATHER VELOCITY Vpdwf (ft/s)	PEAK WET WEATHER VELOCITY Vpwwf (ft/s)	PEAK DRY WEATHER DEPTH d_{pdwf} (ft)	PEAK WET WEATHER DEPTH d_{pwwf} (ft)	MAXIMUM CAPACITY FLOW Q_{mcf} (gpm)	MAXIMUM CAPACITY VELOCITY V_{mcf} (ft/s)	Contributing Area (AC)
															velocity after find depth	velocity after find depth	Nomal depth		discharge full	velocity	
A-15	33+08.86	31+92.55	22	22	3.21	4.29	13.76	0.00	13.76	0.35	8	3.36	0.03	0.03	2.24	2.24	0.05	0.05	994.13	6.35	0.00
A-14	31+92.55	29+87.55	0	112	16.33	4.06	66.26	0.00	66.26	2.45	8	1.85	0.15	0.15	2.93	2.93	0.14	0.14	737.67	4.71	0.00
A-13	29+87.55	26+91.55	0	144	21.00	4.01	84.12	3.10	87.22	3.31	8	4.00	0.19	0.19	3.06	3.31	0.08	0.09	1084.69	6.92	5.95
A-12	26+91.55	23+32.30	8	334	48.71	3.80	185.05	7.46	192.51	9.08	12	0.34	0.41	0.43	2.06	2.09	0.30	0.31	932.38	2.64	14.32
A-11	23+32.30	22+34.85	2	336	49.00	3.80	186.07	8.62	194.69	9.15	12	0.34	0.41	0.43	2.06	2.09	0.25	0.31	932.38	2.64	16.54
A-10	22+34.85	21+20.65	3	344	50.17	3.79	190.17	9.72	199.89	9.41	12	0.34	0.42	0.45	2.07	2.11	0.30	0.32	932.38	2.64	18.66
A-9	21+20.65	19+44.61	4	348	50.75	3.79	192.21	9.72	201.93	9.54	12	0.35	0.43	0.45	2.11	2.13	0.31	0.32	945.99	2.68	18.66
A-8	19+44.61	18+81.38	2	350	51.04	3.79	193.24	9.72	202.96	9.60	12	0.34	0.43	0.45	2.09	2.11	0.31	0.32	932.38	2.64	18.66
A-7	18+81.38	17+34.25	2	352	51.33	3.78	194.26	10.09	204.35	9.67	12	0.34	0.43	0.46	2.09	2.12	0.31	0.32	932.38	2.64	19.37
A-6	17+34.25	14+05.34	0	352	51.33	3.78	194.26	12.91	207.16	9.67	12	2.58	0.43	0.46	4.40	4.37	0.19	0.19	2568.39	7.29	24.78
A-5	14+05.34	11+44.79	0	352	51.33	3.78	194.26	12.91	207.16	9.67	12	2.78	0.43	0.46	4.40	4.49	0.18	0.19	2666.08	7.56	24.78
A-4	11+44.79	7+49.07	0	352	51.33	3.78	194.26	12.91	207.16	9.67	12	5.88	0.43	0.46	5.72	5.84	0.15	0.16	3877.39	11.00	24.78
A-3	7+49.07	6+59.98	0	352	51.33	3.78	194.26	0.28	194.53	9.67	12	4.51	0.43	0.43	5.32	5.32	0.17	0.17	3395.78	9.63	0.53
A-2	6+59.98	5+25.28	0	352	51.33	3.78	194.26	0.28	194.53	9.67	12	5.30	0.43	0.43	5.63	5.63	0.16	0.16	3681.20	10.44	0.53
A-1	5+25.28	1+00.00	0	352	51.33	3.78	194.26	0.28	194.53	9.67	12	1.05	0.43	0.43	3.18	3.18	0.24	0.24	1638.50	4.65	0.53
B-17	5+02.60	2+81.53	10	10	1.46	4.35	6.35	0.21	6.56	0.14	8	0.67	0.01	0.01	0.91	0.91	0.05	0.05	443.93	2.83	0.41
B-16	2+81.53	29+87.55	4	14	2.04	4.33	8.84	1.02	9.86	0.20	8	0.73	0.02	0.02	1.16	1.16	0.06	0.06	463.38	2.96	1.96
C-19	5+20.60	22+34.85	5	5	0.73	4.40	3.21	0.00	3.21	0.06	8	5.20	0.01	0.01	1.87	1.87	0.03	0.03	1236.73	7.89	0.00
D-21	6+30.00	3+65.00	10	10	1.46	4.35	6.35	0.55	6.91	0.14	8	0.34	0.01	0.02	0.72	0.89	0.06	0.08	316.24	2.02	1.07
D-20	3+65.00	29+87.55	8	18	2.63	4.31	11.31	0.64	11.95	0.27	8	1.18	0.03	0.03	1.55	1.55	0.07	0.07	589.14	3.76	1.23
E-22	6+08.01	26+91.55	12	12	1.75	4.34	7.60	0.14	7.74	0.17	8	3.50	0.02	0.02	1.99	1.99	0.04	0.04	1014.63	6.48	0.27
G-24	6+08.01	3+88.00	6	6	0.88	4.39	3.84	0.00	3.84	0.07	8	2.87	0.01	0.01	1.51	1.51	0.03	0.03	918.79	5.86	0.00
G-23	3+88.00	9+01.75	4	10	1.46	4.35	6.35	1.07	7.42	0.14	8	3.45	0.01	0.02	1.60	1.98	0.03	0.04	1007.36	6.43	2.06
F-30	10+96.01	10+62.01	153	153	22.31	3.99	89.09	0.00	89.09	3.56	8	0.34	0.20	0.20	1.74	1.74	0.24	0.24	316.24	2.02	0.00
F-29	10+62.01	9+01.75	2	155	22.60	3.99	90.19	0.00	90.19	3.62	8	0.34	0.20	0.20	1.74	1.74	0.24	0.24	316.24	2.02	0.00
F-28	9+01.75	4+37.05	16	165	24.06	3.98	95.68	1.07	96.75	3.90	8	0.34	0.21	0.22	1.76	1.79	0.25	0.26	316.24	2.02	2.06
F-27	4+37.05	3+60.87	1	166	24.21	3.97	96.22	2.04	98.26	3.93	8	0.34	0.21	0.22	1.76	1.79	0.25	0.26	316.24	2.02	3.91
F-26	3+60.87	2+84.69	2	168	24.50	3.97	97.32	3.19	100.51	3.99	8	0.34	0.22	0.22	1.79	1.79	0.26	0.26	316.24	2.02	6.13
F-25	2+84.69	26+91.55	2	170	24.79	3.97	98.41	3.19	101.60	4.04	8	0.34	0.22	0.23	1.79	1.80	0.26	0.26	316.24	2.02	6.13
H-31	2+00.00	31+92.55	90	90	13.13	4.10	53.78	6.88	60.66	1.89	8	1.97	0.12	0.14	2.81	2.93	0.12	0.13	761.22	4.86	13.21

ATTACHMENT B
SEWER AVAILABILITY DOCUMENTATION

ATTACHMENT C
GENERAL WASTEWATER NOTES



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

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POINT #	NORTHING	EASTING	ELEVATION	FULL DESCRIPTION
1	13,818,446.35	2,242,690.14	738.93'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
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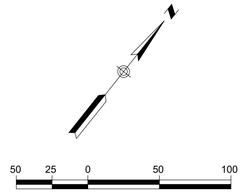

SCALE IN FEET
SCALE 1" = 50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

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ITEM	UNIT	QUANTITY
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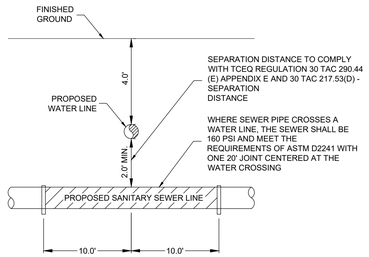

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
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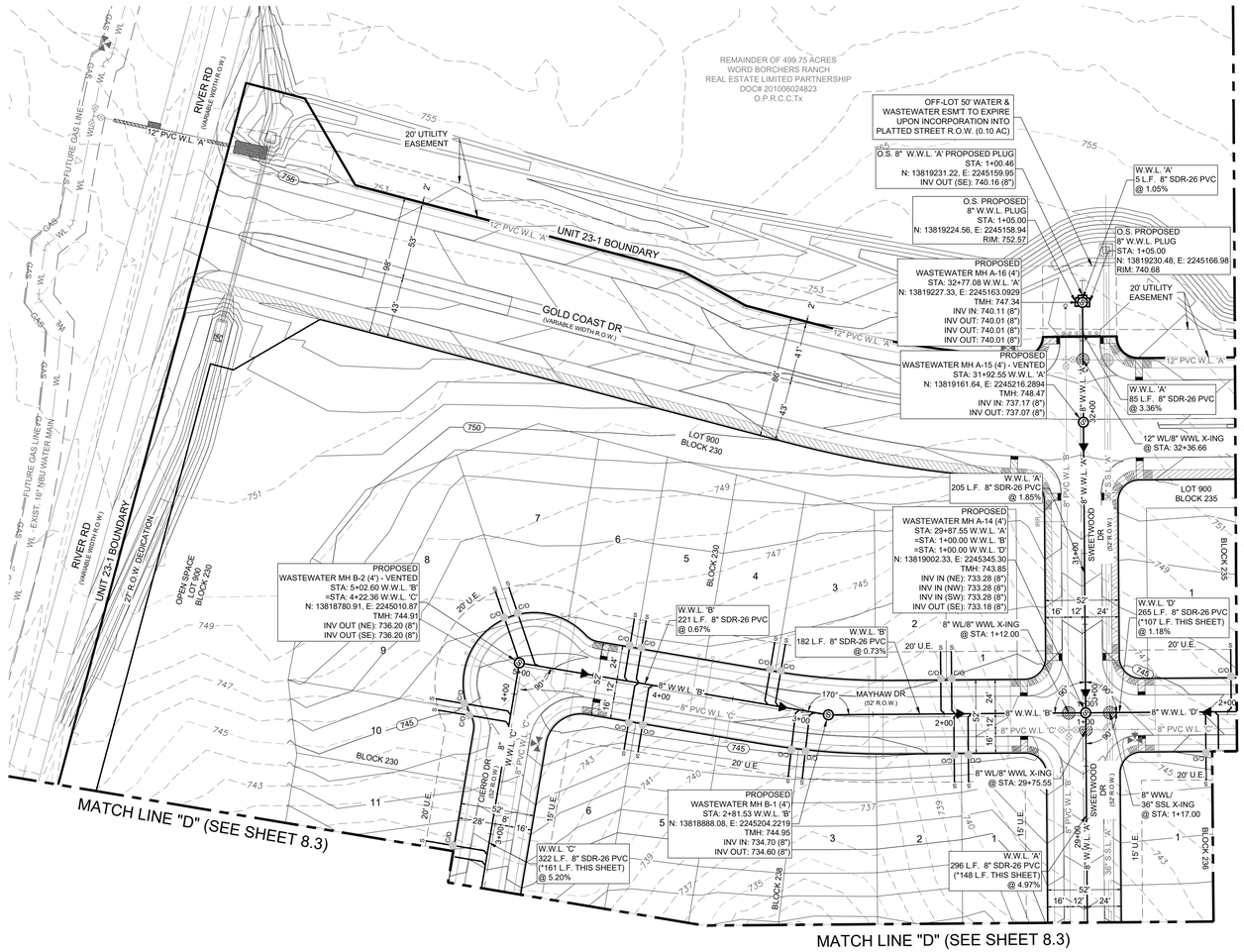
8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLES MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH A CORROSION RESISTANT MATERIAL.



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TRENCH EXCAVATION SAFETY PROTECTION
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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (1 OF 5)

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 80_Wastewater_Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.0**

FOR PERMIT

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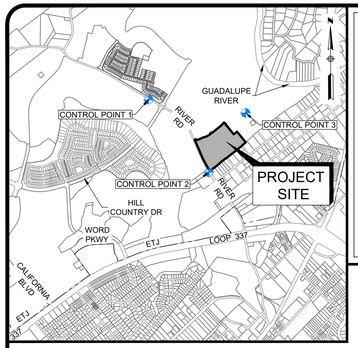
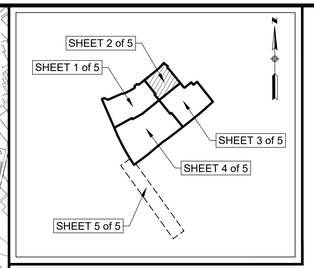
User: ngower
Last Modified: Jul 07, 25 - 17:38
Xref Dependencies: Jul 07, 25 - 14:43



LOCATION MAP
N.T.S.



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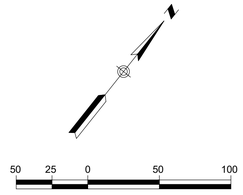

SCALE IN FEET
SCALE 1" = 50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
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		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
12" SANITARY SEWER PIPE	LF	2592
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LUEs	EA	103
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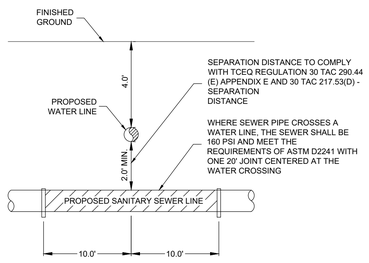

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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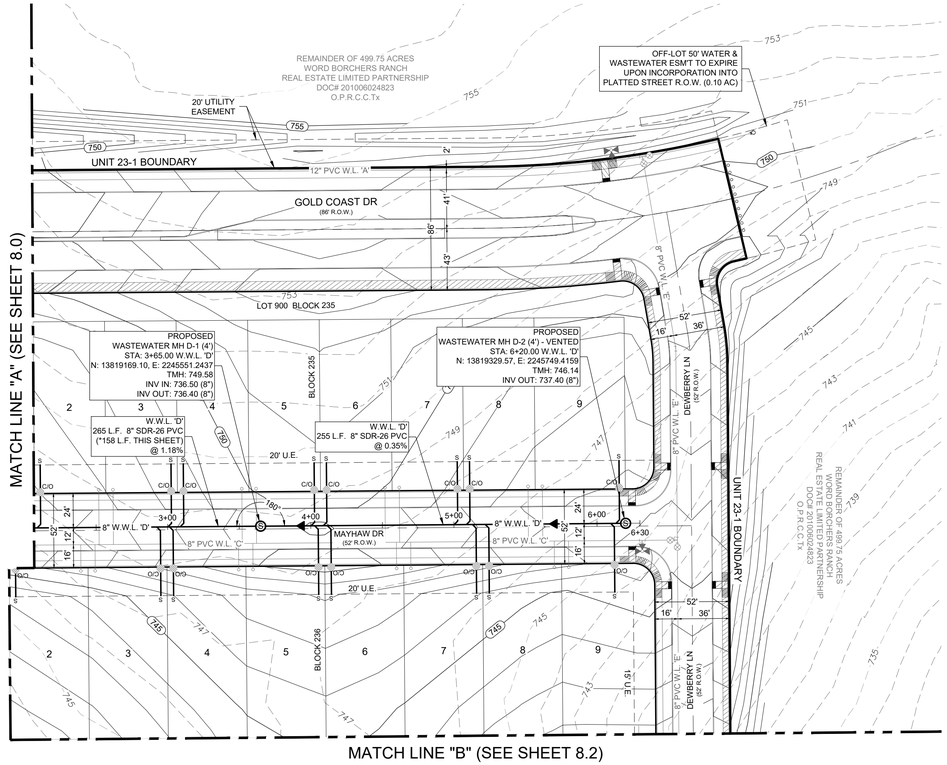

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (2 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sht_WastewaterLayout.dwng

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.1

FOR PERMIT

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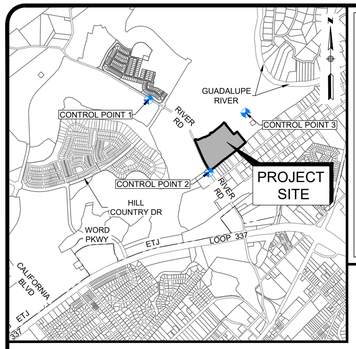
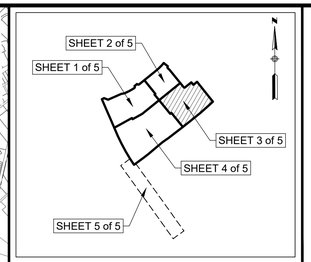
Last Modified: Jul 07 25 - 17:38
Plot Date/Time: Jul 08 25 - 08:13



LOCATION MAP
N.T.S.



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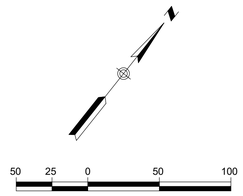

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		FIRE HYDRANT
		WATER METER
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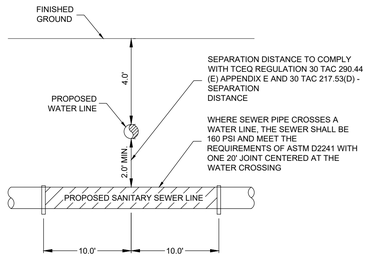

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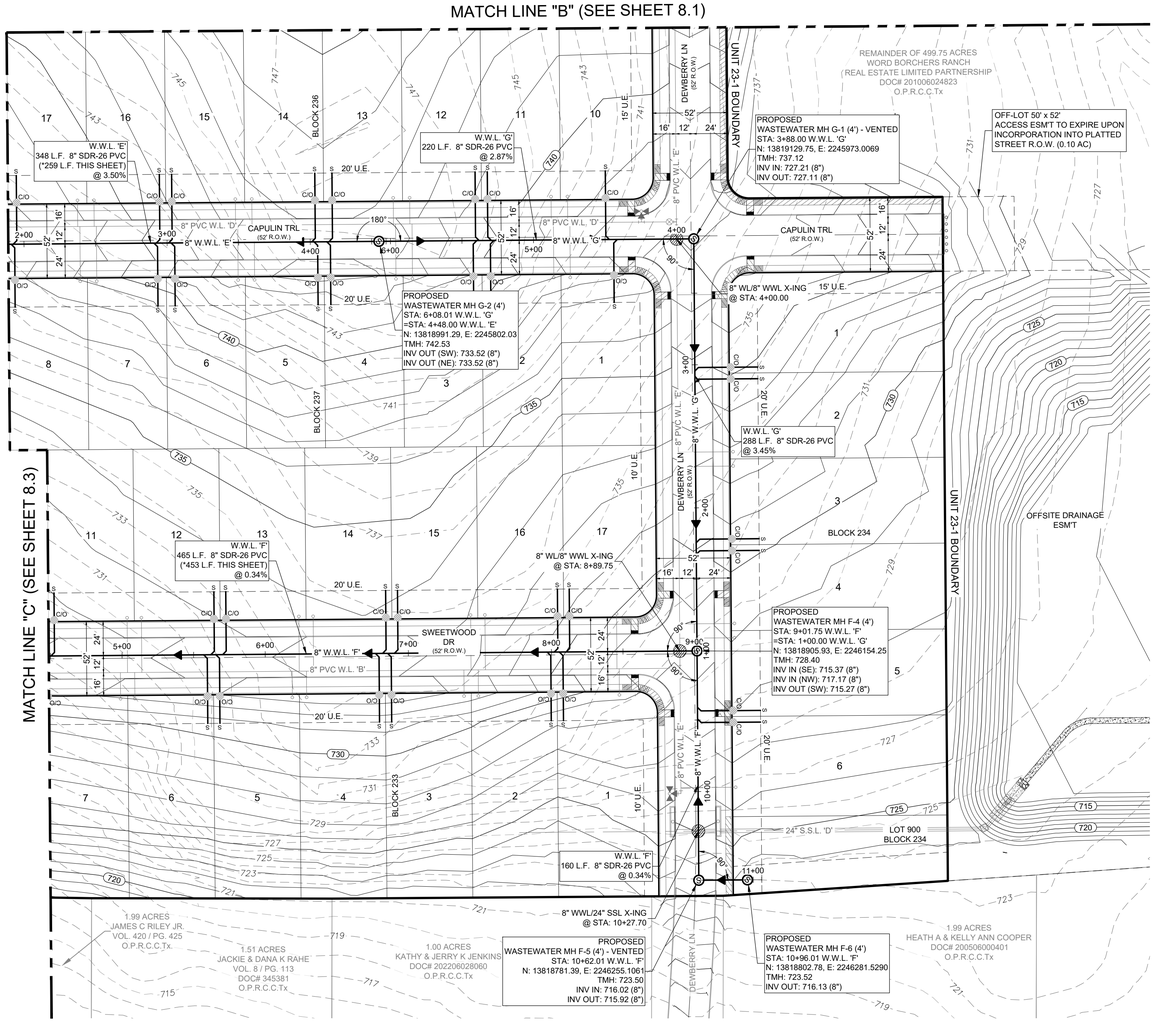
MATCH LINE "B" (SEE SHEET 8.1)



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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (3 OF 5)

NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sht_Wastewater_layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

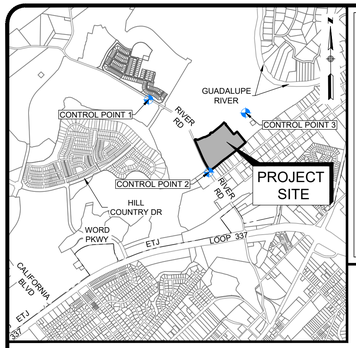
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

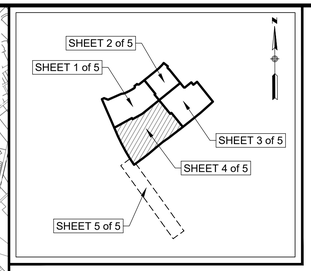
SHEET NO. 8.2

FOR PERMIT

K:\SAD\SA3856.2405 Properties\2405 255-1405 Site Development Plans\DWG\Sheet\sht_Wastewater_layout.dwg
User: hgower
Last Modified: Jul. 07, 25 - 17:38
Plot Modified: Jul. 08, 25 - 11:13



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

HORIZONTAL AND VERTICAL CONTROL POINTS				
POINT #	NORTHING	EASTING	ELEVATION	FULL DESCRIPTION
1	13,818,446.35	2,242,690.14	738.93'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
2	13,819,854.81	2,245,002.60	732.78'	SET 5/8" IRON ROD w/ ALUMINUM CAP STAMPED "LJA SURVEYING"
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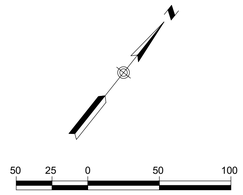
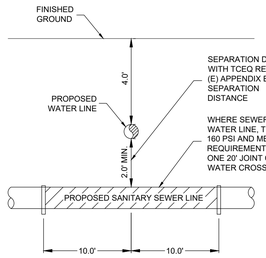


SCALE IN FEET
SCALE 1" = 50'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
12" SANITARY SEWER PIPE	LF	2592
8" SANITARY SEWER PIPE	LF	3824
6" WASTEWATER SERVICE	EA	103
LUEs	EA	103
48" MANHOLE	EA	21



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NTS

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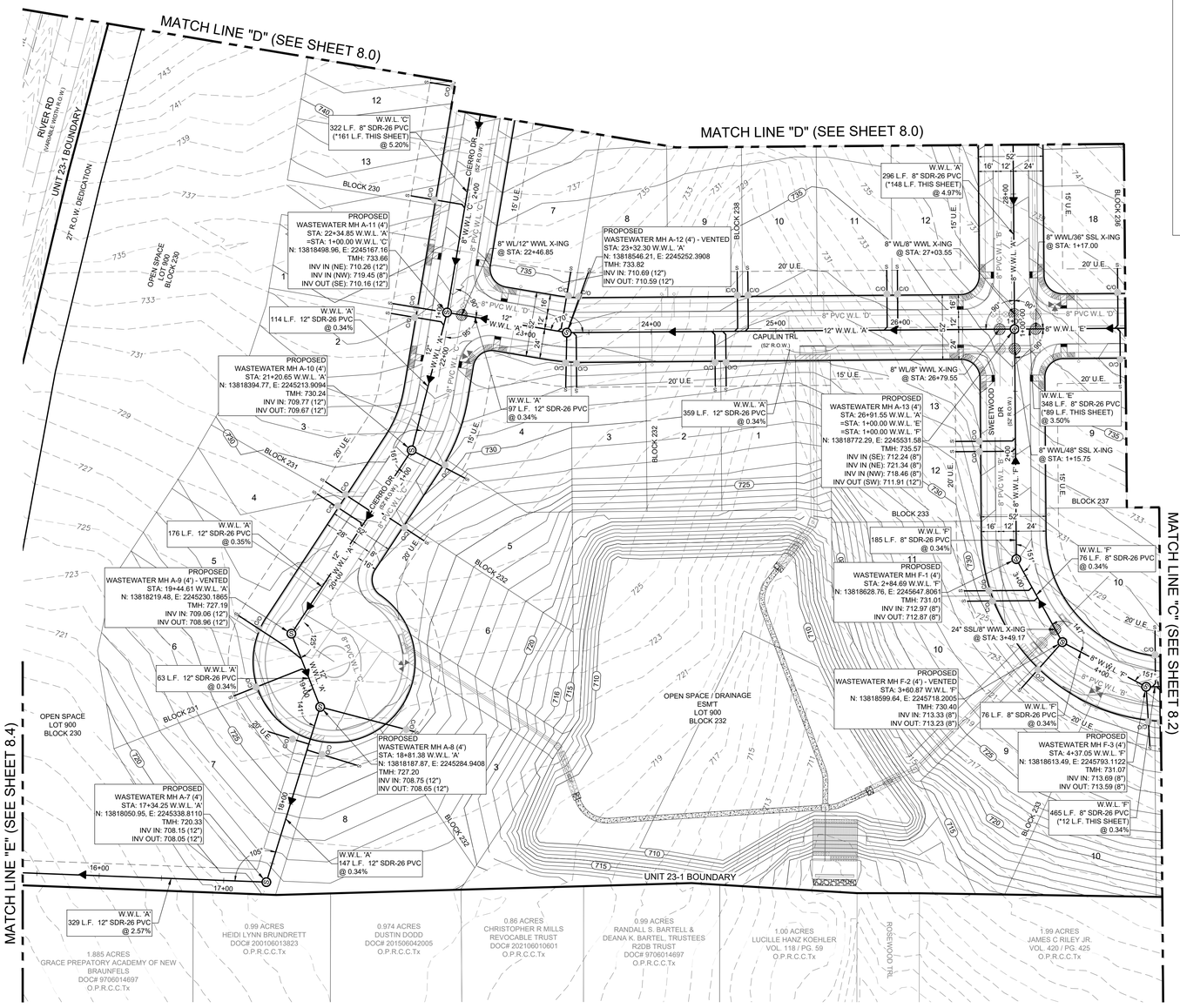

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TRENCH EXCAVATION SAFETY PROTECTION

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (4 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE:	7/8/2025
DESIGNED BY:	NG
DRAWN BY:	HEW
CHECKED BY:	PGF
DRAWING NAME:	s:\c_d\wastewater_layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.3

FOR PERMIT

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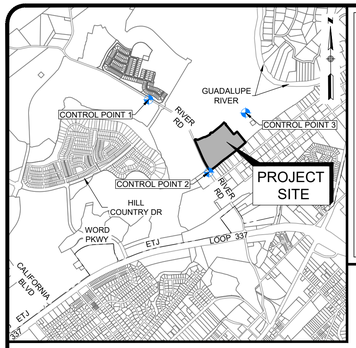
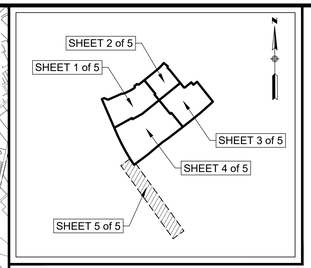
User: tgower
Last Modified: Jul. 07, 25 - 17:28
Plotted/Saved: Jul. 08, 25 - 14:13:20



LOCATION MAP
N.T.S.



SHEET INDEX
N.T.S.

WASTEWATER (NBU JOB NO. WW-263130)		
ITEM	UNIT	QUANTITY
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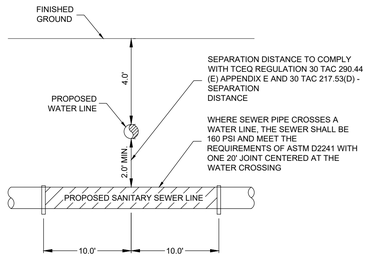

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
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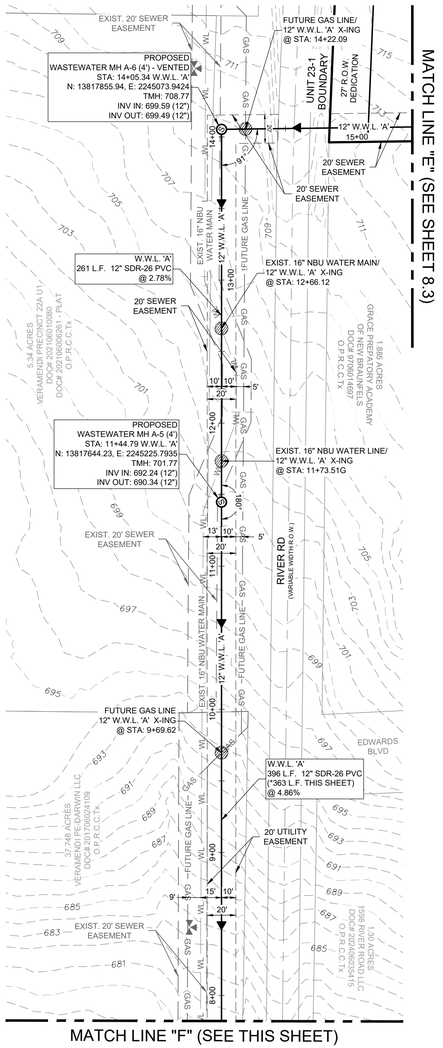
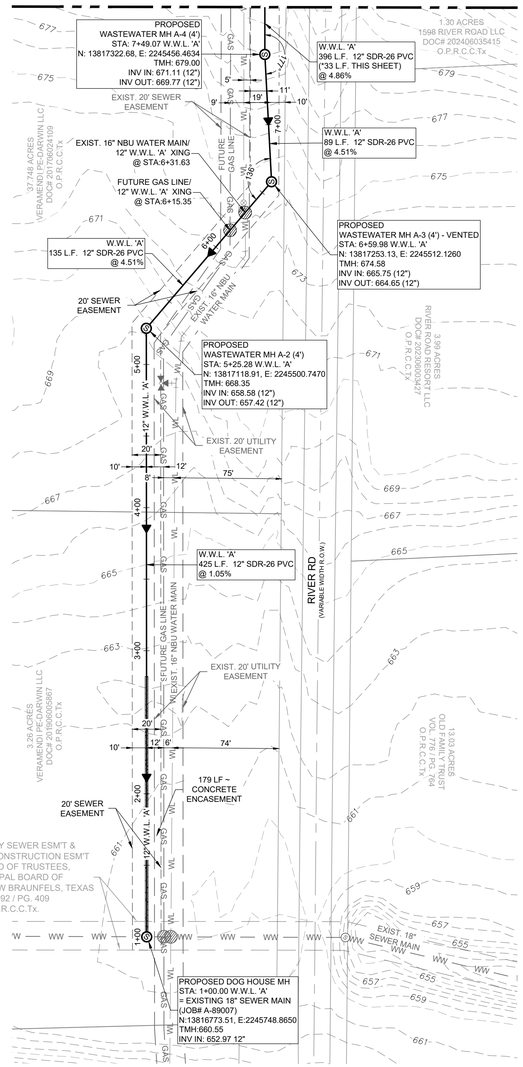
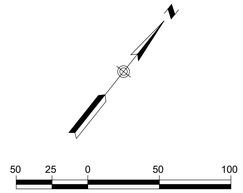


MATCH LINE "F" (SEE THIS SHEET)





LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
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		STREET LIGHT (100 WATT LED)
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	U.E.	UTILITY EASEMENT
	VOL	VOLUME
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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LAYOUT (5 OF 5)

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 08_Wastewater_Layout.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.4**

FOR PERMIT

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User: jgomez
Last Modified: Jul 07, 25 - 17:35
Xref Attached: Jul 26, 24 - 14:10:39

GENERAL NOTES:

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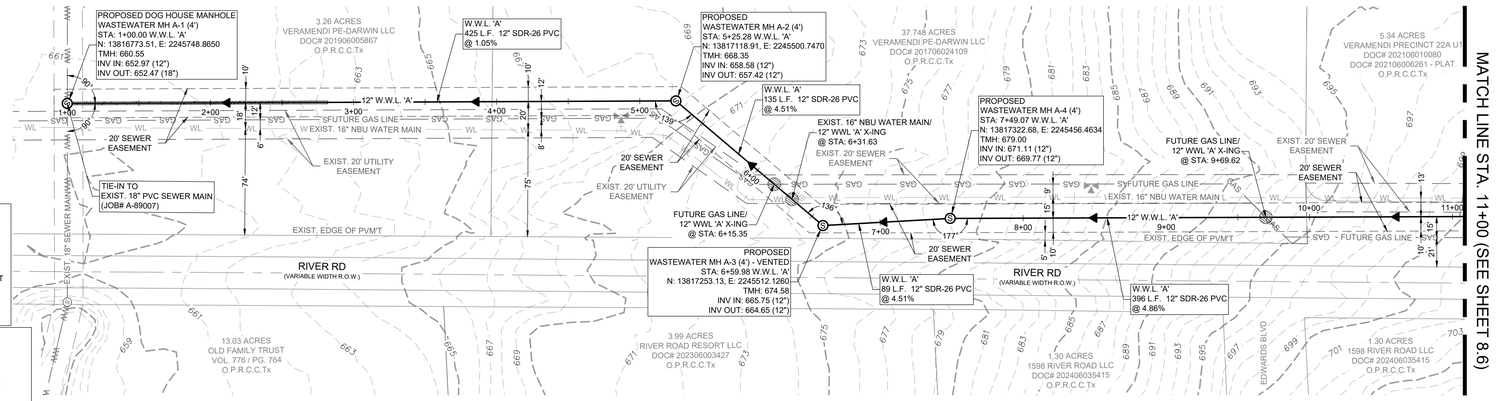

WASTEWATER LINE 'A' STA. 1+00 TO STA. 11+00

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
	GV	WATER METER / GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
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	TMH	TOP OF MANHOLE
	EX.	EXISTING
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	U.E.	UTILITY EASEMENT
	VOL	VOLUME
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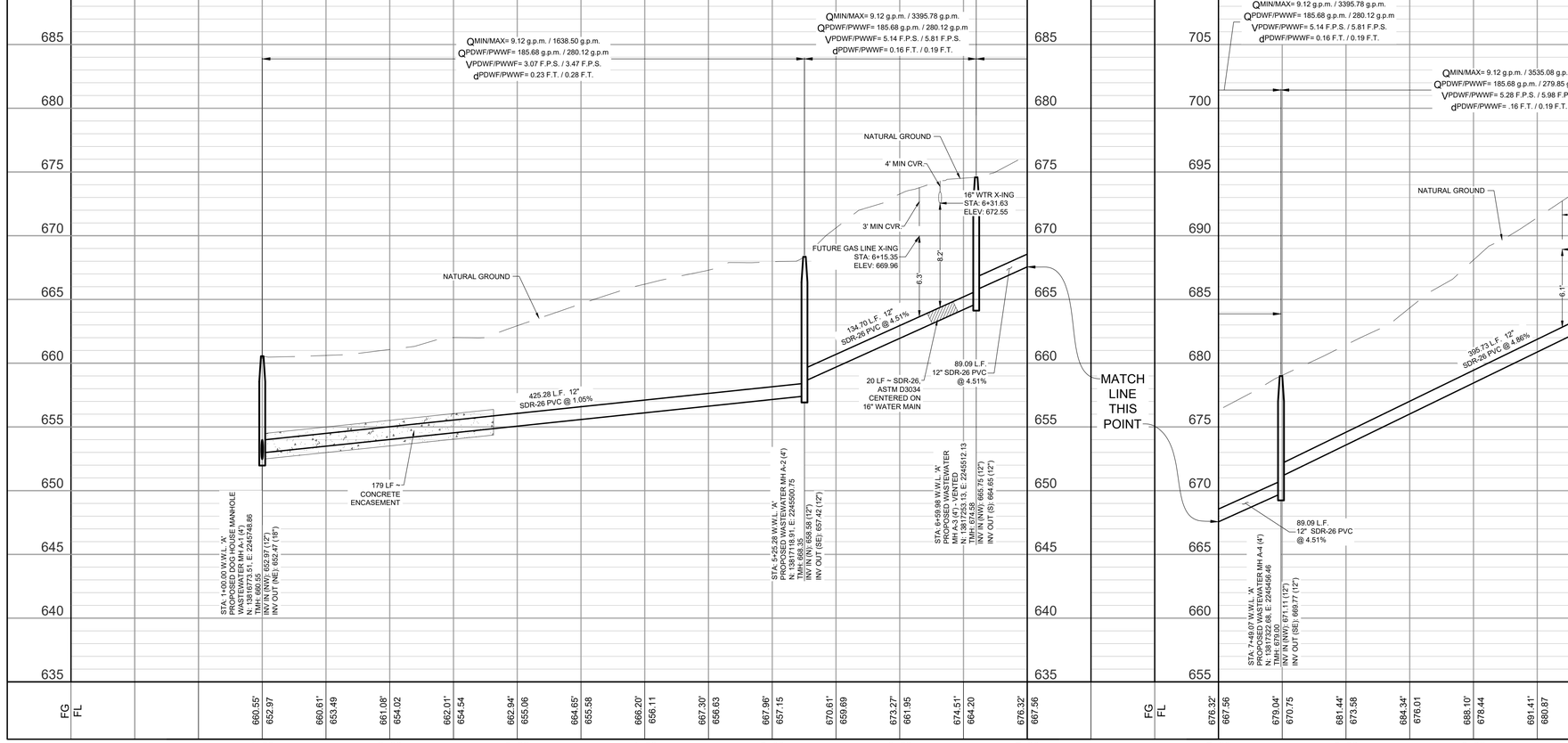
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 1+00 TO STA. 11+00

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: s:\...\WW_1A P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.5

K:\SA3856.A5A Properties\3405 23-1426 Site Development Plans\PW\S-Sheet\ss_WW_1A P&P.dwg
User: jogorman
Last Modified: Jun. 14, 25 - 20:28
Last Saved: Jul. 08, 25 - 14:14:47

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PRE TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
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8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLE MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH CORROSION RESISTANT MATERIAL.

CAUTION:

CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

TRENCH EXCAVATION SAFETY PROTECTION

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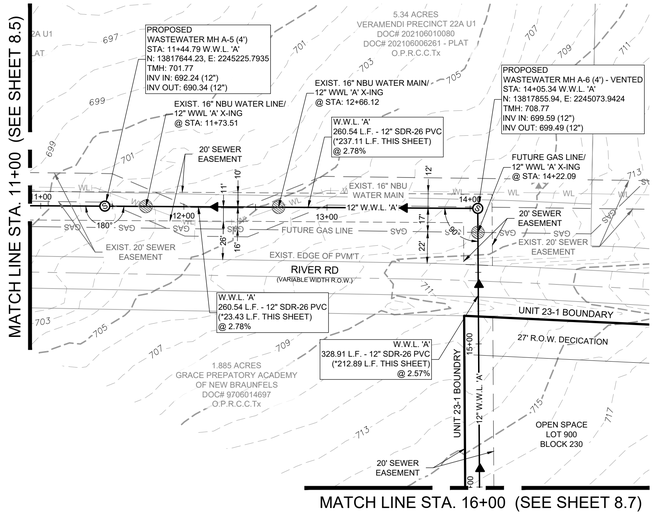
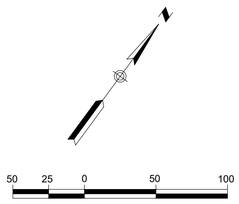


WASTEWATER LINE 'A' STA. 11+00 TO STA. 16+00



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
S C/O	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
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		UTILITY XING

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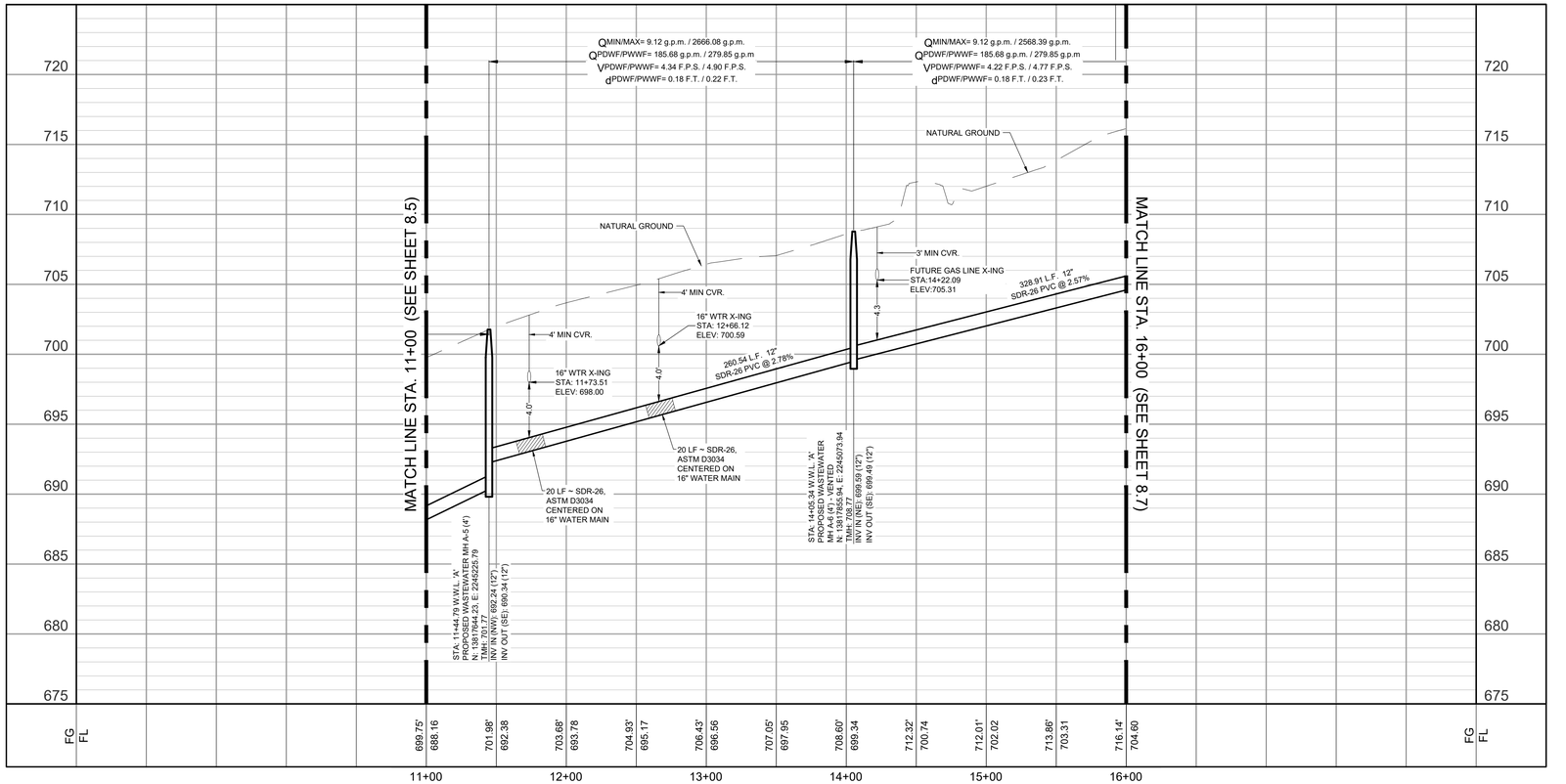

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: sh_LWWL 'A' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.6**

FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 11+00 TO STA. 16+00

K:\SA3856.ASA Properties\2405.23-1429 Site Development Plans\DWG\Sheetset, WWL 'A' P&P.dwg
User: ngower
Last Modified: Jun. 14, 25 - 20:38
Plotted on: Jul. 08, 25 - 14:14:46

GENERAL NOTES:

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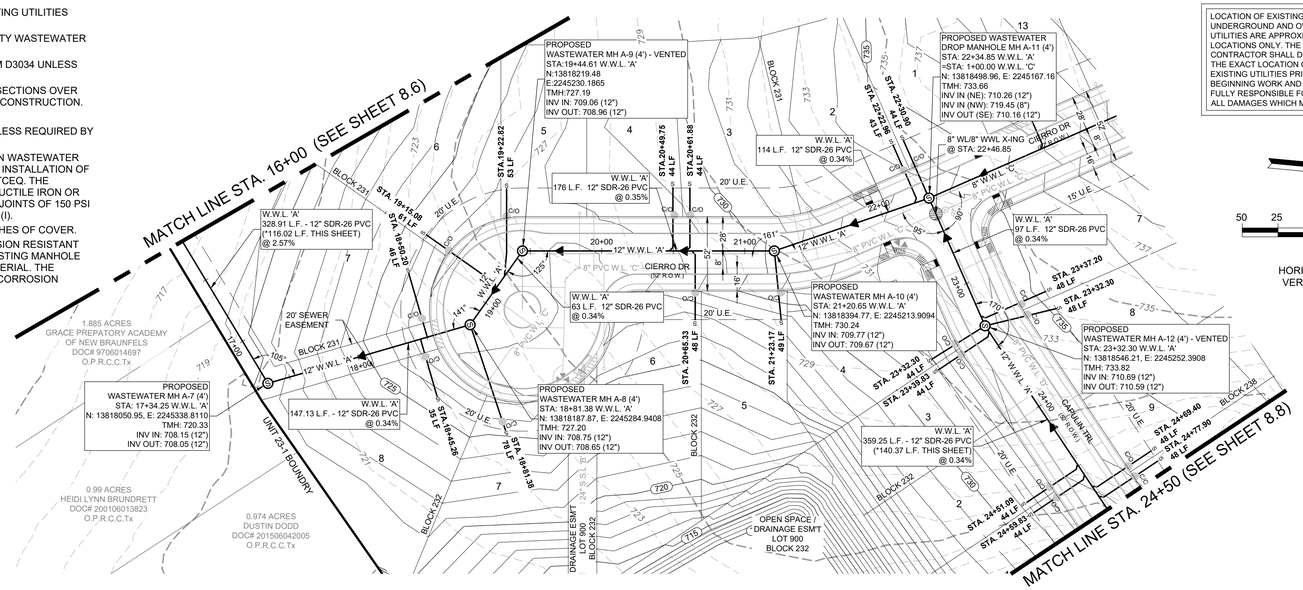

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50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
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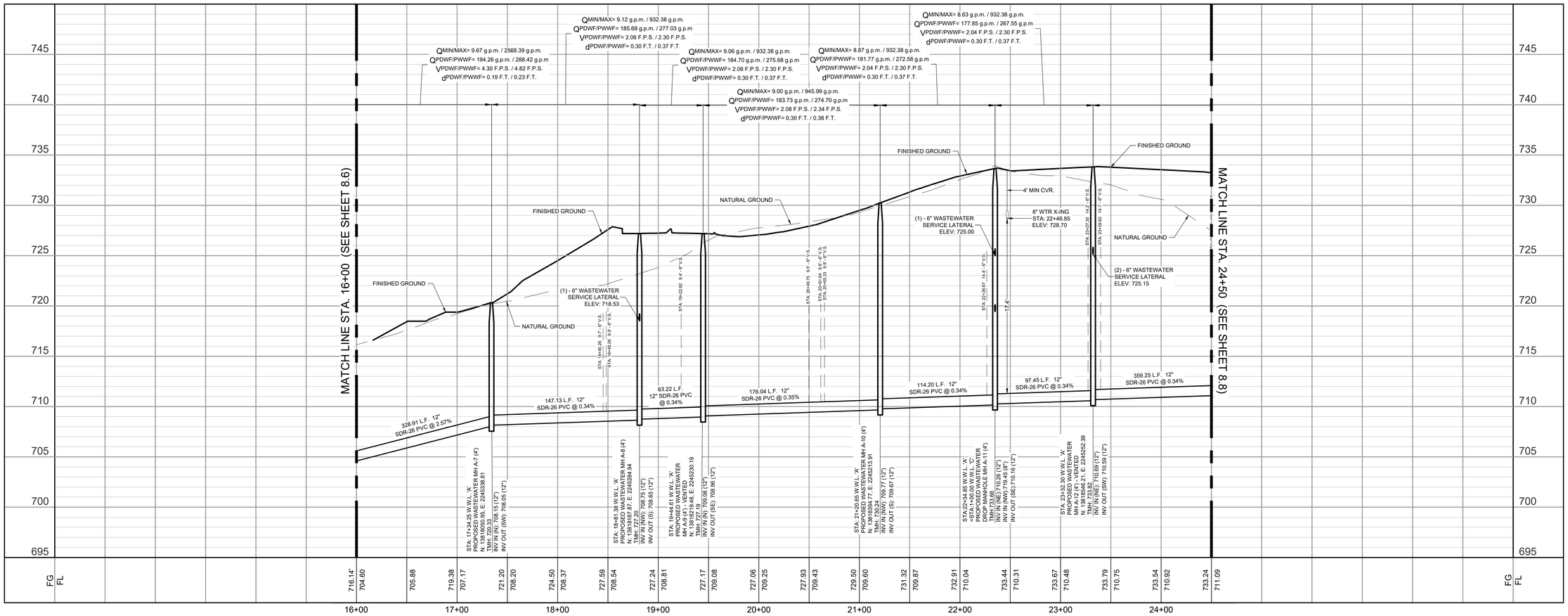
		UTILITY XING

WASTEWATER LINE 'A' STA. 16+00 TO STA. 24+50



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 16+00 TO STA. 24+50

REVISIONS NO.	DESCRIPTION	BY	DATE

DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PDF
DRAWING NAME: 90_WWL 'A' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.7

K:\SA3856.SAA Properties\Arch\PS 23-1425 Site Development Plans\DWG\Sheets\90_WWL 'A' P&P.dwg
Last Modified: Jun 14, 25 - 23:38
Xref Name(s): xr-sa_24_1414.dwg
User: rgoyer

GENERAL NOTES:

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50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
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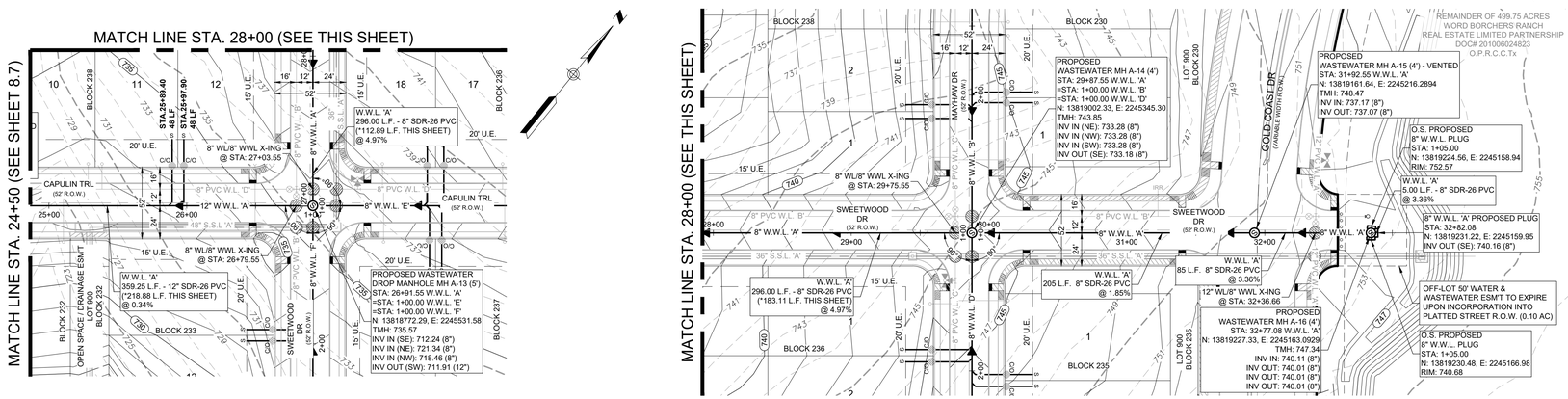
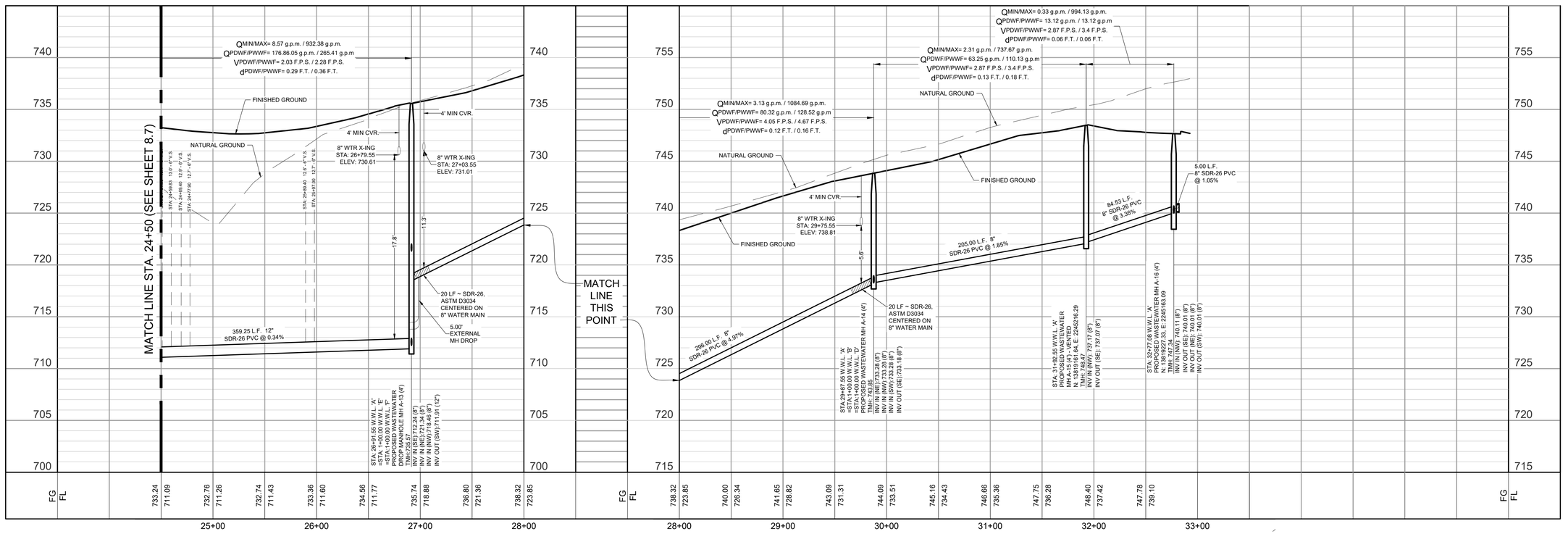


WASTEWATER LINE 'A' STA. 24+50 TO END



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'A' PLAN & PROFILE
STA. 24+50 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

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DATE: 7/8/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 8X_WWL_A' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
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TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.8

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User: hgower
Last Modified: Jun. 14, 25 - 20:38
Plotted/Saved: Jul. 08, 25 - 14:11:16

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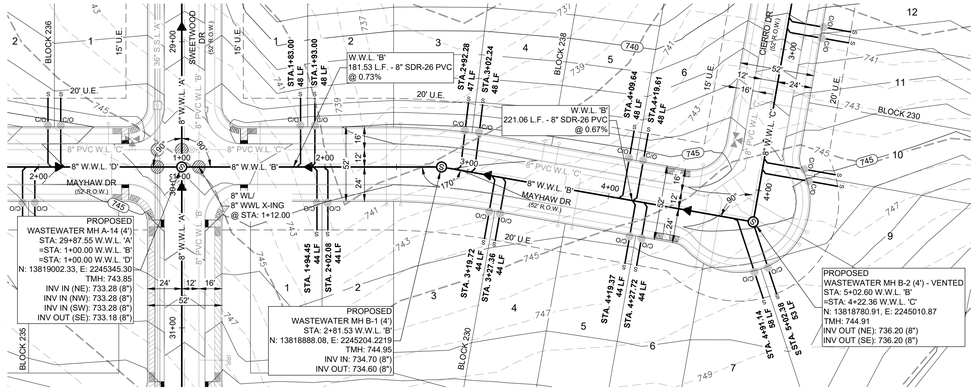

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PROPOSED	EXISTING	
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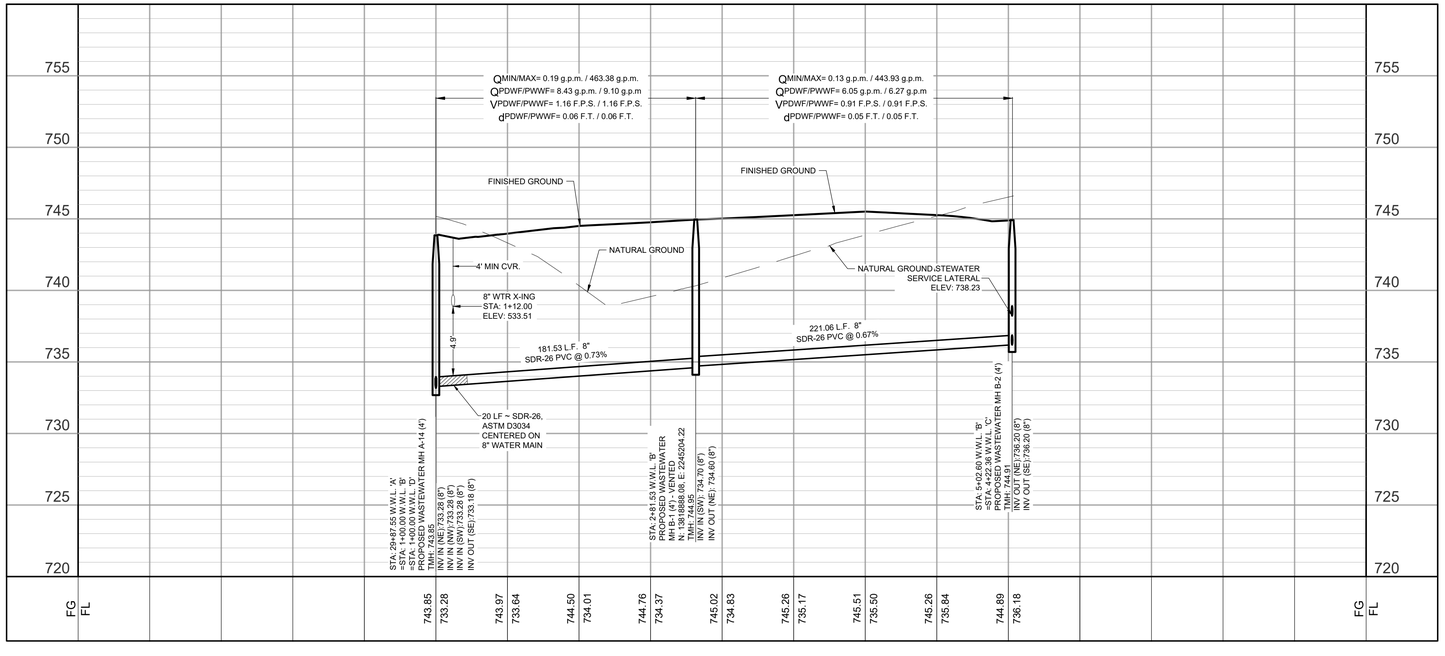

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VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'B' PLAN & PROFILE
STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 4/3/25
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ss_LWWL 'B' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. **8.9**

FOR PERMIT

P:\LJA3856 - KSA Properties\2405 23-1\425 Site Development Plans\CAD\Sheets\ph_LWWL 'B' P&P.dwg
Last Modified: Jun 09, 25 - 13:07
Last Plotted: Jun 09, 25 - 13:07

TRENCH EXCAVATION SAFETY PROTECTION

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GENERAL NOTES:

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2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PRE TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
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6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
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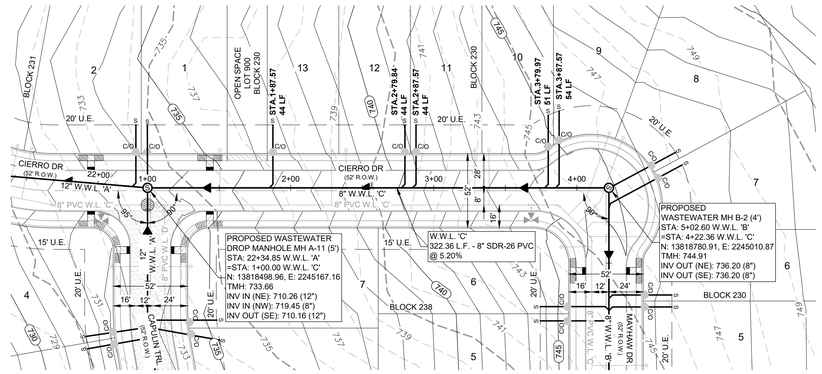
9. MANHOLE MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH CORROSION RESISTANT MATERIAL.

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



WASTEWATER LINE 'C' STA. 1+00 TO END

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

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'C' PLAN & PROFILE
STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 4/3/25
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: st_WWL 'C' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.10

FOR PERMIT

K:\SA3856 IGA Properties\2405 23-1\426 Site Development Plans\GWC-Sheets\sh_WWL 'C' P&P.dwg
User: nicholas.gower
Last Modified: Jun. 10, 25 - 15:17
Layout: Plan&Prof Jul. 08, 25 - 10:30:49

GENERAL NOTES:

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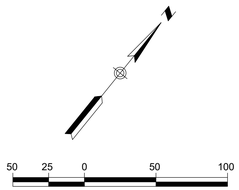

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VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
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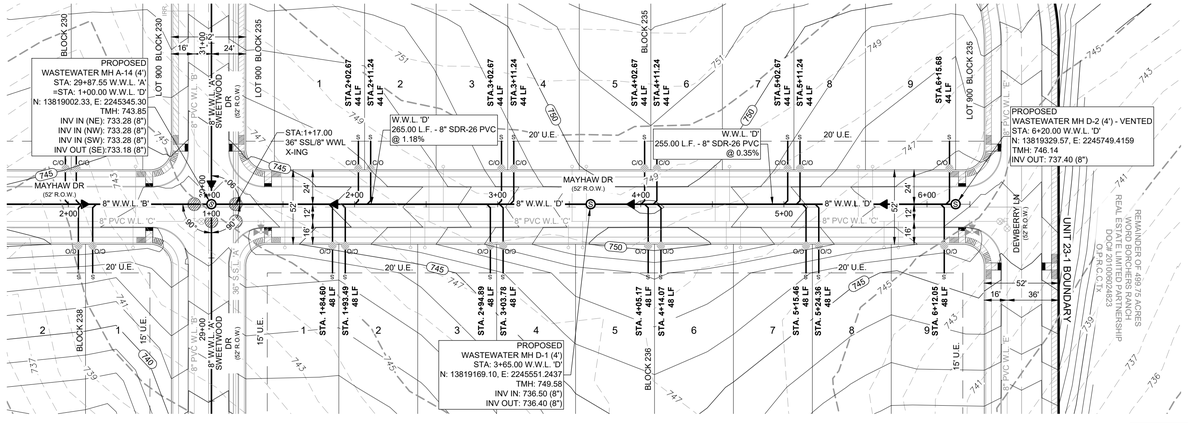

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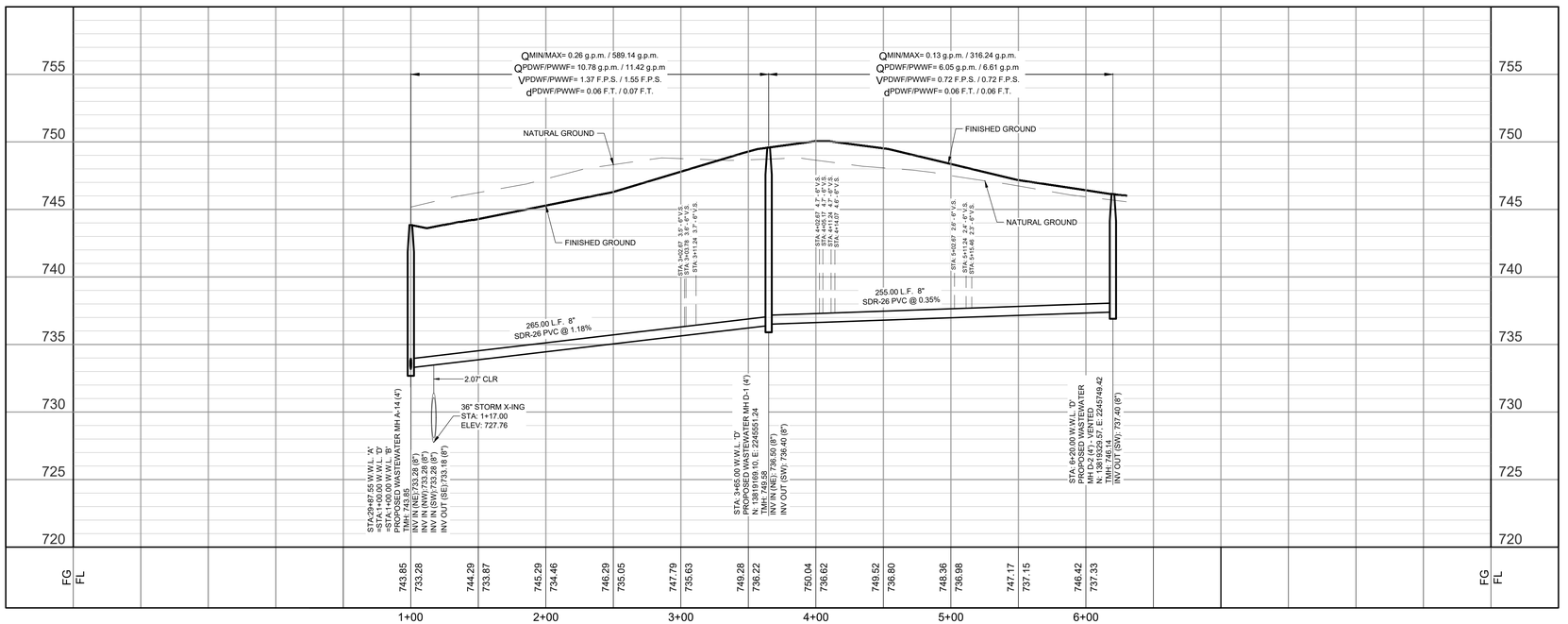
WASTEWATERLINE 'D' 1+00 TO END



VERAMENDI PRECINCT 23 UNIT 1

WASTEWATERLINE 'D' PLAN & PROFILE
1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 3/17/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: 8b_WWL 'D' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.11

FOR PERMIT

K:\SA3856_KSA Properties\2405 23-1\425 Site Development Plans\CAD\~Sheets\sh_WWL 'D' P&P.dwg
Xref Name: ...
Last Modified: Jun 10, 25 - 15:19
Last Plotted: Jul 07, 25 - 14:52:34

GENERAL NOTES:

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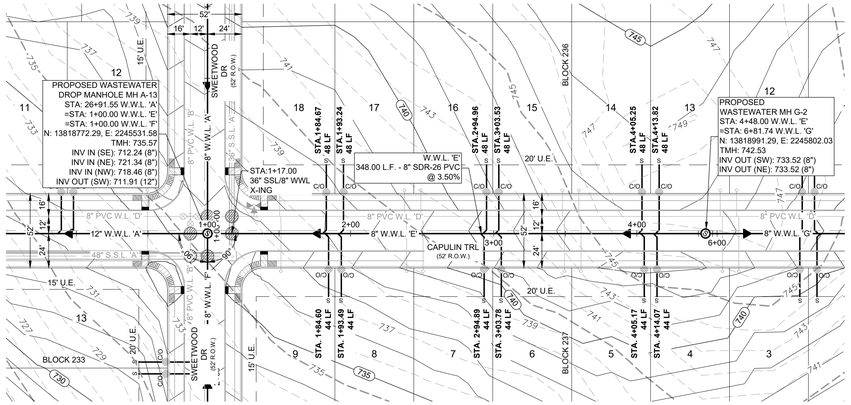
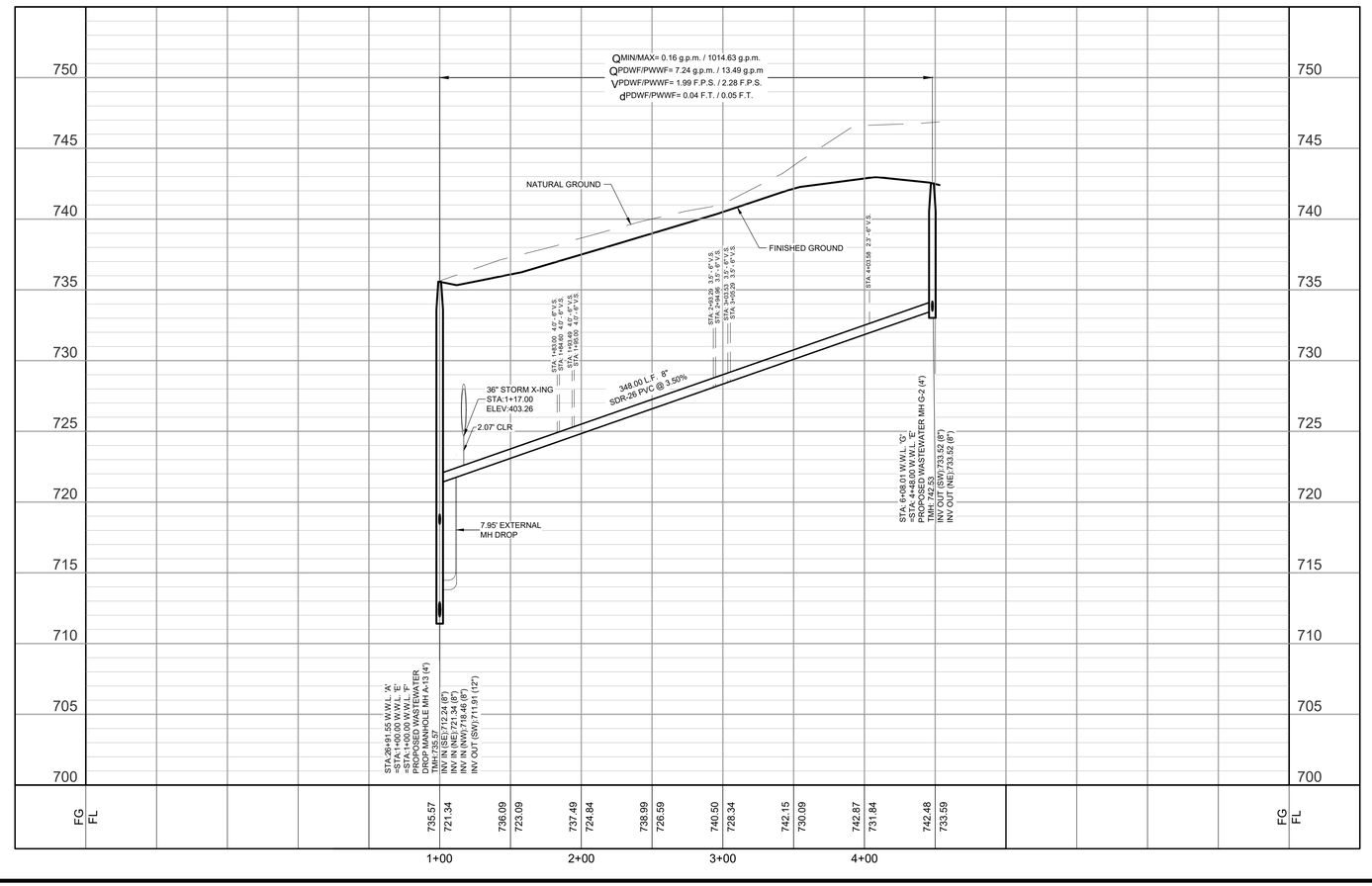


WASTEWATER LINE 'E' STA. 1+00 TO END



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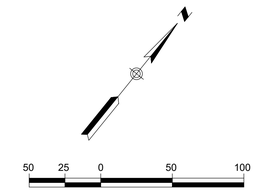

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW	SANITARY SEWER LINE
	WL	WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
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	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'E' PLAN & PROFILE
STA. 1+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 6/3/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: ...\01_WWL 'E' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.12

FOR PERMIT

I:\SA3856 -KSA Properties\2405 23-1\426 Site Development Plans\GWC-Sheets\dn_WWL 'E' P&P.dwg
User: ngower
Last Modified: Jun. 10, 25 - 15:22
Xref Dep/Files: Jun. 06, 25 - 10:57:13

GENERAL NOTES:

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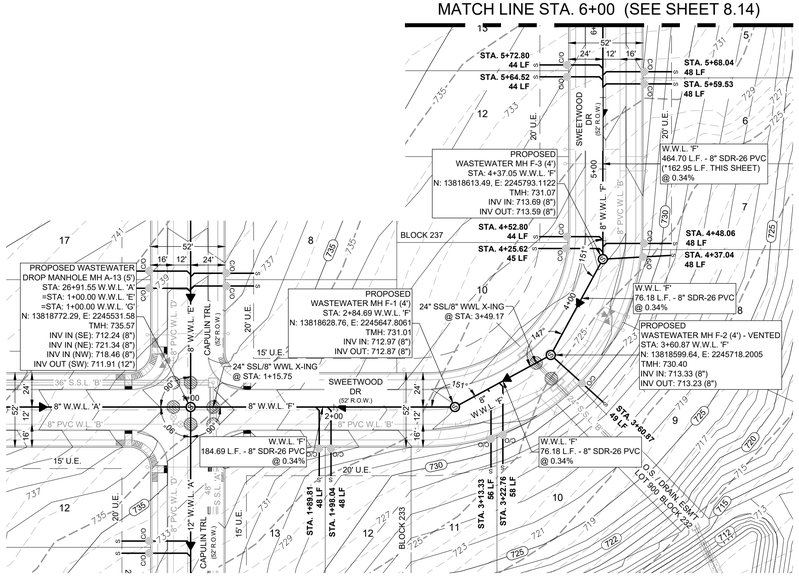
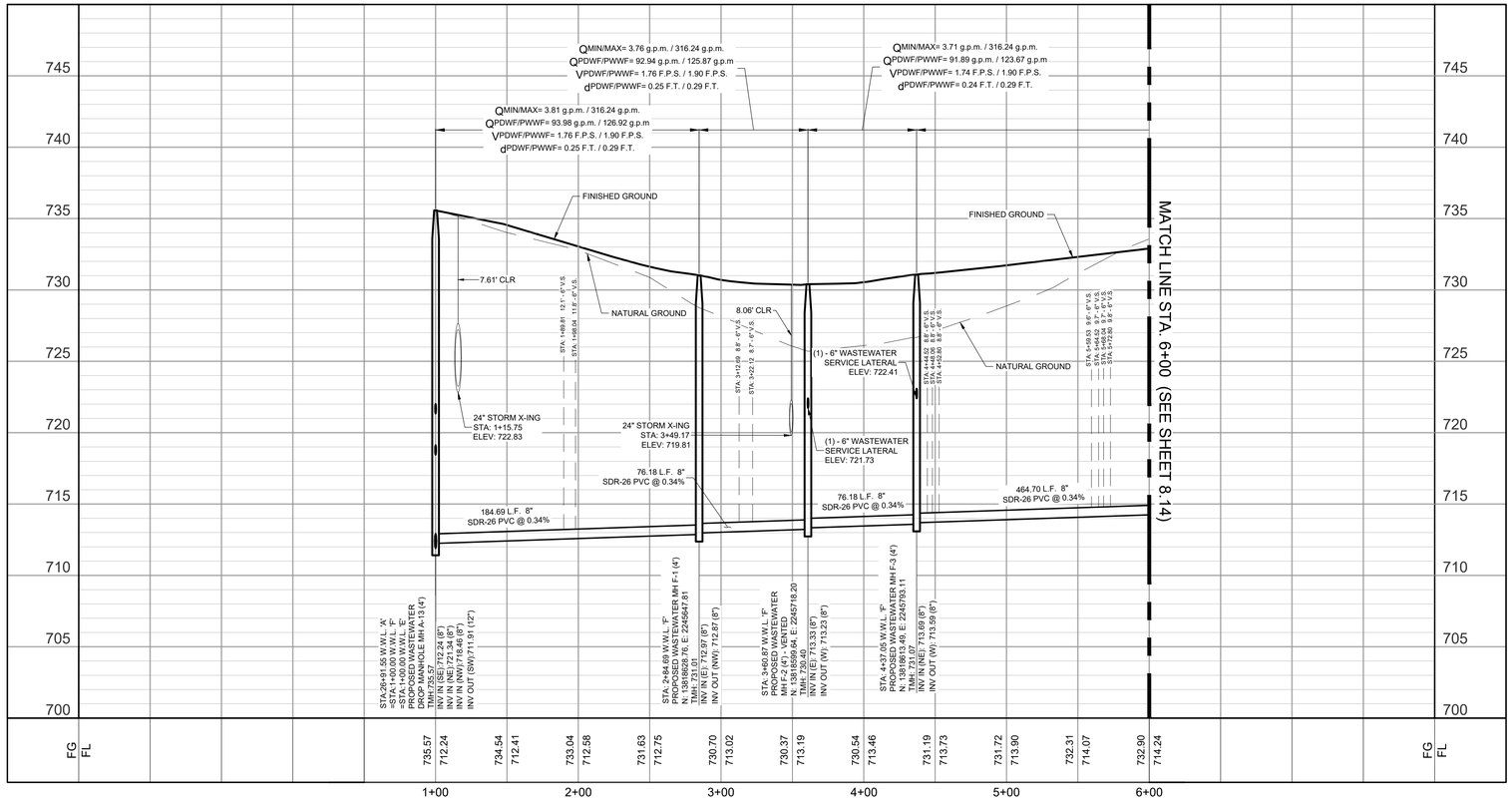


WASTEWATER LINE 'F' STA. 1+00 TO 6+00



LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

50 25 0 50 100

HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'F' PLAN & PROFILE
STA. 1+00 TO 6+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/9/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sht_WWL_F P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.13

FOR PERMIT

K:\SA3856.ISA Properties\2405 23-01(45) Site Development Plans\GWC-Sheets\sh_WWL_1" P&P.dwg
Plotted: Jun. 10, 25 - 15:32
Last Modified: Jun. 10, 25 - 15:32
By: Nicholas Gower

GENERAL NOTES:

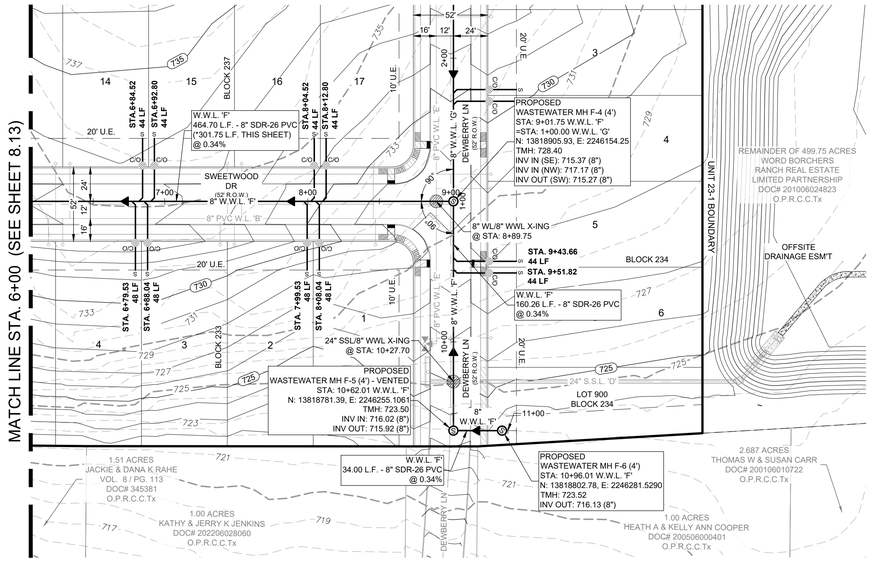
1. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF ALL EXISTING UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION.
2. MANDREL TESTING WILL BE REQUIRED ON ALL FLEXIBLE GRAVITY WASTEWATER PIPE AS PRE TCEQ RULES.
3. ALL GRAVITY WASTEWATER LINES SHALL BE SDR-26 WWL ASTM D3034 UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO FILL AND COMPACT TO 95% DENSITY IN FILL SECTIONS OVER WASTEWATER LINES. 2.0'(MIN.) COVER OVER WATER PRIOR TO CONSTRUCTION.
5. ALL SERVICES SHALL TERMINATE WITH A 2-WAY CLEANOUT.
6. ALL ON-SITE UTILITIES SHALL BE LOCATED UNDERGROUND UNLESS REQUIRED BY THE UTILITY TO BE OTHERWISE LOCATED (SECTION 25-2-1125).
7. 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).
8. WASTEWATER LATERALS SHALL BE LAID WITH AT LEAST 36 INCHES OF COVER.
9. MANHOLE MUST BE CONSTRUCTED OF OR LINED WITH CORROSION RESISTANT MATERIAL. WHERE NEW CONSTRUCTION CONNECTS TO AN EXISTING MANHOLE THAT IS NOT CONSTRUCTED OF A CORROSION RESISTANT MATERIAL. THE EXISTING MANHOLE MUST BE LINED WITH OR REPLACED WITH CORROSION RESISTANT MATERIAL.

CAUTION:

CONTRACTOR TO NOTIFY TEXAS ONE CALL AT 1-800-245-4545 48 HOURS PRIOR TO CONSTRUCTION FOR UTILITY LINE LOCATE. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY SIGNIFICANT DISCREPANCIES OR REQUIRED DESIGN CHANGES. EXISTING UTILITIES SHOWN HEREON ARE FOR INFORMATIONAL PURPOSES ONLY. ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OF THIS INFORMATION.

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 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.



WASTEWATER LINE 'F' STA. 6+00 TO END

LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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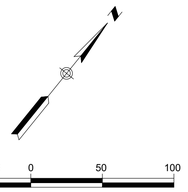
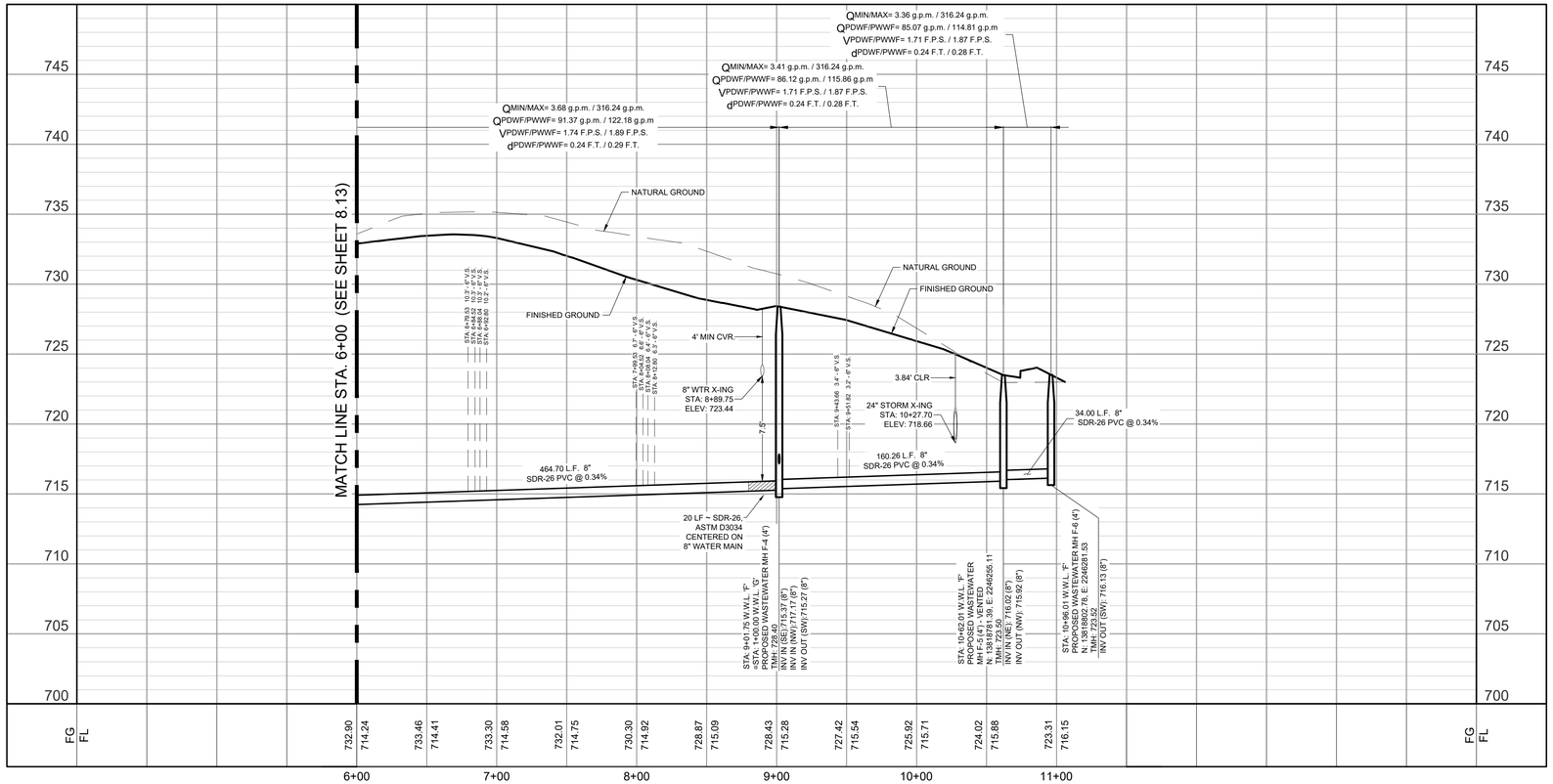


HORIZONTAL SCALE 1" = 50'
VERTICAL SCALE 1" = 5'

LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
WL	WW / WL	SANITARY SEWER LINE / WATER LINE
S C/O	S C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING



FOR PERMIT

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'F' PLAN & PROFILE
STA. 6+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/9/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sht_WWL_F' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.14

K:\SA3856 IGA Properties\2405 23-1 (145 Site Development Plans\GWC-Sheets\sh_WWL_1" P&P.dwg
Xrefs: None
Last Modified: Jun. 10, 25 - 15:32
Last Plotted: Jul. 08, 25 - 10:50

GENERAL NOTES:

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50 25 0 50 100

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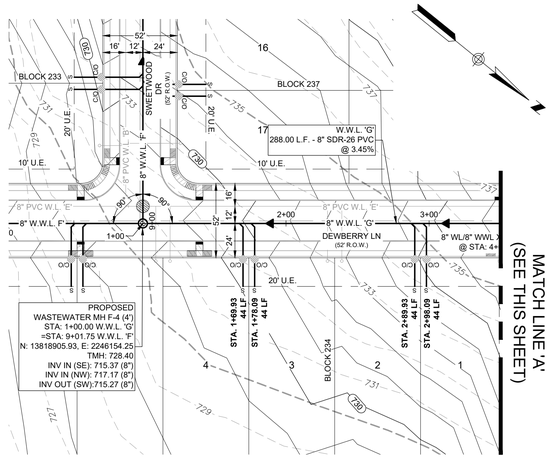
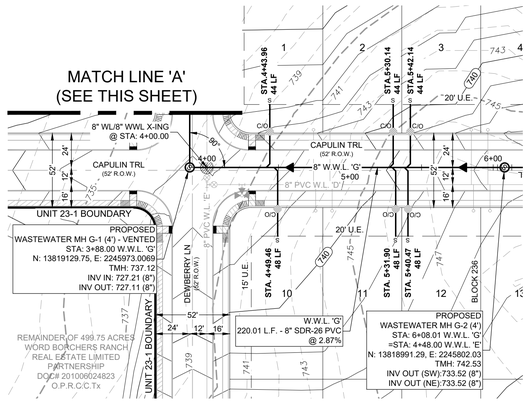
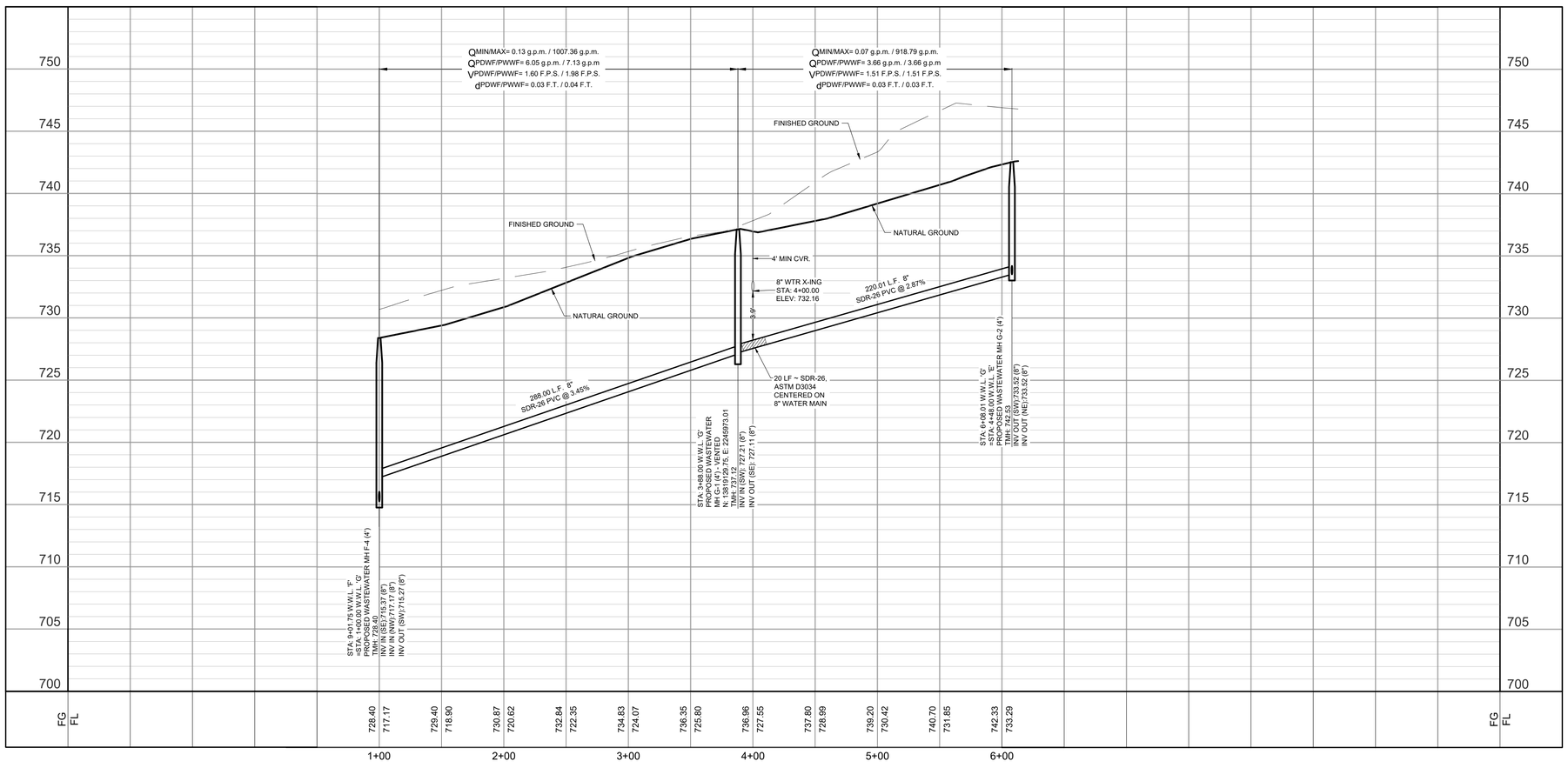




WASTEWATER LINE 'G' STA. 1+00 TO END



LEGEND

PROPOSED	EXISTING	
S	S	SANITARY SEWER MANHOLE
	WW	SANITARY SEWER LINE
WL	WL	WATER LINE
C/O S	C/O	SANITARY SEWER LATERAL w/ CLEANOUT
		WATER VALVE
		SINGLE WATER SERVICE
		FIRE HYDRANT
		WATER METER
	GV	GAS VALVE
GAS	GAS	GAS LINE
D	D	STORM SEWER MANHOLE
		CURB INLET
		POWER POLE
		STREET LIGHT (100 WATT LED)
		STREET LIGHT (250 WATT LED)
		GUY WIRE
OHE	OHE	OVERHEAD ELECTRIC
		BENCHMARK
	TMH	TOP OF MANHOLE
	EX.	EXISTING
	ESM'T.	EASEMENT
	U.E.	UTILITY EASEMENT
	VOL	VOLUME
	PG	PAGE
	DPR	DEED & PLAT RECORDS OF GUADALUPE COUNT,Y TEXAS
	OPR	OFFICIAL PUBLIC RECORDS OF GUADALUPE COUNTY, TEXAS
		UTILITY XING

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER LINE 'G' PLAN & PROFILE
STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 6/3/2025
DESIGNED BY: NG
DRAWN BY: HEW
CHECKED BY: PGF
DRAWING NAME: sh_UWL 'G' P&P.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED PROFESSIONAL ENGINEER
07/08/2025

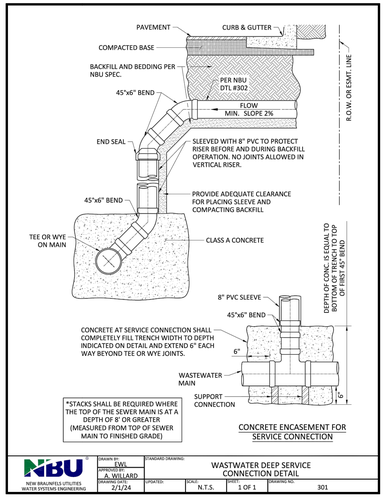
LJA Engineering, Inc.
9830 Colonnade Blvd
Suite 300
San Antonio, Texas 78230
Phone 210.503.2700
LJA.COM
TBPE No. F-1386

JOB NUMBER: SA3856.2405

SHEET NO. 8.15

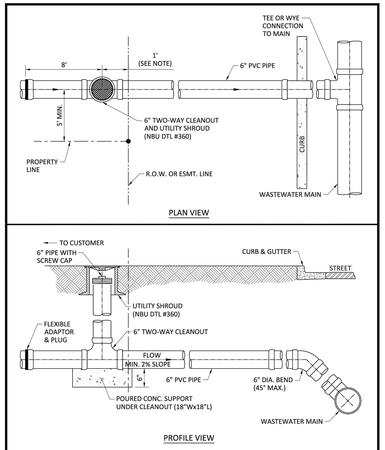
FOR PERMIT

N:\SA3856.ASA Properties\VJA05 23-1\VJ26 Site Development Plans\UWG-Sheets\sh_#WL 'G' P&P.dwg
User Name: ...
Last Modified: Jun. 10, 25 - 10:37
Plot Date/Time: Jun. 10, 25 - 10:37:40



CONCRETE ENCASEMENT FOR SERVICE CONNECTION

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	WASTWATER DEEP SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 301



PLAN VIEW

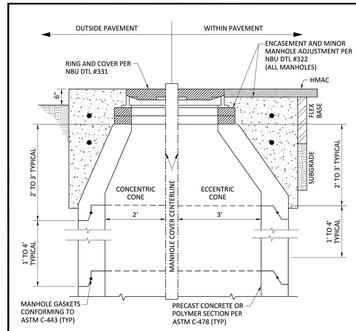
PROFILE VIEW

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SINGLE WASTWATER SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 2	DRAWING NO.: 302

NOTES:

1. UTILITY CONTRACTOR, DURING SUBDIVISION CONSTRUCTION, SHALL INSTALL WASTEWATER CONNECTION TO MAIN, 6" STUB WITH 6" SERVICE BRANCH WITH 2-WAY CLEANOUT, CONCRETE SUPPORT (MIN. 18"Wx18"Lx6"H), RISER FOR CLEAN OUT (CAPPED), UTILITY SHROUD, 7' EXTENSION, AND PLUG. ALL WASTEWATER PIPING SHALL HAVE ELASTOMERIC GASKET TYPE JOINTS AND SHALL SLOPE DOWNWARD TO MAIN AT A MINIMUM 2% SLOPE, ¼" PER FOOT, MINIMUM TO 45° MAXIMUM. DEPTH OF SERVICE STUB AT PROPERTY LINE WILL BE SHOWN ON PLANS BY ENGINEER OR DESIGNATED REPRESENTATIVE IF GREATER THAN 6', OTHERWISE, THE INSTALLED DEPTH WILL TYPICALLY BE 4' TO 6'. IF WASTEWATER SERVICE LINE TO MAIN REQUIRES DEFLECTION EXCEEDING 45°, REFER TO DETAIL 301. ALL INSTALLATIONS SHALL BE MADE IN ACCORDANCE WITH INFORMATION SHOWN ON APPLICABLE STANDARD DRAWINGS AND WILL BE INSPECTED BY NBU CONSTRUCTION INSPECTION PERSONNEL.
2. CUSTOMER SHALL REMOVE PLUG, INSTALL 4" WASTEWATER LINE [EXTEND 4" PIPE 6" MINIMUM INTO 6" PIPE AND JOINT WITH FLEXIBLE ADAPTOR]. IF WASTEWATER WILL NOT SATISFACTORILY FLOW BY GRAVITY TO SEWER MAIN ADJACENT TO PROPERTY, PUMP EQUIPMENT MUST BE PROVIDED BY THE CUSTOMER AS PART OF CUSTOMER'S WASTEWATER SYSTEM.
3. CUSTOMER IS RESPONSIBLE FOR PIPING SYSTEM UNTIL WASTEWATER IS CONNECTED. ANY MISSING OR DAMAGED PARTS SHALL BE REINSTALLED BY CUSTOMER WHO SHALL GUARANTEE, FOR A PERIOD OF TWO (2) YEARS FROM DATE OF FINAL ACCEPTANCE, THAT CONNECTIONS TO NBU SYSTEMS ARE FREE FROM DEFECTS IN WORKMANSHIP OR MATERIALS. CUSTOMER MUST ENSURE THAT 2-WAY CLEANOUTS REMAIN CLEAR OF SIDEWALKS AND OTHER OBSTRUCTIONS.
4. NBU ACTIVITY IS LIMITED TO INSPECTION OF CONNECTIONS TO NBU'S WASTEWATER SYSTEM. NBU'S MAINTENANCE RESPONSIBILITY ENDS AT THE CUSTOMER'S WASTEWATER CONNECTION TO THE 2-WAY CLEANOUT OR THE PROPERTY LINE, WHICHEVER IS CLOSER TO WASTEWATER MAIN.
5. PIPING IN STREET RIGHT-OF-WAY AND IN EASEMENT AREA SHALL BE BEDDED IN GRANULAR MATERIALS AND BACKFILLED AS REQUIRED BY NBU STANDARD SPECIFICATIONS. SERVICE LINES IN THESE AREAS SHALL HAVE A MINIMUM COVER BELOW FINAL STREET GRADE OF 42"; ANY EXCEPTION MUST BE SPECIFICALLY APPROVED BY NBU WATER ENGINEERING.

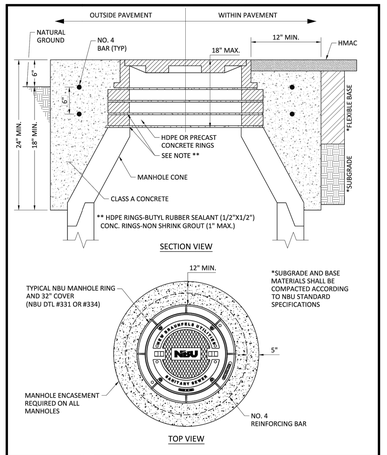
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SINGLE WASTWATER SERVICE CONNECTION DETAIL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 2 OF 2	DRAWING NO.: 302



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.

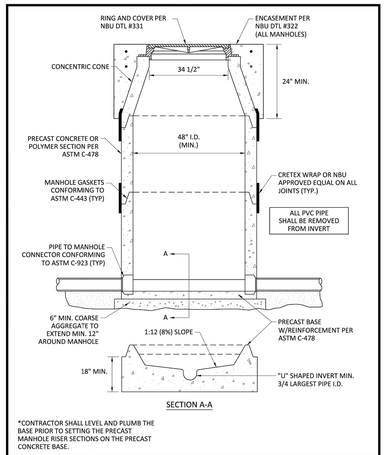
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MAJOR MANHOLE ADJUSTMENT	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 321



SECTION VIEW

TOP VIEW

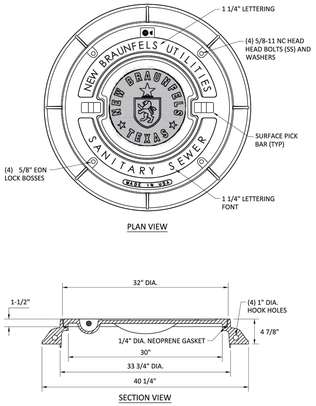
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENT	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 322



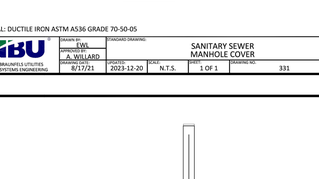
SECTION A-A

*CONTRACTOR SHALL LEVEL AND PLUMB THE BASE PRIOR TO SETTING THE PRECAST MANHOLE RISER SECTIONS ON THE PRECAST CONCRETE BASE.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	WASTEWATER MANHOLE ON PRECAST BASE	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 328



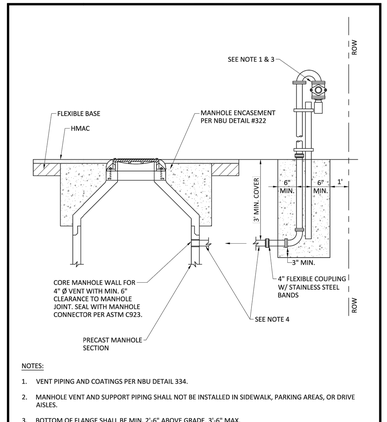
PLAN VIEW



SECTION VIEW

MATERIAL: DUCTILE IRON ASTM A536 GRADE 70-50-05

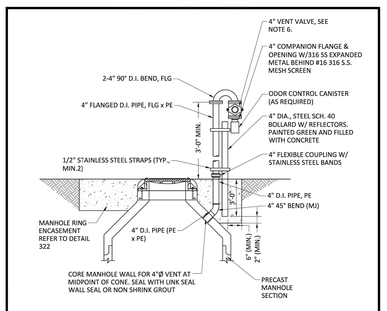
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	SANITARY SEWER MANHOLE COVER	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 8/17/21	UPDATED: 2023-12-20	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 331



NOTES:

1. VENT PIPING AND COATINGS PER NBU DETAIL 334.
2. MANHOLE VENT AND SUPPORT PIPING SHALL NOT BE INSTALLED IN SIDEWALK, PARKING AREAS, OR DRIVE AISLES.
3. BOTTOM OF FLANGE SHALL BE MIN. 2'-6" ABOVE GRADE, 3'-6" MAX.
4. VENT PIPING FROM MANHOLE TO 90 DEG. VERTICAL BEND MUST BE LAID TO DRAIN TO THE MANHOLE AT MIN. 2% SLOPE.

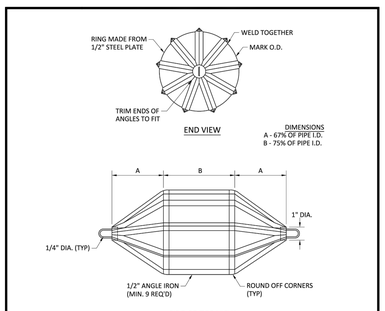
NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MANHOLE VENT PAVED AREAS	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 333



NOTES:

1. ALL BOLTS AND HARDWARE TO BE 316 STAINLESS STEEL.
2. DUCTILE IRON PIPE AND FITTINGS TO HAVE FACTORY APPLIED PROTECTO 401 EPOXY INTERIOR COATING.
3. EXTERIOR OF DUCTILE IRON PIPES AND FITTINGS TO BE FACTORY COATED WITH FACTORY APPLIED PRIME COAT AND SURFACE COAT OF GREEN FUSION BONDED EPOXY.
4. CONTRACTOR TO FIELD COAT WITH PENETRATING EPOXY PRE-PRIMER AND HIGH SOLIDS EPOXY SILOXANE PER NBU SPECIFICATION 530.
5. PROVIDE ODOR CONTROL CANISTERS ON VENTS WHERE INDICATED ON THE PLANS.
6. BOTTOM OF COMPANION FLANGE MUST BE 1' ABOVE THE FEMA BASE FLOOD ELEVATION (BFE), MAXIMUM HEIGHT ABOVE GRADE OF 6'. INSTALL WAGER 1700 VENT VALVE, OR APPROVED EQUAL, WHERE BFE IS MORE THAN 18" ABOVE PROPOSED GRADE.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	MANHOLE VENT NON-PAVED AREAS	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 334



END VIEW

DIMENSIONS
A - 67% OF PIPE I.D.
B - 75% OF PIPE I.D.

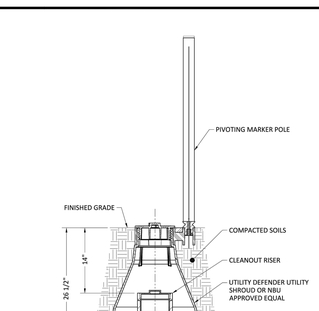
SIDE OR TOP VIEW

MANDREL REQUIREMENTS:

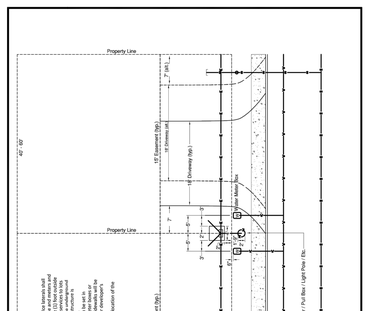
1. O.D. NOT LESS THAN 95% OF THE I.D. OF THE PIPE, AS SPECIFIED BY THE APPLICABLE ASTM, AWWA, UNI-BELL OR ANSI STANDARD.
2. ABLE TO WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
3. ODD NUMBER OF RUNNERS OR LEGS.

*THIS INFORMATION IS PROVIDED AS A REFERENCE. ALL DEFLECTION TESTING SHALL BE DONE IN ACCORDANCE WITH TCEQ CHAPTER 217.

NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	GO, NO GO DEFLECTION TESTING MANDREL	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 350



NBU	DRAWN BY: EWL	APPROVED BY: A. WILLARD	STANDARD DRAWING:	UTILITY SHROUD FOR SEWER CLEANOUT ASSEMBLY	
NEW BRAUNFELS UTILITIES WATER SYSTEMS ENGINEERING	DRAWING DATE: 2/1/24	UPDATED:	SCALE: N.T.S.	SHEET: 1 OF 1	DRAWING NO.: 360


Property Line
40' 60'
1.5" Electrical Conduit
1.5" Telephone Conduit
1.5" Drainage Pipe
Property Line
3'
3'
6'
7'
6'
Property Line
NOTE:
a. Electrical, telephone and drainage services shall be constructed in the property line and underground as shown on the plan. Any deviation from the property line, Wastewater services to lots shall be constructed in the property line and shall be installed in the front easement.
b. Wastewater service to lots without a driveway or sidewalks, any meter, boxes or appurtenances shall be placed in the property line unless approved by the inspector.
c. Contractor shall be held responsible for the location of the clean out and sewer stub.
4" PVC SCH 40
4" PVC SCH 40
Transformer / Pull Box / Light Pole / Etc.
Property Line
4" PVC SCH 40
4" PVC SCH 40
4" PVC SCH 40

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 __ of __.

   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 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329

THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

NBU Wastewater Notes

1. The point of delivery for an NBU owned and maintained wastewater line is typically the cleanout, property line, or edge of easement or as determined by NBU.
2. The contractor shall maintain service to the existing wastewater system at all times during construction.
3. All new wastewater mains and fittings shall be minimum 8-inch diameter (ASTM D-3034 SDR-26 PVC).
4. All residential wastewater service laterals shall be extended four (4) feet into the Public Utility Easement and a cleanout installed at the ROW line per NBU Standard Details. Services to lots will extend four (4) feet past the underground electric conduit if electric is installed in the front easement.
5. All sewer cleanouts that lead to NBU mains shall be installed with a protective utility shroud and pivoting marker pole during time of construction.
6. Pipe bedding of wastewater lines shall be compliant with NBU specification No. 120, "Utility Trenching and Backfill".
7. Wastewater mains shall have a minimum of 48 inches of cover to finished grade and wastewater laterals must have a minimum of 36 inches of cover to finished grade. Concrete encasement will be required if minimum cover cannot be met.
8. All gravity wastewater pipes shall have gasketed, compression or fused joints per 30 TAC §217.53 (c) (2).
9. For wastewater lines less than 24 inches 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-inch, 12-inch maximum lifts shall be used.
10. All manholes shall be water-tight, either monolithic, cast-in-place concrete structures or prefabricated manholes specifically approved by NBU. Polymer concrete is required for manholes on mains 18-inch diameter and larger, at force main discharge points, or at drop manholes with high corrosion potential.
11. Manholes shall have bolted water-tight rings and covers. In non-paved areas, a manhole marker assembly shall be installed on the manhole cover.
12. Manhole vents shall be installed at intervals no greater than 1500 feet.
13. All manholes shall be constructed so that the top of the ring is six inches (6") above surrounding ground in non-paved areas. In paved areas, the manhole ring shall be flush with pavement.
14. All new manholes, unless approved by NBU, shall have covers with 32-inch openings.
15. Wastewater pipe connections to pre-cast manholes will be compression joints or mechanical "boot type" joint as approved by NBU.
16. Existing manholes shall be lined, coated, or replaced with a corrosion resistant material if a new connection is made by a main or lateral.
17. Wastewater mains shall be tested from manhole to manhole.
18. 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.
19. NBU Inspector to be present for all wastewater lines to be installed at depths of 15 feet or greater from final grade.
20. 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 requirements. The wastewater line shall be constructed of ASTM D2241 PVC or AWWA C900 PVC with pressure rating of 150 psi and shall be in accordance with 30 TAC §217.53 (d) (3) (A) (i).
21. Contractor shall coordinate with the assigned water/wastewater inspector for completion of the Field Acceptance Checklist. No testing will be performed prior to 30 days from complete installation. All testing and acceptance shall conform to NBU Specifications be completed in the following order:
    a. Pipe Deflection Test (Mandrel Test)
    b. Pipe Low Pressure Air Test
    c. Manhole Vacuum Test
    d. Manhole Protective Coating Test
    e. CCTV Inspection (within 72 hours of cleaning and flushing)
22. 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.

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.
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.

VERAMENDI PRECINCT 23 UNIT 1

WASTEWATER DETAILS (SHEET 2 OF 2)

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 6/6/2025
DESIGNED BY: NG
DRAWN BY: TM
CHECKED BY: PF
DRAWING NAME: sh_Wastewater Details.dwg

STATE OF TEXAS
NICHOLAS GOWER
139260
LICENSED
PROFESSIONAL ENGINEER
07/08/2025

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JOB NUMBER: SA3856.2405

SHEET NO. 8.17

FOR PERMIT

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Xref Name: ...
Last Modified: Jun. 06, 25 - 14:42
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Exhibit CC

to Development Agreement

Utility Agreement

UTILITY CONSTRUCTION COST SHARING AGREEMENT FOR THE VERAMENDI DEVELOPMENT

This *Utility Construction Cost Sharing Agreement for the Veramendi Development* (the "Agreement") is made and entered into as of February 25, 2013, by and between **NEW BRAUNFELS UTILITIES** ("NBU"), a municipally owned utility charged with exclusive management and control of the water and sewer systems of the **CITY OF NEW BRAUNFELS** ("City") as authorized under Section 11.09 of the charter of the City; **WORD-BORCHERS RANCH JOINT VENTURE,** a Texas general partnership ("Developer"); and **COMAL COUNTY WATER IMPROVEMENT DISTRICT NO. 1,** a political subdivision of the State of Texas (the "District"). NBU, Developer, and the District are sometimes collectively referred to herein as the "Parties".

RECITALS

A. Developer owns the rights to acquire approximately 2,400 acres of land (the "Property") located in Comal County, Texas and within the extraterritorial jurisdiction of the City and within the geographical boundaries of the District. The Property is more particularly described in the attached **Exhibit No. 4**. In order for NBU to provide long-term, adequate water and sewer service to the Property, major potable water and sanitary sewer infrastructure facility improvements will need to be constructed;

B. The Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited Partnership, (the "Landowner") is the currently the owner of the Property. By the signature below of its authorized representatives the Landowner affirms it has an agreement with Developer as described in A above and accepts and consents to the terms of this Agreement;

C. Developer also is or will be party to the February 25, 2013 *Development Agreement Between City of New Braunfels and Word-Borchers Ranch Joint Venture for Proposed Mixed Use Development* (the "Development Agreement") authorizing development of the Property in accordance with the Master Framework Plan attached as **Exhibit No. 5**, as it will be amended from time to time under the Development Agreement. The Property may also be referred to in this Agreement as the Veramendi Development;

D. Developer has filed a service extension application for potable water and sanitary sewer service for the Property, which application requests cost participation by NBU for oversizing the elevated storage tank within the Property and a rebate of capital recovery fees for the elevated storage tank and booster station pursuant to the NBU's Water Systems Connection and Construction Policy dated May 2003 (the "NBU Policy");

E. As provided in the NBU Policy, a written contract is required between the Developer, the District and NBU, as well as a study determining the amount of cost reimbursement which may be appropriate;

F. The Chief Executive Officer of NBU ("CEO") has determined that (i) the elevated water storage tank and booster station that Developer proposes to construct are designated in the NBU's current impact fee capital improvements plan for that category of capital improvement; (ii) the size, of the proposed elevated water storage tank and booster

station complies with generally accepted engineering practices, and other planning criteria of NBU, and the final design will comply with the NBU Policy; (iii) the proposed elevated water storage tank and booster station are a reasonable addition to the NBU's water system; (iv) funds for participating in the cost of oversizing will be available to meet the proposed payment schedule; and (v) the study prepared by the Developer proposing the rebate of capital recovery fees fairly apportions the improvement costs among prospective users of the facilities to be installed;

G. NBU desires to increase the size of the elevated water storage tank from 1.5 million gallons to 2.5 million gallons, and to request oversizing of various water and wastewater lines depicted in the Developer's proposed utility infrastructure facilities and as described in Exhibit No. 1, subject to final review and approval by NBU prior to the beginning of design of the proposed improvements;

H. Developer has agreed to construct its proposed water and wastewater facilities as generally shown in **Exhibit No. 2**, Master Water Plan, and **Exhibit No. 3**, Master Sewer Plan, and as further described and recommended in the Utility Engineering Report of August 2011, and included in this Agreement as **Exhibit No. 6**;

I. Developer understands and agrees that the current available uncommitted service capacity in the NBU water and wastewater infrastructure is limited to 400 living unit equivalents ("LUEs") of water and 400 LUEs of wastewater service and that additional service capacity may be available to Developer if Developer assists NBU with the installation of additional offsite utility infrastructure as Developer and NBU may agree in accordance with Section 5.01 below;

J. Developer agrees to construct the elevated water tank and booster stations at sites within the Property acceptable to NBU to service the needs of the development on the Property, as well as the surrounding area, and that Developer will pay for the design and construction of the elevated tank and other improvements in accordance with this Agreement;

K. After considering the factors set forth in the NBU Policy, the CEO finds that it is appropriate to enter into this Agreement to reimburse Developer for utility facility oversizing identified in this Agreement, and to pay Developer a rebate of capital recovery fees in accordance with the terms of this Agreement and the NBU Policy;

L. NBU and Developer are entering into this Agreement to set forth more particularly the rights and obligations of NBU and Developer with respect to the site, design, construction and payment for the proposed water and wastewater facilities , including the elevated water storage tank and booster station;

M. This Agreement is necessary to protect the health, safety and general welfare of the community and to limit the harmful effects of substandard subdivisions; to facilitate Developer's construction of the desired facilities; and to protect the City of New Braunfels and NBU from bearing any unnecessary expense of constructing or completing subdivision improvements; and

N. This Agreement is authorized by and consistent with state law, the ordinances, regulations, and policies of the City of New Braunfels and NBU, as well as other requirements governing development of subdivisions, and provision of utility services to customers of NBU.

NOW THEREFORE, IN CONSIDERATION of the foregoing recitals and the mutual covenants, promises and obligations by the parties set forth in this Agreement, the Parties agree as follows:

ARTICLE I.

For purposes of this Agreement, the District may act on behalf of the Developer in accordance with the terms and conditions of this Agreement.

ARTICLE II.
Definitions

Section 2.01 For purposes of this Agreement, the terms set forth below shall have the meanings set forth below.

(a) Agreement: This *Utility Construction Cost Sharing Agreement for the Veramendi Development.*

(b) City: The City of New Braunfels, Texas, a Texas home rule city.

(c) Consent Resolution: The February 25, 2013 "Consent Resolution" of the City of New Braunfels consenting to the creation of the Comal County Water Improvement District No. 1.

(d) Developer: The Word-Borchers Ranch Joint Venture, a Texas general partnership, whose principal place of business is New Braunfels, Texas.

(e) Development Agreement: The February 25, 2013 *Development Agreement Between City of New Braunfels and Word-Borchers Ranch Joint Venture for Proposed Mixed Use Development* by and between the City of New Braunfels and Word-Borchers Ranch Joint Venture.

(f) District: The Comal County Water Improvement District No. 1, a water control and improvement district created under Section 59, Article XVI of the Texas Constitution and authorized and operating pursuant to Chapter 9038 of the Texas Special Districts and Local Laws and Chapters 49 and 51 of the Texas Water Code.

(g) Fire Flow: Water required for firefighting purposes as defined in the City of New Braunfels Code of Ordinances.

(h) GWWTP: The Gruene wastewater treatment plant owned and operated by New Braunfels Utilities and commonly referred to as the Gruene Plant.

(i) Impact Fee: The water and wastewater capital recovery fees, defined in Chapter 130,

Article VI, Section 130-336 of the City of New Braunfels Code of Ordinances.

(j) Internal Water Facilities: Those water facilities necessary to provide water service within the Property.

(k) Internal Sewer Facilities: Those sewer facilities necessary to provide sewer service within the Property.

(l) Intensity of Utility Service and Phasing Exhibit: The exhibit attached as Exhibit 1 to the Utility Engineering Report.

(m) LUE: The standardized unit of measure for water and wastewater service as defined in Section 130-336 of the City of New Braunfels Code of Ordinances.

(n) Master Framework Plan: The land use plan attached hereto as Exhibit 5 and as amended from time to time in accordance with the Development Agreement.

(o) NBU: New Braunfels Utilities, a municipally owned utility charged with exclusive management and control of the water and sewer systems of the City of New Braunfels, as authorized under Section 11.09 of the charter of the City.

(p) NBU Facilities: Those water and sewer facilities owned by NBU.

(q) Parties: ~~The parties to this~~ *Utility Construction Cost Sharing Agreement for the Veramendi Development,* specifically New Braunfels Utilities, Word-Borchers Ranch Joint Venture, and the Comal County Water Improvement District No. 1.

(r) Policy: The Water Systems Connection and Construction Policy of New Braunfels Utilities, as amended from time to time.

(s) Potable Water: All water distributed by NBU which meets the applicable state, local and federal standards for human consumption or which may be used in the preparation of foods or beverages, specifically including, by way of example and not in limitation, the rules of the Texas Commission on Environmental Quality (TECQ) set out in 31 TAC Section 290.

(t) Drinking water standards: The TCEQ rules setting drinking water standards set out in 31 TAC Section 290.

(u) Project: The master-planned, mixed use development on the Property as more fully described in the Development Agreement, and commonly known as the Word-Borchers Ranch or the Veramendi Development.

(v) Property: Approximately 2,462 acres of real property in Comal County, Texas, within the Extraterritorial Jurisdiction of the City of New Braunfels, and as more particularly described in Exhibit No. 4.

(w) Utility Engineering Report: The August 2011 "Word-Borchers Tract Utility Engineering Report—Water and Sewer Infrastructure" by Pape-Dawson Engineers.

ARTICLE III.

Section 3.01 Water Service.

(a) The Property is within the area covered by Certificate of Convenience and Necessity Number 10677 issued to New Braunfels Utilities by the Texas Commission on Environmental Quality or its predecessor agency. NBU projects the Property will require a total of 7,686 LUEs of water service for the ultimate build-out of the Property. Subject to Developer's satisfaction of its obligations under this Agreement, NBU agrees to provide water service in such capacity to customers within the Property. NBU shall provide such service at such time or times as the Property, or a specific phase of it, is completed by Developer according to the terms of this Agreement and NBU policy in effect at that time, and accepted by NBU. The number and location of the points of connection between NBU's Facilities and the Internal Water Facilities shall be agreed upon by NBU and the Developer. All references in this Agreement to "water" shall be deemed to refer to "Potable Water" unless the water is expressly referred to as non-potable water.

(b) NBU projects that sufficient water capacity exists or will be available to provide the projected LUEs of water to serve the Property. In addition, NBU acknowledges the Property is included in the current NBU Water Availability Report submitted to Comal County.

(c) Subject to Developer completing its obligations under this Agreement and NBU Policy, NBU shall manage its water supply, treatment and distribution facilities so that the projected capacity to serve development within the Property is available at the time(s) that the water facilities within the Property are approved and accepted by NBU. NBU has within its water supply capacity to provide the Property with up to 400 LUEs of water provided that Developer constructs Internal Water Facilities that meet NBU standards and policies.

(d) As required by law to serve the Property, NBU agrees to expand, enlarge, and modify its water supply, treatment and distribution facilities, and to secure all necessary approvals of applicable local, state and federal regulatory authorities.

(e) To enable NBU to manage effectively its water system capacities so as to meet the future water needs outlined in this Agreement and NBU Policy, the Developer shall provide to NBU by December 31 of each year during the term of this Agreement, a written projection of the new development within the Property expected to be connected to the Internal Facilities within the year following that projection and to provide any other related information NBU may reasonably require.

(f) NBU agrees to construct, at its cost and expense, improvements and new facilities outside the Property that NBU determines are needed to provide the water capacity to serve the expected needs of the Property.

Section 3.02 Construction of Internal Facilities.

(a) As more fully described in Section 3.03, below, Developer shall be responsible for the construction of those Internal Facilities necessary to provide adequate potable water service and Fire Flow pressure within the boundaries of the Property. Unless provided otherwise in this Agreement, "**Internal Facilities**" means water and wastewater lines, water storage tanks, booster stations, and other physical structures or improvements related to or necessary for water and wastewater utility service within the Property.

(b) NBU reserves the right to request oversizing of water facilities needed to serve the system beyond those required by the Property. NBU agrees to provide Developer with appropriate advance written notice of such oversizing requests prior to the Developer's design of the related facilities and to pay Developer the cost of oversizing as permitted by NBU policy.

Section 3.03 Internal Facilities.

The development of the Property will include areas within NBU Pressure Zones 4 and 5. Of the 7,686 LUEs of water service projected for the ultimate build out of the Property, approximately 5,578 LUEs will be located within Pressure Zone 5 and approximately 2,102 LUEs will be located within Pressure Zone 4. In this regard, Developer may allocate said LUEs of water service within its Property without restriction provided that NBU first verifies that sufficient capacity exists for such usage at the pertinent location. Possible Internal Facilities necessary for potable water service for the development of the Property include the following, all of which Developer will be obligated to construct at its sole cost and expense:

(a) An estimated 1,500-foot extension of the existing 12-inch water main in Oak Run Parkway;

(b) A series of 120 to 150-foot extensions from the property to connect to the existing 12-inch water main along Loop 337 within the two pressure zones;

(c) Multiple 8-inch and 12-inch mains in accordance with NBU's policies and the proposed Word-Borchers Master Water Plan for the development (depicted in Exhibit 2);

(d) A series of 12-inch to 24-inch mains along major roads to provide appropriate interconnections within the Property;

(e) New elevated water storage tank as follows:

- An elevated storage tank of 1.5 million gallons on a site within the Property determined by NBU with the shape and materials to be determined by NBU. The real property for the tank lot must be adequate to accommodate up to a 2.5 million gallon tank.

- Utilization of 500,000 gallons of the new elevated tank as ground storage for Pressure Zone 4 and a new high service pump for Pressure Zone 4.

(f) A new 16-inch main from the new water storage facility to service Pressure Zone 4;

(g) A new 12-inch and a new 24-inch main from the proposed elevated storage facility along Loop 337 to serve Pressure Zone 5;

(h) The proposed elevated water storage tank may be oversized by NBU;

(i) A high service pump station at the proposed elevated tank site location to provide adequate service to the portions of the Property within Service Level 4. This high service pump station shall be designed to operate within similar parameters to existing pump stations operating within the Pressure Zone 4 (Kerlick Zone). This high service pump station shall provide appropriate flows for peak day demands and provide appropriate fire flows to the Property in accordance with NBU guidelines and City requirements.

Section 3.04 Fire Flow.

NBU shall deliver water service to the points of connection agreed upon by the Parties with sufficient quantity to meet Fire Flow requirements of applicable law and consistent with standards for NBU service in effect at the time of connection.

Section 3.05 Capacity Requirement for Potable Water Main System.

NBU will require the potable water main system within the Property located within Pressure Zone 5 to provide an additional pass through flow capacity of 5,000 gallons per minute, or the equivalent capacity of a 36-inch water main, from the northern property line at Hueco Springs Road to Loop 337. The final alignment and water main sizes to convey the additional flow capacity will be coordinated with the Developer. Selected main(s) to be oversized for the benefit of NBU will be coordinated with the Developer.

Section 3.06 Joint Efforts and Obligations.

(a) NBU and Developer agree to coordinate the sizing of the new water mains (two [2] estimated) required to provide this additional pass through capacity. This additional capacity requirement will require the oversizing of proposed 12-inch and 16-inch distribution water mains to a 24-inch and a 36-inch water transmission main to eliminate the need for construction of parallel border mains.

(b) NBU and Developer agree that Developer will be allowed to make 12-inch service taps at intervals of a minimum of 500-feet along the oversized transmission mains to provide service to developments adjacent to the larger transmission mains. Developer shall be subject to the fees for each tap in effect at that time if the tap is installed by NBU.

ARTICLE IV.

Section 4.01 Sewer Service. NBU projects s the Property will require a total of 6,427 LUEs of sewer collection, treatment and disposal service for the ultimate build-out of the Property. Subject to Developer's satisfaction of its obligations under this Agreement, NBU represents it has or will have facilities to provide the needed wastewater service. NBU shall provide such

service at such time or times as the Property, or a specific phase of it, is completed by Developer according to the terms of this Agreement and NBU policy in effect at that time, and accepted by NBU. The number and location of the points of connection between NBU's Facilities and the Internal Facilities shall be agreed upon by NBU and the Developer.

(a) NBU has current wastewater treatment and collection capacity within its existing system to provide the Property with up to 400 LUEs of interim, initial sewer capacity, provided that Developer constructs the necessary Internal Facilities according to the terms of this Agreement. However, this capacity is not intended to offset or reduce the total projected LUEs specified above and will not be used to reduce the sewer collection and treatment infrastructure capacity required for the Property development. NBU agrees it may add new wastewater capacity to meet the needs of its system in accordance with the time frames required under law.

(b) As more fully described in Section 4.02, below, Developer shall be responsible for the construction of those Internal Facilities necessary to provide wastewater service meeting the requirements mandated by state and federal law.

(c) In order to have sufficient wastewater treatment capacity to serve the Property in excess of its present capacity, NBU agrees to construct at its own cost and expense, as and when required by 30 TAC § 305.12.6, as amended, and by any report submitted to the TCEQ pursuant to such administrative rule, a new wastewater treatment plant with sufficient capacity to serve the projected needs of the Property when combined with NBU's existing wastewater treatment plant capacity. NBU agrees that it will file a completed permit application with the TCEQ, and then commence and complete on-ground construction on such treatment plant within the time frames required by law.

Section 4.02 Internal Sewer Infrastructure.

(a) The Property will include development within three sewersheds, with all generated sanitary sewer flows transferred through the NBU wastewater collection and treatment systems. Exhibit No. 3, Master Sewer Plan, reflects the preliminary alignments and locations of the proposed gravity mains, lift stations, and force mains required to provide sanitary sewer service to the Property.

(b) The preliminary sizing of the facilities reflected in the Master Sewer Plan was defined to provide service to the proposed development only. NBU reserves the right to request extension of proposed gravity sewer mains within the Property in accordance with the NBU Policy in effect to support future developments north of this tract.

Section 4.03 Off Site Sewer Improvements.

(a) NBU has developed a program for the expansion and/or replacement of the Blieders Creek Lift Station and Force Main and the GWWTP (collectively, the "**Offsite Improvements**"). The actual development rates of the Property will have a direct impact on these facilities. Developer will provide support and participation in the improvement or expansions of the Offsite Improvements according to the specific terms and conditions that will be outlined in a separate agreement with NBU and any reimbursement of

Developer will be governed by that separate agreement, and as allowed by the NBU impact fee policy in effect at that time. Developer and NBU agree that NBU's existing sanitary sewer facilities, including but not limited to the existing gravity mains located within the Property to the Blieders Creek Lift Station, the Blieders Creek Lift Station and Force Main, the GWWTP, and the existing easements, do not have adequate capacities or space to support and accommodate anticipated generated sewer flows and additional gravity sewer mains from the fully developed Property.

(b) If NBU determines that the Blieders Creek Lift Station and Force Main are to remain in operation under the conditions defined in this Section 4.03, Developer agrees to provide, as part of its development of the Property, designs, surveys, and easement descriptions for the gravity outfall segments designated as S1 through S5.

(c) NBU agrees to secure and purchase all additional easements required for construction of the proposed outfall main segments S1 through S5 to the Blieders Creek Lift Station.

(d) NBU agrees to pay the cost for oversizing of wastewater lines that may be required to serve the Property based on the difference between the cost of the competitive bids received for the proposed lines and the cost of the competitive bids received for the oversized lines. NBU will reimburse Developer for the cost of oversizing such wastewater lines as provided in Article X.

(e) Should NBU determine that a new and differently aligned gravity outfall sewer main, lift station, and force main to transfer generated sanitary sewer flows to the existing or relocated GWWTP are required to accommodate anticipated sewer flows, Developer agrees to coordinate the design and construction with NBU on the new facilities and participate in its share of these costs as described above.

ARTICLE V.

Non-Potable Water

Section 5.01 Re-Use Water. To the extent NBU has treated wastewater effluent ("Re-Use Water") not contracted for or reserved by NBU, Developer may request such unreserved Re-Use Water at NBU's customary rates provided that Developer pays the costs of the required permit, the construction of any new or additional infrastructure needed for the treatment of Re-Use water, and the new or additional infrastructure needed for transportation of the Re-Use Water from NBU treatment facilities to the boundary of the Property. The Re-Use Water shall meet all applicable state and federal standards for its intended re-use at the time of the request. Developer may use such water for the development and irrigation of the various parks and open spaces to be developed on the Property if such use is permitted by TCEQ rules and regulations. NBU shall assist and cooperate with Developer in seeking any permits necessary to allow the use of Re-Use Water on the Property.

Section 5.02 Re-Use Water Infrastructure and Rates. NBU and Developer will enter into a separate contract concerning Re-Use Water, including the costs for construction of infrastructure, the terms and conditions for use and the rates. Developer shall be responsible for obtaining any

permits required by TCEQ and the Edward Aquifer Authority (EAA) concerning Re-Use Water use and transportation within the Property.

Section 5.03 Developer Water. Subject to local and state regulations and requirements concerning Developer's use of non-potable water, NBU shall not preclude Developer from constructing, developing, operating, and maintaining groundwater wells within the Property for non-potable water service to the Project, provided that Developer is responsible for ensuring its facilities to transport and store such non-potable water (i) do not allow the non-potable water to enter the facilities or pipes of NBU and (ii) comply with all TCEQ and EAA rules and requirements. By way of example and not in limitation, Developer may develop and use such groundwater sources for the development and irrigation of the various parks and open spaces to be developed on the Property. NBU must be notified if Developer intends to construct, develop, operate, and maintain groundwater wells within the Property and will have the right to inspect Developer's facilities to assure compliance with this subsection.

ARTICLE VI.

Easements

Section 6.01 Costs. Except as required by Section 6.04 below, NBU shall pay for the costs and expenses to acquire all easements or rights-of-way necessary for the construction, installations and ongoing maintenance of the NBU Facilities outside the limits of this Property, including the extension of the Developer's gravity sewer main from the boundary of the Property at Loop 337 to the Blieders Creek Lift Station. Developer shall provide at no cost to NBU all necessary easements for the water and wastewater Internal Facilities at locations consistent with the Master Framework Plan, as amended, and as approved by NBU.

Section 6.02 Securing Rights Outside Property. NBU agrees to coordinate and secure all necessary rights of entry for design surveys and necessary easements for construction outside the Property.

Section 6.03 NBU Rights. The District acknowledges that assignment of rights or conveyance of rights-of-way for streets within the Property from Developer to the District will not limit or restrict the right of NBU to use such easements and rights-of-way. The District specifically understands and agrees that pursuant to this Agreement NBU will have the same right to use and access the streets, rights-of-way, and easements within the Property as NBU has within the City of New Braunfels.

Section 6.04 Determination of Easements. The Parties agree that NBU will have the right to determine the size and dimensions needed for the easements for the water and wastewater systems within the Property. No fencing or improvements will be installed on easements by the Developer or any third party. The easements established under this Agreement will be conveyed in the form required by NBU and may include sanitary control easements as buffer zones adjacent to the water tank lot and other real property conveyed by deed to NBU.

Section 6.05 Costs of Re-Location. Developer and the District agree that they will pay the costs for re-locating existing NBU facilities and will provide new easements within the Property for NBU facilities that the Texas Department of Transportation requires NBU to move due to the

expansion of Loop 337 adjacent to the Property. The costs include engineering and design fees, construction costs, and acquisition expenses for new easements needed to relocate NBU facilities out of the new State right of way along Loop 337. To the extent a third party may agree to accept responsibility for all or part of such costs, the District and NBU shall cooperate with efforts of the Developer to have such third party pay for all or part of such costs.

ARTICLE VII.

Design and Construction of the Internal Facilities

Section 7.01 Design.

(a) Developer agrees to coordinate the locations and related alignments of the Internal Water and Wastewater Facilities within the Property that are acceptable to NBU. The site(s) and alignments of the potable water and primary sanitary sewer infrastructure improvements must have free access to a public road for water improvements or public easements for wastewater facilities and provide adequate areas at NBU's discretion to place, maintain, and operate the utility infrastructure improvements. Where appropriate, Developer must identify the proposed alignments and facility sites and obtain NBU's consent to such sites prior to preparation of the design drawings and bid documents for the water and wastewater Internal Facilities. Developer may locate its water and sewer mains on one side of the street only and will not be required to locate them on both sides of the street. Developer agrees to arrange for a professional engineer registered in the State of Texas to prepare design drawings and bid documents for the construction and installation of the Internal Facilities.

(b) Except as otherwise provided herein, or agreed upon in writing by NBU and Developer, the water and wastewater Internal Facilities must be designed in conformance with NBU's design criteria, construction standards, and specifications for utility construction, including, without limitation, environmental protection requirements.

(c) NBU is authorized to review and approve the design drawings and its approval will not be unreasonably conditioned, withheld or delayed. Nevertheless, approval by NBU shall not waive or relieve Developer, its employees, agents, and representatives from compliance with the standards, regulations, rules, and directives of the Texas Commission on Environmental Quality (TCEQ) and any other regulatory agency or body.

Section 7.02 Project Bidding for NBU Participation Projects.

(a) Developer must solicit and publish invitations for competitive bids and in conformance with NBU's standard bidding and procurement procedures for all projects that will be oversized by NBU or that will receive rebates towards Capital Recovery Fees, also referred to as Impact Fees.

(b) Developer must bid the work out in a manner that allows the incremental cost of the oversized utility infrastructure facilities described in Articles III, IV and X to be clearly ascertained inasmuch as NBU's oversizing reimbursement obligations will extend only to the incremental cost increase attributable solely to the increased size of such facilities.

NBU reserves the right to request additional bids for oversizing mains, for alternate configurations of the elevated water storage tank and high service pump station components. Final size and configurations of the elevated water storage tank and high service pump station configuration and capacities will be selected at NBU's sole discretion.

Section 7.03 Construction.

(a) Developer must enter into a contract for the construction of the Internal Water and Wastewater Facilities in accordance with the terms and conditions of this Agreement and with the approved construction plans.

(b) Developer must exercise reasonable diligence and assure the final completion of the incrementally required water and wastewater Internal Facilities. NBU must accept the water and wastewater facilities serving the Property, or any segment of it, prior to the connection of individual water or wastewater services for either new residential or commercial customers within the development.

(c) Any change orders must be jointly agreed to in writing by NBU and Developer in advance of authorization for or request for payment to the contractor. NBU agrees that its approval of a submitted change order shall not be unreasonably withheld.

(d) NBU has the right to inspect the construction of the water and wastewater Internal Facilities and to enforce compliance with NBU requirements and all applicable City state and federal standards. Acceptance of water and wastewater Internal Facilities by NBU will not be official until a Letter of Acceptance is issued by the NBU Chief Water Engineer.

(e) If Developer contracts with one or more contractors for the construction of the water and wastewater Internal Facilities in which NBU participates in the funding, Developer must require the contractor to post bid, payment, and performance bonds. NBU shall be included on any bonds obtained by a utility contractor as an additional insured. Any jointly funded construction must conform to State law for contract procurement, bidding and bonds.

ARTICLE VIII.

Financing of the Facilities

Section 8.01 Each Party Responsible for its own Costs. NBU shall be solely responsible for funding the acquisition and construction of the NBU Facilities and Developer shall be solely responsible for funding the acquisition and construction of the Internal Facilities. Any bonds of the District, as to both principal and interest, shall be and remain obligations solely of the District and shall never be deemed or construed to be obligations or indebtedness of NBU.

ARTICLE IX.

Fiscal Security

Section 9.01 Fiscal Security. Developer must post fiscal security in the form of an irrevocable Letter of Credit or Bond or bank set-aside letter ("Fiscal Security") in the amount of 100% of the contract cost for the construction of the Developer's share of any costs associated with the Offsite Improvements or any other improvements in which NBU participates or agrees to reimburse Developer for oversizing (collectively, the "Jointly Funded Improvements"), to secure the actual completion of such facilities in accordance with the terms of this Agreement. Developer agrees to post such Fiscal Security after design of the pertinent Jointly Funded Improvement is completed and approved by NBU and within ten (10) business days of the date that the bids are accepted for the pertinent Jointly Funded Improvement. The form and substance of the Fiscal Security must be approved by NBU in advance and its approval shall not be unreasonably conditioned, denied, withheld or delayed. If the construction of the Jointly Funded Improvements proceeds in discrete phases, as defined in the approved plans and specifications and the construction contract, the Fiscal Security may be reduced by an amount equal to the cost of the completed work for each defined phase of construction at the written request of the Developer. Such requests shall be made no more frequently than once every quarter, provided Developer is not in default under this Agreement, the Fiscal Security or other obligations relating to the project. At such time as the Improvements are accepted by NBU the Fiscal Security shall be released by NBU. If at any time during the course of the work on the Improvements the cost estimate for the remaining work exceeds, or is expected to exceed, the amount of the Fiscal Security, NBU will advise Developer in writing and Developer must remit, within thirty (30) calendar days of the receipt of the notice, a new or replacement Fiscal Security for the required amount.

ARTICLE X.

Payment of Construction Costs for Oversizing and Impact Fees

Section 10.01 Construction Costs.

(a) Developer will pay all costs associated with the water and wastewater facilities within the Property, including the construction costs of the elevated water storage tank and the booster station, subject to the reimbursements provided in this Agreement and the NBU policy. In the event of any conflict, the provisions of the NBU policy shall control.

(b) NBU will pay Developer costs for oversizing water and wastewater facilities as outlined in this Agreement and authorized by the NBU Policy. No interest shall be due on any amount owed by NBU. Reimbursement for oversizing will be paid when NBU accepts the improvement.

(c) Upon completion and acceptance of the Improvements and delivery of acceptable deeds, easements, and other dedicatory instruments conveying real property or rights in real property to NBU, NBU will reimburse Developer for an amount not exceeding the actual eligible construction costs (the Eligible Costs) in accordance with the NBU Policy and this Section 10. "Eligible Costs" as used in this Agreement means the actual construction

cost of the water and wastewater Internal Facilities and excludes the soft cost items. "Soft Cost Items" include, but are not limited to, the Developer's cost of engineering, design, site acquisition, permits, inspections, Developer's consultants, Developer's studies, regulatory related fees, fiscal security, Developer's accounting fees and services, Developer's project management costs, Developer's attorney fees, and Developer's financial costs such as construction period interest and loan fees.

Section 10.02 Eligible Differential Cost.

(a) NBU and Developer agree that, as used herein, the term "Eligible Differential Cost" means only the actual increased cost attributable solely to construction of oversized water and wastewater facilities that are larger than necessary to serve the Property as determined by NBU. The term does not include the actual costs to build or install the minimum-sized tank, booster station or other facilities necessary to provide water and wastewater service to the Property only or to meet minimum requirements of the NBU Policy, nor does it include Developer's costs for engineering, design, financing, interest, project management, site acquisition, accounting, legal services, fiscal security, or for other soft costs expended by Developer.

(b) NBU's oversizing reimbursement obligations pursuant to this Agreement extend only to the Eligible Differential Cost related to the water and wastewater Internal Facilities.

(c) In accordance with current NBU policies, Developer shall submit a formal written request to NBU for the reimbursement of the Eligible Differential Costs of the oversized Internal Facilities in cash, with such reimbursement to occur as specified in Section 2.07 of NBU's Water-Wastewater Extension Policy.

Section 10.03 Impact Fees. Pursuant to Chapter 395 of the Texas Local Government Code, the City has enacted an Impact Fee Ordinance to impose water and wastewater capital recovery fees against new development in the NBU service area to generate revenue for funding or recouping costs of capital improvements or facility expansion necessitated by or attributable to new development. The City ordinance authorizes the NBU Board of Trustees to adopt a Capital Recovery Policy for assessment of Impact Fees and to amend that Policy from time to time.

Section 10.04 Assessment of Impact Fees. Developer agrees that capital recovery fees will be assessed against the Property pursuant to the provisions of Section 2.05 of the NBU Capital Recovery Policy. NBU and the Developer agree that the assessment of the capital recovery fee related to the Property shall be assessed at the time of the final plat recordation and shall be collected on a lot by lot basis at the time a meter is requested.

(a) NBU will pay as a rebate of capital recovery fees pursuant to this Agreement an amount equal to the Eligible Costs less the Eligible Differential Cost multiplied by the ratio of effective impact fee. The maximum total allowable reimbursement shall be in accordance with the NBU policy (Total Rebate Payment). NBU and Developer acknowledge that such calculation will be made in accordance with the amounts allowed under the NBU Policy in effect on the date the final plat for the Property, or any section of it, is recorded. No rebate shall be given for capital improvements which are not

identified within the applicable capital recover fee capital improvements plan.

Section 10.05 Rebate of Impact Fees.

(a) Provided that the Developer has complied with the terms and conditions of this Agreement, and provided further that NBU has accepted the eligible Internal Facilities described in this Agreement, the Total Rebate Payment shall be paid by NBU to the Developer in annual payments for no more than thirty (30) years on October 1, beginning on October 1 of the year following completion and acceptance of the Internal Facilities. Nothing herein shall be construed to require NBU to make rebates of Impact Fees except as required under NBU's Policy applied equally to all other customers.

(b) The amount of each annual rebate payment will be the amount of the impact fees collected for meters set during the prior fiscal year in accordance with the NBU Policy for the prior fiscal year period (Total Annual Rebate). NBU will not be obligated to pay interest on the rebate. In no event will the Total Annual Rebate paid to Developer exceed that Total Rebate Payment authorized by NBU policy. Developer agrees to provide all information and documents reasonably required by NBU for proper processing and for accurate accounting and documentation of actual project costs.

Section 10.06 If Developer allows work to commence on a change order before receiving NBU approval as required under Section 7.03(c) any costs incurred on that change order that are not approved by NBU are not eligible for rebate or reimbursement.

Section 10.07 Within thirty (30) days after final acceptance by NBU of the Internal Facilities, Developer must submit a report to NBU of the total costs of the Internal Facilities that includes the supporting information. Developer must submit an Owner's Affidavit that all suppliers and subcontractors have been paid and there are no outstanding liens or claims on the Internal Facilities.

Section 10.08 The obligations of NBU under this Agreement to make rebate payments in any fiscal year constitute a current expense for that fiscal year payable solely from the revenues from the Property deposited into a capital recovery fee account pursuant to the Policy for that fiscal year. The obligation of NBU to make payments does not constitute a general obligation or indebtedness of the City or NBU for which the City is obligated to levy or pledge any form of taxation. If no water impact fees are collected from the Property for any fiscal year, no rebate payments are due for that year.

ARTICLE XI.

Ownership, Operation and Maintenance of Facilities

Section 11.01 Delivery and Ownership of Utility Infrastructure Internal Facilities.

(a) From and after the time of final completion and acceptance by NBU of the Internal Facilities, either Developer funded or jointly funded with NBU, NBU will own, operate and maintain the same.

(b) Developer agrees to execute and deliver to NBU before the date of the final acceptance by NBU of the Internal Facilities, such bills of sale, easements, assignments or other instruments of transfer as may be deemed reasonably necessary by NBU. Developer must also execute and deliver to NBU before the date of final acceptance of the Internal Facilities special warranty deeds for the water tank lot, lift station site(s), and sites for utility infrastructure components and related facilities to be operated by NBU. All real property transferred to NBU must be free and clear of all liens and encumbrances, including without limitation, any reservations, exceptions, and conveyances or leases of water and mineral rights prior to final acceptance by NBU. Provided, however, that the real property conveyed to NBU under this Agreement will be subject to the encumbrances listed as Items 10.a, 10.b, 10.d, 10.e, 10.g and 10.h in Schedule B of the title commitment for the Property issued by Chicago Title Insurance and dated October 10, 2012, a copy of which is attached as **Exhibit 7**.

(c) Developer will also deliver all warranties secured by construction of the Internal Facilities and affidavits that all suppliers of labor and materials for Internal Facilities have been paid, together with releases of any mechanic's liens related to the Project, before NBU accepts the Internal Facilities. Upon execution and delivery of such instruments, Developer will have no further obligations or responsibility for the Internal Facilities, except as provided by paragraph (d) below. Prior to acceptance of the Internal Facilities Developer must also deliver to NBU all bonds, warranties, guarantees and other assurances of performance, record drawings, easements, project manuals and all other documentation related to the Internal Facilities.

(d) Developer acknowledges that NBU will not accept any Internal Facilities or real property burdened by any lien, reservation of rights, or any other encumbrance. In the event that the Developer, the District, or the Landowner creates, retains, or conveys any lien, reservation of rights, or any other encumbrance related to the real property to be conveyed to NBU under this Article XI without first obtaining the express written consent of NBU, NBU will have no obligations under this Agreement.

(e) Prior to final acceptance Developer must provide to NBU an affidavit certifying that all suppliers of labor and materials for the Internal Facilities have been paid and that mechanic's or materialmans' liens related to the Internal Facilities or the Property, if any, have been satisfied and fully released.

(f) Developer shall provide NBU with a two (2) year warranty on the construction and materials used for the water and wastewater Internal Facilities, including the elevated water storage tank and the booster station. The warranty shall begin on the date NBU issues its letter of final acceptance for the Internal Facilities.

(g) The parties agree and understand that upon acceptance of the Internal Facilities by NBU the Property shall be subject to enforcement of all utility ordinances of the City of New Braunfels and policies of NBU, including water conservation ordinances and the NBU Drought Management Plan.

ARTICLE XII.

Provision of Utility Services

Section 12.01 The parties agree and acknowledge that from and after the time of final acceptance by NBU of the water and wastewater facilities and Improvements, NBU will operate and maintain the water and wastewater systems and will provide water and wastewater service to customers within the Property subject to the conditions stated in this Agreement and according to the applicable ordinances and NBU policies, as amended from time to time. Nothing in this Agreement will be construed to limit, restrict, modify or abrogate the City's or NBU's governmental authority or ordinances respecting the operation and maintenance of its water systems nor its duty to provide for the public health, safety and welfare in the operation and maintenance of the same.

Section 12.02 Notwithstanding final acceptance by NBU of the water and wastewater facilities and Improvements.

(a) This Agreement does not exempt Developer, or its successors and assigns, from the requirements of any ordinance or Development Agreement applicable to development within the Property;

(b) This Agreement does not guarantee approval of any final plat or the approval of any other applications or permits related to the project;

(c) This Agreement will not be construed to create or confer upon Developer, the District, the Landowner, or their successors or assigns, any ownership rights in or monopoly regarding capacity in the water facilities and Improvements, whether total or partial, after final acceptance of the project by NBU;

(d) This Agreement will not be construed to create or confer upon Developer, the District, the Landowner, or their successors or assigns, any manner of right of use, legal title to, equitable interest in, or other claim of joint ownership with respect to property, whether real, personal or mixed, comprising the water facilities and Improvements, after final acceptance of the project by NBU; and

(e) Nothing in this Agreement shall be construed to grant Developer, the District, the Landowner, or their successors or assigns any preferential rights to water and wastewater service.

ARTICLE XIII.

Default and Termination

Section 13.01 Default by Developer.

(a) Developer will be in default under this Agreement upon the occurrence of one or more of the following events (an "Event of Default"):

(1) Developer fails to timely commence or complete design or construction of the Improvements as provided in this Agreement; or

(2) Developer fails to post the required Fiscal Security or to increase the amount of Fiscal Security required by this Agreement when requested to do so by NBU; or

(3) Developer transfers or conveys the Property or a portion of the Property through foreclosure or an assignment or conveyance in lieu of foreclosure.

(b) Developer shall have thirty (30) calendar days from the date Developer receives written notice from NBU of the failure to cure a failure described in Subsection (a).

Section 13.02 Default by NBU.

(a) NBU will be in default under this Agreement if NBU fails to reimburse Developer or credit Developer as required by this Agreement.

(b) NBU shall have thirty (30) calendar days from the date NBU received written notice from the Developer of the failure to cure a failure described in Subsection (a).

Section 13.03 Cure Provisions and Remedies.

(a) Failure or unreasonable delay by either party to perform or otherwise act in accordance with any term or provision of this Agreement for a period of thirty (30) calendar days (the "Cure Period") after written notice thereof from the other party, shall constitute a default under this Agreement. However, that if the failure or delay is such that more than thirty (30) calendar days would reasonably be required to perform such action or comply with any term or provision hereof, then such party shall have such additional time as may be necessary to perform or comply so long as such party commences performance or compliance within said 30-day period and diligently proceeds to complete such performance or fulfill such obligation. Such notice shall specify the nature of the alleged default and the manner in which said default may be satisfactorily cured, if possible. In the event such default is not cured within the Cure Period, the non-defaulting party shall have all rights and remedies which may be available under law or equity, including without limitation the right to specifically enforce any term or provision hereof and/or the right to institute an action for damage or mandamus. There shall be no event of default under this Agreement until and unless the Cure Period described in this Section has expired.

(b) Either Developer or NBU may at any time initiate the Conflict Resolution provisions set forth in Section 13.04 below. If the Conflict Resolution provisions are initiated, but fail to result in a mutually acceptable resolution, the Parties shall have those rights set forth below.

(c) If after notice and an opportunity to cure as provided for in Section 13.03 (a), Developer does not commence work on the jointly funded utility infrastructure improvements, or commences but does not complete such work as required by the terms of this Agreement, the Developer will be in default of this Agreement and NBU shall have the right, but not the obligation, to draw on the fiscal security posted by the Developer and complete some,

none, or all of the jointly funded utility infrastructure improvements. NBU may draw on the Letter of Credit following an Event of Default to pay for the costs and expenses incurred by NBU in the completion of the jointly funded utility infrastructure improvements or to correct defects in the Improvements. NBU may perform such construction and repairs itself, or engage a third party to complete such construction and repairs on behalf of NBU.

(d) If NBU elects to complete the jointly funded utility infrastructure improvements, Developer shall provide all plans, designs, easements, and other documents related to the design and construction of the Improvements to NBU within five (5) business days of the date that NBU requests same. If NBU elects to complete the jointly funded utility infrastructure improvements as allowed by this Agreement, Developer will not be entitled to reimbursement for any costs or expenses incurred with regard to the jointly funded utility infrastructure improvements.

(e) If Developer does not commence or complete construction of the jointly funded utility infrastructure improvements as required by this Agreement, and if NBU elects not to draw on the fiscal security in order to complete the jointly funded utility infrastructure improvements, NBU will have the right, in its sole discretion, to terminate this Agreement following notice to Developer and an opportunity to cure.

(f) Notwithstanding any provision to the contrary in this Agreement, the exclusive remedy for NBU's failure to provide water or wastewater service required by this Agreement is to seek de-certification of the area not adequately served. NBU will not be liable for consequential or exemplary damages.

Section 13.04 Conflict Resolution. At any time after a party notifies the other party of a default, either party may initiate the following conflict resolution procedures. The Parties shall designate a qualified mediator with sufficient knowledge and skills to evaluate the dispute and relevant issues. If the Parties cannot agree upon the designation of a qualified mediator within thirty (30) calendar days of the date that this Conflict Resolution provision is initiated, the parties shall each designate three proposed mediators and select a mediator from among them within thirty (30) calendar days. In the event no mediator from the proposed names is agreed upon within sixty (60) calendar days of the date that this Conflict Resolution provision is initiated, the parties may file a petition in Comal County District Court for such designation and the Court may award attorney's fees and costs related to use of this procedure. After designation the mediator shall have sixty (60) calendar days to gather information on the issues and to render a proposed resolution. Each party may also submit written reports in support of its position to the mediator within the same said sixty (60) days. If the mediator is unable to resolve the dispute the Parties may use any rights available under this Agreement and as permitted by law.

Section 13.05 Damages. The measure of damages for breach of this Agreement by a party for failure to timely complete construction of infrastructure that is the subject of this Agreement is the reasonable cost of completing the jointly funded utility infrastructure and improvements in conformance with NBU's requirements, procedures, and specifications and the terms and conditions of this Agreement, including without limitation, any and all associated administrative expenses. For work on the jointly funded utility infrastructure improvements upon which

construction has not begun, the estimated cost of the jointly funded utility infrastructure improvements shown in the bid documents will be prima facie evidence of the minimum cost of completion; however, that amount does not establish the maximum amount of a party's liability Nothing in this section is intended to limit the amount of damages NBU may recover for breach of this Agreement.

ARTICLE XIV.

General Provisions

Section 14.01 Other Infrastructure Improvements. Developer agrees that it must construct all other infrastructure improvements required for the project and/or the Property at its sole expense and in conformance with the Policy and all other applicable City and NBU standards and requirements.

Section 14.02 Remedies and Venue. The remedies available under this Agreement and the laws of Texas are cumulative in nature. Venue for enforcement of any right or obligation under this Agreement shall be in Comal County, Texas.

Section 14.03 Third Party Rights. No person or entity who or which is not a party to this Agreement will have any right of action under this Agreement or shall be considered a third party beneficiary of this Agreement.

Section 14.04 Release and Indemnity.

(a) By submitting plans or specifications for NBU for review, the Developer Parties (as that term is defined below) each agree to waive all claims, fully release, indemnify, defend and hold harmless NBU and all of its respective officials, officers, agents, consultants, employees, attorneys, and invitees in both their public and private capacities (collectively, the "NBU Parties") from any and all liability, claims, lawsuits, demands or causes of action, including all expenses of litigation and/or settlement which may arise for injury to property or person occasioned by error, omission, intentional or negligent act of the Developer, its officers, agents, engineers, consultants, employees or invitees (collectively, the "Developer Parties") arising out of or in connection with submission of construction plans or any other plans or specifications submitted to NBU. The Developer Parties further agree that they each will, at their own cost and at their own expense, indemnify, defend and protect NBU Parties from any and all such claims, losses, damages, causes of action, suits, and liability of any kind, including all expenses of litigation, court costs and attorneys' fees for injury to or death of any person, or for any damage to any property arising out of or in connection with the negligence, error, omission, intentional or grossly negligent acts of any of the Developer Parties.

(b) Approvals by NBU staff or other NBU representative of any plans, designs or specifications submitted pursuant to the requirements of this Agreement, the Policy, any other provision of the Code of Ordinances of the City, or applicable technical manuals will not constitute or be deemed to be a release of the responsibility and liability of the Developer Parties, or acceptance by NBU of the accuracy and competency of the designs or specifications. Such approval shall not be deemed to be an assumption of

responsibility or liability by NBU for any defect in the design or specifications prepared by the Developer Parties.

(c) Approval of plans, designs and specifications by NBU staff or the City staff signifies only the general approval of the general design concept by NBU. In this connection, Developer must indemnify and hold harmless NBU and the City from any loss, damage, liability, or expense on account of damage to property, injuries, and death suffered by any persons which may arise out of any defect, deficiency, or negligence of Developer's designs, plans, and specifications to the extent prepared or caused to be prepared by the Developer Parties that are incorporated into any Internal Facilities constructed according to such designs, plans, and specifications. Developer must defend at its own expense any claims, suits, or proceedings brought against NBU on account of Developer's designs, plans, or specifications, pay all related expenses and satisfy any judgment which may be incurred by or rendered against the Developer, its employees, agents, and representatives.

(d) Further Release of Claims. In addition to the foregoing Release and Indemnity, in further consideration for NBU's agreement to reimburse Developer in accordance with the terms of this Agreement and NBU policy, and for other promises herein, the receipt and sufficiency of which is hereby acknowledged, Developer agrees to fully and completely release and forever discharge NBU and its respective employees, attorneys and officers, in both their individual and official capacities, and their successors, agents, representatives, servants, and any other related or affiliated persons, natural or corporate, in privity with them, from any and all possible claims, demands, actions, causes of action, costs, expenses, obligations, liabilities, suits and damages of every kind and character whatsoever, now existing or that may arise hereafter, whether known or unknown, at law or equity, however, whenever, and by whomever caused, whether solely, jointly, or otherwise, including, without limitation, any and all causes of action directly or indirectly arising out of, resulting from, or attributable to the Internal Facilities that the Developer is required to construct by the terms of the Policy and this Agreement Effective Time Period. The provisions of Section 14.04 concerning releases, indemnities, and duty to defend and hold harmless shall survive for a period of two years following the date NBU accepts the Internal Facilities, or any section of the Internal Facilities. Further, any release, indemnification, and duty to defend and hold harmless shall only apply to liabilities, claims, lawsuits, demands, and causes of action arising from acts or omissions prior to the date NBU accepts the Internal Facilities.

(e) No waiver of any provision of this Agreement will be deemed or constitute a waiver of any other provision, nor will it be deemed or constitute a continuing waiver unless expressly provided for by a written amendment to this Agreement; nor will the waiver of any default under this Agreement be deemed a waiver of any subsequent defaults of the same type. The failure at any time to enforce this Agreement or covenant by NBU, Developer, or their respective heirs, successors or assigns, whether any violations thereof are known or not, will not constitute a waiver or estoppel of the right to do so.

Section 14.05 Attorney's Fees.

(a) Should litigation against any party be required to enforce the terms of this Agreement, the prevailing party, plaintiff or defendant, will be entitled to recover from the opposing party its costs and reasonable and necessary attorney's fees that are necessary and just and costs subject to the limitations imposed by Section 271 of the Texas Local Government Code.

(b) Developer will be obligated to pay NBU's attorneys fees in connection with the preparation of this Agreement within 30 days of the date NBU submits an invoice therefor, but not to exceed $10,000.00.

Section 14.06 Term. This Agreement shall be in effect for a term of fifteen (15) years from the Effective Date ("Original Term"), provided that the Original Term may be amended by written agreement of the Parties for an additional term of fifteen (15) years. If the build-out of the Project has not occurred within the Original Term, Developer may, upon written request to NBU prior to the expiration of the Original Term, seek an extension of the Term for up to one (1) additional fifteen (15) year period. For purposes of this Agreement, "build-out" is defined as the permanent completion of substantially all sales and development activities relating to the Project by Developer.

Section 14.07 Assignment. This Agreement is binding upon Developer, the District, the Landowner, and NBU and their successors or assigns. Developer may assign its rights and obligations under this Agreement in connection with a sale of some or all of the Property, provided, however, that any assignment shall not relieve Developer of its obligations to NBU under this Agreement, unless NBU approves the assignment in writing and executes a written release of Developer from the obligations imposed by this Agreement. In any event Developer, its successors, and assigns will give NBU notice of any assignment of its rights or obligations under this Agreement. NBU may assign its rights and obligations under this Agreement and shall give written notice of any assignment to Developer or its successors and assigns.

Section 14.08 Amendment. Any agreement to modify this Agreement must be signed by all Parties in writing. The Development Agreement solely controls any future amendment to the Master Framework Plan and no amendment to this Agreement is necessary to amend the Master Framework Plan so long as the amendment is approved by the City of New Braunfels in accordance with the Development Agreement and provided any amendment or modification of the Master Framework Plan does not conflict with, modify, or waive any term, condition, or obligation contained in this Agreement.

Section 14.09 Notice. Any notice required or permitted by this Agreement is effective when personally delivered in writing or three (3) days after notice is deposited with the U.S. Postal Service, postage prepaid, certified with return receipt requested, and addressed as follows:

If to Developer: ASA Properties, L.L.C.
177 W. Mill Street, Suite 200
P.O. Box 310699
New Braunfels, Texas 78131
Attention: Peter James

with copies to: Phillip H. Schmandt
McGinnis, Lochridge & Kilgore, L.L.P.
600 Congress Avenue
Suite 2100
Austin, Texas 78701

If to NBU: New Braunfels Utilities
263 E. Main Plaza
New Braunfels, Texas 78130
Attention: Chief Executive Officer

If to the District : Comal County Water Improvement District No.1
c/o Coats Rose Yale Ryman & Lee
Attention: Timothy Green
3 East Greenway Plaza, Suite 2000
Houston, Texas 77046
Phone: 855.291.0282
Fax: 713.651.0220

with copies to: Coats Rose Yale Ryman & Lee
Attention: Timothy Green
1020 Northeast Loop 410, Suite 800
San Antonio, Texas 78209
Phone: 855.739.7515
Fax: 210.212.5698

If to the Landowner: Word-Borchers Ranch Real Estate Limited Partnership
c/o Dean Word III
220 Lakeview Blvd.
New Braunfels, Texas 78130

If to the City of New Braunfels: City of New Braunfels
4424 South Castel
New Braunfels, Texas 78130
Attention: City Manager

Section 14.10 Change of Address for Notice. The parties may, from time to time, change their respective addresses listed above to any other location in the United States for the purpose of notice under this Agreement. A party's change of address is effective when notice of the change is provided to the other party in accordance with the provisions of Section 14.09 above.

Section 14.11 Severability. If any part, term or provision of this Agreement is held by the courts to be illegal, invalid, or otherwise unenforceable, such illegality, invalidity or unenforceability will not affect the validity of any other party, term or provision, and the rights of the parties will be construed as if the part, term or provision was never part of this Agreement.

Section 14.12 Personal Jurisdiction and Venue. Personal jurisdiction and venue for any civil action commenced by any party to this Agreement, whether arising out of or relating to the Agreement or the security, will be deemed to be proper only if such action is commenced in District Court for Comal County, Texas, or the United States District Court for the Western District of Texas, San Antonio Division.

Section 14.13 Captions Immaterial. The numbering, order, and captions or headings of the paragraphs of this Agreement are for convenience only and may not be considered in construing this Agreement.

Section 14.14 Entire Agreement; Multiple Counterparts.

(a) This Agreement contains the entire agreement between the parties and correctly sets forth the rights, duties and obligations of each to the other as of the Effective Date. Any oral representations or modifications concerning this Agreement will be of no force or effect excepting a subsequent written modification executed by the parties.

(b) This Agreement may be executed in multiple counterparts.

Section 14.15 Binding Agreement. The execution and delivery of this Agreement and the performance of the transactions contemplated thereby have been duly authorized by all necessary corporate or governmental action of each party. This Agreement, when duly executed and delivered by each party, constitutes a legal, valid and binding obligation of each party enforceable in accordance with the terms as of the Effective Date.

Section 14.16 Recording. The parties agree that this Agreement may be recorded in the Official Public Records of Real Property of Comal County, Texas, at the expense of Developer.

Section 14.17 Further Assurances. The Parties agree to take such actions and to execute and deliver related documents as may be reasonably necessary or appropriate to effect the provisions of this Agreement.

Section 14.18 Effective Date and Recording. This Agreement shall be executed by the Landowner, Developer, the District, and NBU promptly following approval of the Agreement by NBU Board of Trustees and shall become effective on the effective date of the Development Agreement.

Section 14.19 Conflicts. In the event of any conflict between this Agreement and any other agreement related to the Property, including without limitation the Development Agreement referred to herein, the terms and conditions of this Agreement and applicable NBU policy will control.

Section 14.20 Authorized Representatives. Each person signing this Agreement for an organization or entity represents that he or she is acting as a representative of the named entity and is authorized to bind that entity to the terms and conditions of this Agreement.
EXECUTED by the parties on the dates indicated below:

NEW BRAUNFELS UTILITIES

By: _____

Name: Paula J. DiFonzo
Title: Chief Executive Officer
Date: February 26, 2013

WORD-BORCHERS RANCH JOINT VENTURE

By: ASA Properties, LLC
Its: Manager

By: _____

Name: Mitch Nielsen

Title: Manager

Date: February 25, 2013

By: _____

Name: Peter James

Title: Manager

Date: February 25, 2013

COMAL COUNTY WATER IMPROVEMENT DISTRICT NO. 1

By: _____

Name: Ronnie Shaw

Title: President

Date: February ___, 2013

STATE OF TEXAS §
§
COUNTY OF COMAL §

CORPORATE ACKNOWLEDGMENT

This instrument was acknowledged before me on this the 26th day of February 2013, by Paula J. DiFonzo, known to me in her capacity as Chief Executive Officer of New Braunfels Utilities.

LAURA L. RIVERS
Notary Public, State of Texas
My Commission Expires
November 27, 2015

_____
Notary Public, in and for the State of Texas

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

This instrument was acknowledged before me on this the 25 day of February 2013, by Mitchell Nielsen and Peter James, persons known to me in their capacities as managers of ASA Properties Holding Co. LLC, the sole manager of ASA PROPERTIES, L.L.C., on behalf of Word-Borchers Ranch Joint Venture.

DESAREE FRANKLIN
NOTARY PUBLIC STATE OF TEXAS
COMMISSION EXPIRES:
05-13-2014

Desaree Franklin
Notary Public, in and for the State of Texas

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

This instrument was acknowledged before me on this the 12th day of ~~February~~ April 2013, by Grady Rangle, a person known to me in his capacity as President of Comal County Water Improvement the District No. 1, on behalf of Comal County Water Improvement the District No. 1.

Melinda L. Koehne
Notary Public, in and for the State of Texas

MELINDA L. KOEHNE
Notary Public, State of Texas
My Commission Expires 10-14-2014

LIMITED JOINDER OF WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERHSIP

WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, A TEXAS LIMITED PARTNERSHIP, IS THE OWNER OF THE REAL PROPERTY THAT IS REFERRED TO IN THIS AGREEMENT AS THE PROPERTY,, THE WORD-BORCHERS RANCH, OR THE VERAMENDI PROJECT. ACTING THROUGH ITS GENERAL PARTNER WORD – BORCHERS RANCH MANAGEMENT COMPANY, L.L.C., A TEXAS LIMITED LIABILITY COMPANY, WORD BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, EXECUTES THIS AGREEMENT FOR THE PURPOSE OF ACKNOWLEDGING THAT IT IS INFORMED ABOUT AND ACCEPTS THE TERMS AND CONDITIONS OF THIS AGREEMENT AND CONSENTS TO THE RECORDING OF THE AGREEMENT IN THE REAL PROPERTY RECORDS.

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

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

By: T. Dean Word
Timothy Dean Word III, Manager

Date: 2/25/2013

By: Amber Word Heisner
Amber Word Heisner, Manager

Date: 2/25/2013

By: Marcia Borchers McGlothlin, Manager
Marcia Borchers McGlothlin, Manager

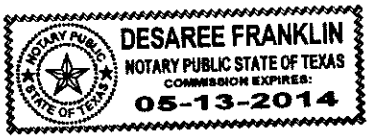
Date: 2-25-13

By: Georgia Borchers Duettra
Georgia Borchers Duettra, Manager

Date: 2/25/13

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

This instrument was acknowledged before me on this the 25 day of February 2013, by Timothy Dean Word III, Amber Word Heisner, Marcia Borchers McGlothlin, and Georgia Borchers Duettra, persons known to me in their capacities as managers of Word-Borchers Ranch Management Company, L.L.C., the sole manager of WORD-BORCHERS RANCH REAL ESTATE LIMITED PARTNERSHIP, on behalf of Word-Borchers Ranch Joint Venture.



Desaree Franklin
Notary Public, in and for the State of Texas

LIMITED JOINDER OF CITY OF NEW BRAUNFELS

THE CITY OF NEW BRAUNFELS, A TEXAS HOME RULE MUNICIPAL CORPORATION, EXECUTES THIS AGREEMENT FOR THE SOLE PURPOSE OF EVIDENCING ITS CONSENT TO THE AGREEMENT AND TO AGREE THAT THIS AGREEMENT, TOGETHER WITH THE DEVELOPMENT AGREEMENT, SATISFIES THE REQUIREMENTS OF SECTION 9038.004 (2) OF THE TEXAS LOCAL GOVERNMENT CODE.

CITY OF NEW BRAUNFELS

By: _____

Name: Robert Camareno

Title: Interim City Manager

Date: April 26, 2013

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

This instrument was acknowledged before me on this the 26th day of April 2013, by Robert Camareno, a person known to me in his capacity as Interim City Manager of the City of New Braunfels, on behalf of the City of New Braunfels.

C. WILKE
Notary Public, State of Texas
My Commission Expires
August 06, 2015

C. Wilke

Notary Public, in and for the State of Texas

List of Exhibits

EXHIBIT NO. 1: List of Proposed Infrastructure Improvements Subject to Oversizing by NBU

EXHIBIT NO. 2: Master Water Plan

EXHIBIT NO. 3: Master Sewer Plan

EXHIBIT NO. 4: Metes and Bounds Description of the Land

EXHIBIT NO. 5: Master Framework Plan

EXHIBIT NO. 6: Utility Engineering Report of August 2011

EXHIBIT NO. 7: Title Commitment

EXHIBIT NO. 1
LIST OF PROPOSED INFRASTRUCTURE IMPROVEMENTS SUBJECT TO OVERSIZING BY NBU

Potable Water System

- 1.5m gallon elevated storage tank to 2.5m gallon elevated storage tank
- Proposed 12-inch and 16-inch Pressure Zone 5 water mains to a proposed 24-inch and a 36-inch water main (equivalent capacity of a 36-inch water main) to accommodate an additional flow of 5,000 gallons per minute through the Property to NBU's water main(s) along Loop 337
- Other 12-inch and 16-inch water mains as may be defined by NBU for future oversizing to support surrounding areas.
- Potential oversizing of pumps and controls at the high service pump station proposed for serving areas of the Property within Pressure Zone 4.

Sanitary Sewer System

- Potential oversizing of internal gravity sewer mains and lift stations to serve adjacent undeveloped areas north and west of the Property.
- Potential oversizing of sewer segments S1 through S6 should NBU elect to remove and replace the existing 18-inch gravity sewer main extending through the Property to the existing Bleiders Creek Lift Station.
- Potential oversizing of alternative alignments of an gravity outfall sewer main from the Property to a relocated GWWTP, a new Bleiders Creek Lift Station and Force Main.

EXHIBIT NO. 2

to Utility Agreement

Master Water Plan

CONNECT TO EXISTING ZONE 4 12" WATER MAIN ON OAK RUN PKWY.

12" CAP FOR FUTURE EXPANSION BY NBU

PROPOSED NEW ELEVATED STORAGE TANK ZONE 5 WITH NEW HIGH SERVICE PUMP STATION ZONE 4

DIVISION VALVE

RIVER ROAD

WHITE WATER RD.

GUADALUPE RIVER

HWY 46

EDWARDS BLVD.

LOOP 337 / HWY 46

CONNECT TO EXISTING ZONE 5 12" WATER MAIN

CONNECT TO EXISTING ZONE 5 12" WATER MAIN

EXISTING ZONE 4 12" WATER MAIN

EXISTING ZONE 5 12" WATER MAIN

EXISTING LOOP 33 ELEVATED TANK HGL= 895'

EXISTING ZONE 5 12" WATER MAIN

SCALE: 1"= 500'

0' 500' 1,000' 1,500'

DESCRIPTION

ZONE 5 (HGL = 895')

ZONE 4 (HGL = 1000')

ZONE 5 WATER MAIN ALIGNMENT

VALVE

ZONE 4 WATER MAIN ALIGNMENT

VALVE

ET PROPOSED ELEVATED WATER STORAGE TANK & HIGH SERVICE PUMP STATION

NOTES:

1. PROPERTY IS WITHIN COMAL COUNTY WCID#1.
2. THIS EXHIBIT REFLECTS PRELIMINARY LAND USE CONCEPTS. APPLICANT RESERVES THE RIGHT TO REALLOCATE INTENSITY OF SERVICE DEMANDS AND CHARACTER OF LAND USES BETWEEN TRACTS AT DISCRETION OF APPLICANT, WITH THE INTENTION TO MAINTAIN THE MAXIMUM SERVICE DEMAND LIMITS SPECIFIED IN THE NOTES ARE NOT EXCEEDED.
3. APPLICANT RESERVES THE RIGHT WITHIN THIS PRELIMINARY EXHIBIT TO INCREASE OR DECREASE THE NUMBER OF PERMITTED RESIDENTIAL UNITS OR NON-RESIDENTIAL COMMERCIAL SQUARE FEET, SO LONG AS THERE IS A CORRESPONDING ADJUSTMENT IN THE OTHER NUMBER OF CATEGORY OF USE WHICH CAUSES OVERALL DEMAND TO BE EQUAL TO OR LOWER THAN THE DEMAND ATTRIBUTABLE TO THE NUMBER OF PERMITTED RESIDENTIAL UNITS OR NON-RESIDENTIAL COMMERCIAL SQUARE FEET SPECIFIED ABOVE.

DRAFT

ASA PROPERTIES LLC ("APPLICANT") RESERVES THE RIGHT TO CHANGE ALL OR ANY PORTION OF THIS PRELIMINARY EXHIBIT OR ITS NOTES AT ANY TIME UNTIL FINAL APPROVAL BY APPLICABLE GOVERNMENTAL ENTITIES. THIS DOCUMENT REMAINS PRELIMINARY AND UNTIL AUTHORIZED BY APPLICANT IS CONFIDENTIAL AND NOT FOR PUBLIC DISTRIBUTION.

REVISIONS:

PAPE-DAWSON ENGINEERS

555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.9000 FAX: 210.375.9010

TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WORD BORCHERS TRACT
MASTER WATER PLAN
NOVEMBER 15, 2010
NEW BRAUNFELS, TEXAS

JOB NO. 762000

DATE NOVEMBER 2010

DESIGNER LN

CHECKED - DRAWN TA

SHEET 1 of 1

Date: Nov 15, 2010, 3:49pm User ID: TAlexander
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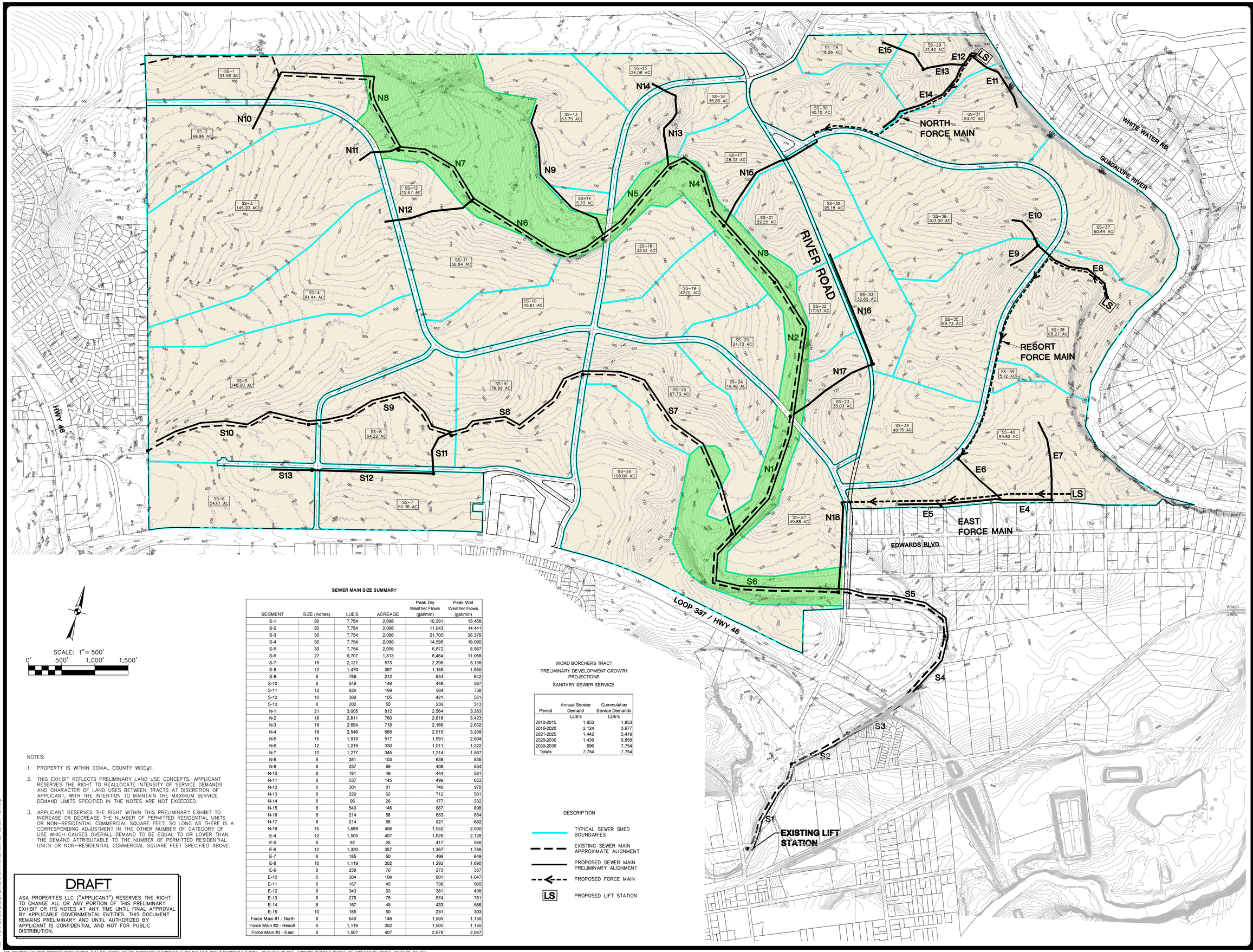
THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL.

EXHIBIT NO. 3

to Utility Agreement

Master Sewer Plan



SCALE: 1"= 500'

0' 500' 1,000' 1,500'

SEWER MAIN SIZE SUMMARY

SEGMENT	SIZE (inches)	LUE'S	ACREAGE	Peak Dry Weather Flows (gal/min)	Peak Wet Weather Flows (gal/min)
S-1	30	7,754	2,096	10,291	13,458
S-2	30	7,754	2,096	11,043	14,441
S-3	30	7,754	2,096	21,700	28,376
S-4	30	7,754	2,096	14,598	19,090
S-5	30	7,754	2,096	6,872	8,987
S-6	27	6,707	1,813	8,464	11,068
S-7	15	2,121	573	2,398	3,136
S-8	12	1,470	397	1,185	1,550
S-9	8	786	212	644	842
S-10	8	548	148	449	587
S-11	12	626	169	564	738
S-12	10	388	105	421	551
S-13	8	202	55	239	313
N-1	21	3,005	812	2,564	3,353
N-2	18	2,811	760	2,618	3,423
N-3	18	2,654	718	2,166	2,832
N-4	18	2,546	688	2,515	3,289
N-5	15	1,913	517	1,991	2,604
N-6	12	1,219	330	1,011	1,322
N-7	12	1,277	345	1,214	1,587
N-8	8	381	103	638	835
N-9	8	257	69	408	534
N-10	8	181	49	444	581
N-11	8	537	145	499	653
N-12	8	301	81	748	978
N-13	8	229	62	712	931
N-14	8	96	26	177	232
N-15	8	540	146	687	898
N-16	8	214	58	653	854
N-17	8	214	58	521	682
N-18	15	1,689	456	1,552	2,030
E-4	12	1,505	407	1,628	2,128
E-5	8	92	25	417	546
E-6	12	1,320	357	1,367	1,788
E-7	8	185	50	496	649
E-8	10	1,119	302	1,292	1,690
E-9	8	258	70	273	357
E-10	8	384	104	801	1,047
E-11	8	167	45	738	965
E-12	8	343	93	381	498
E-13	8	276	75	574	751
E-14	8	167	45	433	566
E-15	10	185	50	231	303
Force Main #1 - North	6	540	146	1,505	1,150
Force Main #2 - Resort	6	1,119	302	1,505	1,150
Force Main #3 - East	8	1,507	407	2,678	2,047

NOTES:

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WORD BORCHERS TRACT
PRELIMINARY DEVELOPMENT GROWTH PROJECTIONS
SANITARY SEWER SERVICE

Period	Annual Service Demand LUE's	Cummulative Service Demands LUE's
2010-2015	1,853	1,853
2016-2020	2,124	3,977
2021-2025	1,442	5,419
2026-2030	1,439	6,858
2030-2036	896	7,754
Totals	7,754	7,754

DESCRIPTION

- TYPICAL SEWER SHED BOUNDARIES
- EXISTING SEWER MAIN APPROXIMATE ALIGNMENT
- PROPOSED SEWER MAIN PRELIMINARY ALIGNMENT
- PROPOSED FORCE MAIN
- LS PROPOSED LIFT STATION

REVISIONS:

PAPE-DAWSON ENGINEERS
555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.9000 FAX: 210.375.9010
TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WORD BORCHERS TRACT
MASTER SEWER PLAN
NOVEMBER 15, 2010
NEW BRAUNFELS, TEXAS

JOB NO. 762000
DATE NOVEMBER 2010
DESIGNER LN
CHECKED _ DRAWN TA
SHEET 1 of 1

Date: Nov 15, 2010, 2:51pm User ID: TAlexander
File: P:\76\120\00\Design\Exhibits\Utilities\EX100T102-SEWER-TSA.dwg
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EXHIBIT NO. 4

to Utility Agreement

Metes and Bounds Description of the Land

The approximately 2,404 acres comprised of the 1746.9 acres described on the attached metes and bounds description as Tract "A" and the 657.1 acres described on the attached metes and bounds description as Tract "B" and depicted on the attached illustration.

FIELD NOTES
FOR A
POLITICAL SUBDIVISION

Being 1746.9 acres, more or less, out of the J.M. Veramendi Survey No. 2, Abstract 3, Comal County, Texas. Said 1746.9 acres also being a portion of a 2086 acre tract of land described as First Tract in Deed recorded in Volume 167, Pages 80-92 of the Deed Records of Comal County, Texas. Said 1746.9 acre tract being more fully described as follows;

BEGINNING: At a found ½" iron rod on the southwest right-of-way line of River Road, for an eastern corner of this tract and the north corner of a 9.839 acre tract described in Document Number 200406026508 of the Official Records of Comal County, Texas;

THENCE: Departing said southwest right-of-way line of River Road and along the northwest line of said 9.839 acre tract, South 50°21'26" West a distance of 600.17 feet to the western corner of said 9.839 acre tract;

THENCE: Along the southwest line of said 9.839 acre tract, South 36°27'37" East a distance of 646.39 feet to a point on the northwest right-of-way line of State Highway Loop 337;

THENCE: along said northwest right-of-way line of State Highway Loop 337, the following bearings and distances:

South 79°25'02" West a distance of 43.50 feet to a point,

South 73°42'02" West a distance of 201.00 feet to a point,

South 79°25'02" West a distance of 700.00 feet to a point,

South 76°33'02" West a distance of 200.30 feet to a point,

South 79°25'02" West a distance of 1258.30 feet to a point,

along a tangent curve to the left, said curve having a radius of 5839.60 feet, a central angle of 11°49'01", a chord bearing and distance of South 73°30'33" West, 1202.27 feet, for an arc length of 1204.40 feet to a point, and

South 67°36'02" West a distance of 518.39 feet to a point being the southeast corner of the called 17.089 acre tract of land conveyed to Oakwood Baptist Church of New Braunfels, Texas, by Deed Recorded in Document No. 200706020677, of the Official Records of Comal County, Texas;

THENCE: departing the northwest right-of-way line of State Highway Loop 337 and along the common line between said 17.089 acres and the herein described tract, the following bearings and distances:

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along a non-tangent curve to the left, said curve having a radial bearing of North 22°28'30" West, a radius of 50.00 feet, a central angle of 90°15'34", a chord bearing and distance of North 22°23'43" East, 70.87 feet, for an arc length of 78.77 feet to a point,

North 22°44'04" West a distance of 149.65 feet to a point,

North 32°57'24" West a distance of 61.98 feet to a point,

North 16°39'22" West a distance of 43.27 feet to a point,

along a tangent curve to the right, said curve having a radius of 616.00 feet, a central angle of 03°30'57", a chord bearing and distance of North 14°53'53" West, 37.79 feet, for an arc length of 37.80 feet to a point,

North 13°08'25" West a distance of 65.66 feet to a point,

Along a tangent curve to the right, said curve having a radius of 605.00 feet, a central angle of 10°21'40", a chord bearing and distance of North 07°57'35" West, 109.26 feet, for an arc length of 109.41 feet to a point,

North 02°46'45" West a distance of 107.03 feet to a point,

along a tangent curve to the left, said curve having a radius of 25.00 feet, a central angle of 90°00'00", a chord bearing and distance of North 47°46'45" West, 35.36 feet, for an arc length of 39.27 feet to a point,

South 87°13'15" West a distance of 667.49 feet to a point,

along a tangent curve to the left, said curve having a radius of 926.14 feet, a central angle of 47°34'06", a chord bearing and distance of South 63°26'12" West, 747.01 feet, for an arc length of 768.90 feet to a point,

South 35°47'46" East a distance of 479.08 feet to a point

South 54°12'14" West a distance of 150.00 feet to a point;

South 35°47'46" East a distance of 115.00 feet to a point;

North 54°12'14" East a distance of 150.00 feet to a point;

South 35°47'46" East a distance of 311.31 feet to a point on the northwest right-of-way line of State Highway Loop 337, the south corner of said 17.089 acres;

THENCE: along the northwest right-of-way line of State Highway Loop 337, the following bearings and distances:

South 60°43'02" West a distance of 101.06 feet to a point;

South 54°19'02" West a distance of 391.10 feet to a point;

South 53°26'02" West a distance of 4077.20 feet to a point;

along a non-tangent curve to the left, said curve having a radial bearing of South 36°30'07" East, a radius of 2412.00 feet, a central angle of 10°41'17", a chord bearing and distance of South 48°09'15" West, 449.29 feet, for an arc length of 449.94 feet to a point for the south corner of the herein described tract;

THENCE: departing the northwest right-of-way line of State Highway Loop 337 and along the south line of said 2086 acre tract, North 37°35'41" West a distance of 6349.56 feet to a point;

THENCE: North 39°08'41" West a distance of 787.92 feet to a the southwest corner of said 2086 acre tract;

THENCE: along the west line of said 2086 acre tract, North 52°30'17" East a distance of 8742.44 feet to a point on the southwest right-of-way line of Hueco Springs Loop Road;

THENCE: along the southwest right-of-way line of said Hueco Springs Loop Road, the following bearings and distances:

South 85°40'41" East a distance of 308.21 feet to a point;

South 76°17'58" East a distance of 54.07 feet to a point;

South 54°55'14" East a distance of 119.87 feet to a point;

South 46°52'45" East a distance of 55.24 feet to a point;

South 37°19'35" East a distance of 197.53 feet to a point of curvature on the southern right-of-way line of River Road;

THENCE: along the southern right-of-way line of said River Road, the following bearings and distances:

along a tangent curve to the left, said curve having a radius of 450.00 feet, a central angle of 32°18'28", a chord bearing and distance of South 53°28'49" East, 250.40 feet, for an arc length of 253.74 feet to a point;

South 69°38'03" East a distance of 794.06 feet to a point;

along a tangent curve to the right, said curve having a radius of 3795.00 feet, a central angle of 10°11'42", a chord bearing and distance of South 64°32'12" East, 674.37 feet, for an arc length of 675.26 feet to a point;

South 59°26'22" East a distance of 2543.48 feet to a point;

along a tangent curve to the right, said curve having a radius of 1408.00 feet, a central angle of 35°39'13", a chord bearing and distance of South 41°36'45" East, 862.09 feet, for an arc length of 876.16 feet to a point;

South 23°47'08" East a distance of 1000.15 feet to a point;

along a tangent curve to the left, said curve having a radius of 2890.00 feet, a central angle of 11°10'04", a chord bearing and distance of South 29°22'10" East, 562.42 feet, for an arc length of 563.31 feet to a point;

South 34°57'13" East a distance of 1491.54 feet to the POINT OF BEGINNING, and containing 1746.9 acres.

This document was prepared under 22 TAC 663.21, does not reflect the results of an on the ground survey, and is not to be used to convey or establish interests in real property except those rights and interests implied or established by the creation or reconfiguration of the boundary of the political subdivision for which it was prepared.

PREPARED BY: PAPE DAWSON ENGINEERS, INC.
DATE: March 23, 2012
JOB No.: 9127-10
FILE: N:\Survey10\10-9100\9127-10\WORD\1746.9 Ac MBs.doc

FIELD NOTES
FOR A
POLITICAL SUBDIVISION

Being 657.1 acres, more or less, out of the J.M. Veramendi Survey No. 2, Abstract 3, Comal County, Texas. Said 657.1 acres also being a portion of a 694 acre tract of land described as Fourth Tract in Deed recorded in Volume 167, Pages 80-92 of the Deed Records of Comal County, Texas. Said 657.1 acre tract being more fully described as follows;

BEGINNING: at a found ½" iron rod on the northeast right-of-way line of River Road, for the south corner of this tract and the south corner of said 694 acre tract;

THENCE: along said northeast right-of-way line of River Road, the following bearings and distances:

Along a curve to the right, said curve having a radial bearing of North 55°28'38" East, a radius of 2840.00 feet, a central angle of 10°44'14", a chord bearing and distance of North 29°09'15" West, 531.43 feet, for an arc length of 532.21 feet to a point;

North 23°47'08" West a distance of 1000.15 feet to a point;

Along a tangent curve to the left, said curve having a radius of 1458.00 feet, a central angle of 35°39'13", a chord bearing and distance of North 41°36'45" West, 892.71 feet, for an arc length of 907.28 feet to a point;

North 59°26'22" West a distance of 2543.48 feet to a point;

along a tangent curve to the left, said curve having a radius of 3845.00 feet, a central angle of 10°11'42", a chord bearing and distance of North 64°32'12" West, 683.26 feet, for an arc length of 684.16 feet to a point;

North 69°38'03" West a distance of 794.06 feet to a point;

along a tangent curve to the right, said curve having a radius of 400.00 feet, a central angle of 32°18'28", a chord bearing and distance of North 53°28'49" West, 222.57 feet, for an arc length of 225.55 feet to a point;

North 37°19'35" West a distance of 74.92 feet to a point;

North 24°39'43" West a distance of 84.03 feet to a point;

North 03°54'02" West a distance of 73.10 feet to a point;

North 32°15'55" East a distance of 337.26 feet to a point;

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North 27°47'36" East a distance of 106.84 feet to a point;

North 23°29'03" East a distance of 58.43 feet to a point;

North 18°42'36" East a distance of 166.96 feet to a point;

North 00°50'37" West a distance of 58.28 feet to a point;

North 08°13'11" West a distance of 191.91 feet to a point;

North 08°36'56" West a distance of 186.83 feet to a point;

THENCE: departing the northeast right-of-way line of River Road and along the northwest line of said 694 acre tract, North 52°07'56" East a distance of 1441.70 feet to a point;

THENCE: departing the northwest line of said 694 acre tract, over and across said 694. acre tract the following bearings and distances:

South 37°52'04" East a distance of 360.00 feet to a point,

South 88°30'00" East a distance of 932.68 feet to a point,

North 24°30'01" East a distance of 910.13 feet to a point on the Guadalupe River;

THENCE: along the meanders of the Guadalupe River, the following bearings and distances:

South 66°20'58" East a distance of 253.10 feet to a point;

South 72°43'51" East a distance of 223.08 feet to a point;

South 79°52'21" East a distance of 524.56 feet to a point;

South 81°07'29" East a distance of 278.44 feet to a point;

South 88°15'17" East a distance of 278.53 feet to a point;

South 87°39'50" East a distance of 212.64 feet to a point;

North 81°43'30" East a distance of 282.13 feet to a point;

North 86°35'39" East a distance of 414.94 feet to a point;

North 87°24'18" East a distance of 341.41 feet to a point;

South 83°38'12" East a distance of 482.30 feet to a point;

South 58°14'14" East a distance of 405.29 feet to a point;

South 59°04'08" East a distance of 162.27 feet to a point;

South 27°19'15" East a distance of 277.64 feet to a point;

South 01°19'17" East a distance of 431.31 feet to a point;

South 11°28'18" West a distance of 438.24 feet to a point;

South 01°16'05" East a distance of 728.38 feet to a point;

South 08°53'25" East a distance of 554.01 feet to a point;

South 29°52'02" East a distance of 672.19 feet to a point;

South 66°26'35" East a distance of 387.33 feet to a point;

South 86°37'11" East a distance of 582.83 feet to a point;

North 84°48'17" East a distance of 651.28 feet to a point;

North 67°16'02" East a distance of 474.64 feet to a point;

THENCE: departing the Guadalupe River and along the southeast line of said 694 acre tract the following bearings and distances:

South 52°07'58" West a distance of 331.98 feet to a point;

South 85°07'58" West a distance of 175.30 feet to a point;

South 07°07'58" West a distance of 135.00 feet to a point;

South 52°49'58" West a distance of 771.50 feet to a point;

South 57°08'58" West a distance of 516.90 feet to a point;

South 52°11'58" West a distance of 1029.10 feet to a point;

South 60°36'58" West a distance of 72.70 feet to a point;

South 47°21'58" West a distance of 764.75 feet to a point;

South 51°59'58" West a distance of 848.20 feet to a point;

South 50°16'58" West a distance of 324.40 feet to a point;

South 53°32'58" West a distance of 277.92 feet to the POINT OF BEGINNING, and containing 657.1 acres.

This document was prepared under 22 TAC 663.21, does not reflect the results of an on the ground survey, and is not to be used to convey or establish interests in real property except those rights and interests implied or established by the creation or reconfiguration of the boundary of the political subdivision for which it was prepared.

PREPARED BY: PAPE DAWSON ENGINEERS, INC.
DATE: March 23, 2012
JOB No.: 9127-10
FILE: N:\Survey10\10-9100\9127-10\WORD\657.1 Ac MBs.doc

PAPE-DAWSON ENGINEERS

LINE TABLE		
LINE	BEARING	LENGTH
L1	S79°25'02"W	43.50
L2	S73°42'02"W	201.00
L3	S76°33'02"W	200.30
L4	N67°36'02"E	518.39
L5	S22°44'04"E	149.65
L6	S32°57'24"E	61.98
L7	S16°39'22"E	43.27
L8	S13°08'25"E	65.66
L9	S02°46'45"E	107.03
L10	N35°47'46"W	479.08
L11	S54°12'14"W	150.00
L12	S35°47'46"E	115.00
L13	N54°12'14"E	150.00
L14	N35°47'46"W	311.31
L15	S60°43'02"W	101.06
L16	S54°19'02"W	391.10
L17	N85°40'41"W	308.21
L18	N76°17'58"W	54.07
L19	N54°55'14"W	119.87
L20	N46°52'45"W	55.24
L21	S37°19'35"E	197.53
L22	N37°19'35"W	74.92
L23	N24°39'43"W	84.03
L24	N03°54'02"W	73.10
L25	N32°15'55"E	337.26
L26	N27°47'36"E	106.84
L27	N23°29'03"E	58.43
L28	N18°42'36"E	166.96
L29	N00°50'37"W	58.28
L30	N08°13'11"W	191.91
L31	N08°36'56"W	186.83
L34	S66°20'58"E	253.10
L35	S72°43'51"E	223.08
L36	S79°52'21"E	524.56
L37	S81°07'29"E	278.44
L38	S88°15'17"E	278.53
L39	S87°39'50"E	212.64
L40	N81°43'30"E	282.13
L41	N86°35'39"E	414.94
L42	N87°24'18"E	341.41
L43	S83°38'12"E	482.30
L44	S58°14'14"E	405.29
L45	S59°04'08"E	162.27
L46	S27°19'15"E	277.64
L47	S01°19'17"E	431.31
L48	S11°28'18"W	438.24
L49	S01°16'05"E	728.38
L50	S08°53'25"E	554.01
L51	S29°52'02"E	672.19
L52	S66°26'35"E	387.33
L53	S86°37'11"E	582.83
L54	N84°48'17"E	651.28
L55	N67°16'02"E	474.64
L56	S52°07'58"W	331.98
L57	S85°07'58"W	175.30
L58	S07°07'58"W	135.00
L59	S60°36'58"W	72.70
L60	S50°16'58"W	324.40
L61	S53°32'58"W	277.92

HUECO SPRINGS LOOP ROAD

RIVER ROAD

RIVER ROAD ICEHOUSE

N52°07'56"E 1441.70'

S37°52'04"E 380.00'

S88°30'00"E 932.68'

N24°30'01"E 910.13'

GUADALUPE RIVER

N52°30'17"E 8742.44'

CHRISTIAN PAPE SURVEY NO. 831 ABSTRACT 777

N39°08'41"W 791.92'

S.A.& M.G. R.R. CO. SURVEY NO. 276 ABSTRACT 586

N37°35'41"W 6349.56'

HIGHWAY 46

ANDRES SANCHES SURVEY NO. 286 ABSTRACT 528

JUAN MARTIN de VERAMENDI SURVEY NO. 2 ABSTRACT 3

R=400.00'
L=225.55'
Δ=32°18'28"
CB=N53°28'49"W
CH=222.57'

R=450.00'
L=253.74'
Δ=32°18'28"
CB=S53°28'49"E
CH=250.40'

N69°38'03"W 794.08'

S69°38'03"E 794.08'

R=3845.00'
L=684.16'
Δ=10°11'42"
CB=N64°32'12"W
CH=683.26'

R=3795.00'
L=675.26'
Δ=10°11'42"
CB=S64°32'12"E
CH=674.37'

N59°28'22"W 2543.48'

S59°28'22"E 2543.48'

R=1458.00'
L=907.28'
Δ=35°39'13"
CB=N41°36'45"W
CH=892.71'

R=1408.00'
L=876.16'
Δ=35°39'13"
CB=S41°36'45"E
CH=862.09'

1000.15'

S23°47'08"E

N23°47'08"W

R=2840.00'
L=532.21'
Δ=10°44'14"
CB=N29°09'15"W
CH=531.43'

P.O.B.

S51°59'58"W 848.20'

R=2890.00'
L=563.31'
Δ=11°10'04"
CB=S29°22'10"E
CH=562.42'

RADIAL BEARING N55°28'38"E

CENTO SCHOOL

S57°08'58"W 516.90'

S52°49'58"W 771.50'

S52°11'58"W 1029.10'

S47°21'58"W 764.75'

S34°57'13"E 1491.54'

S50°21'26"W 600.17'

P.O.B.

S56°07'37"E 646.59'

S79°25'02"W 1258.30'

S79°25'02"W 700.00'

R=926.14'
L=768.90'
Δ=47°34'06"
CB=S63°26'12"W
CH=747.01'

S87°13'15"W 667.49'

R=605.00'
L=109.41'
Δ=10°21'40"
CB=N07°57'35"W
CH=109.26'

OAKWOOD BAPTIST CHURCH
V-362 PG-359
DOC. NO. 200706020677
V-7 PG-118, M. & P.R.

R=25.00'
L=39.27'
Δ=90°00'00"
CB=N47°46'45"W
CH=35.36'

R=616.00'
L=37.80'
Δ=3°30'57"
CB=N14°53'53"W
CH=37.79'

R=5839.60'
L=1204.40'
Δ=11°49'01"
CB=S73°30'33"W
CH=1202.27'

R=50.00'
L=78.77'
Δ=90°15'34"
CB=N22°23'43"E
CH=70.87'

R=2412.00'
L=449.94'
Δ=10°41'17"
CB=S48°09'15"W
CH=449.29'

S53°26'02"W 4077.20'

LOOP 337 / HWY 46

NEW BRAUNFELS HIGH SCHOOL

JUAN MARTIN de VERAMENDI SURVEY NO. 1 ABSTRACT 2

RIVER ROAD

THIS MAP REPRESENTS THE APPROXIMATE BOUNDARIES OF THE PROJECT COMPILED FROM DEED RECORDS AND LIMITED FIELD EVIDENCE.
THIS DOES NOT REFLECT THE RESULTS OF AN ON THE GROUND SURVEY AND IT IS NOT TO BE USED TO CONVEY OR ESTABLISH INTERESTS IN REAL PROPERTY.

DISCLAIMER: All information furnished regarding this property is from sources deemed reliable. However RPS has not made an independant investigation of these sources and no warranty or representation is made by RPS as to the accuracy thereof and same is submitted subject to errors, omissions, land plan changes, or other conditions. This land plan is conceptual in nature and does not represent any regulatory approval. Land plan is subject to change. The developer has reserved the right, without notice, to make changes to this map and other aspects of the development to comply with government requirements and to fulfill its marketing objective.

Exhibit B
Description of Property

February 2013 I Project No 21983-105a

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EXHIBIT NO. 5

to Utility Agreement

Master Framework Plan

Minimum Overall Park Acreage:	480 acres
Minimum Overall Regional Park Acreage:	100 acres
Maximum Overall No. of Dwelling Units:	6000 units
Town Centre Planning Area Acreage:	30 acres
High Density Residential Planning Area Acreage:	55 acres
Nbhd. (Mixed Density) Residential Planning Area Acreage:	1567 acres
Large Format Retail Planning Sub Area Acreage:	82 acres
Mixed Use Employment Planning Sub Area Acreage:	89 acres
Resort Planning Area Acreage:	49 acres
Maximum Overall Impervious Cover:	65%

Note:
Future ROW, and Parks are included in acreages.

NOTES:
- (A) Collector Road to connect to Principal East West Arterial Road - alignment not fixed.
- (B) Future Collector Loop Road - alignment not fixed.
- (C) Only one external connection to be provided based on finalization of alignment by future studies.

DISCLAIMER: This Master Framework Plan is a part of that certain Development Agreement between the Developer and the City of New Braunfels dated _____, provided that this Master Framework Plan may be amended in accordance with the Development Agreement without amending the Development Agreement. This Master Framework Plan demonstrates one example of the possible future development of the Project. It remains subject to change to accommodate the Developer's marketing objectives and comply with applicable laws. The roadway alignments, land uses and other items depicted on this Master Framework Plan are general depictions only and should not be relied upon.

Exhibit H - Plan 1 of 4
Master Framework Plan

February 2013 I Project No 21983_85i

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LEGEND

- Project Boundary
- City Limits

Land Use Framework

- Town Center Planning Area
- Town Center Frame Overlay
- Mixed Commercial & Business Planning Area
- Large Format Retail Planning Sub Area
- Mixed Use Employment Planning Sub Area
- Resort Planning Area
- High Density Residential Planning Area
- Neighborhood (Mixed Density) Residential Planning Area
- Activity Node (AN)
- Linear Open Space Park
- Regional Park (RP)
- Expressway
- Arterial Road
- Collector Road
- Conceptual External Connection
- External Access Point
- Pedestrian Crossing Point
- Flood Control Dam
- Regional Detention Facility

Minimum Overall Park Acreage:	480 acres
Minimum Overall Regional Park Acreage:	100 acres
Maximum Overall No. of Dwelling Units:	6000 units
Town Centre Planning Area Acreage:	30 acres
High Density Residential Planning Area Acreage:	55 acres
Nbhd. (Mixed Density) Residential Planning Area Acreage:	1567 acres
Large Format Retail Planning Sub Area Acreage:	82 acres
Mixed Use Employment Planning Sub Area Acreage:	89 acres
Resort Planning Area Acreage:	49 acres
Maximum Overall Impervious Cover:	65%

Note:
Future ROW, and Parks are included in acreages.

NOTES:

(A) Collector Road to connect to Principal East West Arterial Road - alignment not fixed.

(B) Future Collector Loop Road - alignment not fixed.

(C) Only one external connection to be provided based on finalization of alignment by future studies.

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Exhibit H - Plan 2 of 4
Master Framework Plan

February 2013 I Project No 21983_85i

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LEGEND

- Project Boundary
- Town Center Planning Area
- Large Format Retail Planning Sub Area
- Mixed Use Employment Planning Sub Area
- Resort Planning Area
- High Density Residential Planning Area
- Neighborhood (Mixed Density) Residential Planning Area
- Expressway
- Arterial Road
- Collector Road
- Conceptual External Connection

Planning Area Pod Number	Approximate Acreage
1	30ac
2	38ac
3	51ac
4	19ac
5	63ac
6	38ac
7	161ac
8	180ac
9	15ac
10	106ac
11	110ac
12	12ac
13	39ac
14	34ac
15	47ac
16	7ac
17	10ac
18	45ac
20	75ac
21	603ac
22	49ac

HUECO SPRINGS LOOP ROAD
RIVER ROAD ICEHOUSE
RIVER ROAD
GUADALUPE RIVER
Principal North South Arterial Road
Principal East West Arterial Road
HIGHWAY 46
CITY OF NEW BRAUNFELS ETJ LIMITS
CITY OF NEW BRAUNFELS
337
LOOP
ROAD
RIVER
I CENTO SCHOOL
NEW BRAUNFELS HIGH SCHOOL

Approximate Potential Development Statistics.

Town Centre Planning Area Acreage:	30 acres
High Density Residential Planning Area Acreage:	55 acres
Nbhd. (Mixed Density) Residential Planning Area Acreage:	1567 acres
Large Format Retail Planning Sub Area:	82 acres
Mixed Use Employment Planning Sub Area:	89 acres
Resort Planning Area Acreage:	49 acres

Note:
Future ROW, and Parks are included in POD acreages.

NOTES:
(A) Collector Road to connect to Principal East West Arterial Road - alignment not fixed.
(B) Future Collector Loop Road - alignment not fixed.
(C) Only one external connection to be provided based on finalization of alignment by future studies.

DISCLAIMER: This Master Framework Plan is a part of that certain Development Agreement between the Developer and the City of New Braunfels dated _____, provided that this Master Framework Plan may be amended in accordance with the Development Agreement without amending the Development Agreement. This Master Framework Plan demonstrates one example of the possible future development of the Project. It remains subject to change to accommodate the Developer's marketing objectives and comply with applicable laws. The roadway alignments, land uses and other items depicted on this Master Framework Plan are general depictions only and should not be relied upon.

Exhibit H - Plan 3 of 4
Master Framework Plan - Planning Area Pods

February 2013 | Project No 21983_112a

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LEGEND

- Project Boundary
- City Limits
- Activity Node Location Buffer (R500ft)
- Road Network Location Buffer (500ft)
- Town Center Planning Area
- Large Format Retail Planning Sub Area
- Mixed Use Employment Planning Sub Area
- Resort Planning Area
- High Density Residential Planning Area
- Neighborhood (Mixed Density) Residential Planning Area
- Activity Node (AN)
- Linear Open Space Park
- Regional Park (RP)
- Expressway
- Arterial Road
- Collector Road
- Conceptual External Connection

HUECO SPRINGS LOOP ROAD

RIVER ROAD

RIVER ROAD ICEHOUSE

GUADALUPE RIVER

Principal North South Arterial Road

Principal East West Arterial Road

RP2

RP1

AN

Ⓑ

Ⓒ

Ⓐ

OAKRUN MIDDLE SCHOOL

HIGHWAY 46

CITY OF NEW BRAUNFELS ETJ LIMITS

WESTPOINTE VILLAGE CENTRE

NEW BRAUNFELS HIGH SCHOOL

LOOP

337

ROAD

RIVER

I CENTO SCHOOL

CITY OF NEW BRAUNFELS ETJ LIMITS

CITY OF NEW BRAUNFELS

NOTES:

Ⓐ Collector Road to connect to Principal East West Arterial Road - alignment not fixed.

Ⓑ Future Collector Loop Road - alignment not fixed.

Ⓒ Only one external connection to be provided based on finalization of alignment by future studies.

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Exhibit H - Plan 4 of 4

Master Framework Plan - Buffer Areas

February 2013 I Project No 21983_115a

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EXHIBIT NO. 6

to Utility Agreement

Utility Engineering Report of August 2011

WORD BORCHERS TRACT

Utility Engineering Report –
Water and Sewer Infrastructure

November 2010

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EXHIBITS

Exhibit 1 – Master Framework Plan
Exhibit 2 – Intensity of Utility Service and Phasing Exhibit
Exhibit 3 – Master Water Plan
Exhibit 4 – Master Sewer Plan
Exhibit 5 – Sewer System Hydraulic Calculations

I. EXECUTIVE SUMMARY

The Word Borchers Tract, a 2,400± acre multi-use development is located in northern New Braunfels, outside of Loop 337. This tract is located within the limits of the Comal County Water Control and Improvements District No. 1 established by legislative action during 2009. This property is located over the Edwards Aquifer Recharge Zone and all development activities will be in accordance with rules and regulations established for the Edwards Aquifer Recharge Zone.

Development of this property will include a mix of residential and commercial land uses and is expected to occur over a 25-30 year period. The land use plan for the Word Borchers Tract that will be incorporated into a Development Agreement with the City of New Braunfels is included as Exhibit 1, Master Framework Plan, and as attached as Exhibit 5 to the Utility Construction Cost Sharing Agreement. Information from the Master Framework Plan was used to prepare Exhibit 2 (Intensity of Utility Service and Phasing Exhibit) that identifies the distribution of utility service requirements and reflects the preliminary phasing plan for the development. The development is requesting extension of water and sanitary sewer service from New Braunfels Utilities (NBU). The full build-out of the property is projected to require an estimated 6,724 Living Unit Equivalents (LUE's) of sanitary sewer service and an estimated 7,680 LUE's of potable water service.

The local contact for the developer of the Word Borchers Tract is Ms. Tiffany Lacey. Her local contact information is provided below:

Ms. Tiffany Lacey
ASA Properties LLC
396 North Seguin Avenue
New Braunfels, TX 78131
Phone: (512) 761-0061

Ms. Lacey will be the primary contact for this project.

Sanitary sewer proposed to serve this tract will require extension of a 27-inch gravity sewer main from this property to the existing Blieders Creek Lift Station. Sewer flows from the Word Borchers Tract will be transferred to the Gruene WWTP for treatment. New on-site gravity mains, 8-inch to 27-inches diameter, three (3) new lift stations and force mains, and connections to two (2) existing gravity sewer mains will provide the sewer infrastructure required to support development of this property. Discussions with NBU staff reflect that the two (2) existing sewer mains each have 200 of available capacity that can be utilized to support the first 2-4 years of development. The developer is requesting that NBU provide an additional 300 LUEs of temporary sewer service capacity within the each of the two existing sewer mains for five years. This will enable the development to generate adequate activity to support the financial burden of the off-site sewer main construction.

The proposed development of the Word Borchers Tract will occur across water system Pressure Zones 4 and 5. Development of the property will require construction of new elevated storage capacity of 1.5 million gallons in the two pressure zones to meet the needs of the residential and commercial properties. A potable piping network incorporating primary trunk water mains sized 12 to 36-inches within the two Pressure Zones will be required to provide adequate flows and pressures to the proposed development, and to provide adequate capacity for additional flows to support the new water treatment plant proposed by NBU north of this property.. Preliminary discussions with NBU staff suggest that adequate capacity exists to support initial growth within the property for approximately 400 LUEs, or 3-4 years. This will enable development to begin prior to expenditures for significant infrastructure components are required.

NBU has requested that this development oversize a few segments of its water mains to accommodate future flows (5,000 gallons/minute) from a new water treatment plant to be

located north of this development. This will require oversizing of some 12 and 16-inch water mains to 24 and 36 inch mains to accommodate the additional capacity requested by NBU. Also, NBU has requested that the elevated storage tank be oversized from 1.5 mgallons to a 2.5 mgallons to accommodate future growth and provide supplemental capacity and support to its existing water system infrastructure. All oversizing costs will be funded by NBU in accordance with its standard policies.

II. GENERAL DEVELOPMENT

The Word-Borchers Tract encompasses approximately 2,400-acres in northern New Braunfels and Comal County. The property is generally bounded on the east by the Guadalupe River, the south by Loop 337 and existing subdivisions on the west by SH 46, and by several large, undeveloped acreage tracts to the north.

This property is located entirely within the limits of the proposed Comal County Water Control and Improvements District No. 1 established by legislative action in 2009. This property overlays the Edwards Aquifer Recharge Zone. All development will be completed in accordance with rules applicable to development over the Edwards Aquifer Recharge Zone, as established in the Texas Commission on Environmental Quality (TCEQ) Chapter 213.

Development of this property will include a mixture of residential, commercial and retail use. Exhibit No. 2 illustrates the anticipated residential and commercial development areas within the property. The rate of development will follow local demands supported by economic conditions. Development of this property is expected to extend over a twenty-five to thirty year period. Initially, the development will incorporate primarily single-family residential subdivision units with some limited commercial or retail developments. Both types of development areas will utilize existing roads and utility infrastructure. These existing roads and water and sewer lines will establish the initial growth patterns.

As noted in Exhibit 2, the revised roadway network has been established to define potential development areas and to reflect anticipated initial alignments of interior streets within the property. These road alignments indicate the general traffic patterns through the property and are used to conceptually establish water service pressure zones and sanitary sewersheds for the property.

Anticipated land uses include a mixture of residential and commercial developments. These broad classifications will include a variety of subcategories within both the residential and commercial classifications. A listing of some anticipated project types are provided below.

Residential Developments

- Single-family residential developments, home sizes ranging from 1,500-4,500 square feet
- Small, localized recreational facilities commonly found in residential developments, such as swimming pools, tennis courts, soccer fields, mixed-use parks, etc.
- Elementary and/or middle schools
- Churches and related facilities

Commercial Developments

- Large retail developments incorporating small shopping outlets, grocery outlets, and multi-purpose retail outlets
- Small to medium office buildings
- Medical offices, doctor offices
- Service stations
- Multi-family developments including apartments and town-homes
- Restaurants

- Major utility infrastructure facilities (storage tanks, pump stations)
- Town centers incorporating a mixture of all of the above types of retail and restaurant establishments
- Secondary schools, including community schools and specialized educational facilities
- Community athletic park facilities including parks, soccer and softball complexes
- Hotels with specific river/water related activities

Multiple land use concepts have been developed to define the utility service requirements for the Word-Borchers Tract. Based on the current conceptual land use concepts, it is estimated that the utility service requirements (Living Unit Equivalents – LUE's) will be as noted below.

• Residential use	5,520	LUEs (estimated)
• Commercial/Retail/non-residential	1,204	LUEs (estimated)
	6,724	LUEs – sewer
	7,680	LUEs – water*

**includes approximately 8% for irrigation use, roadway medians and parkways, greenbelt and selected parks*

This conceptual development plan anticipates an average wastewater service demand of approximately 4.3 LUE's per acre of developable land (estimated 1,567 acres, exclusive of roads, local parks, schools, greenbelts, exclusive of floodplain or detention pond areas). Actual service requirements may vary depending on several factors such as residential lot sizes, density of multi-family areas, number of offices and restaurants, and types of retail and shopping areas. It is anticipated that development and its service

requirements will average 75-125 LUE's in the first 2-3 years, gradually increasing to an annual average of 150-300 LUE's per year over the following 25-30 years.

III. PROPOSED FACILITIES – WATER

A. Water Service Demand Requirements

The development of the Word-Borchers Tract will require potable water service connections in NBU's Pressure Zones 4 and 5 (ref. Exhibit 2). As noted previously, the development of the Word-Bochers Tract is estimated to require 7,680 LUE's of potable water service as build-out. Based on conceptual layouts, these demands will be split among the two Pressure Zones approximately as noted below.

Pressure Zone 5	5,578* LUE's (72.6%)
Pressure Zone 4	2,102* LUE's (27.4%)

**Includes approximately 8% for landscape irrigation use, road medians, parkways, greenbelts, parks*

These LUE requirements are preliminary and may be modified in future years as development patterns are more clearly defined. For purposes of this utility service request, the proposed water infrastructure required to support the Word-Borchers tract will be based on a total service requirement of 7,680 LUE's for potable water. NBU has indicated that they have adequate water supply to support this development without the developer providing or securing additional water rights, or access to available surface water sources.

B. Mains and Infrastructure

Development of the Word-Borchers tract will incorporate new water mains and storage facilities in Pressure Zone 5. The first residential development units within Phase 1 are expected to occur in Pressure Zone No. 5. These initial residential pods would to be located in the eastern portion of the property. These

units would be served by an extension of the existing 12-inch water main from along Loop 337. This main would be adequate to support the first 400 residential connections. The first commercial/non-residential developments are anticipated to be located along Loop 337. Similarly, these development units would connect to the existing 12-inch mains along Loop 337 for water service.

These initial development areas would incorporate multiple internal 8-inch and 12-inch mains in accordance with NBU's policies and in conformance with the Master Water Plan provided as Exhibit 3. In addition to these internal lines, as illustrated in the Master Water Plan, a series of 12-to 36-inch mains, some that will be oversized by NBU, are proposed along the major roads to provide appropriate interconnections within the property. These proposed trunk mains will be extended as development progresses. Where appropriate, interconnections within smaller development areas will be made to maintain adequate fire flow capabilities and to minimize water quality concerns.

These service requirements will require additional off-site mains and water storage facilities to support long-term growth.

Table 1. Pressure Zone Requirements

Infrastructure	Pressure Zone 5	Pressure Zone 4	Totals
LUE's (ea)	5,578	2,102	7,680
Total Storage (gal)	1.116 MG	0.420 MG	1.536 MG
Average Day Demand *	3.90 MGD*	1.47 MG*	5.37 MGD*

**Assumes 3.5 persons/LUE – NBU requirements, for full build out.*

Discussions with NBU staff indicate that the existing water system infrastructure has adequate capacity to support some initial development. A confirmation of

available infrastructure capacity (water supply, water mains, storage and pump capacity) will be required to formalize a Utility Agreement for this development. The size of this proposed development and its 25-30 year development schedule will require NBU and the developer to closely coordinate growth including its future water supply capacities.

As development continues, the demand from this development will outstrip the existing available capacity from NBU's system. NBU's regulations require this development to provide and construct adequate facilities (mains, storage, etc.) to support its needs. Based on projected demands, it is recommended that water storage facilities be provided for the NBU system as noted below.

Pressure Zone 5 (5,578 LUE's)	1,115,600 gallons
Pressure Zone 4 (2,102 LUE's)	420,400 gallons
Totals	1,536,000 gallons

A 1.5 million gallon tank size is considered a standard size for elevated storage tanks. It is recommended that this development provide a 1.5 million gallon elevated storage tank for Pressure Zone 5. The required additional 36,000 gallons of additional storage capacity, if necessary, could be provided from existing NBU facilities, or could be included in future elevated storage tanks to be constructed within NBU's future Capital Improvements Program over the next 20-25 years. This elevated tank would provide appropriate ground storage capacity to support a proposed high service pump station for areas within Pressure Zone 4.

NBU has requested that the proposed 1.5 mgallon elevated storage tank be oversized to a 2.5 mgallon elevated storage tank to provide additional capacity for future growth and provide additional support to its current infrastructure system. NBU will participate in the oversizing of this elevated storage tank in accordance

with its standard policies and the Utility Cost Sharing Agreement. This oversized tank would enable NBU to remove the existing 250,000 gallon elevated storage along Loop 337 tank from service.

The new elevated storage tank and high service pump station improvements would require the developer to dedicate a 2-3 acre parcel to NBU for the proposed new elevated storage tank and pump station. Final size of the facility site dedication would be confirmed as preliminary designs for each of these facilities are begun. It is recommended that this dedicated parcel be located adjacent to the existing elevated storage tank to facilitate interconnections and minimize future piping and related electrical utility extensions for the high service pump station.

A series of 12 to 24-inch water trunk mains will be required to provide proper service and pressures to all areas of the Word-Borchers tract. These mains will generally be located along the proposed roadways throughout the development. As illustrated in the Master Water Plan (Exhibit 2), some internal 12-inch mains are recommended to maintain appropriate service levels within the development. These mains will also follow internal roads, with final alignments to be determined as development units are further defined and platting begins.

The required water main sizes as defined in NBU's current regulations (Article 2 2.9.2.A) for each of the Pressure Zones are noted below in Table 4.

Table 2. Water Main Capacity Requirements

Pressure Zone 5	**5,578 LUEs***	**@ 3.5 persons/LUE**
Avg. Daily Flows	200 gal/persons/day	2,711 gal/min
Peak Daily Flows	530 gal/persons/day	7,185 gal/min
Peak Hour Flows	900 gal/persons/day	12,202 gal/min
Pressure Zone 4	**2,102 LUEs***	**@ 3.5 person/LUE**
Ave. Daily Flows	200 gal/persons/day	1,022 gal/min
Peak Daily Flows	530 gal/persons/day	2,708 gal/min
Peak Hourly Flows	900 gal/persons/day	4,600 gal/min

**Reflects full build out of development.*

Under NBU's current regulations (Article 2.9.2A), allowable velocities for domestic use and fire flow conditions are 5 ft/sec. and 10 ft/sec respectively.

Table 3. Water Main Capacities

Main Size	**5 ft/sec***	**10 ft/sec****
8"	783 gpm	1,567 gpm
12"	1,762 gpm	3,525 gpm
16"	3,133 gpm	6,266 gpm
24"	7,050 gpm	14,100 gpm
30"	11,015 gpm	22,030 gpm
36"	15,862 gpm	31,724 gpm

**Domestic use conditions*
***Fire Flow conditions*

Fire flows will be defined by the type of development (residential, commercial, etc.) and if internal fire sprinkler systems are provided as part of the building construction. The 2009 International Fire Code provides recommendations for minimum fire flow rates of 1,500 – 2,000 gallons per minute which have been

used in development of this Master Water Plan. The required water main flow capacities for each Pressure Zone are summarized in Table 4 below.

Table 4. Required Water Main Equivalents Sizes (2.6.2A)

	Pressure Zone 5	Pressure Zone 4
LUE's (3.5 persons/LUE)	5,578*	2,102*
Ave. Daily Flow	2,711 gpm	1,022 gpm
Peak Day Flow	7,185 gpm	2,708 gpm
Peak Day & Fire Flow (residential)	8,685 gpm	4,208 gpm
Peak Day & Fire Flow (commercial)	9,185 gpm	4,708 gpm
Peak Hour Flow	12,202 gpm	4,600 gpm
Peak Day & Fire Flow (residential)	1-12", 1-24"	1-16"
Peak Day & Fire Flow (commercial)	1-12", 1-24"	1-16"
Peak Hour Flow	1-24", 2-16"	1-12", 1-16"

**3.5 persons/LUE, reflecting full build out of the development.*

The sizes identified in the tables above are based on flow in one direction only. Connections to existing mains within NBU's water system will enable this development to reduce the sizes of water mains needed to serve development within each Pressure Zone. The recommended connections to NBU's existing infrastructure are provided below.

Pressure Zone 4

- Connect to existing 12-inch mains on Oak Run Parkway and Loop 337
- Provide a new 16-inch main from the new water storage facility to provide service to areas within Pressure Zone 4.

Pressure Zone 5

- Provide new 16-inch and a 24-inch main from proposed elevated storage facility along Loop 337
- Provide two 12-inch main connections to the existing 12-inch mains along Loop 337
- Connect a 16-inch main along a future north-south arterial road expansion of River Road to a future water main extending from NBU's proposed water production facility north of this development

These recommended connections to existing and future water mains will provide adequate circulation of flows within the Word-Borchers tract and surrounding developments, minimizing concerns over water quality within the water mains.

Previous review meeting discussions with NBU has requested that this development's potable water system infrastructure be designed and constructed to provide an additional 5,000 gallons per minute of flow capacity through the development within its piping infrastructure from north to south. This additional capacity would be carried through oversized mains along the two North-South arterial roads within the Word Tract. The additional capacity will require the proposed 12 and 16-inch mains to be oversized to 24 and 36-inch sizes to provide the requested flow capacity. The oversizing of these mains will be funded by NBU under its standard policies.

C. Hydraulic Analyses

The proposed water mains identified in the Master Water Plan were determined through preliminary calculations and initial hydraulic analysis. NBU staff has indicated that adequate available capacity to meet currently anticipated demands in the first 2-3 years of 400-500 LUEs exist in its current water system

infrastructure. The proposed water main size determinations also included a review of potential connections internal to the Word Borchers Tract.

Information provided in Tables 1 to 4 was used to establish main sizes for internal loops within the property. Based on this data, the Master Water Plan provides that the majority of the primary water mains would typically be 12-inch mains. It is not recommended that water mains be provided on both sides of the internal major roads within the same pressure zone. Use of parallel mains would not reduce main sizes from 12-inch due to fire flow requirements within the development. The use of parallel mains along on both sides of all internal roads would yield lower average flows throughout the water mains within the development, potentially resulting in lower water quality in the larger mains, and increasing the amount of system flushing by NBU to maintain desired water quality.

It is recommended that NBU and the developer coordinate the location and alignments of future potable water service mains along the larger arterial roads within proposed commercial pods to provide appropriate service connections and access. This will minimize the installation of short, dead-end mains that would require constant flushing by NBU to maintain water quality to its customers.

D. Oversizing

The water mains and storage facilities identified in this report and on the Master Water Plan are sized to provide appropriate capacities to serve this development. The adjacent undeveloped areas and their potential service needs have not been included in any calculations or water main alignments.

There are limited water infrastructure facilities associated with the Word Borchers Tract that could be oversized by NBU to benefit surrounding areas including

existing developments. Infrastructure facilities that could be oversized by NBU as part of its long-term infrastructure network are identified below.

- 12 and 16-inch main along the primary north-south arterial roads to support the requested flows of 5,000 gallons/minute from NBU's future water treatment plans
- 12-inch main (Pressure Zone 5) along Loop 337

IV. PROPOSED FACILITIES – SEWER

A. Sewer Service Demand Requirements

Flows from the Word-Borchers tract, located north of Loop 337, will be treated at NBU's existing Gruene WWTP. The property has three primary sewersheds, two of which have an existing sewer main crossing through the sewersheds. Each of these mains provides service to existing developments. Discussions with NBU staff reflect that these two existing sewer mains have available un-allocated capacity of approximately 200 LUEs that would be reserved for use by the Word Borchers Tract's developments to support initial phases of the development.

Under NBU's current guidelines, the proposed sanitary sewer service requirements of 6,724 LUEs at full build-out will generate an average daily dry weather flow of 3,269 gallons per minute (gpm), or 4.50 MGD.

ADF = (6,724 LUE's) (3.5 persons/LUE) (200 gal/day/LUE) = 4,706,800 gal/day

The three primary sewersheds illustrated in Exhibit 3 – Preliminary Sewersheds are generally described below.

- East – Approximately 34% of the property, encompassing an estimated 536 acres of developable land with an estimated 2,168 LUE's of service, generally extending from east of River Road to the Guadalupe River.
- North – Approximately 40% of the property, encompassing an estimated 619 acres of developable land, with an estimated 2,312 LUE's of sewer service demands. This sewershed includes an existing 15-18-inch main generally paralleling Blieders Creek, extending to the northwest corner of the Word Borchers Tract.
- South – Approximately 26% of the property, encompassing an estimated 411 acres of developable land, with an estimated 2,244 LUE's of sewer service demands. This sewershed includes an existing 12 to 18-inch gravity main generally paralleling a tributary of Blieders Creek, extending to an existing subdivision at the southwest corner of the Word Borchers Tract.

Table 5. Sewershed Requirements

Sewershed	Acres	LUEs*	Average Daily Flows*
North	619	2,312	1.62 MGD*
South	411	2,244	1.57 MGD*
East	536	2,168	1.52 MGD*
Totals	1,566	6,724	4.71 MGD*

**reflects full build out of development.*

These primary sewersheds have been broken into smaller sub-sewersheds for an analysis of the development's sewer service demands, and for use in the sizing of sewer mains and lift stations required to serve this property. The Master Sewer Plan is provided as Exhibit 4. Preliminary sewer main sizing calculations are provided in Exhibit 5. A summary of the estimated sewer flows by primary sewersheds is provided in Table 5 above.

B. NBU Service Capabilities

As noted previously, all sewer flows generated from the Word Borchers Tract will be treated by the Gruene WWTP. The two existing gravity sewer outfalls were constructed to serve developments west of the Word Borchers Tract. Discussions with NBU's staff indicate that each of these gravity mains have an estimated 200 LUE's of un-assigned and available capacity that can be reserved for the Word Borchers Tract.

Also, discussions with NBU staff indicated that the Blieders Creek Lift Station and force main and the Gruene WWTP each have approximately 45-50% of their design capacity available and uncommitted at the time of this report. Full build-out of this property is expected to require expansions and/or upgrades to both facilities to support the anticipated development through its completion.

Development of the Word Borchers Tract is projected to take 25-30 years to complete. The rate of internal development will vary with economic conditions. A preliminary projection of the internal growth of service requirements is provided in Table 6.

Table 6. Preliminary Development Growth Projections

Sanitary Sewer Service

Period	Sewer Service Demands (LUE's)	Cumulative Sewer Service Demands
2012-2016	750	750
2017-2021	1,250	2,000
2021-2026	1,475	3,475
2026-2036	1,575	5,050
2031-2036	1,674	6,724
Totals	6,724	6,724

These preliminary growth projections indicate that within the next five to ten years, NBU will need to begin planning and design of the expansion of its Gruene WWTP and the Blieders Creek Lift Station and Force Main system. These expansions will fit within NBU's planning period for the next Capital Improvements Plan and can be considered in the calculation of its impact fees. This planning process will enable NBU to recoup its costs for the expansion of the treatment plant, the Blieders Creek lift station and force main and related outfall mains from new development within the Word Brochers tract and surrounding developments.

C. Proposed Mains and Infrastructure

The Preliminary Development Growth Projections provided in Table 6 are used to determine gravity main, lift station and force main sizes necessary to serve the Word Borchers Tract. The Master Sewer Plan provided as Exhibit 4 illustrates the proposed alignments and sizes of the gravity sewer mains and the recommended location of the three new lift stations and force mains for this development.

The north and south sewersheds will utilize gravity sewer mains generally paralleling the existing sewer mains crossing the property that are providing sewer service to areas west of this property. As noted in the Master Sewer Plan, the onsite mains will vary in sizes from 8 to 27-inches. A 27-inch outfall is proposed to transfer flows from this property to the existing Bleiders Creek Lift Station for eventual treatment by the Gruene WWTP. The sewer main sizes reflected in the Master Sewer Plan are sized to meet the needs of the Word Borchers Tract only, and do not include capacity for undeveloped parcels north or west of the property.

Preliminary sizing calculations for the Master Sewer Plan are provided in Exhibit 5. These calculations are based on NBU's current design standards and design criteria.

The anticipated sanitary sewer flows generated within the East Sewershed will be transferred by three lift stations and force mains to the proposed gravity mains along Bleiders Creek. These three lift stations will have design capacities as noted below.

- North Lift Station 356 LUE's (94 acres)
- Resort Lift Station 1,311 LUE's (309 acres)
- East Lift Station 421 LUE's (112 acres)

The preliminary sizes and alignments of the gravity sewer mains, lift stations and force mains will be confirmed during final designs and platting of the various units of the property. Any revisions to the preliminary sizes will be coordinated with NBU and, if appropriate, revisions to the Master Sewer Plan for the Word Borchers Tract will be completed in accordance with NBU's governing regulations.

The design slopes used in the sewer design calculations are based on available aerial topography and assumed an average depth of 12 feet for downstream and upstream invert elevations. The calculated slopes were reduced by 10% to provide a safety factor for design and master planning of infrastructure. Final designs of all gravity mains will include field surveys to confirm grades and elevations, and to identify potential conflicts with other utilities and drainage structures.

Construction of the first subdivision units for Phase I will include construction of a large detention pond required by the City of New Braunfels on the southern tributary of Blieders Creek. This detention pond will aid in reducing downstream flows in the Blieders Creek during larger rainfall events within the City of New Braunfels. As illustrated on Exhibit 4, the detention pond depending on storm event size and intensity is anticipated to store accumulated stormwater approximately 1,100 feet upstream of the dam, potentially inundating a portion of the existing southern 12-inch sewer main and the proposed new sewer main Segment S-7.

Construction of this detention pond will require a retrofit of the existing manholes to preclude direct inflow from ponded water behind the dam. The existing sewer main trench will have to be reconstructed and backfilled with appropriate materials, constructed keyways, and other features to prevent water seepage along the existing piping that could potentially undermine the proposed dam structure. Similar construction techniques and materials will be required for the proposed Segment S-7 for similar reasons.

The size and width of the proposed detention pond dam has not been preliminarily defined at this time. It is estimated that 100-120 feet of the existing 12-inch sewer main and the proposed Segment S-7 will be located under this new detention dam structure. It is proposed that the new sewer main be installed in steel sleeving to provide NBU with the ability to remove the portions of the new sewer main under the dam for service. It is recommended that NBU consider a similar sleeve for its existing 12-inch main that would be located under the new detention dam structure.

If NBU is concerned about multiple mains located under the detention dam structure, an alternate construction scenario could be considered. The proposed

Segment S-7 would be installed generally as shown in Exhibit 4. The sewer flows from the existing southern 12-inch sewer main would be diverted into Segment S-7 at its intersection with Segment S-13 at the upper or western end of the detention pond, and carried through the detention pond limits. A new flow diversion structure would be constructed near the eastern end of Segment S-7 to re-divert appropriate flows back into the exiting 12-inch main. The Segment S7 sewer main would require an overizing to accommodate the flows of the existing 12-inch main (726 LUEs per NBU) of its ultimate flows would be increased from an 18-inch to a 21-inch main. The costs associated with this oversizing would be shared by the developer and NBU in accordance with NBUs current regulations. The limits of this possible sewer main alternate are shown on Exhibit 4 (Segment 7A).

D. Hydraulic Analyses

The preliminary sewer main designs are based on NBU's current design criteria, Section 2.9.3 Wastewater Systems. The calculations provided in Exhibit 5, utilize standard PVC Pipe (8"-18") and Reinforced Plastic Mortar Pipe (ASTM D3262, "Hobas Pipe" - 21" and larger) for gravity sewer mains, and either PVC or HDPE for the force mains.

The sewer calculations reflect that all generated sewer flows for this property will be transferred to the Blieders' Creek Lift station by a single new, 27-inch outfall main (S-1 to S-5). Three lift stations within the East Sewershed will transfer flows to other on-site gravity mains connecting to the outfall segments. An alternate solution to these on-site transfers would require a separate outfall from the eastern portion of this property through developed areas, extending a new 15-18-inch sewer main to the existing gravity main at the Gruene WWTP. This alternate outfall option would only eliminate one (East Lift Station) of the three lift stations proposed for the eastern portion of this development. For purposes of

securing a formal utility agreement with NBU, the Master Sewer Plan reflects only a single, 27-inch gravity sewer outfall to the Blieders Creek Lift Station.

The hydraulic calculations reflect the sanitary sewer infrastructure required to support an estimated 1,567 acres of developable land. These calculations assume that areas within the 100-year floodplain and Greenbelts along Blieders Creek are not developed, and all roadways are not included in the infiltration and inflow calculations.

The property's three sewersheds were further subdivided into smaller sub-sewersheds for use in sizing calculations for the proposed sewer infrastructure. Flow capacity requirements for each of the gravity mains and lift stations/force mains are provided in Exhibit 5. The calculations reflect that the proposed mains and force mains shown on the Master Sewer Plan will provide adequate capacity to serve the proposed development. For most of the proposed on-site sewer mains and force mains, there is little surplus capacity available to support additional sewer flows from surrounding developments under current NBU design guidelines.

The NBU staff has confirmed that the two existing sewer mains have 200 LUEs of un-assigned capacity that can be reserved for the Word Borchers Tract. The information on the existing two sewer mains provided by the NBU staff also reflects these two mains are currently serving from approximately 20% (Southern 12-inch main) to 50% (northern 15-18-inch main) of their available, reserved capacities.

It is requested that NBU allow the Word Borchers Tract to temporarily borrow an additional 300 LUEs from each existing sewer mains for five years. This additional capacity will enable the existing infrastructure to support new

development within the Word Borchers Tract and to generate sufficient revenues for the construction of the proposed outfall segments S1 to S7.

E. Offsite Improvements

As illustrated in the Master Sewer Plan, the Word Borchers Tract will require the capacity of 27-inch gravity main to support its anticipated development. The Master Sewer Plan reflects this requirement, and identifies a proposed off-site gravity sewer outfall extending approximately 6,600 feet to the Blieders' Creek Lift Station.

The Blieders' Creek Lift Station, its force main, and the Gruene WWTP have approximately 40% to 50% of unused or non-committed capacity. These facilities will require expansions and/or upgrades to provide adequate sewer service for the entire Word Borchers Tract. Improvements to these facilities will not be required for several years, giving NBU an opportunity to incorporate them into its next Capital Improvements Plan, and subsequently its next set of impact fee calculations.

Construction of the proposed 27-inch outfall sewer main regardless of options will require the developer and NBU to closely coordinate to complete designs and to identify new easements for acquisition by NBU. The Master Sewer Plan reflects the 27-inch outfall alignment would be constructed generally parallel to the existing 18-inch gravity main. This is expected to require a new 15 to 20-foot permanent sewer easement, and a temporary 20 to 30-foot construction easement to build the new sewer main. The requirement for securing these easements will need to be defined in the final utility agreement for this property. It is recommended that the securing of these easements be provided by NBU (and City of New Braunfels) as these entities have eminent domain authority to support the acquisition of the necessary easements.

An alternate option to providing a parallel outfall main to the Bleiders Creek Lift Station would be for NBU and the developer share in the costs of removing the existing 18-inch outfall sewer main and replacing it with a single 36-inch sewer main. Both NBU and the developer would share in these costs. It is recommended that the cost sharing be distributed on an LUE basis to more accurately reflect the required capacity assignments of the two parties. This remove and replace option could utilize the existing sewer easements, possibly only requiring the need for NBU and the City of New Braunfels to secure temporary construction easements to complete the construction.

Construction of the parallel outfall sewer main will require coordination and construction permits from Texas Department of Transportation (TxDOT, Loop 337 crossing), NBU and the City of New Braunfels (street/road crossings, floodplain permits.) Securing these permits would be the responsibility of the developer, with coordination by NBU.

F. Oversizing

The proposed sewer infrastructure shown in the Master Sewer Plan is projected to have very little surplus capacity that would be available for surrounding developments.

Should NBU be interested in oversizing mains for future surrounding developments, the following sewer mains are suggested for oversizing.

S-1 through S-6
N-1 through N-9, N-13, N-14
E-11 and E-13, North Lift Station

These mains could be extended through the Word Borchers Tract to provide service to the undeveloped tracts to the north. Any oversizing requested by NBU would be reimbursed to the developer under NBU's current regulations.

V. RECOMMENDATIONS

Development of the Word Borchers Tract will require new water and sewer infrastructure facilities over the next 25-30 years. Initially, NBU's existing water and sewer mains and facilities appear to have adequate and available capacities to support 400-750 LUEs of development. The use of these available capacities will enable both the NBU and the development to begin construction without extensive and significant capital investments. Use of the available capacities will enable NBU to update its Capital Improvements Program to include this development, providing for its ability to provide proper and adequate service to its new customers. Also, use of existing capacity will provide adequate time to secure additional off-site easements and sites for water storage and pumping facilities in advance of proposed construction.

The Master Water and Sewer Plans identify the required improvements for this development. Facilities that could be easily oversized to support surrounding areas have been identified in this report. It is suggested that NBU evaluate its long range plans to identify which of these Word Borchers Tract infrastructure projects should be oversized to provide optimal solutions for water and sanitary sewer service to the area.

EXHIBITS

EXHIBIT 1

Master Framework Plan

REVISED LAND USE PLAN 5C

Precinct	Dwelling Yield Estimate	Commercial Floorspace Estimate	Other Non Res Floorspace	
	(dw)	*(square feet)*	*(other use, square feet, total rooms/students)*	
1	59	***330000***	-	-
2	191	**—**	*University/Institution*	***80,000***
3	205	***130000***	-	-
4	343	**—**	-	-
5	153	**—**	-	-
6	225	**—**	-	-
7	37	***130000***	-	-
8	55	***235000***	-	-
9	—	***428000***	*Hotel*	*180 room*
10	—	***400000***	-	-
11	—	***732000***	-	-
12	149	**—**	-	-
13	399	**—**	-	-
14	242	**—**	*School*	*900 students*
15	289	***35000***	*Community Fac.*	***20,000***
16	273	**—**	-	-
17	99	**—**	-	-
18	211	**—**	-	-
19	158	**—**		
20	170	**—**		
21	—	***280000***		
22	35	**—**	*School*	*900 students*
23	90	***75000***		
24	217	**—**	*Community Fac.*	***20,000***
25	308	**—**		
26	59	**—**	*Resort*	*300 room*
27	465	**—**		
28	116	**—**		
29	427	**—**		
30	274	**—**		
31	168	**—**		
32	247	**—**		
TOTAL:	5665	***2775000***		

Land Use Area	*Low Density*		*High Density*		*Town Centre*		*Total Residential*	
Total Acreage	1192.1		55.1		5.0		1252.2	
Average Density	3.8		20.3		11.8		4.5	
Product Types	*dwellings*	*% Mix*	*dwellings*	*% Mix*	*dwellings*	*% Mix*	*dwellings*	*% Mix*
3 St. MU Apt/Unit - Base.	—		—		*59*	*100%*	*59*	*1%*
3 St. Apt/Unit. - No Base.	—		*324*	*29%*	—		*324*	*6%*
3 St. Apt/Unit - Base.	*195*	*4%*	795	*71%*	—		*989*	*17%*
Townhome	*250*	*6%*	—		—		*250*	*4%*
Row House	*421*	*9%*	—		—		*421*	*7%*
Duplex	*51*	*1%*	—		—		*51*	*1%*
Live/Work	*287*	*6%*	—		—		*287*	*5%*
Low SFD 1	*1047*	*23%*	—		—		*1047*	*18%*
Low SFD 2	*779*	*17%*	—		—		*779*	*14%*
Mid SFD 1	*688*	*15%*	—		—		*688*	*12%*
Mid SFD 2	*422*	*9%*	—		—		*422*	*7%*
High SFD 1	*167*	*4%*	—		—		*167*	*3%*
High SFD 2	*182*	*4%*	—		—		*182*	*3%*
	4488	***100%***	***1119***	***100%***	***59***	***100%***	*5666*	*100%*

Legend

General Details
- Site Boundary

Open Space
- Regional Park
- Community Park
- Linear Park & Open Space
- Indicative Neighborhood Park
- River Interface Overlay
- Private Conservation

Development Area
- Town Center
- Neighborhood Center
- Commercial & Business
- Large Format Retail Core
- Mixed Use Business Frame
- High Density Residential
- Medium Density Residential
- Neighborhood Residential
- Higher Education / Medical / Other Institutional
- School
- Community Facility
- Resort Commercial

Road
- ROW
- Buffer Loop 337
- Indicative Divided Primary Arterial
- Indicative Divided Secondary Arterial
- Indicative Undivided Collector

Hueco Springs Loop Rd
River Road
WHITE WATER RD.
GUADALUPE RIVER
RIVER ROAD
EDWARDS BLVD.
River
LOOP 337 / HWY 46
Loop 337
Highway 46
Assumed Earthworks to alter preliminary breach line to bring without private property

Yield & Population Projection:
The projections are based on a development footprint derived from preliminary studies and advice
The projections and other outputs derived from them are mathematically generated

The projection is preliminary and is subject to an approximate tolerance of +/- 5%

The projection is based on the below assumptions which should be considered when reviewing the preliminary land use plan
Subject to detail design and ongoing studies to verfiy development extents, infrastructure and traffic studies.
Subject to relevant State and Local Government approvals
Preliminary flora & fauna, stormwater, infrastructure and geotechical studies were provided.
No traffic modelling or economic demand studies were provided.
Floorspace estimates have not been referenced to an economic demand study and are based on predominately surface parking as a design assumption.
Land areas indicated do not incorporate potential setbacks and buffers to Karst Features

Roads:
25-27% of Net Residential Land is identified for local road network, subject to concept design verification.
Trunk Roads identified are subject to confirmation by a traffic study and are not included in the local road network perecentages identified above

Park:
Allocated Sport & Recreation Parks are based on prelimi, subject to confirmation with City of New Braunfels

Stormwater:
3% of Net Residential Areas & Employment Land are utilised for stormwater quantity and quality, subject to engineering and stormwater management plan
Balance Stormwater requirements are facilitated in Water Course, Recreation & Sports Open Space
Water bodies indicated are preliminary, subject to engineering and hydraulic studies.

Education:
Education campuses shown are preliminary, location, size and feasability subject to ongoing studies.

word borchers ranch

Scale 1":500' / 1:6000 @ ANSI E I **July** 2011 I **Project No** 21983_87

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EXHIBIT 2

Intensity of Utility Service and Phasing Exhibit

PHASE 1

PHASE 2

PHASE 3

PHASE 4

PHASE 5

PROPOSED DETENTION BASIN

RIVER INTERFACE OVERLAY

WHITE WATER RD.

GUADALUPE RIVER

EDWARDS BLVD.

LOOP 337 / HWY 46

ROADWAY BUFFER (TYP.)

SCALE: 1"= 500'

0' 500' 1,000' 1,500'

LEGEND

- RESIDENTIAL
- COMMERCIAL
- FLOOD PLAIN / PARK / OPEN SPACE / RECREATIONAL AND SUPPORTING FACILITIES
- PHASE BOUNDARY
- (18) DEVELOPMENT POD NUMBER

NOTES:

1. PROPERTY IS WITHIN COMAL COUNTY WCID#1.
2. THIS EXHIBIT IS SUBJECT TO THE MASTER FRAMEWORK PLAN ATTACHES TO THE DEVELOPMENT AGREEMENT DATED _____2011, AS AMENDED FROM TIME TO TIME IN ACCORDANCE WITH THE DEVELOPMENT AGREEMENT. IN THE EVENT OF A CONFLICT BETWEEN THIS EXHIBIT AND THE MASTER FRAMEWORK PLAN, AS AMENDED, THE MASTER FRAMEWORK PLAN CONTROLS. AN AMENDMENT TO THE MASTER FRAMEWORK PLAN DOES NOT REQUIRE AN AMENDMENT TO THIS EXHIBIT SO LONG AS THE AMENDMENT DOES NOT CAUSE TOTAL SERVICE DEMAND OF THE PROPERTY TO EXCEED THE MAXIMUM SERVICE LIMITS SPECIFIED IN THE UTILITY CONSTRUCTION COST SHARING AGREEMENT.
3. DEVELOPER RESERVES THE RIGHT TO RE-ALLOCATE INTENSITY OF SERVICE DEMANDS AND LAND USES AMONG TRACTS WITHIN THE PROPERTY SO LONG AS SUCH RE-ALLOCATION IS CONSISTENT WITH THE MASTER FRAMEWORK PLAN AND DOES NOT CAUSE TOTAL SERVICE DEMAND FOR THE PROPERTY TO EXCEED THE MAXIMUM SERVICE LIMITS SPECIFIED IN THE UTILITY CONSTRUCTION SERVICE COST SHARING AGREEMENT.
4. DEVELOPER RESERVES THE RIGHT TO INCREASE OR DECREASE THE NUMBER OF PERMITTED RESIDENTIAL UNITS OR NON-RESIDENTIAL COMMERCIAL SQUARE FEET IN THE PROPERTY, SO LONG AS IT IS CONSISTENT WITH THE MASTER FRAMEWORK PLAN AND THERE IS A CORRESPONDING ADJUSTMENT IN THE OTHER CATEGORY OF USE WHICH CAUSES OVERALL DEMAND TO BE EQUAL TO OR LOWER THAN THE MAXIMUM SERVICE LIMITS SPECIFIED IN THE UTILITY CONSTRUCTION COST SHARING AGREEMENT.
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REVISIONS:

PAPE-DAWSON ENGINEERS
555 EAST RAMSEY | SAN ANTONIO, TEXAS 78216 | PHONE: 210.375.9000 FAX: 210.375.9010
TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WORD BORCHERS TRACT
INTENSITY OF SERVICE UTILITY AND PHASING EXHIBIT
NEW BRAUNFELS, TX

JOB NO. 7620.04
DATE AUGUST 2011
DESIGNER LN
CHECKED LN DRAWN TB
SHEET EX-1

Date: Aug 08, 2011, 8:03am User ID: LNiles
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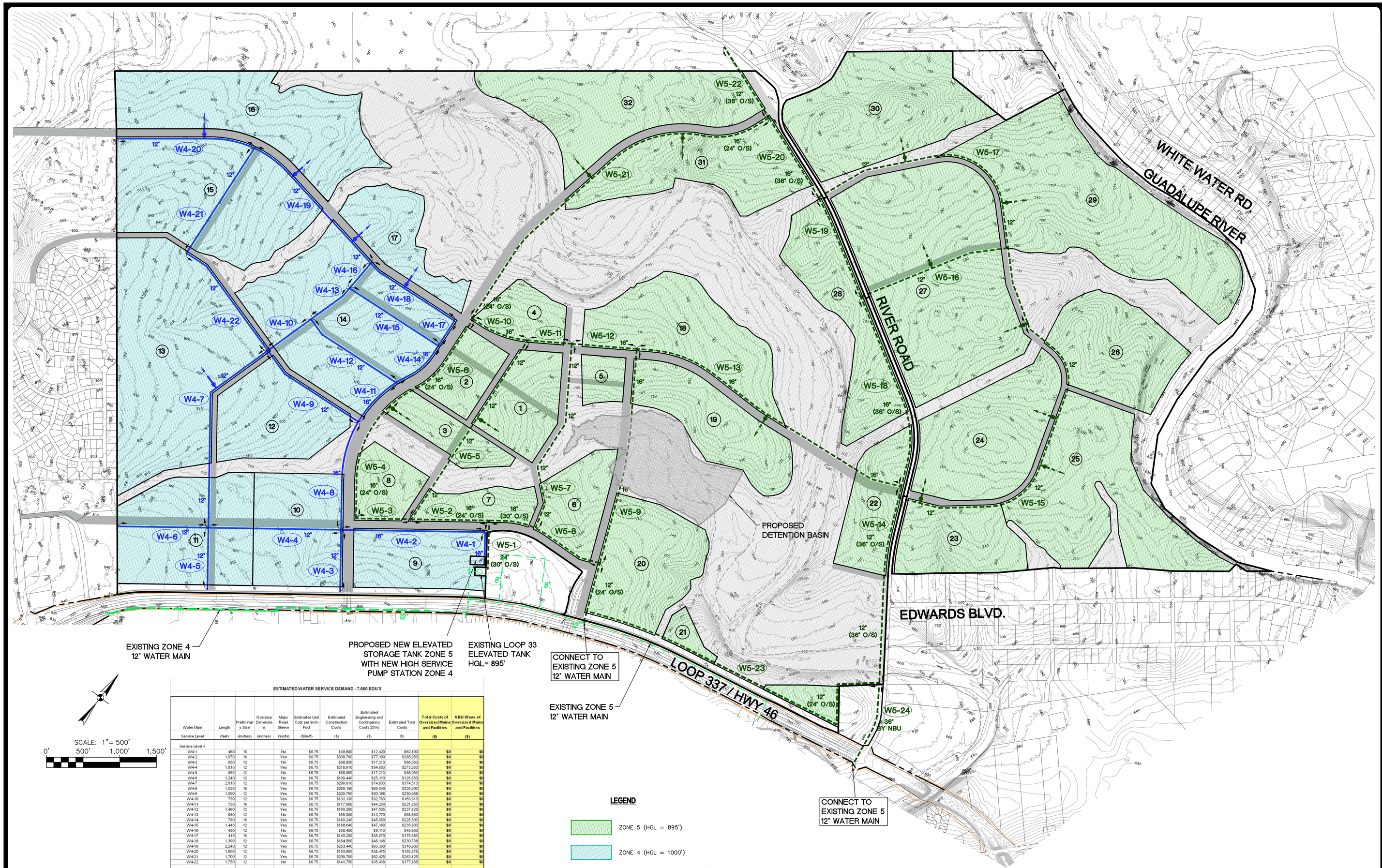
EXHIBIT 3

Master Water Plan



SCALE: 1"= 500'

0' 500' 1,000' 1,500'

ESTIMATED WATER SERVICE DEMAND - 7,680 EDU'S

Water Main Service Level	Length (feet)	Preliminary Size (inches)	Oversize Dimension (inches)	Major Road Sleeve Yes/No	Estimated Unit Cost per Inch-Foot ($/in-ft)	Estimated Construction Costs ($)	Estimated Engineering and Contingency Costs 25%) ($)	Estimated Total Costs ($)	Total Costs of Oversized Mains and Facilities ($)	NBU Share of Oversized Mains and Facilities ($)
Service Level 4										
W4-1	460	16		No	$6.75	149,660	$12,420	$62,100	$0	$0
W4-2	1,970	16		Yes	$6.75	$308,760	$77,190	$385,950	$0	$0
W4-3	850	12		No	$6.75	$68,850	$17,213	$86,063	$0	$0
W4-4	1,810	12		Yes	$6.75	$218,610	$54,653	$273,263	$0	$0
W4-5	850	12		No	$6.75	$68,850	$17,213	$86,063	$0	$0
W4-6	1,240	12		No	$6.75	$100,440	$25,110	$125,550	$0	$0
W4-7	2,810	12		Yes	$6.75	$299,610	$74,903	$374,513	$0	$0
W4-8	1,520	16		Yes	$6.75	$260,160	$65,040	$325,200	$0	$0
W4-9	1,560	12		Yes	$6.75	$200,790	$50,198	$250,988	$0	$0
W4-10	730	12		Yes	$6.75	$131,130	$32,783	$163,913	$0	$0
W4-11	750	16		Yes	$6.75	$177,000	$44,250	$221,250	$0	$0
W4-12	1,460	12		Yes	$6.75	$190,260	$47,565	$237,825	$0	$0
W4-13	680	12		No	$6.75	$55,080	$13,770	$68,850	$0	$0
W4-14	760	16		Yes	$6.75	$180,240	$45,060	$225,300	$0	$0
W4-15	1,440	12		Yes	$6.75	$188,640	$47,160	$235,800	$0	$0
W4-16	450	12		No	$6.75	$36,450	$9,113	$45,563	$0	$0
W4-17	410	16		Yes	$6.75	$140,280	$35,070	$175,350	$0	$0
W4-18	1,390	12		Yes	$6.75	$184,590	$46,148	$230,738	$0	$0
W4-19	2,240	12		Yes	$6.75	$253,440	$63,360	$316,800	$0	$0
W4-20	1,900	12		No	$6.75	$153,900	$38,475	$192,375	$0	$0
W4-21	1,700	12		Yes	$6.75	$209,700	$52,425	$262,125	$0	$0
W4-22	1,750	12		No	$6.75	$141,750	$35,438	$177,188	$0	$0
Service Level 5										
W5-1	670	24	30	Yes	$6.75	$252,540	$63,135	$315,675	$394,594	$78,919
W5-2	1,060	16	24	No	$6.75	$114,480	$28,620	$143,100	$214,650	$71,550
W5-3	760	16	24	Yes	$6.75	$178,080	$44,520	$222,600	$333,900	$111,300
W5-4	1,650	16	24	Yes	$6.75	$274,200	$68,550	$342,750	$514,125	$171,375
W5-5	2,910	12		Yes	$6.75	$307,710	$76,928	$384,638	$0	$0
W5-6	1,690	16	24	Yes	$6.75	$278,520	$69,630	$348,150	$522,225	$174,075
W5-7	2,670	12		Yes	$6.75	$288,270	$72,068	$360,338	$0	$0
W5-8	1,660	16	30	Yes	$6.75	$275,280	$68,820	$344,100	$645,188	$301,088
W5-9	2,970	16		Yes	$6.75	$416,760	$104,190	$520,950	$0	$0
W5-10	830	16		No	$6.75	$89,640	$22,410	$112,050	$0	$0
W5-11	600	16		Yes	$6.75	$160,800	$40,200	$201,000	$0	$0
W5-12	890	16		No	$6.75	$96,120	$24,030	$120,150	$0	$0
W5-13	4,130	16		No	$6.75	$446,040	$111,510	$557,550	$0	$0
W5-14	2,700	12	36	Yes	$6.75	$290,700	$72,675	$363,375	$1,090,125	$726,750
W5-15	4,440	12		Yes	$6.75	$431,640	$107,910	$539,550	$0	$0
W5-16	2,130	12		Yes	$6.75	$244,530	$61,133	$305,663	$0	$0
W5-17	4,650	12		Yes	$6.75	$448,650	$112,163	$560,813	$0	$0
W5-18	2,720	16	36	No	$6.75	$293,760	$73,440	$367,200	$826,200	$459,000
W5-19	1,480	16	36	No	$6.75	$159,840	$39,960	$199,800	$449,550	$249,750
W5-20	1,280	16	36	No	$6.75	$138,240	$34,560	$172,800	$388,800	$216,000
W5-21	5,190	16	24	No	$6.75	$560,520	$140,130	$700,650	$1,050,975	$350,325
W5-22	1,140	12	36	Yes	$6.75	$164,340	$41,085	$205,425	$616,275	$410,850
W5-23	5,700	12	24	No	$6.75	$461,700	$115,425	$577,125	$1,154,250	$577,125
W5-24	1,220	0	36	Yes	$6.75	$0	$0	$0	$648,575	$648,575
Elevated Storage Tank		1,500,000	2,500,000		$2.10	$3,150,000	$787,500	$3,937,500	$6,562,500	$2,625,000
Pump Station (gpm)		5,200			$325.00	$1,890,000	$422,500	$2,112,500	$0	$0
Misc. Electrical to PS		1			$625,000.00	$925,000	$156,250	$781,250	$0	$0
Totals	83,922					$15,599,732	$3,899,933	$19,319,489	$15,412,941	$7,163,681

LEGEND

- ZONE 5 (HGL = 895')
- ZONE 4 (HGL = 1000')
- ZONE 5 WATER MAIN ALIGNMENT
- VALVE
- ZONE 4 WATER MAIN ALIGNMENT
- VALVE
- FLOOD PLAIN / PARK / OPEN SPACE
- (18) DEVELOPMENT POD NUMBER

NOTES:

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TEXAS BOARD OF PROFESSIONAL ENGINEERS, FIRM REGISTRATION # 470

WORD BORCHERS TRACT
MASTER WATER PLAN
NEW BRAUNFELS, TX

JOB NO. 7620-04
DATE AUGUST 2011
DESIGNER LN
CHECKED LN DRAWN TA
SHEET EX-2

Date: Aug 06, 2011, 4:37pm User ID: UNes
File: P:\Projects\Design Civil\Exhibits\EX-PROPOSE_MWP.dwg

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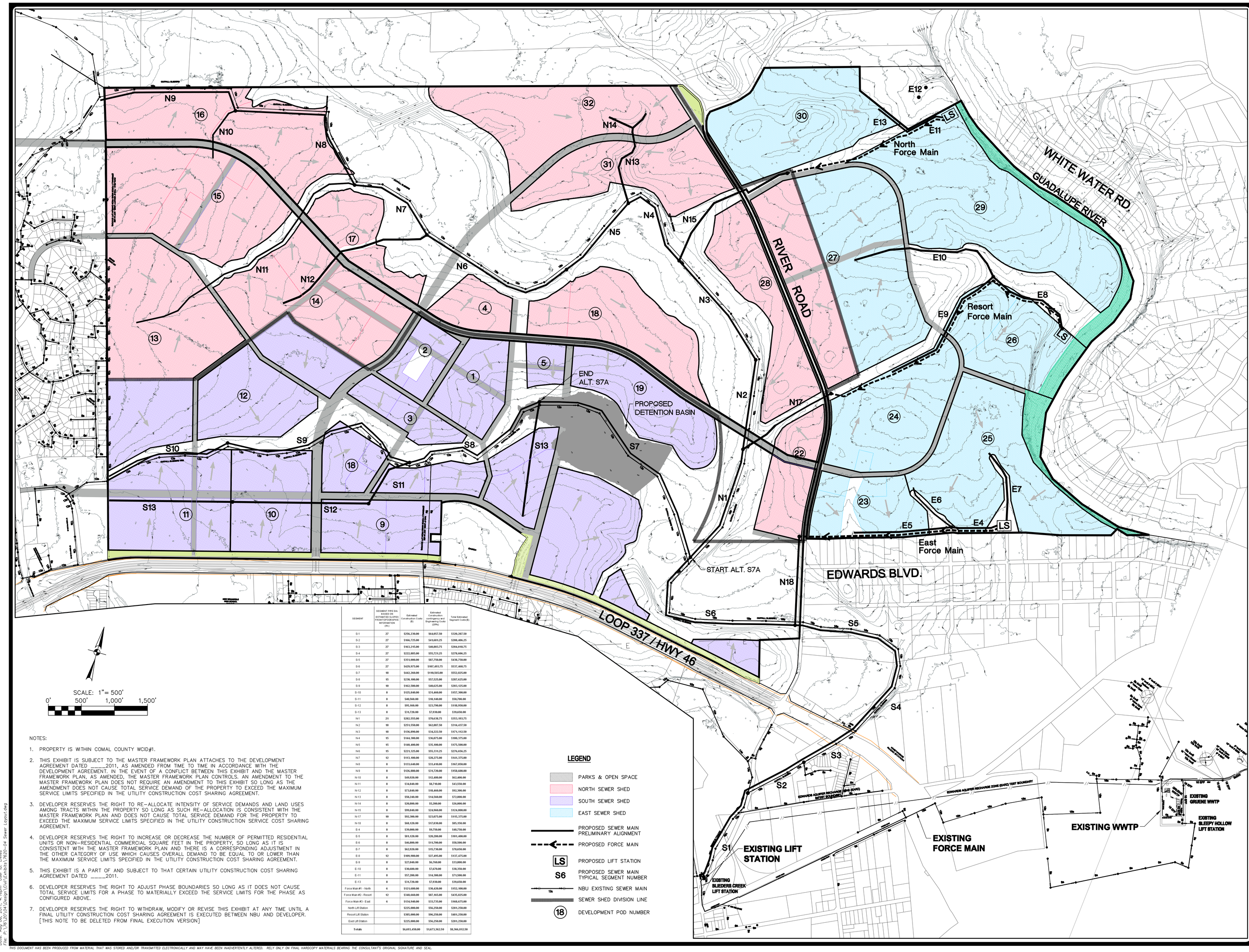
EXHIBIT 4

Master Sewer Plan



SEGMENT	SEGMENT TYPE DIA. (IN.) BASED ON ESTIMATED SLOPES FROM TOPOGRAPHIC INFORMATION (IN.)	Estimated Construction Costs ($)	Estimated Construction contingency and Engineering Costs (25%)	Total Estimated Segment Costs($)
S-1	27	$256,250.00	$64,057.50	$320,307.50
S-2	27	$166,725.00	$41,681.25	$208,406.25
S-3	27	$163,215.00	$40,803.75	$204,018.75
S-4	27	$222,885.00	$55,721.25	$278,606.25
S-5	27	$351,000.00	$87,750.00	$438,750.00
S-6	27	$429,975.00	$107,493.75	$537,468.75
S-7	18	$442,260.00	$110,565.00	$552,825.00
S-8	15	$230,100.00	$57,525.00	$287,625.00
S-9	10	$162,500.00	$40,625.00	$203,125.00
S-10	8	$125,840.00	$31,460.00	$157,300.00
S-11	8	$40,560.00	$10,140.00	$50,700.00
S-12	8	$95,100.00	$23,790.00	$118,950.00
S-13	8	$31,728.00	$7,932.00	$39,660.00
N-1	21	$282,555.00	$70,638.75	$353,193.75
N-2	18	$251,550.00	$62,887.50	$314,437.50
N-3	18	$136,896.00	$34,222.50	$171,112.50
N-4	15	$144,300.00	$36,075.00	$180,375.00
N-5	15	$140,400.00	$35,100.00	$175,500.00
N-6	15	$221,325.00	$55,331.25	$276,656.25
N-7	12	$112,100.00	$28,275.00	$141,375.00
N-8	8	$133,648.00	$33,418.00	$167,050.00
N-9	8	$126,888.00	$31,728.00	$158,608.00
N-10	8	$40,920.00	$12,480.00	$62,400.00
N-11	8	$34,848.00	$8,712.00	$43,550.00
N-12	8	$73,848.00	$18,468.00	$92,300.00
N-13	8	$58,240.00	$14,560.00	$72,800.00
N-14	8	$20,000.00	$5,200.00	$26,000.00
N-15	8	$99,840.00	$24,960.00	$124,800.00
N-17	10	$92,300.00	$23,075.00	$115,375.00
N-18	8	$68,520.00	$17,130.00	$85,650.00
E-4	8	$30,000.00	$9,750.00	$48,750.00
E-5	8	$81,126.00	$20,280.00	$101,400.00
E-6	8	$46,800.00	$11,700.00	$58,500.00
E-7	8	$62,920.00	$15,730.00	$78,650.00
E-8	12	$109,980.00	$27,495.00	$137,475.00
E-9	8	$27,040.00	$6,760.00	$33,800.00
E-10	8	$30,680.00	$7,670.00	$38,350.00
E-11	8	$57,200.00	$14,300.00	$71,500.00
E-13	8	$31,726.00	$7,930.00	$39,656.00
Force Main #1 - North	6	$121,680.00	$30,420.00	$152,100.00
Force Main #2 - Resort	12	$348,660.00	$87,165.00	$435,825.00
Force Main #3 - East	6	$114,540.00	$12,735.00	$168,675.00
North Lift Station		$225,000.00	$56,250.00	$281,250.00
Resort Lift Station		$385,000.00	$96,250.00	$481,250.00
East Lift Station		$225,000.00	$56,250.00	$281,250.00
Totals		**$6,693,450.00**	**$1,673,362.50**	**$8,366,812.50**

LEGEND

- PARKS & OPEN SPACE
- NORTH SEWER SHED
- SOUTH SEWER SHED
- EAST SEWER SHED
- PROPOSED SEWER MAIN PRELIMINARY ALIGNMENT
- PROPOSED FORCE MAIN
- LS — PROPOSED LIFT STATION
- S6 — PROPOSED SEWER MAIN TYPICAL SEGMENT NUMBER
- NBU EXISTING SEWER MAIN
- SEWER SHED DIVISION LINE
- (18) — DEVELOPMENT POD NUMBER

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WORD BORCHERS TRACT
MASTER SEWER PLAN
NEW BRAUNFELS, TEXAS

JOB NO. 7620.04
DATE AUGUST 2011
DESIGNER LN
CHECKED LN DRAWN TB
SHEET EX-3

EXHIBIT 5

Sewer System Hydraulic Calculations

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

SERVICE REQUIREMENTS BY DEVELOPMENT POD

Item No.	Sewer Shed Designation	Size (acres)	LUE's Sewer (LUE's)	Participation Amount	LUE's Water (+8% For Irrigation) (LUE's)	Participation Amount
1	POD-1	25.60	262	3.90%	283	3.68%
2	POD-2	13.65	194	2.89%	210	2.73%
3	POD-3	9.99	208	3.09%	225	2.93%
4	POD-4	16.90	304	4.52%	328	4.27%
5	POD-5	7.53	136	2.02%	147	1.91%
6	POD-6	24.33	219	3.26%	237	3.09%
7	POD-7	16.13	62	0.92%	67	0.87%
8	POD-8	17.74	106	1.58%	114	1.48%
9	POD-9	33.16	114	1.70%	123	1.60%
10	POD-10	40.04	121	1.80%	131	1.71%
11	POD-11	52.82	210	3.12%	227	2.96%
12	POD-12	40.32	153	2.28%	165	2.15%
13	POD-13	108.56	380	5.65%	410	5.34%
14	POD-14	86.44	232	3.45%	251	3.27%
15	POD-15	81.63	258	3.84%	279	3.63%
16	POD-16	74.60	283	4.21%	306	3.98%
17	POD-17	26.21	100	1.49%	108	1.41%
18	POD-18	56.02	213	3.17%	230	2.99%
19	POD-19	41.93	159	2.36%	172	2.24%
20	POD-20	47.98	168	2.50%	181	2.36%
21	POD-21	12.83	52	0.77%	56	0.73%
22	POD-22	26.95	80	1.19%	86	1.12%
23	POD-23	29.79	107	1.59%	116	1.51%
24	POD-24	59.20	229	3.41%	247	3.22%
25	POD-25	82.60	314	4.67%	339	4.41%
26	POD-26	51.95	329	4.89%	355	4.62%
27	POD-27	125.48	477	7.09%	515	6.71%
28	POD-28	45.14	135	2.01%	146	1.90%
29	POD-29	114.49	435	6.47%	470	6.12%
30	POD-30	72.77	277	4.12%	299	3.89%
31	POD-31	53.62	161	2.39%	174	2.27%
32	POD-32	70.29	246	3.66%	266	3.46%
33	POD-33 Greenbelt		0	0.00%	10	0.13%
34	POD-34 Greenbelt		0	0.00%	10	0.13%
35	POD-35 Greenbelt		0	0.00%	7	0.09%
36	POD-36 Greenbelt		0	0.00%	70	0.91%
37	POD-37 Greenbelt		0	0.00%	70	0.91%
38	POD-38 Greenbelt		0	0.00%	50	0.65%
39	POD-39 N-S Arterial Road Medians, Parkways		0	0.00%	100	1.30%
40	POD-40 E-W Arterial Road Medians, Parkways		0	0.00%	100	1.30%
		1,566.69	**6,724**	**100.00%**	**7,680**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of **4.29** **LUE/ac**
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Do not alter values

Required Main Size

Size (in)	Min Slope (%)	Area (ft^2)	Hyd Rad (A/P)	$R^{2/3}$	$S^{1/2}$	Q - full pipe (cfs)	Vel - full pipe (ft/s)	Qmax - Pipe Full at Min. Flow (gal/min)	Qmax - Peak Dry Weather Flow - 65% of Qmax (gal/min)	Qmax - Peak West Weather Flow - 80% or 85% of Qmax (gal/min)	Max Capacity - Peak Dry Weather Flows (LUE's)	Max Capacity - Peak Wet Weather Flows (LUE's)
8	0.33	0.3491	0.1667	0.3029	0.0574	0.70	1.99	312.4	203.1	265.5	368.3	**367.9**
10	0.25	0.5454	0.2083	0.3514	0.0500	1.10	2.01	493.0	320.5	419.1	581.2	**580.8**
12	0.20	0.7854	0.2500	0.3969	0.0447	1.60	2.03	717.0	466.1	609.5	845.2	**844.7**
15	0.15	1.2272	0.3125	0.4605	0.0387	2.51	2.04	1,125.9	731.8	957.0	1327	**1,326.2**
18	0.11	1.7671	0.3750	0.5200	0.0332	3.49	1.98	1,567.8	1,019.1	1,254.2	1848	**1,738.1**
21	0.09	2.4053	0.4375	0.5763	0.0300	4.77	1.98	2,139.1	1,390.4	1,711.3	2521.3	**2,371.5**
24	0.08	3.1416	0.5000	0.6300	0.0283	6.42	2.04	2,879.4	1,871.6	2,303.5	3393.9	**3,192.2**
27	0.06	3.9761	0.5625	0.6814	0.0245	7.61	1.91	3,413.8	2,219.0	2,731.0	4023.9	**3,784.6**
30	0.55	4.9087	0.6250	0.7310	0.0742	30.50	6.21	13,688.8	8,897.7	10,951.0	16134.8	**15,176.0**
33	0.50	5.9396	0.6875	0.7790	0.0707	37.50	6.31	16,828.7	10,938.7	13,463.0	19835.9	**18,657.2**
36	0.45	7.0686	0.7500	0.8255	0.0671	44.86	6.35	20,134.5	13,087.4	16,107.6	23732.3	**22,322.1**
42	0.40	9.6211	0.8750	0.9148	0.0632	63.80	6.63	28,634.6	18,612.5	22,907.7	33751.3	**31,745.7**
48	0.40	12.5664	1.0000	1.0000	0.0632	91.09	7.25	40,882.3	26,573.5	32,705.8	48187.5	**45,324.0**
54	0.40	15.9043	1.1250	1.0817	0.0632	124.71	7.84	55,968.3	36,379.4	44,774.6	65969.2	**62,049.1**

1	LUE =	70 Gal/per/day * 3.5 per/LUE	245.0	gal/day/LUE	=	0.17014	gal/min	
	I / I =	750 gal/day/acre	174.7	gal/day/LUE	=	0.12132	gal/min	
	Typical Density =		4.29	LUE's/acre	=	0.00298	gal/min	
	Average Dry Weather Flow per LUE		245.0	gal/day	=	0.17014	gal/min	
	Peak Dry Weather Flow per LUE		794.1	gal/day	=	0.55146	gal/min	65% of Full Pipe
	Peak Wet Weather Flow per LUE		1,039.1	gal/day	=	0.72160	gal/min	80% or 85% of Full Pipe

Q (cfs)=(1.49 A $R^{2/3}$ $S^{1/2}$)/ n (n=0.013)

Q-90/95% = 90% pipe capacity for <18", 95% capacity for pipes > or = 18".

V=2.25 ft/sec

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
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SEGMENT	ELEVATIONS (ft) BEGIN	END	SEGMENT LENGTH (ft)	AVERAGE SLOPE (%)	ESTIMATED RESTRICTING SLOPE (%)	SEGMENT PIPE DIA. BASED ON ESTIMATED SLOPES FROM TOPOGRAPHIC INFORMATION (IN.)	Estimated Construction Costs ($)	Estimated Construction contingency and Engineering Costs (20%)	Total Estimated Segment Costs ($)
S-1	614	626	1,460	0.822%	0.740%	27	$256,230.00	$64,057.50	$320,287.50
S-2	626	635	950	0.947%	0.852%	27	$166,725.00	$41,681.25	$208,406.25
S-3	635	649	930	1.505%	1.355%	27	$163,215.00	$40,803.75	$204,018.75
S-4	649	660	1,270	0.866%	0.779%	27	$222,885.00	$55,721.25	$278,606.25
S-5	660	670	2,000	0.500%	0.450%	27	$351,000.00	$87,750.00	$438,750.00
S-6	670	680	2,450	0.408%	0.367%	27	$429,975.00	$107,493.75	$537,468.75
S-7	680	700	3,780	0.529%	0.476%	18	$442,260.00	$110,565.00	$552,825.00
S-8	700	723	2,360	0.975%	0.878%	15	$230,100.00	$57,525.00	$287,625.00
S-9	723	768	2,500	1.800%	1.620%	10	$162,500.00	$40,625.00	$203,125.00
S-10	768	803	2,420	1.446%	1.301%	8	$125,840.00	$31,460.00	$157,300.00
S-11	723	752	780	3.718%	3.346%	8	$40,560.00	$10,140.00	$50,700.00
S-12	752	785	1,830	1.803%	1.623%	8	$95,160.00	$23,790.00	$118,950.00
S-13	785	787	610	0.328%	0.330%	8	$31,720.00	$7,930.00	$39,650.00
N-1	658	668	2,070	0.483%	0.435%	21	$282,555.00	$70,638.75	$353,193.75
N-2	668	679	2,150	0.512%	0.461%	18	$251,550.00	$62,887.50	$314,437.50
N-3	679	683	1,170	0.342%	0.308%	18	$136,890.00	$34,222.50	$171,112.50
N-4	683	695	1,480	0.811%	0.730%	15	$144,300.00	$36,075.00	$180,375.00
N-5	695	703	1,440	0.556%	0.500%	15	$140,400.00	$35,100.00	$175,500.00
N-6	703	720	2,270	0.749%	0.674%	15	$221,325.00	$55,331.25	$276,656.25
N-7	720	738	1,450	1.241%	1.117%	12	$113,100.00	$28,275.00	$141,375.00
N-8	738	765	2,570	1.051%	0.946%	8	$133,640.00	$33,410.00	$167,050.00
N-9	703	740	2,440	1.516%	1.364%	8	$126,880.00	$31,720.00	$158,600.00
N-10	765	800	960	3.646%	3.281%	8	$49,920.00	$12,480.00	$62,400.00
N-11	738	748	670	1.493%	1.381%	8	$34,840.00	$8,710.00	$43,550.00
N-12	720	745	1,420	1.761%	1.585%	8	$73,840.00	$18,460.00	$92,300.00
N-13	695	720	1,120	2.232%	2.009%	8	$58,240.00	$14,560.00	$72,800.00
N-14	720	740	400	5.000%	4.500%	8	$20,800.00	$5,200.00	$26,000.00
N-15	683	770	1,920	4.531%	4.078%	8	$99,840.00	$24,960.00	$124,800.00
N-17	668	728	1,420	4.225%	3.803%	10	$92,300.00	$23,075.00	$115,375.00
N-18	648	698	1,310	3.817%	3.435%	8	$68,120.00	$17,030.00	$85,150.00
E-4	690	695	750	0.667%	0.600%	8	$39,000.00	$9,750.00	$48,750.00
E-5	695	696	1,560	0.064%	0.330%	8	$81,120.00	$20,280.00	$101,400.00
E-6	695	723	900	3.111%	2.800%	8	$46,800.00	$11,700.00	$58,500.00
E-7	690	723	1,210	2.727%	2.454%	8	$62,920.00	$15,730.00	$78,650.00
E-8	648	670	1,410	1.560%	1.404%	12	$109,980.00	$27,495.00	$137,475.00
E-9	670	680	520	1.923%	1.731%	8	$27,040.00	$6,760.00	$33,800.00
E-10	670	683	590	2.203%	1.983%	8	$30,680.00	$7,670.00	$38,350.00
E-11	673	723	1,100	4.545%	4.091%	8	$57,200.00	$14,300.00	$71,500.00
E-13	673	708	610	5.738%	5.164%	8	$31,720.00	$7,930.00	$39,650.00
Force Main #1 - North	770	678	3,120	2.949%	2.654%	6	$121,680.00	$30,420.00	$152,100.00
Force Main #2 - Resort	723	648	4,470	1.678%	1.510%	12	$348,660.00	$87,165.00	$435,825.00
Force Main #3 - East	698	703	3,460	0.145%	0.131%	6	$134,940.00	$33,735.00	$168,675.00
North Lift Station							$225,000.00	$56,250.00	$281,250.00
Resort Lift Station							$385,000.00	$96,250.00	$481,250.00
East Lift Station							$225,000.00	$56,250.00	$281,250.00
Totals			**77,200**				**$6,693,450.00**	**$1,673,362.50**	**$8,366,812.50**

NBU MINIMUM SIZES	NBU MINIMUM SLOPES	PEAK DRY WEATHER FLOW	PEAK WET WEATHER FLOW
8	0.330	65%	85%
10	0.250	65%	85%
12	0.200	65%	85%
15	0.150	65%	85%
18	0.110	65%	80%
21	0.090	65%	80%
24	0.080	65%	80%
27	0.060	65%	80%
30	0.055	65%	80%
33	0.050	65%	80%
36	0.045	65%	80%
39	0.040	65%	80%
42	CALCULATE	65%	80%

Cost per in-ft	$	6.50 per in-ft

Notes and Assumptions

1 Minimum restricting slope values are the lesser of NBU minimum slope or 90% of estimated Topographic slopes.

2 Design Fees	10%
3 Contingency	15%
TOTALS	25%

- ☑ REVISIONS COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
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GRAVITY SEWER MAIN AND FORCE MAIN SIZING CALCULATIONS - PRELIMINARY - UTILIZING ESTIMATED SLOPES BASED ON TOPOGRAPHIC MAPPING INFORMATION.

Line Segment	Proposed Base Design Size	Proposed Oversize	Segment Length	Minimum Controlling Slope / Design Slope	Estimated Demand - LUE's	I & I Contribution (NBU)	Estimated Pipe Capacity at min. controlling slope	Estimated Wastewater Flows Average Dry Weather Flow	Estimated Wastewater Flows Peak Dry Weather Flow	Estimated Wastewater Flows - Infiltration and Inflow	Estimated Wastewater Flows - Peak Wet Weather Flows	Estimated Wastewater Flows - Minimum Flows	Estimated Pipe Capacity - Peak Dry Weather Flows	Estimated Pipe Capacity - Peak Dry Weather Flows	Estimated Surplus Capacity in Main Segment	Estimated Pipe Capacity - Peak Wet Weather Flows	Estimated Pipe Capacity - Peak Wet Weather Flows	Estimated Surplus Capacity In Main Segment
			(ft)	(%)	NBU (LUE's)	Acres	(gal/min)	Qadry (gal/min)	Qpdry (gal/min)	I/I (gal/min)	Qpwet = Qdry + I/I (gal/min)	Qmin (gal/min)	(66% Full Pipe) (gal/min)	(65% Full Pipe) (LUE's)	(65% Full Pipe) (LUE's)	(80% or 85% Full Pipe) (gal/min)	(80% or 85% Full Pipe) (LUE's)	(80% or 85% Full Pipe) (LUE's)
S-1	27	N / A	1,460	0.74%	6,724	1,567	11,955	1,144.0	2,415.6	816.0	3,231.6	975.6	7,771	14,091	7,367	9,564	13,816	2,840
S-2	27	N / A	950	0.85%	6,724	1,567	12,828	1,144.0	2,415.6	816.0	3,231.6	975.6	8,338	15,120	8,396	10,262	14,825	3,538
S-3	27	N / A	930	1.36%	6,724	1,567	16,177	1,144.0	2,415.6	816.0	3,231.6	975.6	10,515	19,068	12,344	12,942	18,696	6,218
S-4	27	N / A	1,270	0.78%	6,724	1,567	12,266	1,144.0	2,415.6	816.0	3,231.6	975.6	7,973	14,458	7,734	9,813	14,176	3,089
S-5	27	N / A	2,000	0.45%	6,724	1,567	9,322	1,144.0	2,415.6	816.0	3,231.6	975.6	6,059	10,988	4,264	7,458	10,773	734
S-6	27	N / A	2,450	0.37%	6,724	1,567	8,419	1,144.0	2,415.6	816.0	3,231.6	975.6	5,472	9,923	3,199	6,735	9,730	11
S-7	18	N / A	3,780	0.48%	2,175	407	3,252	370.1	1,007.0	212.0	1,219.0	342.0	2,114	3,833	1,658	2,602	3,758	427
S-8	15	N / A	2,360	0.88%	1,859	321	2,716	316.3	886.6	167.0	1,053.6	293.6	1,765	3,201	1,342	2,309	3,335	450
S-9	10	N / A	2,500	1.62%	832	168	1,251	141.6	462.6	87.3	539.9	131.2	813	1,475	643	1,063	1,536	231
S-10	8	N / A	2,420	1.30%	200	54	618	34.0	127.4	27.9	155.3	28.7	402	728	528	525	759	325
S-11	8	N / A	780	3.35%	280	80	991	47.6	173.1	41.5	214.6	41.5	644	1,168	888	842	1,217	562
S-12	8	N / A	1,830	1.62%	280	80	691	47.6	173.1	41.5	214.6	41.5	449	814	534	587	849	307
S-13	8	N / A	610	0.33%	219	24	311	37.3	138.6	12.7	151.3	31.8	202	367	148	264	382	45
N-1	21	N / A	2,070	0.44%	3,674	912	4,689	625.1	1,525.2	474.9	2,000.1	562.4	3,048	5,527	1,853	3,751	5,419	77
N-2	18	N / A	2,150	0.46%	2,414	614	3,199	410.7	1,094.9	320.0	1,414.9	378.1	2,079	3,771	1,357	2,559	3,697	145
N-3	18	N / A	1,170	0.31%	2,027	502	2,616	344.9	951.2	261.4	1,212.6	319.4	1,700	3,083	1,056	2,093	3,023	66
N-4	15	N / A	1,480	0.73%	1,596	394	2,476	271.5	782.3	205.2	987.5	252.7	1,609	2,918	1,322	2,105	3,040	509
N-5	15	N / A	1,440	0.50%	1,365	322	2,049	232.2	687.3	167.9	855.2	216.4	1,332	2,415	1,050	1,742	2,516	377
N-6	15	N / A	2,270	0.67%	1,365	322	2,379	232.2	687.3	167.9	855.2	216.4	1,546	2,804	1,439	2,022	2,921	657
N-7	12	N / A	1,450	1.12%	951	277	1,689	163.5	511.7	144.2	655.9	152.0	1,098	1,991	1,030	1,436	2,074	475
N-8	8	N / A	2,570	0.95%	438	124	527	74.5	258.5	64.4	322.9	67.1	343	621	183	448	647	10
N-9	8	N / A	2,440	1.36%	114	30	633	19.4	75.8	15.7	91.5	15.4	411	746	632	538	777	424
N-10	8	N / A	960	3.28%	155	49	982	26.4	100.9	25.5	126.4	21.7	638	1,157	1,002	835	1,206	680
N-11	8	N / A	670	1.38%	459	138	637	78.1	269.5	71.7	341.2	70.5	414	751	292	541	782	82
N-12	8	N / A	1,420	1.59%	214	71	683	36.4	135.6	37.2	172.8	31.0	444	805	591	581	839	367
N-13	8	N / A	1,120	2.01%	366	110	768	62.3	220.4	57.4	277.8	55.4	499	905	539	653	943	287
N-14	8	N / A	400	4.50%	246	70	1,150	41.9	154.1	36.6	190.7	36.1	748	1,355	1,109	978	1,412	732
N-15	8	N / A	1,920	4.08%	498	141	1,095	84.7	289.5	73.4	362.9	76.8	712	1,291	793	931	1,345	433
N-17	10	N / A	1,420	3.80%	1,057	280	1,916	186.6	572.3	146.0	718.3	173.8	1,245	2,258	1,161	1,629	2,353	532
N-18	8	N / A	1,310	3.44%	138	38	1,005	23.5	90.6	19.8	110.4	19.1	653	1,185	1,047	854	1,234	716
E-4	8	N / A	750	0.60%	183	50	420	31.1	117.4	25.9	143.3	26.1	273	495	312	357	516	174
E-5	8	N / A	1,560	0.33%	107	30	311	18.2	71.4	15.5	86.9	14.4	202	367	260	264	382	157
E-6	8	N / A	900	2.80%	76	20	907	12.9	51.6	10.4	62.0	9.7	590	1,069	993	771	1,114	695
E-7	8	N / A	1,210	2.45%	238	63	849	40.5	149.5	32.6	182.1	34.8	552	1,001	763	722	1,043	484
E-8	12	N / A	1,410	1.40%	1,311	309	1,894	223.1	664.8	161.1	825.9	208.0	1,231	2,232	921	1,610	2,326	299
E-9	8	N / A	520	1.73%	390	95	713	66.4	233.4	49.3	282.7	59.3	463	840	450	606	876	216
E-10	8	N / A	590	1.98%	369	97	763	62.8	222.0	50.6	272.6	55.9	496	899	530	649	937	280
E-11	8	N / A	1,100	4.09%	355	93	1,096	60.4	214.4	48.6	263.0	53.6	712	1,292	937	932	1,346	577
E-13	8	N / A	610	5.16%	277	73	1,232	47.1	171.4	37.9	209.3	41.0	801	1,452	1,175	1,047	1,513	770

				Velocity	LUE's	Acres	Flow (gal/min)	Qadry	Qpdry	I/I	Qpwet = Qdry + I/I	Qmin (gal/min)	Estimated Pipe Capacity - Peak Dry Weather Flows (gal/min)	Estimated Surplus Capacity Peak Dry Weather Flows (LUE's)	Estimated Pipe Capacity - Peak Wet Weather Flows (gal/min)	Estimated Surplus Capacity Peak Wet Weather Flows (LUE's)
Force Main #1 - North	6	N / A	Min. Vel.	3.00	356	94	264	60.6	215.1	48.7	263.8	53.8	479	123	381	25
	6	N / A	Max Vel.	6.00			529	60.6	215.1	48.7	263.8	53.8	959	959	764	764
Force Main #2 - Resort	12	N / A	Min. Vel.	3.00	1,311	309	1,057	223.1	664.8	161.1	825.9	208.0	1,917	606	1,527	216
	12	N / A	Max Vel.	6.00			2,115	223.1	664.8	161.1	825.9	208.0	3,835	3,835	3,055	3,055
Force Main #3 - East	6	N / A	Min. Vel.	3.00	421	112	264	71.6	249.6	58.5	308.1	64.3	479	58	381	(40)
	6	N / A	Max Vel.	6.00			529	71.6	249.6	58.5	308.1	64.3	959	959	764	764

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GRAVITY SEWER MAIN AND FORCE MAIN SIZING CALCULATIONS - PRELIMINARY - UTILIZING ESTIMATED SLOPES BASED ON TOPOGRAPHIC MAPPING INFORMATION.

Segment	Diameter (Inches)	Area Full (sq-ft)	Hydraulic Radius	Estimated Minimum Restricting Slope (%)	Pipe Flowing Full Flow Capacity (cft/sec)	Pipe Flowing Full Flow Capacity (gal/min)	NBU Peak Dry Weather Capacity - 65% Full (gal/min)	NBU Peak Wet Weather Capacity - 80% or 85% Full (gal/min)
S-1	27	3.9761	0.563	0.74%	26.637	11,955	7,771	9,564
S-2	27	3.9761	0.563	0.85%	28.582	12,828	8,338	10,262
S-3	27	3.9761	0.563	1.36%	36.044	16,177	10,515	12,942
S-4	27	3.9761	0.563	0.78%	27.330	12,266	7,973	9,813
S-5	27	3.9761	0.563	0.45%	20.772	9,322	6,059	7,458
S-6	27	3.9761	0.563	0.37%	18.759	8,419	5,472	6,735
S-7	18	1.7671	0.375	0.48%	7.245	3,252	2,114	2,602
S-8	15	1.2272	0.313	0.88%	6.051	2,716	1,765	2,309
S-9	10	0.5454	0.208	1.62%	2.787	1,251	813	1,063
S-10	8	0.3491	0.167	1.30%	1.378	618	402	525
S-11	8	0.3491	0.167	3.35%	2.209	991	644	842
S-12	8	0.3491	0.167	1.62%	1.539	691	449	587
S-13	8	0.3491	0.167	0.33%	0.694	311	202	264
N-1	21	2.4053	0.438	0.44%	10.448	4,689	3,048	3,751
N-2	18	1.7671	0.375	0.46%	7.129	3,199	2,079	2,559
N-3	18	1.7671	0.375	0.31%	5.828	2,616	1,700	2,093
N-4	15	1.2272	0.313	0.73%	5.517	2,476	1,609	2,105
N-5	15	1.2272	0.313	0.50%	4.666	2,049	1,332	1,742
N-6	15	1.2272	0.313	0.67%	5.301	2,379	1,546	2,022
N-7	12	0.7854	0.250	1.12%	3.764	1,689	1,098	1,436
N-8	8	0.3491	0.167	0.95%	1.175	527	343	448
N-9	8	0.3491	0.167	1.36%	1.411	633	411	538
N-10	8	0.3491	0.167	3.28%	2.188	982	638	835
N-11	8	0.3491	0.167	1.38%	1.419	637	414	541
N-12	8	0.3491	0.167	1.59%	1.521	683	444	581
N-13	8	0.3491	0.167	2.01%	1.712	768	499	653
N-14	8	0.3491	0.167	4.50%	2.562	1,150	748	978
N-15	8	0.3491	0.167	4.08%	2.439	1,095	712	931
N-17	10	0.5454	0.208	3.80%	4.270	1,916	1,245	1,629
N-18	8	0.3491	0.167	3.44%	2.239	1,005	653	854
E-1 Optional Outfall	18	1.7671	0.375	2.19%	15.636	6,973	4,532	5,578
E-2 Optional Outfall	18	1.7671	0.375	0.68%	8.653	3,883	2,524	3,106
E-3 Optional Outfall	18	1.7671	0.375	0.36%	6.283	2,820	1,833	2,256
E-4	8	0.3491	0.167	0.60%	0.936	420	273	357
E-5	8	0.3491	0.167	0.33%	0.694	311	202	264
E-6	8	0.3491	0.167	2.80%	2.021	907	590	771
E-7	8	0.3491	0.167	2.45%	1.892	849	552	722
E-8	12	0.7854	0.250	1.40%	4.220	1,894	1,231	1,610
E-9	8	0.3491	0.167	1.73%	1.589	713	463	606
E-10	8	0.3491	0.167	1.98%	1.701	763	496	649
E-11	8	0.3491	0.167	4.09%	2.443	1,096	712	932
E-13	8	0.3491	0.167	5.16%	2.745	1,232	801	1,047

	Pipe Size (inches)	Pipe Area (sqft)	Hydraulic Radius	Velocity (ft/sec)	Full PipeFlow (CFS)	Full Pipe Flow (gal/min)		
Force Main #1 - North	6	0.1963	N / A	3.00	0.589	264	N / A	N / A
	6	0.1963	N / A	6.00	1.178	529	N / A	N / A
Force Main #2 - Resort	12	0.7854	N / A	3.00	2.356	1,057	N / A	N / A
	12	0.7854	N / A	6.00	4.712	2,115	N / A	N / A
Force Main #3 - East	6	0.1963	N / A	3.00	0.589	264	N / A	N / A
	6	0.1963	N / A	6.00	1.178	529	N / A	N / A

Average Density of Service Requirements			3.70	LUE/ac
1 LUE =	70 Gal/per/day * 3.5 per/LUE	245.0	gal/day/LUE	0.17014 gal/min/LUE
I / I =	750 gal/day/acre	202.7	gal/day/LUE	0.14076 gal/min/LUE
Typical Density =		3.70	LUE's/acre	
Average Dry Weather Flow per LUE		245.0	gal/day	0.17014 gal/min/LUE
Peak Dry Weather Flow per LUE (65% Full Pipe)		794.1	gal/day	0.55146 gal/min/LUE
Peak Wet Weather Flow per LUE (85% Full Pipe)		996.8	gal/day	0.69222 gal/min/LUE

Wastewater Flow Calculations

1. Wastewater - Average Dry Weather Flow	Qadry =	(LUE's) x (3.5 People/LUE) x (70 gal/person/day)	
		1440 min/day	
	=	(LUE's) x (0.17014 gal/day)	
	=	0.17014 gal/day/LUE	
2. Wastewater - Peak Dry Weather Flow	Qpdry =	([18+(0.0206 x Qadry)^0.5])	
		[4+(0.0206xQadry)^0.5] x Qadry	
3. Wastewater - Inflow/Infiltration	Q I/I =	(acreage)x(750 gal/acre/day)	
		(1440 min/day)	
	=	(acreage)x(0.52 gal/min/acre)	
4. Wastewater - Peak Wet Weather Flow	Qpwet =	(Qpd) + (I/I)	
5. Wastewater - Minimum Flow	Qmin =	(0.2*(0.0144 x Qadry)^0.198) x Qadry	

6. The minimum Controlling Slope = 90% of Average Slope to accommodate variations in site conditions and topography.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-1**
Size 27 Inch
Length 1,460 Feet
Total LUE **6,724** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-2**
Size 27 Inch
Length 950 Feet
Total LUE **6,724** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-3**
Size 27 Inch
Length 930 Feet
Total LUE **6,724** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre 0.60%
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**S-4**	
Size	27	Inch
Length	1,270	Feet
Total LUE	**6,724**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**S-5**
Size	27 Inch
Length	2,000 Feet
Total LUE	**6,724** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**S-6**	
Size	27	Inch
Length	2,450	Feet
Total LUE	**6,724**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	3.90%
2	POD-2	13.65	194	14	194	2.89%
3	POD-3	9.99	208	10	208	3.09%
4	POD-4	16.90	304	17	304	4.52%
5	POD-5	7.53	136	8	136	2.02%
6	POD-6	24.33	219	24	219	3.26%
7	POD-7	16.13	62	16	62	0.92%
8	POD-8	17.74	106	18	106	1.58%
9	POD-9	33.16	114	33	114	1.70%
10	POD-10	40.04	121	40	121	1.80%
11	POD-11	52.82	210	53	210	3.12%
12	POD-12	40.32	153	40	153	2.28%
13	POD-13	108.56	380	109	380	5.65%
14	POD-14	86.44	232	86	232	3.45%
15	POD-15	81.63	258	82	258	3.84%
16	POD-16	74.60	283	75	283	4.21%
17	POD-17	26.21	100	26	100	1.49%
18	POD-18	56.02	213	56	213	3.17%
19	POD-19	41.93	159	42	159	2.36%
20	POD-20	47.98	168	48	168	2.50%
21	POD-21	12.83	52	13	52	0.77%
22	POD-22	26.95	80	27	80	1.19%
23	POD-23	29.79	107	30	107	1.59%
24	POD-24	59.20	229	59	229	3.41%
25	POD-25	82.60	314	83	314	4.67%
26	POD-26	51.95	329	52	329	4.89%
27	POD-27	125.48	477	125	477	7.09%
28	POD-28	45.14	135	45	135	2.01%
29	POD-29	114.49	435	114	435	6.47%
30	POD-30	72.77	277	73	277	4.12%
31	POD-31	53.62	161	54	161	2.39%
32	POD-32	70.29	246	70	246	3.66%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**1,567**	**6,724**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads

2. Service capacity levels assume average service requirements of 4.29 LUE's/acre

3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.

4. Assumes 30' sewer easements will require 30' temporary construction easements.

5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-7**
Size 18 Inch
Length 3,780 Feet
Total LUE **2,175** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	12.05%
2	POD-2	13.65	194	14	194	8.92%
3	POD-3	9.99	208	10	208	9.56%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	8	136	6.25%
6	POD-6	24.33	219	16	140	6.44%
7	POD-7	16.13	62	16	62	2.85%
8	POD-8	17.74	106	18	106	4.87%
9	POD-9	33.16	114	33	114	5.24%
10	POD-10	40.04	121	40	121	5.56%
11	POD-11	52.82	210	53	210	9.66%
12	POD-12	40.32	153	40	153	7.03%
13	POD-13	108.56	380	27	96	4.41%
14	POD-14	86.44	232	17	46	2.11%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	42	159	7.31%
20	POD-20	47.98	168	48	168	7.72%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**407**	**2,175**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**S-8**	
Size	15	Inch
Length	2,360	Feet
Total LUE	**1,859**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	26	262	14.09%
2	POD-2	13.65	194	14	194	10.44%
3	POD-3	9.99	208	10	208	11.19%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	8	136	7.32%
6	POD-6	24.33	219	16	140	7.53%
7	POD-7	16.13	62	16	62	3.34%
8	POD-8	17.74	106	18	106	5.70%
9	POD-9	33.16	114	33	114	6.13%
10	POD-10	40.04	121	40	121	6.51%
11	POD-11	52.82	210	53	210	11.30%
12	POD-12	40.32	153	40	153	8.23%
13	POD-13	108.56	380	26	92	4.95%
14	POD-14	86.44	232	17	46	2.47%
15	POD-15	81.63	258	5	15	0.81%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**321**	**1,859**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
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- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-9**
Size 10 Inch
Length 2,500 Feet
Total LUE **832** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	10	139	16.71%
3	POD-3	9.99	208	5	104	12.50%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	22	129	15.50%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	20	61	7.33%
11	POD-11	52.82	210	26	105	12.62%
12	POD-12	40.32	153	40	153	18.39%
13	POD-13	108.56	380	27	95	11.42%
14	POD-14	86.44	232	17	46	5.53%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**168**	**832**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-10**
Size 8 Inch
Length 2,420 Feet
Total LUE **200** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	26	105	52.50%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	27	95	47.50%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**54**	**200**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-11**
Size 8 Inch
Length 780 Feet
Total LUE **280** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	33	114	40.71%
10	POD-10	40.04	121	20	61	21.79%
11	POD-11	52.82	210	26	105	37.50%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**80**	**280**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**S-12**
Size	8 Inch
Length	1,830 Feet
Total LUE	**280** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	33	114	40.71%
10	POD-10	40.04	121	20	61	21.79%
11	POD-11	52.82	210	26	105	37.50%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**80**	**280**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED; PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **S-13**
Size 8 Inch
Length 610 Feet
Total LUE **219** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	24	219	100.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**24**	**219**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-1**
Size 21 Inch
Length 2,070 Feet
Total LUE **3,674** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	8.27%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	7.76%
14	POD-14	86.44	232	13	35	0.95%
15	POD-15	81.63	258	82	258	7.02%
16	POD-16	74.60	283	75	283	7.70%
17	POD-17	26.21	100	26	100	2.72%
18	POD-18	56.02	213	56	213	5.80%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	9	27	0.73%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	6.23%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	52	329	8.95%
27	POD-27	125.48	477	125	477	12.98%
28	POD-28	45.14	135	45	135	3.67%
29	POD-29	114.49	435	114	435	11.84%
30	POD-30	72.77	277	73	277	7.54%
31	POD-31	53.62	161	14	41	1.12%
32	POD-32	70.29	246	70	246	6.70%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**912**	**3,674**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads

2. Service capacity levels assume average service requirements of 4.29 LUE's/acre

3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.

4. Assumes 30' sewer easements will require 30' temporary construction easements.

5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-2**
Size 18 Inch
Length 2,150 Feet
Total LUE **2,414** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	12.59%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	11.81%
14	POD-14	86.44	232	15	39	1.62%
15	POD-15	81.63	258	82	258	10.69%
16	POD-16	74.60	283	75	283	11.72%
17	POD-17	26.21	100	26	100	4.14%
18	POD-18	56.02	213	56	213	8.82%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	41	154	6.38%
28	POD-28	45.14	135	45	135	5.59%
29	POD-29	114.49	435	21	79	3.27%
30	POD-30	72.77	277	73	277	11.47%
31	POD-31	53.62	161	14	41	1.70%
32	POD-32	70.29	246	70	246	10.19%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**614**	**2,414**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-3**	
Size	18	Inch
Length	1,170	Feet
Total LUE	**2,027**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	15.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	14.06%
14	POD-14	86.44	232	13	35	1.73%
15	POD-15	81.63	258	82	258	12.73%
16	POD-16	74.60	283	75	283	13.96%
17	POD-17	26.21	100	26	100	4.93%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	41	154	7.60%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	21	79	3.90%
30	POD-30	72.77	277	73	277	13.67%
31	POD-31	53.62	161	14	41	2.02%
32	POD-32	70.29	246	60	211	10.41%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**502**	**2,027**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-4**
Size 15 Inch
Length 1,480 Feet
Total LUE **1,596** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	19.05%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	17.86%
14	POD-14	86.44	232	13	35	2.19%
15	POD-15	81.63	258	82	258	16.17%
16	POD-16	74.60	283	75	283	17.73%
17	POD-17	26.21	100	26	100	6.27%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	40	120	7.52%
32	POD-32	70.29	246	60	211	13.22%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**394**	**1,596**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
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- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-5**	
Size	15	Inch
Length	1,440	Feet
Total LUE	**1,365**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
	0					
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	22.27%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	110	385	28.21%
14	POD-14	86.44	232	13	35	2.56%
15	POD-15	81.63	258	82	258	18.90%
16	POD-16	74.60	283	75	283	20.73%
17	POD-17	26.21	100	26	100	7.33%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**322**	**1,365**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-6**	
Size	15	Inch
Length	2,270	Feet
Total LUE	**1,365**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	17	304	22.27%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	110	385	28.21%
14	POD-14	86.44	232	13	35	2.56%
15	POD-15	81.63	258	82	258	18.90%
16	POD-16	74.60	283	75	283	20.73%
17	POD-17	26.21	100	26	100	7.33%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**322**	**1,365**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-7**	
Size	12	Inch
Length	1,450	Feet
Total LUE	**961**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	29.66%
14	POD-14	86.44	232	13	35	3.64%
15	POD-15	81.63	258	82	258	26.85%
16	POD-16	74.60	283	75	283	29.45%
17	POD-17	26.21	100	26	100	10.41%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**277**	**961**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-8**
Size	8 Inch
Length	2,570 Feet
Total LUE	**438** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	49	155	35.39%
16	POD-16	74.60	283	75	283	64.61%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**124**	**438**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-9**	
Size	8	Inch
Length	2,440	Feet
Total LUE	**114**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	30	114	100.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**30**	**114**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-10**
Size 8 Inch
Length 960 Feet
Total LUE **155** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	49	155	100.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**49**	**155**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-11**
Size 8 Inch
Length 670 Feet
Total LUE **459** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	81	285	62.09%
14	POD-14	86.44	232	17	46	10.02%
15	POD-15	81.63	258	33	103	22.44%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	7	25	5.45%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**138**	**459**	**100.00%**

Notes:

1. **Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads**
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-12**	
Size	8	Inch
Length	1,420	Feet
Total LUE	**214**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	52	139	64.95%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	20	75	35.05%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**71**	**214**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-13**
Size	8 Inch
Length	1,120 Feet
Total LUE	**366** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	40	120	32.79%
32	POD-32	70.29	246	70	246	67.21%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**110**	**366**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-14**
Size	8 Inch
Length	400 Feet
Total LUE	**246** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	70	246	100.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**70**	**246**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-15**	
Size	8	Inch
Length	1,920	Feet
Total LUE	**498**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	34	101	20.28%
29	POD-29	114.49	435	21	79	15.86%
30	POD-30	72.77	277	73	277	55.62%
31	POD-31	53.62	161	14	41	8.23%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**141**	**498**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **N-17**
Size 10 Inch
Length 1,420 Feet
Total LUE **1,097** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	9	27	2.46%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	20.88%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	14	88	8.02%
27	POD-27	125.48	477	84	318	28.99%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	114	435	39.65%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**280**	**1,097**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**N-18**	
Size	8	Inch
Length	1,310	Feet
Total LUE	**138**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	30	107	77.54%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	8	31	22.46%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**38**	**138**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-4**
Size	8 Inch
Length	750 Feet
Total LUE	**183** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	30	107	58.47%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	20	76	41.53%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**50**	**183**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads

2. Service capacity levels assume average service requirements of 4.29 LUE's/acre

3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.

4. Assumes 30' sewer easements will require 30' temporary construction easements.

5. Assumes no East Outfall to Gruene WWTP included.

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **E-5**
Size 8 Inch
Length 1,560 Feet
Total LUE **107** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	30	107	100.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**30**	**107**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **E-6**
Size 8 Inch
Length 900 Feet
Total LUE **76** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
		0				
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	20	76	100.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**20**	**76**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
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- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **E-7**
Size 8 Inch
Length 1,210 Feet
Total LUE **238** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	63	238	100.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**63**	**238**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
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- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-8**
Size	12 Inch
Length	1,410 Feet
Total LUE	**1,311** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	17.47%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	52	329	25.10%
27	POD-27	125.48	477	84	318	24.26%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	114	435	33.18%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**309**	**1,311**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

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- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-9**	
Size	8	Inch
Length	520	Feet
Total LUE	**390**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	58.72%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	10	66	16.92%
27	POD-27	125.48	477	25	95	24.36%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**95**	**390**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

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- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-10**	
Size	8	Inch
Length	590	Feet
Total LUE	**369**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	59	223	60.43%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	38	146	39.57%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**97**	**369**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-11**
Size	8 Inch
Length	1,100 Feet
Total LUE	**355** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	21	78	21.97%
30	POD-30	72.77	277	73	277	78.03%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**93**	**355**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment	**E-13**	
Size	8	Inch
Length	610	Feet
Total LUE	**277**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	73	277	100.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**73**	**277**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Lift Station #1 North**

Size N / A Inch
Length N / A Feet
Total LUE **356** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	21	79	22.19%
30	POD-30	72.77	277	73	277	77.81%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**94**	**356**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Force Main #1 - North**

Size 6 Inch
Length 3,120 Feet
Total LUE **356** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	21	79	22.19%
30	POD-30	72.77	277	73	277	77.81%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**94**	**356**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Lift Station #2 - Resort**

Size N / A Inch
Length N / A Feet
Total LUE **1,311** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	17.47%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	52	329	25.10%
27	POD-27	125.48	477	84	318	24.26%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	114	435	33.18%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**309**	**1,311**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- [x] NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- [ ] PRELIMINARY DESIGN
- [ ] FINAL DESIGN
- [ ] OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Force Main #2 - Resort**

Size 12 Inch
Length 4,470 Feet
Total LUE **1,311** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	0	0	0.00%
24	POD-24	59.20	229	59	229	17.47%
25	POD-25	82.60	314	0	0	0.00%
26	POD-26	51.95	329	52	329	25.10%
27	POD-27	125.48	477	84	318	24.26%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	114	435	33.18%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**309**	**1,311**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED. PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Lift Station #3 - East**
Size N / A Inch
Length N / A Feet
Total LUE **421** In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	30	107	25.42%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	83	314	74.58%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**112**	**421**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. **Assumes no East Outfall to Gruene WWTP included.**

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

WORD-BORCHERS PROPERTY
PRELIMINARY SEWER OUTFALL DESIGNS
Revised August 2011

Segment **Force Main #3 - East**

Size	6	Inch
Length	3,460	Feet
Total LUE	**421**	In Segment

Parcel Identifier	Developer Name	Size Acres	Requested Capacity LUE	Total Acres in Watershed Acres	LUE's in Segment Watershed LUE	Percentage of Total Capacity in Watershed %
1	POD-1	25.60	262	0	0	0.00%
2	POD-2	13.65	194	0	0	0.00%
3	POD-3	9.99	208	0	0	0.00%
4	POD-4	16.90	304	0	0	0.00%
5	POD-5	7.53	136	0	0	0.00%
6	POD-6	24.33	219	0	0	0.00%
7	POD-7	16.13	62	0	0	0.00%
8	POD-8	17.74	106	0	0	0.00%
9	POD-9	33.16	114	0	0	0.00%
10	POD-10	40.04	121	0	0	0.00%
11	POD-11	52.82	210	0	0	0.00%
12	POD-12	40.32	153	0	0	0.00%
13	POD-13	108.56	380	0	0	0.00%
14	POD-14	86.44	232	0	0	0.00%
15	POD-15	81.63	258	0	0	0.00%
16	POD-16	74.60	283	0	0	0.00%
17	POD-17	26.21	100	0	0	0.00%
18	POD-18	56.02	213	0	0	0.00%
19	POD-19	41.93	159	0	0	0.00%
20	POD-20	47.98	168	0	0	0.00%
21	POD-21	12.83	52	0	0	0.00%
22	POD-22	26.95	80	0	0	0.00%
23	POD-23	29.79	107	30	107	25.42%
24	POD-24	59.20	229	0	0	0.00%
25	POD-25	82.60	314	83	314	74.58%
26	POD-26	51.95	329	0	0	0.00%
27	POD-27	125.48	477	0	0	0.00%
28	POD-28	45.14	135	0	0	0.00%
29	POD-29	114.49	435	0	0	0.00%
30	POD-30	72.77	277	0	0	0.00%
31	POD-31	53.62	161	0	0	0.00%
32	POD-32	70.29	246	0	0	0.00%
33	POD-33 Greenbelt	0.00	0	0	0	0.00%
34	POD-34 Greenbelt	0.00	0	0	0	0.00%
35	POD-35 Greenbelt	0.00	0	0	0	0.00%
36	POD-36 Greenbelt	0.00	0	0	0	0.00%
37	POD-37 Greenbelt	0.00	0	0	0	0.00%
38	POD-38 Greenbelt	0.00	0	0	0	0.00%
39	POD-39 N-S Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
40	POD-40 E-W Arterial Road Medians, Parkways	0.00	0	0	0	0.00%
	Totals	**1,567**	**6,724**	**112**	**421**	**100.00%**

Notes:

1. Calculated areas do not include roads or greenbelt areas along floodplain or proposed major roads
2. Service capacity levels assume average service requirements of 4.29 LUE's/acre
3. Main slopes assume average depth of 12' below natural ground unless otherwise noted. Minimum slopes per NBU regulations will dictate final main line slopes.
4. Assumes 30' sewer easements will require 30' temporary construction easements.
5. Assumes no East Outfall to Gruene WWTP included.

- ☑ NO DESIGN COMPLETED, PREL. MASTER PLANNING ONLY
- ☐ PRELIMINARY DESIGN
- ☐ FINAL DESIGN
- ☐ OTHER

EXHIBIT NO. 7

to Utility Agreement

Title Commitment

THE FOLLOWING COMMITMENT FOR TITLE INSURANCE IS NOT VALID UNLESS YOUR NAME AND THE POLICY AMOUNT ARE SHOWN IN SCHEDULE A, AND OUR AUTHORIZED REPRESENTATIVE HAS COUNTERSIGNED BELOW.

COMMITMENT FOR TITLE INSURANCE

ISSUED BY

CHICAGO TITLE INSURANCE COMPANY

We, Chicago Title Insurance Company, will issue our title insurance policy or policies (the Policy) to You (the proposed insured) upon payment of the premium and other charges due, and compliance with the requirements in Schedule B and Schedule C. Our Policy will be in the form approved by the Texas Department of Insurance at the date of issuance, and will insure your interest in the land described in Schedule A. The estimated premium for our Policy and applicable endorsements is shown on Schedule D. There may be additional charges such as recording fees, and expedited delivery expenses.

This Commitment ends ninety (90) days from the effective date, unless the Policy is issued sooner, or failure to issue the Policy is our fault. Our liability and obligations to you are under the express terms of this Commitment and end when this Commitment expires.

Heritage Title Company of Austin, Inc.
401 Congress Avenue, Suite 1500
Austin, Texas 78701
512.505.5000 • 512.505.5024 fax
www.heritagetitleofaustin.com

CHICAGO TITLE INSURANCE COMPANY

By:

ATTEST President

Secretary

Authorized Signature

Amy L. Fisher
Vice President

CONDITIONS AND STIPULATIONS

1. If you have actual knowledge of any matter which may affect the title or mortgage covered by this Commitment, that is not shown in Schedule B, you must notify us in writing. If you do not notify us in writing, our liability to you is ended or reduced to the extent that your failure to notify us affects our liability. If you do notify us, or we learn of such matter, we may amend Schedule B, but we will not be relieved of liability already incurred.

2. Our liability is only to you, and others who are included in the definition of Insured in the Policy to be issued. Our liability is only for actual loss incurred in your reliance on this Commitment to comply with its requirements or to acquire the interest in the land. Our liability is limited to the amount shown in Schedule A of this Commitment and will be subject to the following terms of the Policy: Insuring Provisions, Conditions and Stipulations, and Exclusions.

COMMITMENT FOR TITLE INSURANCE

Issued By

Chicago Title Insurance Company

SCHEDULE A

Effective Date: **September 28, 2012, 8:00 AM**

GF No. **081579**

Issued: **October 10, 2012, 3:56 PM**

1. The policy or policies to be issued are:

(a) OWNER'S POLICY OF TITLE INSURANCE (Form T-1)

(Not applicable for improved one-to-four family residential real estate)

Policy Amount:
PROPOSED INSURED:

(b) TEXAS RESIDENTIAL OWNER'S POLICY OF TITLE INSURANCE

- ONE-TO-FOUR FAMILY RESIDENCES (Form T-1R

Policy Amount:
PROPOSED INSURED: **TO BE DETERMINED**

(c) LOAN POLICY OF TITLE INSURANCE (Form T-2)

Policy Amount:
PROPOSED INSURED:

Proposed Borrower:

(d) TEXAS SHORT FORM RESIDENTIAL LOAN POLICY OF TITLE INSURANCE (Form T-2R)

Policy Amount:
PROPOSED INSURED:
Proposed Borrower:

(e) LOAN TITLE POLICY BINDER ON INTERIM CONSTRUCTION LOAN (Form T-13)

Binder Amount:
PROPOSED INSURED:

Proposed Borrower:

(f) OTHER

Policy Amount:
PROPOSED INSURED:

Proposed Borrower:

2. The interest in the land covered by this Commitment is:

Fee Simple

3. Record title to the land on the Effective Date appears to be vested in:

Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership

4. Legal description of the land:

TRACT 1: Being all of that certain tract or parcel of land situated in the Andreas Sanchez Survey No. 286, Abstract No. 528, J. M. Veramendi Survey No. 1, Abstract No. 2 and the J. M. Veramendi Survey No. 2, Abstract No. 3, Comal County, Texas, said tract being more particularly described by metes and bounds shown on Exhibit "A" TO BE furnished in accordance with the requirement under Schedule "C".

TRACT 2: Being all of that certain tract or parcel of land containing 694 acres, more or less, situated in the Juan Veramendi Survey No. 2, Comal County, Texas, said tract being more particularly described by metes and bounds shown on Exhibit "B" attached hereto and made a part hereof.

NOTE: The Company does not represent that the above acreage or square footage calculations are correct.

Exhibit "B"

694 acres, being all that certain tract, piece or parcel of land situated in Comal County, Texas, and being a part of the Juan Veramendi Survey No. 2, and being more particularly described by metes and bounds as follows, to-wit;

BEGINNING at a cedar in fence at intersection of the New Braunfels-Sattler Road with the Waco Spring Loop Road for most Western corner of this tract.

THENCE with fence along the New Braunfels-Sattler Road N. 21-55' E. 60 feet -- N. 36-13' E. 217 feet -- N. 31-47' E. 106.9 feet -- N. 26-57' E. 82 2/3 feet -- N. 15-41' E. 140.3 feet -- N. 14-30' E. 73.9 feet -- N. 0-38' E. 25.3 feet -- N. 9-58' E. 101.4 feet -- N. 6-22' W. 203 1/4 feet to a post near the Carter gate;

THENCE N. 33-00' E. at 2662 feet a stake at water edge of Guadalupe River being S. 69-00' E. 16 feet from a thirty inch burnt Cypress stump, at 2720 feet to a point in middle bed of Guadalupe River;

THENCE with said river in its middle bed as follows: N. 73-12' E. 140.9 feet -- N. 66-33' E. 262.2 feet -- N. 58-53' E. 195 2/3 feet -- N. 67-15' E. 283.5 feet -- N. 69-15' E. 184 1/4 feet -- N. 79-09' E. 541.4 feet -- N. 82-09' E. 262.4 feet -- N. 87-13' E. 165.3 feet -- N. 88-52' E. 258.7 feet -- N. 82-36' E. 224 3/4 feet -- N. 87-23' E. 210.4 feet -- N. 88-16' E. 248.8 feet -- N. 88-39' E. 97.5 feet -- N. 87-25' E. 293.2 feet -- N. 80-53' E. 316.8 feet -- N. 53-09' E. 548 1/4 feet -- N. 26-42' E. 299.4 feet -- N. 0-06' W. 1086.8 feet with the deer-proof fence to the N. E. corner of the Dean Word 35.40 acre tract in the J. M. Veramendi Subdivision No. 1;

THENCE N. 39 deg. 41' W. 1086.8 feet with the deer-proof fence to the N. E. corner of the Dean Word 35.40 acre tract in the J. M. Veramendi Subdivision No. 1;

THENCE S. 51 deg. 21' W. 1067 feet with deer-proof fence line to the S. W. corner of said tract and to the point of beginning being in all 35.40 acres of land.

THIRD TRACT: A 30 foot lane connecting the Dean Word 30.63 acre tract of land located in the J. M. Veramendi Subdivision No. 2, and the Dean Word 35.40 acre tract of land located in the J. M. Veramendi Subdivision No. 1, described as follows:

BEGINNING in the S. E. corner of the Dean Word 59.63 acre tract and the N. E. corner of the Landa Park Highlands Subdivision No. 2;

THENCE S. 38 deg. 05' E. 612.5 feet with the East fence line of the Landa Park Highlands Subdivision No. 2;

THENCE N. 51 deg. 21' E. 30 feet to the S. E. corner of said lane;

THENCE N. 38 deg. 05' W. 612.5 feet with the East line and deer-proof fence to the N. E. corner of said lane;

THENCE N. 55 deg. 32' W. 30 feet with the deer-proof fence to the East line of the 59.63 acres;

THENCE S. 34 deg. 28' E. 12.4 feet to the place of beginning; being in all 0.47 acres of land.

Said lands are a portion of the lands described in two certain deeds executed by HARRY LANDA and wife to the donors herein, recorded respectively in Volume 74, Pages 512-514, and Volume 74, Pages 510-512 of the Deed Records of Comal County, Texas, here referred to for all purposes.

BEING the same property described in and conveyed by a deed dated August 8, 1952 from DEAN WORD and wife EUNICE WORD to TIMOTHY DEAN WORD, JR. and JOYCE CARL WORD recorded in Volume 99, Pages 205-206 of the Deed Records of Comal County, Texas, reference to said deed and said recording being here made for all purposes.

Recorder's Memorandum
This document was of poor quality at the time of recording and may not reproduce.

COMMITMENT FOR TITLE INSURANCE

Issued By

Chicago Title Insurance Company

SCHEDULE B

EXCEPTIONS FROM COVERAGE

In addition to the Exclusions and Conditions and Stipulations, your Policy will not cover loss, costs, attorneys' fees, and expenses resulting from:

1. The following restrictive covenants of record itemized below (We must either insert specific recording data or delete this exception):

   DELETED

   (But omitting any covenant or restriction based on race, color, religion, sex, handicap, familial status or national origin unless and only to the extent that said covenant (a) is exempt under Chapter 42, Section 3607 of the United States Code or (b) relates to handicap but does not discriminate against handicapped persons)

2. Any discrepancies, conflicts, or shortages in area or boundary lines, or any encroachments or protrusions, or any overlapping of improvements.

3. Homestead or community property or survivorship rights, if any, of any spouse of any insured. (Applies to the Owner's Policy only.)

4. Any titles or rights asserted by anyone, including, but not limited to, persons, the public, corporations, governments or other entities,

   a. to tidelands, or lands comprising the shores or beds of navigable or perennial rivers and streams, lakes, bays, gulfs or oceans, or

   b. to lands beyond the line of harbor or bulkhead lines as established or changed by any government, or

   c. to filled-in lands, or artificial islands, or

   d. to statutory water rights, including riparian rights, or

   e. to the area extending from the line of mean low tide to the line of vegetation, or the rights of access to that area or easement along and across that area.

   (Applies to the Owner's Policy only.)

5. Standby fees, taxes and assessments by any taxing authority for the year **2012**, and subsequent years; and subsequent taxes and assessments by any taxing authority for prior years due to change in land usage or ownership, but not those taxes or assessments for prior years because of an exemption granted to a previous owner of the property under Section 11.13, *Texas Tax Code*, or because of improvements not assessed for a previous tax year. (If Texas Short Form Residential Loan Policy (T-2R) is issued, that policy will substitute "which become due and payable subsequent to Date of Policy" in lieu of "for the year 2012 and subsequent years.")

6. The terms and conditions of the documents creating your interest in the land.

7. Materials furnished or labor performed in connection with planned construction before signing and delivering the lien document described in Schedule A, if the land is part of the homestead of the owner. (Applies to the Loan Title Policy Binder on Interim Construction Loan only, and may be deleted if satisfactory evidence is furnished to us before a binder is issued.)

8. Liens and leases that affect the title to the land, but that are subordinate to the lien of the insured mortgage. (Applies to Loan Policy (T-2) only.)

9. The Exceptions from Coverage and Express Insurance in Schedule B of the Texas Short Form Residential Loan Policy (T-2R). (Applies to Texas Short Form Residential Loan Policy (T-2R) only. Separate exceptions 1 through 8 of this Schedule B do not apply to the Texas Short Form Residential Loan Policy (T-2R).

10. The following matters and all terms of the documents creating or offering evidence of the matters (We must insert matters or delete this exception.):

a. **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.**

b. **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.**

c. **The terms, conditions and stipulations of that certain Oil, Gas and/or Mineral Lease dated May 21, 1981, recorded in Volume 322, Page 254 of the Official Public Records of Comal County, executed by and between Timothy Dean Word, Jr., et al, as Lessors, and Jack E. Klinger, as Lessee.**

d. **Electric line right of way agreement granted to the City of New Braunfels Utilities, by instrument dated June 10, 1985, recorded in Volume 343, Page 37 and Volume 451, Page 871 of the Official Public Records of Comal County, Texas.**

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

f. **The terms, conditions and stipulations of that certain Lease Agreement dated October 14, 1986, executed by and between Timothy Dean Word, et al, as Lessors, and San Antonio Cellular Telephone Company, as Lessee, evidenced by Memorandum of Assignment of Leasehold Interest 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.**

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

h. **Right of Use granted to Southwestern Bell Telephone Company, by instrument dated August 9, 1996, recorded in County Clerk's File No. 9606018259 of the Official Public Records of Comal County, Texas.**

i. **Any and all liens arising by reason of unpaid bills or claims for work performed or materials furnished in connection with improvements placed, or to be placed, upon the subject land. However, the Company does insure the Insured against loss, if any, sustained by the insured under this policy if such liens have been filed with the County Clerk of Comal County, Texas, prior to the date hereof.**

(EXCEPTION MAY BE DELETED IF PROPOSED TRANSACTION DOES NOT INCLUDE COST OF CONTEMPLATED IMPROVEMENTS, CONSTRUCTION OR REPAIRS AND LOAN PROCEEDS ARE FULLY DISBURSED).

j. **Liability hereunder at the date hereof is limited to $_____. Liability shall increase as contemplated improvements are made, so that any loss payable hereunder shall be limited to said sum plus the amount actually expended by the Insured in improvements at the time the loss occurs. Any expenditures made for improvements, subsequent to the date of this policy, will be deemed made as of the date of this policy. In no event shall the liability to the Company hereunder exceed the face amount of this policy. Nothing contained in this paragraph shall be construed as limiting any exception or any printed provisions of this policy. (Owner's Policy Only)**

(EXCEPTION MAY BE DELETED IF PROPOSED TRANSACTION DOES NOT INCLUDE COST OF

CONTEMPLATED IMPROVEMENTS, CONSTRUCTION OR REPAIRS AND LOAN PROCEEDS ARE FULLY DISBURSED).

k. Any and all leases, recorded or unrecorded, with rights of tenants in possession.

l. Easements, or claims of easements, which are not recorded in the public records.

m. Rights of parties in possession. (Owner's Policy Only)

COMMITMENT FOR TITLE INSURANCE

Issued By

Chicago Title Insurance Company

SCHEDULE C

Your Policy will not cover loss, costs, attorneys' fees, and expenses resulting from the following requirements that will appear as Exceptions in Schedule B of the Policy, unless you dispose of these matters to our satisfaction, before the date the Policy is issued:

1. Documents creating your title or interest must be approved by us and must be signed, notarized and filed for record.

2. Satisfactory evidence must be provided that:

   a. no person occupying the land claims any interest in that land against the persons named in paragraph 3 of Schedule A,

   b. all standby fees, taxes, assessments and charges against the property have been paid,

   c. all improvements or repairs to the property are completed and accepted by the owner, and that all contractors, subcontractors, laborers and suppliers have been fully paid, and that no mechanic's, laborer's or materialmen's liens have attached to the property,

   d. there is legal right of access to and from the land,

   e. (on a Loan Policy only) restrictions have not been and will not be violated that affect the validity and priority of the insured mortgage.

   You must pay the seller or borrower the agreed amount for your property or interest.

4. Any defect, lien or other matter that may affect title to the land or interest insured, that arises or is filed after the effective date of this Commitment.

5. **This Company must follow Procedure Rule P-27 as set out by the Department of Insurance in disbursing funds provided by the Assured and/or Insured on Schedule "A" of this Commitment. Good Funds shall be in possession of the title company prior to any disbursements. Good Funds shall be as defined in Rule P-27, and include cash or wire transfers, certified, cashier's or teller checks.**

6. **For each entity that will execute any document in connection with the proposed closing (AND any other entity executing said document on its behalf), this company must be furnished the following authority and existence documentation:**

   (a) Corporation - Certificate of Existence from the Secretary of State, Articles of Incorporation from the Secretary of State, and a properly executed Corporate Resolution (in recordable form) to support the proposed transaction.

   (b) Limited Liability Company - Certificate of Existence from the Secretary of State, Articles of Organization from the Secretary of State, copy of Regulations (and any Amendments thereto), and Secretary's Certificate (in recordable form).

   (c) General Partnership - copy of Partnership Agreement (and any Amendments thereto).

   (d) Limited Partnership - Certificate of Limited Partnership from the Secretary of State, Certificate of Existence from the Secretary of State, copy of Limited Partnership Agreement (and any Amendments), and evidence of consent of limited partners (in recordable form), if required.

   (e) Joint Venture - copy of Joint Venture Agreement (and any Amendments thereto).

f) Trust - copy of the Trust Agreement (and any Amendments thereto) for review or, in the alternative, the Trustee must file a Certification of Trust in the real property records meeting all of the provisions of Section 114.086(a) and (c) of the Texas Property Code, and provide excerpts from the Trust Agreement sufficient to evidence authority of the Trustee to enter into this transaction.

7. We are to be furnished with a survey showing a plat and containing the correct metes and bounds description of the subject property made by a licensed public surveyor of the State of Texas, suitable to this title company. When same is submitted, it is to be shown to Examiner for inspection and approval. (if applicable)

8. NOTE: The last recorded deed to convey the subject property (or a portion thereof) is dated December 31, 2009, filed for record on July 29, 2010, recorded under Document No. 201006024825 of the Official Public Records of Comal County, Texas, executed by BMB Ranch Holdings, Ltd., et al, to Word-Borchers Ranch Real Estate Limited Partnership, a Texas limited partnership.

9. Company must be furnished a satisfactory Affidavit of Debts and Liens executed by Seller(s).

10. Company must be furnished a satisfactory Waiver of Inspection executed by Purchaser(s).

11. THIS COMMITMENT MUST BE UPDATED PRIOR TO CLOSING AND FUNDING.

Countersigned
Heritage Title Company of Austin, Inc.

By _____
Amy Fisher

COMMITMENT FOR TITLE INSURANCE

SCHEDULE D

GF No. **081579**

Pursuant to the requirements of Rule P-21, Basic Manual of Rules, Rates and Forms for the writing of Title Insurance in the State of Texas, the following disclosures are made:

1. The following individuals are directors and/or officers, as indicated, of the Title Insurance Company issuing this Commitment Disclosure of: **CHICAGO TITLE INSURANCE COMPANY, a Nebraska Corporation**

   (a) The Shareholders owning or controlling, directly or indirectly, ten (10%), or more of the shares of Chicago Title Insurance Company: CHICAGO TITLE AND TRUST COMPANY, an Illinois Corporation

   (b) The names of the Directors of Chicago Title Insurance Company: Christopher Abbinante, John A. Wunderlich, Erika Meinhardt, Raymond R. Quirk, Roger S. Jewkes, Anthony J. Park, Alan L. Stinson, and Thomas E. Evans, Jr.

   (c) The president, the executive or senior vice-president, the secretary and the treasurer of Chicago Title Insurance Company:

Chairman of the Board, President and Chief Executive Officer	Raymond R. Quirk
Executive Vice President and Regional Manager	John A. Wunderlich
Vice President and Corporate Secretary	Fernando Velez, Jr.
Vice President and Treasurer	Patrick G. Farenga

2. The issuing Title Insurance Agent, Heritage Title Company of Austin, Inc., is a corporation whose shareholders owning or controlling, directly or indirectly, 1% or more of said corporation (or owning or controlling 10% or more of any entity that owns 1% or more of the Agent), directors, and officers are listed below:

   Owners of 10% or more: Gary S. Farmer, Jan Cox Dwyer and Laura A. Beuerlein

   Officers: Gary S. Farmer - President, Brenda K. Hindsman - Secretary and Laura A. Beuerlein - Treasurer

   Board of Directors: Gary S. Farmer, Jan Cox Dwyer and Laura A. Beuerlein

3. You are entitled to receive advance disclosure of settlement charges in connection with the proposed transaction to which this commitment relates. Upon your request, such disclosure will be made to you. Additionally, the name of any person, firm or corporation receiving a portion of the premium from the settlement of this transaction will be disclosed on the closing or settlement statement.

   You are further advised that the estimated title premium* is:

Owner's Policy	**$229.00**
Loan Policy	**$100.00**
Endorsement Charges	**$0.00**
Other	**$0.00**
Total	**$329.00**

Of this total amount: 15% will be paid to the policy issuing Title Insurance Company: 60% will be retained by the issuing Title Insurance Agent; and the remainder of the estimated premium will be paid to other parties as follows:

Amount	To Whom	For Services
25.00%	**Chicago Title Insurance Company**	**Title Evidence**

*The estimated premium is based upon information furnished to us as of the date of this Commitment for Title Insurance. Final determination of the amount of the premium will be made at closing in accordance with the Rules and Regulations adopted by the Commissioner of Insurance.

DELETION OF ARBITRATION PROVISION

(Not applicable to the Texas Residential Owner's Policy)

Arbitration is a common form of alternative dispute resolution. It can be a quicker and cheaper means to settle a dispute with your Title Insurance Company. However, if you agree to arbitrate, you give up your right to take the Title Company to court and your rights to discovery of evidence may be limited in the arbitration process. In addition, you cannot usually appeal an arbitrator's award.

Your policy contains an arbitration provision (shown below). It allows you or the Company to require arbitration if the amount of insurance is $2,000,000 or less. If you want to retain your right to sue the Company in case of a dispute over a claim, you must request deletion of the arbitration provision before the policy is issued. You can do this by signing this form and returning it to the Company at or before the closing of your real estate transaction or by writing to the Company.

The arbitration provision in the Policy is as follows:

"Either the Company or the Insured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Insured arising out of or relating to this policy, any service in connection with its issuance or the breach of a policy provision, or to any other controversy or claim arising out of the transaction giving rise to this policy. All arbitrable matters when the Amount of Insurance is $2,000,000 or less shall be arbitrated at the option of either the Company or the Insured, unless the Insured is an individual person (as distinguished from an Entity). All arbitrable matters when the Amount of Insurance is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Insured. Arbitration pursuant to this policy and under the Rules shall be binding upon the parties. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction."

_____ _____

SIGNATURE DATE

CHICAGO TITLE INSURANCE COMPANY

TEXAS TITLE INSURANCE INFORMATION

Title Insurance insures you against loss resulting from certain risks to your title. The Commitment for Title Insurance is the Title Insurance Company's promise to issue the Title Insurance Policy. The Commitment is a legal document. You should review it carefully to completely understand it before your closing date.	El seguro de titulo le asegura en relacion a perdidas resultantes de ciertos riesgos que pueden afectar el titulo de su propiedad. El Compromiso para Seguro de Titulo es la promesa de la compania aseguradora de titulos de emitir la poliza de seguro de titulo. El Compromiso es un documento legal. Usted debe leerlo cuidadosamente y entenderlo complemente antes de la fecha para finalizar su transaccion.

Your Commitment for Title Insurance is a legal contract between you and us. The Commitment is not an opinion or report of your title. It is a contract to issue you a Policy subject to the Commitment's terms and requirements.

Before issuing a Commitment for Title Insurance (the Commitment) or a Title Insurance Policy (the Policy), the Title Insurance Company (the Company) determines whether the title is insurable. This determination has already been made. Part of that determination involves the Company's decision to insure the title except for certain risks that will not be covered by the Policy. Some of these risks are listed in Schedule B of the attached Commitment as Exceptions. Other risks are stated in the Policy as Exclusions. These risks will not be covered by the Policy. The Policy is not an abstract of title nor does a Company have an obligation to determine the ownership of any mineral interest.

---**MINERALS AND MINERAL RIGHTS** may not be covered by the Policy. The Company may be unwilling to insure title unless there is an exclusion or an exception as to Minerals and Mineral Rights in the Policy. Optional endorsements insuring certain risks involving minerals, and the use of improvements (excluding lawns, shrubbery and trees) and permanent buildings may be available for purchase. Neither this Policy, nor the optional endorsements, insure that the purchaser has title to the mineral rights related to the surface estate.

Another part of the determination involves whether the promise to insure is conditioned upon certain requirements being met. Schedule C of the Commitment lists these requirements that must be satisfied or the Company will refuse to cover them. You may want to discuss any matters shown in Schedules B and C of the Commitment with an attorney. These matters will affect your title and your use of the land.

When your Policy is issued, the coverage will be limited by the Policy's Exception, Exclusions and Conditions, defined below.

---**EXCEPTIONS** are title risks that a Policy generally covers but does not cover in a particular instance. Exceptions are shown on Schedule B or discussed in Schedule C of the Commitment. They can also be added if you do not comply with the Conditions section of the Commitment. When the Policy is issued, all Exceptions will be on Schedule B of the Policy.

---**EXCLUSIONS** are title risks that a Policy generally does not cover. Exclusions are contained in the Policy but not shown or discussed in the Commitment.

---**CONDITIONS** are additional provisions that qualify or limit your coverage. Conditions include your responsibilities and those of the Company. They are contained in the Policy but not shown or discussed in the Commitment. The Policy Conditions are not the same as the Commitment Conditions.

You can get a copy of the policy form approved by the Texas Department of Insurance by calling Chicago Title Insurance Company at 1-800-442-4303 or by calling the title insurance agent that issued the Commitment. The Texas Department of Insurance may revise the policy form from time to time.

You can also get a brochure that explains the Policy from the Texas Department of Insurance by calling 1-800-252-3439.

Before the Policy is issued, you may request changes in the Policy. Some of the changes to consider are:

---Request amendment of the "area and boundary" exception (Schedule B, paragraph 2). To get this amendment, you must furnish a survey and comply with other requirements of the Company. On the Owner's Policy, you must pay an additional premium for the amendment. If the survey is acceptable to the Company and if the Company's other requirements are met, your Policy will insure you against loss because of discrepancies or conflicts in boundary lines, encroachments or protrusions, or overlapping of improvements. The Company may then decide not to insure against specific boundary or survey problems by making special exceptions in the Policy.

Whether or not you request amendment of the "area and boundary" exception, you should determine whether you want to purchase and review a survey if a survey is not being provided to you.

---Allow the Company to add an exception to "rights of parties in possession." If you refuse this exception, the Company or the title insurance agent may inspect the property. The Company may except to and not insure you against the rights of specific persons, such as renters, adverse owners or easement holders who occupy the land. The Company may charge you for the inspection. If you want to make your own inspection, you must sign a Waiver of Inspection form and allow the Company to add this exception to your Policy.

The entire premium for a Policy must be paid when the Policy is issued. You will not owe any additional premiums unless you want to increase your coverage at a later date and the Company agrees to add an Increased Value Endorsement.

Fidelity National Financial, Inc.

Privacy Statement

Fidelity National Financial, Inc. and its subsidiaries ("FNF") respect the privacy and security of your non-public personal information ("Personal Information") and protecting your Personal Information is one of our top priorities. This Privacy Statement explains FNF's privacy practices, including how we use the Personal Information we receive from you and from other specified sources, and to whom it may be disclosed. FNF follows the privacy practices described in this Privacy Statement and, depending on the business performed, FNF companies may share information as described herein.

Personal Information Collected

We may collect Personal Information about you from the following sources:

- Information we receive from you on applications or other forms, such as your name, address, social security number, tax identification number, asset information, and income information;
- Information we receive from you through our Internet websites, such as your name, address, email address, Internet Protocol address, the website links you used to get to our websites, and your activity while using or reviewing our websites;
- Information about your transactions with or services performed by us, our affiliates, or others, such as information concerning your policy, premiums, payment history, information about your home or other real property, information from lenders and other third parties involved in such transaction, account balances, and credit card information; and
- Information we receive from consumer or other reporting agencies and publicly recorded documents.

Disclosure of Personal Information

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to restrict these disclosures. Disclosures may include, without limitation, the following:

- To insurance agents, brokers, representatives, support organizations, or others to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure in connection with an insurance transaction;
- To third-party contractors or service providers for the purpose of determining your eligibility for an insurance benefit or payment and/or providing you with services you have requested;
- To an insurance regulatory authority, or a law enforcement or other governmental authority, in a civil action, in connection with a subpoena or a governmental investigation;
- To companies that perform marketing services on our behalf or to other financial institutions with which we have joint marketing agreements; and/or
- To lenders, lien holders, judgment creditors, or other parties claiming an encumbrance or an interest in title whose claim or interest must be determined, settled, paid or released prior to a title or escrow closing.

We may also disclose your Personal Information to others when we believe, in good faith, that such disclosure is reasonably necessary to comply with the law or to protect the safety of our customers, employees, or property and/or to comply with a judicial proceeding, court order or legal process.

Disclosure to Affiliated Companies - We are permitted by law to share your name, address and facts about your transaction with other FNF companies, such as insurance companies, agents, and other real estate service providers to provide you with services you have requested, for marketing or product development research, or to market products or services to you. We do not, however, disclose information we collect from consumer or credit reporting agencies with our affiliates or

others without your consent, in conformity with applicable law, unless such disclosure is otherwise permitted by law.

Disclosure to Nonaffiliated Third Parties - We do not disclose Personal Information about our customers or former customers to nonaffiliated third parties, except as outlined herein or as otherwise permitted by law.

Confidentiality and Security of Personal Information
We restrict access to Personal Information about you to those employees who need to know that information to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard Personal Information.

Access to Personal Information/
Requests for Correction, Amendment, or Deletion of Personal Information
As required by applicable law, we will afford you the right to access your Personal Information, under certain circumstances to find out to whom your Personal Information has been disclosed, and request correction or deletion of your Personal Information. However, FNF's current policy is to maintain customers' Personal Information for no less than your state's required record retention requirements for the purpose of handling future coverage claims.

For your protection, all requests made under this section must be in writing and must include your notarized signature to establish your identity. Where permitted by law, we may charge a reasonable fee to cover the costs incurred in responding to such requests. Please send requests to:

Chief Privacy Officer
Fidelity National Financial, Inc.
601 Riverside Avenue
Jacksonville, FL 32204

Changes to this Privacy Statement
This Privacy Statement may be amended from time to time consistent with applicable privacy laws. When we amend this Privacy Statement, we will post a notice of such changes on our website. The effective date of this Privacy Statement, as stated above, indicates the last time this Privacy Statement was revised or materially changed.

AUSTIN, TEXAS

PRIVACY POLICY

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information-particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, we have adopted this Privacy Policy to govern the use and handling of your personal information.

Applicability

This Privacy Policy governs our use of the information which you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity.

Types of Information

Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, form and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

Use of Information

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

Former Customers

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

Confidentiality and Security

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

FIRST AMENDMENT TO UTILITY CONSTRUCTION COST SHARING AGREEMENT FOR THE VERAMENDI DEVELOPMENT

1. Parties. The parties to this Amendment are NEW BRAUNFELS UTILITIES ("NBU"), a municipally owned utility charged with exclusive management and control of the water and sewer systems of the City of New Braunfels, WORD-BORCHERS RANCH JOINT VENTURE, a Texas general partnership ("Developer"), and COMAL COUNTY WATER IMPROVEMENT DISTRICT NO. 1, a political subdivision of the State of Texas (the "District"). NBU, Developer and the District are sometimes collectively referred to herein as the "Parties".

2. Recitals. NBU, Developer and District are parties to the Utility Construction Cost Sharing Agreement for the Veramendi Development (the "Original Agreement") dated February 25, 2013, by the terms of which the Parties agreed on the nature, timing and construction of water and sanitary sewer infrastructure facility improvements for the development of the Property, containing approximately 2462 acres of land in Comal County, Texas (the "Project"). The Original Agreement acknowledges that 400 living unit equivalents (LUEs) of water and wastewater service capacity were available and uncommitted for use in the Project and that additional service capacity may be available to Developer based on a subsequent agreement with NBU for design and construction of additional off-site water and wastewater facilities. Developer has requested an additional initial commitment of LUEs as a means of gaining an extension of time within which it must construct an elevated water storage tank and certain trunk sewer lines necessary to serve the Project as required by the Original Agreement, and has agreed to design and construct certain additional off-site water and wastewater infrastructure facilities to increase the number of LUEs currently available for the Project. Developer, NBU and the District intend hereby to amend the Original Agreement as provided in the following paragraphs. This Amendment and the Original Agreement are together referred to as "the Agreement".

3. Increased Water Service Capacity. The following sections in Article III of the Original Agreement are amended or added to reflect the agreement among the Parties for an increase in current available uncommitted service capacity in the NBU water utility system for the Project from 400 LUEs to 700 LUEs:

   (a) The last sentence of Section 3.01(c) is amended and restated, reading in its entirety as follows: "NBU has within its water supply the capacity to provide the Property with up to 700 LUEs of water, provided that Developer constructs Internal Water Facilities that meet NBU standards and policies, of which no more than 400 LUEs can be allocated to Zone 5."

   (b) Section 3.03 is amended to add a new subsection (j), reading in its entirety as follows: "(j) A combination flow control valve and pressure reducing valve as specified by NBU is required, which will be designed and constructed by NBU within 12 months from the effective date of this Amendment, the estimated cost of which is $300,000.00. Developer must pay and advance the cost for the

design and construction of such valves, within 30 days after NBU submits an invoice therefor, subject to reconciliation when actual costs are determined.

4. Increased Wastewater Service Capacity. The first sentence of Section 4.01(a) of the Original Agreement is amended and restated, reading in its entirety as follows: "(a) NBU will have available wastewater treatment and collection capacity within its existing system to provide the Property with up to 700 LUEs of interim, initial sewer capacity, provided that Developer constructs the necessary Internal Facilities and funds its 47% prorata share of the total estimated cost of design and construction of a 30" gravity sewer main (the "30" sewer main") between the Blieders Creek Lift Station and the proposed new wastewater treatment plant as contemplated in Sections 4.01(c) and 4.03(e)." Developer may allocate these 700 LUEs to either the north or south sewer mains on the Property as it may elect. Developer's prorata share of such estimated costs is due and payable within 30 days from the date NBU submits an invoice therefor, after entering into a contract for the construction of the proposed new wastewater treatment plant, subject to reconciliation when actual costs are determined.

5. Impact Fees. NBU acknowledges that the 30" sewer main is a capital improvement attributable to or necessitated by the Project. NBU agrees to amend its Capital Recovery Policy as contemplated in Section 10.03 of the Original Agreement to include the 30" sewer main as part of the capital improvements plan. The effect of such amendment will be to allow Developer to receive a rebate of capital recovery fees for costs advanced by Developer attributable to the 30" sewer main as allowed by NBU's Capital Recovery Policy and the Agreement.

6. Water Storage Tank. NBU and Developer acknowledge that Developer must fully complete construction of the water storage tank referenced in Section 3.03(e) of the Original Agreement before the current available uncommitted service capacity in the NBU water utility system for the Project exceeds 700 LUEs.

7. Attorneys' Fees. Developer will be obligated to pay NBU's attorneys fees in connection with the preparation of this Amendment within 30 days after NBU submits an invoice therefor, but not to exceed $5,000.00.

8. Definitions. All capitalized terms used but not defined herein have the meanings ascribed to such terms in the Original Agreement.

9. Conflict. In the event of a conflict between the provisions of this Amendment and the Original Agreement, the Amendment controls over the Original Agreement.

10. Ratification; Complete Agreement. All other provisions of the Original Agreement remain the same and unmodified except as provided herein. The Parties acknowledge that this Amendment and the Original Agreement together evidence their agreement with respect to the Project and the rights, duties and obligations of each Party to the other as of the Effective Date. The Parties ratify and confirm the terms and conditions of the Original Agreement as modified hereby. Any other agreements, representations or understandings among NBU, the Word-Borchers Ranch Real Estate Limited Partnership (the "Landowner"), any predecessor-in-interest of the Landowner, or any principal of the Landowner or its predecessors with respect to prorata or impact fees in connection with

the development of the Property are of no further force and effect and are superseded in their entirety by the Original Agreement, as modified hereby.

11. Execution. The Parties agree that telecopy, facsimile or electronic signatures may be used in place of original signatures on this Amendment with the same legal effect, and that third parties may rely on telecopy, facsimile or electronic signatures as original signatures and hereby waive any defense to the enforcement of this Amendment based on the form of signature. If Developer notifies NBU that Developer elects to record this Amendment in accordance with Section 14.16 of the Original Agreement, NBU shall deliver a counterpart of this Amendment bearing an original signature on behalf of NBU.

12. Counterparts. This Amendment may be executed in any number of counterparts, each of which is an original for all purposes and which together constitute one and the same agreement.

13. Approval by Board of Trustees. This Amendment will be executed by the authorized representatives of the Parties promptly following approval of this Amendment by the NBU Board of Trustees and becomes effective on the effective date of the Development Agreement ("Effective Date").

NEW BRAUNFELS UTILITIES

By: _____
Name: PAULA DIFONZO
Title: CEO

Date: JULY 23, 2015

WORD-BORCHERS RANCH JOINT VENTURE,
By ASA Properties, LLC, its Manager

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

By: _____
Name: Tiffany Lacey
Title: Vice President, Design and Approvals
Date: July 16, 2015

COMAL COUNTY WATER IMPROVEMENT DISTRICT NO. 1

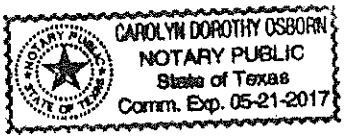
By: _____
Name: Donnie Shaw
Title: President

Date: JULY 27, 2015

STATE OF TEXAS §
§ CORPORATE ACKNOWLEDGMENT
COUNTY OF COMAL §

This instrument was acknowledged before me on this the 16th day of July 2015, by Tiffany Lacey, a person known to me in her capacity as Vice President of Design and Approvals of ASA Properties Holding Co. LLC, the sole manager of ASA Properties, LLC, on behalf of Word-Borchers Ranch Joint Venture.

Carolyn Dorothy Osborn
Notary Public, in and for the State of Texas



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

This instrument was acknowledged before me on this the 21st day of July 2015, by Katrina Raigosa, a person known to me in his or her capacity as DONNIE SHAW of Comal County Water Improvement District No. 1, on behalf of Comal County Water Improvement District No. 1.

Katrina marie Raigosa
Notary Public, in and for the State of Texas

KATRINA MARIE RAIGOSA
Notary Public, State of Texas
My Commission Expires
December 11, 2018

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

This instrument was acknowledged before me on this the 2nd day of July 2015, by PAULA V. DiFRANCO, a person known to me in his or her capacity as CEO of New Braunfels Utilities, on behalf of New Braunfels Utilities.

Laura L. Rivers
Notary Public, in and for the State of Texas

LAURA L. RIVERS
Notary Public, State of Texas
My Commission Expires
November 27, 2015

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: Nicholas Gower, PE

Date: 7/8/2025

Signature of Customer/Agent:

Nicholas Gower

Regulated Entity Name: Veramendi Precincts 23-1

Project Information

Potential Sources of Contamination

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

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

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

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

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

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

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

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

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

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

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

Sequence of Construction

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

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

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

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

- [X] A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.
- [X] A description of how BMPs and measures will prevent pollution of surface water or groundwater that originates on-site or flows off site, including pollution caused by contaminated stormwater runoff from the site.
- [X] A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.
- [X] A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

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

   - [ ] **Attachment E - Request to Temporarily Seal a Feature**. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.
   - [X] There will be no temporary sealing of naturally-occurring sensitive features on the site.

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

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

    - [X] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.
    - [ ] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.
    - [ ] For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.
    - [ ] There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

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

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

    ☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

18. [X] 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. [X] Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

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

21. [X] 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. [X] 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.

Temporary Stormwater Section

Attachment A – Spill Response Actions

Spill Prevention and Control

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

The following steps will help reduce the storm water impacts of leaks and spills:

Education

(1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information available in 30 TAC 327.4 and 40 CFR 302.4.

(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.

(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).

(4) Establish a continuing education program to indoctrinate new employees.

(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, and substances listed under 40 CFR parts 110,117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.

(2) Store hazardous materials and wastes in covered containers and protect from vandalism.

(3) Place a stockpile of spill cleanup materials where it will be readily accessible.

(4) Train employees in spill prevention and cleanup.

(5) Designate responsible individuals to oversee and enforce control measures.

(6) Spills should be covered and protected from stormwater runoff during rainfall to the extent that it doesn't compromise cleanup activities.

(7) Do not bury or wash spills with water.

(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.

(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.

(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.

(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.

(2) Use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be disposed of as hazardous waste.

(3) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this section for specific information.

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.

(2) Use absorbent materials on small spills rather than hosing down or burying the spill.

(3) Absorbent materials should be promptly removed and disposed of properly.

(4) Follow the practice below for a minor spill:
   a) Contain the spread of the spill.
   b) Recover spilled materials.
   c) Clean the contaminated area and properly dispose of contaminated materials.

Semi-significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.

(2) Notify the project foreman immediately.

(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.

(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

(3) Notification should first be made by telephone and followed up with a written report.

(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at:
http://www.tnrcc.state.tx.us/enforcement/emergency_response.html.

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately.

(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.

(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.

(5) Place drip pans or absorbent materials under paving equipment when not in use.

(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.

(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.

(8) Oil filters disposed of in trashcans or dumpsters can leak 03 and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.

(9) Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries even if you & think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.

(2) Discourage “topping off” of fuel tanks.

(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/leaks.

Spill Response Actions

In the event that a spill of hydrocarbons or hazardous substances does occur, the contractor shall be required to maintain a sufficient stockpile of sand material in the staging area. This sand material shall be used to immediately isolate and provide containment of the spill by constructing dikes. Furthermore, this sand material shall act as an absorbent material that can be disposed of offsite and out of the Recharge Zone during clean-up operations. The contractor, in the event of a spill, shall also notify the owner who shall contact TCEQ. All contaminated soils resulting from an accidental release will be required to be removed and disposed of in accordance with all local, state and federal regulations.

Attachment B – Potential Sources Contamination

Potential Source	Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle dripping.
Preventive Measure	Vehicle maintenance, when possible, will be performed within a construction staging area specified by the General Contractor.
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	Stormwater contamination from excess application of fertilizers, herbicides and pesticides.
Preventive Measure	Fertilizers, herbicides and pesticides will be applied only when necessary and in accordance with manufacturer's directions.

Potential Source	Soil and mud from construction vehicle tires as they leave the site.
Preventive Measure	A temporary construction entrance/exit shall be utilized as vehicles leave the site. Any soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.
Potential Source	Sediment from soil, sand, gravel and excavated materials stockpiled on site.
Preventive Measure	Silt fence shall be installed on the down gradient side of all stockpiled materials. Reinforced rock berms shall be installed at all downstream discharge locations.
Potential Source	Portable toilet spill.
Preventive Measure	Toilets on the site will be emptied on a regular basis by the contracted toilet company.

Attachment C – Sequence of Major Activities

The sequence of major activities which disturb soil during construction on this site will be divided into stages. The first stage is site preparation that will include clearing and grubbing of vegetation, where applicable. This will disturb approximately 1.80 acres. The second is construction that will include installation of utilities, construction of the water quality basin and the proposed buildings, parking lot, landscaping and site cleanup. This will disturb approximately 1.80 acres.

Sequence Item	Description
1.	**Install TBMP's as required. (Silt Fence, etc.)**
2.	**Clearing of Disturbed Areas**
3.	**Grading of Disturbed Areas**
4.	**Construction of Permanent BMP's /Storm Drains**
5.	**Complete Construction**
6.	**Soil Stabilization and/or re-vegetation**
7.	**Clean site**
8.	**Remove TBMP's**

Attachment D – Temporary Best Management Practices and Measures

1. Temporary Construction Entrance/Exit – A stabilized pad of crushed stone located at any point where traffic will be entering or leaving the construction site from a public R.O.W., street, alley, sidewalk or parking area. It shall be a minimum of 50 feet long, 12 feet wide and 8 inches thick. The rock shall be 4" to 8" in size.

2. Silt Fence – A barrier consisting of geotextile fabric supported by metal posts to prevent soil and sediment loss from a site. Silt fences shall be installed on the down gradient side of the proposed areas to be disturbed that have a drainage area of ¼ acres per 100 feet of fence.

3. Rock Berms – A sediment trap consisting of 3" to 5" diameter rock wrapped in a woven wire sheathing. The berm shall have a minimum height of 36" and a minimum top width of 2 feet. A rock berm shall be placed at locations of the concentrated flows where the drainage area is between 2 and 5 acres.

4. Inlet Protection – Placed around inlets to catch and stop sediment from entering the storm drain system before filtration system are in place.

5. Concrete Washout Pit – Designed to trap and store waste from concrete and similar activities. This allows for safe storage and removal from the site by not allowing contaminants to enter the storm water. Contaminants can be kept in a location that will not allow storm water to mix and flow off the site.

Sequence of installation during construction process

1. The Temporary Construction Entrance/Exit (Item 1) shall be installed prior to disturbing any soil except at the location of the Temporary Construction Entrance/Exit. It shall stay in place and be maintained until the end of the infrastructure construction.

2. Silt fence (Item 2) shall be installed along the western boundary of the site prior to any disturbance of the site

3. Rock berms (Item 4) shall be installed around the perimeter of the project at natural low points following rough grading of the site and shall be removed once grading to the on-site stormwater drainage system with bagged gravel inlet filters in sump is complete. Rock berms will also be utilized at the outlet of the pond while it is being constructed.

The TBMPs and measures utilized for the proposed project to prevent pollution of storm water, groundwater, and surface water during the construction phase are the following:

1. Temporary Construction Entrance/Exit
2. Silt Fence
3. Concrete Washout Pit
4. Rock Berm
5. Inlet Protection

Attachment D – Temporary Best Management Practices and Measures

Stormwater originating from upgradient.

- Stormwater originating from upgradient from the east site of the property will be routed around the site by proposed grading.

Stormwater originating from onsite.

- Stormwater originating from onsite will be maintained by the proposed TMBPs (Silt fence, rock berms, etc.) to stay within the project limits and treated by the proposed PBMP.

Prevent stormwater from entering surface water, sensitive features and aquifer.

- No stormwater is expected to enter any surface water, sensitive feature or directly to the aquifer.

Will maintain flow to naturally occurring sensitive features.

- No naturally occurring sensitive features are documented on the geological assessment table.

1.4.2 Temporary Construction Entrance/Exit

The purpose of a temporary gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. This practice should be used at all points of construction ingress and egress. Schematic diagrams of a construction entrance/exit are shown in Figure 1-24 and Figure 1-25.

Excessive amounts of mud can also present a safety hazard to roadway users. To minimize the amount of sediment loss to nearby roads, access to the construction site should be limited to as few points as possible and vegetation around the perimeter should be protected were access is not necessary. A rock stabilized construction entrance should be used at all designated access points.

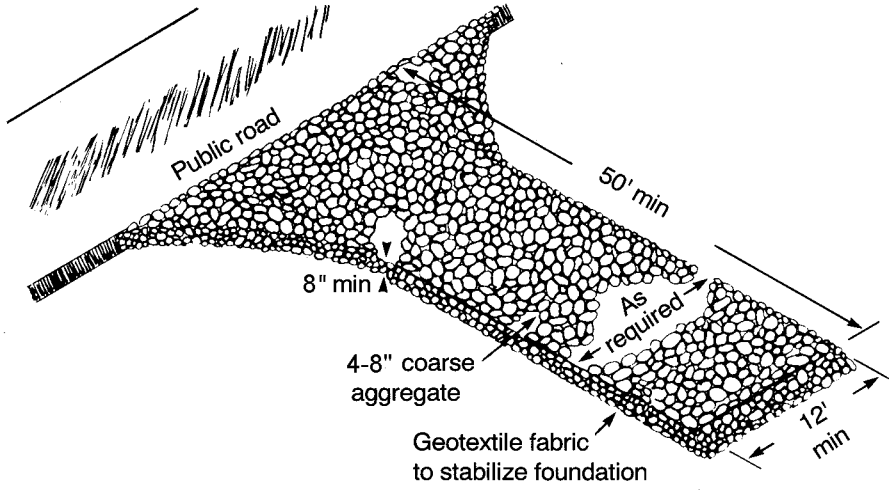


Figure 1-24 Schematic of Temporary Construction Entrance/Exit (after NC, 1993)

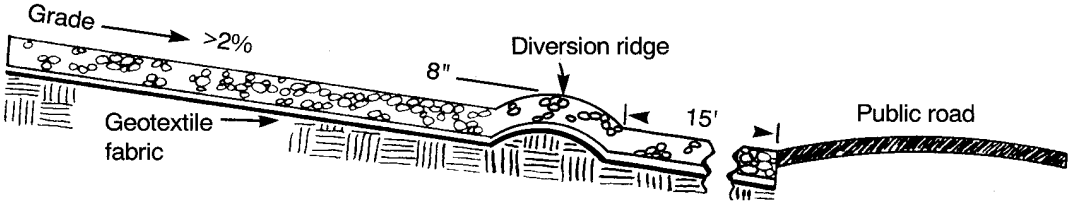


Figure 1-25 Cross-section of a Construction Entrance/Exit (NC, 1993)

Materials:

(1) The aggregate should consist of 4 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/yd^2, a mullen burst rating of 140 lb/in^2, 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 rack should be included in the plans. Divert wastewater to a sediment trap or basin.

Installation: (North Carolina, 1993)

(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 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 edge.

(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.

1.4.3 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. A schematic illustration of a silt fence is shown in Figure 1-26.

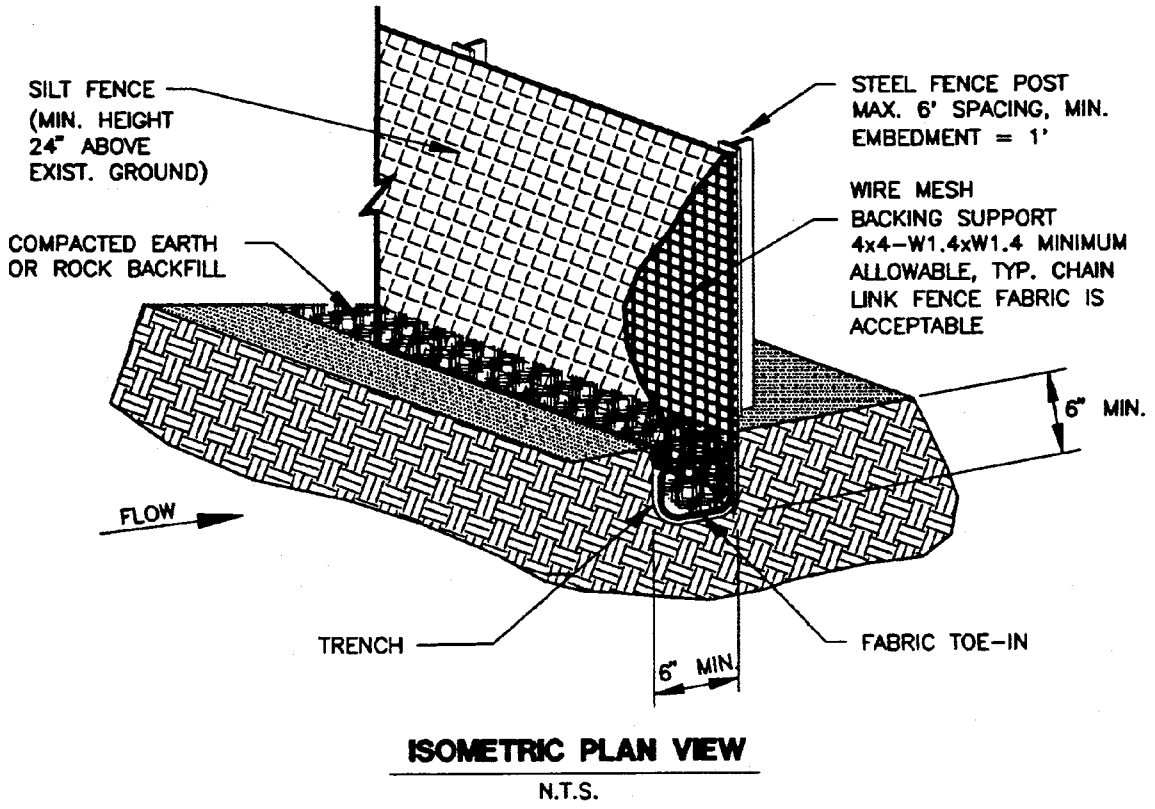


Figure 1-26 Schematic of a Silt Fence Installation (NCTCOG, 1993b)

The purpose of a silt fence is to intercept and detain water-borne 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 width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in^2, ultraviolet stability exceeding 70%, and minimum apparent opening size of U.S. Sieve No. 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 nominal weight 1.25 lb/ft^2, and Brindell hardness exceeding 140.

(3) Woven wire backing to support the fabric should be galvanized 2" x 4" welded wire, 12 gauge minimum.

Installation:

(1) Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1-foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.

(2) Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is ¼ acre/100 feet of fence.

(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 any rainfall.

(2) Remove sediment when buildup reaches 6 inches.

(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.

(4) Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.

(5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

1.4.5 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.

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- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- 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 (Figure 1-28), 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.

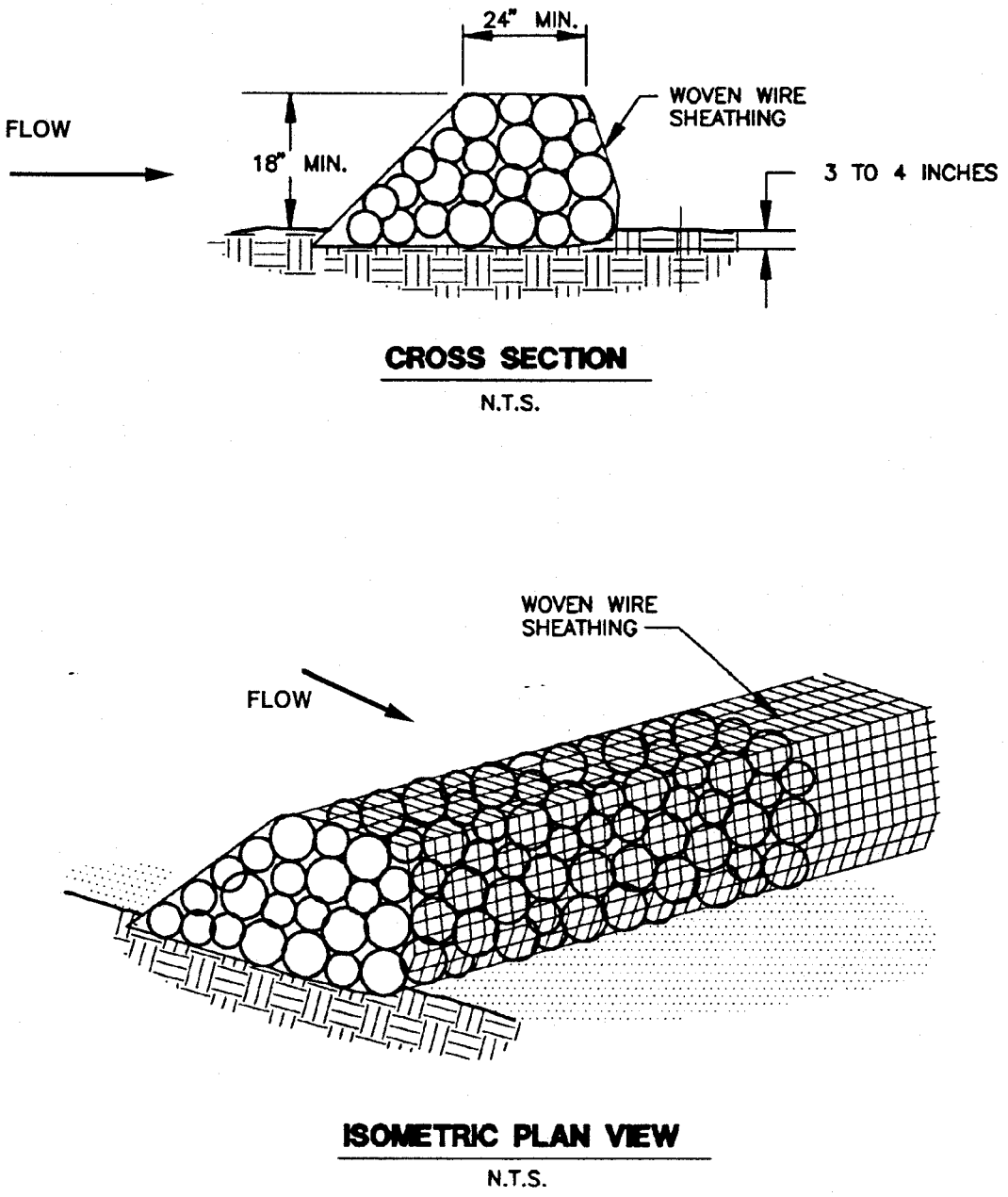


Figure 1-28 Schematic Diagram of a Rock Berm (NCTCOG, 1993)

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)

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.

1.4.18 Concrete Washout Areas

The purpose of concrete washout areas is to prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employees and subcontractors.

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped onsite, except in designated areas.

For onsite washout:

- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Below grade concrete washout facilities are typical. These consist of a lined excavation sufficiently large to hold expected volume of washout material. Above grade facilities are used if excavation is not practical. Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this section, with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. 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.

When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

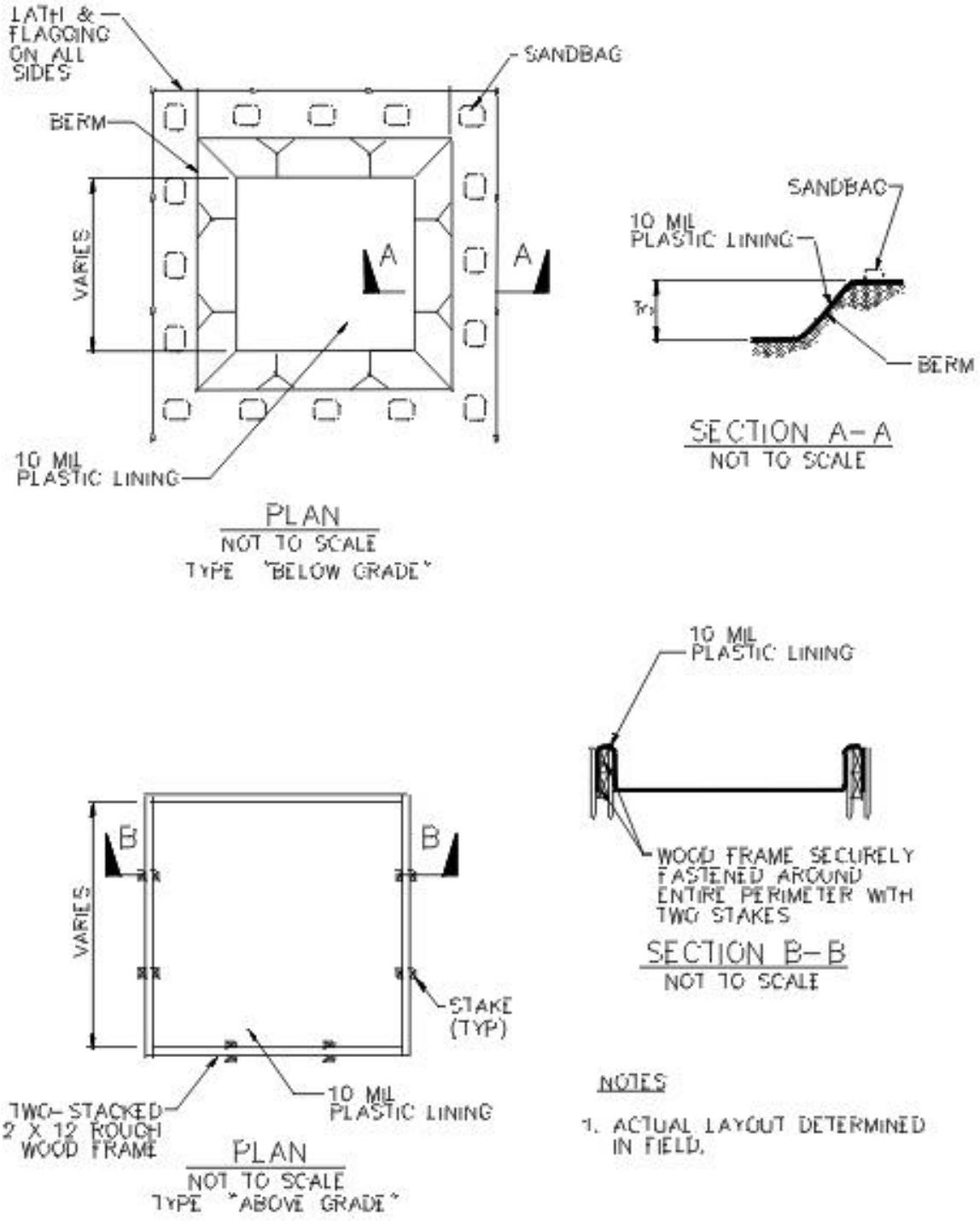


Figure 1-43 Schematics of Concrete Washout Areas

1.4.11 Inlet Protection

Storm sewers that are made operational prior to stabilization of the associated drainage areas can convey large amounts of sediment to natural drainage ways. In case of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets. The following guidelines for inlet protection are based primarily on recommendations by the Virginia Dept. of Conservation and Recreation (1992) and the North Central Texas Council of Governments (NCTCOG, 1993b).

In developments for which drainage is to be conveyed by underground storm sewers (i.e., streets with curbs and gutters), all inlets that may receive storm runoff from disturbed areas should be protected. Temporary inlet protection is a series of different measures that provide protection against silt transport or accumulation in storm sewer systems. This clogging can greatly reduce or completely stop the flow in the pipes. The different measures are used for different site conditions and inlet types.

Care should be taken when choosing a specific type of inlet protection. Field experience has shown that inlet protection that causes excessive ponding in an area of high construction activity may become so inconvenient that it is removed or bypassed, thus transmitting sediment-laden flows unchecked. In such situations, a structure with an adequate overflow mechanism should be utilized.

It should also be noted that inlet protection devices are designed to be installed on construction sites and not on streets and roads open to the public. When used on public streets these devices will cause ponding of runoff, which can cause minor flooding and can present a traffic hazard. An example of appropriate siting would be a new subdivision where the storm drain system is installed before the area is stabilized and the streets open to the general public. When construction occurs adjacent to active streets, the sediment should be controlled on site and not on public thoroughfares. Occasionally, roadwork or utility installation will occur on public roads. In these cases, inlet protection is an appropriate temporary BMP.

The following inlet protection devices are for drainage areas of one acre or less. Runoff from larger disturbed areas should be routed to a temporary sediment trap or basin.

Filter barrier protection using silt fence is appropriate when the drainage area is less than one acre and the basin slope is less than five percent. This type of protection is not applicable in paved areas.

Block and gravel protection is used when flows exceed 0.5 cubic feet per second and it is necessary to allow for overtopping to prevent flooding. This form of protection is also useful for curb type inlets as it works well in paved areas.

Wire mesh and gravel protection is used when flows exceed 0.5 cubic feet per second and construction traffic may occur over the inlet. This form of protection may be used with both curb and drop inlets.

Excavated impoundment protection around a drop inlet may be used for protection against sediment entering a storm drain inlet. With this method, it is necessary to install weep holes to allow the impoundment to drain completely. If this measure is implemented, the impoundment should be sized such that the volume of excavation is 3,600 cubic feet per acre (equivalent to 1 inch of runoff) of disturbed area entering the inlet.

Materials:

(1) Filter fabric should be a nylon reinforced polypropylene fabric which meets the following minimum criteria: Tensile Strength, 90 lbs.; Puncture Rating, 60 lbs.; Mullen Burst Rating, 280 psi; Apparent Opening Size, U.S. Sieve No. 70.

(2) Posts for fabric should be 2" x 4" pressure treated wood stakes or galvanized steel, tubular in cross-section or they may be standard fence "T" posts.

(3) Concrete blocks should be standard 8" x 8" x 16" concrete masonry units.

(4) Wire mesh should be standard hardware cloth or comparable wire mesh with an opening size not to exceed 1/2 inch.

Guidelines for installation:

Silt Fence Drop Inlet Protection

(1) Silt fence should conform to the specifications listed above and should be cut from a continuous roll to avoid joints.

(2) For stakes, use 2 x 4-inch wood or equivalent metal with a minimum length of 3 feet.

(3) Space stakes evenly around the perimeter of the inlet a maximum of 3 feet apart, and securely drive them into the ground, approximately 18 inches deep (Figure 1-33).

(4) To provide needed stability to the installation, a frame with 2 x 4-inch wood strips around the crest of the overflow area at a maximum of 1½ feet above the drop inlet crest should be provided.

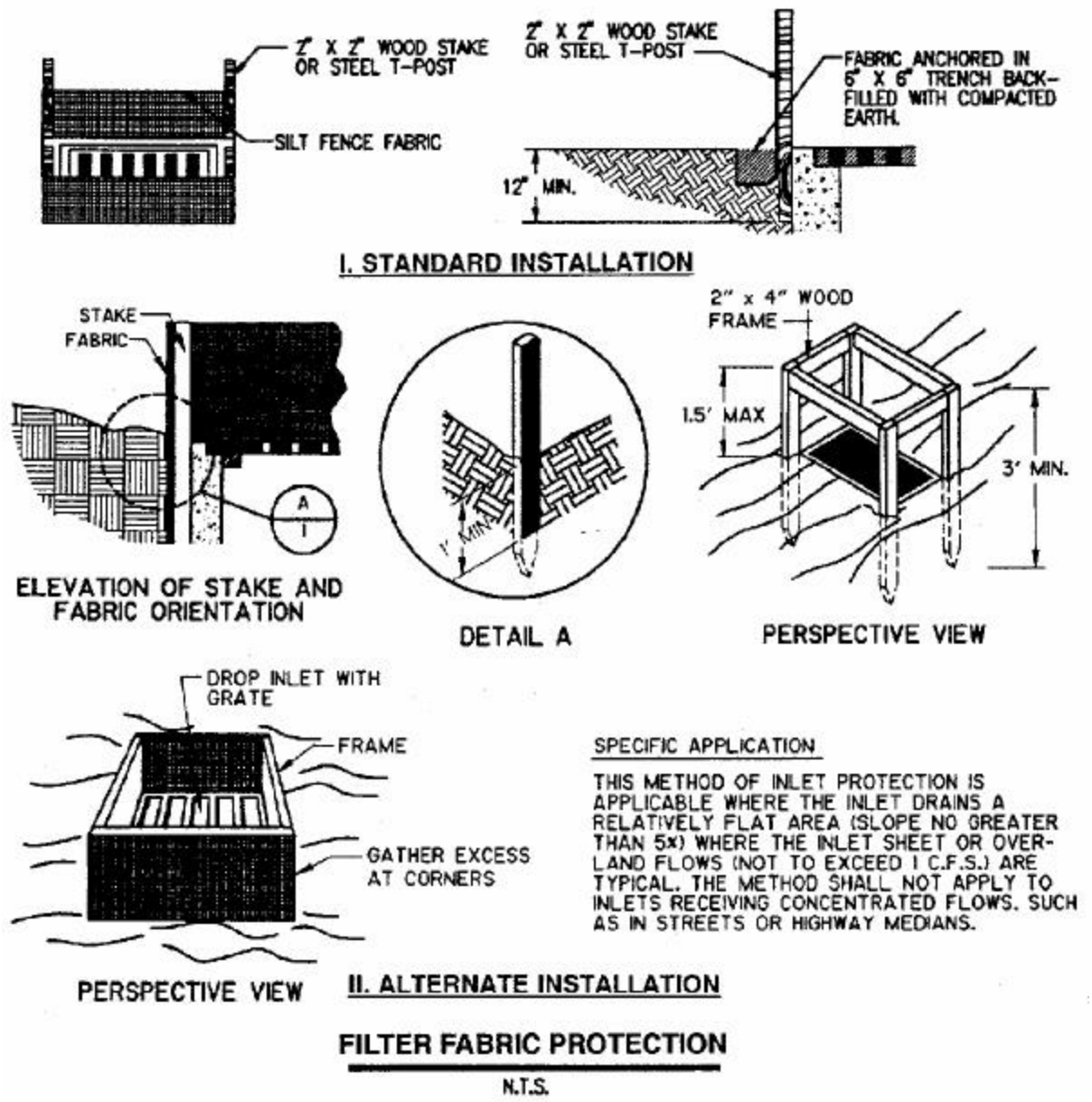


Figure 1-33 Filter Fabric Inlet Protection (NCTCOG, 1993)

(5) Place the bottom 12 inches of the fabric in a trench and backfill the trench with 12 inches of compacted soil.

(6) Fasten fabric securely by staples or wire to the stakes and frame. Joints must be overlapped to the next stake.

(7) It may be necessary to build a temporary dike on the down slope side of the structure to prevent bypass flow.

If the drop inlet is above the finished grade, the grate may be completely covered with filter fabric. The fabric should be securely attached to the entire perimeter of the inlet using 1"x 2" wood strips and appropriate fasteners.

Gravel and Wire Mesh Drop Inlet Sediment Filter

(1) Wire mesh should be laid over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Wire mesh with 1/2-inch openings should be used. If more than one strip of mesh is necessary, the strips should be overlapped (see Figure 1-34).

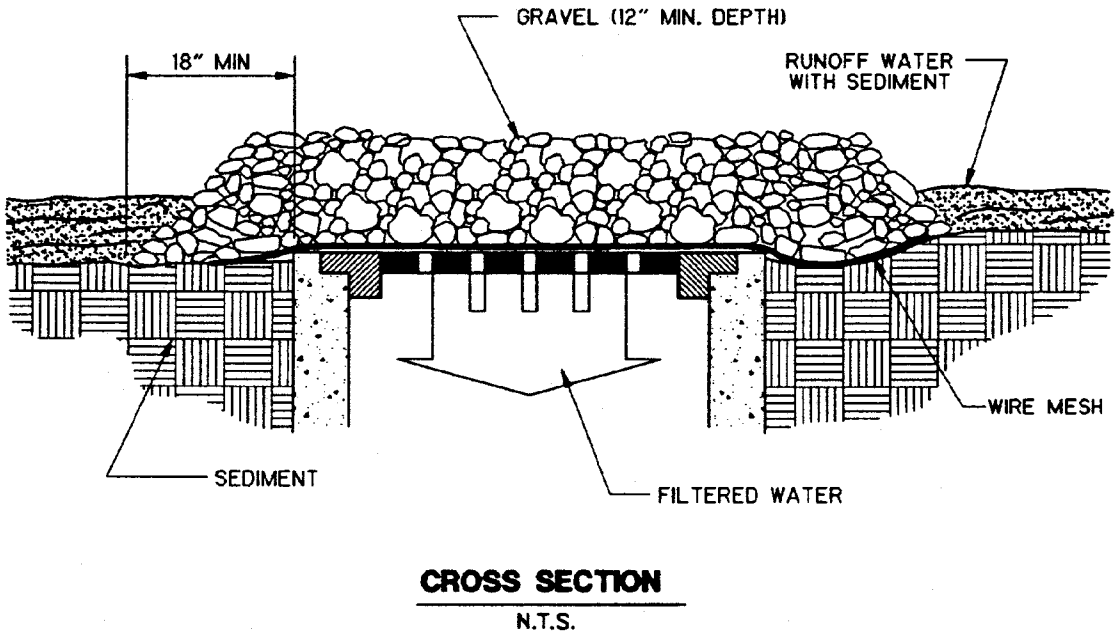


Figure 1-34 Wire Mesh and Gravel Inlet Protection (NCTCOG, 1993)

(2) Coarse aggregate should be placed over the wire mesh as indicated in Figure 1-34. The depth of stone should be at least 12 inches over the entire inlet opening. The stone should extend beyond the inlet opening at least 18 inches on all sides.

(3) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet, cleaned and/or replaced.

Note: This filtering device has no overflow mechanism; therefore, ponding is likely especially if sediment is not removed regularly. This type of device should never be used where overflow may endanger an exposed fill slope. Consideration should also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, adjacent property, etc.

Block and Gravel Drop Inlet Sediment Filter

(1) Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending on design needs, by stacking combinations of 4-inch, 8-inch and 12-inch wide blocks. The barrier of blocks should be between 12 and 24 inches high.

(2) Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.

(3) Stone should be piled against the wire to the top of the block barrier, as shown in Figure 1-35.

(4) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and replaced.

Block and Gravel Curb Inlet Sediment Filter

(1) Two concrete blocks should be placed on their sides abutting the curb at either side of the inlet opening.

(2) A 2-inch x 4-inch stud should be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.

(3) Concrete blocks should be placed on their sides across the front of the inlet and abutting the spacer blocks as depicted in Figure 1-35.

(4) Wire mesh should be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Wire mesh with 1/2-inch openings should be used.

(5) Coarse aggregate should be piled against the wire to the top of the barrier as shown in Figure 1-35.

(6) If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and/or replaced.

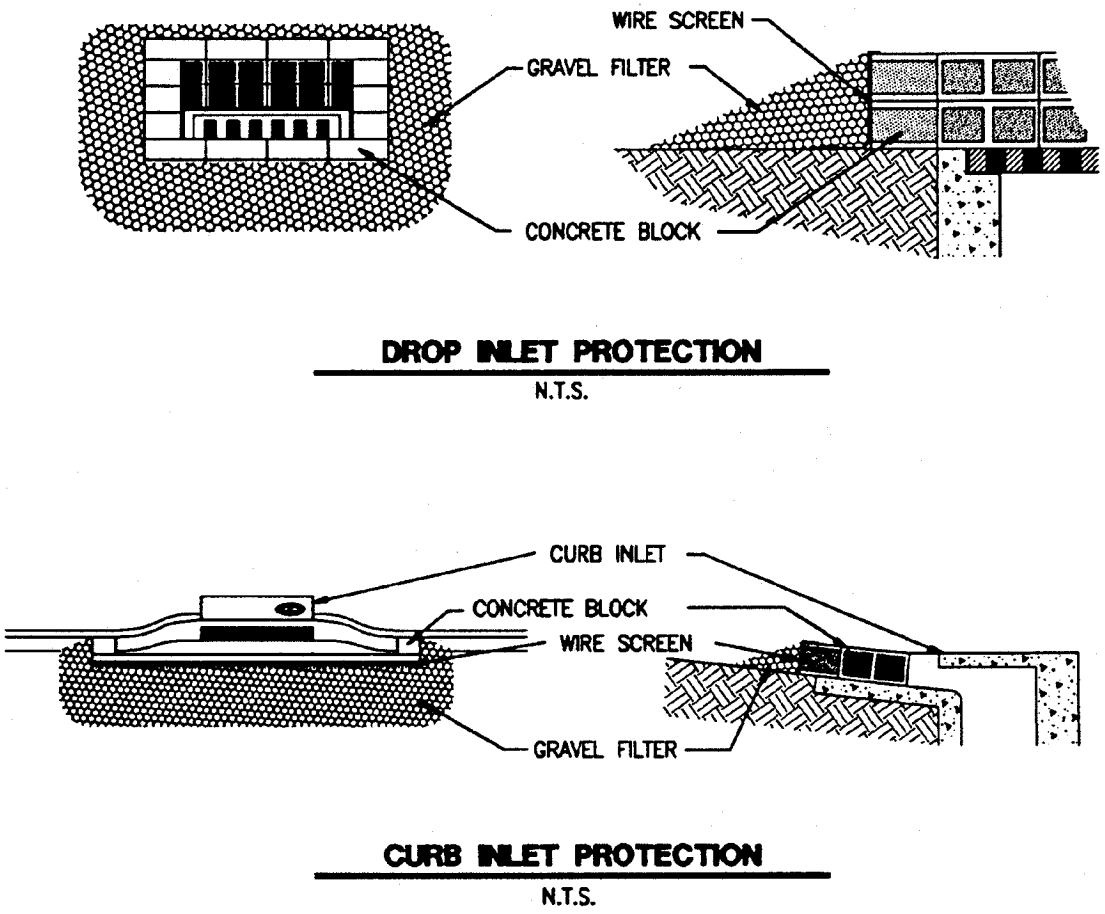


Figure 1-35 Block and Gravel Inlet Protection (NCTCOG, 1993)

Excavated Drop Inlet Sediment Trap

(1) The excavated trap should be sized to provide a minimum storage capacity calculated at 3,600 cubic feet per acre of drainage area. A trap should be no less than 1-foot nor more than 2 feet deep measured from the top of the inlet structure. Side slopes should not be steeper than 2:1 (see Figure 1-36).

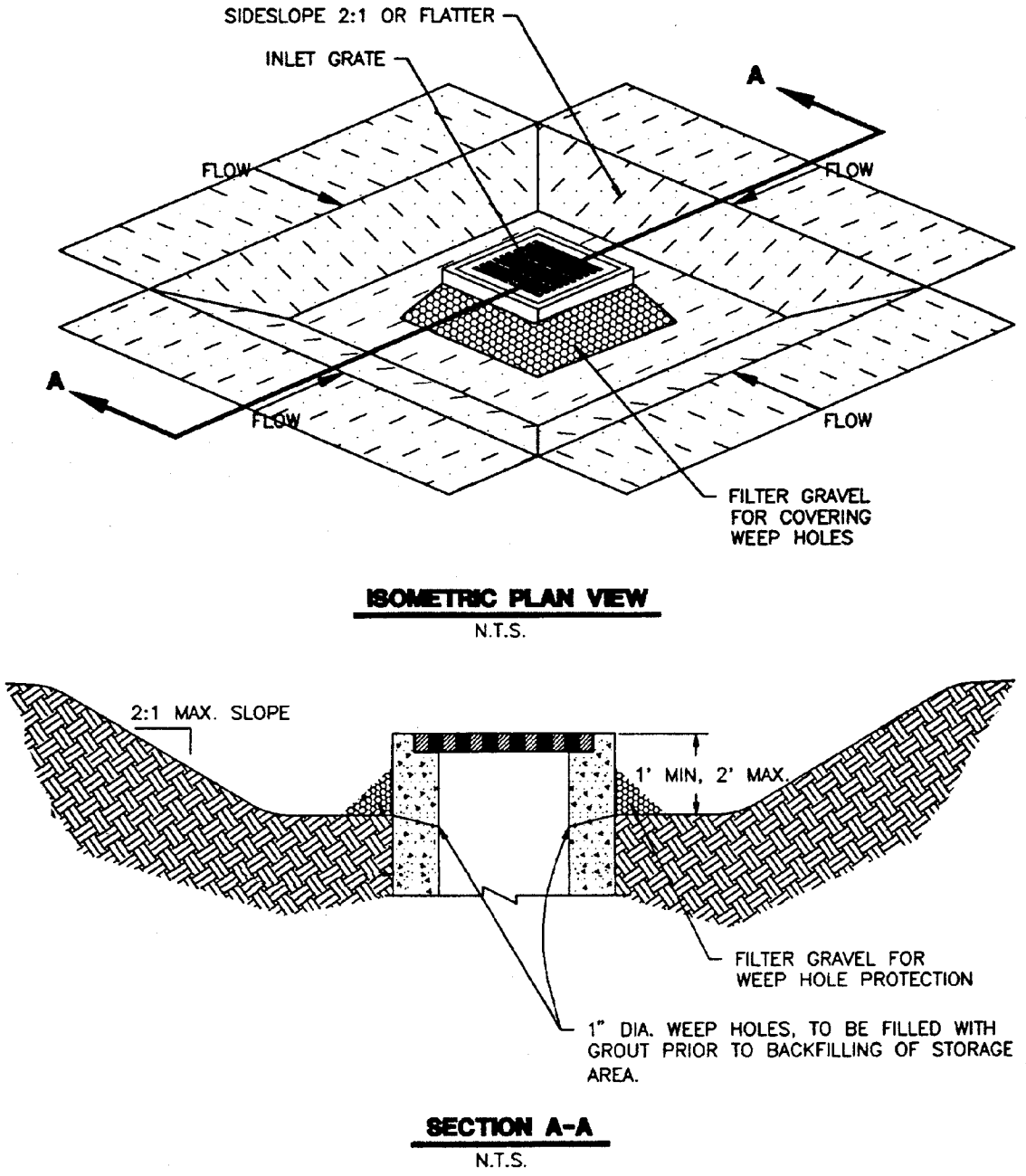


Figure 1-36 Excavated Inlet Protection (NCTCOG, 1993)

(2) The slope of the basin may vary to fit the drainage area and terrain. Observations must be made to check trap efficiency and modifications should be made as necessary to ensure satisfactory trapping of sediment. Where an inlet is located so as to receive concentrated flows, such as in a highway median, it is recommended that the basin have a rectangular shape in a 2:1 (length/width) ratio, with the length oriented in the direction of the flow.

(3) Sediment should be removed and the trap restored to its original dimensions when the sediment has accumulated to one-half the design depth of the trap. Removed sediment should be deposited in a suitable area and in a manner such that it will not erode.

Curb Inlet Protection with 2-inch x 4-inch Wooden Weir

(1) Attach a continuous piece of wire mesh (30-inch minimum width x inlet throat length plus 4 feet) to the 2-inch x 4-inch wooden weir (with a total length of throat length plus 2 feet) as shown in Figure 1-37. Wood should be "construction grade" lumber.

(2) Place a piece of approved filter cloth of the same dimensions as the wire mesh over the wire mesh and securely attach to the 2-inch x 4-inch weir.

(3) Securely nail the 2-inch x 4-inch weir to the 9-inch long vertical spacers which are to be located between the weir and inlet face at a maximum 6-foot spacing.

(4) Place the assembly against the inlet throat and nail 2-foot (minimum) lengths of 2-inch x 4-inch board to the top of the weir at spacer locations. These 2-inch x 4-inch anchors should extend across the inlet tops and be held in place by sandbags or alternate weight.

(5) The assembly should be placed so that the end spacers are a minimum 1 foot beyond both ends of the throat opening.

(6) Form the wire mesh and filter cloth to the concrete gutter and against the face of curb on both sides of the inlet. Place coarse aggregate over the wire mesh and filter fabric in such a manner as to prevent water from entering the inlet under or around the filter cloth.

(7) This type of protection should be inspected frequently and the filter cloth and stone replaced when clogged with sediment.

(8) Assure that storm flow does not bypass inlet by installing temporary earth or asphalt dikes directing flow into inlet.

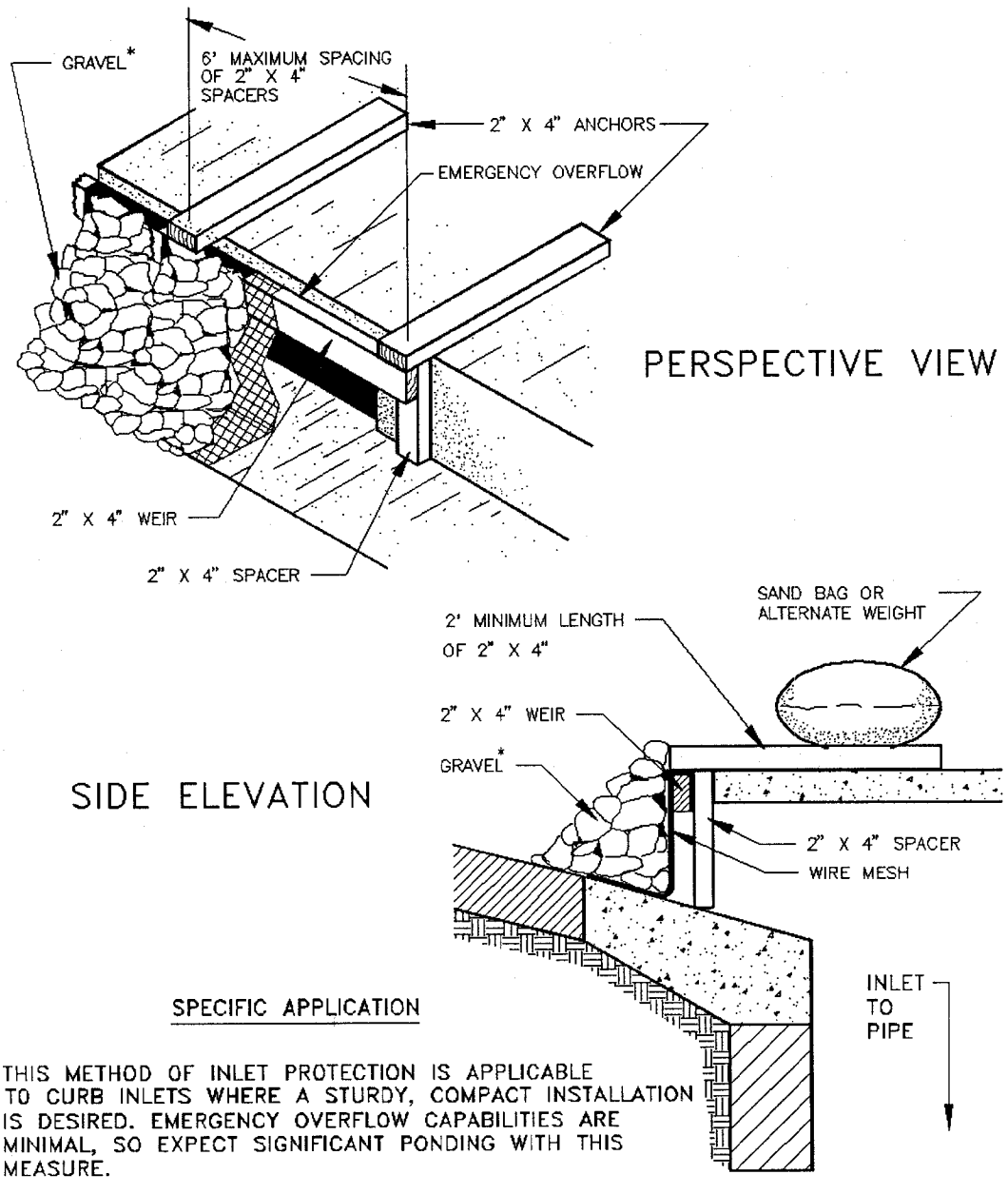


Figure 1-37 Wooden Weir Curb Inlet Protection (VA Dept of Conservation, 1992)

Common Trouble Points:

(1) Gaps between the inlet protection and the curb (flows bypass around side of filter).

(2) Filter fabric skirt not anchored to pavement (flows pass under filter).

Bagged Gravel Inlet Filter

Sandbags filled with pea gravel can also be used to construct a sediment barrier around curb and drain inlets. The sandbags should be filled with washed pea gravel and stacked to form a continuous barrier about 1 foot high around the inlets. The bags should be tightly abutted against each other to prevent runoff from flowing between the bags. This measure should be installed as shown in Figure 1-38.

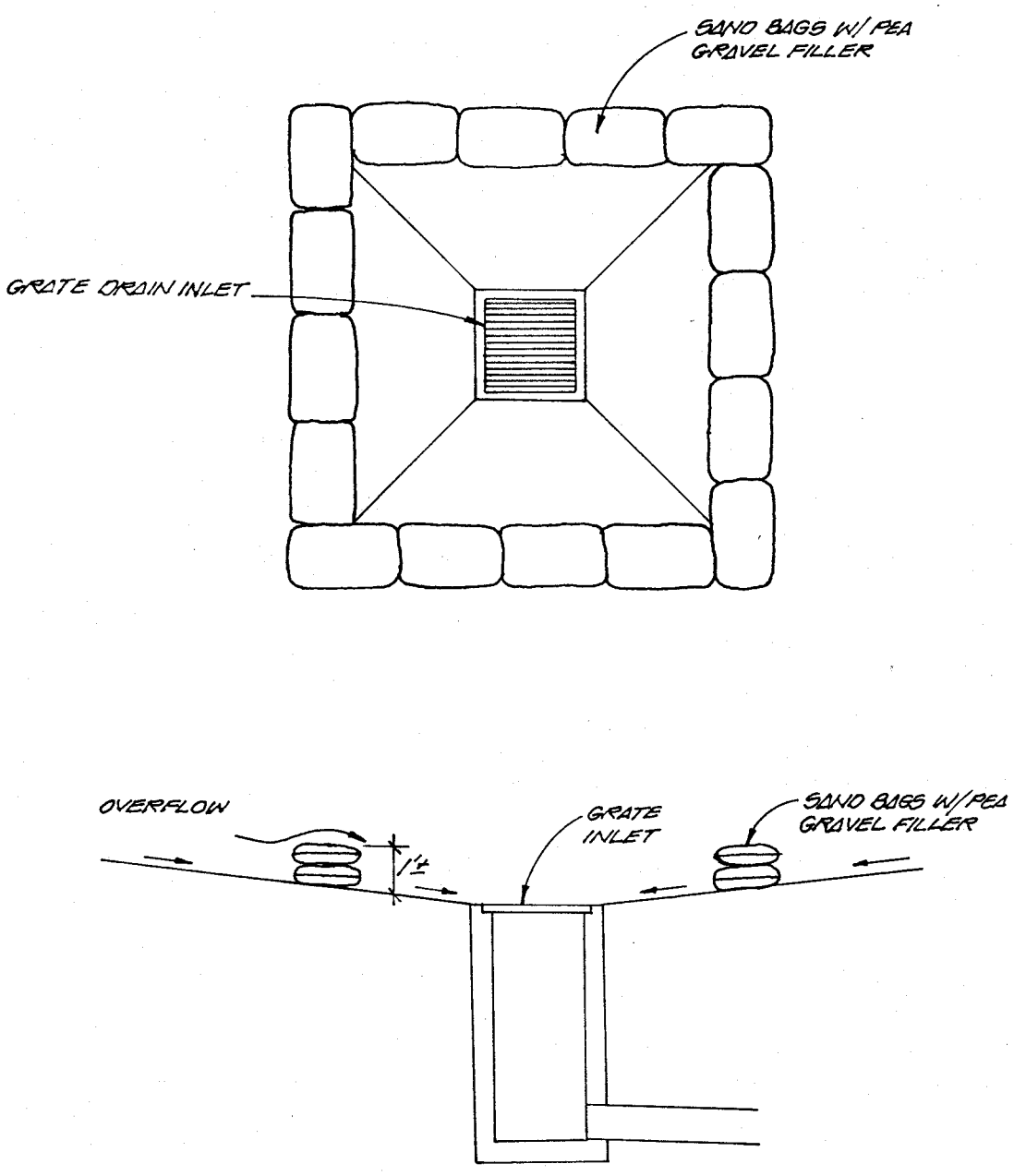


Figure 1-38 Diagram of Bagged Gravel Grate Inlet Protection (Pape-Dawson)

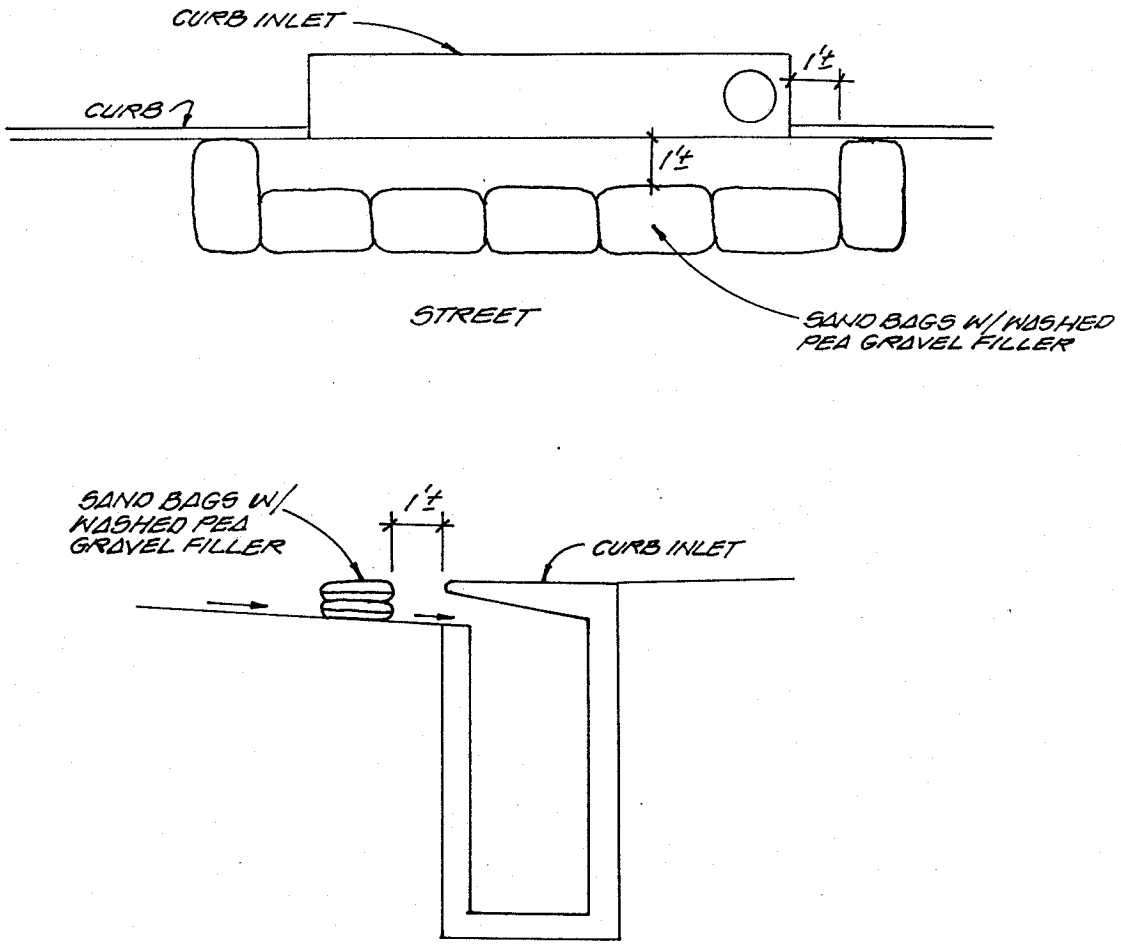


Figure 1-39 Diagram of Bagged Gravel Curb Inlet Protection (Pape-Dawson).

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.

Attachment E – Request to Temporarily Seal a Feature

No sensitive features will be sealed in this project site.

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 WPAP SITE PLAN
- Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on WPAP SITE PLAN

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 WPAP SITE PLAN

Attachment G – Drainage Area Map

See Sheet WPAP Drainage Area Map attached at the end of these attachments.

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

No Temporary Sediment Pond will be utilized with this project.

Attachment I – Inspection and Maintenance for TBMPs

Inspections

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event greater than 0.5 inches of rainfall. 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 date o the inspection. 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, and (6) concrete truck rinse-out pit for signs of potential failure. Deficiencies noted during the inspection will be corrected and documented within seven (7) calendar days following the inspection or before the next anticipated storm event if practicable.

Pollution Prevention Measure	Inspected	Corrective Action	
		Description	Date Completed
General			
Revegetation			
Erosion/Sediment Controls			
Vehicle Exits			
Material Areas			
Equipment Areas			
Concrete Rinse			
Construction Debris			
Trash Receptacles			
Infrastructure			
Roadway Clearing			
Utility Clearing			
Roadway Grading			
Utility Construction			
Drainage Construction			
Roadway Base			
Roadway Surfaces			
Site Cleanups			
Building			
Clearing for Building			
Foundation Grading			
Utility Construction			
Foundation Construction			
Building Construction			
Site Grading			
Site Cleanup			

**Indicate N/A where measure does not apply.*

By my signature below, I certify that all items are acceptable and the project site is in compliance with SWPPP.

Inspector's Name _____ Inspector's Signature _____

_____ _____

Name of Owner/Operator (Firm) Date

Note: Inspector is to attach a brief statement of his qualifications to this report.

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity	Date

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

Construction Activity	Date

Date when stabilization measures are initiated:

Stabilization Activity	Date

Attachment I (con't) – Inspection and Maintenance for TBMPs

Temporary Sediment Control Fences

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

Rock Berm/High Service Rock Berm

1. Inspections should be made weekly and after each rainfall by the responsible party.
2. Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt of in an approved manner.
3. Repair any loose wire sheathing.
4. The berm should be reshaped as needed during inspection.
5. The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.
6. The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Temporary Construction Entrance and Exits

1. The entrance should be maintained in a condition, which will prevent tracking or following 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 on to public rights-of-ways 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 ant storm drain, ditch, or water course by using approved methods.

Bagged Gravel Inlet Filters

1. Inspections 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 reached a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not eride.
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.

Temporary Sedimentation Basin

1. Inspection should be made weekly and after each rainfall. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Repair should be made promptly as needed by contractor.
2. Trash and other debris should be removed after each rainfall to prevent clogging out fo the outlet structure.
3. Accumulated silt should be removed and the basin should be re-graded to its original dimensions at such point that the capacity of the impoundment has been reduced to 75% of its original storage capacity.
4. The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.

Documentation Procedures

1. A copy of the inspection report is located on the following page.
2. The inspection report must be maintained on site at all times.
3. The inspection report is incorporated as part of the WPAP. The contractor is responsible for completing and updating the form in compliance with TCEQ rules.

Attachment J – Schedule of Interim and Permanent Soil Stabilization

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing only 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.

Owner Authorization Form

Edwards Aquifer Protection Program

Instructions

Complete the following form by adding the requested information in the fields below. The form must be notarized for it to be considered complete. Attach it to other programmatic submittals required by 30 Texas Administrative Code (30 TAC), Chapter 213, and provide it to TCEQ's Edwards Aquifer Protection Program (EAPP) as part of your application.

If you have questions on how to fill out this form or about EAPP, please contact us by phone at 512-339-2929 or by e-mail at eapp@tceq.texas.gov.

Landowner Authorization

I, Dean Word of Word-Borchers Ranch Real Estate Limited Partnership

am the owner of the property located at:

33.95-acres of land, out of the 499.75-acre tract of land described in document no. 202206035304 in the official public record of Comal County, Texas in the Juan Martin Veramendi No. 2, Abstract 3, Comal County, Texas.

and am duly authorized in accordance with 30 TAC 213.4(c)(2) and 213.4(d)(1), or 30 TAC 213.23(c)(2) and 213.23(d), relating to the right to submit an application, signatory authority, and proof of authorized signatory.

I do hereby authorize Garrett Mechler
To conduct construction of single family residential development including but not limited to streets, drainage, water, wastewater, sidewalks, dry utilities, water quality bmps and other site improvements .
At 2400 LF north of the intersection between Loop 337 and River Road

Landowner Acknowledgement

I understand that Word-Borchers Ranch Real Estate Limited Partnership

Is ultimately responsible for the compliance with the approved or conditionally approved Edwards Aquifer protection plan and any special conditions of the approved plan through all phases of plan implementation even if the responsibility for compliance and the right to possess and control the property referenced in the application has been contractually assumed by another legal entity. I further understand that any failure to comply with any condition of the executive director's approval is a violation and subject to administrative rule or orders and penalties as provided under 30 TAC 213.10, relating to enforcement. Such violations may also be subject to civil penalties.

Landowner Signature

T. Dean Word

Landowner Signature

7/1/2025

Date

THE STATE § OF TEXAS

County § of Comal

BEFORE ME, the undersigned authority, on this day personally appeared

Timothy Dean Word III

known to me to be the person whose name is subscribed to the foregoing instrument and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 1 day of July 2025

NOTARY PUBLIC

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

Alex Hardeman

MY COMMISSION EXPIRES: Date 5/20/2028

Optional Attachments

Select All that apply:

☐ Lease Agreement

☐ Signed Contract

☐ Deed Restricted Easement

☐ Other legally binding documents

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

Co-CEO,
Title - Owner/President/Other

of VERAMENDI PE-GOLD COAST, LLC,
Corporation/Partnership/Entity Name

have authorized Nicholas Gower
Print Name of Agent/Engineer

of LJA Engineering
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

6/23/2025
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 23 day of June, 2025

NOTARY PUBLIC

Alex Hardeman
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 5/20/2028

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Veramendi Precincts 23-1

Regulated Entity Location: 2400 LF north of the intersection between Loop 337 and River Rd

Name of Customer: Veramendi PE-Gold Coast LLC

Contact Person: Garrett Mechler Phone: (830)643-5633

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	6,405 L.F.	$ 3,202.5
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: 6/23/2025

Application Fee Schedule

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions on completing 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-Gold Coast, 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*)
0804261133	32081307095		

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ 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 ☐ VCP/BSA Applicant ☐ Other:

15. Mailing Address: 2168 Oak Run Parkway, Ste 101

City	New Braunefls	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)*
(830) 660-4755		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ 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 Core 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 Precinct 23-1

23. Street Address of the Regulated Entity: *(No PO Boxes)*								
	City		**State**		**ZIP**		**ZIP + 4**	
24. County								

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	2400 LF north of the intersection between Loop 337 and River Rd				
26. Nearest City			**State**	**Nearest ZIP Code**	
New Braunfels			TX	78130	

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	29.7383		**28. Longitude (W) In Decimal:**	98.12344	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	44	18	98	7	46

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)
1521			

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

single family houses

34. Mailing Address:								
	City		**State**		**ZIP**		**ZIP + 4**	
35. E-Mail Address:								

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
( ) -		( ) -

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	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	LJA Engineering	41. Title:	Engineer

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(210) 503-2700		( ) -	ngower@lja.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:	ASA Properties	Job Title:	Co-CEO
Name *(In Print)*:	Garrett Mechler	Phone:	(830)643-5633
Signature:		Date:	6/23/2025