# Water Pollution Abatement Plan & Organized Sewage Collection System Application

La Cima-Phase 6

Prepared for:

LCSM PH 4, LLC 303 Colorado St, Ste. 2300 Austin, TX 78701

Prepared by:



Bowman Consulting Group, Ltd. • 151 Stagecoach Trail, Suite 130 • San Marcos, Texas 78666 • P: 512.327.1180

TBPE Firm No. 14309 • TBPLS Firm No.101206-00

**NOVEMBER 2023** 

## **Organized Sewage Collection System Plan Checklist**

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

Attachment A - Road Map

Attachment B - USGS / Edwards Recharge Zone Map

Attachment C - Project Description

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

Attachment A - Geologic Assessment Table (TCEQ-0585-Table)

Attachment B - Stratigraphic Column

Attachment C - Site Geology

Attachment D - Site Geologic Map(s)

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

Attachment A - SCS Engineering Design Report

Attachment B - Justification and Calculations for Deviation in Straight Alignment

Without Manholes

Attachment C - Justification for Variance from Maximum Manhole Spacing

Attachment D - Calculations for Slopes for Flows Greater Than 10.0 Feet Per Second

Site Plan

Final Plan and Profile Sheets

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

Attachment A - Engineering Design Report

Site Plan

Final Plan and Profile Sheets

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

Attachment A - Spill Response Actions

Attachment B - Potential Sources of Contamination

Attachment C - Sequence of Major Activities

Attachment D - Temporary Best Management Practices and Measures

Attachment E - Request to Temporarily Seal a Feature (if requested)

Attachment F - Structural Practices

Attachment G - Drainage Area Map

Attachment H - Temporary Sediment Pond(s) Plans and Calculations

Attachment I - Inspection and Maintenance for BMPs

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

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

#### Application Fee Form (TCEQ-0574)

- Check Payable to the "Texas Commission on Environmental Quality"
- Core Data Form (TCEQ-10400)

## **Water Pollution Abatement Plan Checklist**

- Edwards Aguifer Application Cover Page (TCEQ-20705)
- General Information Form (TCEQ-0587)
  - Attachment A Road Map
  - Attachment B USGS / Edwards Recharge Zone Map
  - Attachment C Project Description
- Geologic Assessment Form (TCEQ-0585)
  - Attachment A Geologic Assessment Table (TCEQ-0585-Table)
  - Attachment B Stratigraphic Column
  - Attachment C Site Geology
  - Attachment D Site Geologic Map(s)
- Water Pollution Abatement Plan Application Form (TCEQ-0584)
  - Attachment A Factors Affecting Surface Water Quality
  - Attachment B Volume and Character of Stormwater
  - Attachment C Suitability Letter from Authorized Agent (if OSSF is proposed)
  - Attachment D Exception to the Required Geologic Assessment (if requested)
  - Site Plan
- Temporary Stormwater Section (TCEQ-0602)
  - Attachment A Spill Response Actions
  - Attachment B Potential Sources of Contamination
  - Attachment C Sequence of Major Activities
  - Attachment D Temporary Best Management Practices and Measures
  - Attachment E Request to Temporarily Seal a Feature (if requested)
  - Attachment F Structural Practices
  - Attachment G Drainage Area Map
  - Attachment H Temporary Sediment Pond(s) Plans and Calculations
  - Attachment I Inspection and Maintenance for BMPs
  - Attachment J Schedule of Interim and Permanent Soil Stabilization Practices
- Permanent Stormwater Section (TCEQ-0600)
  - Attachment A 20% or Less Impervious Cover Waiver (if requested for multi-family, school, or small business site)
  - Attachment B BMPs for Upgradient Stormwater
  - Attachment C BMPs for On-site Stormwater
  - Attachment D BMPs for Surface Streams
  - Attachment E Request to Seal Features (if sealing a feature)
  - Attachment F Construction Plans
  - Attachment G Inspection, Maintenance, Repair and Retrofit Plan
  - Attachment H Pilot-Scale Field Testing Plan (if proposed)
  - Attachment I Measures for Minimizing Surface Stream Contamination

- Agent Authorization Form (TCEQ-0599), if application submitted by agent
- Application Fee Form (TCEQ-0574)
- Check Payable to the "Texas Commission on Environmental Quality"
- Core Data Form (TCEQ-10400)

# 1 - TCEQ - 20705 Attachments

Edwards Aquifer Application Cover Page



## **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. <u>Edwards Aquifer applications</u> 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: <a href="http://www.tceq.texas.gov/field/eapp">http://www.tceq.texas.gov/field/eapp</a>.
- 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**

- 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: La Cima -Phase 6 & 8				2. Regulated Entity No.: RN111615928					
3. Customer Name: LCSM PH 4, LLC			4. Customer No.: CN605868074			868074			
5. Project Type: (Please circle/check one)	New		Modif	Modification Exte			Exception 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)	Reside	ntial	Non-residential		8. Site		e (acres):	55.02	
9. Application Fee:	\$10,181	1.50	10. Permanent I			BMP(	MP(s): Vegetative Filter Strip a Detention Ponds		
11. SCS (Linear Ft.):	7,363	·	12. AST/UST (No			o. Tar	. Tanks): N/A		
13. County:	Hays		14. Watershed:					Upper San Marcos 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.)	X	_	_		
Region (1 req.)	X	_	_		
County(ies)	X		_		
Groundwater Conservation District(s)	X Edwards Aquifer AuthorityBarton Springs/ Edwards AquiferHays TrinityPlum Creek	Barton Springs/ Edwards Aquifer	NA		
City(ies) Jurisdiction	AustinBudaDripping SpringsKyleMountain City X San MarcosWimberleyWoodcreek	AustinBee CavePflugervilleRollingwoodRound RockSunset ValleyWest Lake Hills	AustinCedar ParkFlorenceGeorgetownJerrellLeanderLiberty HillPflugervilleRound Rock		

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	_		_	_	_
Region (1 req.)	_	_		_	_
County(ies)	_				
Groundwater Conservation District(s)	Edwards Aquifer Authority Trinity-Glen Rose	Edwards Aquifer Authority	Kinney	EAA Medina	EAA Uvalde
City(ies) Jurisdiction	Castle HillsFair Oaks RanchHelotesHill Country VillageHollywood ParkSan Antonio (SAWS)Shavano Park	BulverdeFair Oaks RanchGarden RidgeNew BraunfelsSchertz	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 administ	application is hereby submitted to TCEQ for administrative review and technical review.			
Managart III alsola				
Margaret Hickok				
Print Name of Customer/Authorized Agent				
1 10 0				
Muraevet firtob	11/14/2023			
Signature of Customer/Authorized Agent				
Signature of Customer/Authorized Agent	Date			

**FOR TCEQ INTERNAL USE ONLY**				
Date(s)Reviewed:	Date Adm	ninistratively Complete:		
Received From:	Correct N	Correct Number of Copies:		
Received By:	Distributi	on Date:		
EAPP File Number:	Complex:			
Admin. Review(s) (No.):	No. AR Ro	ounds:		
Delinquent Fees (Y/N):	Review Ti	ime Spent:		
Lat./Long. Verified:	SOS Custo	omer Verification:		
Agent Authorization Complete/Notarized (Y/N):	Fee	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):		

# 2 - TCEQ - 0587 Attachments

**General Information Form** 



## **General Information Form**

**Texas Commission on Environmental Quality** 

Print Name of Customer/Agent: Margaret Hickok

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

Date: <u>9/22/2023</u>

Signature of Customer/Agent:

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:

V	hargeret therob
Pi	roject Information
1.	Regulated Entity Name: LA CIMA PHASE 6 & 8
2.	County: <u>Hays</u>
3.	Stream Basin: <u>Guadalupe River Basin</u>
4.	Groundwater Conservation District (If applicable): N/A
5.	Edwards Aquifer Zone:
	Recharge Zone Transition Zone
6.	Plan Type:
	<ul><li>WPAP</li><li>SCS</li><li>☐ Modification</li><li>☐ AST</li><li>UST</li><li>☐ Exception Request</li></ul>

7. C	ustomer (Applicant):	
E N C T	ontact Person: <u>Bryan W. Lee</u> ntity: <u>LCSM PH 4, LLC</u> Nailing Address: <u>303 Colorado St., Ste. #2300</u> ity, State: <u>Austin, TX</u> elephone: <u>512-457-8000</u> mail Address: <u>dougg@nd-ausin.com</u>	Zip: <u>78701</u> FAX:
8. A	gent/Representative (If any):	
E N C T	ontact Person: Margaret Hickok ntity: Bowman Consulting Group, LTD Nailing Address: 151 Stagecoach Trail, Suite 130 ity, State: San Marcos, TX elephone: 512-327-1180 mail Address: mhickok@bowman.com	Zip: <u>78666</u> FAX:
9. P	roject Location:	
	<ul> <li>The project site is located inside the city limits</li> <li>The project site is located outside the city limit jurisdiction) of <u>San Marcos, TX</u>.</li> <li>The project site is not located within any city's</li> </ul>	s but inside the ETJ (extra-territorial
10. 🏻	The location of the project site is described bel detail and clarity so that the TCEQ's Regional so boundaries for a field investigation.	
	The project site is located south of La Cima Pha Marcos, Hays County, Texas.	ase 5A, 5B, and Central Park Loop in San
11.	Attachment A – Road Map. A road map showi project site is attached. The project location ar the map.	_
12. 🏻	Attachment B - USGS / Edwards Recharge Zon USGS Quadrangle Map (Scale: 1" = 2000') of th The map(s) clearly show:	
	<ul> <li>☑ Project site boundaries.</li> <li>☑ USGS Quadrangle Name(s).</li> <li>☑ Boundaries of the Recharge Zone (and Trance)</li> <li>☑ Drainage path from the project site to the boundaries.</li> </ul>	
13. 🏻	The TCEQ must be able to inspect the project sufficient survey staking is provided on the protect the boundaries and alignment of the regulated features noted in the Geologic Assessment.	ject to allow TCEQ regional staff to locate

⊠ Sur	vey staking will be completed by this date:
nar	achment C – Project Description. Attached at the end of this form is a detailed rative description of the proposed project. The project description is consistent oughout the application and contains, at a minimum, the following details:
	Area of the site Offsite areas Impervious cover Permanent BMP(s) Proposed site use Site history Previous development Area(s) to be demolished
15. Existing	g project site conditions are noted below:
	Existing commercial site Existing industrial site Existing residential site Existing paved and/or unpaved roads Undeveloped (Cleared) Undeveloped (Undisturbed/Uncleared) Other:
Prohib	ited Activities
	n aware that the following activities are prohibited on the Recharge Zone and are not posed 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.
	n aware that the following activities are prohibited on the Transition Zone and are proposed for this project:

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

Injection Control);

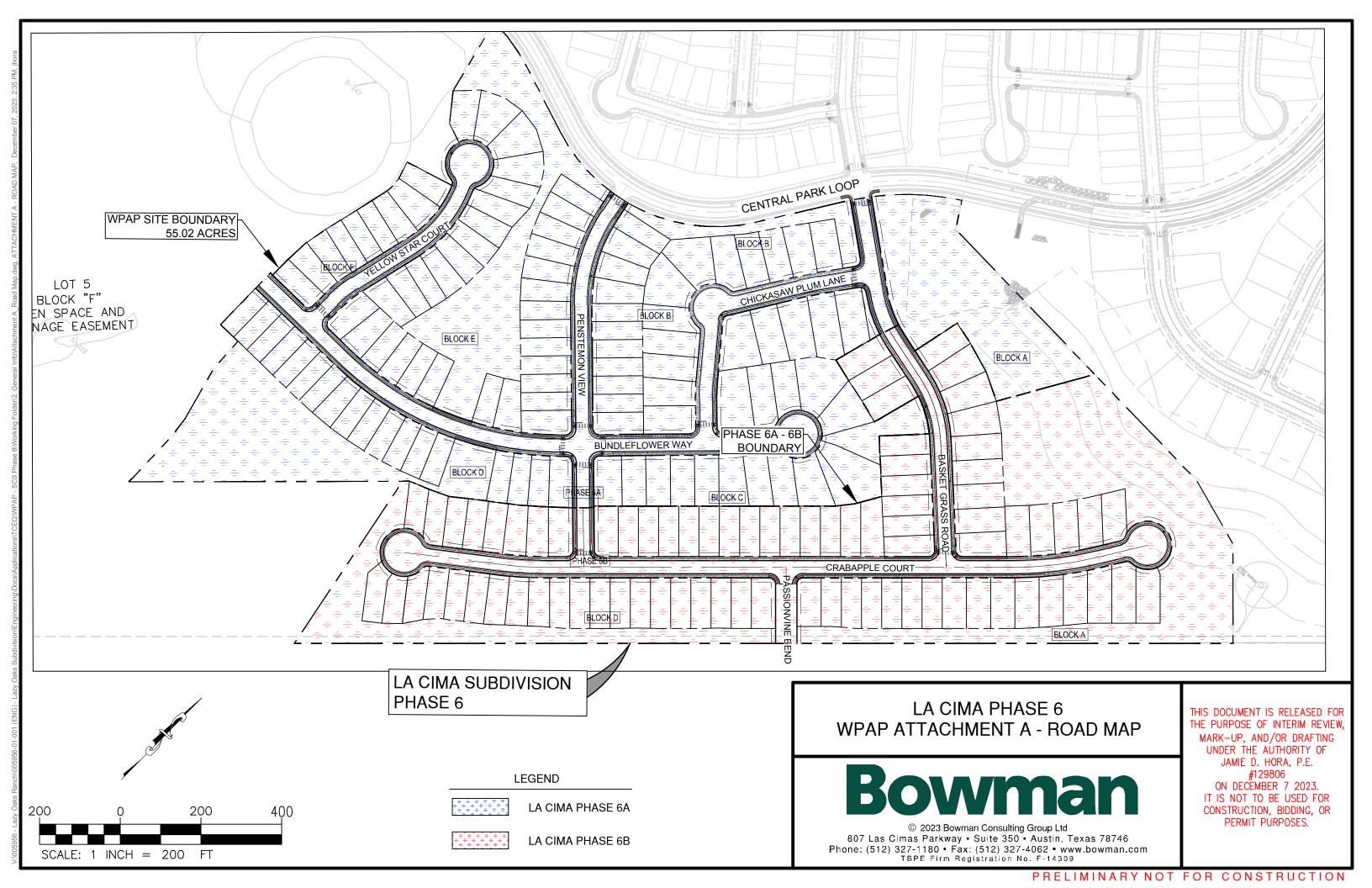
- (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and
- (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

## **Administrative Information**

18. The	e fee for the plan(s) is based on:
	For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.  For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.  For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.  A request for an exception to any substantive portion of the regulations related to the protection of water quality.  A request for an extension to a previously approved plan.
19. 🔀	Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:
	<ul> <li>☐ TCEQ cashier</li> <li>☐ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)</li> <li>☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)</li> </ul>
20. 🔀	Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
21. 🔀	No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

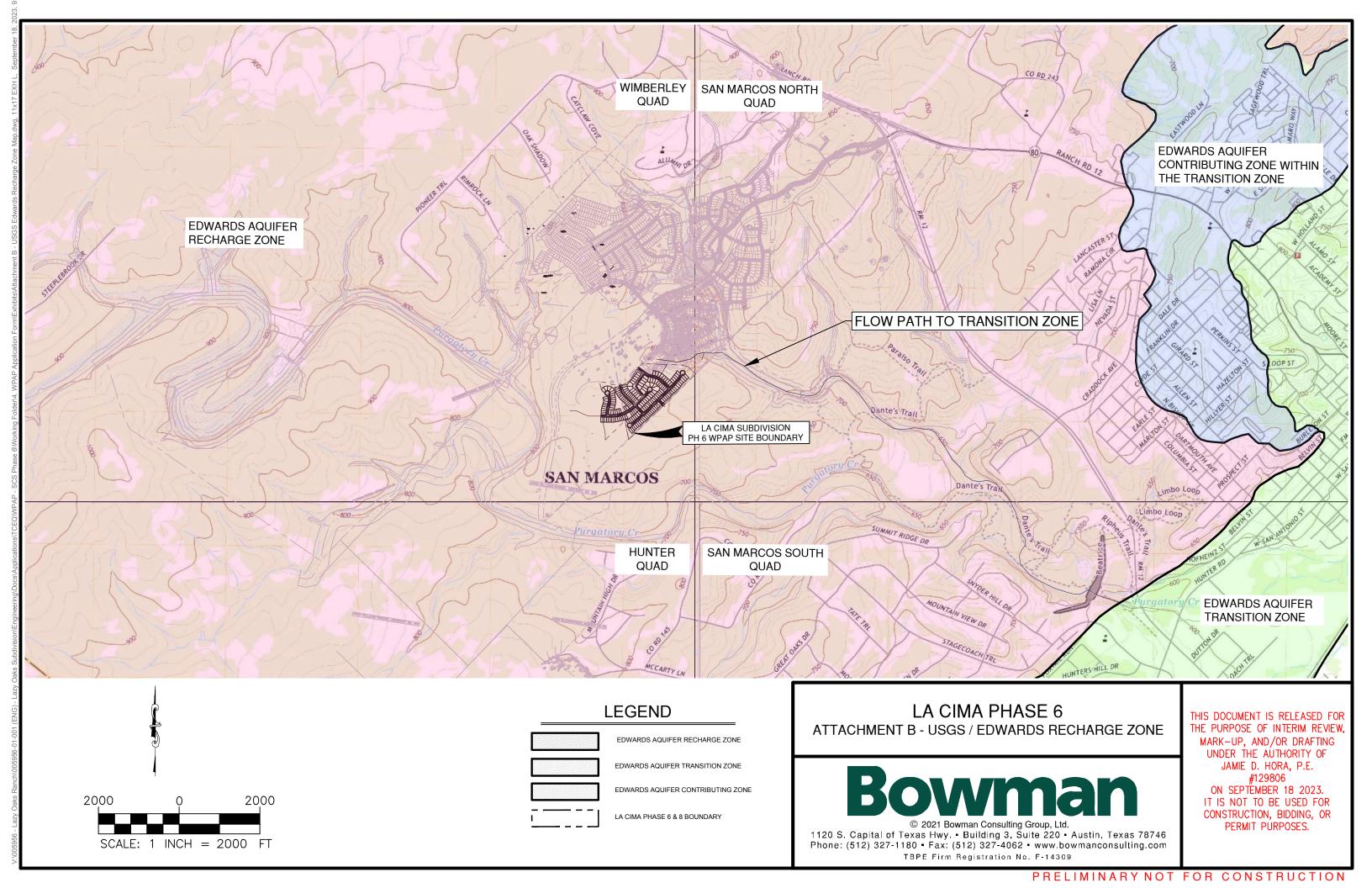
## Attachment A - Road Map





# Attachment B – USGS/Edwards Aquifer Recharge Zone Map





# Attachment C – Project Description



#### **TCEQ-0587**

#### Attachment C - Project Description

This WPAP and SCS application covers a total area of approximately 32.01 acres within the limits of construction. The total area of this project is 55.02 Acres per the Phase 6 Preliminary Plat boundary.

The project is single family residential which includes utility improvements, residential roads and drainage improvements to serve La Cima Phase 6. There are no areas being demolished as part this SCS as the area is currently undeveloped and vacant. Approximately 36.44 acres of impervious cover is being proposed for the residential roads, sidewalks, and homes for La Cima Phase 6. There will be 2 permanent BMP(s) on site and the runoff from the proposed impervious cover is captured in the batch ponds to achieve 91% TSS removal efficiency. One of ponds was proposed and constructed with La Cima Phase 4, permit number 2020-34300, indicated in the plans as Water Quality Batch Pond #3 and will require minor modifications. Note, this pond is designed to treat additional areas outside the limits of Phase 6. The other to be built with the construction of Phase 6B is called out as Water Quality Batch Pond #4.

Vegetative filter strips are also included in the design and details can be found within the attached plan set.

#### **Project Information:**

Limits of Construction = 32.01 Acres

Project Site Area = 55.02 Acres

Total Impervious cover = 36.44 Acres

= 66.23%

Total Length of Wastewater = 7,690.1 LF

#### Total water quality volumes for onsite & offsite for:

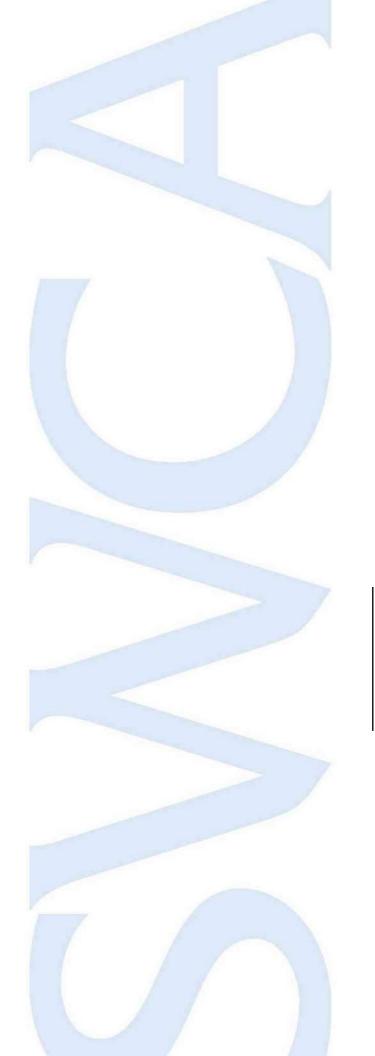
Batch pond 3 = 283,434 CF

Batch pond 4 = 93,542 CF

# 3 - TCEQ - 0585 Attachments

Geological Assessment Form





# Geologic Assessment for the La Cima Phases 6 and 8, 185-Acre Tract, San Marcos, Hays County, Texas

SWCA Project Number 57088.10

October 2022

#### **SUBMITTED TO:**

La Cima San Marcos.

#### **SUBMITTED BY:**

SWCA Environmental Consultants Board of Professional Geoscientists Firm Registration No. 50159

4949 N. Loop 1604 Suite 235 San Antonio, Texas 78249

## GEOLOGIC ASSESSMENT FOR LA CIMA PHASES 6 AND 8, 185-ACRE TRACT, SAN MARCOS, HAYS COUNTY, TEXAS

Prepared for

#### La Cima San Marcos

11612 FM 2244, Bldg. 1, Suite 140 Austin, Texas 78738

Prepared by

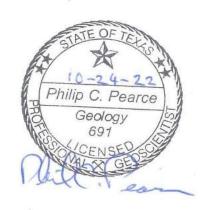
Philip Pearce, P.G. and Ben Dilly, G.I.T.

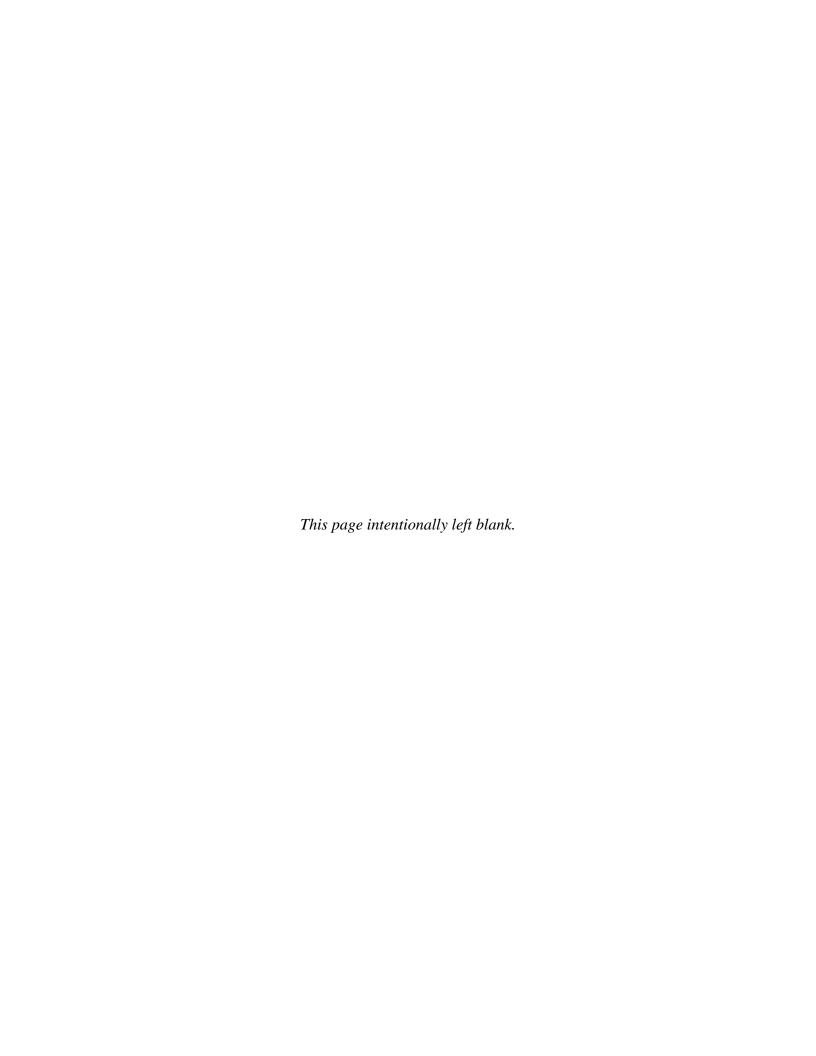
#### **SWCA Environmental Consultants**

Texas Board of Professional Geoscientists Firm Registration No. 50159 4949 Loop 1604 W, Suite 235 San Antonio, TX 78249 www.swca.com

SWCA Project Number 57088.10

October 2022





#### TABLE OF CONTENTS

E' 1	LIST OF FIGURES  . Project location.	3
	A TOTAL OF PROLIPES	
4.0	References	6
	ture Descriptions	5
3.4	Site Hydrogeologic Assessment	4
3.3	Soils	4
3.2	Geology	4
3.1	Site Overview	. 1
3.0	RESULTS	
2.0	METHODOLOGY	
1.0	INTRODUCTION	

#### **APPENDICES**

Appendix A: Texas Commission on Environmental Quality (TCEQ) Forms and Attachments

- Attachment A Geologic Assessment Table
- Attachment B Stratigraphic Column
- Attachment C Narrative Description of Site Geology
- Attachment D Site Geologic Map and Soils Map

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#### 1.0 INTRODUCTION

This narrative Geologic Assessment accompanies the Texas Commission on Environmental Quality (TCEQ) Geologic Assessment form TCEQ-0585 completed for La Cima Phases 6 and 8, which is an approximately 185-acre tract located west of RM 12 in San Marcos, Hays County, Texas (Figure 1).

#### 2.0 METHODOLOGY

An SWCA geologist, under the supervision of a senior SWCA geologist (Lic. #3863), conducted a geologic assessment of a 406-acre property including the subject property on 19 July, 23 July, 24 July, 24 July, 31 July, 2 August, 5 August, and 9 August 2019. The subject project consists of a 185-acre portion of the La Cima development. The pedestrian survey was completed by walking parallel transects spaced approximately 50 feet apart as directed by the TCEQ in the Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (Rev. 10-01-04). Closer spacing was used where vegetation inhibited clear observation. All potential karst features, including depressions, holes, and animal burrows, were carefully examined for evidence of subsurface extent. A number of techniques were used for this effort, including probing with a digging implement to determine the thickness and consistency of fill material and feeling for the presence of air flow, which may indicate the presence of a sub-surface void space. Other techniques included making observations of any notable characteristics of the feature site such as the presence of various types of vegetation or a semi-circular burrow mound produced by the activities of small mammals.

On 12 September, 1 October, and 17 October 2019 SWCA returned to the site to further investigate forty-five features that were initially determined to be sensitive based on the original reconnaissance probing. Features found were flagged with pink tape and marked on a GPS unit. Each feature was excavated to determine if it had a karst origin, what the infill material consisted of, and if clayey infilling showed a color change with depth. Data gathered from the excavation efforts were used to determine the probability of rapid infiltration and sensitivity ranking of each feature.

On 18 October 2022, SWCA returned to evaluate an additional approximately 5-acre parcel that was added to the project area.

#### 3.0 RESULTS

#### 3.1 SITE OVERVIEW

The site lies within the Recharge Zone of the San Antonio Segment of the Edwards Aquifer. The subject property generally slopes to the southwest. The surface elevations range from 735 to 835 feet above mean sea level (amsl). The property consists of ranch land located southwest of RM 12. The surrounding area consists of single-family residences to the north and east, and rangeland to the west and south. Purgatory creek is to the west of the property.

The La Cima development can be divided into three general vegetation communities: Ashe Juniper/Live Oak Woods, Mesquite/Huisache Scrub, and Myrtlecroton/Condalia Scrub. Ashe Juniper/Live Oak Woods occurs in the western half and southeastern corners of the property. The tree canopy in this community is dominated by Ashe juniper (*Juniperus asheii*) and live oak (*Quercus fusiformis*). Trees in this community average approximately 15 to 30 feet in height, with occasional mature live oaks ranging in height from 50 to 80 feet. Shrub layer species occur in moderate to high densities and include Ashe juniper saplings,

kidney wood (*Eysenhardtia texana*), agarita (*Berberis trifoliata*), and prickly pear (*Opuntia engelmanii* var. *lindheimeri*). Canopy closure is moderate, approximately 50%.

Mesquite/Huisache scrub occurs in the central and eastern portions of the La Cima property. Tree species in this community are dominated by huisache (*Acacia farnesiana*) and Mesquite (*Prosopis glandulosa*); other woody species observed included condalia (*Condalia hookeri*), prickly pear, hackberry (*Celtis reticulata*) saplings, and Ashe juniper saplings. Trees range in height from approximately 12 to 15 feet. Canopy cover is low, approximately 20%.

Myrtlecroton/Condalia scrub occurs in the northwestern and northeastern portions of the La Cima property and is characterized by its lack of Ashe juniper. Tree species consist of occasional live oaks and hackberry, approximately 30 feet tall. The shrub layer is extremely dense and is dominated by white bush (*Aloysia gratissima*), condalia, and myrtle croton (*Bernardia myricaefolia*). Other shrub species observed included spiny hack berry (*Celtis pallida*), prickly pear, and Texas persimmon (*Diospyros texana*). Canopy cover is very low, approximately 10%.

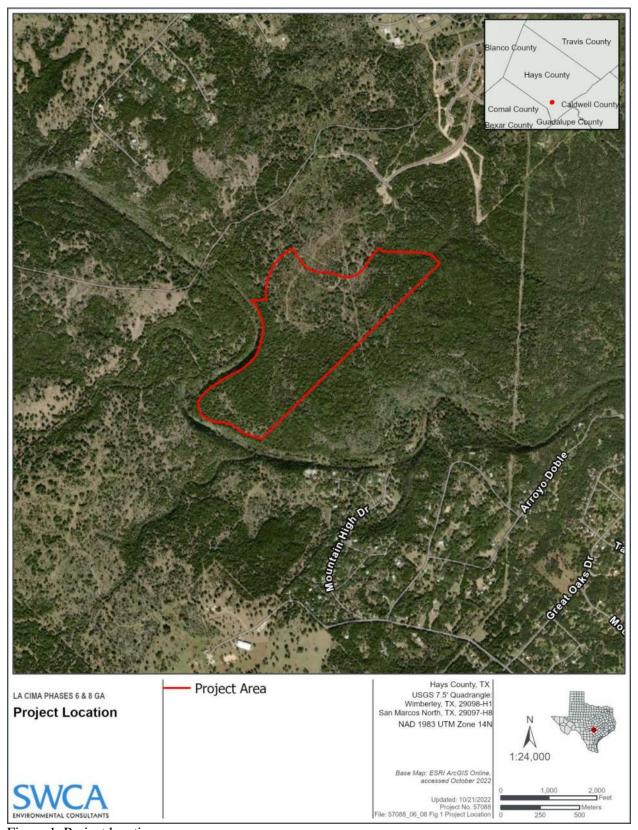


Figure 1. Project location.

#### 3.2 GEOLOGY

The subject property is underlain by the cyclic and marine member, the leached and collapsed member, and regional dense member of the Person Formation and the grainstone member of the Kainer Formation of the Edwards Group. The cyclic and marine member is comprised of mudstone to packstone. The leached and collapsed member consists of crystalline limestone. The regional dense member is composed of argillaceous mudstone. The grainstone member consists of white, cross-bedded, miliolid grainstone. (Hanson and Small 1995). A Stratigraphic Column is included as Appendix A, Attachment B.

The subject property occurs within the Balcones Fault Zone (BFZ) within the Edwards Aquifer Recharge Zone. During the middle Tertiary, structural down-warping occurred to the southeast associated with the formation of the ancestral Gulf of Mexico. The earth's crust was stretched in response, and the BFZ formed along a zone of weakness, which today marks the boundary between the Edwards Plateau and the Gulf Coastal Plain throughout central Texas. This zone consists of a series of northeast trending, predominantly normal, nearly vertical, en echelon faults. Faults are mapped to the north and south of the property, including the Academy Fault north of the project area. One fault was mapped on the the site.

The project area is within the Edwards Aquifer Recharge Zone. Recharge into the Edwards Aquifer primarily occurs in areas where the Edwards Group and Georgetown Formation are exposed at the surface. Most recharge is from direct infiltration via precipitation and streamflow loss. Recharge occurs predominantly along secondary porosity features such as faults, fractures, and karst features (caves, solution cavities, sinkholes, etc.). Karst features are commonly formed along joints and bedding plane surfaces in the Edwards Group and Georgetown Formation.

Eight sensitive features were located during our field survey. Much of the property is underlain by exposures of the Edwards Group that have weathered to a relatively thick cover of soil. This promotes runoff and soil storage followed by evapotranspiration over on-site infiltration of precipitation. The potential for rapid Edwards Aquifer recharge occurs primarily in the streambeds and is greatest outside of the property boundaries where runoff in Purgatory Creek and its tributaries flow over faulted and fractured bedrock.

#### 3.3 Soils

A review of soils data from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) indicates that two soil map units are present within the subject property (NRCS 2022): Rumple-Comfort association (1 to 8 percent slopes) (RUD) and Comfort-Rock outcrop complex (1 to 8 percent slopes) (CrD). The RUD soils are dark colored, very shallow, stony clay soils developed over hard limestone. The CrD soils consist of shallow, well drained, permeable soils. The soil types are in the "D" classification of the hydrologic soil groups, which have a very slow infiltration rate when thoroughly wetted (NRCS 2022).

#### 3.4 SITE HYDROGEOLOGIC ASSESSMENT

Overall, the potential for fluid movement to the Edwards Aquifer at the site is high, due to the presence of eight sensitive features. The predominant trend for the subject site is N45°E, based on the trend of the nearby Academy Fault.

#### **FEATURE DESCRIPTIONS**

- **S-222** Feature S-222 is a cave with an opening approximately 2 feet by 4 feet. The cave is basically a single shaft approximately 10 feet deep that gets wider with depth. The dimensions of the floor are approximately 5 feet by 8 feet. Due to the presence of no infilling and size of the void, the probability of rapid infiltration is high.
- **S-234** Feature S-234 is a solution cavity. Solution cavity is 30-40'deep. Due to the presence of no infilling, the probability of rapid infiltration is high.
- **S-237** Feature S-237 is a solution cavity. Due to the presence of no infilling, the probability of rapid infiltration is high.
- **S-238** Feature S-238 is a small non-karst closed depression formed by animal burrowing. Hand excavation revealed fine infilling. Due to the non-karst origin and presence of fine infilling, the probability of rapid infiltration is low.
- **S-239** Feature S-239 is a possible solution cavity. Due to the presence of organic infilling, the probability of rapid infiltration is high.
- **S-240** Feature S-240 is a possible solution cavity. Due to the presence of organic infilling, the probability of rapid infiltration is high.
- **S-241** Feature S-241 is a possible solution cavity. Due to the presence of organic infilling, the probability of rapid infiltration is high.
- **S-242** Feature S-242 is a small non-karst closed depression. Hand excavation revealed fine infilling. The feature appears to have formed by animal burrowing between loose slabs in the soil profile. Due to the non-karst origin of the feature and presence of fine infilling, the probability of rapid infiltration is low.
- **S-243** Feature S-243 is a solution enlarge fracture with coarse infilling and some animal burrowing. Due to the presence of coarse and organic infilling, the probability of rapid infiltration is high.
- **S-244** Feature S-244 is a small non-karst closed depression. Hand excavation revealed fine infilling. Due to the non-karst origin of the feature and presence of fine infilling, the probability of rapid infiltration is low.
- **S-247** Feature S-247 is a large sinkhole. Due to the presence of coarse infilling, the probability of rapid infiltration is high.
- **S-249** Feature S-249 is a small non-karst closed depression. Hand excavation revealed fine infilling. Due to the non-karst origin of the feature and presence of fine infilling, the probability of rapid infiltration is low.

**F-62** The feature consists of a mapped fault (Hansen and Small, 1995) trending approximately N60°E. No field evidence of enhanced permeability along the fault was observed in the field. The approximate location of this fault can be seen on the site geologic map. The potential for recharge associated with this feature is highest where the fault intersects channelized flow. SWCA does not consider it sensitive outside of stream channels.

#### **FEATURE BUFFERS**

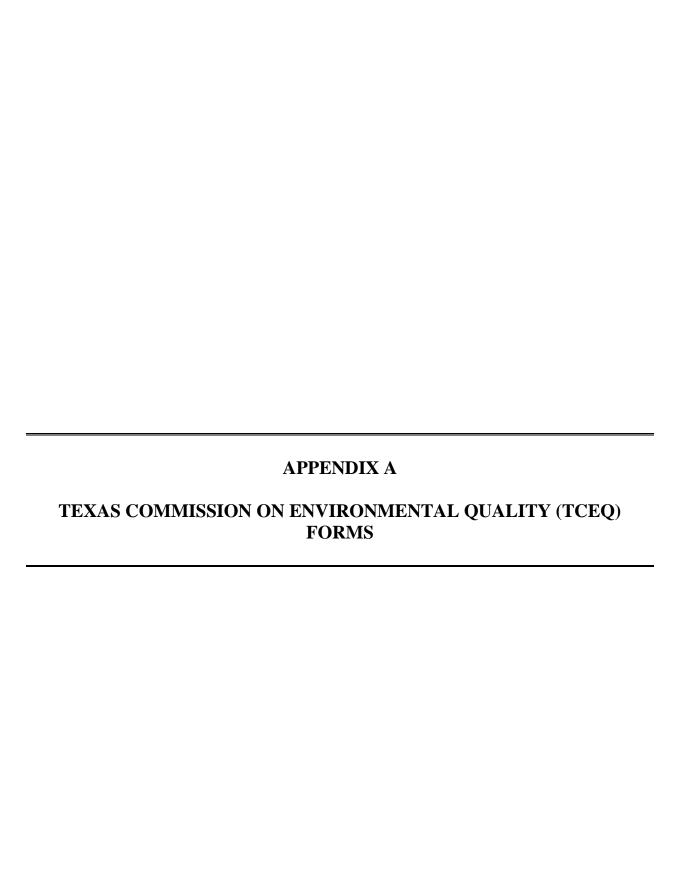
Features with point values of 40 points or more, as presented in column 10 of the Geologic Assessment Table, Appendix A, Attachment A, are considered sensitive by TCEQ. Buffers for each feature ranked as sensitive were delineated in accordance with TCEQ guidance and are displayed on the Site Geologic Map, Appendix A, Attachment D.

Each buffer was delineated by drawing a line around the feature a distance of 50-feet in all directions beyond the edge of each feature. Utilizing 1-foot interval topographic lines, the catchment area extending 200 feet upslope of each feature was also included in the buffer. For feature S-222, which is a cave, the buffer was delineated based on the footprint of the cave as opposed to the cave entrance.

Feature S-247 is a Major Recharge Feature according to City of San Marcos regulations, because it has a catchment area greater than 10 acres. The City of San Marcos Unified Development Code requires a buffer of a Major Recharge Feature to extend 25 feet from the perimeter of the feature and 275 feet upslope of the perimeter of the feature when detailed topographic information is available. Therefore, the buffers meeting both TCEQ and City of San Marcos criteria are presented for feature S-247.

#### 4.0 REFERENCES

- Blome, C.D., Faith, J.R., Pedraza, D.E., Ozuna, G.B., Cole, J.C., Clark, A.K., Small, T.A., and Morris, R.R. 2005. Geologic Map of the Edwards Aquifer Recharge Zone, South-Central Texas. U.S. Geological Survey SIM-2873, scale 1:200,000.
- Natural Resource Conservation Service (NRCS). 2022. Web Soil Survey. U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Staff. Available online at: <a href="https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm">https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm</a>. Accessed October 2022.
- Hanson, J. and Small, T. 1995. Geologic Framework and Hydrogeologic Characteristics of the Edwards Aquifer Outcrop, Hays County, Texas. U.S. Geological Survey Water-Resources Investigations Report 95-4265. 10 pp. 1 plate



# **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: Philip Pearce, P.G.	Telephone: <u>210.877.2847</u>
Date: <u>10/24/2022</u>	Fax: <u>210.877.2848</u>
Representing: <u>SWCA Environmental Consultants - <sup>-</sup></u> TBPG or TBPE registration number)	<u>FBPG No. 50159</u> (Name of Company and
Signature of Geologist:	
Regulated Entity Name: La Cima Phases 6 and 8	

## **Project Information**

1.	Date(s) Geologic Assessment was performed: Aug	ust 1, 5, 6, 14, 15, and 2	20, 2013 <u>;</u>
	September 12, 2019; October 1 and 17, 2019, a	and October 18, 2022.	TATE OF TELL
2.	Type of Project:		STATES
	<ul><li>WPAP</li><li>SCS</li></ul>	☐ AST ☐ UST	Philip C. Pearce
3.	Location of Project:		Geology S
	Recharge Zone Transition Zone Contributing Zone within the Transition Zone		691 CENSED SO

- 4. Attachment A Geologic Assessment Table. Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.
- 5. Soil cover on the project site is summarized in the table below and uses the SCS Hydrologic Soil Groups\* (Urban Hydrology for Small Watersheds, Technical Release No. 55, Appendix A, Soil Conservation Service, 1986). If there is more than one soil type on the project site, show each soil type on the site Geologic Map or a separate soils map.

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Rumple-Comfort Rubbly association		
(RUD)	D	<2
Comfor-Rock outcrop complex, 1 to 8 percent slopes	D	-23
(CrD)	U	<2

Soil Name	Group*	Thickness(feet)

- \* Soil Group Definitions (Abbreviated)
  - A. Soils having a high infiltration rate when thoroughly wetted.
  - B. Soils having a moderate infiltration rate when thoroughly wetted.
  - C. Soils having a slow infiltration rate when thoroughly wetted.
  - D. Soils having a very slow infiltration rate when thoroughly wetted.
- 6. Attachment B Stratigraphic Column. A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
- 7. Attachment C Site Geology. A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
- 8. Attachment D Site Geologic Map(s). The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

Applicant's Site Plan Scale: 1" = 200' Site Geologic Map Scale: 1" = 200'

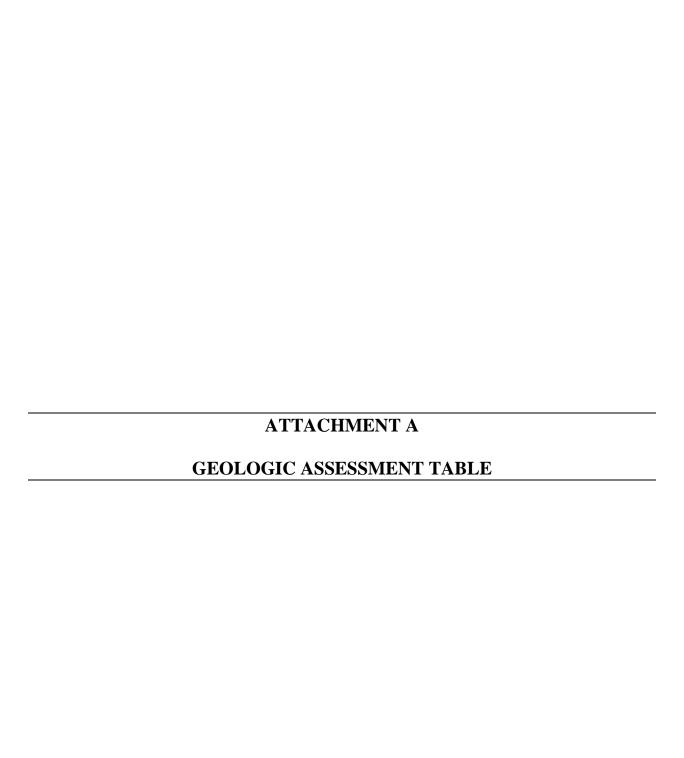
Site Soils Map Scale (if more than 1 soil type): 1" = 2000'

- 9. Method of collecting positional data:
  - Global Positioning System (GPS) technology.

	Other method(s). Please describe method of data collection:
10.	igotimes The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11.	igotimes 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.	igstyle igstyle igstyle The Recharge Zone boundary is shown and labeled, if appropriate.
	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.
	<ul> <li>There are 0 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)</li> <li>☐ The wells are not in use and have been properly abandoned.</li> <li>☐ The wells are not in use and will be properly abandoned.</li> <li>☐ The wells are in use and comply with 16 TAC Chapter 76.</li> <li>☐ There are no wells or test holes of any kind known to exist on the project site.</li> </ul>
Λα	lministrative Information

## aministrative 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.



EOLOGIC ASSESSMENT TABLE							OJEC1	NAM	E:	La Cir	na Pl	hases 6	8 & 6						
LOCATIO	N				FE	ATUF	RE CHA	RACTE	RIS	TICS				EVA	\LU/	ATION	PHY	SICAL	SETTING
1B *	1C*	2A	2B	3		4		5	5A	6	7	8A	8B	9		10		11	12
LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMA TION	DIME	NSIONS (	FEET)	TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTUR E (FEET)	INFILL	RELATIVE INFILTRA- TION RATE	TOTAL	SEN	ISITIVITY			TOPOGRAPHY
					Х	Υ	Z		10						<40	<u>&gt;40</u>	<1.6	>1.6	
29.879913°	-98.008895°	С	30	Ked	4	2	10	N45W	0			N	35	65		Χ	Χ		Hillside
29.878411°	-98.009407°	SC	20	Ked	1	0.8	35	N3E	0			N	35	55		Х	Χ		Hillside
29.877712°	-98.009073°	SC	20	Ked	1	1	5.5	N60W	0			N	35	55		X	Χ		Hillside
29.879065°	-98.011347°	CD	5	Ked	2.5	2	1.5	N89W	0			F	5	10	Χ		Χ		Hillside
29.879121°	-98.011361°	SC	20	Ked	2	1.5	3	N90E	0			0	35	55		X	Χ		Hillside
29.87926°	-98.012362°	SC	20	Ked	2	2	1.5	N10W	0			0	35	55		X	Χ		Hillside
29.877361°	-98.012197°	SC	20	Ked	5	3	1	N10E	0			O,C	35	55		X	Χ		Hillside
29.877558°	-98.014132°	CD	5	Ked	6	4	1	N56E	10			F	5	20	Χ		Χ		Hillside
29.876099°	-98.01312°	SF	20	Ked	12	6	2	N8E	0			O,C	35	55		X	Χ		Hillside
29.876177°	-98.013021°	CD	5	Ked	6	4	0.5	None	0			F	5	10	Χ		Χ		Hillside
29.882439°	-98.008709°	SH	20	Ked	340	340	3	None	0			С	35	55		Χ		Х	Hillside
29.883262°	-98.001751°	CD	5	Ked	2	2	1	None	0			F	5	10	Х		Χ		Hillside
29.884461°	-98.010867°	F	20	Ked	5000+			N45E	10			F	5	35	Χ		X		Hillside
									-							1		1	
	29.879913° 29.879913° 29.878411° 29.877712° 29.879065° 29.879121° 29.87926° 29.877361° 29.877558° 29.876099° 29.876177° 29.882439° 29.883262°	LOCATION  1B* 1C*  LATITUDE LONGITUDE  29.879913° -98.008895° 29.878411° -98.009407° 29.877712° -98.009073° 29.879065° -98.011347° 29.879121° -98.011361° 29.87926° -98.012362° 29.877361° -98.012197° 29.877558° -98.014132° 29.876099° -98.01312° 29.876177° -98.013021° 29.882439° -98.008709° 29.883262° -98.001751°	LOCATION  18* 1C* 2A  LATITUDE LONGITUDE FEATURE TYPE  29.879913° -98.008895° C 29.878411° -98.009407° SC 29.877712° -98.009073° SC 29.879065° -98.011347° CD 29.879121° -98.011361° SC 29.87926° -98.012362° SC 29.877361° -98.012197° SC 29.877558° -98.014132° CD 29.876099° -98.01312° SF 29.876177° -98.013021° CD 29.882439° -98.008709° SH 29.883262° -98.001751° CD	LOCATION           1B*         1C*         2A         2B           LATITUDE         LONGITUDE         FEATURE TYPE         POINTS           29.879913°         -98.008895°         C         30           29.8784411°         -98.009407°         SC         20           29.879065°         -98.009073°         SC         20           29.879065°         -98.011347°         CD         5           29.879121°         -98.011361°         SC         20           29.87926°         -98.012362°         SC         20           29.877361°         -98.012197°         SC         20           29.877558°         -98.014132°         CD         5           29.876099°         -98.01312°         SF         20           29.876177°         -98.013021°         CD         5           29.882439°         -98.008709°         SH         20           29.883262°         -98.001751°         CD         5	LOCATION  1B* 1C* 2A 2B 3  LATITUDE LONGITUDE FEATURE TYPE POINTS FORMATION  29.879913° -98.008895° C 30 Ked 29.878411° -98.009407° SC 20 Ked 29.877712° -98.009073° SC 20 Ked 29.879065° -98.011347° CD 5 Ked 29.879121° -98.011361° SC 20 Ked 29.87926° -98.012362° SC 20 Ked 29.877361° -98.012362° SC 20 Ked 29.877558° -98.012197° SC 20 Ked 29.877558° -98.014132° CD 5 Ked 29.876099° -98.01312° SF 20 Ked 29.876070° -98.013021° CD 5 Ked 29.882439° -98.008709° SH 20 Ked 29.883262° -98.001751° CD 5 Ked	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION	LOCATION

Other materials

#### \* DATUM: NAD 83

2A TYPE	TYPE	2B POINTS
С	Cave	30
sc	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
0	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
٧	None, exposed bedrock
)	Coarse - cobbles, breakdown, sand, gravel
)	Loose or soft mud or soil, organics, leaves, sticks, dark colors
=	Fines, compacted clay-rich sediment, soil profile, gray or red colors
/	Vegetation. Give details in narrative description
S	Flowstone, cements, cave deposits

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

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

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

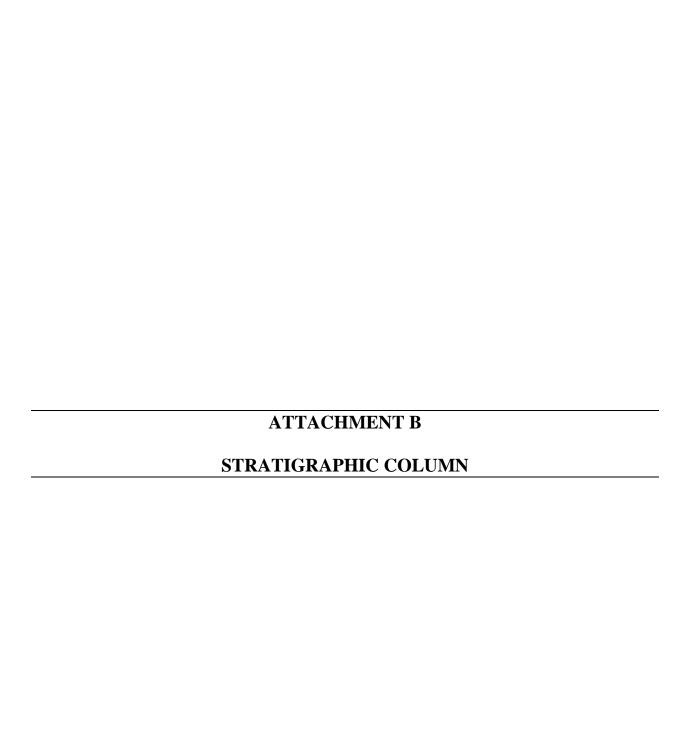
ail C Ceance

Date 10/24/2022

Sheet \_\_1\_ of \_\_1\_

Philip C. Pearce Geology

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



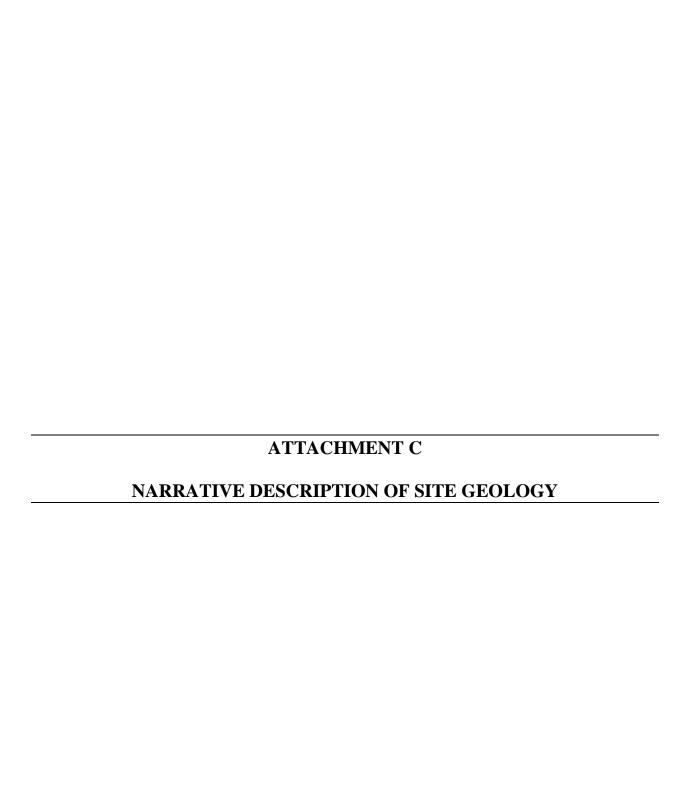
## **Stratigraphic Column**

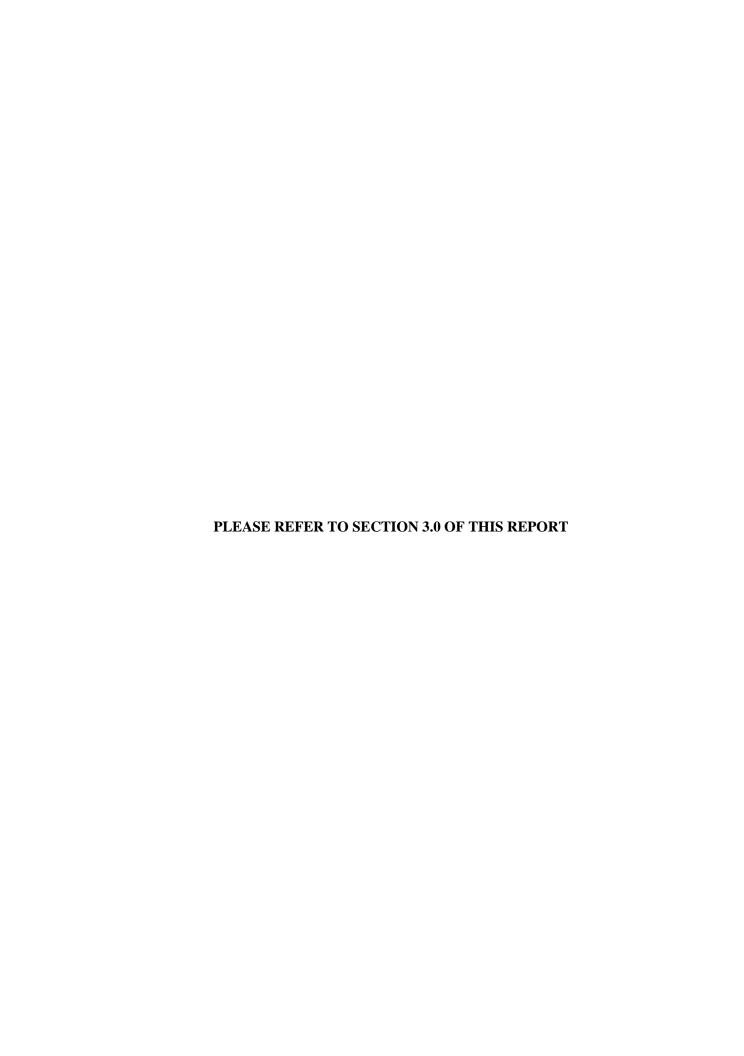
Note: The shaded areas represent the lithology that outcrops on the property.<sup>1</sup>

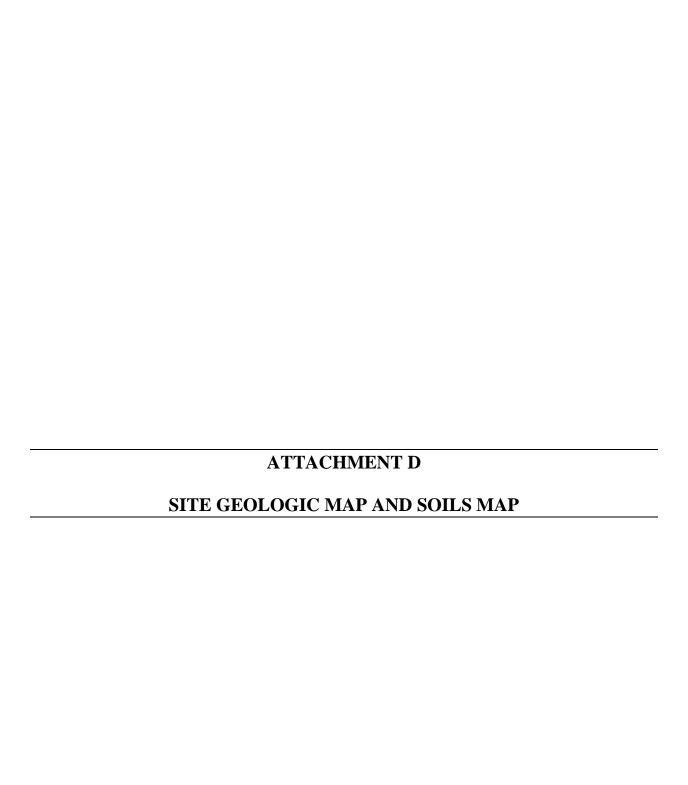
Upper Cretaceous	Upper Confining Units			Navarro and Taylor Groups, undivided; 600 feet thick  Austin Group; 130-150 feet thick  Eagle Ford Group; 30-50 feet thick						
Upper (				Buda Limestone; 40-50 feet thick  Del Rio Clay; 40-50 feet thick						
	_	George		Georgetown Formation	10-40 feet thick					
	I			Person Formation;	Cyclic and Marine member, undivided					
	III	luifer	uifer	170-200 feet thick	Leached and Collapsed member, undivided					
seons	IV	ds Aç	Grou		Regional Dense member					
Lower Cretaceous	V	Edwards Aquifer	Edwards Group	Edwards	Edwards	Edwards	lwards	lwards	Kainer Formation;	Grainstone member
Lowe	VI						260-310 feet thick	Kirschberg Evaporite member		
	VII				Dolomitic member					
	VIII				Basal Nodular member					
	Lower Confining Units			Upper member of Glen l	Rose Formation; 350-500 feet thick					

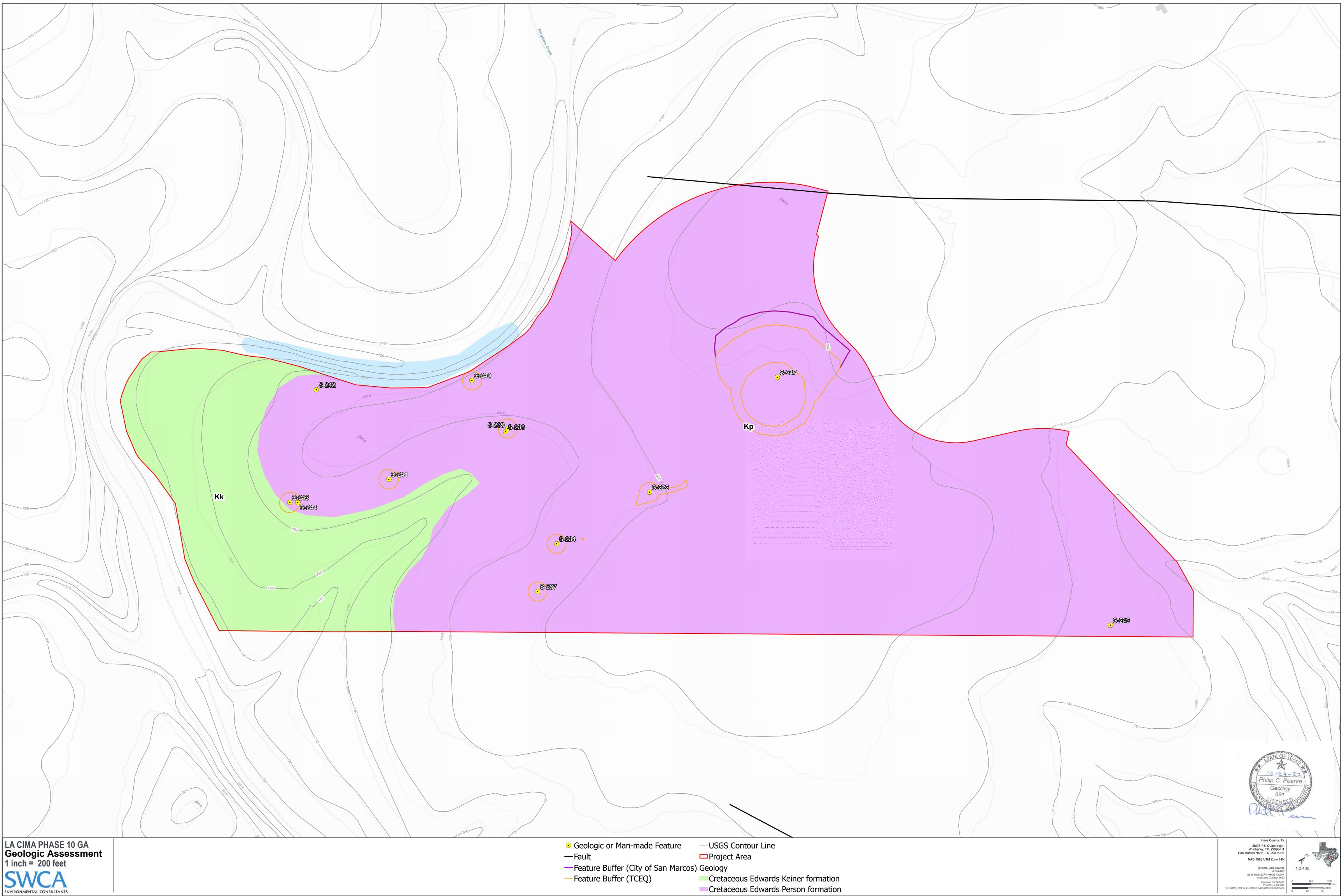
\_

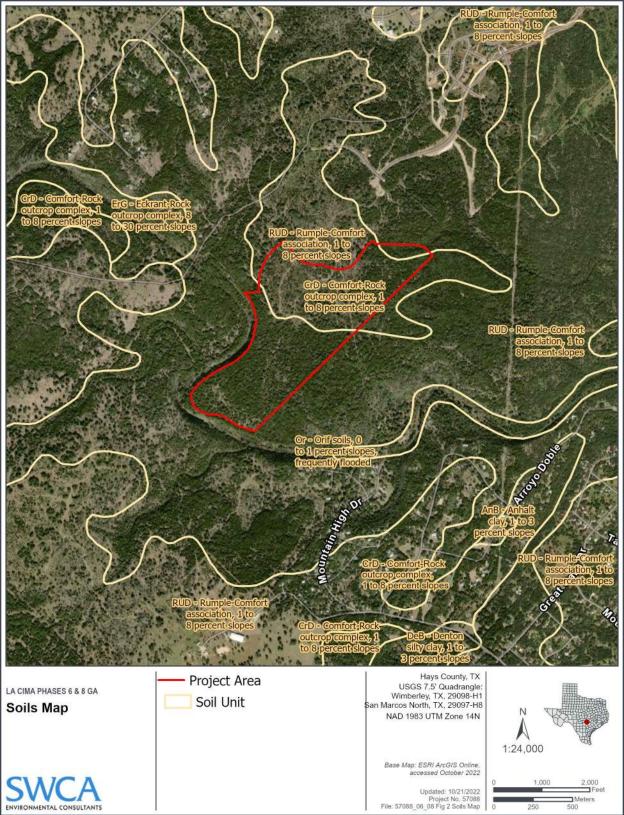
 $<sup>^{1}</sup>$  Blome, C.D., 2005, Geologic map of the Edwards aquifer recharge zone, south-central-Texas. U.S. Geological Survey SIM-2873, scale 1:2000,000.













Photograph 14. View of feature S-222.



Photograph 23. View of feature S-234.



Photograph 24. View of feature S-237.



Photograph 25. View of feature S-238.



Photograph 26. View of feature S-239.



Photograph 27. View of feature S-240.



Photograph 28. View of feature S-241.



Photograph 29. View of feature S-242.



Photograph 30. View of feature S-243.



Photograph 30. View of feature S-244.



Photograph 30. View of feature S-249.

## 4 - TCEQ - 0582 Attachments

Organized Sewage Collection System Plan

# 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: LA CIMA PHASE 6 & 8, LLC

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

### **Customer Information**

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

Contact Person: <u>Bryan W Lee</u> Entity: LCSM Ph 4, LLC

Mailing Address: 303 Colorado St, Ste #2300

 City, State: Austin, TX
 Zip: 78701

 Telephone: 512-457-8000
 Fax: \_\_\_\_\_\_

Email Address: dougg@nd-austin.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: Margaret Hickok, P.E.

Texas Licensed Professional Engineer's Number: 149657

Entity: Bowman Consulting Group, LTD

Mailing Address: 151 Stagecoach Trail, Suite 130

City, State: San Marcos, TX Zip: 78666
Telephone: 512-327-1180 Fax:

Email Address:mhickok@bowman.com

## **Project Information**

	0	7 600 1	CDD 36	C000 DR 14 DVC					
	Pipe Diameter(Inches)	Linear Feet (1)	Pipe Material (2)	Specifications (3)					
Tal	Table 1 - Pipe Description								
8.	Pipe description:								
	<ul> <li>□ The WPAP application for this development was approved by letter dated A copy of the approval letter is attached.</li> <li>☑ The WPAP application for this development was submitted to the TCEQ on 11/15/2023, but has not been approved.</li> <li>□ A WPAP application is required for an associated project, but it has not been submitted.</li> <li>□ There is no associated project requiring a WPAP application.</li> </ul>								
7.	. A Water Pollution Abatement Plan (WPAP) is required for construction of any associated commercial, industrial or residential project located on the Recharge Zone.								
6.		ated infiltration/inflow is cification as city of San M		will be addressed by:					
	100% Domestic% Industrial% Commingle Total gallons/da		41,850 gallons/da gallons/da gallons/da	У					
5.	Commercial Industrial Off-site system (not associated with any development) Other: The character and volume of wastewater is shown below:								
	Residential: Number of single-family lots: 185  Multi-family: Number of residential units:								
4.	<ol> <li>Anticipated type of development to be served (estimated future population to be served, plus adequate allowance for institutional and commercial flows):</li> </ol>								
	-								

Pipe Diameter(Inches)	Linear Feet (1)	Pipe Material (2)	Specifications (3)
8	7,690.1	SDR 26	C900 DR 14 PVC

**Total Linear Feet**: <u>7,690.1</u>

- (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 Plant. The treatment	collection system will convey the wastewater to the <u>COSM</u> (name) Treatment reatment facility is:						
	Existing Proposed							
10.	10. All components of this sewage collection system will comply with:							
		an Marcos standard specifications are attached.	cifications.					
11.	No force main(s	and/or lift station(s) are	e associated with this sew	vage collection system.				
		A force main(s) and/or lift station(s) is associated with this sewage collection system and the <b>Lift Station/Force Main System Application</b> form (TCEQ-0624) is included with this application.						
Al	lignment							
12.		viations from uniform gravith open cut construction		tion system without				
13.	There are no dewell without manhole	viations from straight alig es.	gnment in this sewage co	llection system				
	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.							
M	anholes 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)							
Та	ble 2 - Manholes a	nd Cleanouts		Manhole or Clean-				
	Line	Shown on Sheet	Station	out?				
	See next sheet	Of						
		Of						
		Of						
		Of						
		Of						
		Of						

Of

**Table 2 - Manholes and Cleanouts** 

Phase	Line	Shown on Sheet	Station	Manhole or Cleanout?
6A	WW LN M	41 OF 62	1+00.00	MANHOLE
6A	WW LN M	41 OF 62	1+38.32	MANHOLE
6A	WW LN M	41 OF 62	3+09.97	MANHOLE
6A	WW LN M	41 OF 62	4+90.69	MANHOLE
6A	WW LN M	41 OF 62	7+20.76	MANHOLE
6A	WW LN M	41 OF 62	10+76.87	MANHOLE
6A	WW LN M	41 OF 62	11+26.87	MANHOLE
6A	WW LN M	41 OF 62	13+49.25	MANHOLE
6A	WW LN G	42 OF 62	3+62.98	MANHOLE
6A	WW LN N	43 OF 62	7+08.23	MANHOLE
6A	WW LN N	43 OF 62	7+36.01	MANHOLE
6A	WW LN N	43 OF 62	8+59.39	MANHOLE
6A	WW LN N	43 OF 62	9+77.76	MANHOLE
6A	WW LN N	43 OF 62	10+71.39	MANHOLE
6A	WW LN N	43 OF 62	13+86.83	MANHOLE
6A	WW LN E	44 OF 62	1+62.09	MANHOLE
6A	WW LN E	44 OF 62	2+38.23	MANHOLE
6A	WW LN E	44 OF 62	3+60.95	MANHOLE
6A	WW LN E	44 OF 62	4+81.64	MANHOLE
6A	WW LN E	44 OF 62	6+62.64	MANHOLE
6A	WW LN E	44 OF 62	8+76.97	MANHOLE
6A	WW LN E	44 OF 62	10+25.73	MANHOLE
6A	WW LN F	45 OF 62	1+94.66	MANHOLE
6A	WW LN F	45 OF 62	2+62.00	MANHOLE
6A	WW LN F	45 OF 62	3+89.99	MANHOLE
6A	WW LN F	45 OF 62	5+10.79	MANHOLE
6A	WW LN F	45 OF 62	6+21.76	MANHOLE
6A	WW LN F	45 OF 62	7+17.01	MANHOLE
6B	WW LN A	34 OF 54	1+19.36	MANHOLE
6B	WW LN A	34 OF 54	2+99.99	MANHOLE
6B	WW LN A	34 OF 54	4+48.30	MANHOLE
6B	WW LN A	34 OF 54	7+47.21	MANHOLE
6B	WW LN A	34 OF 54	8+44.76	MANHOLE
6B	WW LN A	34 OF 54	11+73.54	MANHOLE
6B	WW LN A	35 OF 54	15+02.33	MANHOLE
6B	WW LN A	35 OF 54	16+67.38	MANHOLE
6B	WW LN A	35 OF 54	17+39.32	MANHOLE
6B	WW LN A	35 OF 54	18+35.91	MANHOLE
6B	WW LN A	35 OF 54	19+35.88	MANHOLE
6B	WW LN A	35 OF 54	20+35.83	MANHOLE
6B	WW LN A	35 OF 54	22+56.24	MANHOLE
6B	WW LN A	35 OF 54	26+42.49	MANHOLE
6B	WW LN A	36 OF 54	28+43.27	MANHOLE
6B	WW LN A	36 OF 54	30+44.04	MANHOLE
6B	WW LN A	36 OF 54	32+85.80	MANHOLE
6B	WW LN A	36 OF 54	36+35.75	MANHOLE
6B	WW LN B	37 OF 54	3+43.49	MANHOLE
6B	WW LN B	37 OF 54	4+58.60	MANHOLE
6B	WW LN B	37 OF 54	5+44.89	MANHOLE
6B	WW LN B	37 OF 54	6+71.90	MANHOLE

Line	Shown on Sheet	Station	Manhole or Clean- out?		
	Of				
	Of				
	Of				
15. Manholes are line.	installed at all Points of Cur	vature and Points of Te	rmination of a sewer		
16. 🔀 The maximum greater than:	spacing between manholes	on this project for eac	h pipe diameter is no		
Pipe Di	ameter (inches)	Max. Ma	nhole Spacing (feet)		
	6 - 15		500		
	16 - 30	800			
	36 - 48 ≥54	1000 2000			
maximum spa greater than li maximum spa operate and n	<ul> <li>Justification for Variance cing between manholes on sted in the table above. A j cing is attached, and must in naintain the system stating to ling greater than the allowed</li> </ul>	this project (for each pi ustification for any vari nclude a letter from the that it has the capability	pe diameter used) is ance from the entity which will		
	vill be monolithic, cast-in-pl				
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, attached.					
Site Plan Req	uirements				
ltems 18 - 25 must be	included on the Site Plan.				
18. 🔀 The Site Plan r	nust have a minimum scale	of 1" = 400'.			
Cita Dlan Caala	. 1" – 100'				

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

- 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:							
If not shown on the Site sewer systems.	<ul> <li>☐ The entire water distribution system for this project is shown and labeled.</li> <li>☐ If not shown on the Site Plan, a Utility Plan is provided showing the entire water and sewer systems.</li> <li>☐ There will be no water lines associated with this project.</li> </ul>						
22. 100-year floodplain:							
After construction is complete, no part of this project will be in or cross a 100-year floodplain, either naturally occurring or manmade. (Do not include streets or concrete-lined channels constructed above of sewer lines.)  After construction is complete, all sections located within the 100-year floodplain will have water-tight manholes. These locations are listed in the table below and are shown and labeled on the Site Plan. (Do not include streets or concrete-lined channels constructed above sewer lines.)							
Table 3 - 100-Year Floodpla  Line	Sheet	Station					
	of	to					
	of	to					
	of	to					
	of	to					
<ul> <li>23. 5-year floodplain:</li> <li>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.)</li> <li>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.)</li> </ul>							
Line	Sheet	Station					
	of	to					
	of	to					
of to							
of to							
	site are shown. nical specifications are submitted n plans and specifications are dat						

Texas Licensed Professional Engineer responsible for the design on each sheet.

Items 26 - 33 must be included on the Plan and Profile sheets.						
sewer lines rated pipe variance fro	or proposed water I sare listed in the tab to be installed show om the required pre om 30 TAC Chapter	ole below. These I on on the plan and essure rated piping	ines must have the t profile sheets. Any	type of pressure request for a		
_	pe no water line cros pe no water lines wit	_	osed sewer lines.			
Table 5 - Water	Line Crossings		T	<del></del>		
Line	Station or Closest Point	Crossing or Parallel	Horizontal Separation Distance	Vertical Separation Distance		
PH 6A WW LN F	1+20	CROSSING	PERPENDICULAR	2'		
PH 6A WW LN N	13+66	CROSSING	PERPENDICULAR	7.2'		
PH 6B WW LN C	1+10	CROSSING	PERPENDICULAR	2.9'		
27. Vented Manho	oles:					
required by  A portion of the provided the table by	y 30 TAC Chapter 21 of this sewer line is w d at less than 1500 f elow and labeled on	7. vithin the 100-yea oot intervals. The o the appropriate p	r floodplain and ven se water-tight manl profile sheets.			
<b>—</b> ·	all be provided at les	•	•			
	means is described		-			
	of this sewer line is ware than 1500 feet l	•	•			
interval longer than 1500 feet located within. No vented manholes will be used. <b>Table 6 - Vented Manholes</b>						
Line	Manho	ole	Station	Sheet		

			T
Line	Manhole	Station	Sheet
28. Drop manholes:			
Sewer lines whice 24 inches above appropriate pro §217.55(I)(2)(H)		nanholes or "manhole isted in the table belov	v and labeled on the
Table 7 - Drop Manh	oles <i>Manhole</i>	Station	Sheet
Line			
PH 6B WW LN A	A5	7+47.21	34
PH 6B WW LN A	A6	8+44.76	34
29. Sewer line stub-out	s (For proposed extension	ns):	
	and markings of all sewer ub-outs are to be installe m.		
30. Lateral stub-outs (Fo	or proposed private servi	ce connections):	
The placement a	and markings of all latera	stub-outs are shown a	and labeled.
	outs are to be installed du		
31. Minimum flow velo	city (From Appendix A)		
	are flowing full; all slopes	•	uce flows equal to or
32. Maximum flow velo	city/slopes (From Appen	dix A)	
Assuming pipes less than or equ Attachment D – Assuming pipes	are flowing full, all slopes al to 10 feet per second f Calculations for Slopes f are flowing full, some slo	are designed to produ or this system/line. or Flows Greater Than pes produce flows whi	10.0 Feet per Second.

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 $\geq$ 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(I)(2)(B).
	Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.
	<ul><li>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.</li><li>N/A</li></ul>

### **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]	62 of 62 (6A)
	52 of 52 (6B)
Manhole, showing inverts comply with 30 TAC §217.55(I)(2) [Required]	58 of 62 (6A)
	48 of 52 (6B)
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	of
Typical trench cross-sections [Required]	62 of 62 (6A)
	52 of 52 (6B)
Bolted manholes [Required]	58 of 62 (6A)
	48 of 52 (6B)
Sewer Service lateral standard details [Required]	59 of 62 (6A)
	50 OF 52 (6B)
Clean-out at end of line [Required, if used]	- of -

Standard Details	Shown on Sheet
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	- of -
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	of
Mandrel detail or specifications showing compliance with 30 TAC	58 of 62 (Ph 6A)
§217.57(b) and (c) [Required, if Flexible Pipe is used]	48 of 52 (Ph 6B)
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	50- of 52 (Ph 6B)

- 36. All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
- 37. All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.
  - Survey staking was completed on this date: 12/22/2023
- 38. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 39. Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

## Signature

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

Print Name of Licensed Professional Engineer: Margaret Hickok, P.E./Bowman Consulting

Date: <u>9/22/2023</u>

Place engineer's seal here:



Signature of Licensed Professional Engineer:



## Appendix A-Flow Velocity Table

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

**Table 10 - Slope Velocity** 

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

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

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

Figure 1 - Manning's Formula

#### Where:

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

## Attachment A – SCS Engineering Design Report

## **TCEQ Engineering Design Report**

For

## La Cima Phase 6



November, 2023

Prepared By:
Bowman Consulting Group
151 Stagecoach Trail
Suite 130
San Marcos, TX 78666

### **TABLE OF CONTENTS**

Table of Contents	2
PVC Pipe Standards	3
Proposed Type of Pipe	4
Flow Capacity Analysis	4
Minimum and Maximum Grades for Pipes	5
Minimum and Maximum Velocities for the Proposed System	5
Average Values for Modulus of Soil Reaction, E'	6
Pipe Bedding Class	7
Pipe Bedding Angle	8
Live Load Determination	8
Prism Load Determination	9
Buckling Pressure (Allowable)	10
Buckling Pressure (Installed Condition)	11
Wall Crushing Calculation	12
Deflection Analysis: Leonhardt's Zeta Factor	14
Pipe Stiffness	15
Predicted Pipe Deflection	16
Pipe Strain	17
Attachment A	17

#### **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-3034 standard. ASTM D-3034 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 115 psi and fall in the size category listed below. ASTM D-3034 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 AST	M D-3034)		
Size (in)	O.D.	Calc I.D.	Thickness	
Size (III)	(in)	(in)	(in)	
4	4.215	3.891	0.162	
6	6.275	5.793	0.241	
8	8.400	7.754	0.323	
10	10.500	9.692	0.404	
12	12.500	11.538	0.481	
15	15.300	14.124	0.588	

#### 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-3034
Joint Compliance:	ASTM D-3212
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Calculated Inner Diameter (in) = (Outer Diameter - 2t)	7.754
Outer Diameter (inch):	8.400
Wall Thickness (inch):	0.323
Mean Pipe Diameter (in) = (Outer Diameter - Thickness)	8.077
Approximate Trenching Width (feet):	2.70
Minimum Pipe Depth (Cover) used (feet):	4.29

## FLOW/CAPACITY ANALYSIS

Maximum Pipe Depth (Cover) used (feet):

Proposed Waste Water Usage: 41,850.00 GPD

 $Q_{max}$  (As determined in Attachment A) = 0.065 CFS

$$Q_{fidl} = \frac{1.486}{n} \times A \times R^{\frac{2}{3}} \times \sqrt{S}$$

A = Cross-Sectional Area, (ft2) = 0.328 S = Slope, decimal, minimum used = 0.008  $R_h = hydraulic radius = 0.162$ 

For the Specified Pipe at the Minimum Design Slope, the full flow is

$$Q_{full} = 0.963$$
 CFS

0.065 < 0.963

Design meets TCEQ Guidelines

D3034 4

15.29

### MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(I)(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	*	*	

<sup>\*</sup> 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 = velocity (ft/sec)	=	(solve)
			n = Manning's coefficient	=	0.013
1	z = 1.49	$\frac{9}{8} \times R^{0.67} \times \sqrt{S}$	Calc. Inner Diameter (in)	=	7.754
,	$n = \frac{1}{n}$	$\frac{9}{8} \times R_h^{0.67} \times \sqrt{S}$	$A = Cross-Sectional Area, ft^2$	=	0.328
			Wp = Wetted Perimeter, ft	=	2.030
			$R_h$ = hydraulic radius, A/Wp	=	0.162
			S = slope (ft/ft)	=	0.008

Minimum Slope Used (%): 0.75 Maximum Slope Used (%): 8.00

 $V_{min} = \frac{2.94 \text{ ft/sec}}{}$  ft/sec  $V_{max} = \frac{9.61 \text{ ft/sec}}{}$ 

2.94 > 2.00 ft/sec 9.61 < 10.00 ft/sec

Design meets TCEQ Guidelines

Design meets TCEQ Guidelines

### AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

	E' for Degree of Compaction of Bedding, in pounds per square inch			
Soil type-pipe bedding material (Unified Classification System)	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 <sub>b</sub> ) 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  Coarse-grained Soils with Fines GM, GC, SM, SC contains more than 12% fines	100	400	1000	2000
Coarse-grained Soils with Little or no Fines GW, GP, SW, SP 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 = 1000 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 <u>Deflection: The Pipe/Soil Mechanism</u> UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

		Pipe Embe	edment Material		E', psi (kPa) for Degree of Embedment Compaction					
A: Class	STM D 2321* Description	Notation	ASTM D 2487 Description	AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
IA	Open-graded, clean manu- factured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
IB	Dense-graded, clean manu- factured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures; little or no fines							
11	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							
Ш	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	d with	9" (0.20 m)		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							

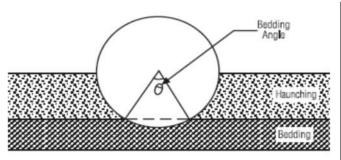
#### **NOTE:**

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 <u>Deflection: The Pipe/Soil Mechanism</u> 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 <u>Deflection: The Pipe/Soil Mechanism</u> UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 14.

Height	Live Load To	ransferred to	Pipe, lb/in <sup>2</sup>	Height of Cover (ft)	Live Load Transferred to Pipe, lb/in <sup>2</sup>		
of Cover (ft)	Highway H20¹	Railway E80 <sup>2</sup>	Airport		Highway H20¹	Railway E80 <sup>2</sup>	Airport
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	*	*,	*

Simulates 20 ton truck + impact

<sup>&</sup>lt;sup>2</sup> Simulates 80,000 lb/ft railway load + impact

<sup>&</sup>lt;sup>3</sup> 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.

<sup>\*</sup> 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, <u>Deflection: The Pipe/Soil Mechanism</u> UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 13.

Pri	sm Load	Table Soil Pre	3 essure (l	bs/in²)	
Height of		Soil Un	it Weight	(lb/ft³)	
Cover (ft)	100	110	120	125	130
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38	0.69 1.39 2.08 2.78 3.47 4.17 4.86 5.56 6.25 6.94 7.64 8.33 9.03 9.72 10.42 11.11 11.81 12.50 13.19 13.89 14.58 15.28 15.97 16.67 17.36 18.06 18.75 19.44 20.83 21.53 22.22 23.61 24.31 25.00 26.39	110 0.76 1.53 2.29 3.06 3.82 4.58 5.35 6.11 6.88 7.64 8.40 9.17 9.93 10.69 11.46 12.22 12.99 13.75 14.51 15.28 16.04 16.81 17.57 18.33 19.10 19.86 20.63 21.39 22.15 22.92 23.68 24.44 25.21 25.97 26.74 27.50 28.26 29.03	120 0.83 1.67 2.50 3.33 4.17 5.00 5.83 6.67 7.50 8.33 9.17 10.00 10.83 11.67 12.50 13.33 14.17 15.83 16.67 17.50 18.33 19.17 20.00 20.83 21.67 22.50 23.33 24.17 25.00 25.83 26.67 27.50 28.33 29.17 30.00 20.83 21.67 21.67 22.50 23.33 24.17 25.00 25.83 26.67 27.50 28.33 29.17 30.00 30.83 31.67	125 0.87 1.74 2.60 3.47 4.34 5.21 6.08 6.94 7.81 8.68 9.55 10.42 11.28 12.15 13.02 13.89 14.76 15.63 16.49 17.36 18.23 19.10 19.97 20.83 21.70 22.57 23.44 24.31 25.17 26.04 26.91 27.78 28.65 29.51 30.38 31.25 32.12 32.99	0.90 1.81 2.71 3.61 4.51 5.42 6.32 7.22 8.13 9.03 10.83 11.74 12.64 13.54 14.44 15.35 16.25 17.15 18.96 20.76 21.67 22.57 24.38 25.28 27.99 28.89 29.79 28.89 29.79 30.69 31.60 32.50 33.40 34.31
39 40 41 42	27.08 27.78 28.47 29.17	29.79 30.56 31.32 32.08	32.50 33.33 34.17 35.00	33.85 34.72 35.59 36.46	35.21 36.11 37.01 37.92
43 44 45 46 47	29.86 30.56 31.25 31.94 32.64	32.85 33.61 34.38 35.14 35.90	35.83 36.67 37.50 38.33 39.17	37.33 38.19 39.06 39.93 40.80	38.82 39.72 40.63 41.53 42.43
48 49 50	33.33 34.03 34.72	36.67 37.43 38.19	40.00 40.83 41.67	41.67 42.53 43.40	43.33 44.24 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 15.29 feet, prism load = 12.22 psi

## **BUCKLING PRESSURE (ALLOWABLE)**

Where: $q_a =$		=	Allowable buckling pressure (psi)				
	h =		Height of soil above top of pipe (in) =		183.48 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 p	ipe (in <sup>3</sup> )				
	t	=	Pipe wall thickness (in)				
	D	=	Mean Pipe Diameter (in)	D =	8.077 in		

Solving for the Empirical coefficient of elastic support, given by Luscher in 1966, as referenced on Pg 113 of Moser, A.P., <u>Buried Pipe Design</u>. 2nd Ed., McGraw-Hill:

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2}$$

$$I = \left(\frac{t^3}{12}\right) = \left(\frac{inches^3}{in_{linear}}\right) =$$

$$B' = \frac{140588}{210979} = 0.666$$

$$I = \frac{0.0336983}{12} = 0.0028$$

Using the Allowable Buckling Pressure Equation as shown in Moser, A.P., <u>Buried Pipe Design</u>. 2nd Ed., McGraw-Hill, Pg 112, and an initial factor of safety (SF) of 2.5, the Allowable Buckling Pressure is then:

$$q_{a} = \frac{1}{FS} * \sqrt{32 * R_{w} * B' * E_{b} * \left(E * \frac{I}{D^{3}}\right)} \text{ Where,}$$

$$R_{w} = 1 - 0.33 (h_{w} / h)$$

$$q_{a} = \frac{1}{2.5} \sqrt{32} \left[ 32 \right] \left[ 1 \right] \left[ 0.666 \right] \left[ 1000 \right] \left[ 400000 \right] \frac{0.0028}{526.93}$$

$$q_{a} = 85.28 \quad \text{psi}$$

## **BUCKLING PRESSURE (INSTALLED CONDITION)**

Where: Pressure applied to pipe under installed conditions (psi) Specific Weight of Water = 0.0361 (pci)  $\gamma_{\mathrm{W}}$ Specific Weight of Soil (pcf)  $\gamma_{\rm S}$  $W_c$ 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 = 0D Mean Pipe Diameter (in) D =8.077 in Pipe Wall Thickness (in) t =0.323 in t

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:  $\gamma_S = 115$  Value taken from: Assumed Worst Case Scenario

$$W_C = \left[ 15.29 \right] \left[ 12 \text{ in/ft} \right] \left[ 115.00 \right] \left[ \frac{1 \text{ ft}^3}{1728 \text{ in}^3} \right] \left[ 8.40 \right]$$

$$W_C = 102.57 \quad \text{lb/in}$$
At Max Pipe Depth (H) of 15.29 ft

Using the Equation on Pg 114 of Moser, A.P., <u>Buried Pipe Design</u>. 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:

$$q_{p} = \gamma_{w} h_{w} + R_{w} \left( \frac{W_{c} + L_{L}}{D} \right) \text{ and } L_{L} = 0$$

$$q_{P} = 0.0361 \times 0 + 1 \times \left[ \frac{102.57}{8.077} \right]$$

$$q_{P} = 12.70 \text{ psi}$$

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. = 8.4 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 = 0.323 in. $^2$ /ft

 $\gamma_{\rm S}$  = specific weight of soil, pcf, = 115 pcf

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

Using the Wall Crushing and Wall Thrust equations, as referenced in <u>Plastic Pipe Design Manual</u> published by Vylon Pipe, Pg 14 the Wall Crushing due to compressive stress can be found using the following:

$$P_c = \frac{T}{A}$$
 where T, Thrust, is calculated as  $T = \frac{P_y D}{2}$ 

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<sub>v</sub>:

$$P_c = \frac{\frac{\gamma_s * H}{144} P_{\text{Rearranging this equation, it becomes:}}{2 A P_c} = \frac{\gamma_s * H}{144} D$$
And simplifies to: 
$$2884 P_c = \gamma_s HD$$

Note that the Surface Area of the Pipe Wall, A, is per unit length in inches<sup>2</sup> per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24AP = \gamma_s HL$$

Solving for H, the equation becomes:

$$H = \frac{24 * P_c * A}{\gamma_s * D_a}$$

(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:

$$H = \frac{24 \int 4000 \int 0.323 \times 12}{115 \times 8.4} = 385.19$$

$$H = 385.19 \text{ feet}$$

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 <u>Handbook of PVC Pipe</u>, Ch VII Design of Buried PVC Pipe, Pg 268

Where: Do = Pipe Outer Diameter, in = 8.400 B = Trench Width, in, = 32.40 in  $E_b$  = Modulus of soil reaction, bedding material (psi) = 1000  $E_n$  = Modulus of soil reaction for the in-situ soil (psi) = 1000

$$zeta = \frac{1.44}{f + \left[1.44 - f\right] \times \left[\frac{E_b}{E'_n}\right]}$$

where,

$$f = \frac{\frac{B}{Do} - 1}{1.154 + 0.444 \left[\frac{B}{Do} - 1\right]}$$

$$f = \frac{2.857143}{2.420571} = 1.1803588$$

Substituting f into the zeta equation:

$$zeta = \boxed{\begin{array}{c} 1.44 \\ 2.260 \end{array}} \boxed{\begin{array}{c} 1.000 \end{array}}$$

The Leonhardt Zeta factor is then determined as: 1.000

## 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:

$$PS = C \times RSC \times (\frac{8.337}{D})$$

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 = 
$$\frac{115}{0.825752}$$

$$RSC = 139.267$$

#### 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 <u>Deflection: The Pipe/Soil Mechanism</u> UNI-TR-1-97, Uni-Bell PVC Pipe Association Pgs 17, the predicted pipe deflection can be calculated.

Where:	$\%\Delta Y/D$	=	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): $15.29$
	DR	=	Dimension Ratio= 26
	E	=	Modulus of tensile elasticity of the pipe material, psi
	Ε'	=	Modulus of Soil Reaction (zeta x Eb) = 1000.00
	$\mathrm{D_{L}}$	=	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 = 12.22 psi

The Predicted Deflection is determined as:

$$(\%) \frac{\Delta Y}{D} = \frac{\left[ \left[ 1.5 \times 1.173 \right] + 0 \right] \times 100}{\left[ \frac{800000}{46875} \right] + \left[ 0.061 \times 1000.00 \right]} = 2.25$$

NOTE: 2.25 < 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 <u>Deflection: the Pipe/Soil Mechanism</u>, 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) = 0.323 D = Pipe Diameter, Outer (in) = 8.400

$$\epsilon_h = \frac{PD}{2tE}$$

Using the maximum cover for both live loads and prism loads as well as the previous unit weight of the soil:

$$\frac{[0.00 + 12.22] \times 8.400}{2 \times 0.323 \times 400.000} = 3.972E-04$$

(Continued on following page)

Where:  $\in_f$  = Maximum Pipe Strain due to Ring Deflection, in/in  $\Delta Y$  = Change in vertical pipe diameter under load, in, (numerator in the deflection equation, but in decimal form) t = Pipe Wall thickness (in) = 0.323 D = Pipe Diameter, Outer (in) = 8.400

Dimension Ratio, PVC Pipe=

DR

$$\epsilon_f = \frac{t}{D} \left[ \frac{3\Delta Y / D}{1 - 2\Delta Y / D} \right] = \frac{1}{DR} \left[ \frac{3\Delta Y}{D - 2\Delta Y} \right]$$

26

$$\frac{0.323}{8.400} \times \frac{5.279}{8.400 - 3.519} = 0.0415912 \frac{\text{in}}{\text{in}}$$

$$\in_{total}$$
 =  $0.0420$  in

## TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

\*\*These notes are provided in the Construction Documents on Plan Sheet 60 of 60 \*\*

## 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.

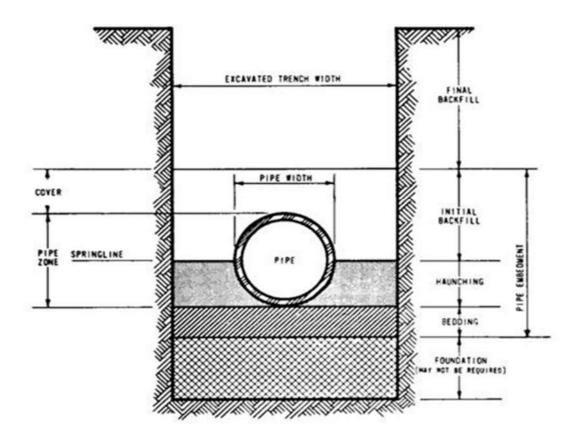
## c. Envelope Size.

- 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 Sheet 60 of 60 (6A) and X of X (6B)

## 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. All WW SCS Lines end with a Manhole
- 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. (Self explanatory, see item a above)
- 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. (Self explanatory)
- 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). (Self explanatory, see Item d above)
- 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 along with CoSM MH Details in Construction Documents
- f. The use of bricks to adjust a manhole cover to grade or construct a manhole is prohibited. (Self explanatory, See Details following these notes)
- 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 Maxim	um 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. (Self explanatory and not applicable)
- i. An intersection of three or more collection pipes must have a manhole. (Self explanatory and 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. (Self explanatory and 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)
- 1. 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 CoSM Specifications and Details within the plan sets.

- B. A manhole located within a 100-year flood plain must have a means of preventing inflow. (Self explanatory but not applicable for this project)
- C. A manhole cover construction must be constructed of impervious material. (Self explanatory, See Manhole Details)
- 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. (Self explanatory, See Manhole Details)

#### 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. (Self explanatory, see CoSM Details within plan sets.)
- 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 (Self explanatory, see CoSM Details within plan sets.)
- 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 (Self explanatory, but not applicable for this project)

- 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 (Self explanatory, but 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. (Self explanatory and maintained throughout the design of the SCS)
- 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. (Self Explanatory, see CoSM Details within plan sets.)
- H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. (Self Explanatory, see CoSM Details within plan sets.)
- m. The inclusion of steps in a manhole is prohibited. (Self Explanatory, steps are not included in CoSM manhole Details)
- 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. (Self Explanatory, see Details within plan sets.)
- 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: (Self Explanatory, MH's are vented every third MH)
  - 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. (Self Explanatory)

#### Precast Manhole Information is provided on the detail sheets as per COSM

## Attachment B – Justification & Calculations for Deviation in Straight Alignment without Manholes

N/A

## Attachment C – Justification for Variance from Maximum Manhole Spacing

N/A

Attachment D – Calculations for Slopes for Flows Greater than 10 Feet Per Second
N/A

## 5 - TCEQ - 0584 Attachments

Water Pollution Abatement Plan Application Form

# 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: Margaret Hickok					
Date: <u>9/22/2023</u>					
Signature of Customer/Agent:					
Margaret Hickob					
Regulated Entity Name: LA CIMA PHASE 6 & 8					

## Regulated Entity Information

1.	The type of project is:
	Residential: Number of Lots: 186 Residential: Number of Living Unit Equivalents: Commercial Industrial Other:
2.	Total site acreage (size of property): <u>55.02</u>
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		÷ 43,560 =	
Parking		÷ 43,560 =	
Other paved surfaces		÷ 43,560 =	
Total Impervious Cover		÷ 43,560 =	36.44

Total Impervious Cover  $\underline{36.44}$  ÷ Total Acreage  $\underline{55.02}$  X 100 =  $\underline{66.23}$ % Impervious Cover

- 5. Attachment A Factors Affecting Surface Water Quality. A detailed description of all factors that could affect surface water and groundwater quality that addresses ultimate land use is attached.
- 6. Only inert materials as defined by 30 TAC §330.2 will be used as fill material.

## For Road Projects Only

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

7.	Type of project:  TXDOT road project.
	County road or roads built to county specifications.  City thoroughfare or roads to be dedicated to a municipality.  Street or road providing access to private driveways.
8.	Type of pavement or road surface to be used:
	Concrete Asphaltic concrete pavement Other:
9.	Length of Right of Way (R.O.W.): feet.
	Width of R.O.W.: feet. $L \times W = $ $Ft^2 \div 43,560 Ft^2/Acre = acres.$
10.	Length of pavement area: feet.
	Width of pavement area: feet. L x W = $Ft^2 \div 43,560 Ft^2/Acre = acres$ . Pavement area acres $\div$ 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.

TCEQ Executive Director. Modificatio	padways that do not require approval from the ns to existing roadways such as widening than one-half (1/2) the width of one (1) existing TCEQ.
Stormwater to be generated	d by the Proposed Project
volume (quantity) and character (quantity) occur from the proposed project is at quality and quantity are based on the	er of Stormwater. A detailed description of the ality) of the stormwater runoff which is expected to stached. The estimates of stormwater runoff area and type of impervious cover. Include the pre-construction and post-construction conditions.
Wastewater to be generated	d by the Proposed Project
14. The character and volume of wastewater	r is shown below:
100% Domestic% Industrial% Commingled TOTAL gallons/day 41,850	41,850 Gallons/dayGallons/dayGallons/day
15. Wastewater will be disposed of by:	
On-Site Sewage Facility (OSSF/Septic	Tank):
will be used to treat and dispose dicensing authority's (authorized athe land is suitable for the use of the requirements for on-site sewarelating to On-site Sewage Faciliti  Each lot in this project/developments. The system will be designed	from Authorized Agent. An on-site sewage facility of the wastewater from this site. The appropriate agent) written approval is attached. It states that private sewage facilities and will meet or exceed age facilities as specified under 30 TAC Chapter 285 es. ent is at least one (1) acre (43,560 square feet) in by a licensed professional engineer or registered sed installer in compliance with 30 TAC Chapter
Sewage Collection System (Sewer Line	es):
to an existing SCS.	vastewater generating facilities will be connected vastewater generating facilities will be connected
<ul><li>☐ The SCS was previously submitted</li><li>☐ The SCS was submitted with this a</li><li>☐ The SCS will be submitted at a late be installed prior to Executive Dir</li></ul>	application. er date. The owner is aware that the SCS may not

$\boxtimes$ The sewage collection system will convey the wastewater to the <u>COSM</u> (name) Treatment Plant. The treatment facility is:	
Existing.  Proposed.	
16. All private service laterals will be inspected as required in 30 TAC §213.5.	
Site Plan Requirements	
Items 17 – 28 must be included on the Site Plan.	
17. $\square$ The Site Plan must have a minimum scale of 1" = 400'.	
Site Plan Scale: 1" = <u>200</u> '.	
18. 100-year floodplain boundaries:	
<ul> <li>Some part(s) of the project site is located within the 100-year floodplain. The floodplais shown and labeled.</li> <li>No part of the project site is located within the 100-year floodplain.</li> <li>The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA FIRM MAP 48209C0369F (9/2/2005)</li> </ul>	
19. The layout of the development is shown with existing and finished contours at appropriate, but not greater than ten-foot contour intervals. Lots, recreation centers, buildings, roads, open space, etc. are shown on the plan.	,
The layout of the development is shown with existing contours at appropriate, but no 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)	
<ul> <li>The wells are not in use and have been properly abandoned.</li> <li>The wells are not in use and will be properly abandoned.</li> <li>The wells are in use and comply with 16 TAC §76.</li> </ul>	
$igstyle \square$ 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:	
<ul> <li>✓ All sensitive geologic or manmade features identified in the Geologic Assessment as shown and labeled.</li> <li>✓ No sensitive geologic or manmade features were identified in the Geologic Assessment.</li> </ul>	are
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. 🔀	$ brack { m The}$ The drainage patterns and approximate slopes anticipated after major grading activities
23. 🔀	Areas of soil disturbance and areas which will not be disturbed.
24. 🔀	Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. 🗵	Locations where soil stabilization practices are expected to occur.
26. 🗵	Surface waters (including wetlands).
	] N/A
27. 🔀	Locations where stormwater discharges to surface water or sensitive features are to occur.
	There will be no discharges to surface water or sensitive features.
28. 🔀	Legal boundaries of the site are shown.
Adn	ninistrative Information
29. 🔀	Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
30. 🔀	Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

## TCEQ-0584

## **Attachment A - Factors Affecting Water Quality**

Potential sources of pollution that may be expected to affect the quality of the stormwater discharges from the construction site include the following:

- Soil erosion due to the clearing of the site for roads, buildings, and drainage structures.
- Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings.
- Hydrocarbons from asphalt paving operations.
- Miscellaneous trash and litter from construction.
- Concrete truck washout.

## **TCEQ-0584**

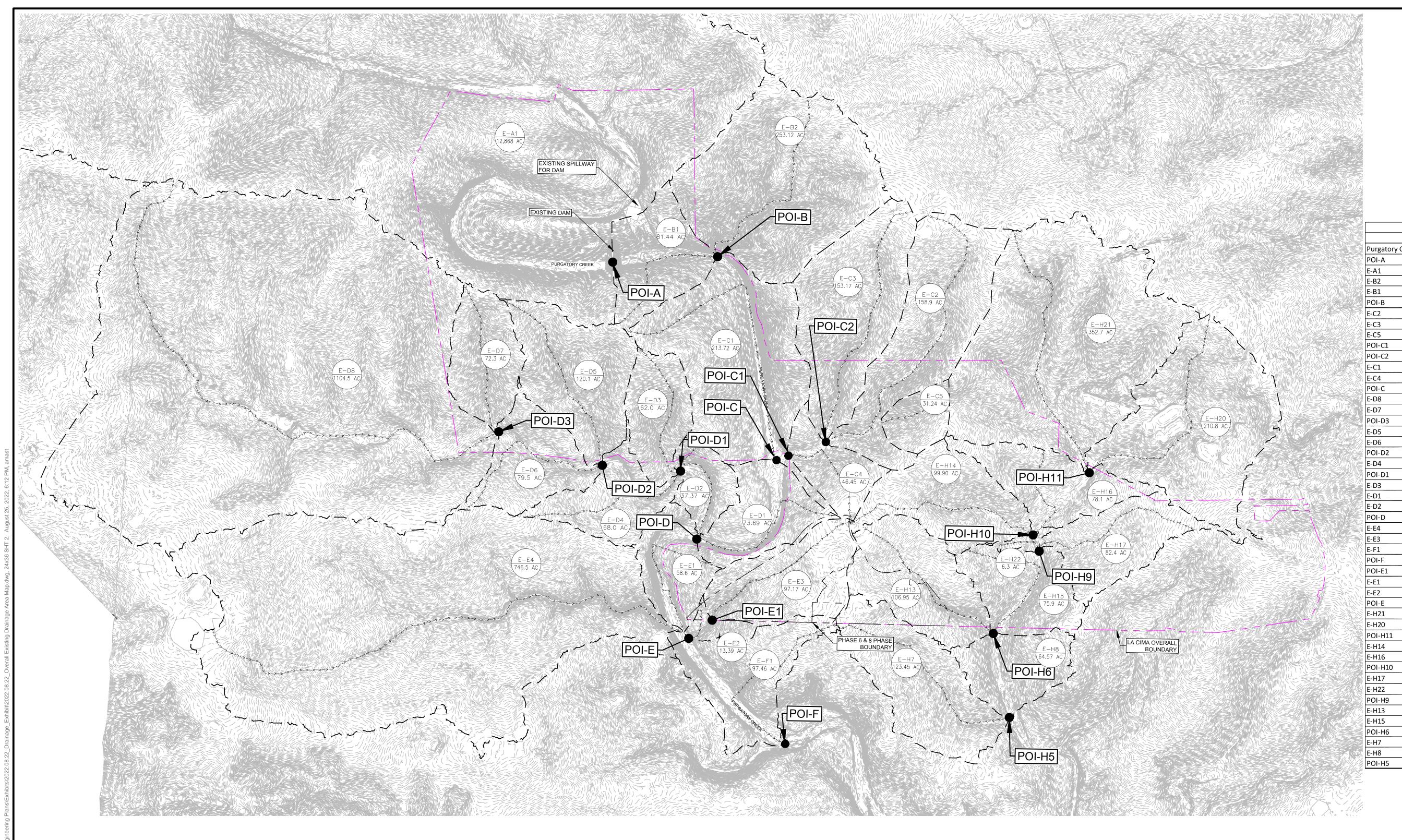
## Attachment B - Volume and Character of Storm Water

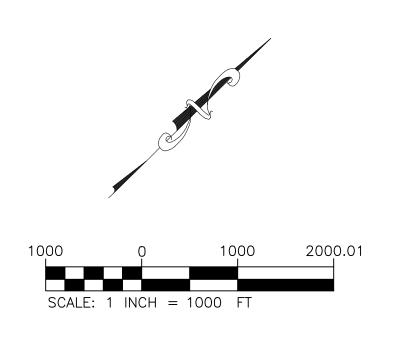
The site generally drains south with a ridge splitting the flows from this WPAP into three zones. The three zones of WPAP, Purgatory Creek-San Marcos River sub-watershed and Upper San Marcos River watershed, were analyzed with the La Cima Preliminary Drainage Report, dated August 25th, 2022. The discharges from two zones were analyzed at Point of Interest POI-H6 and a small portion of the site at Phase 6 discharges and were analyzed at Point of Interest POI-H5. Please refer to the attached exhibits for drainage area maps.

It is expected that the character of surface water and ground water runoff would be consistent with a development used for single family residential purposes. Constituents would include hydro-carbon-based product residues, silt, pesticides, and chemicals resulting from vehicular emissions and landscape maintenance.

Please see the summary table below for volumes of storm water.

Drainage Area ID	Q100 Existing (cfs)	Q100 Proposed (cfs)
H13	839.2	1149.4
H15	672.5	611.4
H7	974.9	1127.8
H8	573.3	478.6
POI-H6	7357.4	7126.7
POI-H5	8786.8	8447.4





	Pre	-Developed	Conditions HEC	HMS Results		
	AREA(AC)	AREA(MI2)	2-YEAR (CFS)	10-YEAR (CFS)	25-YEAR (CFS)	100-YEAR (CFS)
Purgatory Creek Dam	12868.00	20.11	385.1	1168.8	6813.2	21111.4
POI-A	12868.00	20.11	385.1	1168.8	6813.2	21111.4
E-A1	12868	20.11	6771.3	14605.6	20891.8	33025.1
E-B2	253.12	0.40	442	945.1	1344.9	2112.6
E-B1	81.44	0.13	155.1	322.9	454.9	706.7
POI-B	13202.56	20.64	693.7	1464.3	6886.2	21287.5
E-C2	158.90	0.25	183.4	396.7	567.3	895.1
E-C3	153.17	0.24	179.5	389.6	557.8	881.3
E-C5	31.24	0.05	62.6	135	192.5	302.6
POI-C1	389.76	0.61	441.9	954.6	1364.4	2151.6
POI-C2	343.31	0.54	385.2	834.4	1193.4	1884.4
E-C1	213.72	0.33	234.9	504	718.6	1130.6
E-C4	46.45	0.07	62.4	131.6	186.5	291.6
POI-C	13806.04	21.58	1179.7	2518	7032	21635.7
E-D8	1104.50	1.73	1526.2	3255.8	4631.1	7268.8
E-D7	72.30	0.11	103.7	244.4	359.5	584.1
POI-D3	1176.80	1.84	1597.1	3418.9	4868.3	7651.6
E-D5	120.10	0.19	173.9	409.6	602.5	978.5
E-D6	79.50	0.12	143.6	292.3	408.8	631.1
POI-D2	1376.40	2.15	1848.4	3975.6	5672.4	8934.2
E-D4	68.00	0.11	124.1	259.5	366.2	570.7
POI-D1	1506.40	2.36	2052.2	4404	6279.4	9884.8
E-D3	62.00	0.10	131.9	267.6	374	576.6
E-D1	73.69	0.10	106.3	224.8	318.5	497.7
E-D2	37.37	0.06	73.3	155.5	220.6	345
POI-D	15312.44	24.10	3379.9	7246.6	10312.1	22502.6
E-E4	746.50	1.17	1000.7		3045.9	4785.4
E-E3	97.17	0.15	146.7	319.9	458.6	725.4
E-F1	97.46	0.15	161.8	346	492.8	774.1
POI-F	15647.06	25.68	4725.9	10136.8	14432.9	23051.9
POI-E1	97.17	0.15	146.7	319.9	458.6	725.4
E-E1	58.60	0.09	91	195	277.5	435.9
E-E2	13.39	0.03	21.5	51	75.3	122.6
POI-E	15549.60	25.53	4600.5	9857.9	14028.8	23002.4
E-H21	352.70	0.55	524.1	1123.3	1602	2521.8
E-H20	210.80	0.33	361.8	738.6	1035.3	1602.2
POI-H11	563.50	0.88	884.5	1858.9	2634.2	4120.8
E-H14	99.90	0.16	148.9	309.6	436.3	678.7
E-H16	78.10	0.10	139.4	306.9	440.9	698.3
POI-H10	741.50	1.16	1125.5	2373.4	3364	5266
E-H17	82.40	0.13	151.6	319.4	452.1	705.8
E-H22	6.30	0.13	13.4	28.7	41	64.3
POI-H9	830.20	1.30	1270.6	2681.6	3801.8	5951.1
E-H13	106.95	0.17	162.1	363.3	525.8	839.2
E-H15	75.90	0.17	133.9	295	424.2	672.5
POI-H6	1013.05	1.59	1541.7	3287.5	4682	7357.4
E-H7	123.45	0.19	191.6	425.5	613.4	974.9
E-H8	64.57	0.19	117	254	363	573.3
POI-H5	1201.07	1.88	1821.1	3911.3	5581.1	8786.8
. 01 110	1201.07	1.00	1021.1	5,711.5	JJ01.1	0700.8

# PROPERTY BOUNDARY

PROPOSED LOT LINE ---- EASEMENT LINE PROPOSED CURB & GUTTER —830 — EXISTING MAJOR CONTOUR \_\_\_\_ EXISTING MINOR CONTOUR

--- EXISTING DRAINAGE AREA

LEGEND

 $\longrightarrow$ >->->->->- TIME OF CONCENTRATION  $\begin{pmatrix} xx \\ xx.xx \end{pmatrix}$ 

DRAINAGE AREA IDENTIFIER

DETENTION STUDY-POINT OF ANALYSIS POI-B

# **EXHIBIT A**

OVERALL EXISTING DRAINAGE AREA MAP LA CIMA PHASE SUBDIVISION

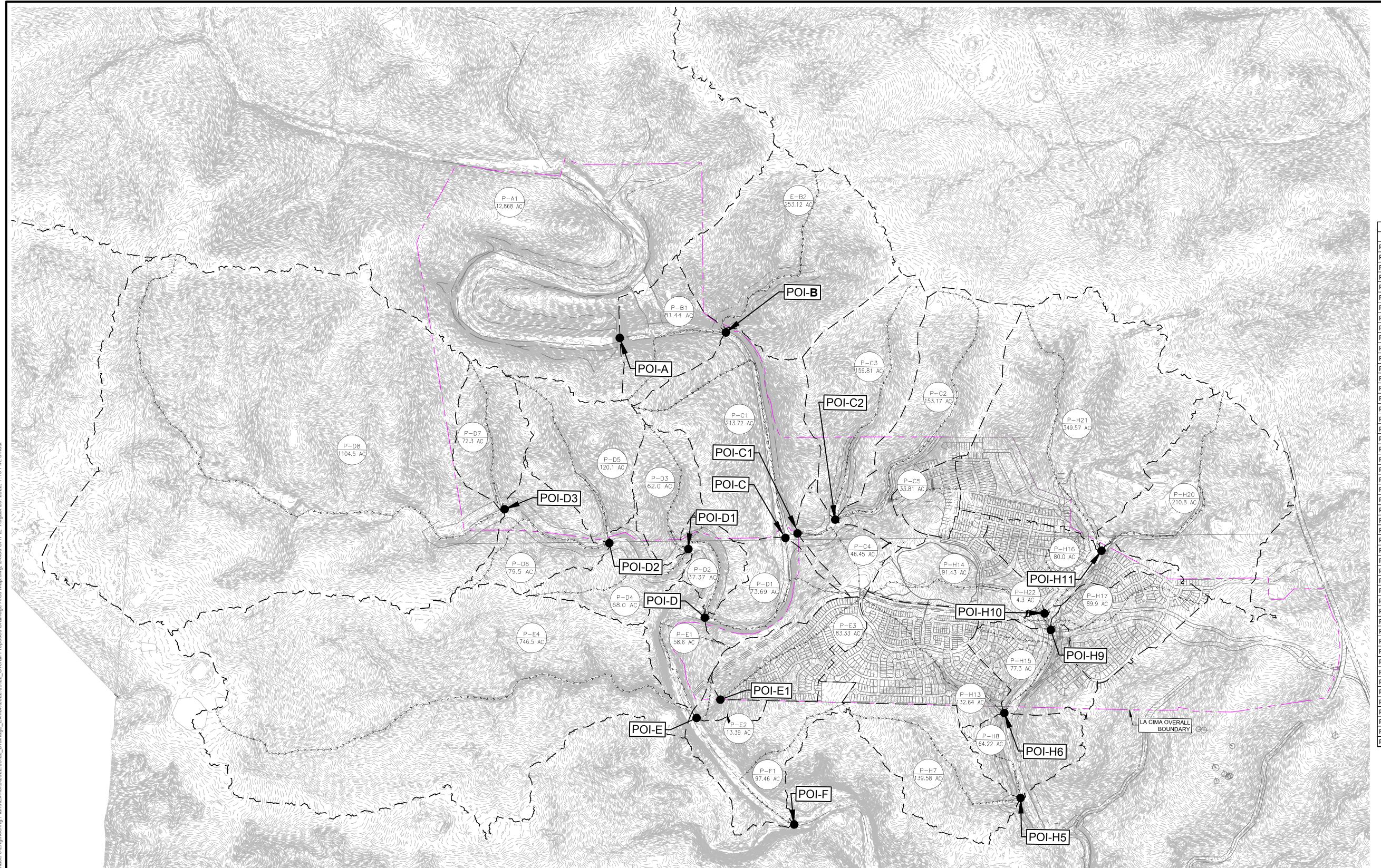


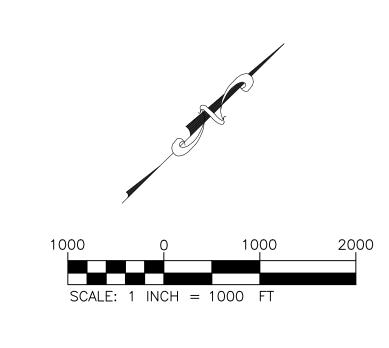
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THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW, MARK-UP, AND/OR DRAFTING UNDER THE AUTHORITY OF NICHOLAS G. KEHL, P.E. #104450
ON AUGUST 25 2022.
IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

August 25, 2022

SHEET 1 OF 2





			tions HEC HM	·		
	AREA(AC)	, ,	· · · · · ·	10-YEAR (CFS)	25-YEAR (CFS)	100-YEAR (CFS)
Purgatory Creek Dam	12868	20.11		1168.8	6813.2	21111.4
POI-A	12868	20.11		1168.8	6813.2	21111.4
P-A1	12868	20.11			20891.8	
P-B2	253.12	0.40		945.1	1344.9	2112.5
P-B1	81.44	0.13	155.1	322.9	454.9	706.7
POI-B	13202.86	20.64	694.3	1464.8	6886.2	21287.4
P-C2	153.17	0.24	176	380.9	545.2	859.3
P-C3	159.81	0.25	187	405.8	581.1	918.2
P-C5	33.81	0.05	76	151.7	211.7	326.6
POI-C1	393.24	0.61	441	950.4	1358	2139.3
POI-C2	346.79	0.54	384.1	830	1186.9	1872.1
P-C1	213.72	0.33	253.8	522.3	735.6	1145.4
P-C4	46.45	0.07	62.4	131.6	186.5	291.6
POI-C	13809.82	21.58	1194.4	2520	7032.8	21636.9
P-D8	1104.50	1.73	1527.2	3257.8	4634.3	7273.5
P-D7	72.30	0.11	102.3	241.1	355.2	576.9
POI-D3	1176.80	1.84	1599.5	3424.6	4876.5	7665.7
P-D5	120.10	0.19	175.7	413	608.3	988.2
P-D6	79.50	0.12	143.1	291.5	407.5	629.2
POI-D2	1376.40	2.15	1849.9	3978.9	5676.9	8941.7
P-D4	68.00	0.11	125.8	263.3	371.7	578.7
P-D3	62.00	0.10	133.1	270.6	378	582.5
POI-D1	1506.40	2.36	2051.4	4402.5	6278.5	9882.7
P-D1	73.69	0.11	116.2	245.5	379.7	593.5
P-D2	37.37	0.06	73.3	155.5	220.6	345
POI-D	15427.28	24.11	3403.6	7273.6	10368.7	22511.3
P-E4	746.50	1.17	1000.7	2140	3045.9	4785.4
P-E3	83.33	0.13	123.9	234.5	321.9	490
P-F1	97.46	0.15			507.2	795.8
POI-F	16426.56				<del> </del>	
POI-E1	83.33	0.13		***************************************	321.9	
P-E1	58.60	0.09	91.8	196.5	279.8	
P-E2	13.39	0.02	21.5		75.3	
POI-E	16329.10	25.52	4588.5		13894.1	22999.5
P-H21	349.57	0.55			1784.9	
P-H20	210.80	0.33			1025.7	1593.3
POI-H11	560.37	0.88		1991.8	2802.7	4356.7
P-H14	91.43	0.14		323.9	447.2	683.2
P-H16	80.00	0.13		358.6	477.3	
POI-H10	731.80	1.15		2669.5	3721.3	
Regional Detention Pond CP	731.80	1.15			2015	5033.6
P-H17	89.90	0.14		328.7	453	691.2
P-H22	4.30	0.01	13.7	27.2	37.9	
POI-H9	826.00	1.30		989.2	2295.7	5700.7
P-H13	132.64	0.20		541.5	767.3	
P-H15	77.30	0.20		283.4	395.6	
P-H12	1035.94	1.62	1080.8	283.4 1772.9	2849.7	7126.7
P-H7	139.58			402.7	709.5	
P-H8	64.22	0.18		211.5	302.9	
POI-H5	1239.74	1.90	1350.8	2374.8	3362.5	8447.4

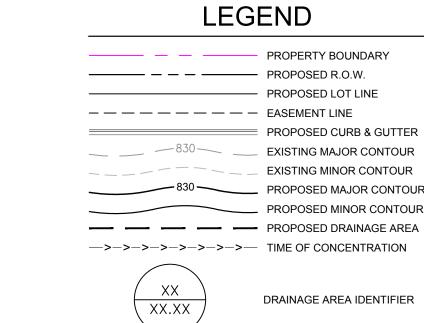
POI-E1	AREA(AC)	AREA(MI2)	2-YEAR	10-YEAR	25-YEAR	100-YEAR
Pre-Developed	97.170	0.150	146.70	319.90	458.60	725.40
Developed	83.330	0.130	123.90	234.50	321.90	490.00
Δ	-13.84	-0.020	-22.80	-85.40	-136.70	-235.40

POI-E	AREA(AC)	AREA(MI2)	2-YEAR	10-YEAR	25-YEAR	100-YEAR
Pre-Developed	16339.460	25.530	4600.50	9857.90	14028.80	23002.40
Developed	16329.100	25.520	4588.50	9763.80	13894.10	22999.50
Δ	-10.36	-0.010	-12.00	-94.10	-134.70	-2.90

POI-F	AREA(AC)	AREA(MI2)	2-YEAR	10-YEAR	25-YEAR	100-YEAR
Pre-Developed	16436.920	25.680	4725.90	10136.80	14432.90	23051.90
Developed	16426.560	25.670	4712.30	10036.50	14292.10	23048.90
Δ	-10.36	-0.010	-13.60	-100.30	-140.80	-3.00

POI-H6	AREA(AC)	AREA(MI2)	2-YEAR	10-YEAR	25-YEAR	100-YEAR
Pre-Developed	1013.050	1.590	1541.70	3287.50	4682.00	7357.40
Developed	1035.940	1.620	1080.80	1772.90	2849.70	7126.70
Δ	22.89	0.030	-460.90	-1514.60	-1832.30	-230.70

POI-H5	AREA(AC)	AREA(MI2)	2-YEAR	10-YEAR	25-YEAR	100-YEAR
Pre-Developed	1201.070	1.880	1821.10	3911.30	5581.10	8786.80
Developed	1239.740	1.900	1350.80	2374.80	3362.50	8447.40
Δ	38.67	0.020	-470.30	-1536.50	-2218.60	-339.40





# **EXHIBIT B**

OVERALL PROPOSED DRAINAGE AREA MAP LA CIMA PHASE SUBDIVISION



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ON AUGUST 25 2022.
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August 25, 2022

SHEET 2 OF 2

## Attachment C – Suitability Letter from Authorized Agent

## N/A

# Attachment D - Exception to the required Geological Assessment

## N/A

# 6 - TCEQ - 0602 Attachments

Temporary Stormwater Section

# **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: Margaret Hickok

Date: 9/22/2023

Signature of Customer/Agent:

Margaret Hickok

Regulated Entity Name: LA CIMA PHASE 6 & 8

## **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.

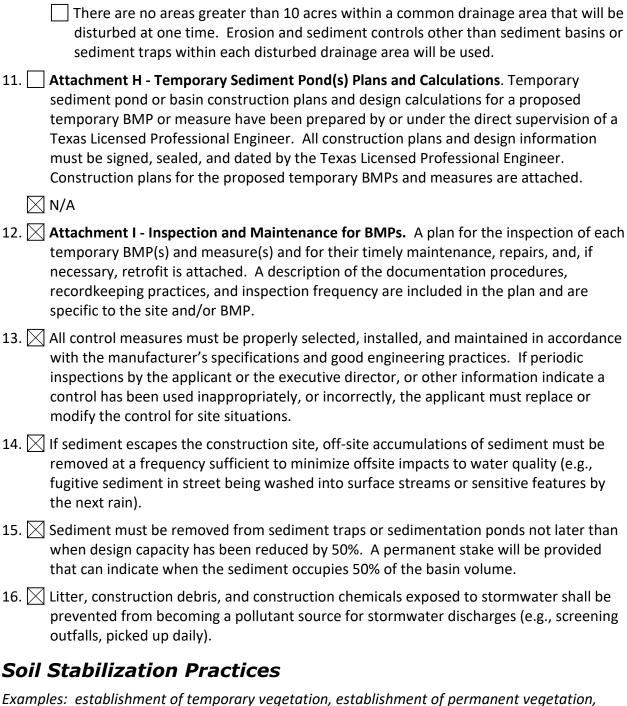
	<ul> <li>Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.</li> <li>Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.</li> </ul>
	igstyle igstyle 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.
S	equence 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.
	<ul> <li>For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.</li> <li>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.</li> </ul>
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: Purgatory Creek

## Temporary Best Management Practices (TBMPs)

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

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

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



mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, or preservation of mature vegetation.

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

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

# Administrative Information

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

#### Attachment A – Spill Response Actions

The objective of this section is to describe measures to prevent or reduce the discharge of pollutants to drainage systems or watercourses. Measures include reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

The following steps will help reduce the stormwater impacts of leaks and spills:

#### Education

- (1) Be aware that different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills. Employees should also be aware of when spill must be reported to the TCEQ. Information is 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 a 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, 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 is 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 BMP's.
- (9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
- (10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.

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

#### Cleanup

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

#### **Minor Spills**

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

#### Semi-Significant Spills

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

Spills should be cleaned up immediately using the following steps:

- (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 spreadwidely.
- (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

- (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 : <a href="http://www.tceq.texas.gov/response/">http://www.tceq.texas.gov/response/</a>

#### 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 runoff 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 drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- (5) Place drip pans or absorbent materials under paving equipment when not in use.
- (6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
- (7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- (8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over the 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 of 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.

#### Attachment B - Potential Sources of Contamination

Potential Source: Oil, grease, fuel, and hydraulic fluid contamination from

construction equipment and vehicle drippings

Preventative Measure: Vehicle maintenance, when possible, will be performed within the

construction staging areas.

Potential Source: Miscellaneous trash and litter from construction

Preventative Measure: Trash containers will be placed throughout the site to encourage

proper trash disposal.

Potential Source: Construction debris

Preventative 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: Asphalt products used on this project

Preventative Measure: After placement of asphalt, emulsion or coatings, the contractor

will be responsible for immediate cleanup, should an unexpected rain occur. For the duration of the asphalt curing time, the

rain occur. For the duration of the asphalt curing time, the contractor will maintain standby personnel and equipment to contain any asphalt wash-off, should an unexpected rain occur. The contractor will be instructed not to place asphalt products on

the ground within 48 hours of a forecasted rain event

#### Attachment C - Sequence of Major Activities

The sequence of major activities will be divided into two stages: Site Preparation and Subdivision Construction. For all activities listed below, Erosion and Sediment control measures have been included in the construction plans to lessen the impact of disturbed soils during the major activities in construction. Please refer to these sheets in the Construction Drawings for more detailed information.

# **Site Preparation:**

- Clearing and grubbing of vegetation
- Removal of existing pavement

#### **Subdivision Construction:**

- Excavate for roadway improvements
- Utility trenching and installation, including water, wastewater, and stormsewers.
- Final grading in right-of-ways
- · Grading for Water quality ponds
- Revegetate all disturbed areas

#### Attachment D – Temporary Best Management Practices and Measures

Only a small amount of upgradient water will need to be intercepted and will be carried by a channel along the existing Central Park Loop Road, which is located within the Phase 6 Limits of Construction. Silt fences and rock berms will be placed along the channel. Temporary measures are intended to provide a method of slowing the flow or runoff from the construction site in order to allow sediment and suspended solids to settle out of the water. By containing the sediment and solids within the site, they will not enter surface streams and/or sensitive features. BMP measures utilized in this plan are intended to allow storm water to continue downstream after passing through for treatment. This will allow stormwater runoff to continue downstream to any existing sensitive features.

#### Site Preparation:

The clearing and grading of the land will disturb the largest area of soil, so erosion control measures will be installed as the first step in construction. The methodology for pollution prevention of all on-site stormwater will include a) the erection of silt fences along the downgradient boundary of the construction activities, b) installation of rock berms with silt fence covering downgradient from areas of concentrated stormwater flow, c) installation of stabilized construction entrances to reduce the dispersion of sediment from the site, and d) installation of a construction staging area.

### Construction:

All installed erosion control measures will be inspected, and if necessary, repaired before any additional construction begins, as well as periodically throughout the construction process. The contractor will be responsible for all maintenance of erosion control measures, as well as the installation of all remaining on-site control measures, including the concrete truck washout, as necessary.

# Attachment E - Request to Temporarily Seal a Feature, if sealing a feature

N/A

#### **Attachment F – Structural Practices**

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

- Silt fences along the downstream boundary of all construction activity, and rock berms with silt fence covering for secondary protection
- Installation of stabilized construction entrances and construction stagingareas
- Installation of concrete truck washout pits, as required

# Attachment G – Drainage Map

# SEE CONSTRUCTION PLANS

# Attachment H - Temporary Sediment Pond(s) Plans and Calculations

N/A

#### Attachment I – Inspection and Maintenance for BMPs

#### Inspections

Designated and qualified person(s) shall inspect BMPs every seven days, 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 the Storm Water TPDES data for a period of three years after the date of the inspection. A copy of the Inspection Report Form is provided in the 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.

SWPPP Inspection Re	eport
Project Name:	Date of Inspection:
nspection Frequency: (Every 7 Days, 14 Days, or Post Rain	)
Post Significant Rainfall: N/A / Rainfall Amount:	
s inspector qualified to perform inspections? Yes	
Are inspector qualifications present in SWPPP? Yes	
Vas the entire site inspected?	
If no, please list conditions limiting the scope of the	inspection:
General Notes:	
Please note if the following areas or controls were observed  Do the following items comply with SWPPP regulation?	Yes/No or Note Corrective Action Taken
Copy of the NOI with the SWPPP?	
Construction Site Notice posted at entrance(s) to site?	
Copy of the NOI at the site entrance?	
Do storage areas show signs of erosion?	
Do disturbed areas show signs of erosion?	
Are there signs of erosion at outfalls?	
BMPs working properly? (If no, make list of issue locations in area of concern/corrective action section below)	

Do BMPs need maintenance? (If yes, make a detailed list of issue locations in area of concern/corrective action seciton below.

Are new BMPs required on-site?

Did the site map/BMP map get updated?

# **SWPPP Inspection Report**

Control		Compliant (Yes - No - N/A)
General		
Revegetation		
Silt Fence		
Rock Berm		
Sediment Traps		
Tree Protection		
Site Stabilization		
Detention and/or Water Quality Pond		
Stabilized Construction Entrance		
Concrete Washout		
Spoils/Materials Site		
Drainage Channels		
Outfall/Outlet Protections		
Inlet Protections		
No Off-site Discharge		
Equipment Area		
Trash receptacles		
Construction Debris		
Infrastructure		
Roadway clearing		
Utility clearing		
Roadway grading		
Utility construction		
Drainage construction		
Roadway base		
Roadway surfaces		
Site cleanups		
Inspector Qualifications: By my signature below, I certify that SWPPP.	all terms are acceptable ar	nd the project site is in compliance with
Inspector's Name	Inspector's Signature	
Name of Owner/Operator (Firm)	Date	<del></del>

# **SWPPP Inspection Report**

# **Project Milestone Dates**

Date when major site grading activities begin:			
Construction Activity		<u>Date</u>	
	_		
	-		
	_		
	_		
	<del>-</del> -		
Dates when construction activities temporarily or pe	ermanently	cease on all or a portion of the	project
Construction Activity		<u>Date</u>	
	-		
	_		
	_		
	_		
	-		
	_		
Dates when stabilization measures are initiated:			
Stabilization Activity		<u>Date</u>	
	_		
	_		
	_		
	_		

#### Attachment J – Schedule of Interim and Permanent Soil Stabilization Practices

#### STABILIZATION PRACTICES

Installation and utilization of stabilization measures will begin as soon as practicable in any portion of the site where construction activities have either temporarily or permanently ceased. Stabilization measures must be initiated immediately, where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. The term "immediately" is used to define the deadline for initiating stabilization measures. In the context of this requirement, "immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth- disturbing activities have temporarily or permanently ceased. Temporary / Interim stabilization methods should be utilized in situations where development and/or construction practices have ceased temporarily, and permanent stabilization methods should be utilized after development and/or construction activities have been completed.

Disturbed areas to receive paving, landscape treatment and turfing shall be covered by erosion control blankets. All other rough graded slopes, disturbed ground surfaces and discharge channels shall receive seeding with native seed mix and then covered by erosion control blankets or straw mulching or other approved BMP. Stockpile materials shall be seeded and covered by soil erosion blankets. A storm water perimeter control device shall be established at a minimum distance of 10 feet from the toe of the stockpile. The materials excavated from utility trenching shall be protected from up gradient storm run- on. The excavated materials shall be covered by erosion control blankets.

#### **TEMPORARY STABILIZATION**

Temporary (Interim) Stabilization

Seed Specification: INTERIM SEEDING: N/A

**Temporary vegetation** - establishment of natural grassy areas that are intended to I be redisturbed during later phases of construction or development. Temporary vegetation is usually accomplished by spreading rapidly growing grasses via the process of hydro-seeding or hydro-mulching.

**Mulching** - the process of spreading a ground layer of chipped wood or brush to protect disturbed and unstable topsoil against erosion by storm water runoff by slowing run-off velocities, promoting sediment deposition, filtering sediment, and promoting increased ground infiltration rates. Mulching also provides the added benefits of reducing soil water loss, which is beneficial when attempting to establish newly planted vegetation. Applied in thicker layers and the size of mulch chips, mulching can also be used to prevent erosion on areas of steeper slope.

**Geo-textiles** - Geo-textiles (i.e. fiber matting, coir, filter fabrics) are porous materials or ground coverings which allow storm water run-off to pass through, but block the passage of most sediment and larger suspended particles. Geo-textiles matting can be used on newly seeded slopes to lessen seed and soil loss, or next to riprap to prevent run-off from washing out the soil beneath.

**Vegetative buffer strips** - areas where vegetation has been left undisturbed or where vegetation has been re-established, typically in long, narrow strips. Buffer strip areas retard the speed of storm water runoff, promote sediment filtration, increase ground infiltration, and improve site aesthetics. Vegetative buffer strips are extremely effective on steep, unstable slopes, or within floodplains, and along the bank slopes of waterways.

**Tree Protection** - is a required practice by most regulatory agencies. Only trees of certain sizes are required to be protected. Refer to your specific governing jurisdiction for specific regulations. However, even if tree protection is not a required, regulated practice it is still and important and cost effective erosion control method. (reference: **Preservation of mature vegetation** for specific details)

Preservation of mature vegetation - provides a natural buffer zone and promotes improved storm water run-off quality by helping minimize topsoil erosion as well as providing cost effective aesthetic benefits. Established, mature vegetation can withstand and tolerate heavier storm events than newly planted vegetation, due to a deeper, more established root system. It is necessary that preservation of existing, mature vegetation be planned for in advance of site construction. Areas to be preserved should be clearly marked and possibly even barricaded to prevent damage during construction.

Interim Stabilization Practices:	When Implemented:	Located:	Purpose:	In Use:
Temporary Vegetation	Throughout site development	N/A	Temporary vegetation growth is recommended to reduce soil erosion in areas that are not actively under development.	NO
Mulching	Throughout site development	N/A	Mulching is utilized to reduce topsoil erosion and to prevent soil water loss. This method can be used in planted/landscaped areas to prevent soil movement and water loss until vegetation is established.	NO

Geo-textiles	Throughout site development	N/A	Geo-textiles (i.e. matting, Curlex) can be used to temporarily stabilize soil in areas where it is not feasible to utilize mulching or temporary vegetation.	NO
Vegetative Buffer Strips	Throughout site development	Located at perimeters of the site and along natural creek beds	Vegetative buffer strips will be utilized throughout the site for both drainage and aesthetic purposes, as well as for the secondary benefits of improved water quality due to sediment deposition and improved infiltration.	YES
Tree Protection	Throughout site development	Located around all desirable trees to be retained, per plan	Desirable trees throughout the site are to be protected during and after construction to promote both water quality and aesthetics.	YES
Preservation of Existing Mature Vegetation	Throughout site development	Desirable existing vegetation to be preserved throughout the site, per plan	Desirable existent mature vegetation (i.e. under-story) is to be preserved throughout the site to promote water quality via sediment deposition and improved infiltration.	YES

PERMANENT STABILIZATION: Permanent drainage structures, including concrete curbs and gutters, concrete pavement, asphalt pavement, drainage swales, drainage ditch, turfing, vegetative strips, concrete culvert and pipe culvert will provide permanent erosion control at this project site. After initial stabilization, the Contractor shall inspect the site once a month until project acceptance as been granted by the Customer Representative/Contract Manager. Unsatisfactory stabilized areas shall be future stabilized at the request of the Customer Representative/Contract Manager. Final or permanent stabilization shall be in accordance with the specification sections: [2300 Earthwork], [02916 Mulching for erosion control],[02921 Seeding],[02922 Sodding],[02923 Sprigging],[02919 Top soil], [02924 Seeding] and [02925or 02926 Establishment of Turf].

**Seed Specification**: PERMANENT SEEDING: Permanent stabilization to be according to site specific re- stabilization / landscape plan and / or the San Antonio Ordinances.

**Permanent vegetation** - the process of establishing a permanent vegetative ground cover that helps reduce topsoil erosion by holding and stabilizing soil particles, which in turn slows storm water run-off velocity, promotes ground infiltration, promoting sediment deposition, and by providing secondary aesthetic benefits. Permanent vegetation is established by planting and seeding in areas where the soil needs stabilization due to existing soil structure, texture, or steeper grade slopes. Permanent vegetation can include trees, grasses and shrubs.

**Mulching** - the process of spreading a ground layer of chipped wood or brush to protect disturbed and unstable topsoil against erosion by storm water runoff by slowing run-off velocities, promoting sediment deposition, filtering sediment, and promoting increased ground infiltration rates. Mulching also provides the added benefits of reducing soil water loss, which is beneficial when attempting to establish newly planted vegetation. Applied in thicker layers and the size of mulch chips, mulching can also be used to prevent erosion on areas of steeper slope.

**Geo-textiles** - Geo-textiles (i.e. fiber matting, coir, filter fabrics) are porous materials or ground coverings which allow storm water run-off to pass through, but block the passage of most sediment and larger suspended particles. Geo-textiles matting can be used on newly seeded slopes to lessen seed and soil loss, or next to riprap to prevent run-off from washing out the soil beneath.

**Sod stabilization** - the practice of installing grass sod strips or squares over a disturbed or unprotected topsoil surface to provide instant protection of soil from the erosive forces of storm water run-off. Sod stabilization is an effective and feasible practice in areas where construction activities are complete increasing the chances that the grass cover will have the opportunity to become established. This measure requires maintenance such as the installation of sub-sod topsoil and frequent watering to promote sod growth.

**Hydro-mulch/seeding stabilization** - the practice of applying seed mixtures hydraulically with paper or wood mulch material over a disturbed or unprotected topsoil surface to provide vegetative protection of soil from the erosive forces of storm water run-off. Hydro-mulch/seeding stabilization is an effective and feasible practice in areas where construction activities are complete increasing the chances that the grass cover will have the opportunity to become established. This measure requires maintenance such as the placement of topsoil and frequent watering to promote sod growth.

**Vegetative buffer strips** - areas where vegetation has been left undisturbed or where vegetation has been re-established, typically in long, narrow strips. Buffer strip areas retard the speed of storm water runoff, promote sediment filtration, increase ground infiltration, and improve site aesthetics. Vegetative buffer strips are extremely effective on steep, unstable slopes, or within floodplains, and along the bank slopes of waterways

**Paved or impervious surfaces** - provides permanent stabilization by protecting soil from exposure of impact erosion by rainfall with a layer of concrete, asphalt or other impervious cover.

**Preservation of mature vegetation** - provides a natural buffer zone and promotes improved storm water run-off quality by helping minimize topsoil erosion as well as providing cost effective aesthetic benefits. Established, mature vegetation can withstand and tolerate heavier storm events than newly planted vegetation, due to a deeper, more established root system. It is necessary that preservation of existing, mature vegetation be planned for in advance of site construction. Areas to be preserved should be clearly marked and possibly even barricaded to prevent damage during construction.

Permanent Stabilization Practices:	When Implemented:	Located:	Purpose:	In Use:
Permanent Vegetation (i.e. grasses, shrubbery, trees)	Installed during the last phase of site development	To be located throughout site, per plan	Installation of permanent vegetation is a method of reducing and preventing soil erosion, improved infiltration and increases site aesthetics.	YES
Mulching	Installed during the last phase of site development	N/A	Mulching is utilized to reduce topsoil erosion and to prevent soil water loss. This method can be used in planted/landscaped areas to prevent soil movement and water loss until vegetation is well established.	NO
Geo-textiles	Installed during the last phase of site development	To be located in areas of significant soil disturbance	Geo-textiles are utilized to reduce soil erosion and promote vegetation growth in high slope and/or high water flow areas.	NO
Sod Stabilization	Installed during the last phase of site development	To be located throughout the site, per landscaping plan	Sod stabilization is used to establish a complete and instant vegetative ground cover in an effort to prevent topsoil erosion.	YES
Hydro- mulch/Seeding	Installed during the last phase of site development	To be used throughout the site, per landscaping plan	Hydro-mulch/seeding stabilization is used to establish a complete vegetative ground cover in an effort to prevent topsoil erosion.	YES
Stabilization				
Vegetative Buffer Strips	Installed during the last phase of site development	To be located at perimeter of site	Vegetative buffer strips will be utilized throughout the site for both drainage and aesthetic purposes, as well as for the secondary benefits of improved water quality due to sediment deposition and improved infiltration.	YES
Paved and/or Impervious Surfaces	Installed during the last phase of site development	Throughout the site	Areas where structural concrete are located within the site; minimize and prevent erosion at those locations	YES
Preservation of Existing Mature Vegetation	Installed during the last phase of site development	Located at perimeters of site	Desirable existent mature vegetation (i.e. under-story) is to be preserved throughout the site to promote water quality via sediment deposition and improved infiltration.	YES

# 7 - TCEQ - 0600 Attachments

Permanent Stormwater Section

# **Permanent Stormwater Section**

**Texas Commission on Environmental Quality** 

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

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

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

# Signature

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

Print Name of Customer/Agent: Margaret Hickok Date: 9/22/2023 Signature of Customer/Agent Regulated Entity Name: LA CIMA PHASE 6 & 8

# Permanent Best Management Practices (BMPs)

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

1.	Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.
	□ N/A
2.	These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.
	The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

	A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is:
	□ N/A
3.	Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.
	□ N/A
4.	Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
	<ul> <li>☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.</li> <li>☐ The site will be used for low density single-family residential development but has</li> </ul>
	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 multifamily 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.
	<ul> <li>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.</li> <li>□ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.</li> <li>□ The site will not be used for multi-family residential developments, schools, or small</li> </ul>
6.	business sites.  Attachment B - BMPs for Upgradient Stormwater.
O.	INTALIGUILLE - DIVIESTUL VURTAUIELL SWITHWALEL.

	<ul> <li>A description of the BMPs and measures that will be used surface water, groundwater, or stormwater that originate and flows across the site is attached.</li> <li>No surface water, groundwater or stormwater originates</li> </ul>	es upgradient from the site
	and flows across the site, and an explanation is attached.  Permanent BMPs or measures are not required to prever water, groundwater, or stormwater that originates upgra	nt pollution of surface
7.	flows across the site, and an explanation is attached.  Attachment C - BMPs for On-site Stormwater.	
٠.		
	A description of the BMPs and measures that will be used surface water or groundwater that originates on-site or for pollution caused by contaminated stormwater runoff from Permanent BMPs or measures are not required to prever or groundwater that originates on-site or flows off the sit caused by contaminated stormwater runoff, and an explain	lows off the site, including m the site is attached. It pollution of surface water ie, including pollution
8.	Attachment D - BMPs for Surface Streams. A description of t that prevent pollutants from entering surface streams, sensit is attached. Each feature identified in the Geologic Assessment addressed.	tive features, or the aquifer
	□ N/A	
9.	.   The applicant understands that to the extent practicable, BM maintain flow to naturally occurring sensitive features identians assessment, executive director review, or during excavation,	fied in either the geologic
	<ul> <li>The permanent sealing of or diversion of flow from a nature feature that accepts recharge to the Edwards Aquifer as a abatement measure has not been proposed.</li> <li>Attachment E - Request to Seal Features. A request to seal features.</li> </ul>	a permanent pollution
	sensitive feature, that includes, for each feature, a justific reasonable and practicable alternative exists, is attached	cation as to why no
10.	O. Attachment F - Construction Plans. All construction plans are the proposed permanent BMP(s) and measures have been predirect supervision of a Texas Licensed Professional Engineer, dated. The plans are attached and, if applicable include:	repared by or under the
	<ul> <li>✓ Design calculations (TSS removal calculations)</li> <li>✓ TCEQ construction notes</li> <li>✓ All geologic features</li> <li>✓ All proposed structural BMP(s) plans and specifications</li> </ul>	
	□ N/A	

11. Attachment G - Inspection, Maintenance, Repair and Retrofit Plan. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
<ul> <li>✓ Prepared and certified by the engineer designing the permanent BMPs and measures</li> <li>✓ Signed by the owner or responsible party</li> <li>✓ Procedures for documenting inspections, maintenance, repairs, and, if necessary</li> </ul>
retrofit  A discussion of record keeping procedures
□ N/A
12. Attachment H - Pilot-Scale Field Testing Plan. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
⊠ N/A
13. Attachment I -Measures for Minimizing Surface Stream Contamination. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
□ N/A
Responsibility for Maintenance of Permanent BMP(s)
Responsibility for maintenance of best management practices and measures after construction is complete.
14. The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
□ N/A
15. A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
□ N/A

Attachment A - 20% or Less Impervious Cover Declaration, if project is multifamily residential, a school, or a small business and 20% or less impervious cover is proposed for the site

# **Attachment B - BMPs for Upgradient Stormwater**

All disturbed areas are provided with perimeter erosion controls. There will be no surface water originating upstream flowing across the site. Offsite storm water runoff bypasses the disturbed areas unless it is included in the BMP. Reference construction plan set.

# Attachment C - BMPs for On-Site Stormwater

Flows from the proposed residential development, La Cima Phase 6, will be treated by Vegetative Filter Strips and Batch Detention Ponds. The water quality ponds will be used to prevent pollution of surface water or groundwater that originates on-site of flows off the site. Please see the attached construction plans.

# **Attachment D - BMPs for Surface Streams**

All disturbed area are provided with perimeter erosion controls. This development will be provided with 2 on-site water quality ponds that will be used to prevent pollutants of surface water from entering surface streams. See Construction Plans.

# Attachment E - Request to Seal Features, if sealing a feature

# **Attachment F – Construction Plans**

The full set of Construction Plans are attached, including the following:

- General Notes
- TCEQ SCS General Notes
- SWPPP
- Proposed Conditions Plan
- Erosion & Sedimentation Control Plan
- Erosion & Sedimentation Control Details
- Proposed Water Quality and Off-Site Drainage Area Map
- Wastewater Plan and Profile

# PROJECT ADDRESS:

THIS PROJECT IS LOCATED SOUTH OF CENTERPOINT ROAD AND CENTRAL PARK LOOP IN SAN MARCOS, HAYS

# FLOODPLAIN:

THIS PROPERTY DOES NOT FALL WITHIN THE 100 YEAR FLOODPLAIN AS SHOWN ON THE HAYS COUNTY FEMA FIRM MAPS 48209C0369F EFFECTIVE AS OF SEPTEMBER 2, 2005.

AQUIFER NOTE:

THIS PROJECT IS IN THE EDWARDS AQUIFER RECHARGE ZONE.

# TCEQ WPAP AND SCS APPROVAL:

THIS SITE CURRENTLY HAS WPAP & SCS SUBMITTALS PENDINDG REVIEW BY TCEQ.

# **GENERAL NOTES:**

- 1. CONTRACTOR SHALL CALL (512) 353-7728 FOR ALL CITY OF SAN MARCOS INSPECTIONS.
- 2. RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN ACCEPTING THESE PLANS, THE CITY OF SAN MARCOS MUST RELY UPON THE ADEQUACY OF
- 3. THIS PROJECT IS SUBJECT TO TCEQ'S TPDES SWPPP REGULATIONS PER TEXAS WATER CODE CHAPTER 26. IF NOT ALREADY DONE, HAVE A TX PE, CPESC, OR QPSWPPP DEVELOP/AMEND A PROJECT-SPECIFIC SWPPP AND SEEK APPLICABLE TPDES PERMIT TXR150000 COVERAGE IMMEDIATELY PER TXR150000 PARTS I-III AND CITY CODE SECTION 86.529(B)(2) OR 86.529(C)(3). A HARD-COPY OF THE SWPPP, INCLUDING FULL-SIZE SITE MAP, MUST BE AVAILABLE AT THE PRE-CON MEETING, KEPT ONSITE, AND UPDATED TO MATCH SITE CONDITIONS DURING THE PROJECT.
- 4. ALL CONSTRUCTION SHOULD COMPLY WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
- 5. ALL CONSTRUCTION SHOULD COMPLY WITH CITY OF SAN MARCOS CONSTRUCTION DETAILS AND CONSTRUCTION NOTES FOR MATERIAL AND INSTALLATION GUIDELINES.
- 6. THIS PROJECT IS SUBJECT TO TPDES REGULATIONS.
- 7. CONTRACTOR SHALL CEASE CONSTRUCTION AND NOTIFY THE CITY OF SAN MARCOS, TEXAS SHPO, AND STATE ARCHAEOLOGIST IF IN SITU CULTURAL DEPOSITS ARE ENCOUNTERED.

# WATER QUALITY POND

UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION AND/OR WATER QUALITY STRUCTURAL CONTROL(S), 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. ANY SUCH STRUCTURAL CONTROL(S) BUILT WITHIN THE CITY OF SAN MARCOS MUST MAINTAIN COMPLIANCE WITH THE CITY'S MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) AND APPLICABLE MS4 ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY, A CITY EASEMENT MUST BE SHOWN AROUND ALL STRUCTURAL CONTROLS INCLUDING A MAINTENANCE COVENANT WITHIN THE CITY LIMITS.

# **BENCHMARKS**:

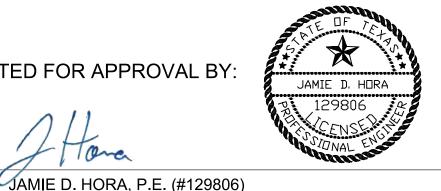
**ELEVATION = 839.48'** 

MAGNAIL W/ WASHER SET IN ROCK OUTCROP GRID NORTHING = 13875703.74, GRID EASTING = 2287016.42'

BM 005956-98 80D NAIL SET GRID NORTHING = 13869237.76', GRID EASTING = 2283165.61' **ELEVATION = 835.23'** 

BM 005956-99 1/2" IRON ROD WITH CAP STAMPED (BCG) SET GRID NORTHING = 13876234.17', GRID EASTING = 2290012.80' ELEVATION = 844.19'

SUBMITTED FOR APPROVAL BY:



10/31/2023 DATE

# REVISIONS / CORRECTIONS

NUMBER	DESCRIPTION	REVISE (R) ADD (A) VOID (V) SHEET NO.'S	TOTAL # SHEETS IN PLAN SET	NET CHANGE IMPERVIOUS COVER (SQ. FT.)	TOTAL IMPERVIOUS COVER (SQ. FT.)/%	CITY OF SAN MARCOS APPROVAL DATE	DATE IMAGED

# LA CIMA PHASE 6A

SAN MARCOS, HAYS COUNTY, TEXAS PERMIT NO. 2023-XXXXX WPP-PH2 PERMIT NO. XXXXXXX



**LOCATION MAP** N.T.S.

OWNER: LCSM PH4, LLC. 303 Colorado Street, Suite 2300 Austin, Texas 78701 [Tel] 512-457-8000

**ENGINEER: BOWMAN** 151 Stagecoach Trail, Suite 130 San Marcos, Texas 78666 [Tel] 512.327.1180 [Fax] 512.327.4062

SURVEYOR: DOUCET 7401 B. HIGHWAY 71 W. Suite 160 Austin, Texas 78735 [Tel] 512.583.2600 www.doucetengineers.com



# Chaot List Table

	Sheet List Table
Sheet Number	Sheet Title
1	COVER
2	FINAL PLAT
3	GENERAL NOTES (1 OF 2)
4	GENERAL NOTES (2 OF 2)
5	SWPPP
6	TREE LIST
7	EXISTING CONDITIONS & DEMOLITION PLAN
8	PROPOSED CONDITIONS PLAN
9	EROSION & SEDIMENTATION CONTROL PLAN
10	OVERALL GRADING PLAN
11	PLAN & PROFILE - BASKET GRASS ROAD
12	PLAN & PROFILE - PENSTEMON VIEW
13	PLAN & PROFILE - YELLOW STAR COURT
14	PLAN & PROFILE - CHICKASAW PLUM LANE
15	PLAN & PROFILE - BUNDLEFLOWER WAY (1 OF 2)
16	PLAN & PROFILE - BUNDLEFLOWER WAY (2 OF 2)
17	INTERSECTION PLAN
18	SIGNAGE & STRIPING PLAN
19	PHOTOMETRIC PLAN
20	WATER QUALITY DRAINAGE AREA MAP
21	WATER QUALITY POND 3
22	VEGETATIVE FILTER STRIPS - DETAIL
23	WATER QUALITY BMP CALCULATIONS 1 OF 2
24	WATER QUALITY BMP CALCULATIONS 2 OF 2
25	INLET DRAINAGE AREA MAP
26	DRAINAGE CALCULATIONS
27	OVERALL STORM DRAIN PLAN
28	STORM DRAIN A AND A LATERALS
29	STORM DRAIN A
30	STORM DRAIN A LATERALS
31	STORM DRAIN B
32	STORM DRAIN A AND A LATERALS
33	STORM DRAIN A A LATERALS AND C C LATERALS
34	STORM DRAIN A AND A LATERALS
35	STORM DRAIN D D LATERALS AND E
36	CHANNEL 6A-1
37	CHANNEL 6A-2
38	WASTEWATER PLAN
39	6A WASTEWATER LN M PLAN & PROFILE
40	6A WASTEWATER LN G PLAN & PROFILE
41	6A WASTEWATER LN N PLAN & PROFILE
42	6A WASTEWATER LN E PLAN & PROFILE
43	6A WASTEWATER LN F PLAN & PROFILE
44	WATER LINE PLAN
45	EROSION AND SEDIMENT CONTROL DETAILS
46	ROADWAY CROSS SECTION
47	STREET LIGHT DETAILS
48	STREET DETAILS (1 OF 3)
49	STREET DETAILS (2 OF 3)
50	STREET DETAILS (3 OF 3)
51	TRAFFIC CONTROL DETAILS (1 OF 2)
52	TRAFFIC CONTROL DETAILS (2 OF 2)
53	STORM DRAIN DETAILS (1 OF 3)
54	STORM DRAIN DETAILS (2 OF 3)
55	STORM DRAIN DETAILS (3 OF 3)
56	WASTEWATER DETAILS (1 OF 2)
57	WASTEWATER DETAILS (2 OF 2)
58	WATER LINE DETAILS (1 OF 2)
59	WATER LINE DETAILS (2 OF 2)
60	CENIED AL LITUITY DETAIL C

GENERAL UTILITY DETAILS

SHEET 1 OF 60



SHEET **2 OF 60** PRELIMINARY NOT FOR CONSTRUCTION

Revised Date: 01-01-2022 The following City of San Marcos (COSM) requirements supersede, as a minimum requirement, any and all non "redline" comments. specifications, or details listed on the plan.

#### Plan Review and Revisions

1. The owner, contractor and representatives are responsible for complying with the most current local, state and federal laws, rules and ordinances.

2. The COSM review does not authorize any violations of details, specification, standard products ordinances or laws of the COSM, No code violations listed, drawn, or described in this plan, and/or otherwise installed, manufactured or built, are "approved" by the

3. A copy of COSM approved plans and any approved revisions bearing a review seal from the COSM must be available on-site at all

4. During construction, plan changes or revisions must be uploaded into MyPermitNow for staff review prior to the changes being made. Final Certificate of Occupancy or Certificate of Acceptance will NOT be issued until all changes have been documented and approved.

5. COSM adopted codes with local amendments:

International Building Code -2015 International Energy Code - 2009/2015 International Plumbing Code-2015 National Electric Code -2014 International Mechanical Code-2015 International Fire Code -2015 International Fuel Gas Code-2015 San Marcos Land Development Code (as amended) Smart Code (as amended) Code SMTX (as amended) International Property Maintenance Code-2015 International Swimming Pool and Spa Code-2015

#### Accessory-Permits and Activities

 Neither the review of these plans, nor the issuance of a Building or Site Plan Permit, authorizes accessory permits. The owner is responsible for completing the following accessory permits or activities: (verify with the department or division listed below, even if depicted within this plan by the design professional):

> - Addressing (Permit Center) Assignment of Building Numbers (Permit Center)

- Controlled Access Gates (Fire Prevention) - Any Fire Protection System [fire alarm, sprinkler, hood
- system] (Fire Prevention) - Any Storage Tanks (Fire Prevention) High Piled Combustible Stock (Fire Prevention)
- Any Sign and/or Sign Standard (Permit Center) - Irrigation (Permit Center)
- Fence (Permit Center) On-Site Sewage Facilities (OSSF's) (Code Compliance)
- Commercial Swimming pools, spa, & Public Interactive Water Feature (PIWF's) (Permit Center/Code Compliance)
- Backflow Prevention Devices (Water Department) - Street Closure/Traffic Control Plans (Public
- Services-Transportation Division)
- Right of Way "ROW" (Public Services-Transportation Division) - EPA or TCEQ permits (State/Permit Center) Floodplain Permit (Permit Center)

2. Any portion of work, including, but not limited to, traffic control, which lies in Texas Department of Transportation (TxDOT), Union Pacific Railroad (UPRR) or County property or right of way, shall be permitted and approved by that authority. All required permits shall be secured by the owner or contractor from COSM and any other appropriate authority. A copy of all permit must be on site and available to City Inspector on request.

3. Contractor shall notify the Engineering Department (512-393-8130) and setup a consultation with Engineering Inspector at least 2 weeks before connection with the City water/wastewater system.

4. Contractor shall submit a road closure permit application and setup a consultation with Engineering Inspector Engineering Department (512-393-8130) at least 2 weeks before any lane or road closure.

# **General Construction Notes**

1. Pre-Construction Meeting - Site and/or Building contractor(s) is/are responsible for scheduling a pre-construction meeting with COSM inspector(s) by contacting the Permit Center (512-805-2630) prior to any site work, including demolition. For Public Improvement Construction Projects (PICP's) contact the Engineering Department at (512-393-8130) at capital\_imp\_info@sanmarcostx.gov.

2. Site Requirements - The general contractor, owner, and subcontractors are responsible for maintaining a safe and clean work

3. Any reference in this section to water, wastewater, electric or other public utility is meant to refer to the utility of certification or Authority Having Jurisdiction.

4. <u>Pre-Construction Video</u> - A video in Windows media format or equivalent of the complete site conditions for all Public Improvement Construction Projects (and as requested for Site Plan Projects) is required <u>prior</u> to construction. Provide a copy to the COSM upon

### 5. Inspections - Inspections can be scheduled with the respective

divisions by contacting them at: Building Inspections Fire Prevention/Inspections Site Final Inspections Engineering Inspections PICP Inspections Code Compliance

www.mypermitnow.org www.mypermitnow.org sitefinal@sanmarcostx.gov 512-393-8130 512-393-8130 512-393-8440 (Food, Pool permits, etc...)

6. Trash - Approved trash containment must be provided for each lot under construction. Commercial solid waste haulers servicing construction sites must hold a permit from the Community Enhancement Initiatives Manager and are subject to commercial solid waste hauler fees.

Open Burning - Burning is prohibited in the COSM limits.

8. Blasting - Blasting is prohibited in the COSM limits.

9. Construction Noise-Construction noise, declared a nuisance under COSM ordinance, is not permitted between 9:00 p.m. and 7:00 a.m.

10. Weekend and Holiday work - Weekend and Holiday work is not allowed within a public right- of- way without prior approval.

11. Facilities - Maintained portable bathroom facilities must be provided with a minimum of one bathroom unit per one and two family residential lots. All construction sites are required to provide one bathroom unit per ten construction persons on the job.

12. Access - Temporary access driveways on the job site (aka stabilized construction entrances/exits) must comply with the current City detail, including curb protection. No mud, rock, or debris permitted on any off site roadway. The general contractor and/or owner are responsible for immediately removing any debris on roadways caused by construction.

13. Combustible Construction -An all-weather surfaced roadway and working fire hydrant(s) are required to be installed on property prior to the construction of combustible material. Road base alone is not acceptable.

Safety - The general contractor, subcontractors and the owner are responsible for maintaining a safe construction operation at all times. All federal OSHA and state details, as well as local codes, shall be adhered to during the construction phase.

15. Address - The site, separate buildings, electrical disconnects, and/or temporary construction trailers must have an address visible from the street or roadway.

16. Required Postings - All COSM and State permits must be posted facing the street or roadway (where practical). Permanent marker is not an approved marking device.

17. Form Survey Requirements- Prior to requesting a foundation inspection by the Building Inspector, a Form Survey must be completed by a State Registered Land Surveyor validating building location to COSM setback requirements.

18. Floodplain Elevation Certificates - Where and when required, a "Building Under Construction" Elevation Certificate must be completed by a State Registered Land Surveyor (or State Registered Engineer or Architect) on FEMA form expiring Nov 2018 and submitted to the Permit Center at least 36 hours prior to foundation pouring to allow time for review and acceptance. A Land Surveyor's "Finished Construction" Elevation Certificate must also be submitted to and accepted by the Floodplain Administrator before Temporary "Certificate of Occupancy" will be issued.

If any geologic or manmade environmental feature is discovered during construction, notify Texas Commission on Environmental Quality (TCEQ) and the COSM Development Services within 24 hours or as soon as practicable. The contractor is required to provide compliance documentation as applicable.

20. EPA/TCEQ - Any required EPA or TCEQ permit(s) is/are separate permit(s) and the responsibility of the contractor. Provide a copy of such permit(s) to the Permit Center.

21. Abandoned wells must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter 76. A plugging report must be submitted (by a licensed water well driller) to the TDLR Water Well Drillers Program, Austin Texas. If a well is intended for use, it must comply with 16 TAC.

22. Any tree 9" in diameter or larger at 4.5' above natural grade is considered "regulated". Please refer to the LDC and technical manuals for tree survey, preservation and mitigation requirements. Also refer to the Design & Construction Guide for the tables and tree protection standard details as noted in #25.

23. All product submittals for Public Improvements Construction Projects shall be submitted to the COSM (after approval by the Design Engineer) in PDF format and approved by the COSM prior to

24. Prior to COSM acceptance of the project, all graded and disturbed areas are to be at least 70% re-vegetated with no large bare areas (greater than 3' diameter) in accordance with COSM and project specifications.

25. On the COSM's Design & Construction Guide webpage, located under Engineering & Capital Improvements, the following documents can be found: These Development Construction Requirements and Notes, Detail Design Criteria, Specifications and Details, Standard Product List, Modification to Austin/TxDOT Standard Specifications, Tree Preservation and Mitigation Tables, Landscape Calculation Table, Parking Table.

26. TX 811(811) must be used to locate all existing utilities for the contractor. Once locates are provided, it is the contractor's responsibility to retain these locations. Repeat locates within 14 days will be charged to the contractor.

27. Appropriate erosion controls and tree protection measures shall be in place prior to any site disturbance.

28. Fire extinguisher is required on all construction sites. Minimum of one per site, per floor at each stairwell or each storage shed. 2A1OBC minimum size (51bs).

29. Standpipe system required for any construction over 30 feet in height. Required to maintained within one floor of top construction floor. Approved lighted stairway access required.

30. Construction site required to be kept clean, travel paths clear and stored combustible pile spread out.

31. Fire watches are required to be approved prior to implementing (does not apply for hot work). (Fire Prevention at 512-393-8480)

32. Hot work permit(s) required as per Chapter 38 of Fire Code.

33. If building is designed with an automatic sprinkler system, the

34. All work in the right-of-way or COSM easement will be constructed and restored in accordance to current COSM details and specifications.

system must be installed, inspected and operational before occupying

## Public Rights-of-Way

building (includes furniture and staff).

1. Where there is a conflict between the drawings and the COSM specifications and details, the more stringent shall apply. In no case is a contractor or owner authorized to construct, build or develop in contrast with adopted COSM codes, standards or details.

 Location of existing lines is approximate. The contractor shall verify the location and elevation of utilities prior to beginning construction. Conflicts with the proposed work should be brought to the attention of the Engineer of Record and the project inspector immediately. It shall be the contractor's responsibility to repair any damages made as a result of construction at the contractor's expense.

3. The contractor shall not attempt to determine locations by scaling from plans. While every attempt has been made to prepare these plans to scale, the Engineer of record should be consulted if clarifications are needed.

4. Emergency Telephone Numbers (numbers may change contractor should verify numbers)

Tx 811 (formerly DigTess) Police - Fire - EMS 512-353-1061 TX DOT Century Telephone 512-754-5223 1-800-464-7928 Southwestern Bell 1-800-427-7142 Gas Company 855-578-5500 Spectrum 800-218-5725 Grande 512-245-2108 and/or 245-2508 University

Pedernales Electric 888-554-4732 800-949-4414 Bluebonnet Electric SM Electric Utilities 512-393-8313 512-393-8010 SM Water/WW Utilities

provided to the Permit Center. 6. The contractor shall be responsible for relocating any COSM water and wastewater utility lines and service taps where required. The contractor shall be responsible for relocating any COSM traffic facilities where required at the contractor's expense.

construction easements for the project. Documentation shall be

The contractor is responsible for acquiring any temporary

7. Contractor shall keep driveways open and accessible during construction. Underground utilities crossing commercial driveways shall be installed such that a minimum 10' traffic lane is kept open at all times. Spoilage material shall not be mounded more than 18" high adjacent to a driveway or intersection.

8. No construction operation relative to installation of utilities. including stockpiling of excavated materials, shall be permitted within the limits of existing pavements carrying traffic on state highways or COSM roads and streets unless specifically authorized in writing by the respective Authority Having Jurisdiction.

The contractor shall develop and submit a traffic control plan, which will show both daytime and nighttime operations during various phases of construction. The plan must be submitted to mypermitnow.org for review at least 14 days before construction begins. The plan must be approved before construction begins. The contractor shall designate a person who will be accessible on a 24hour basis and responsible for the maintenance of the traffic control devices. This 24-hour contact number must be posted visible to the street on the job site and provided to the Public Services-Transportation Division. The contractor is responsible for furnishing the traffic control devices described in the plan and all costs associated with installation, maintenance and removal.

10. Any damage caused to any existing COSM water/wastewater, or storm sewer infrastructure will be repaired by the contractor to the satisfaction of the COSM at the contractor's expense prior to the Certificate of Occupancy or Certificate of Acceptance being issued.

11. When work is performed on private property or easements, all lawn grass, shrubbery, flowers, site utilities (including irrigation systems), trees and fences in the way of the work shall be removed, protected and replaced to their original condition and position upon completion of the work. All property monuments disturbed during construction shall be restored by a Registered Professional Land Surveyor at the contractor's expense.

The contractor must provide a Proof of Destination and truck route documents for trucks used to deliver or remove material or spoils from the job site upon request by inspectors.

13. All valves, manholes, SMEU electrical facilities and other appurtenances must remain accessible to COSM crews AT ALL TIMES during construction. These appurtenances shall also be raised to final grade, if within the project limits.

14. All assets constructed within the COSM's right-of-way must be submitted to the COSM with GPS coordinates at the end of each project. Coordinates will be submitted for all assets (including directional changes, valves, manholes, format, on the NAO 1983 State Plane Texas South Central FIPS 4204 Feet Coordinate System. All coordinates will be submitted in grid units. The required file type for coordinate data submission is \*txt format.

The right-of-way will be kept clean at all times. Daily and sometimes more frequent sweeping may be required. A citation will be issued if the right-of-way is not kept clean. Do NOT wash, sweep or otherwise cause construction soil or debris to be deposited into any storm water drainage or conveyance system.

16. The Owner shall coordinate temporary relocation of mailboxes with the San Marcos Postmaster. Final location shall be in accordance with the local post office requirements.

17. All permanent pavement markings should be Type I and Type II per COSM specifications and details.

18. Any traffic changes, including signs, signals and/or pavement markings shall be the responsibility of the contractor.

19. All Material Testing shall follow the schedule below:

19. All Material Testing shall follow the	schedule below:
CITY OF SAN MARCOS TE	STING SCHEDULE
Description:	*Rate:
Soils: Standard Proctor - Trench Backfill Standard Proctor - Raw Subgrade Densities - Trench Backfill** Densities - Cement Stabilizer Backfill Densities - Raw Subgrade** Densities - Driveways	Per Material Source Per Material Source or Street Per 200 LF Pipe per lift Per 200 LF Pipe Per 100 LF Street per lift Per 5 Driveways
Base: Sieve Analysis Atterbergs Limits Modified Proctor Densities of Compacted Base** Wet Ball Mill Test Triaxial Test	Per 300 LF Street Per 300 LF Street Per Material Change Per 300 LF Street per lift Per Material Source Per Material Source
Hot-Mix Asphalt Concrete (HMAC): Extraction, Sieve Analysis Lab Density & Stability Theoretical Density (Rice Method) Temperature - During Lay-Down Thickness - In Place	Per 500 Tons or Day Per 500 Tons or Day Per 500 Tons or Day Continuous as Needed Per 300 LF Street

Per 300 LF Street

Per 300 LF Street

% Air Voids - In Place

% Theoretical Density - In Place

When a tap is proposed on an existing Asbestos Cement (AC) pipe the contractor will replace the AC pipe segment with an approve PVC pipe per City Standard Product List (SPL). If the proposed tap is less than 24 inches from an AC pipe joint the replacement of the AC pipe will require addition segments to ensure adequate tap and joint separation. New pipe will be connected to the existing AC pipe with

Per 4000 SF and wide range coupling adaptor per City SPL. Per 2500 SF Per 10 Inlets 3. A list of accepted metering devices can be found on the Air, Slump & Compression - In Place | Per exposed structure engineering webpage under SPL WW-144. All metering devices shall Slump & Compression -In Place Per underground structure be located on public right-of-way in easement.

COSM. See detail.

CITY OF SAN MARCOS TESTING SCHEDULE

\* Testing must be conducted during backfill operations

Erosion Control and Stormwater Management

1. It is unlawful for any general contractor, subcontractor or owner to

allow or cause to be allowed, erosion of material from a construction

Appropriate erosion controls and tree protection measures shall be

in place prior to any site disturbance. Site work permitted by a Site

Plan Permit and/or a Demolition Permit cannot begin until erosion

3. All construction-related vehicle parking and activity (including

within the Limits of Construction, with appropriate controls, or

employed to prevent erosion; however, these are only minimum

webpage, located under Engineering & Capital Improvements.

5. In the event of unusual site conditions, proximity to any water

may be necessary (on-site or off) to maintain erosion and

The owner or their designee is responsible for all changes,

bodies and/or weather related events, more stringent requirements

upgrades and continued maintenance of all erosion control and storm

7. Erosion control measures and storm water management practices

Engineering Inspections is responsible for the inspection of

infrastructure in the ROW to the property line or easement,

Public Improvements Construction Projects (PICP) and

excluding sidewalks and drive ways as noted under the

Planning/Development Services is responsible for the

8. All designs to prevent the erosion of soil and the transport of

inspection of all residential and commercial construction.

sediment and debris from the construction site, or surrounding areas

9. All streets adjacent to the project site must be kept clean of mud,

rocks, trash, and building debris at all times. Daily or more frequent

gutters. During muddy conditions, clean vehicle tires before leaving

throughout the day; sweep roads as soon as possible. Or prevent

vehicles from leaving the site during muddy conditions. Migration of

material or sediment from the site will require daily cleanup of paved

10. All storm drain inlets within 200 feet of any permitted construction

11. Dewatering operations must use SWPPP-specified methods only.

If such methods are only general or not applicable, pump from the top

vegetated, upland area (away from waterbodies or drainage) or use

another type of filtration prior to discharge EVERY TIME. Refer to the

responsible for continuous (24 hours a day/7 days a week) monitoring

EPA 2017 Construction General Permit, Section 2.4, as applicable.

of erosion control measures to ensure compliance with all federal,

13. Do NOT wash, sweep or otherwise cause construction soil or

debris to be deposited into any storm water drainage or conveyance

14. COSM MS4- Projects with a disturbed area of 1 to <5 acres must

submit a signed, certified Small Construction Site Notice (CSN) to the

COSM through MyPermitNow prior to construction activity starting.

certified Notice of Intent (NOi) to TCEQ; they must also submit the

signed certified NOi and Large CSN received from TCEQ to the

COSM through MyPermitNow prior to construction activity starting.

15. Contractor shall provide qualified personnel to perform SWPPP

inspections on projects equal to 1 acre or greater. Qualified personnel

shall have CISEC, CESSWI, or equivalent certification approved by

16. Qualified personnel shall inspect the construction site at least

once every seven calendar days. A project-specific SWPPP must be

prepared in accordance with the requirements of the Construction

required by Texas Engineering Practice Act Section 137 and/or a

Certified Professional in Erosion and Sedimentation Control (CPESC).

The SWPPP must be onsite at all times and shall be made available

Water Utility Notes - The requirements stated in most current

version of the Water Distribution System Design Criteria Technical

All taps to the COSM water system for private property shall be

General Permit and shall be designed and signed by a licensed

professional engineer (Texas) with competence in this area as

COSM is the MS4 operator; these submissions to the COSM meet the

Projects with disturbed area of 5+ acres must submit a signed,

required initial notification to the MS4 operator. CSN must be

displayed at a construction site in public view prior to the

commencement of construction activities.

to the City of San Marcos upon request.

metered.

Manual shall supersede these notes if they conflict.

12. The contractor or owner must have a designated person

state, and local laws and regulations.

of the pool of water (rather than the bottom) and discharge to a

streets and of drainage areas impacted by onsite or offsite

area must be protected per City detail (refer to #4 above).

construction. The contractor is required to take any necessary

measures to prevent the migration of dust into the air due to

the site and/or remove mud, dust and dirt from public streets regularly

sweeping may be necessary, including the street center/turn lane and

disturbed by construction shall, be maintained by the contractor during

will be inspected by the COSM prior to and during the construction

designated parking/access on APPROVED surfaces outside the

Certain erosion control measures identified by the COSM are to be

standards. See construction details on Design & Construction Guide

employee personal vehicles and delivery vehicles) must be located

control and tree protection measures are in place.

Per 1000 LF C&G

Description:

Sidewalk

Driveway

Curb Inlets

', 14 & 28 Day)

Curb and Gutter

the COSM's discretion.

Limits of Construction.

sedimentation control.

construction.

construction activities.

water management features at all times.

driveway and sidewalk section.

\*\*\* Density will be per COSM details.

Concrete: (Unconfined Compression,

\* The above testing rates are only anticipated guidelines. The COSM All water utility lines leading to private property (except some reserves the right to require at owner's expense additional testing at authorized small domestic water lines) shall be provided with a

> 5. The back-flow prevention device must be located as close as possible to the public right-of- way on private property.

6. A backflow prevention device with a low-flow indicator is required on all dedicated fire lines as per COSM details.

testable back flow prevention device approved by the AWWA and the

7. Any bypass to a backflow prevention device must have a testable back flow prevention device at least equivalent to the primary line approved by the AWWA and the COSM.

8. It is the responsibility of the owner and contractor to verify the type and size of the backflow prevention device with the COSM's Water Services (512)393-8010, for the property served, prior to construction

9. Accepted Metering Devices - See Standard Product List WW-144

Use	Pipe Material	<sup>1</sup> Pipe Sizes	<sup>2</sup> SPL
Service lines	Copper Tubing	1"	WW-613
Service lines	Polyethylene Tubing	1"	WW-65
Service lines	PVC	2"	WW-587
Service lines	PVC	4",6",8",12"	WW-308
Fire Hydrant Lead	DI	6"	WW-27
<sup>3</sup> Distribution lines	PVC	8" or 12"	WW-308 or WW-308A
<sup>3</sup> Distribution lines	DI	8" or 12"	WW-27 or WW-27F
Transmission lines	PVC	16" or 24"	WW-308C
Transmission lines	DI	16" or 24"	WW-27 or WW-27F

details for more information. The COSM Standard Products List (SPL) can be found on the engineering

The minimum distribution system line size is eight (8) inches, with the

exception of short Cul-de-Sacs as indicated in the City's Water Distribution System Design Criteria Technical Manual

11. Private property fire hydrants shall be RED - Public fire hydrants shall be factory coated aluminum based silver paint. No pre-owned

12. All utility lines shall be tested after all appurtenances (hydrants, sampling ports, valves, etc.) are installed complete in place and located at final grade. All utility lines shall be tested from gate valve to gate valve at 200 psi for 10 minutes and @ 150 psi for 2 hours. A fire line dedicated for a fire protection system shall be tested @ 200 psi for 2 hrs.

13. A licensed underground installer certified by the Texas Commission on Fire Protection must perform underground fire line installation (Fire Sprinkler System). Most plumbers and utility contractors do not meet this criteria! Please verify before construction.

COSM to be given 48-hour notice (required) prior to all testing of

utility lines. COSM inspection required for all utility lines.

All utility taps, line installations, extensions, or adaptations in the public right-of- way, up to and including the metering device, for all Public Improvement Construction Projects will be inspected by the Engineering Inspector.

by Fire Code

- All domestic water line installations, extensions, or adaptations on public or private property for all Site Plan Permits, including the valve, and meter will be inspected by a Building Inspector.

Private utility lines utilized by any fire protection system (fire line), or utility combo line will be inspected by the Fire Prevention Office.

All backflow prevention devices will be reviewed by the Backflow Prevention Manager (Public Services-Water Division) prior to

15. All backflow prevention devices must be tested by a State licensed/certified back flow prevention assembly tester. Test reports shall be on a form as prescribed by the COSM-Public Services Water Division. All testers submitting inspection results must be registered prior to testing devices by the -Public Services Water Division. A copy of the test results are to be submitted to the COSM-Public Services Water Division and the COSM Inspector prior to activation of water service. A copy of the backflow test is to be attached to the back-flow prevention device that was inspected and/or tested.

16. All water lines leading to private property must provide a bacteriological test to the inspector noted in the inspections section above. All bacteriological samplings must be certified within 20 days of project acceptance. On all dead-end lines and lines not yet tied into a water system, an automatic flush valve shall be installed with an approved water meter. After the pressure tests and bacteriological samples have passed, the Contractor must give notice to the Engineering Inspector for activation of the device.

17. Fire hydrants must be placed or moved to finished elevation after installation per detail 511S-17-SM. Finished elevation is 18" to 24" from the center of the lowest connection to the adjacent grade.

Connection (FDC) is building is equipped with a fire sprinkler system. 19. Fire hydrants are required to have a clear area of 5 feet. No plants, trees or obstacles allowed except as impact protection outline

18. Fire hydrant is rejoined within 100 feet of the Fire Department

20. Fire hydrants are required to be marked with a blue reflective marker in the roadway 6" to 10" off center of the roadway towards the hydrant. On corner lot installation, both roadways are required to be

21. The underground contractor must submit a report (on company letterhead) to fireplan@sanmarcostx.gov indicating that the fire line is complete and has been flushed of all debris.

22. All fire hydrants that have not been inspected or flushed are considered "out of service" and are required to have a black plastic wrap covering the hydrant.

23. COSM will not perform the tie-in of a public service line to a private line.

24. It is the responsibility of the owner or contractor to tie to the COSM's line from the right-of-way or public easement to the private property line. It is the licensed plumber/utility contractor responsibility to maintain proper slope and connection of system to the public

portion of the building using accessible surfaced roadway for 26. Fire hydrants must be operational prior to beginning combustible

25. Fire hydrants capable of producing the required GPM (based on

construction type) must be located within 500 foot of the most remote

27. All valves in a COSM right-of-way will be operated by COSM personnel only. The contractor may not operate any COSM owned valve. The general contractor will be fined if a water valve is operated without express written consent of the Water Utility, regardless of who operated the valve.

28. Only temporary water meters approved by the COSM are authorized for use on any fire hydrant (public or private).

29. Temporary meters may be relocated from one hydrant to another only by Water- Waste/Water personnel.

30. A fine will be imposed on operators using fire hydrants without meters, with unapproved meters, or failing to use approved backflow prevention or air gap protection.

31. Thrust blocks are not permitted. All fittings shall be mechanically restrained. Bell joints shall be mechanically restrained in accordance with the Engineer of Record's specifications based on site conditions. A joint restraint table, sealed by the Engineer of Record must be submitted with each set of plans. If a joint restraint table is not available, all joints must be mechanically restrained.

32. The service address must be posted and visible (as per COSM

more than 1000-foot intervals) along public water lines.

specifications) from the street prior to the installation of the meter as per Chapter 38 of local ordinances. 33. Disinfection sample taps shall be installed at proper locations (not

**Wastewater** - The requirements stated in most current version of the Wastewater Collection System Design Criteria Technical Manual shall supersede these notes if they conflict.

1. Required Equipment - The following are the acceptable materials for the type of lines or connections shown:

Public Sewer Lines - SDR 26 in the COSM right of way (as a

minimum). See SPL WW227 &WW-227A Private Sewer Lines - Schedule 40 or SDR 26 Approved connections -

See SPL WW-354 Inspection

construction.

Engineering Inspections is responsible for inspection of all utility taps, line installations, extensions, and adaptations on all Public Improvement Construction Projects. See 510.3(26) Quality Testing for Installed Pipe-of the Modifications of Austin Specifications for

4-psi minimum pressure test on lines

- Lines must be flushed immediately prior to the TV test

Mandrel test required 30 days after installation

- TV test on all public lines (copy of video to Engineering Inspections)

Building Inspections is responsible for inspection of all utility taps, service laterals, and private lines on all Site Preparation Projects and all residential and commercial construction.

- Low-pressure air test with 5 PSI on all lines

3. All sewer lines shall be tested after all appurtenances are located at final grade.

- Force mains; 5 psi over working pressure with minimum of 50 psi,

4. All services must be six inch minimum and must have clean-outs; dual services shall have clean- outs on each line located no less than six feet apart at the property line. See detail 520s- 1-SM & 520S-3-SM for more details and TCEQ specifications.

5. All manholes to be cored (not chiseled) and lined with products from the Standard Products List. See specification 506.5F. Pipe connection to existing manholes and junction boxes for more details.

6. All manholes shall be tested per specification 506.6 prior to lining. All manholes are to be lined per SPL 511. 7. The COSM will not perform the tie-in of lines to privately owned

and maintained lines or clean- outs. It is the licensed plumber/utility

contractor responsibility to maintain proper slope, connection and

drainage of system to the public connection. 8. Pipe stub-outs must be provided and located in manholes to facilitate future expansion. 9. All commercial property must have a wastewater sampling port

installed per the COSM's sample port detail 520-4B-SM, and

wastewater sampling port must not be located in a drive-thru, traffic

wastewater collection system standard design criteria. The

lane, or driveway access area.

Driveways and Sidewalks

1. All sidewalks and driveway approaches will be inspected by the

Engineering Inspections will inspect the following items:

Engineering Inspections will inspect the following items:

- All Commercial project driveway approaches and sidewalks Any new, extension or addition to a drive on a existing property (Driveway Permit or Infill New Residential)

All new subdivision work inclusive of the street, curb, curb cut ramps to a public street, sidewalk and driveway access installed during initial construction prior to COSM acceptance of subdivision - All Public Improvement Construction Projects

Building Inspections will inspect the following: - All sidewalk construction and driveway access in development "build-out" after acceptance of subdivision by the COSM.

Meters, valves, or other obstructions are not permitted in sidewalks or driveways. All meters must be located in a public right-of-way or easement given by the property owner (and legally recorded).

Meters and other utility obstructions must be relocated by and at the expense of the own e r or contractor.

All sidewalks and driveways shall meet applicable TAS standards.

Driveway access grade at sidewalk cannot exceed 2%.

Public Street Construction

1. All new street construction in public right-of-way and easements will be inspected by the Engineering Inspectors.

2. All street lights shown on the approved construction plans shall be active prior to project acceptance. If street light service is to be in the COSM's name, contact San Marcos Electric Utility, (512) 393-8300

3. Flexible Base & Sub-grade: Will follow the City specification noted in the 200: Series Subgrade & Base Construction.

4. Cutback Asphaltic material (Prime Coat) shall be applied to the completed base course and allowed to set 24 hours before paving the roadway. An Emulsified Asphalt Tack Coat can be used in lieu of the prime coat and/or placed on the prime coat.

5. Asphalt must be at a temperature between 250° F and 350° F when discharged from the mixer and compacted using steel-wheel rollers, vibratory rollers and pneumatic-tire rollers.

6. The contractor or their testing technician shall check the density of the compacted asphalt at regular intervals. Samples of the asphalt shall be taken as the asphalt leaves the hopper of the paving machine before compaction and cores shall be taken at these sampling locations. A minimum of 3 samples shall be taken daily unless the total volume is determined to be small enough to warrant taking only one sample.

#### Electric Utility Notes

 Electrical service will be provided in accordance with SMEU "Rules and Regulations" and "Line Extension Policy" within the PUC designated SMEU service area.

Electric Service in San Marcos Electric Utility (SMEU) Service Territory:

A. For non-emergency service, Contact SMEU 48 hours in advance to schedule electric service connection for new service or disconnection/reconnection for modified service. i. For Emergency Electric Service contractors may disconnect and

connection. B. SMEU must receive notification from the COSM Electrical Inspector that the Customer's electrical installation has passed final electrical inspections

reconnect temporary electric service without advanced notice. Contractor

must contact SMEU within 24 hours to make permanent electric service

C. SMEU has the right to deny service connection for any identified

before electric service is connected by SMEU personnel.

3. For plan review of projects requiring electric service from San Marcos Electric Utility (SMEU), a minimum of the following items must be provided to SMEU by the property owner or contractor: a completed Electric Service Application, a set of customer drawings including plat drawings showing all easements, scaled elevation drawings for any structures that exceed a single story, and a total connected load estimate (including service voltage requirements).

Contact San Marcos Electric Utility at 512-393-8300 for detailed plan review submittal requirements.

4. All services shall have a single disconnecting means in an approved location on the exterior or outside of the building served.

All electric disconnecting means and meters shall be assessable.

6. At the time of Phase 2 inspection, the meter sockets shall be labeled with 1" x 2" digitally printed vinyl stickers. Disconnect panel(s) shall be labeled with 2" x 4" digitally printed vinyl stickers. Panel must have address numbers, number of panel (ex. 2 of 4) and location of next disconnect panel. Both doors and meter socket must have permanent labeling affixed before SMEU will install meters. SMEU may deny meter connection if the required labeling is not present.

7. Panel and socket markings are not allowed to be paint or marker.

8. The service mast shall have at least two points of attachment to the building. One point of attachment must be within 12 inches of the service equipment. The service equipment may not be used to meet this

9. If electric overhead power lines exist in the project area, Texas Law Article 1436c, prohibits all activities in which persons or equipment may come within six (6) feet of energized overhead power lines and Federal Regulations, Title 29, Part 1910.180(i) and Part 1926.550(a)(15) require a minimum of 10 feet from these facilities. Where Contractor must work near overhead power lines, contact the service provider for the lines to be de-energized and/or moved at Contractor's expense. For non-emergency work, contact SMEU 48 hours in advance to schedule lines to be de-energized or moved.

10. Contact the local service provider for information on their specific installation requirements

San Marcos Electric Utility(SMEU) 512-393-8300 Pedernales Electric Cooperative 888-554-4732 #7525 Bluebonnet Electric Cooperative 800-842-7708 (Ask for Lockhart engineering dept.)

NOTE: This document is not meant or designed to be an all-inclusive document. The function of this 'requirements' document is to provide information on issues identified by the COSM inspection staff based on daily field operations and common issues. It is the intent of this document to facilitate the construction process in common overlapping areas between COSM departments and divisions and private contractors. In all cases, contractors, subcontractors and owners are responsible for knowing and utilizing the state, federal, or COSM codes and laws where applicable. No code violations are "approved". COSM signed or reviewed plans are not authorization to violate codes, laws, or ordinances. A copy of plans bearing a seal from Building Inspections and/or the Permit Center is required to be available on-site at all times. Any changes or revisions to these plans must first be submitted to the COSM by the design professional for review and written authorization. A review seal from the COSM must be affixed to these revised plans and they must be available on- site at all times.

5 OF PHASE Ш Ē <u>O</u> CIMA P #202 RCOS ENERAL Ŋ

PRELIMINARY NOT FOR CONSTRUCTION

OF 60

JAMIE D. HORA

DATE: OCTOBER 31, 202

DC NK JOB No. 005956-01-113 SHEET

DESIGN | DRAWN |

PAGE 1 OF 6

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

EDWARDS AQUIFER PROTECTION PROGRAM CONSTRUCTION NOTES - LEGAL DISCLAIMER

TCEQ-0596 (REV. JULY 15, 2015) TCEQ-0596 (REV. JULY 15, 2015

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 THE 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.
- 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.

- 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
- 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.
- 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.
- 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.
- 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

- 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 LIGING A MANULEACTURED SADDLE AND IN ACCORDANCE WITH ACCEPTED DILIMBING 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
- 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
- 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:
- 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 C924, 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.
- A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE. 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:

 $(0.085 \times D \times K)$ Equation C.3

Where:

time for pressure to drop 1.0 pound per square inch gauge in seconds

0.000419 X D X L, but not less than 1.0

average inside pipe diameter in inches

length of line of same size being tested, in feet

rate of loss, 0.0015 cubic feet per minute per square foot internal

(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

Pipe Diameter (Inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Lengti (seconds/for
6	340	398	0.855
ů	454	298	1.529
20	567	739	2.374
12	680	199	3,419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10471
24	1360	130	13.676
27	1530	88	17.309
30	1700	80	21 369
33	1870	72	25.856

- (A) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
- (B) 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.
- (C) 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.
- (D) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 38 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
  - (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
- (1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.
- (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

(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.

MANDREL DESIGN.

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. METHOD OPTIONS.

(i) AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.

HAS BEEN IN PLACE AT LEAST 30 DAYS.

(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

(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

1. ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.

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(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. 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. (A) 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

(B) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE

TESTING TO ALLOW SATURATION OF THE CONCRETE.

(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
- 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.

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

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

Fax (210) 545-4329

TCEQ WATER DISTRIBUTION SYSTEM

GENERAL CONSTRUCTION NOTES

- 1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. AT A MINIMUM, CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS MEET TCEQ'S"RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS."
- 2. ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI [§290.44(A)(1)].
- 3. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS [§290.44(A)(2)].
- 4. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR USE IN ANY PUBLIC DRINKING WATER SUPPLY [§290.44(A)(3)].
- 5. ALL WATER LINE CROSSINGS OF WASTEWATER MAINS SHALL BE PERPENDICULAR [§290.44(E)(4)(B)]
- 6. WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE [§290.44(A)(4)].
- 7. THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES IS 0.25 PERCENT [§290.44(B)].
- 8. THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES WITH VENT OPENINGS TO THE ATMOSPHERE COVERED WITH 16-MESH OR FINER, CORROSION RESISTANT SCREENING MATERIAL OR AN ACCEPTABLE EQUIVALENT [§290.44(D)(1)].
- 9. THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION [§290.44(F)(1)].
- 10. WHEN WATERLINES ARE LAID UNDER ANY FLOWING OR INTERMITTENT STREAM OR SEMI-PERMANENT BODY OF WATER THE WATERLINE SHALL BE INSTALLED IN A SEPARATE WATERTIGHT PIPE ENCASEMENT. VALVES MUST BE PROVIDED ON EACH SIDE OF THE CROSSING WITH FACILITIES TO
- ALLOW THE UNDERWATER PORTION OF THE SYSTEM TO BE ISOLATED AND TESTED [§290.44(F)(2)]. 11. PURSUANT TO 30 TAC §290.44(A)(5), THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY THE
- THE HYDROSTATIC LEAKAGE RATE FOR POLYVINYL CHLORIDE (PVC) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-605 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

MOST CURRENT AWWA FORMULAS FOR PVC PIPE, CAST IRON AND DUCTILE IRON PIPE. INCLUDE THE FORMULAS IN THE NOTES ON THE PLANS.

 $Q = (LD\sqrt{P})/148,000$ 

Q = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,

L = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,

D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND

P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).

- THE HYDROSTATIC LEAKAGE RATE FOR DUCTILE IRON (DI) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-600 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

 $L = (SD\sqrt{P})/148,000$ 

L = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,

S = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET, D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND

P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).

- 12. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET §290.44(E)(1)-(4).
- 13. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT [§290.44(E)(5)].
- 14. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION [§290.44(E)(6)].
- 15. SUCTION MAINS TO PUMPING EQUIPMENT SHALL NOT CROSS WASTEWATER MAINS, WASTEWATER LATERALS, OR WASTEWATER SERVICE LINES. RAW WATER SUPPLY LINES SHALL NOT BE INSTALLED WITHIN FIVE FEET OF ANY TILE OR CONCRETE WASTEWATER MAIN, WASTEWATER LATERAL OR WASTEWATER SERVICE LINE [§290.44(E)(7)].
- 16. WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS [§290.44(E)(8)].
- 17. THE CONTRACTOR SHALL DISINFECT THE NEW WATERLINES IN ACCORDANCE WITH AWWA STANDARD C-651-14OR MOST RECENT, THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1.000 FEET OF COMPLETED WATERLINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1.000 FEET AS DESIGNATED BY THE DESIGN ENGINEER [§290.44(F)(3)].
- 18. DECHLORINATION OF DISINFECTING WATER SHALL BE IN STRICT ACCORDANCE WITH CURRENT AWWA STANDARD C655-09 OR MOST RECENT.

CONSTRUCTION SEQUENCING

- 1. OBTAIN CITY APPROVED AND STAMPED PLAN SET FOR THE PERMIT (STAMPED PLANS MUST BE ON SITE AT ALL TIMES).
- 2. OBTAIN TCEQ PERMIT FOR EROSION AND SEDIMENTATION PLAN. SWPPP BOOK MUST BE ON SITE AT ALL TIMES AND AVAILABLE TO INSPECTION TO VERIFY UPDATES TO EROSION CONTROL LAYOUT.
- 3. CLEAR GIS REVIEW PRE-CONSTRUCTION MEETING REQUIREMENT
- 4. PRE-CONSTRUCTION MEETING WITH CITY ROW-ENGINEERING INSPECTORS MANAGER.
- 5. SUBMIT PROPOSED PRODUCT TO DEVELOPMENT ENGINEERING FOR APPROVAL. CITY CONFORMATION/COMPLETENESS REVIEW AND ARCHIVING REQUIRED.
- INSTALLATION OF EROSION CONTROL PER APPROVED TCEQ PERMIT.
- 7. CONDUCTION SWPPP INSPECTION PER GOVERNING ENTITIES REQUIREMENT (CITY OF SAN MARCOS WEEKLY INSPECTION REQUIRED FROM A
- MAINTAIN EROSION CONTROL THAT FAIL INSPECTION PRIOR TO NEXT INSPECTION OR NEXT RAIN EVENT.
- 9. CONSTRUCT IMPROVEMENT PER APPROVED CITY PLANS.
- 10. CALL FOR INSPECTION AS NEEDED WITH CITY INSPECTOR.
- 11. MAINTAIN CURRENT PLAN SET IF ADDENDUM ARE APPLIED FOR AND APPROVED BY THE CITY. UPDATE SHEETS WITH APPROVED STAMP ADDENDUM SHEET FROM THE CITY PERMIT.
- 13. CONTRACTOR, DEVELOPER ENGINEER, AND CITY INSPECTOR CONDUCT PRE-WALK TO VERIFY ALL ITEMS ON THE PLANS ARE INSTALLED. 14. CONTRACTOR COMPLETES WORK LIST ITEM FROM PRE-WALK AND DEVELOPER ENGINEER SUBMITS RECORD DRAWING TO THE CITY FOR REVIEW/APPROVAL.
- 15. 70% REVEGETATION AND DENSITY MUST BE ESTABLISHED. (CITY MS4 ORDINANCES DOES NOT ALLOW SOIL RETENTION BLANKET TO COUNT AS

12. CONTRACTOR REQUEST PRE-WALK WITH CITY ROW/ENGINEERING DEPARTMENT INSPECTOR.

- 16. REMOVAL OF SEDIMENT CONTROLS ON INSPECTOR CONFORMATION OF REVEGETATION. 17. CITY INSPECTOR SETS UP FINAL WALK THROUGH WITH ALL CITY DEPARTMENTS. CONTRACTOR AND DEVELOPMENT ENGINEERING MUST BE
- 18. SUBMIT CLOSE-OUT PACKET TO CITY FOR REVIEW/APPROVAL OF ALL REQUIREMENTS HAVING BEEN COMPLETED.
- 19. ISSUANCE OF CITY CERTIFICATE OF ACCEPTANCE.

5 OF 9  $\overline{\Omega}$ Ш 9 40 ENERAL OŊ JAMIE D. HORA DATE: OCTOBER 31, 202

> DESIGN | DRAWN | DC JOB No. 005956-01-113 SHEET

PRELIMINARY NOT FOR CONSTRUCTION

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

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.
- . NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
- . PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
- ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS. SENSITIVE FEATURES. ETC. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS
- NOT LATER THAN TCEQ-0592 (REV. JULY 15, 2015) PAGE 1 OF 2 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. TCEQ-0592 (REV. JULY 15, 2015) PAGE 2 OF 2

#### **GENERAL NOTES:**

- 1. THE CONTRACTOR SHALL COMPLY WITH ALL OF THE REQUIREMENTS SET FORTH IN THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY (TCEQ) "TEXAS POLLUTION DISCHARGE ELIMINATION SYSTEM" (TPDES). INFORMATION ON THE TPDES CONSTRUCTION GENERAL PERMITS MAY BE OBTAINED BY CONTACTING THE TCEQ AT 512-339-2929. INFORMATION IS ALSO AVAILABLE THROUGH TCEQ WEB SITE. DISCLAIMER: INFORMATION CONTAINED IN THIS PARAGRAPH IS BASED UPON THE BEST INFORMATION AVAILABLE AT THE TIME OF PLAN PREPARATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL NECESSARY FORMS AND DOCUMENTATION AND COMPLY WITH THE PROVISIONS OF THE TPDES.
- 2. THE CONTRACTOR WILL BE REQUIRED TO FOLLOW BEST MANAGEMENT PRACTICES AND TO USE AND MAINTAIN SEDIMENTATION AND WATER POLLUTION CONTROL
- 3. THE CONTRACTOR SHALL PROVIDE THE OWNER 48 HOURS NOTICE PRIOR TO DISTURBING ANY VEGETATION OR BEGINNING ANY SITE PREPARATION IN ADVANCE OF THE EARTHWORK OPERATION. THE 48 HOUR NOTICE PROVIDES THE OWNER THE REQUIRED TIME TO FILE AND POST THE "NOTICE OF INTENT" (NOI) WITH THE TCEQ.
- 4. THE CONTRACTOR SHALL NOT RECEIVE FINAL PAYMENT FOR THE PROJECT UNTIL THE UNPAVED AREAS HAVE ACHIEVED 95% VEGETATIVE COVER WITH PERMANENT GRASSES, AND THE OWNER HAS FILED THE "NOTICE OF TERMINATION" (NOT) WITH THE
- 5. IN AREAS THAT HAVE ACHIEVED 95% VEGETATIVE COVER (WHEN COMPARED TO THE SURROUNDING, UNDISTURBED, VEGETATIVE COVER), THE CONTRACTOR MAY REMOVE AND REUSE ANY TEMPORARY EROSION CONTROL DEVICES (THAT ARE IN REASONABLE CONDITION) ON OTHER LOCATIONS IN THE DEVELOPMENT. ADDITIONAL SEEDING MAY BE REQUIRED TO VEGETATE THE AREAS WHERE THE STRUCTURAL CONTROLS WERE
- 6. PRIOR TO ACCEPTANCE AND FINAL PAYMENT, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES.
- 7. ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE PLACED PRIOR TO CONSTRUCTION IN ANY AREA, OR AS SOON AS PRACTICAL.
- 8. THE CONTRACTOR SHALL PROVIDE FOR ALL INTERIM DRAINAGE ON THE PROJECT. THE INTERIM DRAINAGE SHALL ENSURE THAT ALL RUNOFF IS CHANNELED TO THE TEMPORARY CONTROL DEVICES.
- 9. THE CONTRACTOR SHALL TAKE THE STEPS NECESSARY TO ENSURE THAT ALL CONSTRUCTION TRAFFIC LEAVING THE PROJECT SHALL NOT TRACK MUD OR OTHER DEBRIS ONTO ANY ROADWAY, PUBLIC STREET OR ANY ROADWAY WITHIN THE DEVELOPMENT. SHOULD MUD OR OTHER DEBRIS BE TRACKED ONTO ANY ROADWAY. THE CONTRACTOR SHALL TAKE IMMEDIATE STEPS TO REMOVE IT TO THE SATISFACTION OF THE OWNER AND/OR ANY REGULATORY AUTHORITY.
- 10. TEMPORARY CONSTRUCTION ENTRANCES SHALL BE UTILIZED WHERE NECESSARY.
- 11. SPRINKLING OF ROADWAYS SHALL BE REQUIRED TO CONTROL DUST. 12. THE CONTRACTOR SHALL MODIFY, AS NECESSARY, ANY TEMPORARY EROSION
- CONTROL DEVICES SO THAT THEY SERVE THEIR INTENDED PURPOSE. 13. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION DEVICES TO A CONDITION SIMILAR TO THAT OF WHEN IT WAS ORIGINALLY INSTALLED.
- 14. THE CONTRACTOR SHALL KEEP ALL TEMPORARY EROSION CONTROL DEVICES FREE OF SILT AND/OR ANY OTHER MATERIAL THAT MAY ACCUMULATE. REMOVAL SHALL OCCUR AS SOON AS PRACTICAL AFTER A RAINFALL. IN NO INSTANCE SHALL SILT BE PERMITTED TO ACCUMULATE TO A DEPTH ABOVE, OR IN EXCESS OF 50% OF THE DESIGN CAPACITY
- 15. AS REQUIRED BY THE OWNER, THE CONTRACTOR SHALL ACCOMPANY THE OWNER DURING THE INSPECTION OF THE EROSION CONTROL DEVICES TO DISCUSS
- MODIFICATIONS TO ENSURE THE DEVICES SERVE THEIR INTENDED PURPOSE 16. THE CONTRACTOR SHALL PROTECT ALL AREAS (TREES AND MATURE VEGETATION). WHETHER WITHIN OR OUTSIDE OF THE ACTUAL LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION AS GOOD AS, OR BETTER THAN, THAT PRESENT PRIOR TO THE CONSTRUCTION.
- 17. ALL CONSTRUCTION AND CONSTRUCTION EQUIPMENT SHALL REMAIN WITHIN THE ESTABLISHED STREET RIGHT OF WAY AND DRAINAGE EASEMENTS UNLESS THE OWNER HAS GRANTED PRIOR AUTHORIZATION.
- 18. IN THE EVENT THE CONTRACTOR ESTABLISHES A YARD ON THE PROJECT. HE SHALL BE RESPONSIBLE FOR ESTABLISHING HIS OWN STORM WATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REQUIREMENTS THEREOF.
- 19. THE CONTRACTOR SHALL KEEP THE DEVELOPMENT FREE FROM LITTER.

#### SITE DESCRIPTION

A) THE PROJECT SHALL CONSIST OF THE CONSTRUCTION UTILITY IMPROVEMENTS

B) SEQUENCE OF MAJOR ACTIVITIES: -INSTALLATION OF EROSION/ SEDIMENTATION CONTROLS. -INSTALLATION OF UNDERGROUND UTILITIES. -REVEGETATION OF DISTURBED AREAS. -REMOVAL AND PROPER DISPOSAL OF EROSION/SEDIMENTATION CONTROLS ONCE

C) ESTIMATE OF SITE AREA: TOTAL SIZE: ± 32.01 AC TOTAL DISTURBED AREA: ± 25.20 AC

TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.

PERMANENT VEGETATION IS ESTABLISHED.

D) ESTIMATED RUNOFF COEFFICIENTS FOR THE 100 YEAR STORM AND DESCRIPTION OF RUNOFF: 0.75

### E) LOCATION MAP (COVER SHEET)

F) THERE IS NO INDUSTRIAL ACTIVITY OTHER THAN CONSTRUCTION ACTIVITIES

### G) RECEIVING WATERS:

RUNOFF FROM THE SITE DISCHARGES TO THE SOUTH-SOUTHWEST TOWARDS AN UNNAMED TRIBUTARY TO YORK CREEK, WHICH FLOWS TO THE SAN MARCOS RIVER, AND THEN TO THE GUADALUPE RIVER, AND ULTIMATELY TO THE GULF OF MEXICO.

DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED IMMEDIATELY UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DO SO WITHIN FOURTEEN (14) DAYS THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL

#### REQUIREMENTS

THE FOLLOWING RECORDS SHALL BE KEPT BY THE CONTRACTOR, WITH THE SWPPP: -DATES WHEN MAJOR GRADING ACTIVITIES OCCUR -DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY CEASE -DATES WHEN CONSTRUCTION ACTIVITIES PERMANENTLY CEASE

-INSPECTIONS INDICATE THE PLAN IS NOT MEETING THE DESIRED OBJECTIVES

-DATES WHEN STABILIZATION MEASURES ARE INITIATED THE SWPPP SHALL BE AMENDED WHEN:

THE OWNER/OPERATOR SHALL POST A NOTICE NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE WITH THE FOLLOWING INFORMATION: -TPDES PERMIT NUMBER OR A COPY OF THE NOI IF THE PERMIT NUMBER HAS NOT YET BEEN ASSIGNED

-THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE SYSTEM OR SITE

-THE NAME AND TELEPHONE NUMBER OF A LOCAL CONTACT PERSON -A BRIEF DESCRIPTION OF THE PROJECT

#### STABILIZATION / REVEGETATION NOTES

-THE LOCATION OF THE SWPPP

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).

2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE TCEQ TECHNICAL GUIDANCE MANUAL AND THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.

3. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH THE CITY OF SAN MARCOS STANDARDS 610S-1-SM AND 610-S-2-SM AND/OR 610S-4-SM.

4. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER/PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES AND PRIOR TO BEGINNING ANY SITE PREPARATION WORK.

5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER OR ENVIRONMENTAL SPECIALIST. MINOR CHANGES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES.

6. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

7. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.

8. ALL WORK MUST STOP IF A VOID IN THE ROCK SUBSTRATE IS DISCOVERED WHICH IS; ONE SQUARE FOOT IN TOTAL AREA; BLOWS AIR FROM WITHIN THE SUBSTRATE AND/OR CONSISTENTLY RECEIVES WATER DURING ANY RAIN EVENT. AT THIS TIME IT IS THE RESPONSIBILITY OF THE PROJECT MANAGER TO IMMEDIATELY CONTACT A TCEQ INSPECTOR FOR FURTHER INVESTIGATION.

9. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW.

A. A MINIMUM OF SIX INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK) AND BETWEEN THE CURB AND RIGHT-OF-WAY LINE.

B. RESEEDING SHALL IMMEDIATELY FOLLOW TOP SOILING WITH THE FOLLOWING MIXTURE OF GRASSES AT THE FOLLOWING RATES OF APPLICATION:

5.0 LBS/ACRE TREATED "TOP GUN" BUFFALO GRASS 10.0 LBS/ACRE TEXAS BLUEBONNETS 4.0 LBS/ACRE PRAIRIE VERBENAS 0.5 LBS/ACRE GREENTHREAD 1.0 LBS/ACRE PLAINS COREOPSIS 0.5 LBS/ACRE TOTAL SEEDING RATE\* 21.0 LBS/ACRE

\* PERENNIAL RYE GRASS TO BE ADDED TO THE DESCRIBED MIX AT A RATE OF 10 LBS/ACRE WHEN SEEDING BETWEEN OCTOBER 1 AND MARCH 31.

C. FERTILIZER SHALL BE A PELLETED OR GRANULAR SLOW RELEASE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1 POUND

D. FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT A RATE OF 1.5 POUNDS PER 1000 SF.

E. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SF, WITH SOIL TACKIFIER AR A RATE OF 1.4 POUNDS PER 1000 SF

F. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX INCHES. THE IRRIGATION SHALL OCCUR AT TEN-DAY INTERVALS DURING THE FIRST TWO MONTHS RAINFALL OCCURRENCES OF ½ INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK

G. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1½ INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

H. WHEN REQUIRED, NATIVE GRASS SEEDING SHALL COMPLY WITH REQUIREMENTS OF THE CITY OF SAN MARCOS STANDARDS AND SPECIFICATIONS.

10. ANNUAL GRASSES SUCH AS RYE GRASS WILL NOT BE ACCEPTED AS PERMANENT VEGETATION

11. ALL DISTURBED AREAS TO BE STABILIZED BY VEGETATION OR STRUCTURE.

12. DEVELOPER INFORMATION:

OWNER: OWNER'S REPRESENTATIVE RESPONSIBLE FOR PLAN ALTERATIONS: LCSM PH. 4, LLC BOWMAN 303 COLORADO STREET, SUITE 2300 1120 S. CAPITAL OF TEXAS HWY, BUILDING 3, SUITE 220 AUSTIN, TEXAS 78701 AUSTIN, TEXAS 78746 (TEL) 512-327-1180 (TEL) 512-457-8000

13. ALL REVEGETATION IN THE ROW AND EASEMENTS SHALL CONFORM TO CITY SPECIFICATIONS 601S-609S

#### **INSPECTIONS**

QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS THAT HAVE NOT BEEN FINALLY STABILIZED, STORAGE AREAS, STRUCTURAL CONTROLS, AND AREAS WHERE CONSTRUCTION AND OTHER VEHICLES LEAVE THE SITE AT LEAST ONCE EVERY SEVEN (7) DAYS AND WITHIN TWENTY-FOUR (24) HOURS OF THE END OF A STORM EVENT OF  $\frac{1}{2}$  INCHES OR GREATER.

DISTURBED AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR POTENTIAL FOR, SEDIMENT ENTERING THE

AFTER THE INSPECTIONS, THE SWPPP SHALL BE MODIFIED AS NECESSARY TO INCLUDE ADDITIONAL BMP'S

(BEST MANAGEMENT PRACTICES) DESIGNED TO CORRECT DEFICIENCIES IDENTIFIED.

REVISIONS (MODIFICATIONS) SHALL BE COMPLETED WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE INSPECTION, IF POSSIBLE IMPLEMENT BEFORE NEXT STORM EVENT.

IF EXISTING BMP'S NEED TO BE MODIFIED OR ADDITIONAL BMP'S ARE REQUIRED, IMPLEMENTATIONS SHALL BE COMPLETED PRIOR TO THE NEXT ANTICIPATED STORM EVENT OR AS SOON AS PRACTICAL.

A REPORT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTIONS, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWPPP SHALL BE MADE AND RETAINED AS PART OF THE SWPPP FOR AT LEAST THREE (3) YEARS FROM THE DATE THE "NOTICE OF TERMINATION" (NOT) IS SUBMITTED.

THE OBSERVATIONS SHOULD INCLUDE: -SEDIMENT DISCHARGES FROM THE SITE -LOCATION OF BMP'S THAT SHOULD BE MAINTAINED -LOCATION OF BMP'S THAT WERE INADEQUATE -LOCATION WHERE ADDITIONAL BMP'S SHALL BE INSTALLED

WHERE AN INSPECTION DOES NOT INDICATE THAT MODIFICATIONS TO EXISTING BMP'S ARE NECESSARY OR ADDITIONAL BMP'S ARE REQUIRED, A REPORT SHALL BE PREPARED WITH A CERTIFICATION THAT THE FACILITY IS IN COMPLIANCE WITH THE SWPPP AND THE TPDES PERMIT.

#### STANDARD PERMIT CONDITIONS

STRUCTURAL PRACTICES

X SILT FENCES

\_ BRUSH BERMS

\_\_\_\_\_ SEDIMENT TRAPS \_\_\_\_\_ SEDIMENT BASINS

\_\_\_X STORM SEWERS

\_\_\_X \_\_ INLET PROTECTION

CONCRETE FLUMES

\_\_\_\_\_ VELOCITY CONTROL DEVICES

STONE OUTLET STRUCTURES CURB AND GUTTERS

\_\_\_\_\_ HAY BALES X ROCK BERMS

1. THE PERMITTEE HAS A DUTY TO COMPLY WITH ALL PERMIT CONDITIONS. FAILURE TO COMPLY WITH ANY PERMIT CONDITION IS A VIOLATION OF THE PERMIT AND STATUTES UNDER WHICH IT WAS ISSUED, AND IS GROUNDS FOR ENFORCEMENT ACTION, FOR TERMINATING COVERAGE UNDER THIS GENERAL PERMIT, OR FOR REQUIRING A DISCHARGER TO APPLY FOR AND OBTAIN AN INDIVIDUAL TPDES PERMIT.

2. AUTHORIZATION UNDER THIS GENERAL PERMIT MAY BE SUSPENDED OR REVOKED FOR CAUSE. FILING A NOTICE OF PLANNED CHANGES OR ANTICIPATED NON-COMPLIANCE BY THE PERMITTEE DOES NOT STAY ANY PERMIT CONDITION. THE PERMITTEE MUST FURNISH TO THE EXECUTIVE DIRECTOR, UPON REQUEST AND WITHIN A REASONABLE TIME, ANY INFORMATION NECESSARY FOR THE EXECUTIVE DIRECTOR TO DETERMINE WHETHER CAUSE EXISTS FOR REVOKING, SUSPENDING, OR TERMINATING AUTHORIZATION UNDER THIS PERMIT. ADDITIONALLY, THE PERMITTEE MUST PROVIDE TO THE EXECUTIVE DIRECTOR, UPON REQUEST, COPIES OF ALL RECORDS THAT THE PERMITTEE IS REQUIRED TO MAINTAIN AS A CONDITION OF THIS GENERAL PERMIT.

3. IT IS NOT A DEFENSE FOR A DISCHARGER IN AN ENFORCEMENT ACTION THAT IT WOULD HAVE BEEN NECESSARY TO HALT OR REDUCE THE PERMITTED ACTIVITY TO MAINTAIN COMPLIANCE WITH THE PERMIT

4. INSPECTION AND ENTRY SHALL BE ALLOWED UNDER TEXAS WATER CODE CHAPTERS 26-28, HEALTH AND SAFETY CODE §§ 361.032-361.033 AND 361.037, AND 40 CODE OF FEDERAL REGULATIONS (CFR) § 122.41(i). THE STATEMENT IN TEXAS WATER CODE § 26.014 THAT COMMISSION ENTRY OF A FACILITY SHALL OCCUR ACCORDING TO AN ESTABLISHMENT'S RULES AND REGULATIONS CONCERNING SAFETY, INTERNAL SECURITY, AND FIRE PROTECTION IS NOT GROUNDS FOR DENIAL OR RESTRICTION OF ENTRY TO ANY PART OF THE FACILITY OR SITE, BUT MERELY DESCRIBES THE COMMISSION'S DUTY TO OBSERVE APPROPRIATE RULES AND REGULATIONS DURING AN INSPECTION.

5. THE DISCHARGER IS SUBJECT TO ADMINISTRATIVE, CIVIL, AND CRIMINAL PENALTIES, AS APPLICABLE UNDER TEXAS WATER CODE §§ 26.136, 26.212, AND 26.213 FOR VIOLATIONS INCLUDING BUT NOT LIMITED TO

a. NEGLIGENTLY OR KNOWINGLY VIOLATING CWA, §§ 301, 302, 306, 307, 308, 318, OR 405, OR ANY CONDITION OR LIMITATION IMPLEMENTING ANY SECTIONS IN A PERMIT ISSUED UNDER CWA § 402, OR ANY REQUIREMENT IMPOSED IN A PRETREATMENT PROGRAM APPROVED UNDER CWA, §§ 402(a)(3) OR 402(b)(8);

b. KNOWINGLY MAKING ANY FALSE STATEMENT, REPRESENTATION, OR CERTIFICATION IN ANY RECORD OR OTHER DOCUMENT SUBMITTED OR REQUIRED TO BE MAINTAINED UNDER A PERMIT. INCLUDING MONITORING REPORTS OR REPORTS OF COMPLIANCE OR NONCOMPLIANCE.

6. ALL REPORTS AND OTHER INFORMATION REQUESTED BY THE EXECUTIVE DIRECTOR MUST BE SIGNED BY THE PERSON AND IN THE MANNER REQUIRED BY 30TAC § 305.128 (RELATING TO SIGNATORIES TO REPORTS).

7. AUTHORIZATION UNDER THIS GENERAL PERMIT DOES NOT CONVEY PROPERTY OR WATER RIGHTS OF ANY SORT AND DOES NOT GRANT ANY EXCLUSIVE PRIVILEGE

> CIMA P #202 RCOS LA S

STABILIZATION PRACTICES

X TEMPORARY VEGETATION \_\_\_\_X PERMANENT VEGETATION \_ CELLULOSE FIBER MULCHING \_\_\_\_\_ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES \_\_\_\_\_ VEGETATIVE BUFFER STRIPS X PROTECTION OF TREES \_ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES \_ DIVERSION DIKE AND SWALE COMBINATION \_\_\_\_\_ PROTECTION OF MATURE VEGETATION \_\_ GEOTEXTILES \_\_\_\_\_ SOD STABILIZATION X STABILIZED (ROCK) CONSTRUCTION ENTRANCES

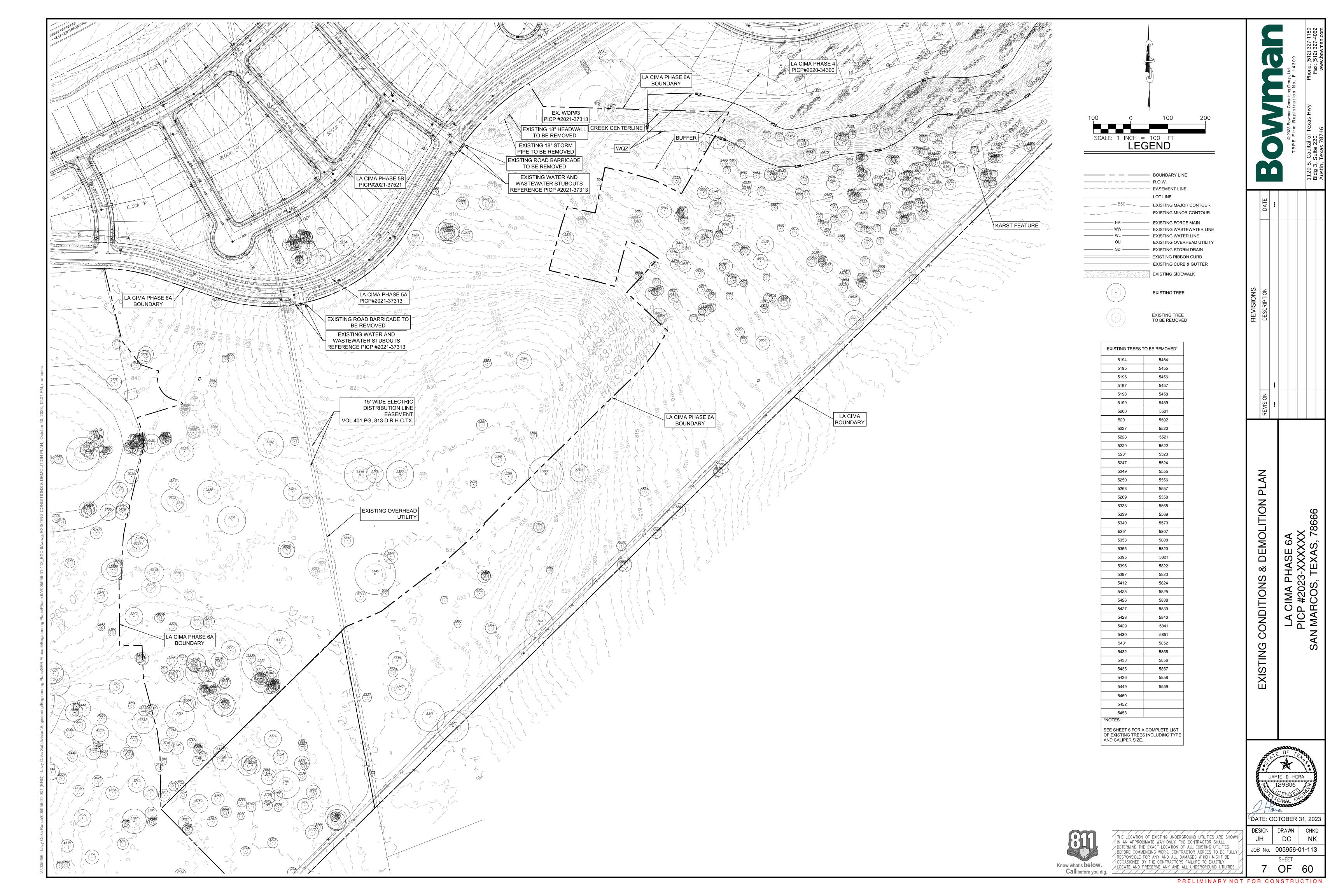
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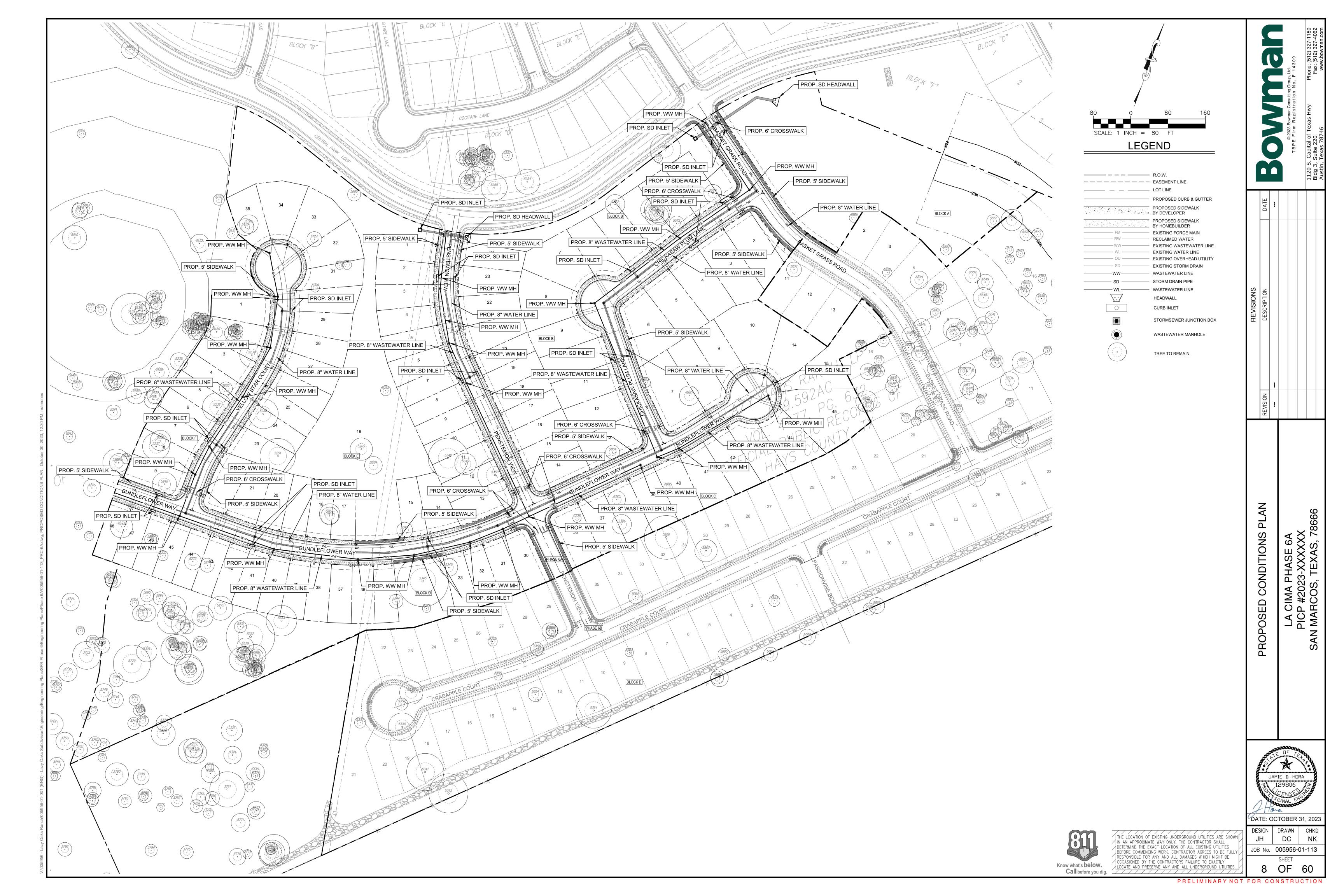
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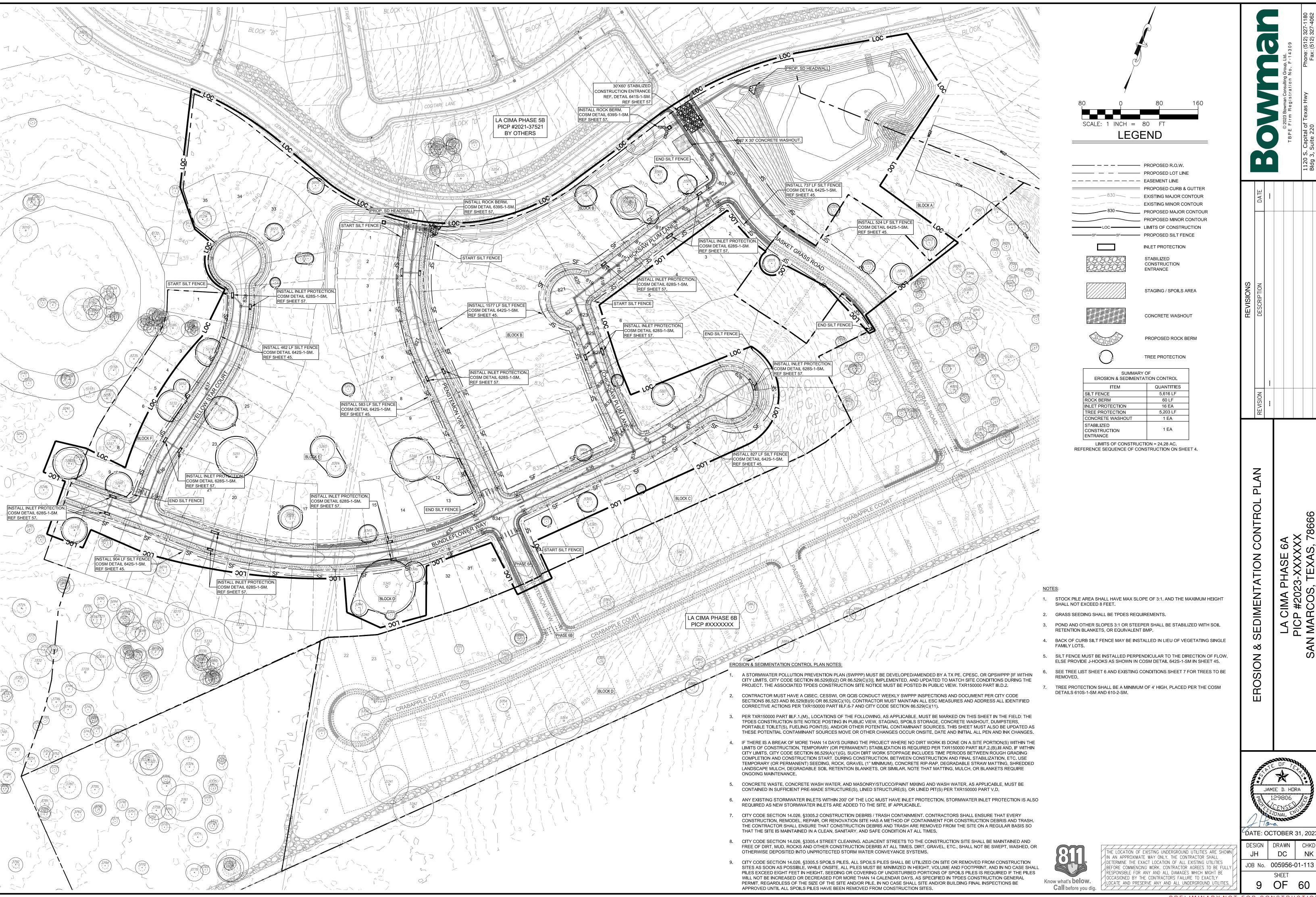
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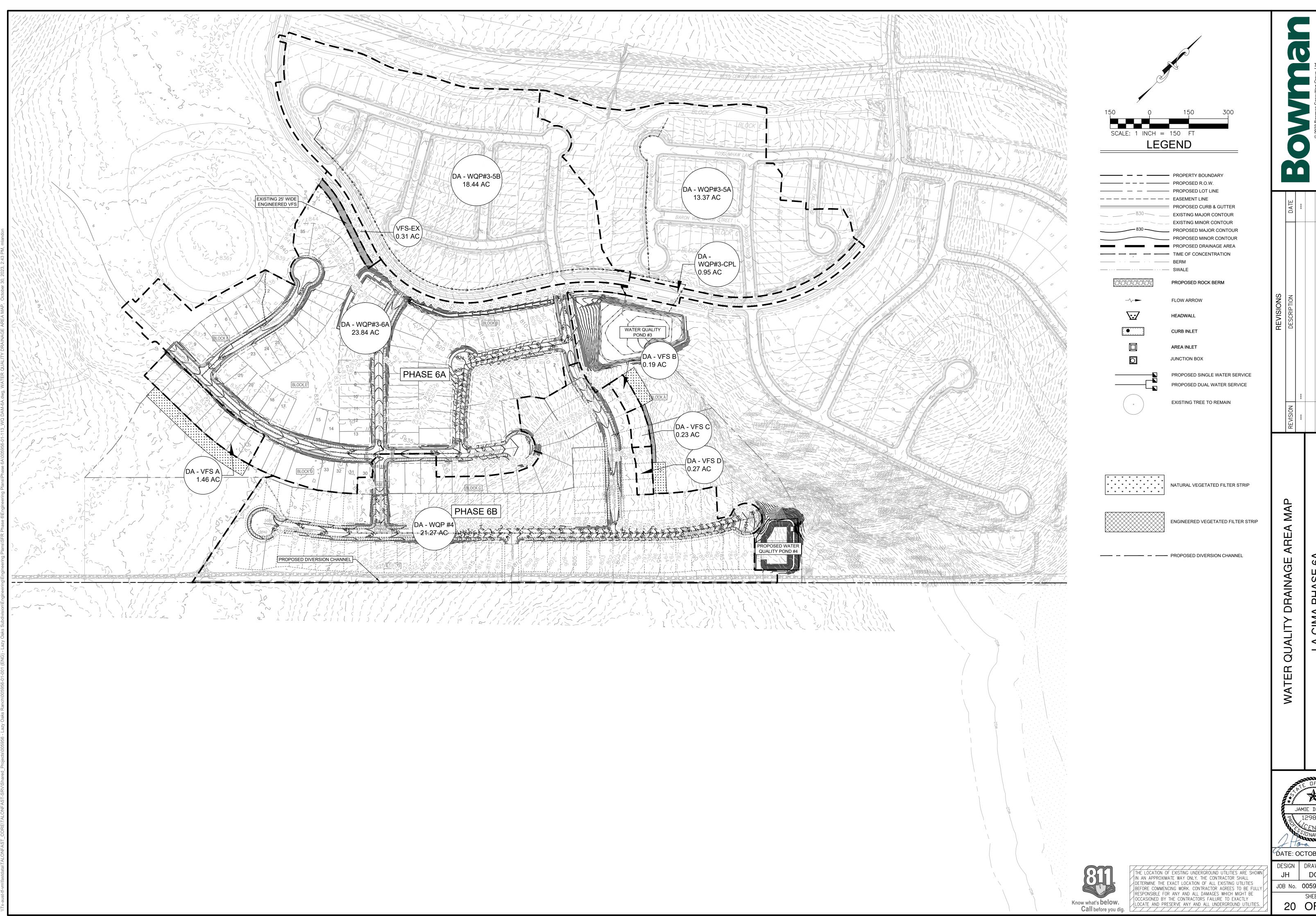
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PRELIMINARY NOT FOR CONSTRUCTION

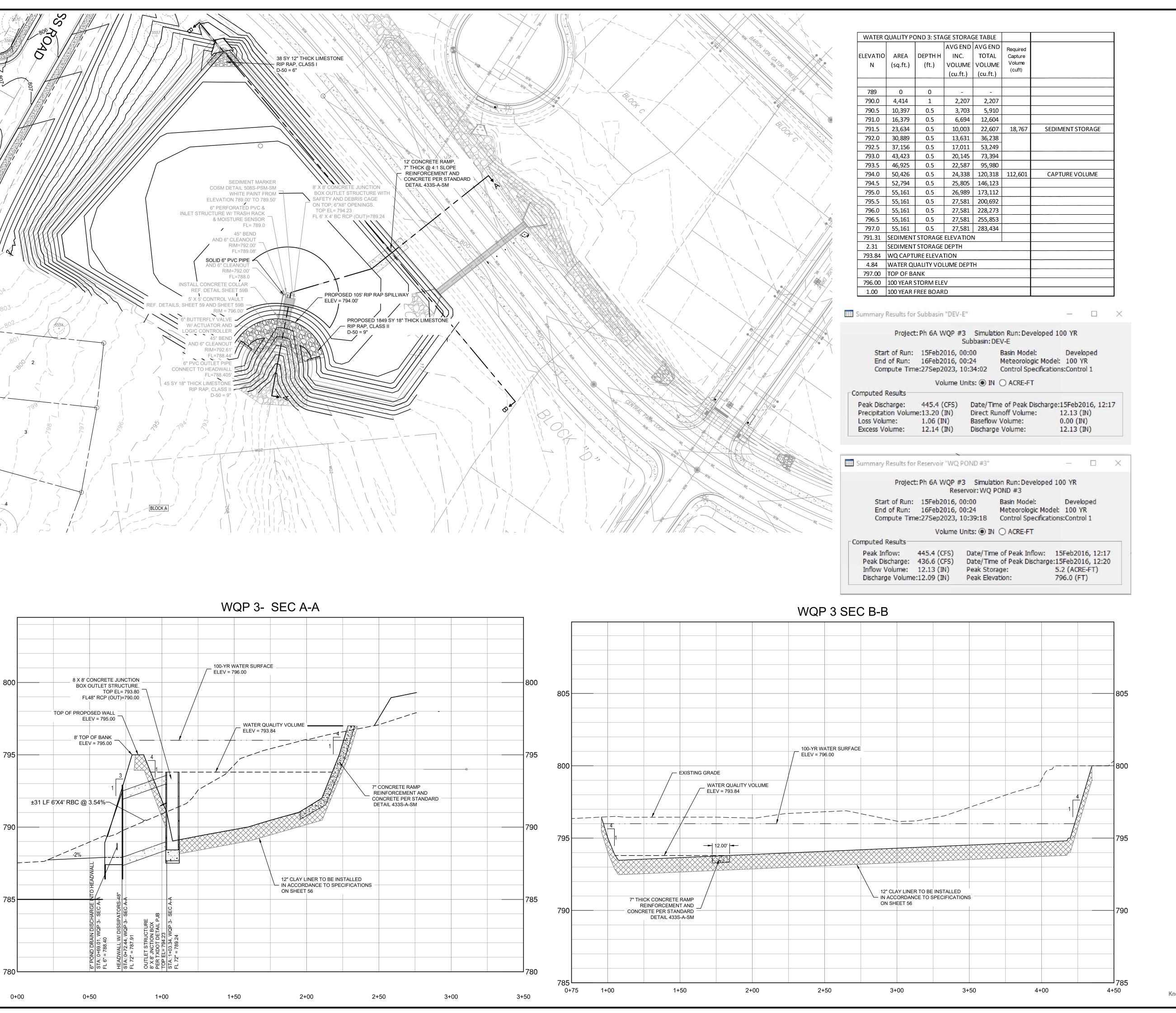
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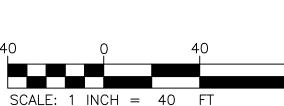




DATE: OCTOBER 31, 2023 DESIGN DRAWN CHKD DC NK JOB No. **005956-01-113** SHEET 20 OF 60 PRELIMINARY NOT FOR CONSTRUCTION







LEGEND

PROPERTY BOUNDARY
PROPOSED R.O.W.
PROPOSED LOT LINE
EASEMENT LINE
PROPOSED CURB & GUTTER
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
PROPOSED MAJOR CONTOUR
PROPOSED MINOR CONTOUR
PROPOSED MINOR CONTOUR
PROPOSED DRAINAGE AREA
TIME OF CONCENTRATION
BERM

PROPOSED ROCK BERM

FLOW ARROW

HEADWALL

CURB INLET

AREA INLET

JUNCTION BOX

PROPOSED SINGLE WATER SERVICE
PROPOSED DUAL WATER SERVICE

. EXISTING TREE TO REMAIN

### NOTES

- 1. WATER QUALITY POND CONTROL PANEL SHALL BE A 2-KNOB SYSTEM: ONE, FOR THE VALVE WITH 3 SETTINGS: OPEN, CLOSED, AND AUTO, THE SECOND, SHALL BE AN AUTO VALVE SETTING WITH TWO SETTINGS: WATER QUALITY AND TEST MODE. THE TEST MODE SHALL OPEN AND CLOSE THE VALVE ON A 1 MINUTE CYCLE. LIGHTS TO INDICATE THE VALVE IS OPEN OR CLOSED SHOULD BE ADDED TO THE CONTROL PANEL.
- 2. CONTRACTOR SHALL PROVIDE SUBMITTAL TO ENGINEER FOR WATER QUALITY POND CONTROL PANEL.
- 3. THE WATER QUALITY POND CONTROL PANEL SHALL ADHERE TO TCEQ REQUIREMENTS FOR BATCH DETENTION.



 $\mathfrak{C}$ 

POND

WATER QUALITY

6A XXX 3, 72

LA CIMA PHASE (PICP #2023-XXXX)



THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

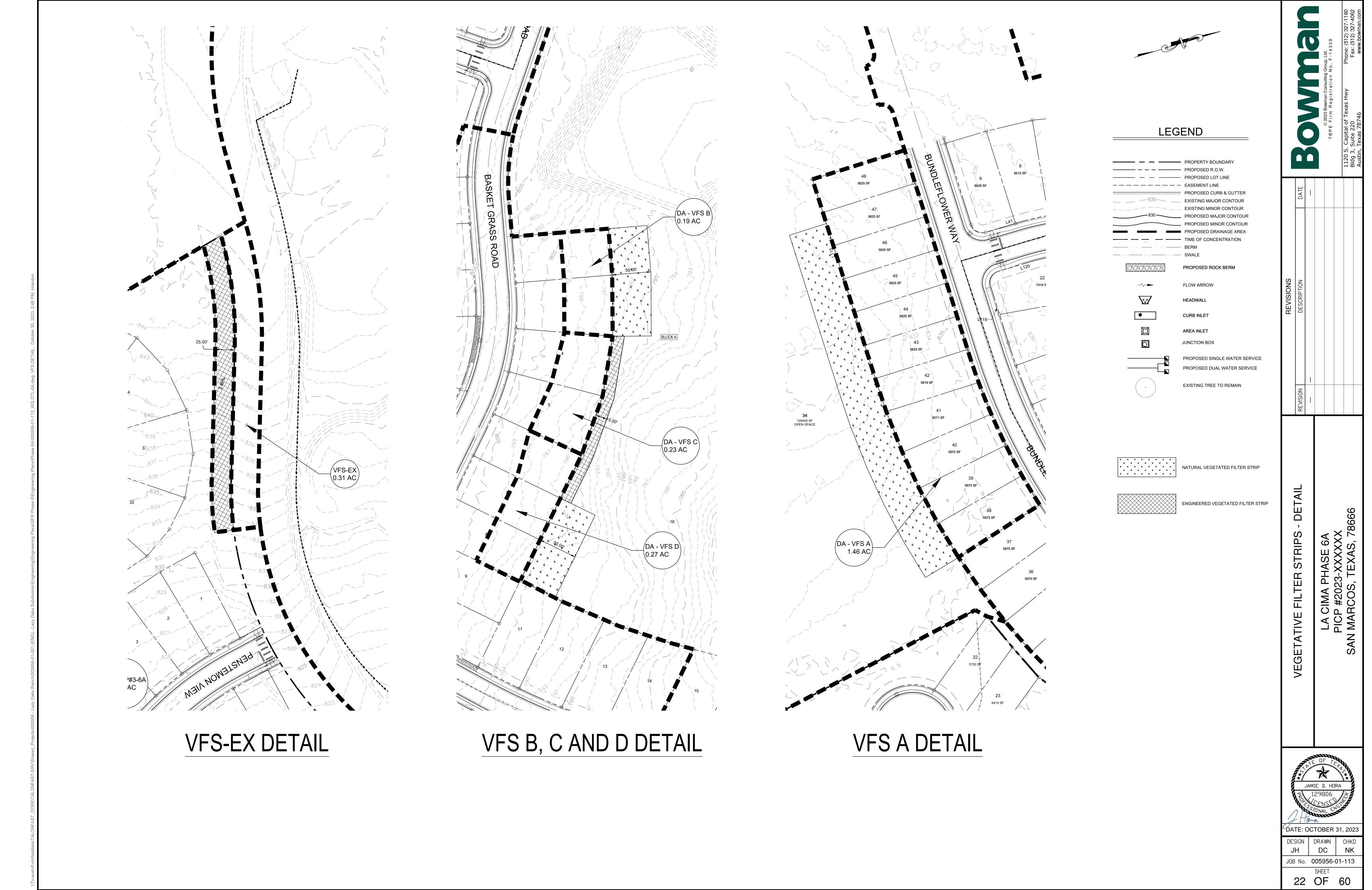
DESIGN DRAWN CHKD

JH DC NK

JOB No. 005956-01-113

SHEET

21 OF 60



 $\mathcal{O}$ OF \_ CALCULATIONS PHASE 23-XXXX LA CIMA F PICP #202( MARCOS, BMP QUALITY SAN WATER JAMIE D. HORA

JH

 $\mathcal{O}$ OF  $\sim$ CALCULATIONS . 6A XXX 78666 PHASE 23-XXXX LA CIMA F PICP #2023 MARCOS, BMP QUALITY SAN WATER JAMIE D. HORA

DATE: OCTOBER 31, 2023

DC

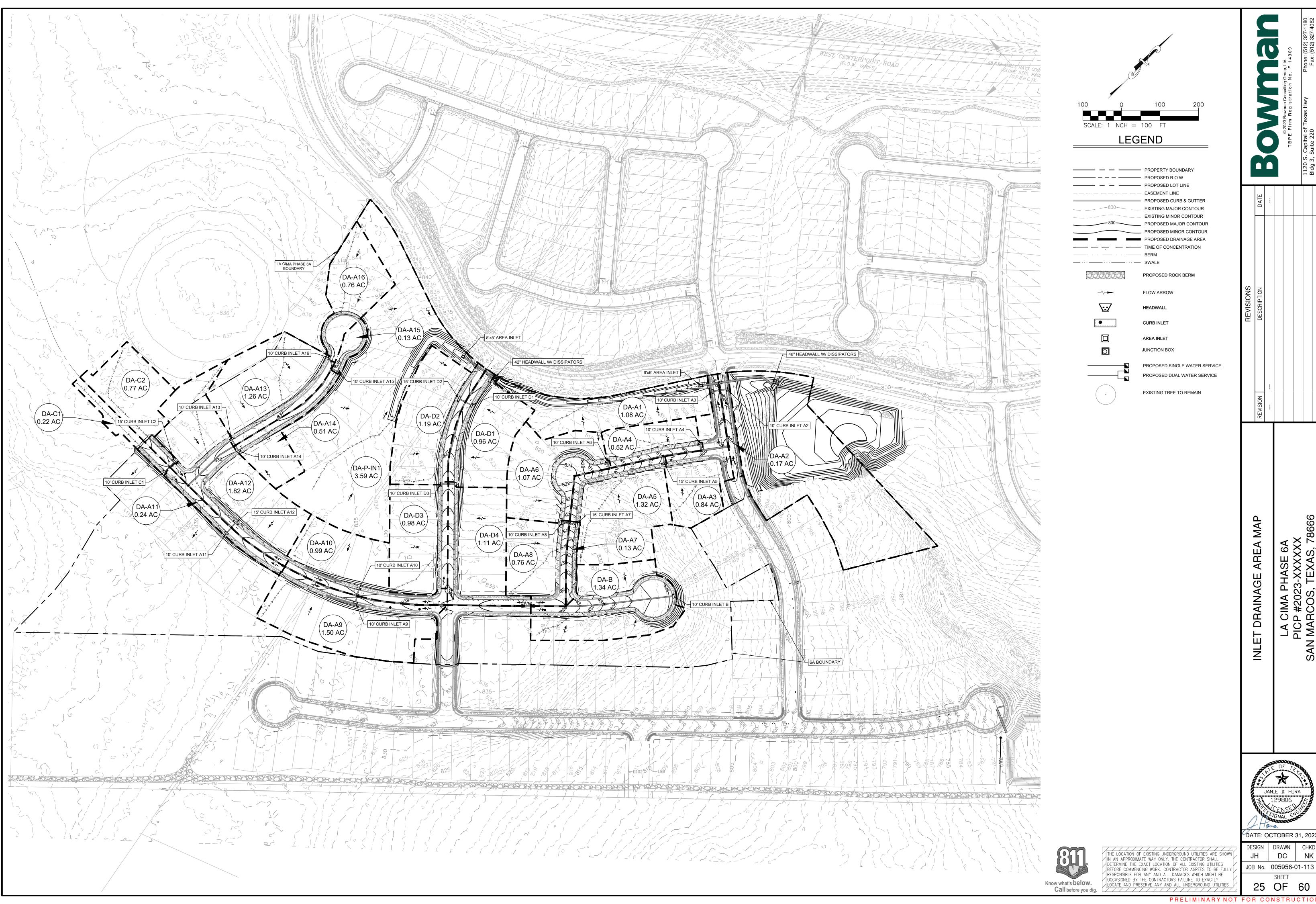
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DESIGN DRAWN

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			L	A CIMA PH	6A Impervi	ous Cover Calcu	lations			
Drainage Area Basin	Area (sf)	Area (ac)	Area (sq mi)	Lot Max Impervious Cover (%)	Roof/Lot Impervious Cover (sf)	Sidewalks and Driveways - ROW Concrete (sf)	Roadway - Asphalt (sf)	Open Area - Grass (sf)	Impervious Cover (sf)	Impervious Cover (%)
DA-A16	33,054	0.76	0.0012	50%	17,037	957	5,091	9,969	23,085	70%
DA-A1	47,058	1.08	0.0017	50%	27,266	0	0	19,792	27,266	58%
DA-A2	7,220	0.17	0.0003	50%	0	1,355	4,432	1,433	5,787	80%
DA-A3	36,679	0.84	0.0013	50%	21,018	2,057	8,180	5,424	31,255	85%
DA-A4	22,667	0.52	0.0008	50%	16,191	1,219	4,156	1,101	21,566	95%
DA-A5	57,343	1.32	0.0021	50%	48,332	1,570	5,794	1,647	55,696	97%
DA-A6	46,772	1.07	0.0017	50%	36,220	1,550	7,625	1,378	45,394	97%
DA-A7	5,486	0.13	0.0002	50%	0	932	3,549	1,005	4,481	82%
DA-A8	33,159	0.76	0.0012	50%	25,610	436	5,017	2,096	31,063	94%
DA-A9	65,361	1.50	0.0023	50%	39,510	2,123	7,324	16,404	48,957	75%
DA-A10	43,242	0.99	0.0016	50%	19,282	2,079	7,729	14,152	29,090	67%
DA-A11	10,668	0.24	0.0004	50%	0	1,976	6,852	1,840	8,828	83%
DA-A12	79,280	1.82	0.0028	50%	56,802	2,979	11,342	8,157	71,123	90%
DA-A13	54,761	1.26	0.0020	50%	37,356	1,686	5,762	9,957	44,804	82%
DA-A14	23,114	0.53	0.0008	50%	13,236	1,697	5,357	2,824	20,290	88%
DA-A15	5,852	0.13	0.0002	50%	0	849	4,146	857	4,995	85%
DA-B	58,243	1.34	0.0021	50%	35,532	3,590	15,199	3,922	54,321	93%
DA-C2	33,747	0.77	0.0012	50%	24,976	1,668	5,477	1,626	32,121	95%
DA-C1	9,736	0.22	0.0003	50%	0	1,316	6,551	1,869	7,867	81%
DA-D4	48,350	1.11	0.0017	50%	35,105	2,328	8,636	2,281	46,069	95%
DA-D1	41,767	0.96	0.0015	50%	33,446	1,337	4,477	2,507	39,260	94%
DA-D2	51,873	1.19	0.0019	50%	42,993	1,686	5,348	1,846	50,027	96%
DA-D3	42,636	0.98	0.0015	50%	35,385	1,588	5,188	475	42,161	99%
DA-P-IN1	156,340	3.59	0.0056	50%	62,494	0	0	93,846	62,494	40%
DA-OS2	128,203	2.94	0.0046	50%	0	0	0	128,203	0	0%

				LA CII	MA PH 6A D	eveloped Co	nditions C-Va	lues							
Drainage Area Basin	Total Area (sf)	Concret Including	-	Asp	Asphalt		ition and %)	Composite C-Values							
Dasiii		Area (sf)	%	Area (sf)	%	Area (sf)	%	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr	
DA-A16	33,054	17,994	54%	5,091	15%	9,969	30%	0.61	0.65	0.68	0.73	0.77	0.81	0.87	
DA-A1	47,058	27,266	58%	0	0%	19,792	42%	0.56	0.60	0.63	0.67	0.71	0.76	0.81	
DA-A2	7,220	1,355	19%	4,432	61%	1,433	20%	0.65	0.69	0.72	0.77	0.81	0.86	0.91	
DA-A3	36,679	23,075	63%	8,180	22%	5,424	15%	0.68	0.72	0.75	0.80	0.84	0.89	0.93	
DA-A4	22,667	17,410	77%	4,156	18%	1,101	5%	0.72	0.77	0.80	0.85	0.89	0.94	0.98	
DA-A5	57,343	49,902	87%	5,794	10%	1,647	3%	0.73	0.78	0.81	0.86	0.90	0.95	0.99	
DA-A6	46,772	37,769	81%	7,625	16%	1,378	3%	0.73	0.78	0.81	0.86	0.90	0.95	0.99	
DA-A7	5,486	932	17%	3,549	65%	1,005	18%	0.65	0.69	0.73	0.78	0.82	0.86	0.92	
DA-A8	33,159	26,046	79%	5,017	15%	2,096	6%	0.72	0.77	0.80	0.85	0.89	0.93	0.97	
DA-A9	65,361	41,633	64%	7,324	11%	16,404	25%	0.63	0.68	0.71	0.75	0.79	0.84	0.89	
DA-A10	43,242	21,361	49%	7,729	18%	14,152	33%	0.60	0.64	0.67	0.72	0.75	0.80	0.86	
DA-A11	10,668	1,976	19%	6,852	64%	1,840	17%	0.66	0.70	0.73	0.78	0.82	0.87	0.92	
DA-A12	79,280	59,781	75%	11,342	14%	8,157	10%	0.70	0.75	0.78	0.83	0.87	0.91	0.95	
DA-A13	54,761	39,042	71%	5,762	11%	9,957	18%	0.66	0.71	0.74	0.79	0.83	0.88	0.92	
DA-A14	23,114	14,933	65%	5,357	23%	2,824	12%	0.69	0.73	0.77	0.82	0.85	0.90	0.95	
DA-A15	5,852	849	15%	4,146	71%	857	15%	0.67	0.71	0.75	0.79	0.83	0.88	0.94	
DA-B	58,243	39,122	67%	15,199	26%	3,922	7%	0.71	0.76	0.79	0.84	0.88	0.93	0.97	
DA-C2	33,747	26,644	79%	5,477	16%	1,626	5%	0.72	0.77	0.80	0.85	0.89	0.94	0.98	
DA-C1	9,736	1,316	14%	6,551	67%	1,869	19%	0.65	0.69	0.72	0.77	0.81	0.86	0.92	
DA-D4	48,350	37,433	77%	8,636	18%	2,281	5%	0.72	0.77	0.80	0.85	0.89	0.94	0.98	
DA-D1	41,767	34,783	83%	4,477	11%	2,507	6%	0.72	0.77	0.80	0.85	0.89	0.94	0.97	
DA-D2	51,873	44,679	86%	5,348	10%	1,846	4%	0.73	0.78	0.81	0.86	0.90	0.95	0.98	
DA-D3	42,636	36,973	87%	5,188	12%	475	1%	0.74	0.79	0.82	0.87	0.91	0.96	1.00	
DA-P-IN1	156,340	62,494	40%	0	0%	93,846	60%	0.47	0.51	0.54	0.59	0.62	0.66	0.74	
DA-OS2	128,203	0	0%	0	0%	128,203	100%	0.29	0.32	0.35	0.39	0.42	0.46	0.56	

							LA CIM	A PH 6A -	Rational	Method (	Calculatio	ns								
		AREA			SHEET	FLOW		SHALL	OW CONC	ENTRATED	FLOW			CHANNI	EL FLOW			Increm	TC	
BASIN		AREA		L		S	Tc	L	n	S	Tc	L	n	S	R	V	Tc	TC	Total	Lag min
	sf	ас	sq mi	ft	n	%	min	ft	• • • • • • • • • • • • • • • • • • • •	%	min	ft	n	%		fps	min	min	min	111111
DA-A16	33054	0.76	0.0012	100	0.150	1.41%	9.9	143	0.15	3.67%	0.8	143	0.015	0.53%	0.10	1.56	1.5	12.2	12.2	7.3
DA-A1	47058	1.08	0.0017	100	0.150	3.20%	7.1	347	0.15	2.57%	2.2	0	0.015	0.50%	0.10	1.51	0.0	9.4	9.4	5.6
DA-A2	7220	0.17	0.0003	17	0.150	4.35%	1.5	0	0.15	0.50%	0.0	216	0.015	1.34%	0.10	2.48	1.5	3.0	5.0	3.0
DA-A3	36679	0.84	0.0013	100	0.150	5.77%	5.6	156	0.15	2.09%	1.1	122	0.015	1.53%	0.10	2.65	0.8	7.5	7.5	4.5
DA-A4	22667	0.52	0.0008	100	0.150	1.95%	8.7	78	0.15	3.78%	0.4	80	0.015	2.52%	0.10	3.40	0.4	9.5	9.5	5.7
DA-A5	57343	1.32	0.0021	100	0.150	5.14%	5.9	187	0.15	6.83%	0.7	77	0.015	3.94%	0.10	4.25	0.3	6.9	6.9	4.2
DA-A6	46772	1.07	0.0017	17	0.150	7.86%	1.2	0	1.15	0.50%	0.0	284	0.015	3.30%	0.10	3.89	1.2	2.4	5.0	3.0
DA-A7	5486	0.13	0.0002	40	0.150	2.75%	3.6	0	0.15	0.50%	0.0	171	0.015	3.95%	0.10	4.25	0.7	4.3	5.0	3.0
DA-A8	33159	0.76	0.0012	100	0.150	1.31%	10.2	85	0.15	4.47%	0.4	67	0.015	4.79%	0.10	4.68	0.2	10.8	10.8	6.5
DA-A9	65361	1.50	0.0023	100	0.150	0.17%	23.1	37	0.15	3.81%	0.2	168	0.015	1.42%	0.10	2.55	1.1	24.4	24.4	14.6
DA-A10	43242	0.99	0.0016	100	0.150	0.13%	25.7	36	0.15	4.02%	0.2	176	0.015	1.49%	0.10	2.61	1.1	27.0	27.0	16.2
DA-A11	10668	0.24	0.0004	27	0.150	3.85%	2.3	0	0.15	0.50%	0.0	191	0.015	1.41%	0.10	2.54	1.3	3.6	5.0	3.0
DA-A12	79280	1.82	0.0028	100	0.150	0.13%	25.7	224	0.15	0.98%	2.3	167	0.015	1.75%	0.10	2.83	1.0	29.0	29.0	17.4
DA-A13	54761	1.26	0.0020	100	0.150	1.01%	11.3	98	0.15	0.63%	1.3	160	0.015	0.50%	0.10	1.51	1.8	14.3	14.3	8.6
DA-A14	23114	0.53	0.0008	19	0.150	3.94%	1.7	0	0.15	0.50%	0.0	319	0.015	0.49%	0.10	1.50	3.5	5.3	5.3	3.2
DA-A15	5852	0.13	0.0002	8	0.150	7.98%	0.7	0	0.15	0.50%	0.0	161	0.015	0.27%	0.10	1.11	2.4	3.1	5.0	3.0
DA-B	58243	1.34	0.0021	100	0.150	2.06%	8.5	19	0.15	0.12%	0.6	283	0.015	2.18%	0.10	3.16	1.5	10.6	10.6	6.3
DA-C2	33747	0.77	0.0012	100	0.150	0.06%	35.0	32	0.15	0.09%	1.1	244	0.015	0.46%	0.10	1.45	2.8	38.9	38.9	23.3
DA-C1	9736	0.22	0.0003	10	0.150	2.44%	1.3	75	0.15	0.50%	1.1	249	0.015	0.46%	0.10	1.45	2.9	5.2	5.2	3.1
DA-D4	48350	1.11	0.0017	15	0.150	0.75%	2.8	0	0.15	0.50%	0.0	471	0.015	1.55%	0.10	2.66	2.9	5.7	5.7	3.4
DA-D1	41767	0.96	0.0015	0	0.150	0.50%	0.0	0	0.15	0.50%	0.0	208	0.015	1.78%	0.10	2.86	1.2	1.2	5.0	3.0
DA-D2	51873	1.19	0.0019	100	0.150	3.83%	6.6	58	0.15	0.31%	1.1	188	0.015	1.20%	0.10	2.34	1.3	9.0	9.0	5.4
DA-D3	42636	0.98	0.0015	100	0.150	0.32%	17.9	62	0.15	5.67%	0.3	167	0.015	2.14%	0.10	3.13	0.9	19.1	19.1	11.4
DA-P-IN1	156340	3.59	0.0056	100	0.150	53.00%	2.3	533	0.15	1.94%	4.0	0	0.015	0.50%	0.10	1.51	0.0	6.3	6.3	3.8
DA-OS2	128203	2.94	0.0046	100	0.150	3.65%	6.8	175	0.15	6.25%	0.7	251	0.150	4.38%	0.10	0.45	9.3	16.8	16.8	10.1

	LA CIMA PH 6A Inlet Calculations - 25 Year Storm												
Inlet ID	Drainage Area	Inlet Type	Length of Inlet (ft)	Long. Slope (%)	Q25 (cfs)	Peak Flow During Analysis	Peak Flow Captured by Inlet	Peak Flow Bypassing Inlet	Inlet Accepting Bypass Flow	Depth in Gutter (ft)	Ponding Width (ft)	Inlet Efficiency	
A1	DA-A1	ON GRADE	3.00	1.96%	6.74	6.74	5.55	1.19	-	0.28	8.96	82%	
<b>A</b> 2	DA-A2	IN SAG	10.00	0.00%	1.50	1.50	15.60	0.00	_	1.39	44.48	100%	
A3	DA-A3	IN SAG	15.00	0.00%	6.79	6.79	11.01	0.00	_	0.83	26.56	100%	
A4	DA-A4	ON GRADE	10.00	2.00%	4.10	4.10	5.91	0.00	<b>A</b> 3	0.33	10.56	100%	
A5	DA-A5	ON GRADE	15.00	2.00%	11.77	11.77	3.26	8.51	A2	0.39	12.48	28%	
A6	DA-A6	ON GRADE	10.00	4.75%	10.57	10.57	6.05	4.52	A4	0.32	10.24	57%	
A7	DA-A7	ON GRADE	15.00	4.75%	1.16	1.16	1.42	0.00	<b>A</b> 5	0.24	7.68	100%	
A8	DA-A8	ON GRADE	10.00	4.75%	5.67	5.67	3.83	1.84	A6	0.22	7.04	68%	
A9	DA-A9	ON GRADE	10.00	0.50%	6.75	6.75	4.18	2.57	Α7	0.23	7.36	62%	
A10	DA-A10	ON GRADE	10.00	0.50%	4.05	4.05	4.00	0.05	A8	0.29	9.28	99%	
A11	DA-A11	IN SAG	10.00	1.00%	2.15	2.15	5.15	0.00	A9	0.98	31.36	100%	
A12	DA-A12	IN SAG	15.00	1.00%	8.25	8.25	8.37	0.00	A10	0.62	19.84	100%	
A13	DA-A13	ON GRADE	10.00	0.50%	7.75	7.75	5.87	1.88	A11	0.34	10.88	76%	
A14	DA-A14	ON GRADE	10.00	0.50%	4.91	4.91	4.67	0.24	A12	0.31	9.92	95%	
A15	DA-A15	ON GRADE	10.00	0.50%	1.18	1.18	1.18	0.00	A14	0.19	6.08	100%	
A16	DA-A16	ON GRADE	10.00	0.50%	4.64	4.64	4.47	0.17	A13	0.31	9.92	96%	
В	DA-B	ON SAG	10.00	0.00%	10.00	10.00	7.50	2.50	_	0.41	13.12	75%	
C2	DA-C2	ON GRADE	15.00	1.59%	1.92	1.92	1.92	0.00	A12	0.18	5.76	100%	
C1	DA-C1	ON GRADE	10.00	1.59%	3.03	3.03	3.03	0.00	A11	0.31	9.92	100%	
D1	DA-D1	IN SAG	10.00	0.00%	9.37	9.37	6.96	2.41	_	0.36	11.52	74%	
D2	DA-D2	IN SAG	15.00	0.00%	9.65	9.65	11.63	0.00	_	0.79	25.28	100%	
D3	DA-D3	IN SAG	10.00	2.09%	5.79	5.79	4.37	1.42	D2	0.26	8.32	75%	
D4	DA-D4	ON GRADE	10.00	2.09%	10.40	10.40	6.35	4.05	D1	0.34	10.88	61%	

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Inlet ID	Drainage Area	Inlet Type	Length of Inlet (ft)	LA Cr Long. Slope (%)	Q100 (cfs)	Peak Flow Including Bypass	Peak Flow Inlet Captured by Inlet	Peak Flow Bypassing Inlet	Inlet Accepting Bypass Flow	Depth in Gutter (ft)	Ponding Width (ft)	Inlet Efficiency
A1	DA-A1	ON GRADE	3.00	1.96%	9.77	9.77	7.25	2.52	_	0.28	8.96	74%
A2	DA-A2	IN SAG	10.00	0.00%	2.17	2.17	24.68	0.00	_	1.39	44.48	100%
<b>A</b> 3	DA-A3	IN SAG	15.00	0.00%	9.68	9.68	18.83	0.00	_	0.83	26.56	100%
A4	DA-A4	ON GRADE	10.00	2.00%	5.79	5.79	7.61	0.00	<b>A</b> 3	0.33	10.56	100%
<b>A</b> 5	DA-A5	ON GRADE	15.00	2.00%	16.68	16.68	4.19	12.49	A2	0.39	12.48	25%
<b>A</b> 6	DA-A6	ON GRADE	10.00	4.75%	15.06	15.06	7.48	7.58	A4	0.32	10.24	50%
Α7	DA-A7	ON GRADE	15.00	4.75%	1.66	1.66	1.99	0.00	A5	0.24	7.68	100%
A8	DA-A8	ON GRADE	10.00	4.75%	7.91	7.91	4.77	3.14	A6	0.22	7.04	60%
<b>A</b> 9	DA-A9	ON GRADE	10.00	0.50%	9.65	9.65	5.03	4.62	A7	0.23	7.36	52%
A10	DA-A10	ON GRADE	10.00	0.50%	5.75	5.75	5.25	0.50	A8	0.29	9.28	91%
A11	DA-A11	IN SAG	10.00	1.00%	3.09	3.09	9.73	0.00	A9	0.98	31.36	100%
A12	DA-A12	IN SAG	15.00	1.00%	11.58	11.58	12.05	0.00	A10	0.62	19.84	100%
<b>A1</b> 3	DA-A13	ON GRADE	10.00	0.50%	10.99	10.99	7.34	3.65	A11	0.34	10.88	67%
A14	DA-A14	ON GRADE	10.00	0.50%	6.95	6.95	5.98	0.97	A12	0.31	9.92	86%
A15	DA-A15	ON GRADE	10.00	0.50%	1.70	1.70	1.70	0.00	A14	0.19	6.08	100%
A16	DA-A16	ON GRADE	10.00	0.50%	6.56	6.56	5.75	0.81	A13	0.31	9.92	88%
В	DA-B	ON SAG	10.00	0.00%	14.12	14.12	9.14	4.98	_	0.41	13.12	65%
C2	DA-C2	ON GRADE	15.00	1.59%	2.77	2.77	2.71	0.06	A12	0.18	13.12	98%
C1	DA-C1	ON GRADE	10.00	1.59%	4.32	4.32	4.32	0.00	A11	0.31	5.76	100%
D1	DA-D1	IN SAG	10.00	0.00%	13.37	13.37	8.61	4.76		0.36	9.92	64%
D2	DA-D2	IN SAG	15.00	0.00%	13.63	13.63	17.57	0.00	_	0.79	11.52	100%
D3	DA-D3	IN SAG	10.00	2.09%	8.15	8.15	5.31	2.84	D2	0.26	25.28	65%
D4	DA-D4	ON GRADE	10.00	2.09%	14.79	14.79	7.64	7.15	D1	0.34	8.32	52%

<b>Location</b> 42" Headw			Based on the	ı	 _	IS Gradat 100yr	on Table	lated	D-50 (in)	Class	1	kness in)
					 _		•					
					SD LN	E P4	36	22.69	6.62	2 32	.61	7.2
					SD LN		42	34.46	_		.22	7.9
	•	•	•		 SD LN	D P10	18	6.35	7.26	7.	64	7.5
7.15	D1	0.34	8.32	52%	SD LN	D P8	24	8.28	7.7	9.	96	8.0
2.84	D2	0.26	25.28	65%	SD LN	D P6	24	8.25	7.69	9.	93	8.0
0.00	_	0.79	11.52	100%	SD LN	D P4	24	8.19	7.68	3 9.	86	8.0
4.76		0.36	9.92	64%	SD LN	D P2	36	20.5	5.7	27	.27	6.
0.00	A11	0.31	5.76	100%	 SD LN	C1 P1	18	1.92	7.59	) 2.	71	8.3
0.06	A12	0.18	13.12	98%	SD LN	C P3	18	3.03	5.14	4.	32	5.6
~ ~ ~	_	U.T I	13.14	65%	SD LN	C P1	18	3.81	4.23	5.	42	4.5
4.98		0.41	13.12	CE0/							+	

	Diameter	25	-YR	100	)-YR
Conduit Label	(in)	Flow	Velocity	Flow	Velocity
		(cfs)	(fps)	(cfs)	(fps)
SD LAT A1 P1	48	5.55	5.49	7.25	5.94
SD LAT A2 P1	24	15.6	4.97	24.68	7.85
SD LAT A3 P1	24	11.01	3.5	18.83	6
SD LAT A4 P1	24	5.91	7.78	7.61	8.36
SD LAT A5 P1	18	3.26	7.3	4.19	7.84
SD LAT A6 P1	24	6.05	9.05	7.48	9.61
SD LAT A7 P1	18	1.42	4.11	1.99	4.52
SD LAT A8 P2	18	3.83	5.42	4.77	5.74
SD LAT A9 P1	18	4.18	7.82	5.03	8.24
SD LAT A10 P1	18	4	9.91	5.25	10.7
SD LAT A11 P1	18	5.15	4.54	9.73	5.51
SD LAT A12 P1	18	8.37	4.74	12.05	6.82
SD LAT A13 P1	18	5.87	7.91	7.34	8.39
SD LAT A14 P1	18	4.67	4.44	5.98	3.38
SD LAT A15 P1	18	1.18	3.07	1.7	3.4
SD LAT D1 P1	18	6.96	6.35	8.61	6.63
SD LAT D2 P1	24	11.63	5.55	17.57	5.59
SD LAT D3 P1	18	4.37	5.67	5.31	5.96
SD LN A P1	48	52.03	12.2	73.31	13.38
SD LN A P2	48	52.07	12.19	73.36	13.36
SD LN A P3	42	49.49	14.36	69.95	15.74
SD LN A P4	42	38.92	11.35	52.69	5.48
SD LN A P5	42	38.98	11.36	52.76	12.31
SD LN A P6	36	36.27	9.63	49.22	10.32
SD LN A P7	36	34.98	12.35	47.54	13.37
SD LN A P8	36	32.72	12.13	44.73	13.16
SD LN A P9	36	32.79	12.14	44.83	13.17
SD LN A P10	36	30.37	10.68	41.69	11.59
SD LN A P11	36	30.46	10.73	41.8	11.64
SD LN A P12	36	26.83	6.89	37.31	7.4
SD LN A P13	36	27.06	6.9	37.6	7.41
SD LN A P14	36	27.16	6.91	37.73	7.41
SD LN A P15	36	27.2	6.91	37.79	7.41
SD LN A P16	30	20.93	6.43	29.82	6.72
SD LN A P17	30	21.03	6.44	29.94	6.72
SD LN A P18	30	21.12	6.45	30.07	6.71
SD LN A P19	30	21.16	6.45	30.12	6.71
SD LN A P20	30	12.13	8.42	16.11	9.11
SD LN A P21	24	13.99	7.58	17.81	7.98
SD LN A P22	24	14.03	7.58	17.87	7.98
SD LN A P23	24	5.24	4.56	6.86	4.9
SD LN A P24	24	5.29	4.57	6.92	4.91
SD LN A P25	24	5.32	4.58	6.96	4.91
SD LN A P26	18	4.47	9.44	5.74	10.13
SD LN A P27	18	4.47	9.44	5.75	10.13
SD LN B P1	24	7.26	4.97	8.86	5.22
SD LN B P3	24	7.33	4.98	8.94	5.23
SD LN B P5	24	7.45	5	9.08	5.25
SD LN B P7	24	7.5	5.01	9.14	5.26
SD LN C P1	18	3.81	4.23	5.42	4.59
SD LN C P3	18	3.03	5.14	4.32	5.65
SD LN C1 P1	18	1.92	7.59	2.71	8.39
SD LN D P2	36	20.5	5.7	27.27	6.1
SD LN D P4	24	8.19	7.68	9.86	8.07
SD LN D P6	24	8.25	7.69	9.93	8.09
SD LN D P8	24	8.28	7.7	9.96	8.09
•					

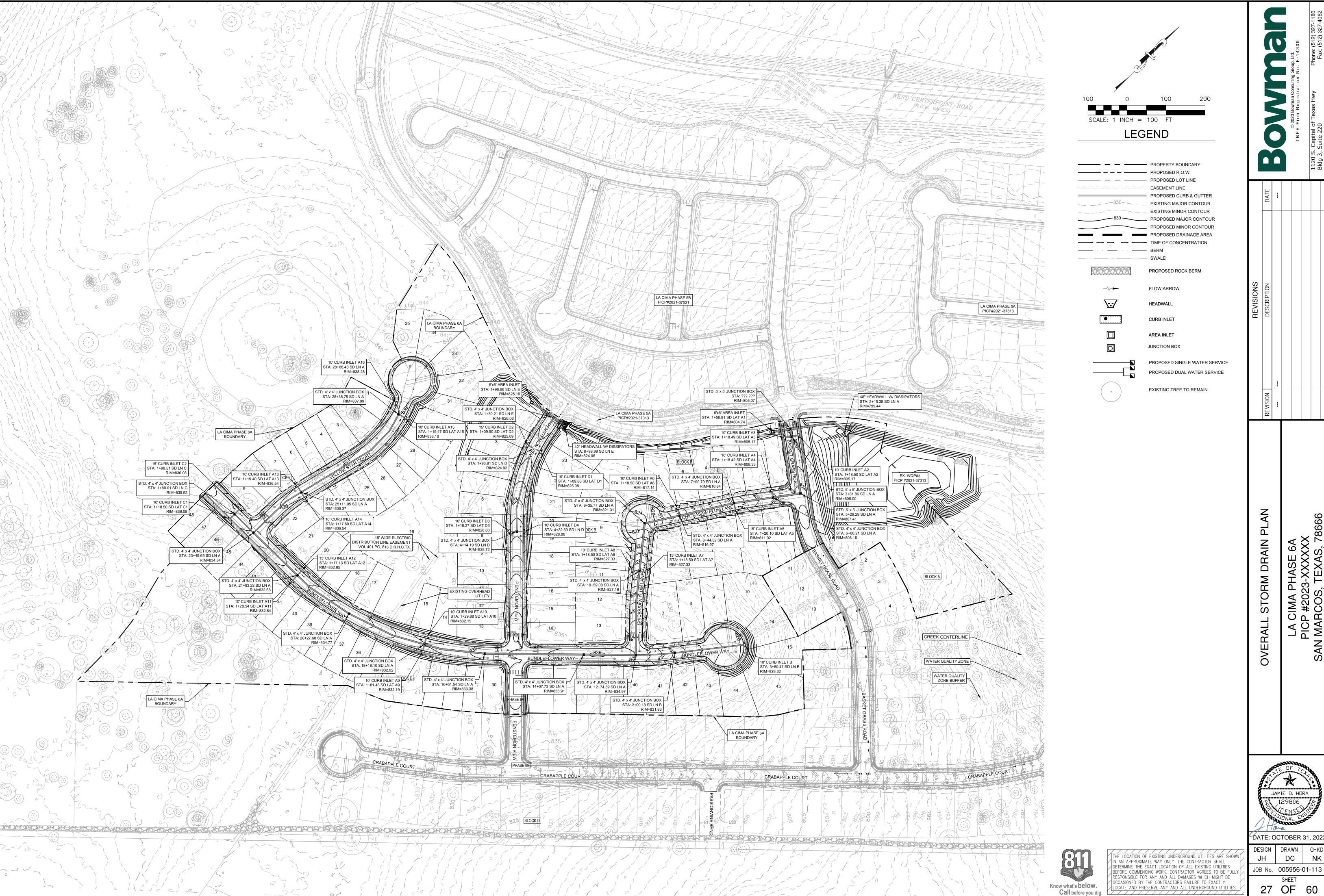
	La Cima Phase ( Based on the City of		_	-									
Location	Pipe Segments	Pipe and Headwall Size	Height of Flow	100yr Velocity After HW (FPS)	Calculated D-50 (in)	D-50 (in)	Class	Thickness (in)					
" Headwall at Line A	SD LN A P1	42	0.28	0.90	0.10	6	I	12					
" Headwall at Line B	Headwall SD LN E P2 36 0.28 1.05 0.14 6 1 12												

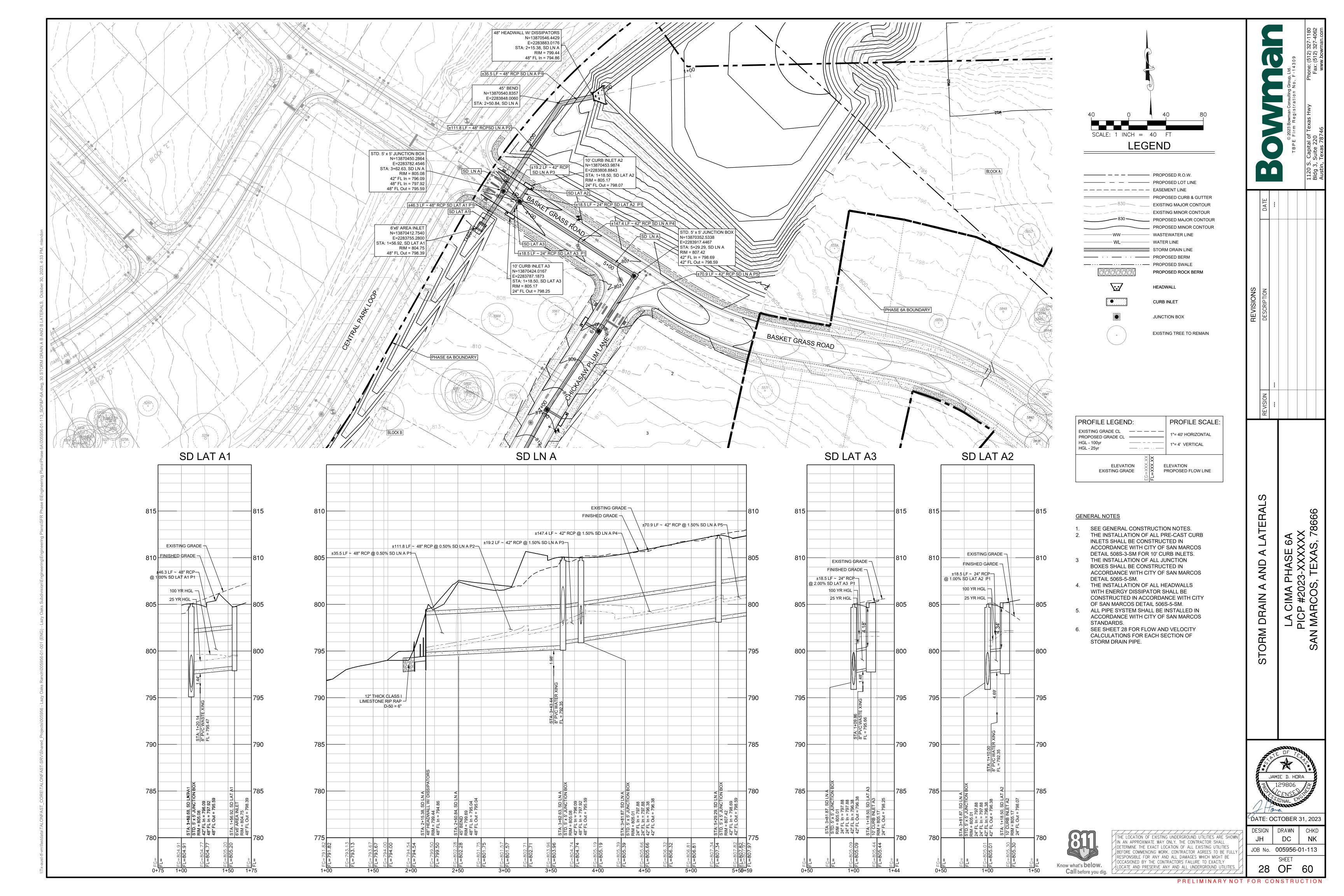


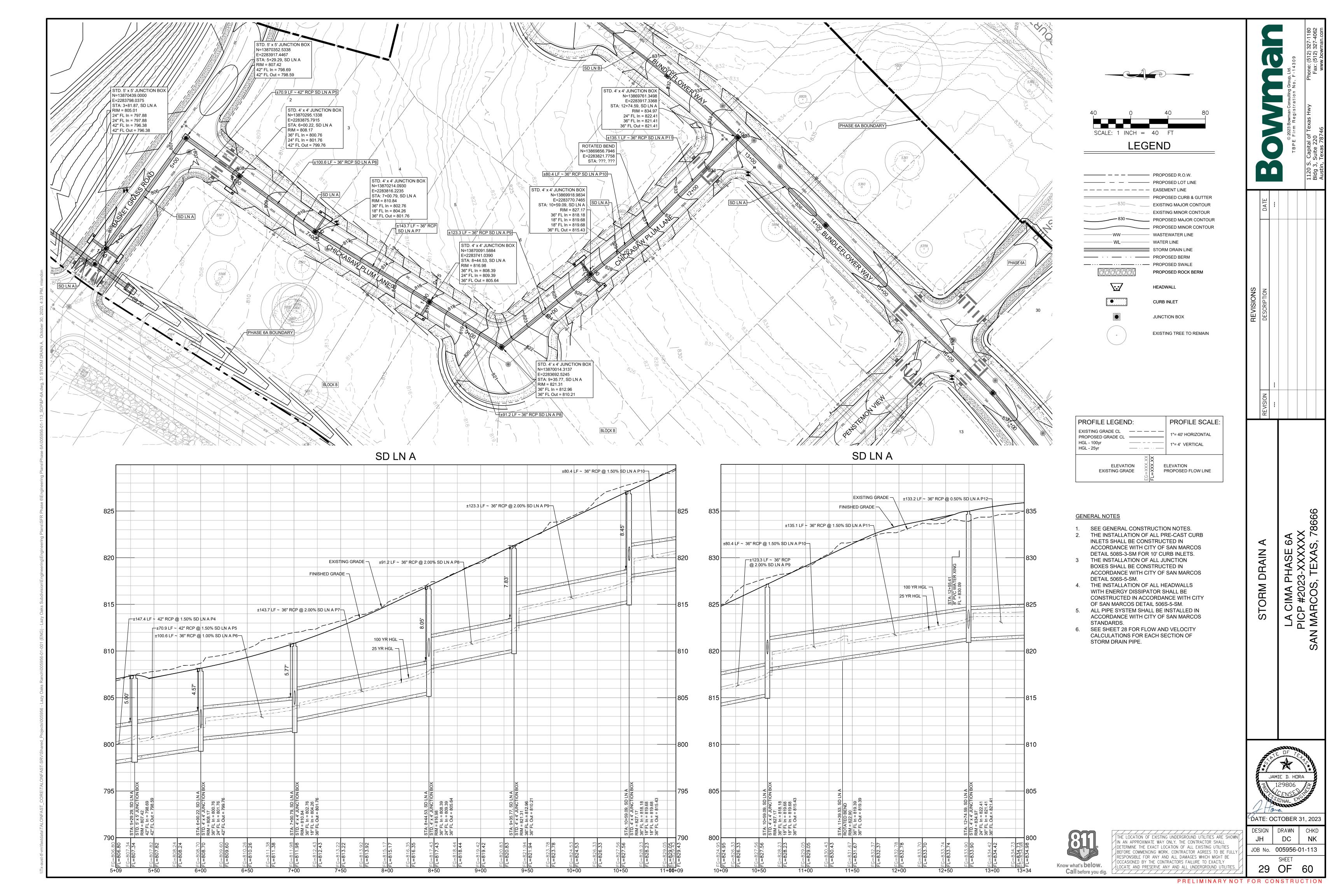
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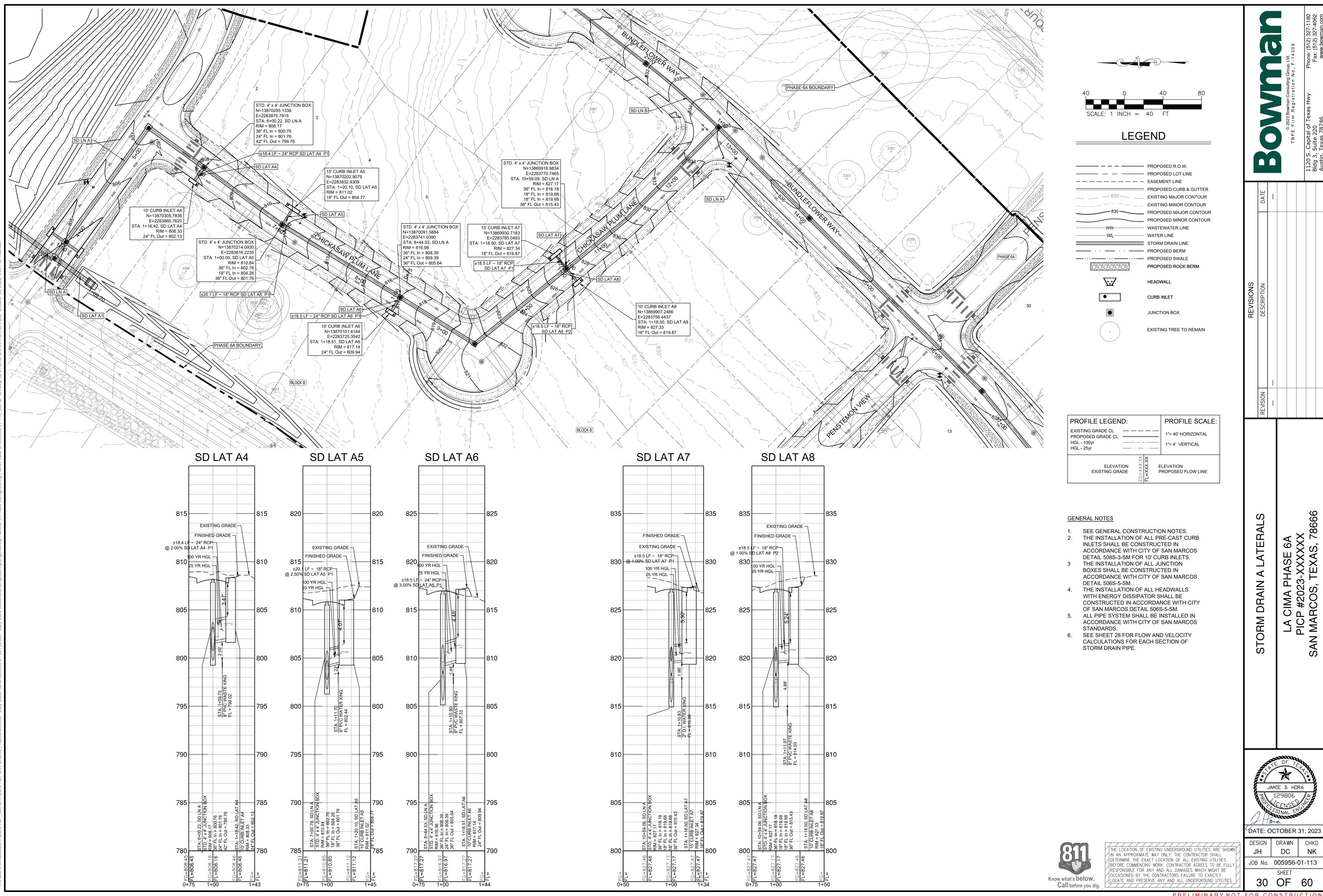
OATE: OCTOBER 31, 2023 DESIGN DRAWN CHKD JH DC NK JOB No. 005956-01-113 SHEET 26 OF 60

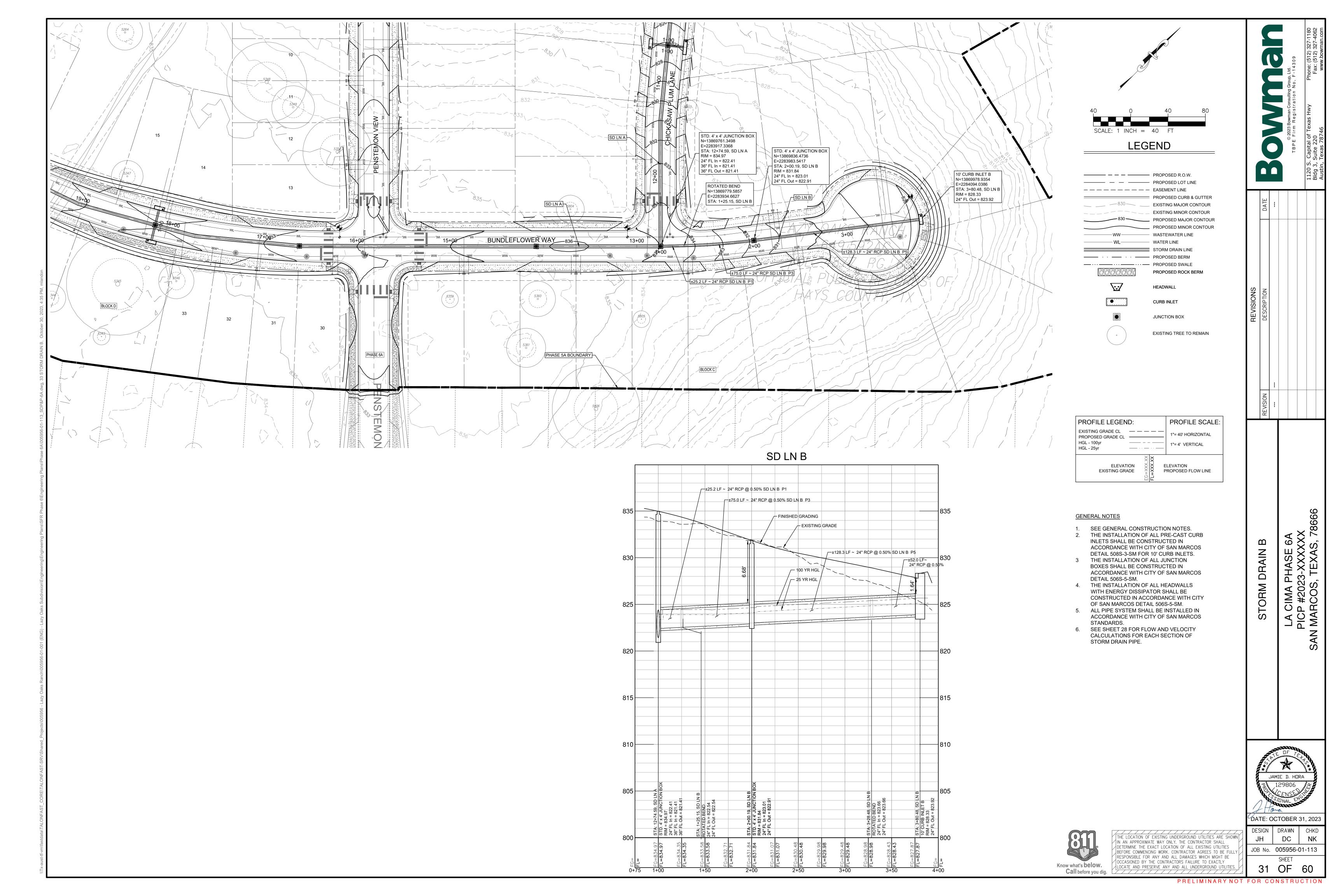
DRAINAGE CALCULATIONS

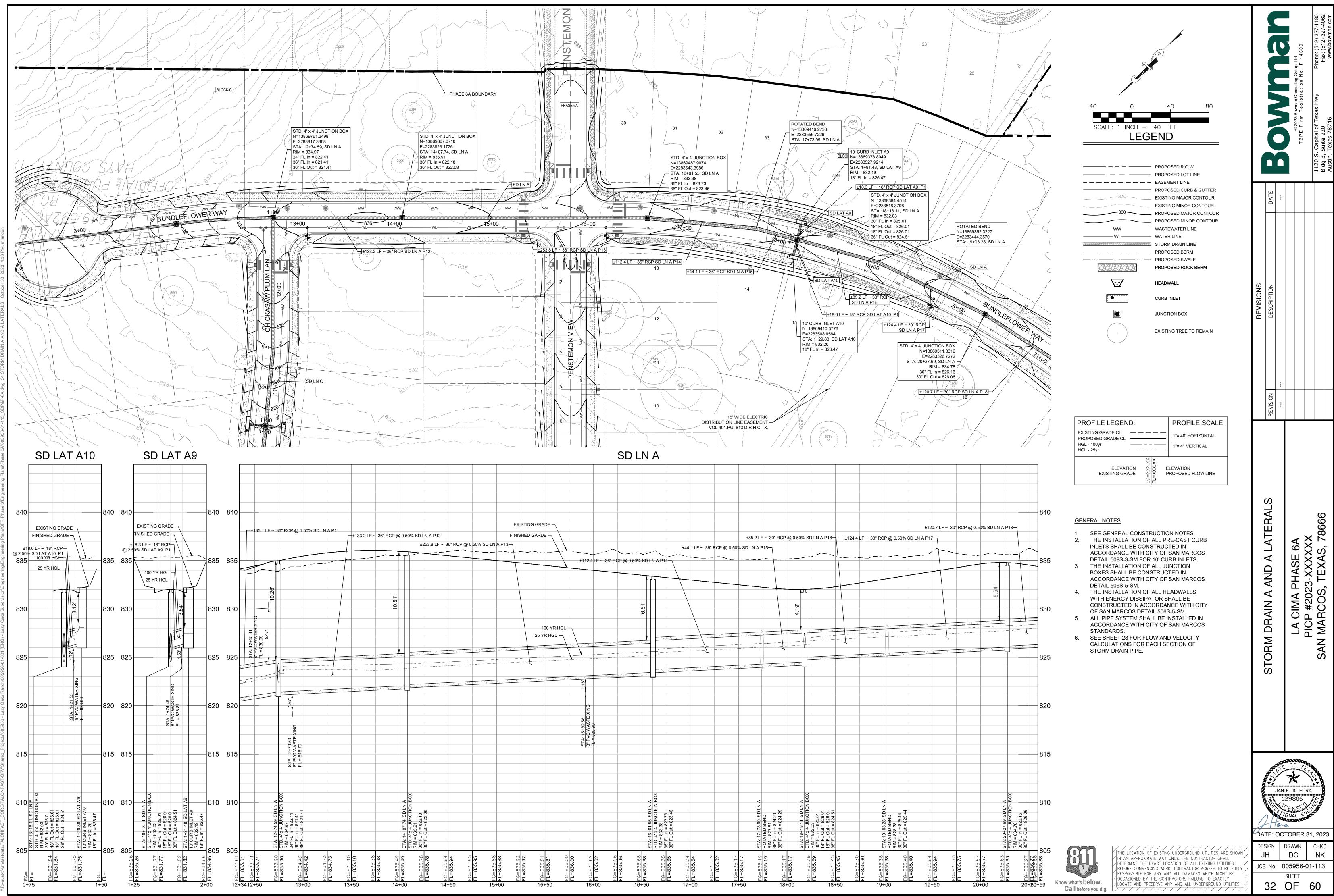


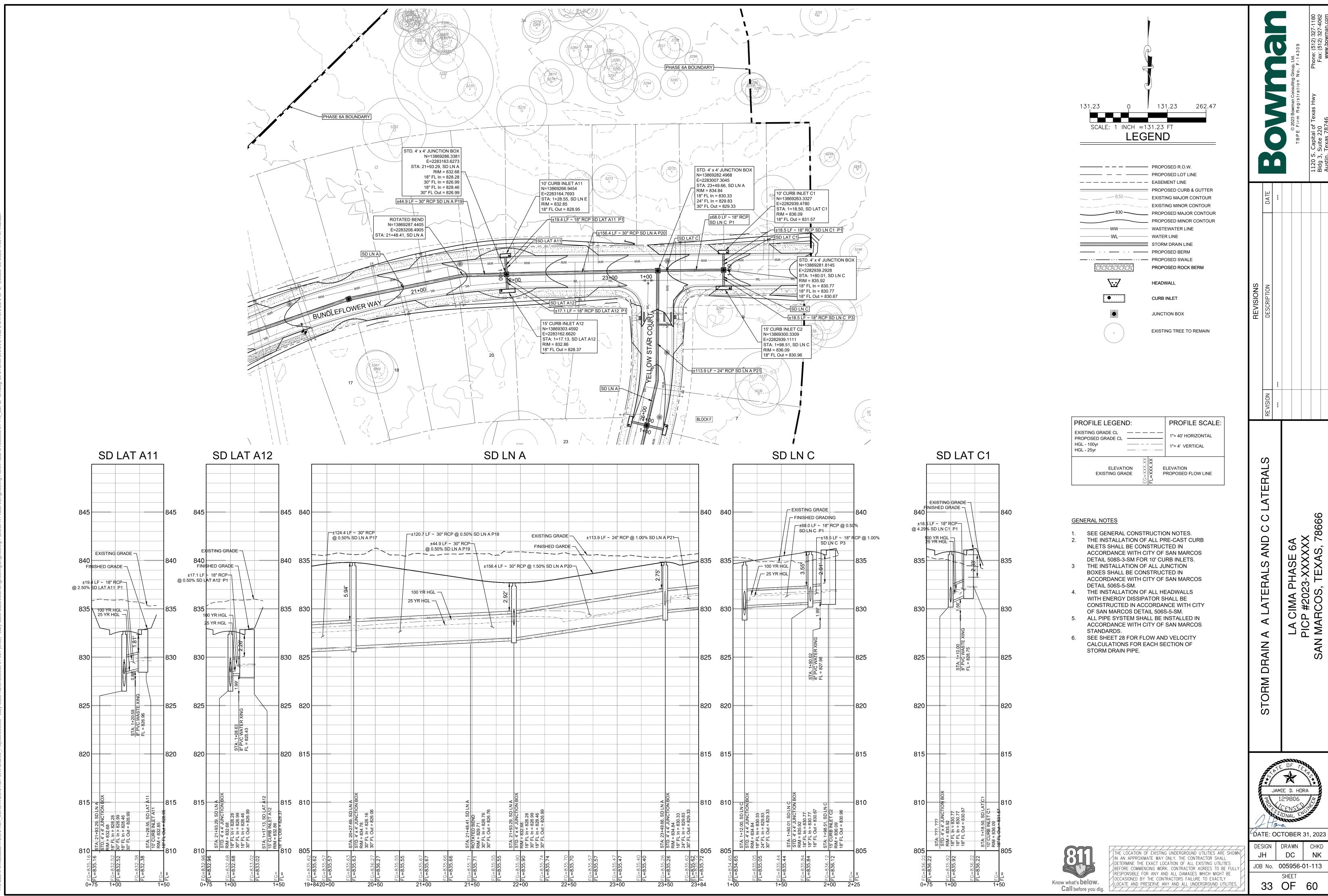


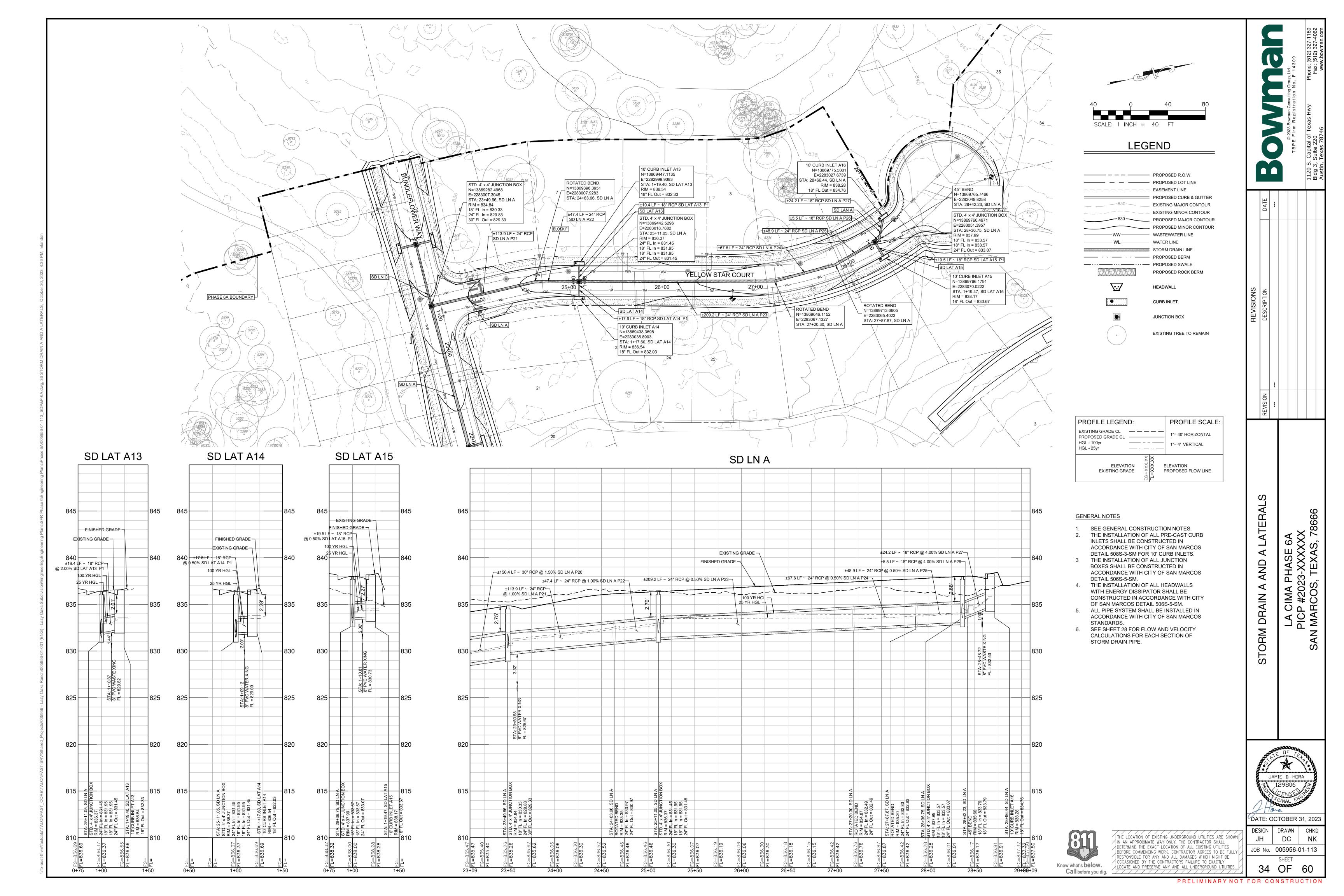


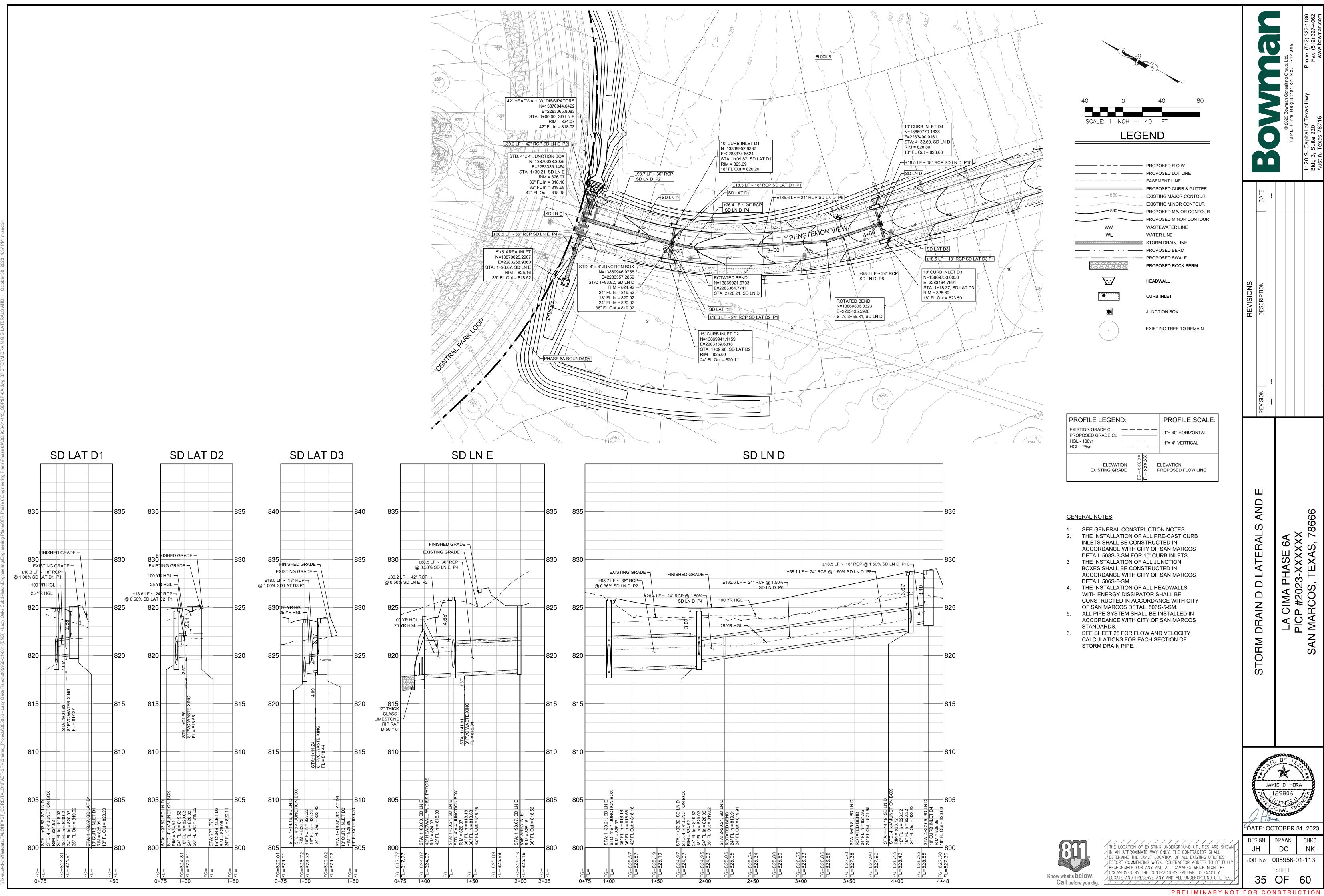


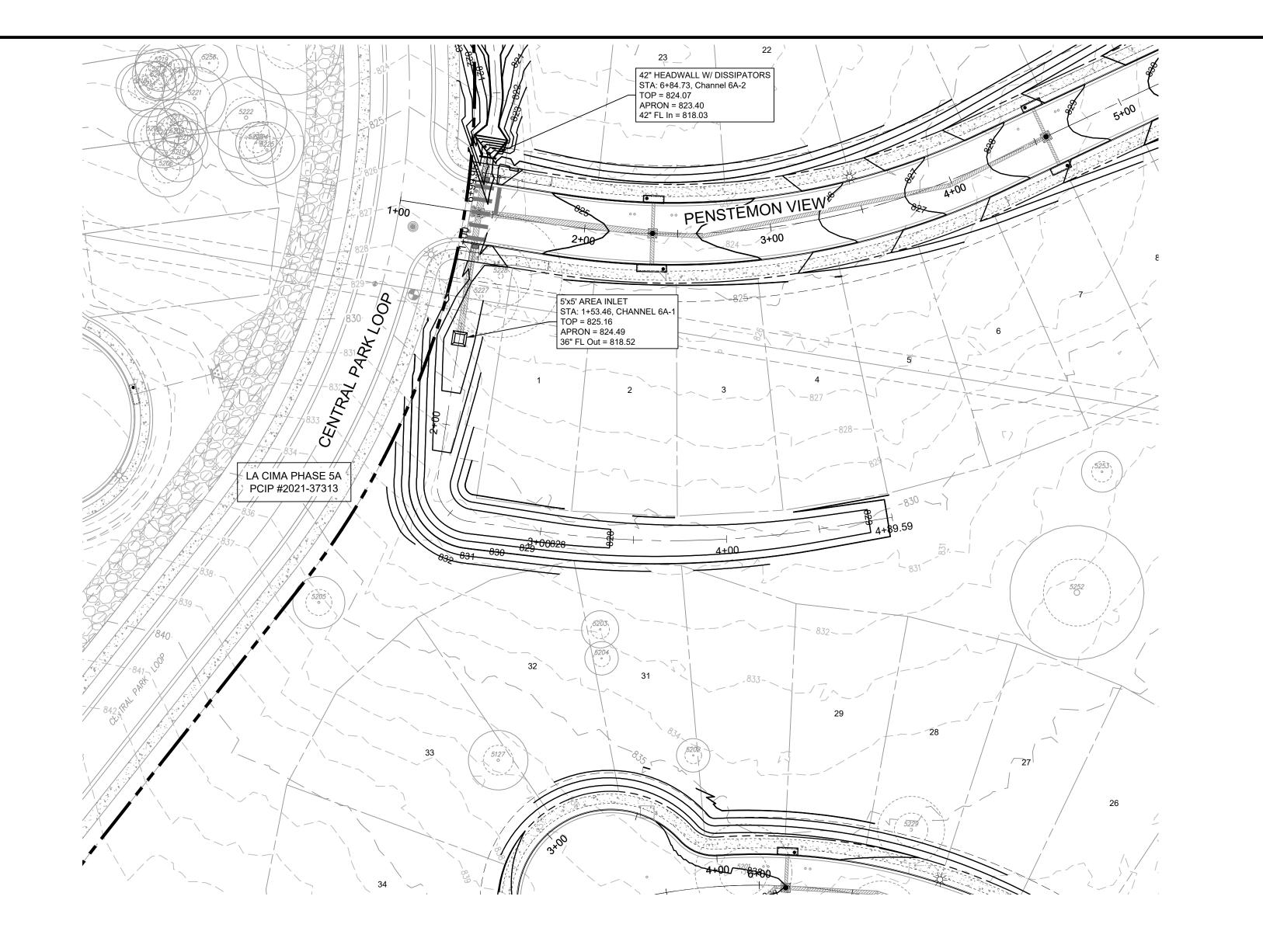


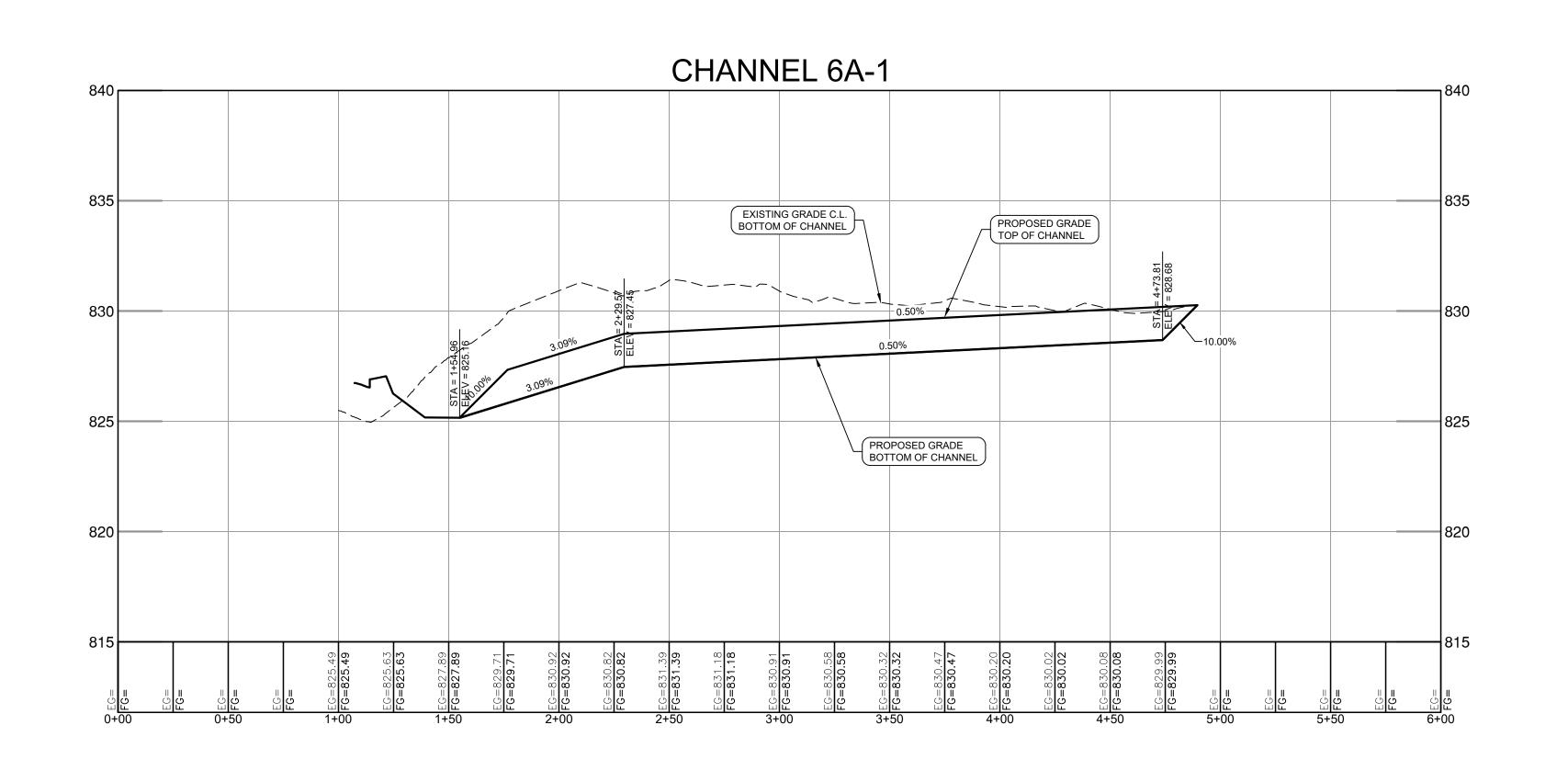














PROPOSED CENTRAL PARK LOOP ROAD AND SWALE CROSS SECTION CHANNEL A N.T.S.

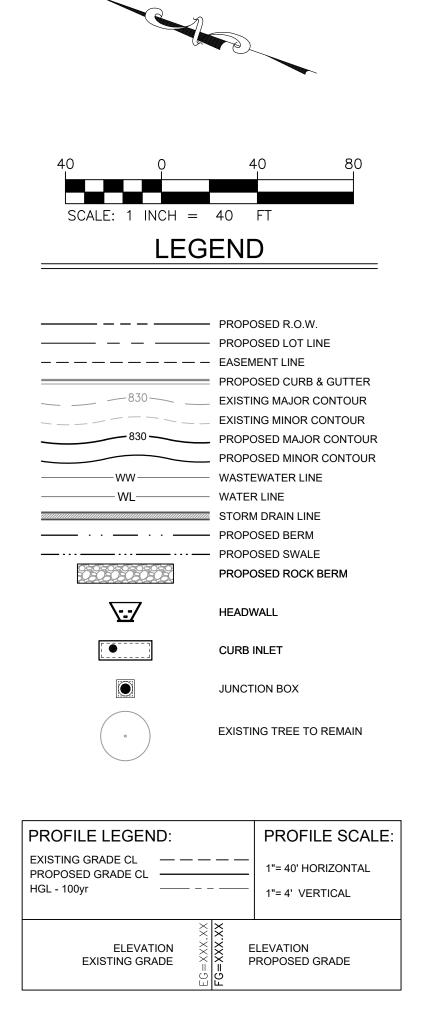
		La Cim	a Phase 6	A: Channe	l 6A-1		
rainage	Channel	Bottom	n-Value	Side Slopes		100 - YR	
Area	Slope	Width (ft)	See Table 3.26 CoSM STM	(X:1)	FLOW (cfs)	VELOCITY (ft/s)	DEPTH (ft)
CH1	0.50%	10	0.040	4:1	32.61	2.21	1.04
CH2	3.08%	10	0.040	4:1	32.61	4.13	0.63

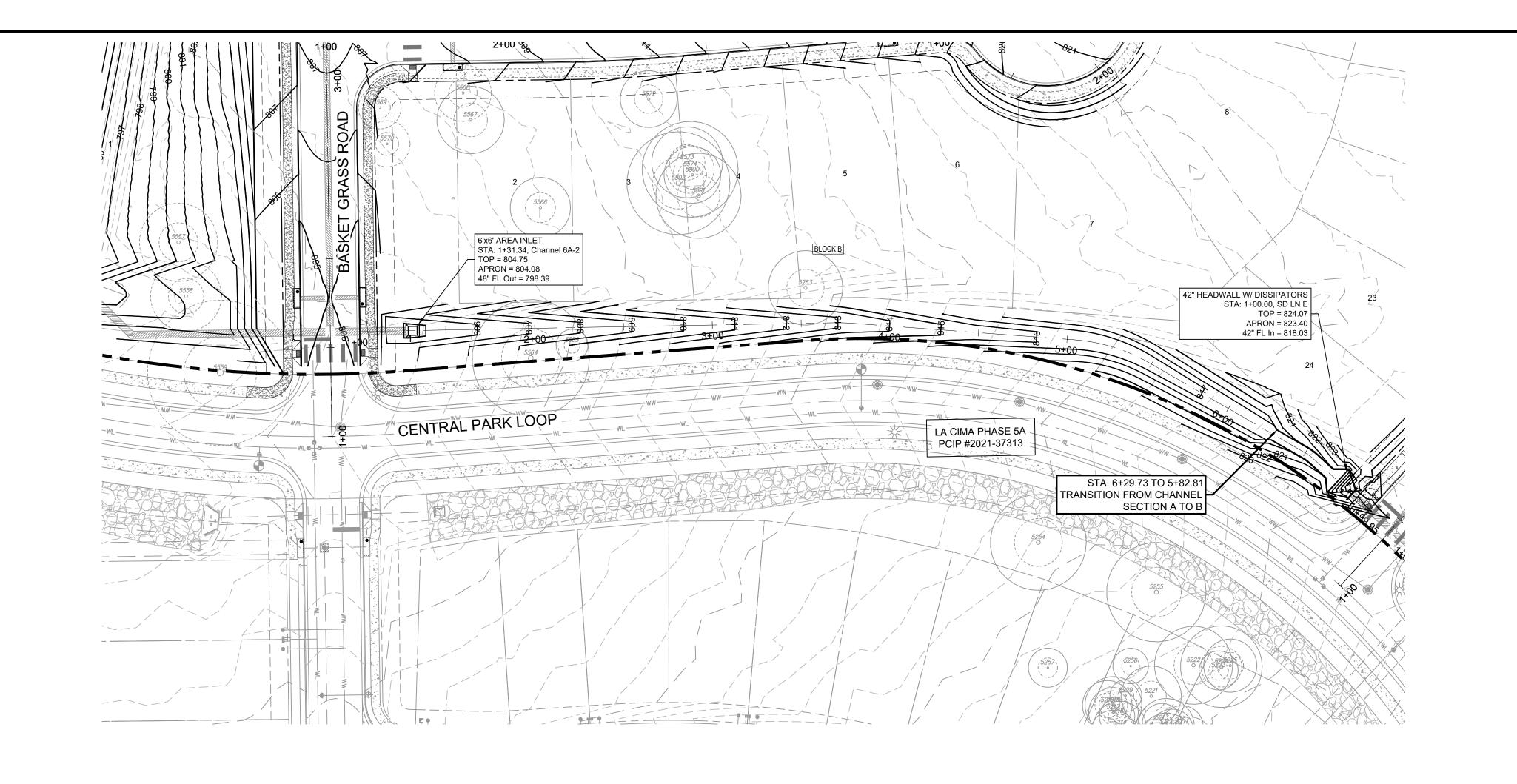
Velocities for this channel were calculated using Hydraflow Express Extension for Autodesk Civil 3D, using n-values of 0.040 for Mowed Bermuda Grass, a bottom width and side slopes vary.

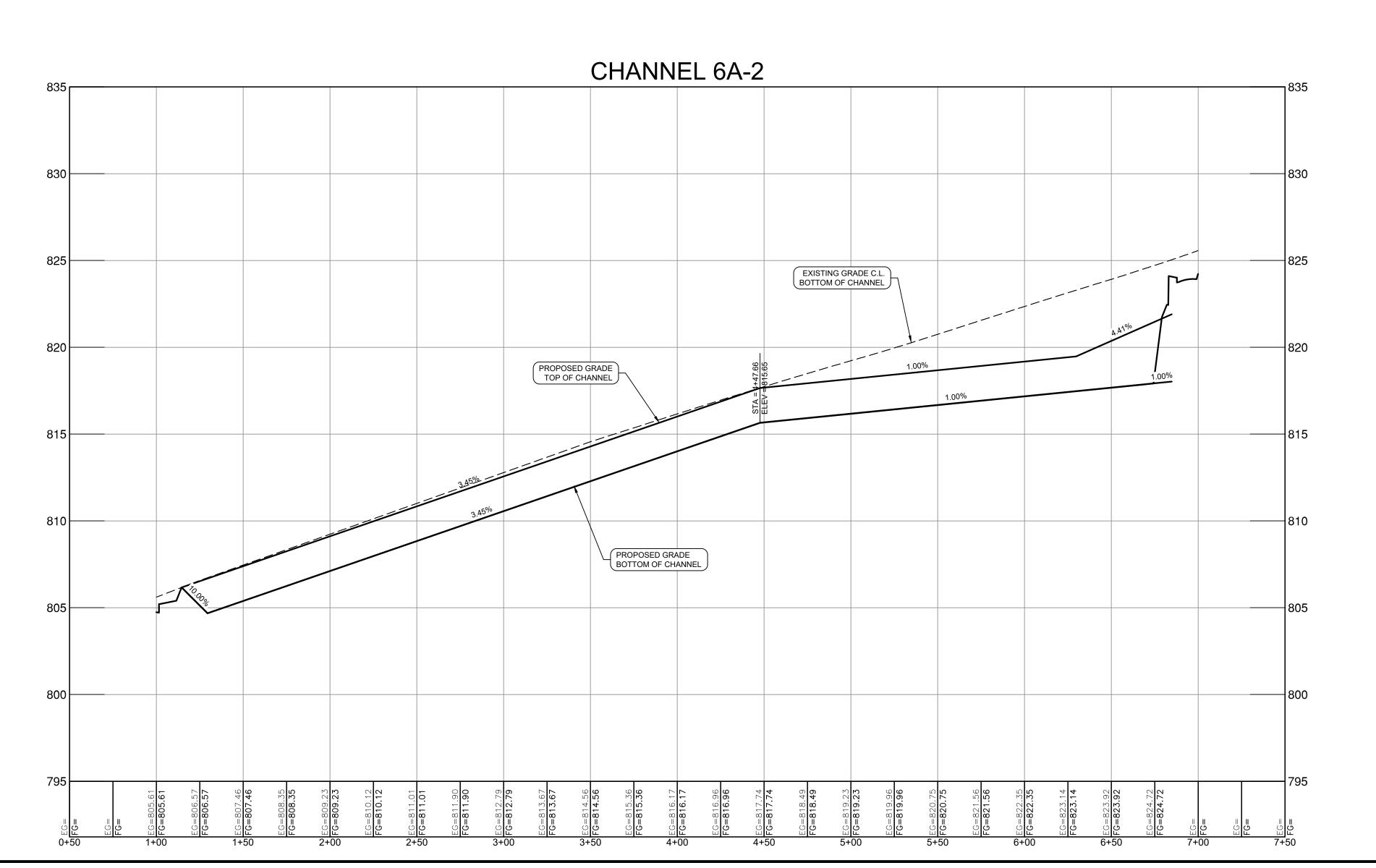


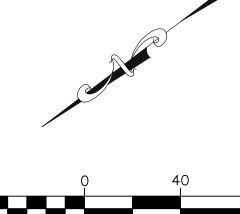
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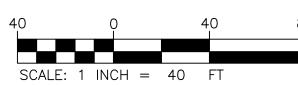
DATE: OCTOBER 31, 2023 DESIGN DRAWN DC JOB No. **005956-01-113** SHEET 36 OF 60











# LEGEND

	PROPOSED R.O.W.
	PROPOSED LOT LINE
	EASEMENT LINE
	PROPOSED CURB & GUTT
	EXISTING MAJOR CONTOL
	EXISTING MINOR CONTOL
830	PROPOSED MAJOR CONT
	PROPOSED MINOR CONTO
	WASTEWATER LINE
WL	WATER LINE
· · · · · ·	PROPOSED BERM
	DDODOCED CWALE



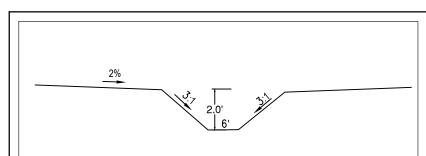
JUNCTION BOX

PROPOSED ROCK BERM

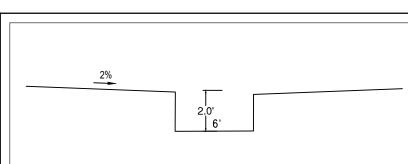


EXISTING TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL — — — — — — — — — — HGL - 100yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
	ELEVATION PROPOSED GRADE



PROPOSED CENTRAL PARK LOOP ROAD AND SWALE CROSS SECTION CHANNEL 6A-2 - SECTION A N.T.S.



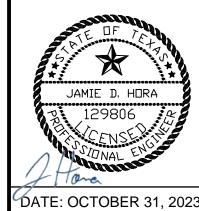
PROPOSED CENTRAL PARK LOOP ROAD AND CHANNEL CROSS SECTION CHANNEL 6A-2 - SECTION B N.T.S.

La Cima Phase 6A: Channel 6A-2								
		Bottom	n-Value			100 - YR		
Drainage Area	Slope Slope	Width (ft) See Table 3.26 CoSM STM	Side Slopes (X:1)	FLOW (cfs)	VELOCITY (ft/s)	DEPTH (ft)		
CH1	3.45%	6	0.040	3:1	57.00	5.78	1.07	
CH2	1.00%	6	0.040	3:1	57.00	3.69	1.48	
CH3	1.00%	6	0.020	1:1	57.00	7.04	1.35	

Velocities for this channel were calculated using Hydraflow Express Extension for Autodesk Civil 3D, using n-values of 0.040 for Mowed Bermuda Grass or 0.020 for Concrete lined, a bottom width and side slopes vary.

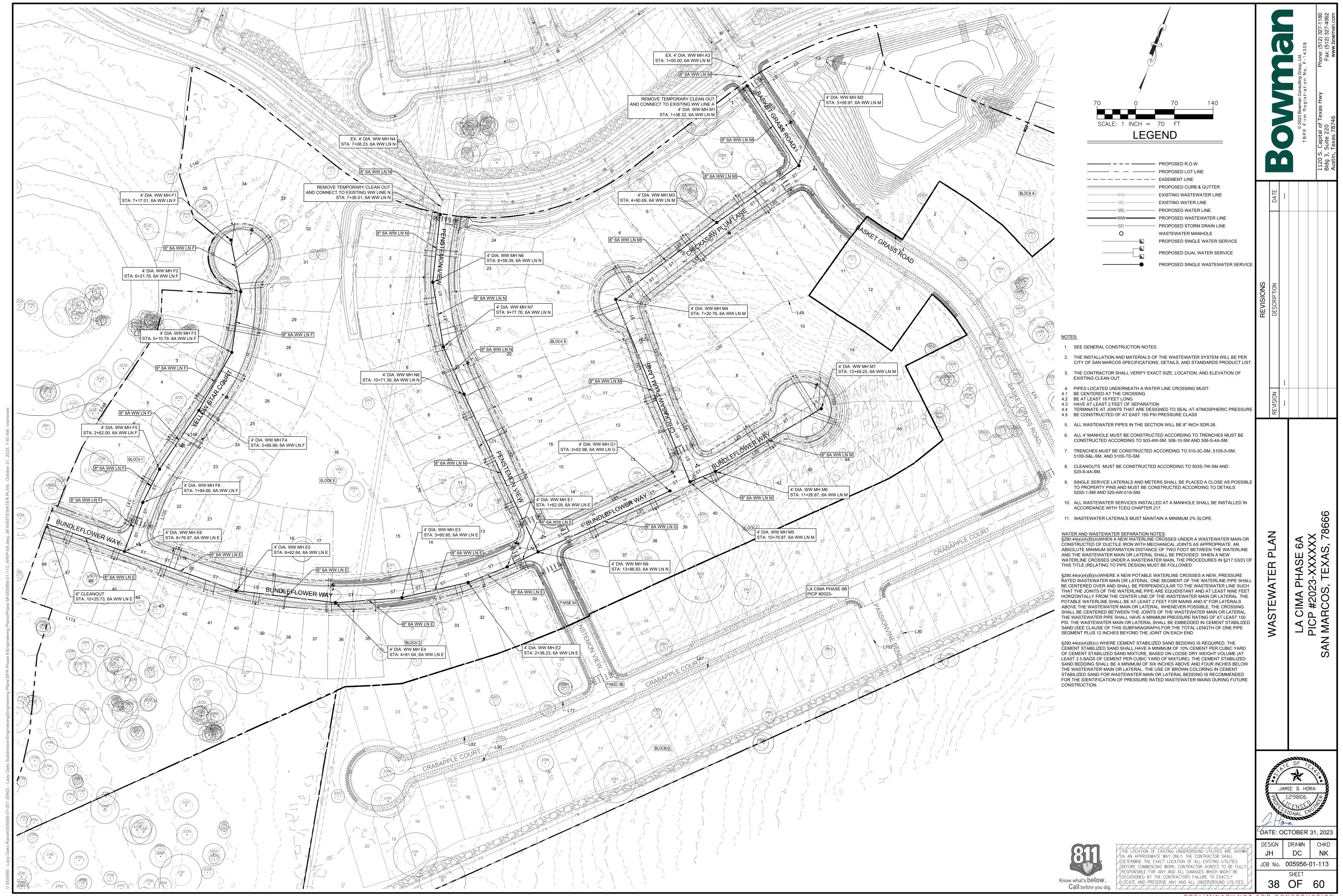


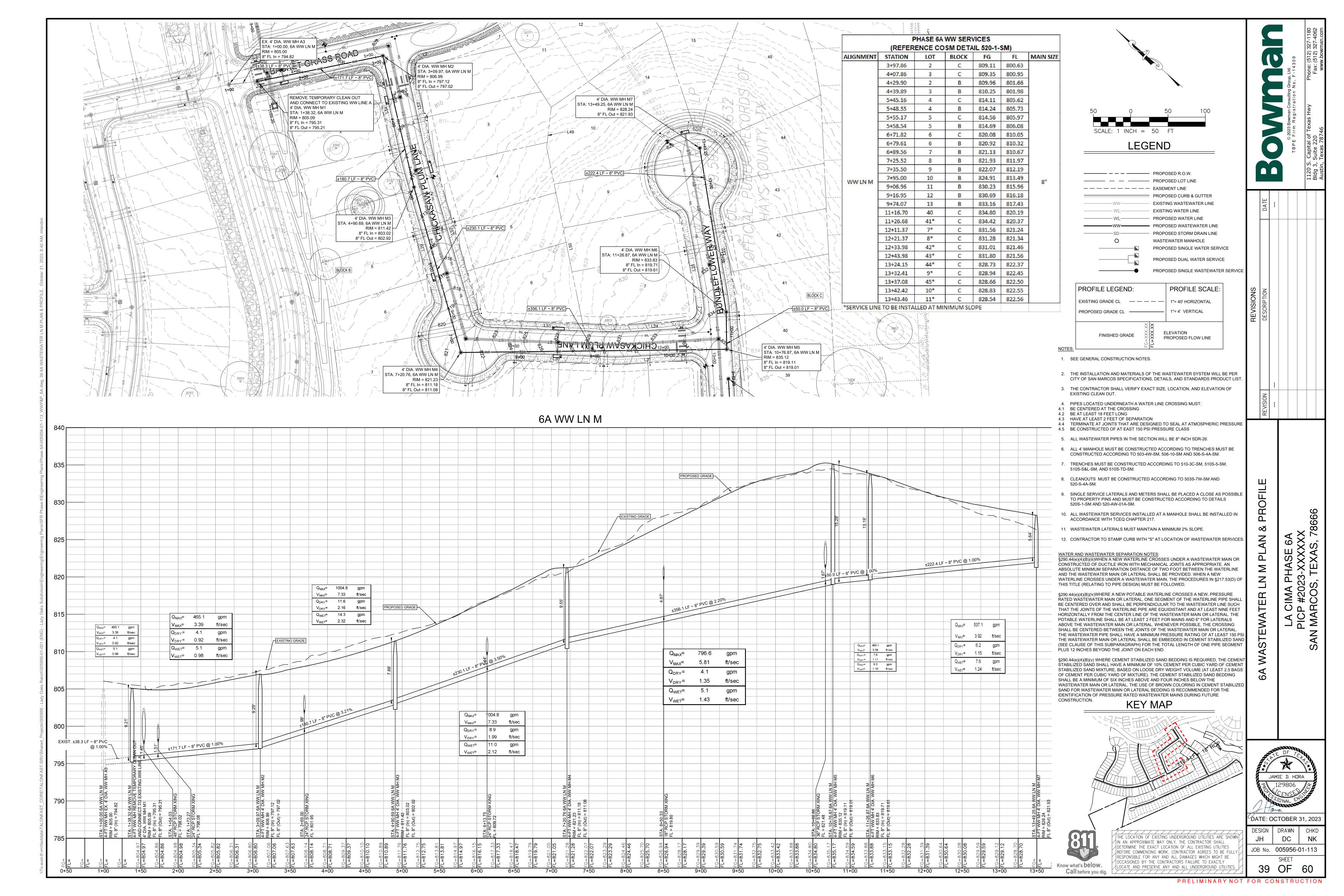
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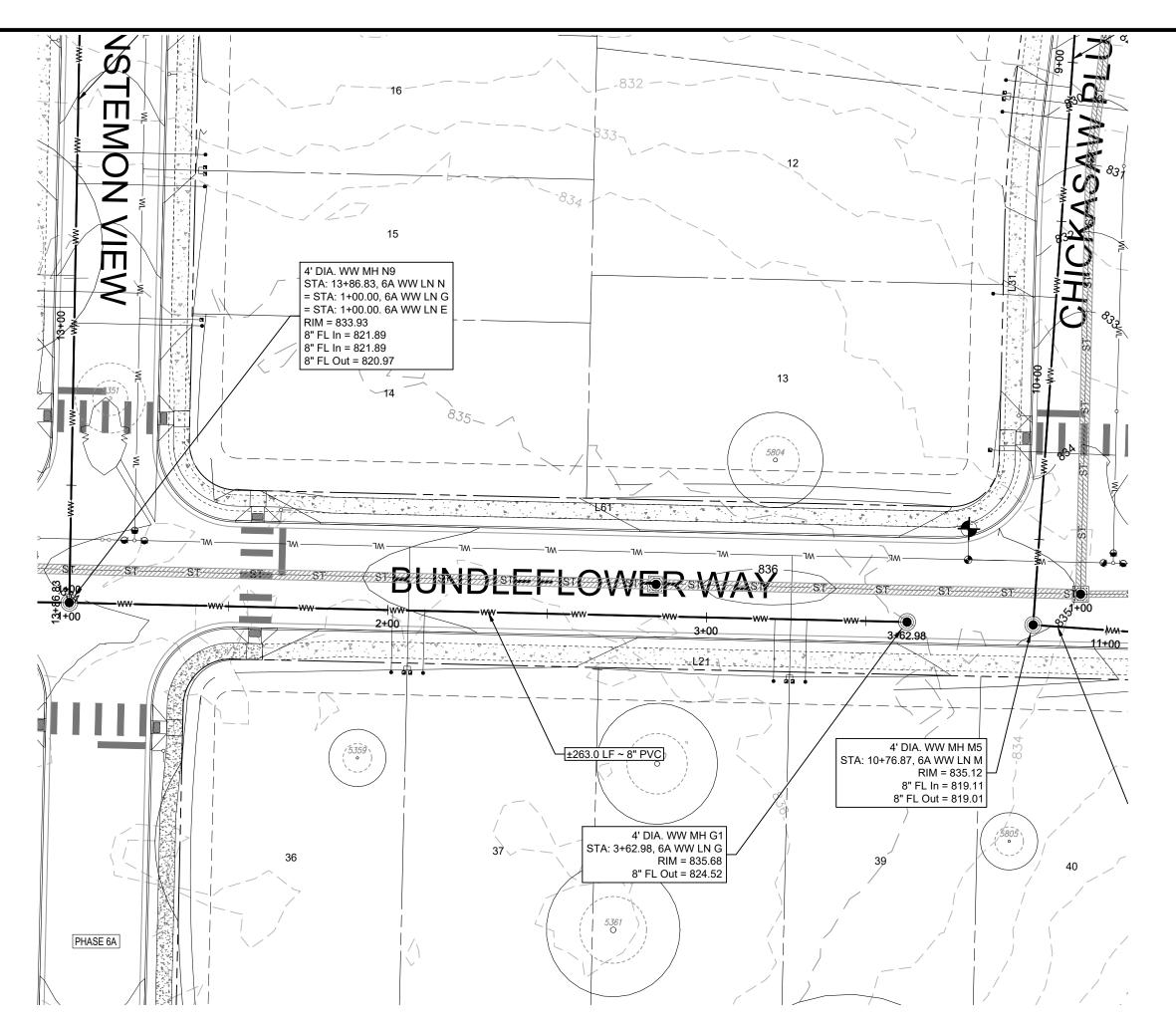


DESIGN DRAWN CHKD DC NK JOB No. **005956-01-113** SHEET

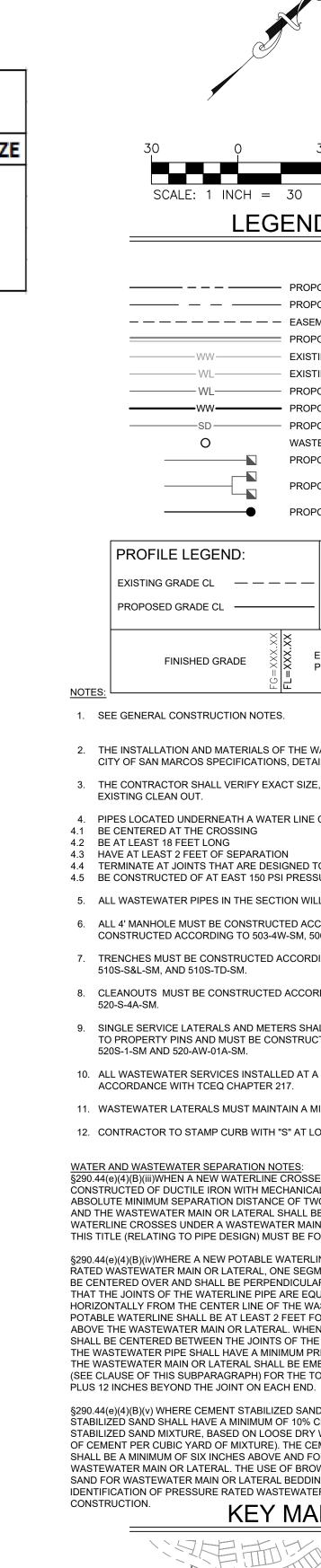
39 OF 60





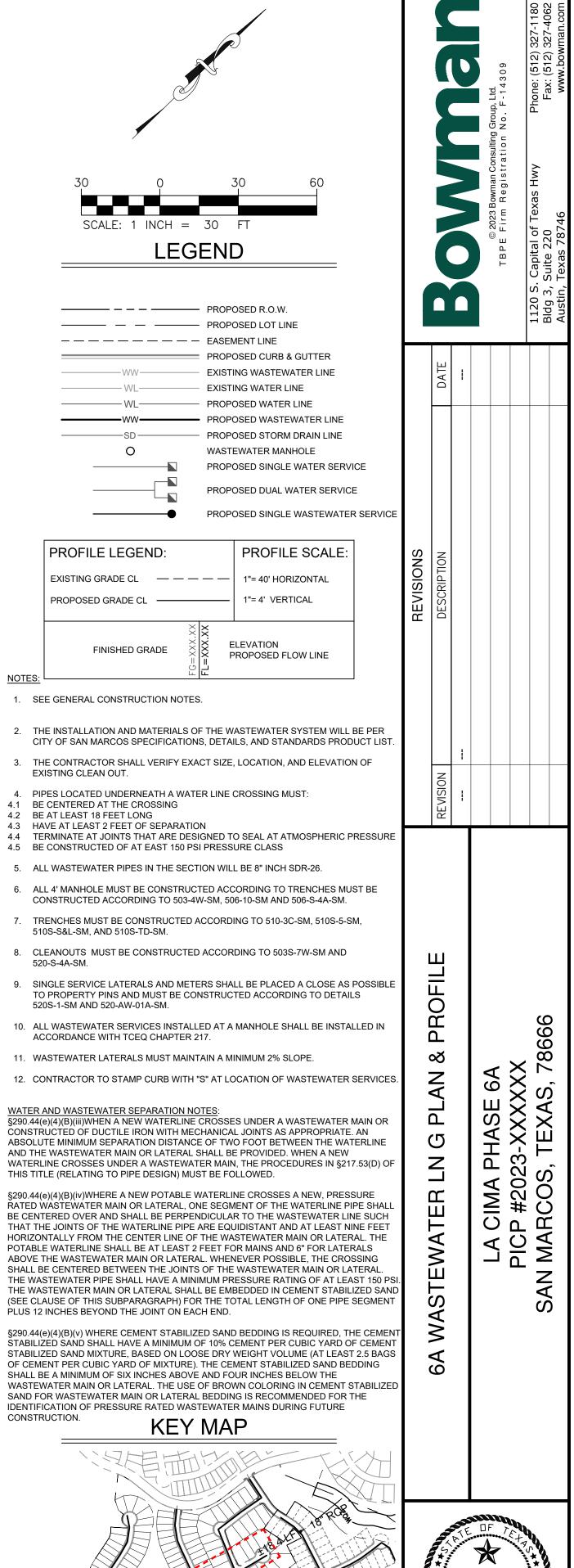


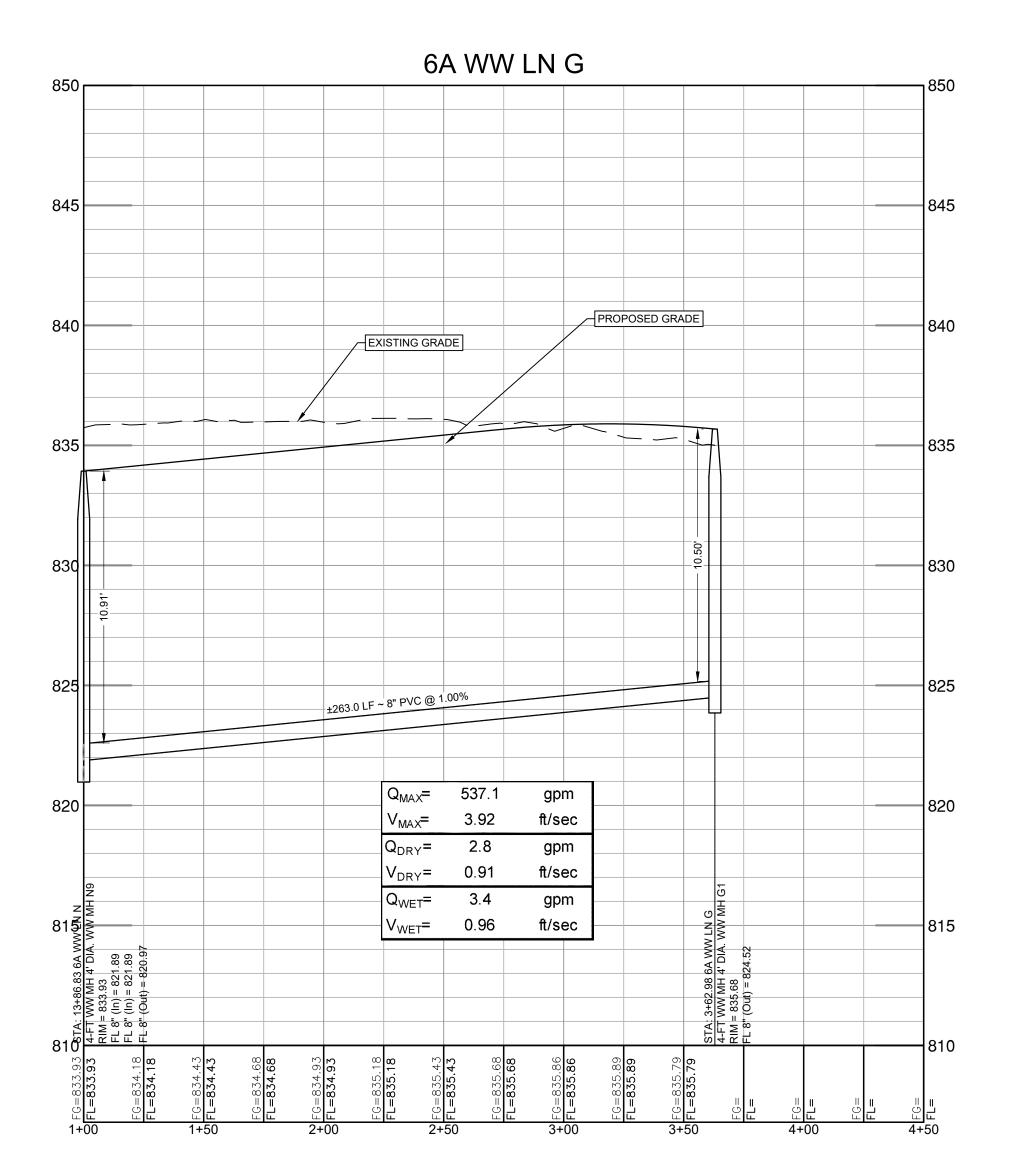
PHASE 6A WW SERVICES						
(REFERENCE COSM DETAIL 520-1-SM) ALIGNMENT STATION LOT BLOCK FG FL MAIN						MAIN SIZ
ALIGINIALINI	2+36.19	36	C	835.42	823.59	IVI/AII V OIL
MANING	2+46.19	37	С	835.52	823.69	8"
WW LN G	3+56.19	38	С	836.38	824.79	•
	3+66.19	39	С	836.36	824.89	]



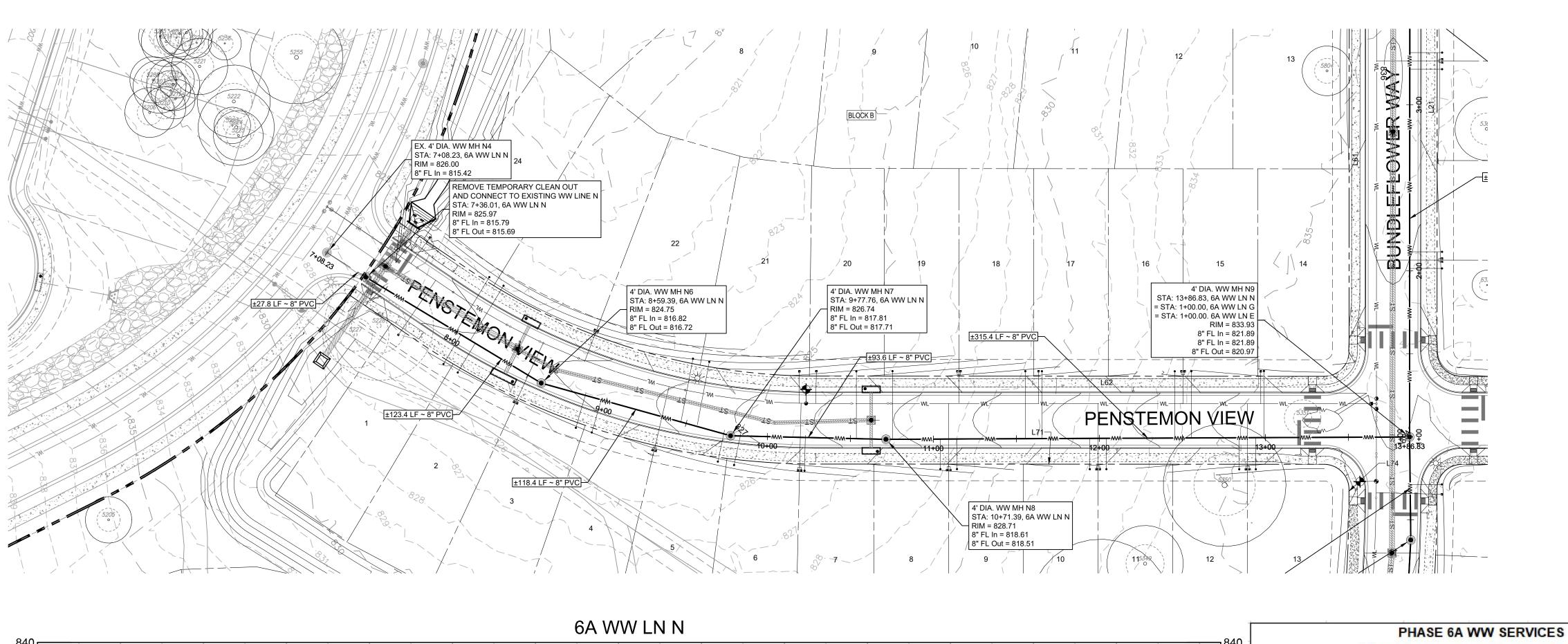
Know what's below.

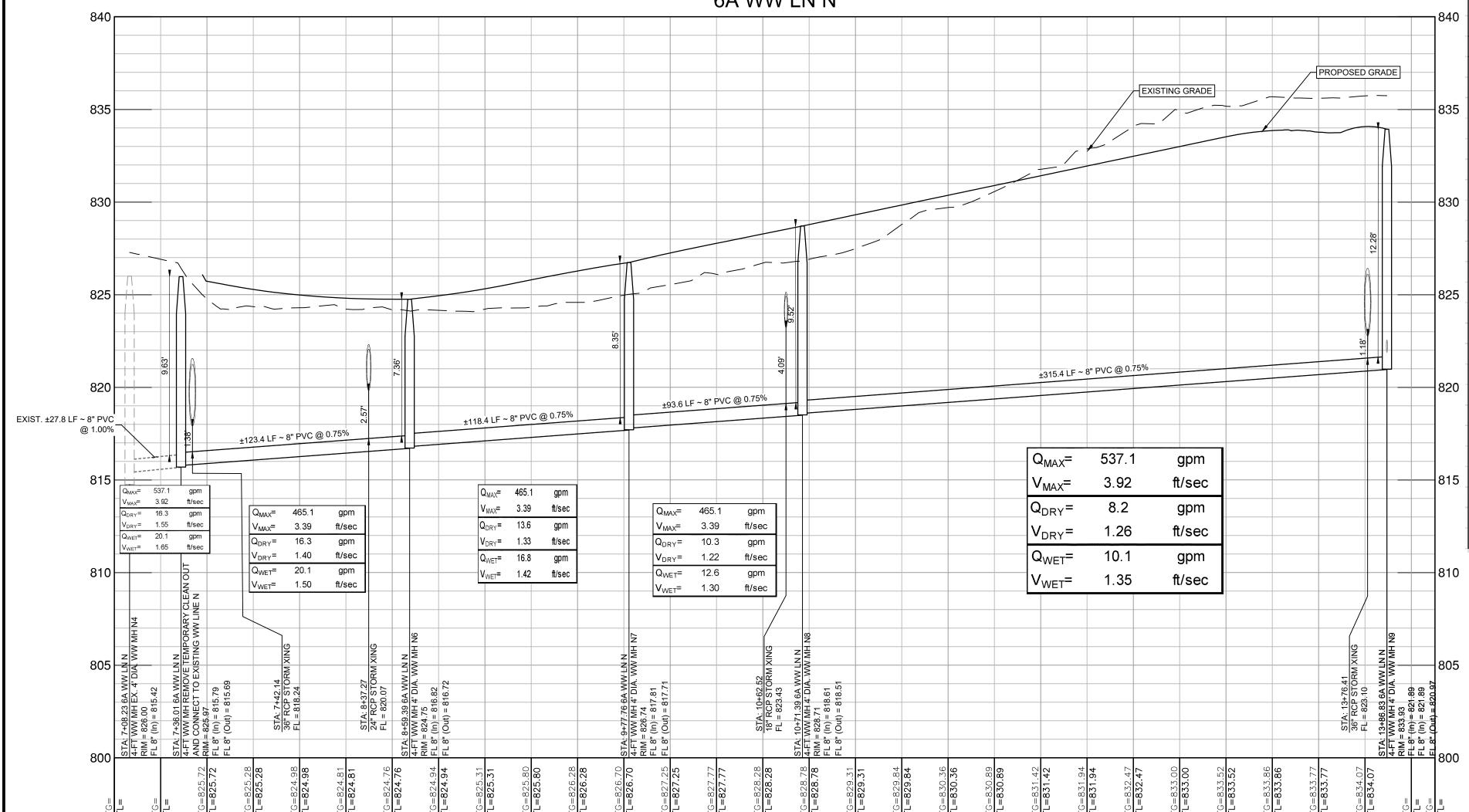
Call before you dig.





JAMIE D. HORA





(REFERENCE COSM DETAIL 520-1-SM) LOT BLOCK FG FL MAIN SIZE 24 B 825.44 816.96 7+99.50 825.40 8+02.95 816.98 23 825.35 817.03 8+09.50 В 825.33 817.06 8+12.95 817.71 8+86.97 3 825.58 825.72 817.79 8+96.96 4 22 826.67 818.16 9+46.72 В 21 9+56.69 826.89 818.23 5 827.20 818.36 9+73.389+84.13 827.39 818.54 6 828.22 818.83 10+22.80 10+53.56 20 В 828.86 819.06 WW LN N 10+75.33 19 829.32 819.32 В 829.92 819.54 11+04.22 8 11+14.22 9 830.13 819.62 11+55.33 18 830.99 819.92 В 17 11+65.33 831.18 820.00 В 10 11+94.22 831.80 820.22 820.29 832.01 12+04.22 11

В

В

E

832.87

833.08

833.68

833.89

833.99

820.60

820.67

820.89

820.97

821.00

16

15

12

13

14

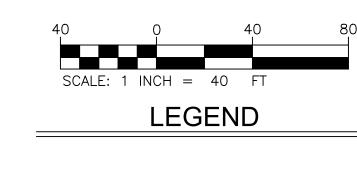
12+45.33

12+55.33

12+84.22

12+94.22

12+99.06



PROPOSED R.O.W.
PROPOSED LOT LINE
PROPOSED LOT LINE
PROPOSED CURB & GUTTER
EXISTING WASTEWATER LINE
EXISTING WATER LINE
WL PROPOSED WATER LINE
PROPOSED WASTEWATER LINE
PROPOSED STORM DRAIN LINE
O WASTEWATER MANHOLE
PROPOSED SINGLE WATER SERVICE
PROPOSED SINGLE WASTEWATER SERVICE

PROFILE LEGEND:		PROFILE SCALE
EXISTING GRADE CL — —		1"= 40' HORIZONTAL
PROPOSED GRADE CL ——		1"= 4' VERTICAL
	SZI	
FINISHED GRADE	^  X -	ELEVATION PROPOSED FLOW LINE

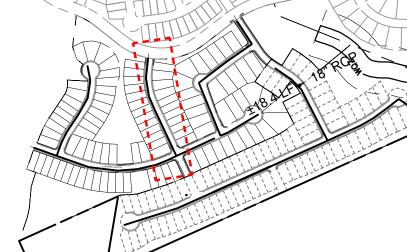
#### 1. SEE GENERAL CONSTRUCTION NOTES.

- 2. THE INSTALLATION AND MATERIALS OF THE WASTEWATER SYSTEM WILL BE PER CITY OF SAN MARCOS SPECIFICATIONS, DETAILS, AND STANDARDS PRODUCT LIST
- THE CONTRACTOR SHALL VERIFY EXACT SIZE, LOCATION, AND ELEVATION OF EXISTING CLEAN OUT.
- 4. PIPES LOCATED UNDERNEATH A WATER LINE CROSSING MUST:4.1 BE CENTERED AT THE CROSSING
- 4.1 BE CENTERED AT THE CROSSING
  4.2 BE AT LEAST 18 FEET LONG
- 4.3 HAVE AT LEAST 2 FEET OF SEPARATION
  4.4 TERMINATE AT JOINTS THAT ARE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE
- 4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS
- 5. ALL WASTEWATER PIPES IN THE SECTION WILL BE 8" INCH SDR-26.
- 6. ALL 4' MANHOLE MUST BE CONSTRUCTED ACCORDING TO TRENCHES MUST BE CONSTRUCTED ACCORDING TO 503-4W-SM, 506-10-SM AND 506-S-4A-SM.
- 7. TRENCHES MUST BE CONSTRUCTED ACCORDING TO 510-3C-SM, 510S-5-SM, 510S-S&L-SM, AND 510S-TD-SM.
- 8. CLEANOUTS MUST BE CONSTRUCTED ACCORDING TO 503S-7W-SM AND 520-S-4A-SM.
- SINGLE SERVICE LATERALS AND METERS SHALL BE PLACED A CLOSE AS POSSIBLE TO PROPERTY PINS AND MUST BE CONSTRUCTED ACCORDING TO DETAILS 520S-1-SM AND 520-AW-01A-SM.
- 10. ALL WASTEWATER SERVICES INSTALLED AT A MANHOLE SHALL BE INSTALLED IN ACCORDANCE WITH TCEQ CHAPTER 217.
- 11. WASTEWATER LATERALS MUST MAINTAIN A MINIMUM 2% SLOPE.
- 12. CONTRACTOR TO STAMP CURB WITH "S" AT LOCATION OF WASTEWATER SERVICES.

WATER AND WASTEWATER SEPARATION NOTES: §290.44(e)(4)(B)(iii)WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR CONSTRUCTED OF DUCTILE IRON WITH MECHANICAL JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF TWO FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

§290.44(e)(4)(B)(iv)WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST 2 FEET FOR MAINS AND 6" FOR LATERALS ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(e)(4)(B)(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.



Know what's below.

Call before you dig.

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JAMIE D. HORA

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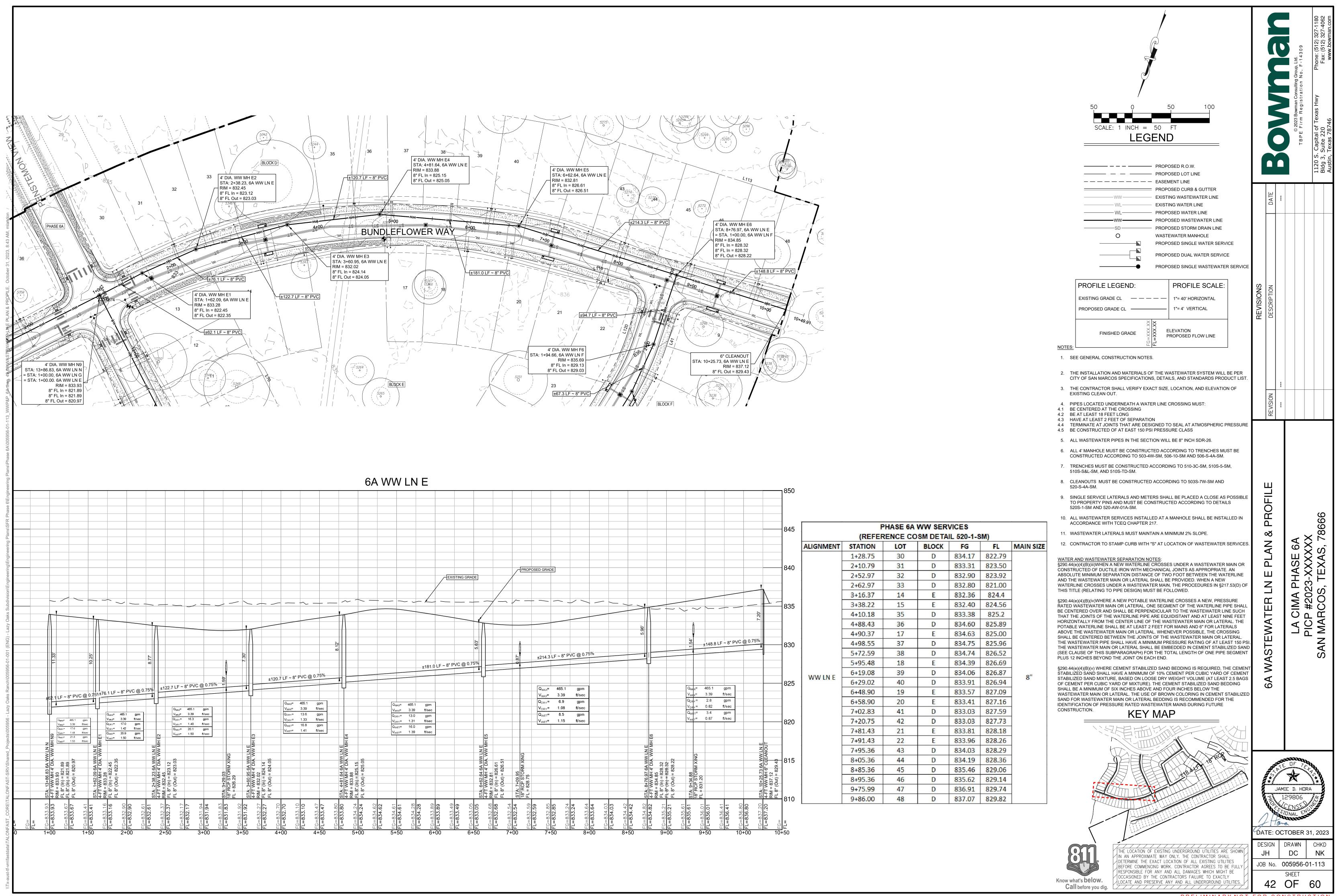
LA CIMA PHASE (PICP #2023-XXXX)
MARCOS, TEXAS

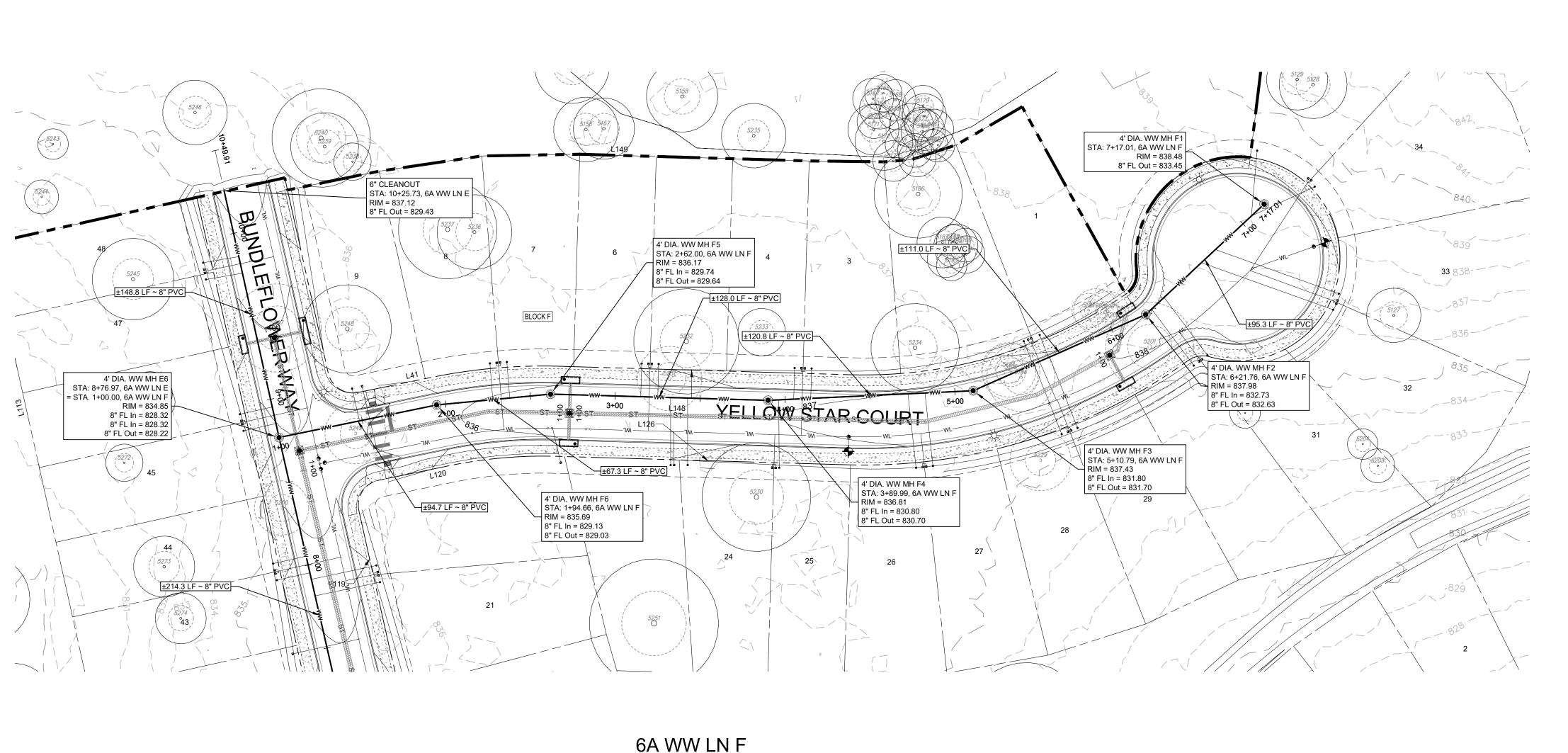
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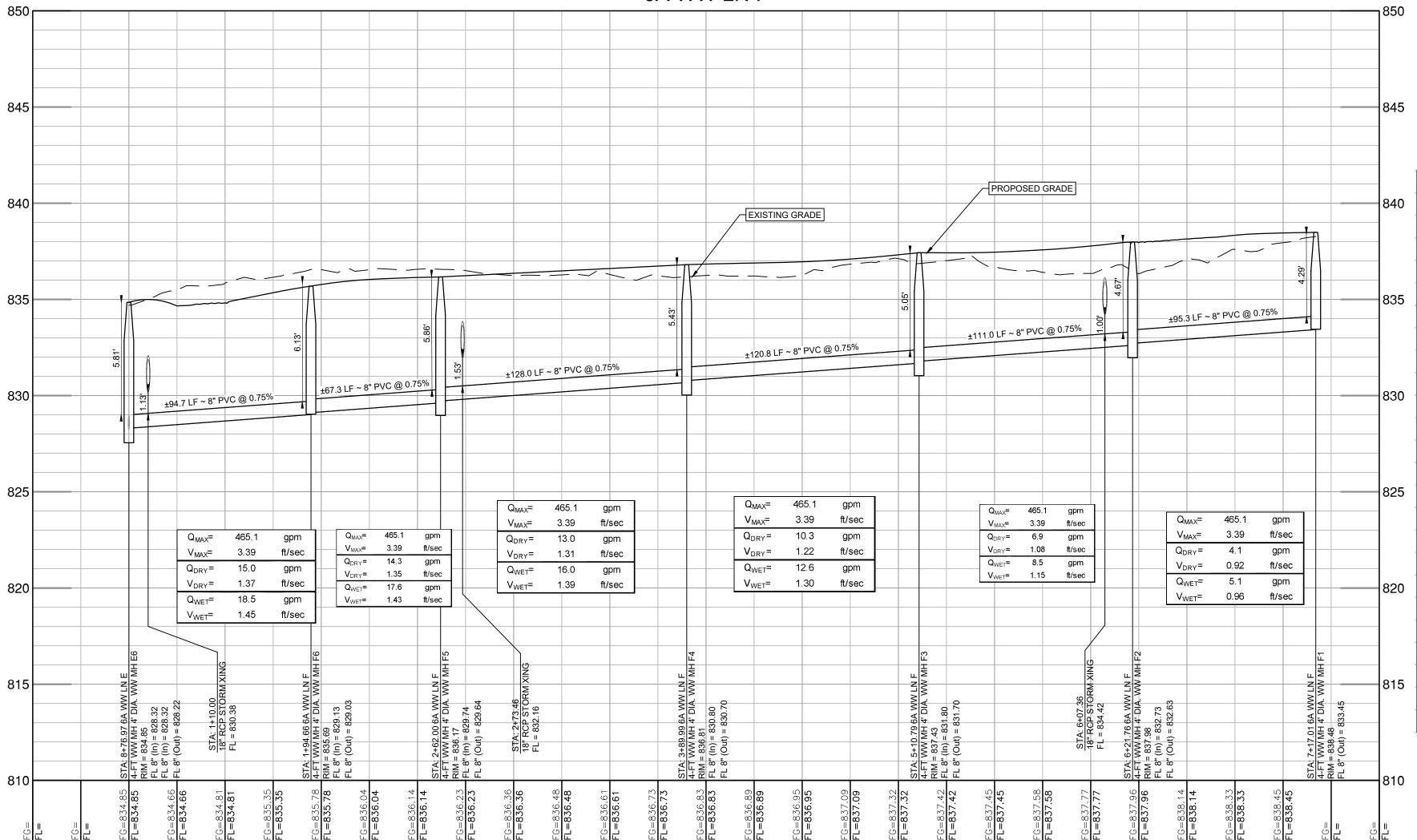
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JH DC NK

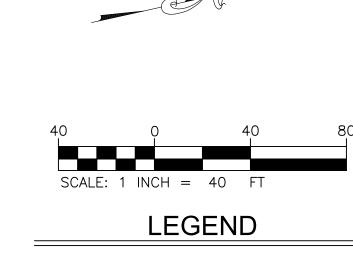
JOB No. 005956-01-113
SHEET
41 OF 60







#### PHASE 6A WW SERVICES (REFERENCE COSM DETAIL 520-1-SM) MAIN SIZE ALIGNMENT STATION BLOCK FG FL 1+48.34 829.37 836.18 2+27.888 836.48 830.06 830.14 2 + 37.88836.53 3+15.07 836.91 830.82 6 3+25.07836.96 830.89 830.95 3 + 32.6623 837.00 3+42.6724 837.00 831.03 3+96.32 837.33 831.53 25 4+05.11 837.36 831.59 831.67 4+15.143 837.41 837.71 832.10 26 4+72.43 WW LN F 4+82.45 832.17 27 837.75 838.10 832.77 5+49.22 28 838.11 832.78 5+49.91 5+59.83 838.16 832.85 838.15 832.85 29 5+59.92 838.55 833.45 6+26.50 30 6+36.54 833.53 31 838.63 6+66.51 32 838.94 833.75 838.98 833.84 6+77.8133 834.06 7+06.82 34 839.07 839.03 7+06.82 35 834.06



	PROPOSED R.O.W.
	PROPOSED LOT LINE
	EASEMENT LINE
	PROPOSED CURB & GUTTER
WW	EXISTING WASTEWATER LINE
	EXISTING WATER LINE
	PROPOSED WATER LINE
	PROPOSED WASTEWATER LINE
——————————————————————————————————————	PROPOSED STORM DRAIN LINE
0	WASTEWATER MANHOLE
	PROPOSED SINGLE WATER SERVICE
	PROPOSED DUAL WATER SERVICE
	PROPOSED SINGLE WASTEWATER SERVICE

	PROFILE LEGEND:		PROFILE SCALE
	EXISTING GRADE CL — -		1"= 40' HORIZONTAL
	PROPOSED GRADE CL		- 1"= 4' VERTICAL
		57 l	
OTES:	FINISHED GRADE	^ IX	ELEVATION PROPOSED FLOW LINE

#### 1. SEE GENERAL CONSTRUCTION NOTES.

- 2. THE INSTALLATION AND MATERIALS OF THE WASTEWATER SYSTEM WILL BE PER CITY OF SAN MARCOS SPECIFICATIONS, DETAILS, AND STANDARDS PRODUCT LIS
- 3. THE CONTRACTOR SHALL VERIFY EXACT SIZE, LOCATION, AND ELEVATION OF EXISTING CLEAN OUT.
- 4. PIPES LOCATED UNDERNEATH A WATER LINE CROSSING MUST: 4.1 BE CENTERED AT THE CROSSING
- 4.2 BE AT LEAST 18 FEET LONG 4.3 HAVE AT LEAST 2 FEET OF SEPARATION
- 4.4 TERMINATE AT JOINTS THAT ARE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE 4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS
- 5. ALL WASTEWATER PIPES IN THE SECTION WILL BE 8" INCH SDR-26.
- 6. ALL 4' MANHOLE MUST BE CONSTRUCTED ACCORDING TO TRENCHES MUST BE CONSTRUCTED ACCORDING TO 503-4W-SM, 506-10-SM AND 506-S-4A-SM.
- 7. TRENCHES MUST BE CONSTRUCTED ACCORDING TO 510-3C-SM, 510S-5-SM, 510S-S&L-SM, AND 510S-TD-SM.
- 8. CLEANOUTS MUST BE CONSTRUCTED ACCORDING TO 503S-7W-SM AND 520-S-4A-SM.
- 9. SINGLE SERVICE LATERALS AND METERS SHALL BE PLACED A CLOSE AS POSSIBLE TO PROPERTY PINS AND MUST BE CONSTRUCTED ACCORDING TO DETAILS 520S-1-SM AND 520-AW-01A-SM.
- 10. ALL WASTEWATER SERVICES INSTALLED AT A MANHOLE SHALL BE INSTALLED IN ACCORDANCE WITH TCEQ CHAPTER 217.
- 11. WASTEWATER LATERALS MUST MAINTAIN A MINIMUM 2% SLOPE.
- 12. CONTRACTOR TO STAMP CURB WITH "S" AT LOCATION OF WASTEWATER SERVICES

WATER AND WASTEWATER SEPARATION NOTE:

§290.44(e)(4)(B)(iii)WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR CONSTRUCTED OF DUCTILE IRON WITH MECHANICAL JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF TWO FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

§290.44(e)(4)(B)(iv)WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST 2 FEET FOR MAINS AND 6" FOR LATERALS ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE. THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 P THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAN (SEE CLAUSE OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(e)(4)(B)(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMEN STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE. BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZE SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE



Know what's **below**.

Call before you dig.

BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULL' RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIE

JAMIE D. HORA DATE: OCTOBER 31, 2023 DESIGN DRAWN DC JOB No. 005956-01-113

SHEET

43 OF 60

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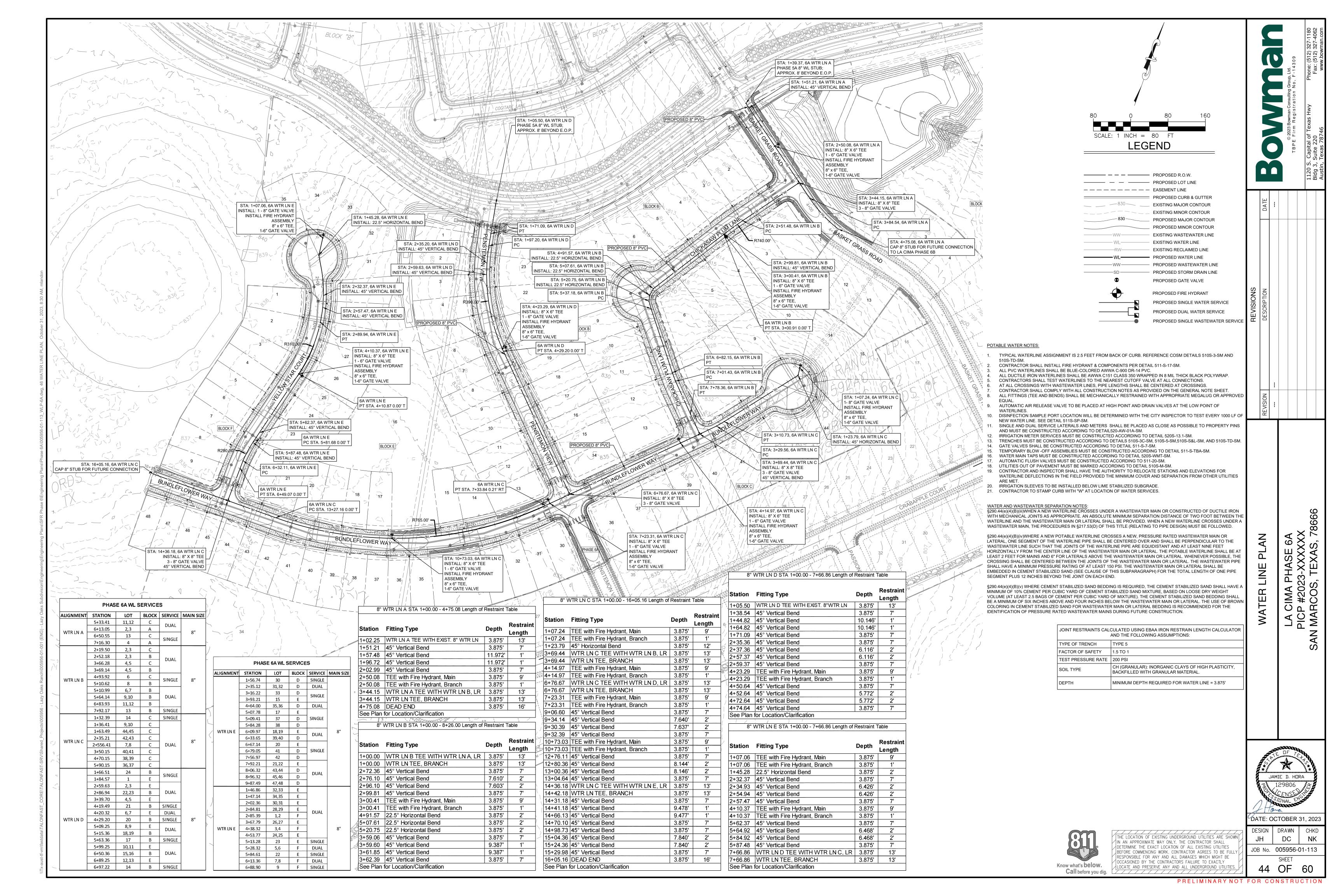
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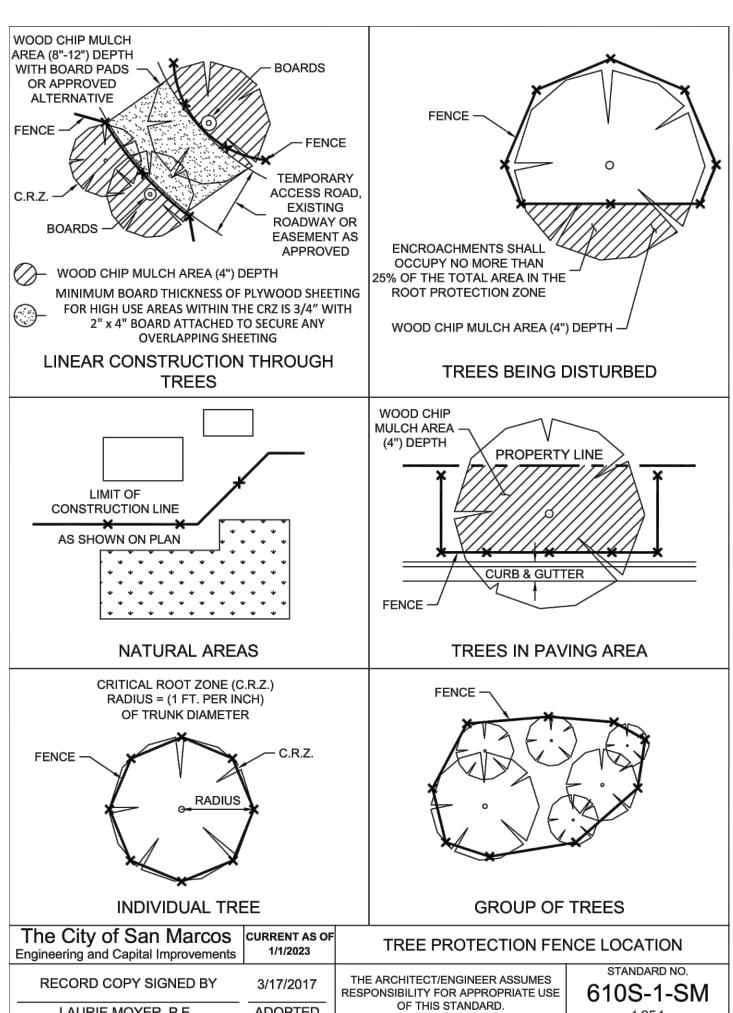
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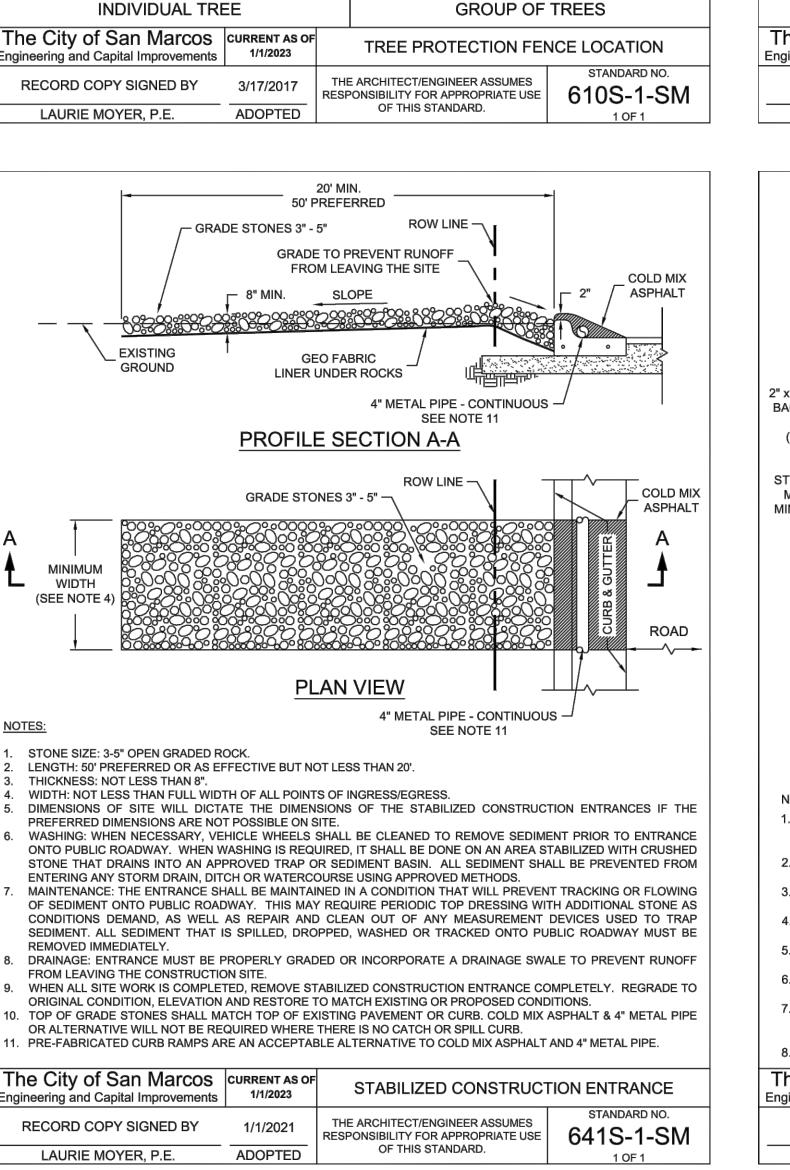
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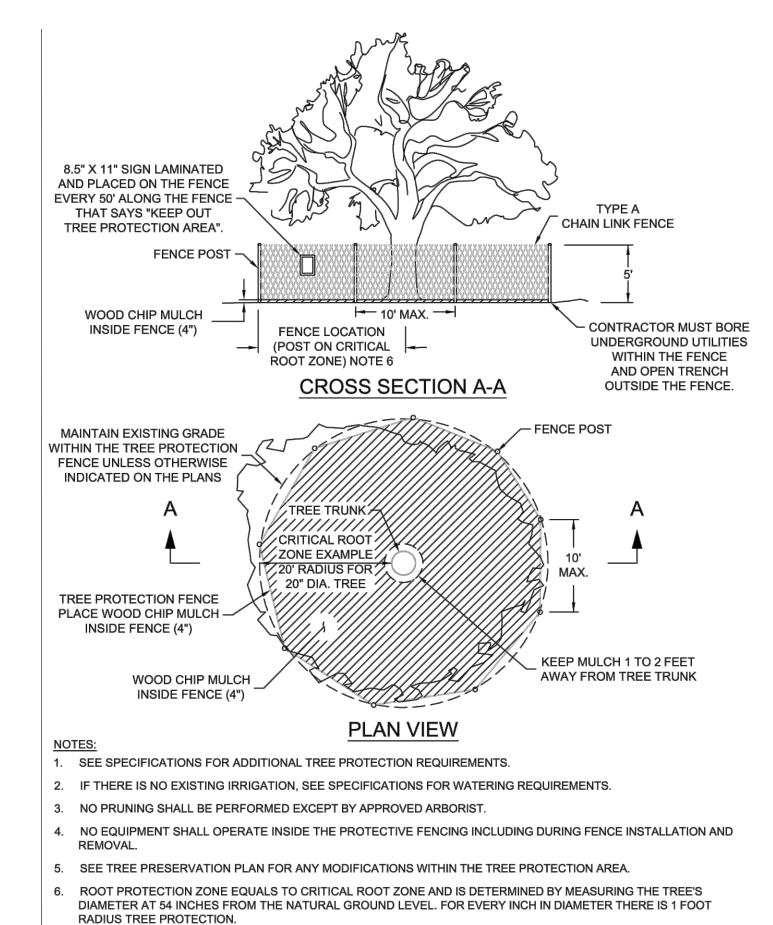
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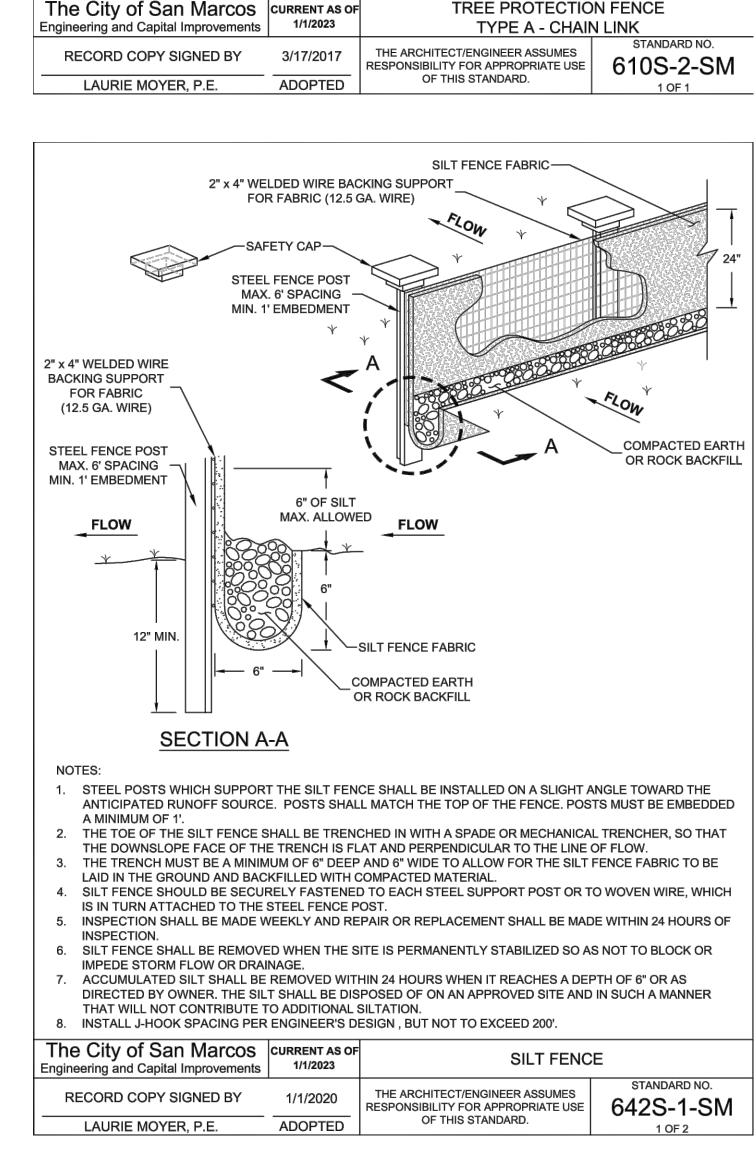
LA CIMA F PICP #202' I MARCOS,

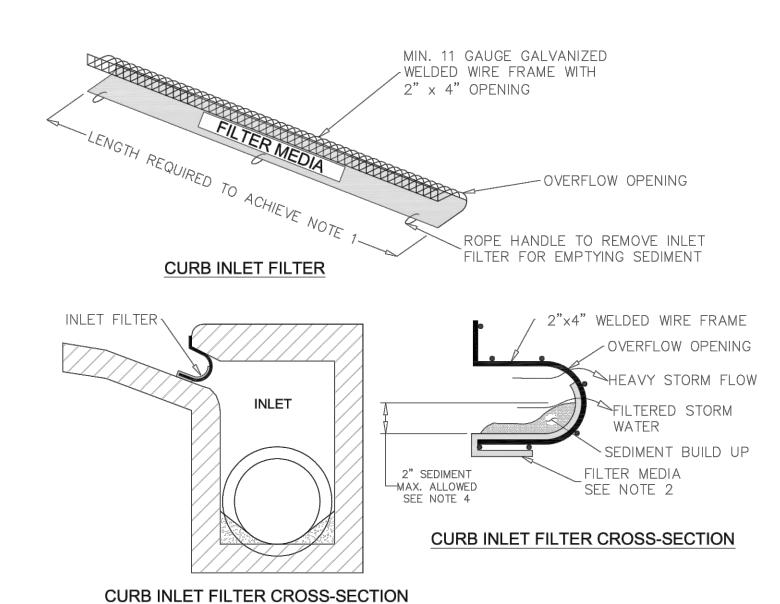








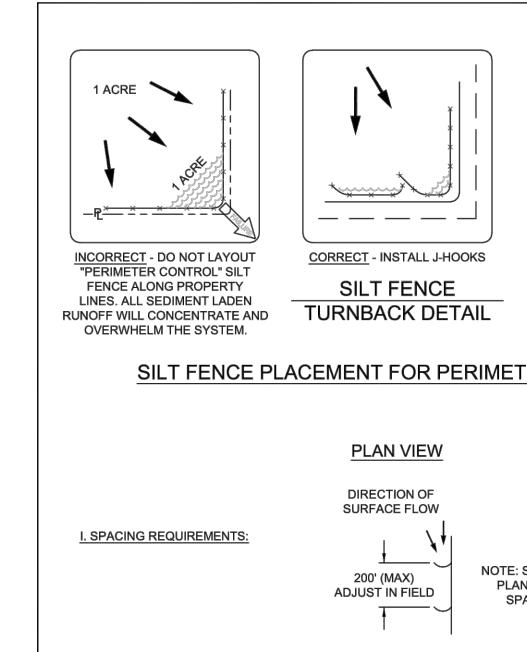


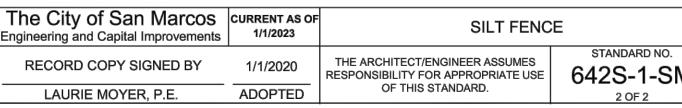


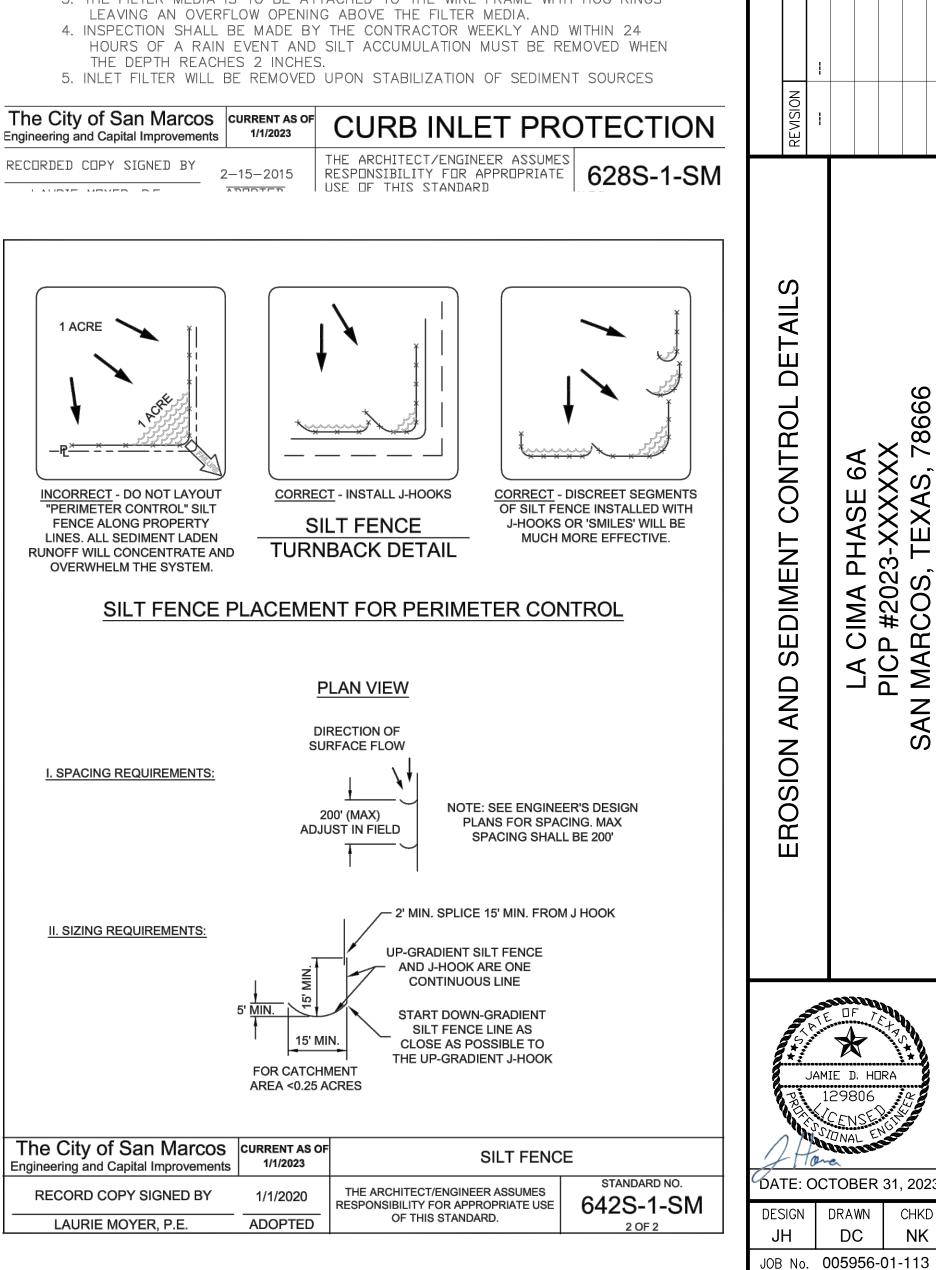
1. THE INLET FILTER SHALL BE INSERTED INTO THE CURB INLET TO CREATE A

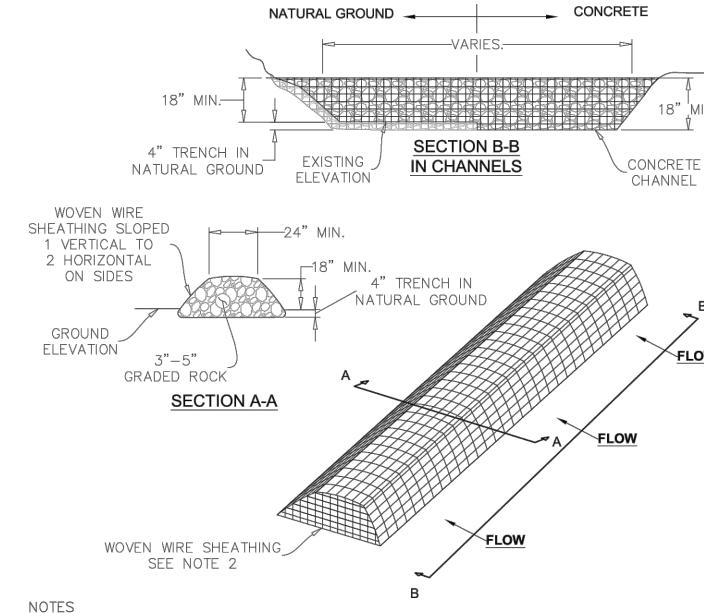
- COMPRESSION FIT IN THE INLET 2. THE FILTER MEDIA FOR PROJECTS WITHIN CITY OF SAN MARCOS JURISDICTION IS TO BE WOVEN FILTER FABRIC WITH A MINIMUM WATER FLOW RATE OF 300
- GALLONS A MINUTE PER SQUARE FOOT (300 GAL/MIN/SF). 3. THE FILTER MEDIA IS TO BE ATTACHED TO THE WIRE FRAME WITH HOG RINGS LEAVING AN OVERFLOW OPENING ABOVE THE FILTER MEDIA.
- 4. INSPECTION SHALL BE MADE BY THE CONTRACTOR WEEKLY AND WITHIN 24 THE DEPTH REACHES 2 INCHES.

SHOWING INLET PLACEMENT









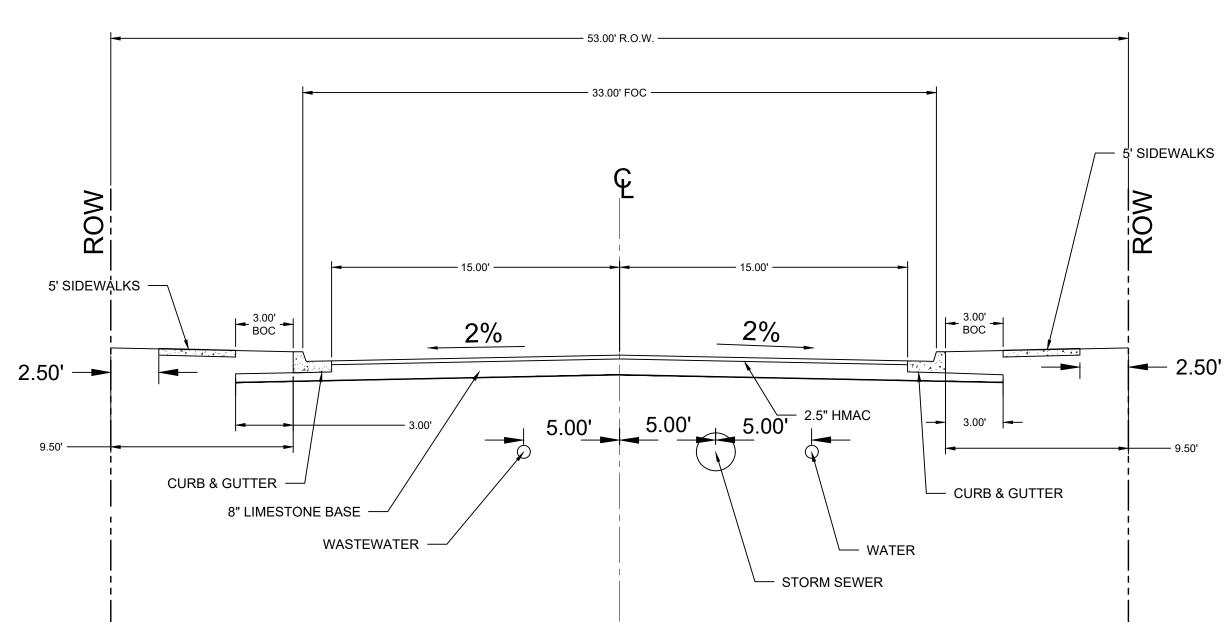
- 1. USE ONLY OPEN GRADED ROCK 3"-5" IN DIAMETER. 2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM
- 1" OPENINGS AND MINIMUM WIRE DIAMETER OF 20 GAUGE. 3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL 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 6", THE SILT WILL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CREATE A SILTATION PROBLEM.
- DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS. 6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	ROCK	<b>BERM</b>	<b>DETAIL</b>
		THE ARCHITECT/E	NGINEER ASSUMES	

RECORDED COPY SIGNED BY

8/4/2014 RESPONSIBILITY FOR APPROPRIATE 639S-1-SM ADDRESS USE OF THIS STANDARD

SHEET 45 OF 60



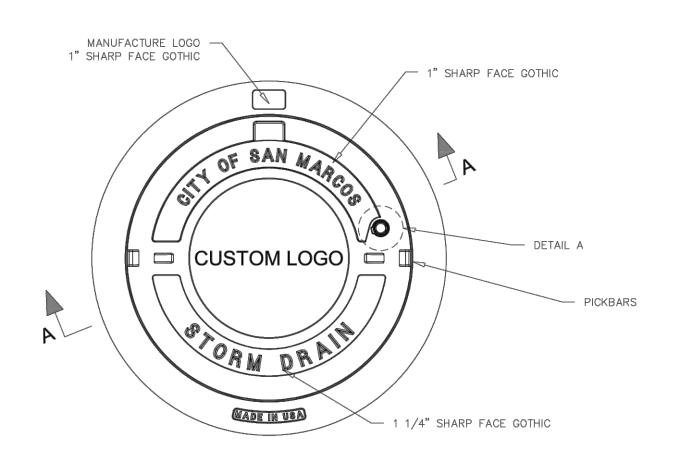
RESIDENTIAL STREET (LOW TRAFFIC) PAVEMENT & UTILITY ASSIGNMENT N.T.S.

NOTE:
RESIDENTIAL STREET SECTION SHALL COMPLY
GEOTECH DATED JULY 2023. ROADWAYS WITH
MORE THAN 2-FEET OF EXISTING CLAY SOILS
WILL BE OVER EXCAVATED TO AVOID
ADDITIONAL BASE THICKNESS

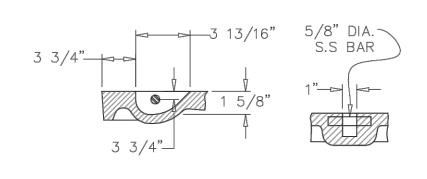
ROADWAY

DC NK

JOB No. **005956-01-113** 46 OF 60



# LID AND FRAME **PLAN VIEW**

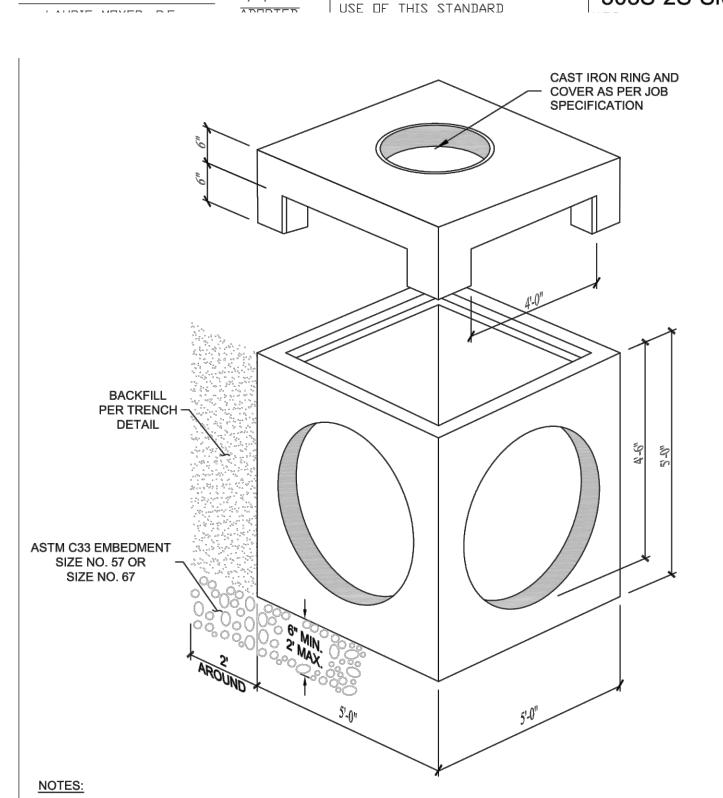


PICKBAR DETAIL

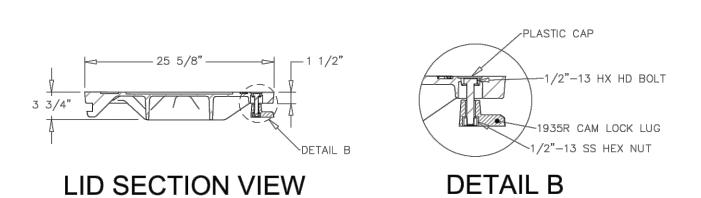


SHT 1 OF 2 The City of San Marcos | CURRENT AS OF | STORM DRAIN CURB INLET RING AND COVER 25 5/8" UNBOLTED Engineering and Capital Improvements THE ARCHITECT/ENGINEER ASSUMES
RESPONSIBILITY FOR APPROPRIATE

503S-2S-SM



- REBAR PLACEMENT WILL BE PER MANUFACTURERS RECOMMENDATION. IF POSSIBLE TRAFFIC LOADS DESIGN MUST MEET HS-20 MINIMUM BEARING CAPACITY. CAST IN PLACE MUST BE SUBMITTED & SEALED BY DESIGN
- ALL CUT STEEL SHALL BE REPLACED WITH ADDITIONAL DIAGONAL BARS OF THE SAME DIAMETER.
- INLET RING AND COVER SHALL BE IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD 503S-2S-SM. CONCRETE COVERAGE OF STEEL SHALL BE 2" MIN. AT ALL SURFACES.
- ALL MEASUREMENTS ARE MINIMUM UNLESS OTHERWISE NOTED.
- CONSULT MANUFACTURER BEFORE HANDLING. 7. DRILL 3" DEEP HOLES (5/8" DIA.) AT 12" O.C.
- The City of San Marcos | CURRENT AS OF PRECAST 4-SIDED AREA INLET Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES 1/1/2021 RECORD COPY SIGNED BY 508S-9-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. ADOPTED LAURIE MOYER, P.E. 3 OF 3



**SECTION A-A DETAIL A** 

# FRAME SECTION VIEW

– 27 3/8" —

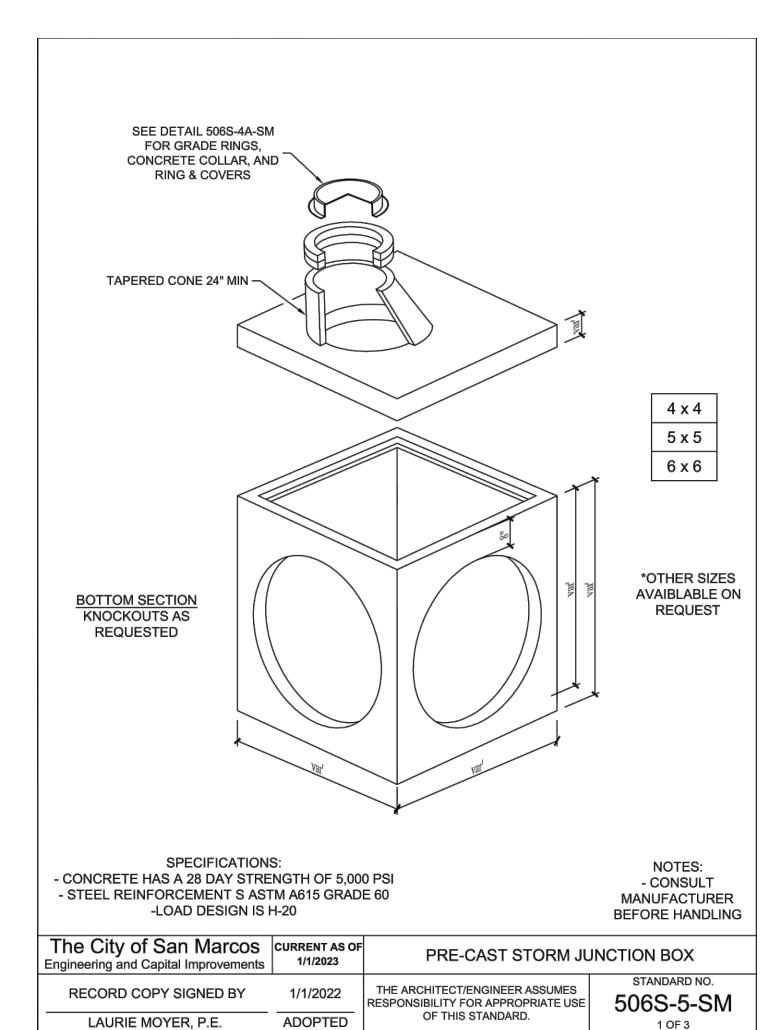
**SECTION A-A** 

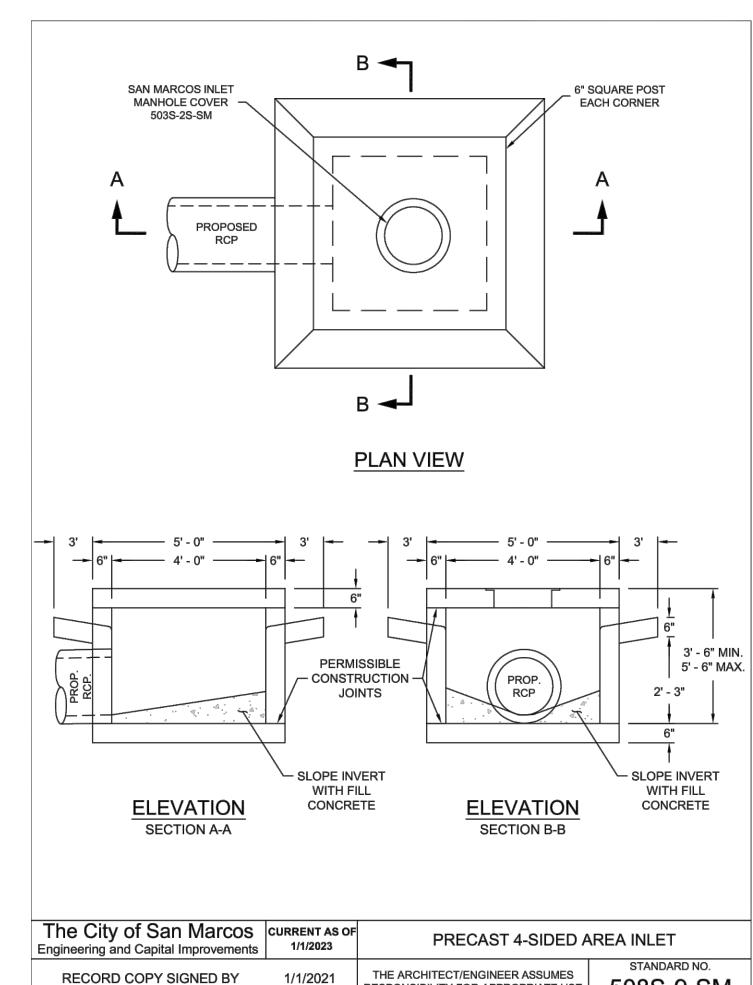
MA	TERIALS
LID	DUCTILE IRON
FRAME	GRAY IRON

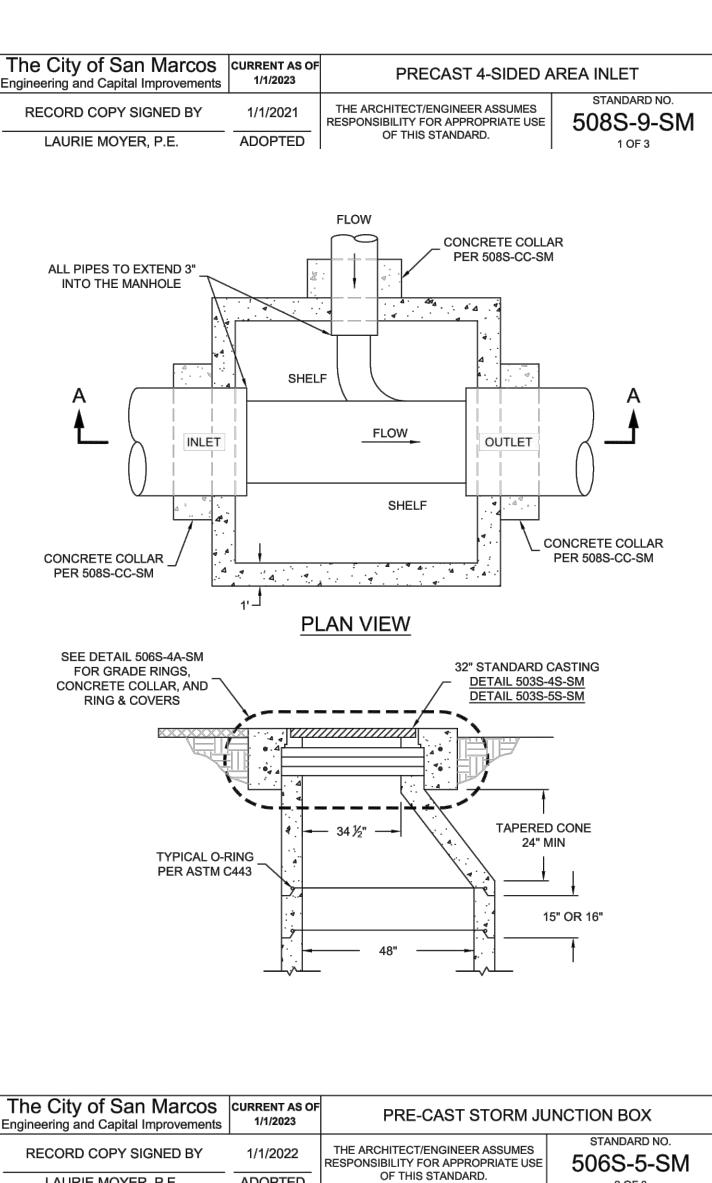
#### NOTE:

- 1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
- 2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

			SHT 2 OF 2
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	STORM DRAIN CURB INI COVER 25 5/8" UN	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	



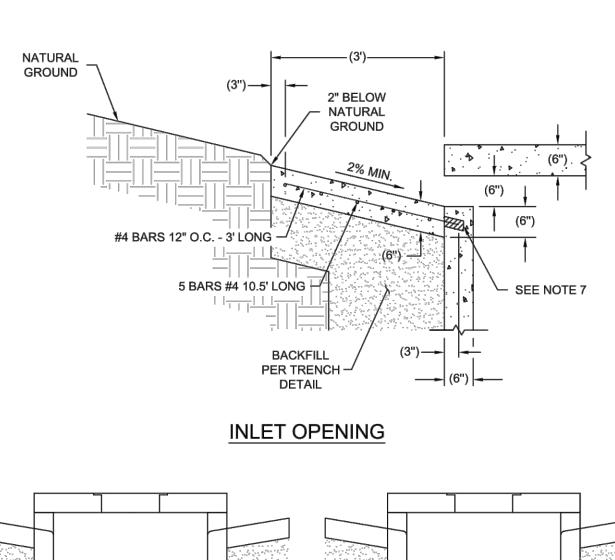


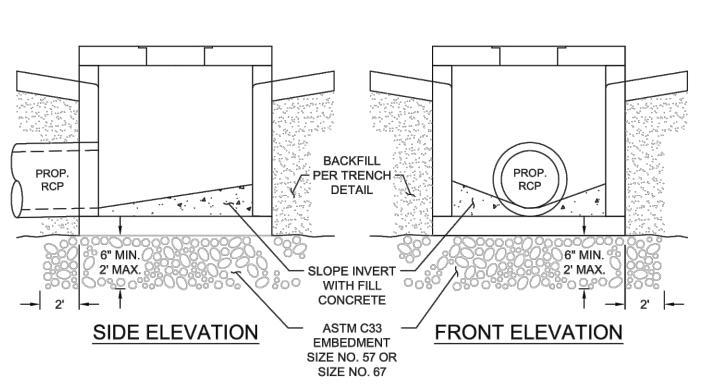


LAURIE MOYER, P.E.

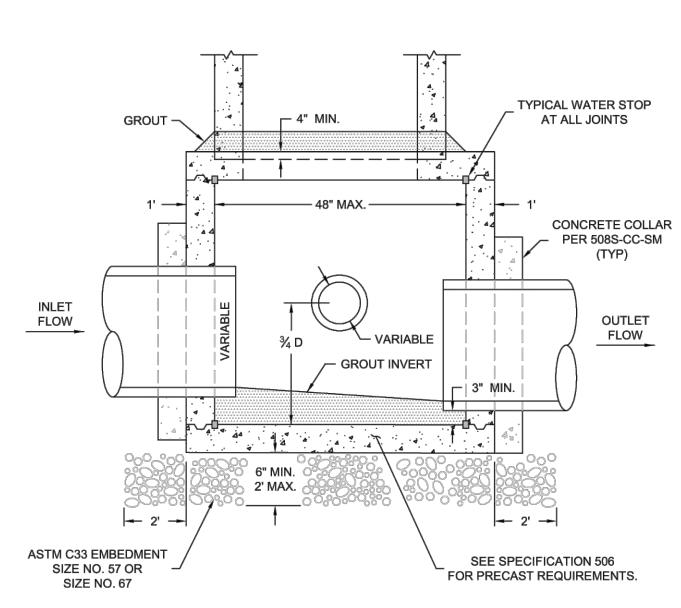
ADOPTED

2 OF 3





The City of San Marcos ngineering and Capital Improvements	CURRENT AS OF 1/1/2023	PRECAST 4-SIDED AREA INLET		
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 508S-9-SM	
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 3	



**SECTION A-A** 

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PRE-CAST STORM JU	JNCTION BOX
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 506S-5-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	3 OF 3

**DETAILS** DRAIN JAMIE D. HORA

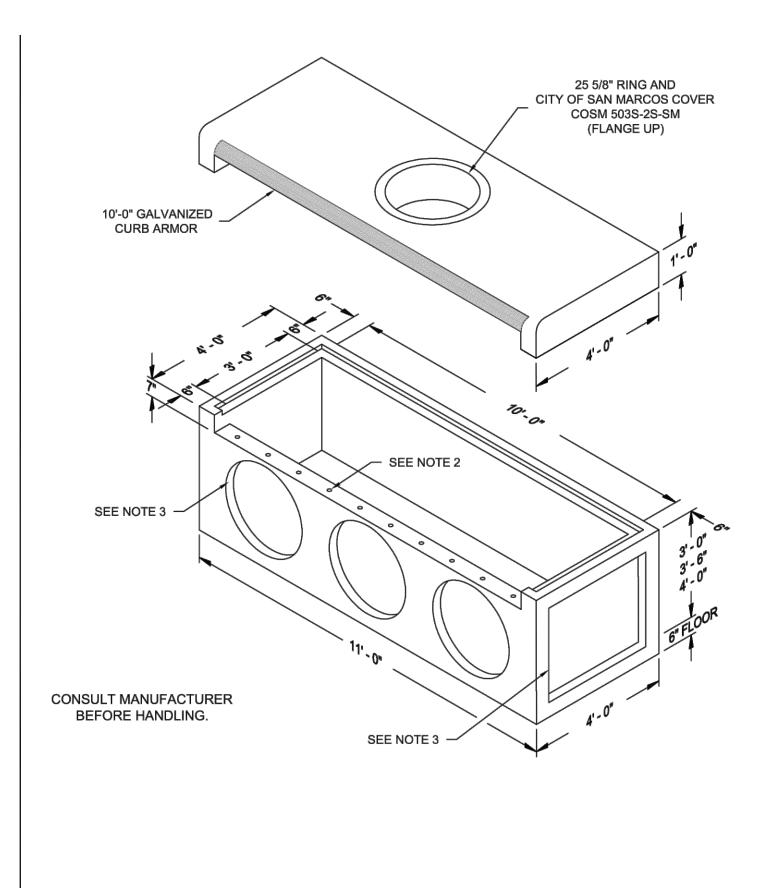
DATE: OCTOBER 31, 2023

DC

JOB No. 005956-01-113

SHEET

DESIGN | DRAWN |



TYPICAL PRE-CAST CURB INLET

THE ARCHITECT/ENGINEER ASSUMES

RESPONSIBILITY FOR APPROPRIATE USE

OF THIS STANDARD.

STANDARD NO.

1 OF 4

The City of San Marcos | CURRENT AS OF

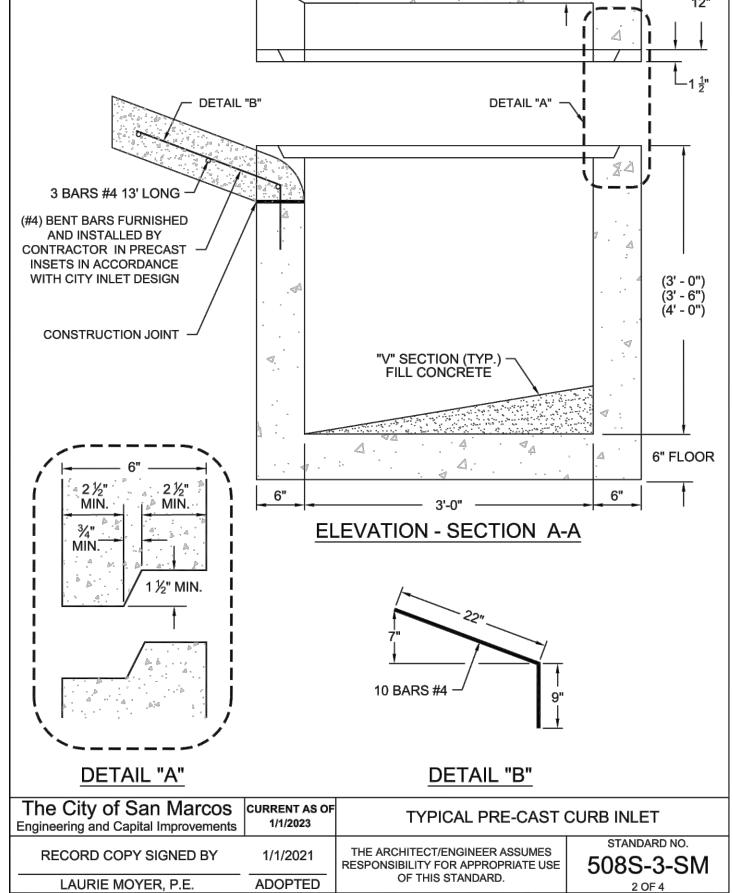
1/1/2021

ADOPTED

Engineering and Capital Improvements

RECORD COPY SIGNED BY

LAURIE MOYER, P.E.

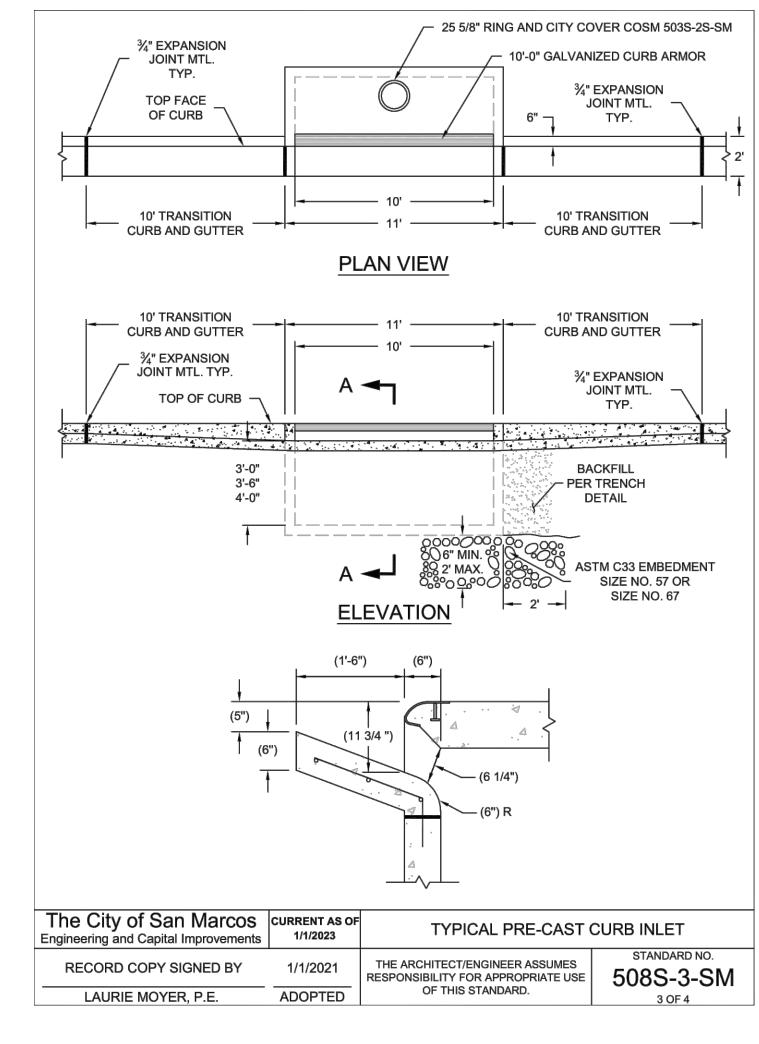


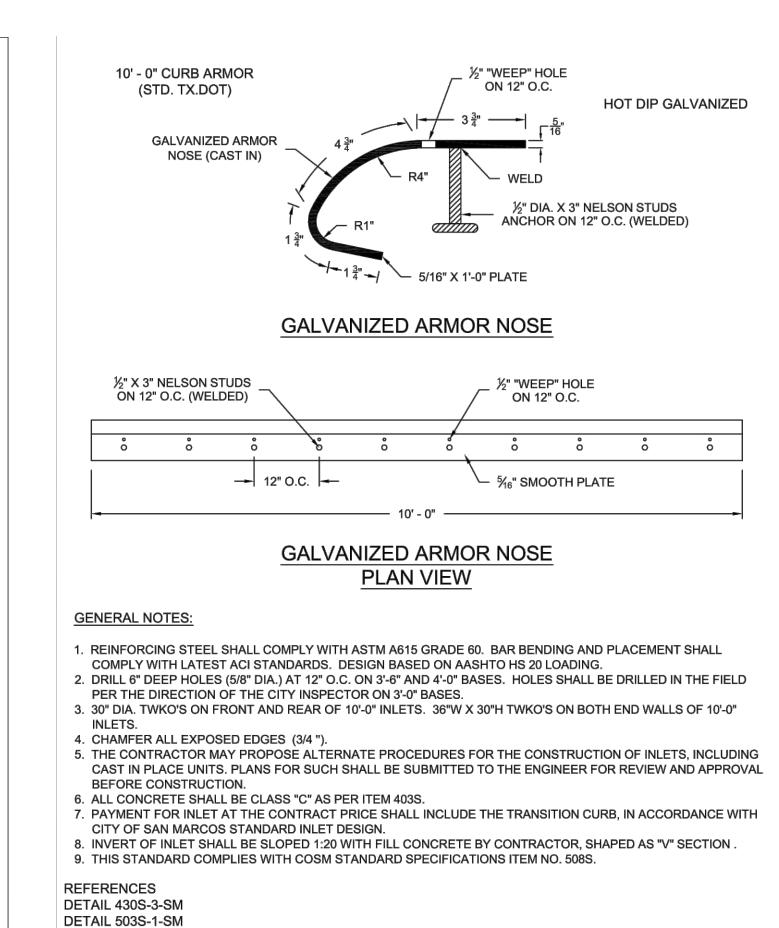
10'-0" GALVANIZED

CURB ARMOR

2% SLOPE (TYP)

USE OF THIS STANDARD.





TYPICAL PRE-CAST CURB INLET

THE ARCHITECT/ENGINEER ASSUMES

RESPONSIBILITY FOR APPROPRIATE USE

OF THIS STANDARD.

STANDARD NO.

4 OF 4

The City of San Marcos | CURRENT AS OF

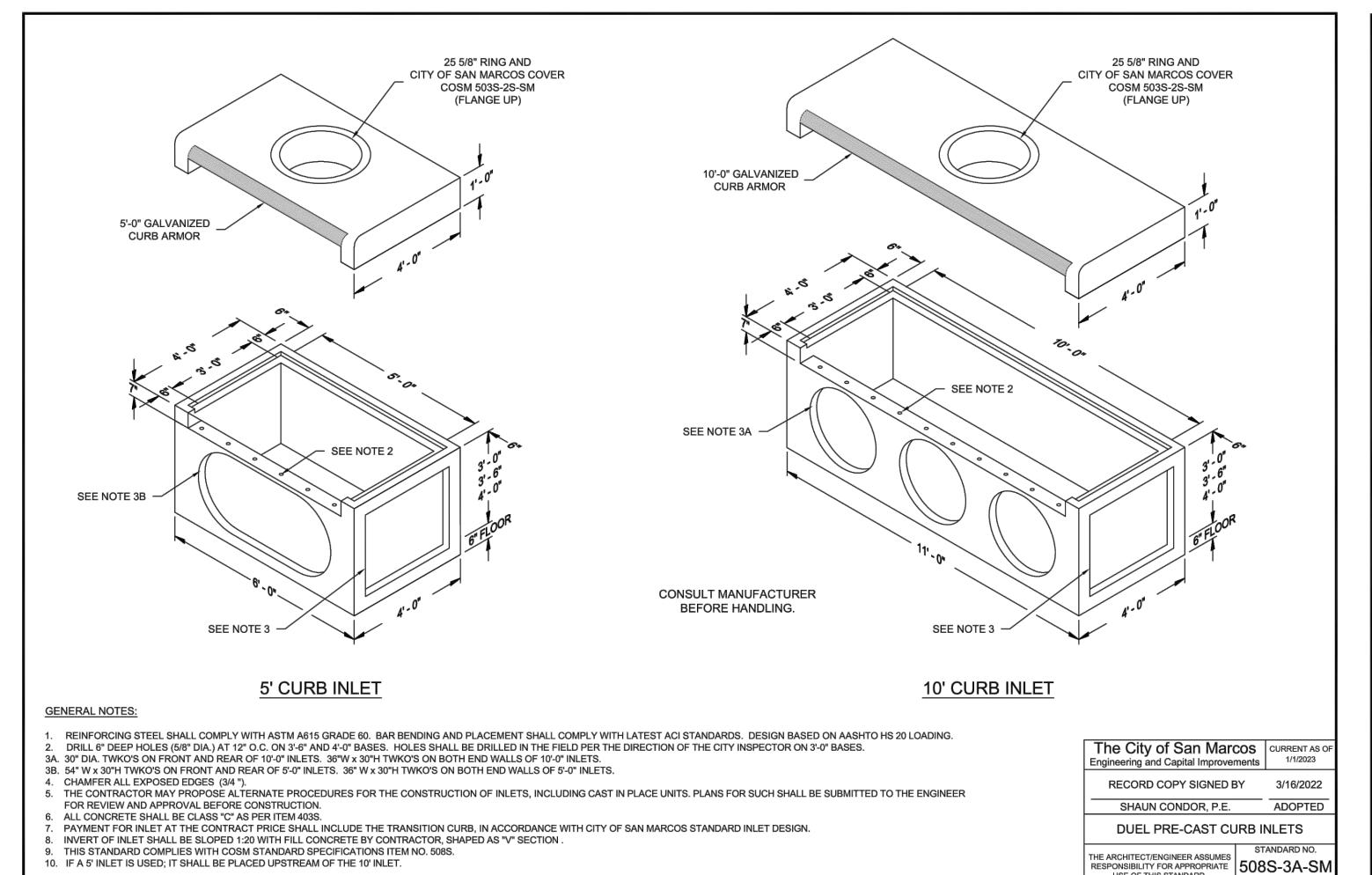
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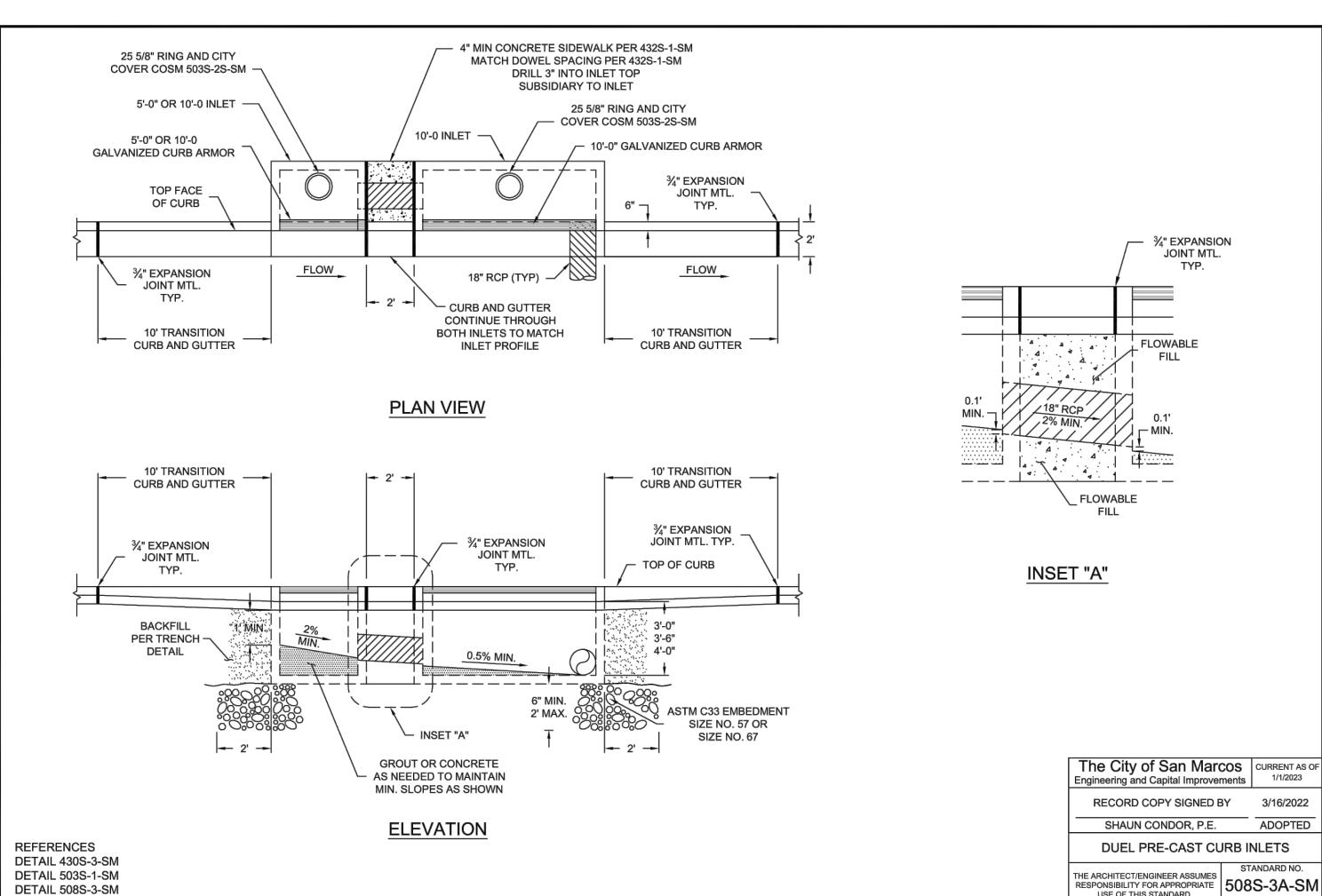
ADOPTED

Engineering and Capital Improvements

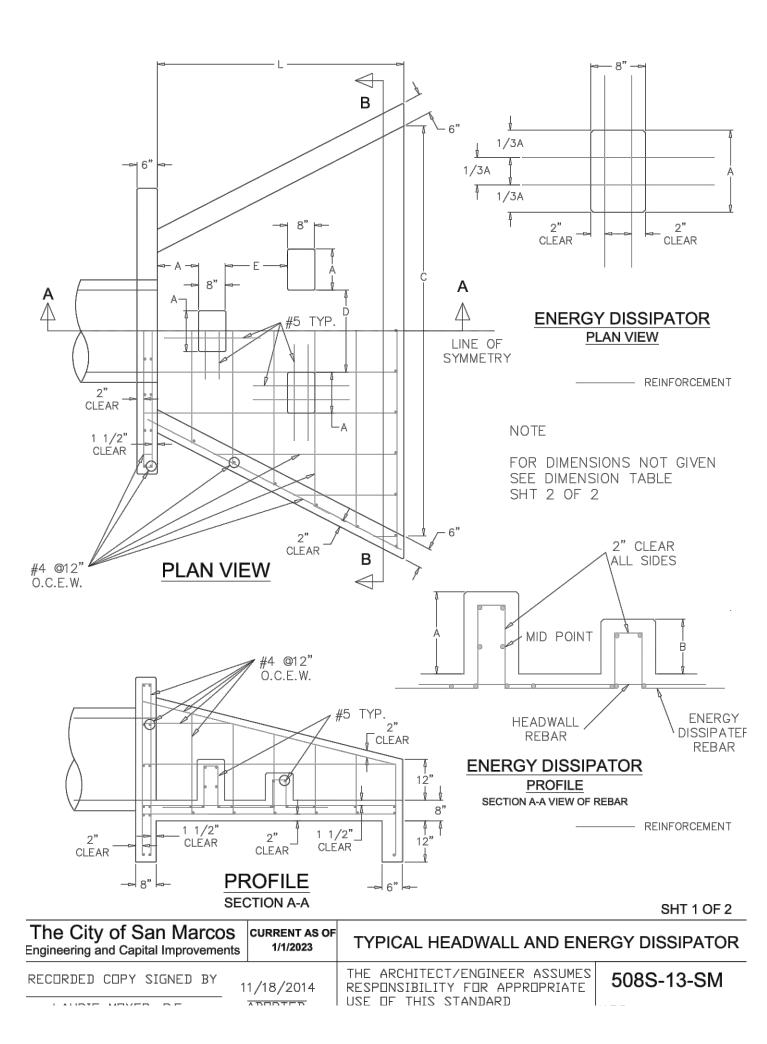
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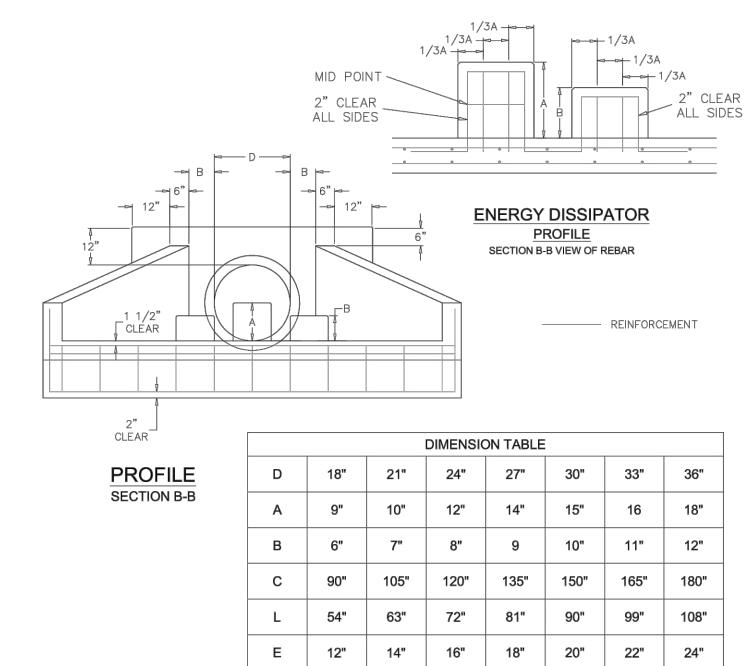
LAURIE MOYER, P.E.





USE OF THIS STANDARD.





1. ALL CONCRETE SHALL BE TYPE "C" PER SPEC. 403S

2. CHAMFER ALL EXTERNAL VISIBLE CORNERS. 3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY.

4. DISCHARGE VELOCITIES GREATER THAN 6 FEET/SECOND AFTER DISSIPATOR ALSO REQUIRE ROCK OUTLET PROTECTION.

THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE 508S-13-SM

5. DETAIL IS NOT FOR PIPES WITH EXIT VELOCITIES EXCEEDING 15 FEET PER

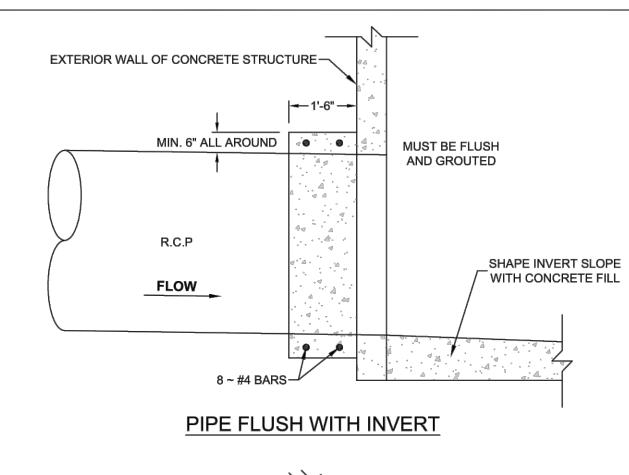
6. ALL SPACING FOR CAST-IN-PLACE HEADWALLS AND DISSIPATORS.

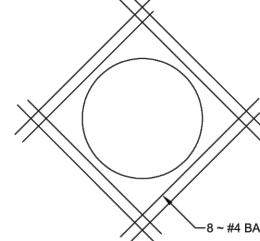
7. ANY WALL THICKER THEN 6" WILL BE DOUBLE MATTED WITH REINFORCEMENT REBAR.

The City of San Marcos
Engineering and Capital Improvements CURRENT AS OF 1/1/2023

TYPICAL HEADWALL AND ENERGY DISSIPATOR

TI/10/2014 | KESPUNSIBILITY FUR APPI





NOTES:

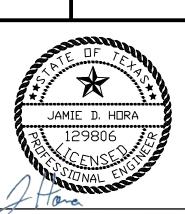
SHT 2 OF 2

- 1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
- ALL EXPOSED EDGES SHALL BE CHAMFERED ¾". 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.
- . ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
- INVERT TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE.
- COST SUBSIDIARY TO INLETS, MANHOLES AND JUNCTION BOXES.

8. CONCRETE COLLARS ARE SUBSIDIARY TO INLETS, MANHOLES AND JUNCTION BOX.

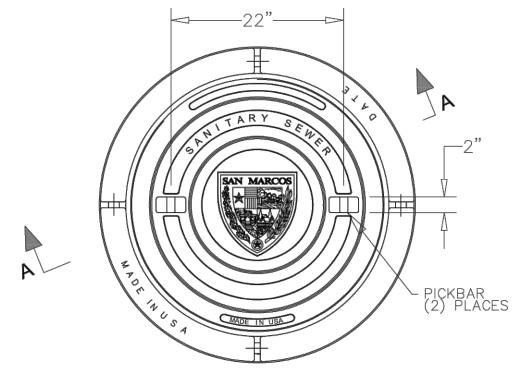
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	CONCRETE COLLAR FOR	DRAINAGE PIPE
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 508S-CC-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1

STORM DRAIN DETAILS (3 OF 3)

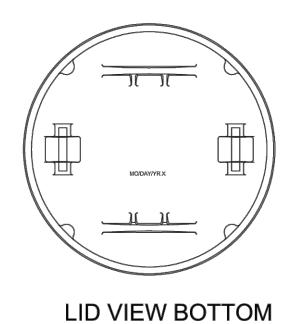


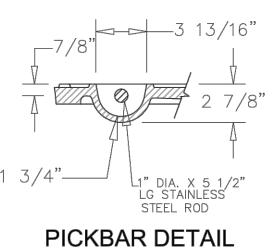
DESIGN DRAWN
JH DC JOB No. **005956-01-113** 

55 OF 60

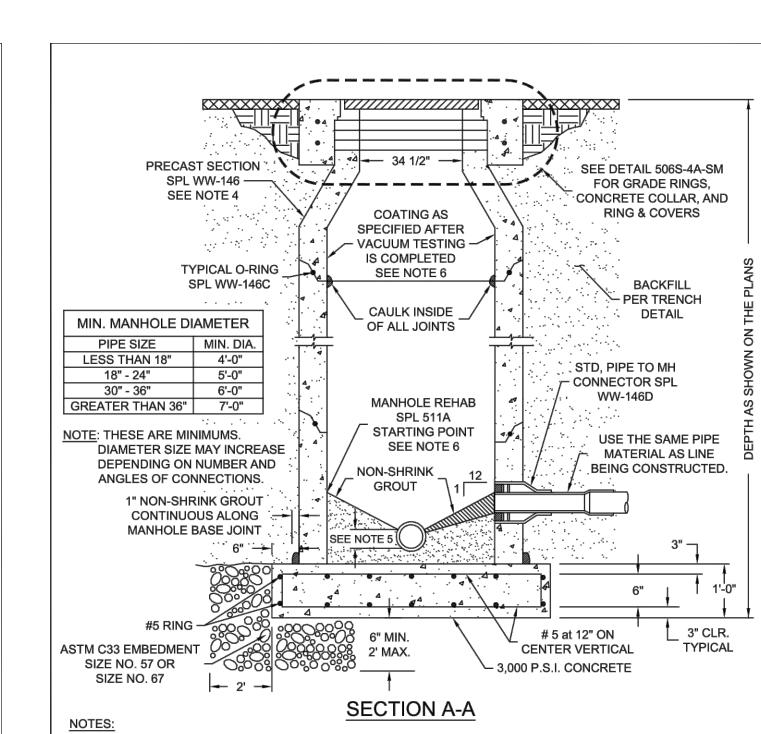


## FRAME AND LID PLAN VIEW





			SHT 1 OF 2
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SANITARY SEWER MANH COVER 32" - UNB	: : : : :
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-4W-SM



## **OUTSIDE PAVEMENT**

IN PAVEMENT

/-- SEE DETAIL 1100S-1-SM

**EXISTING ASPHALT** 

OR CONCRETE

HDPE MANHOLE

ADJUSTMENT RINGS

PER SPL WW-703

MAXIMUM HEIGHT

**ALLOWED PER 506.5.1.2.** 

1/2" x 4 1/2" ZINC PLATED CARBON STEEL

-POWER-STUD + SD1 WEDGE EXPANSION

ANCHOR MFR # 7423SD1-PWR

3" RADIUS OR AS DIRECTED BY

COSM INSPECTOR

- CLASS A CONCRETE (SEE NOTE 4)

1. IF MANHOLE IS WITHIN THE 100-YEAR FLOODPLAIN, USE BOLTED AND GASKET LIDS.

MANHOLE RING AND COVER

PER SPL WW-219

1/2" x 1/2"

MINIMUM BUTYL RUBBER

SEALANT CONTINUOUS, PLACED IN-

RECOMMENDATIONS.

THIS AREA PER MANUFACTURERS

MANHOLE LINER STOP AT

FIRST GRADE RING

FOR WASTEWATER MANHOLES

MANHOLE CONE SECTION -

MANHOLE RING AND COVER

MANHOLE LINER STOP AT FIRST GRADE RING

FOR WASTEWATER MANHOLES

MANHOLE CONE SECTION -

PER SPL WW-219

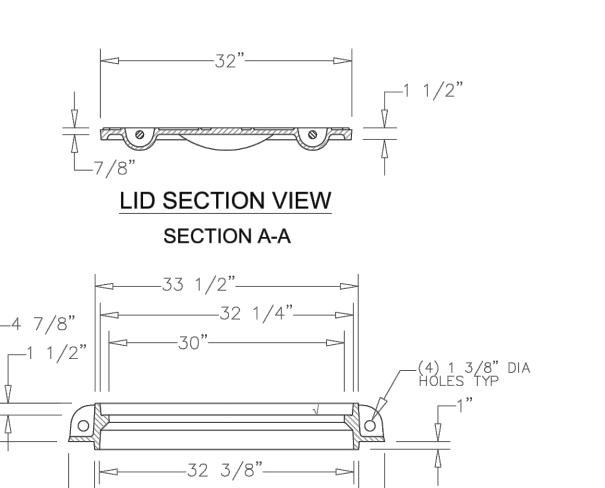
- 2. DIMENSION B = (6"-12" TO FINISH GRADE) FOR MANHOLE LOCATED IN THE 100-YR FLOOD PLAN.
- = (2"-12" TO FINISH GRADE) FOR MANHOLE OUTSIDE THE 100-YR FLOOD PLAN. 3. MANUFACTURES SHALL VERIFY DIMENSION AGAINST RING AND COVER SPECIFIED.
- 4. INSPECTOR MAY APPROVE THE USE OF CONCRETE BAG PER SPL WW-704 AT THE INSPECTORS DISCRETION.
- REFERENCES DETAIL 1100S-1-SM

DETAIL 1100S-1-SM			
The City of San Marcos	CURRENT AS OF	MINOR MANHOLE AD	JUSTMENT &
Engineering and Capital Improvements	1/1/2023	NEW MANHOLE CON	STRUCTION
DECORD CODY CIONED BY	4/4/0000	THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO.
RECORD COPY SIGNED BY	1/1/2020	RESPONSIBILITY FOR APPROPRIATE USE	506S-4A-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1

#### 1. SEE PLANS FOR MANHOLE LOCATION, CONFIGURATION, PIPE SIZES AND TYPES. 2. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.

- 3. MONOLITHIC MANHOLE TO BE CAST-IN-PLACE SHALL CONFORM TO ASTM SPECIFICATION C478 FOR MATERIALS
- AND DESIGN. MANUFACTURER TO PROVIDE DETAILS. 4. MANHOLES FOR MAINS 24" AND LARGER SHALL HAVE ECCENTRIC RISER SECTIONS.
- 5. DEPTH OF U CHANNEL WILL BE 3/4 THE DIAMETER OF PIPES 24" OR LESS AND WILL BE THE DIAMETER OF PIPES
- 6. MANHOLE COATING LIMITS COAT ALL OF THE MANHOLE WALLS.
- AT TOP OF MANHOLE: SEE DETAIL 506S-4A-SM FOR END LOCATION AT GRADE RINGS. AT BOTTOM OF MANHOLE:
  - NEW MANHOLES COAT PER SPL 511; INCLUDING THE BOTTOM AND INVERT. MANHOLE REHABILITATION - COAT PER SPL 511A; EXCLUDING THE BOTTOM AND INVERT.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WASTEWATER MANHOLE	ON PRECAST BASE	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 506S-10-SM	
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 2	



FRAME SECTION VIEW SECTION A-A

MATERIALS LID DUCTILE IRON FRAME GRAY IRON

SHT 2 OF 2

#### NOTE:

- 1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
- 2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

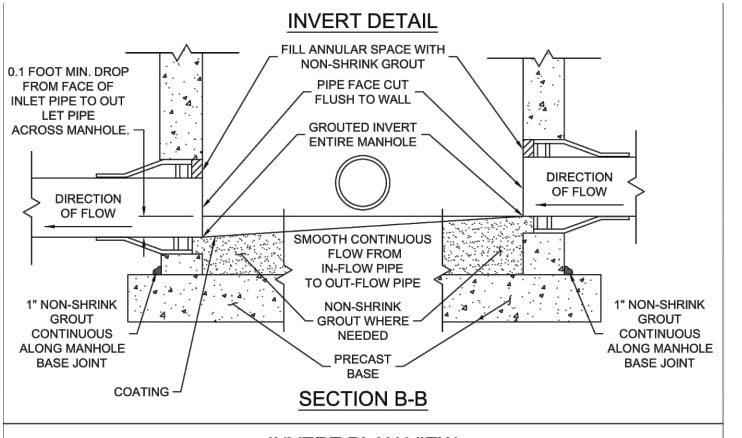
The City of San Marcos | CURRENT AS OF | SANITARY SEWER MANHOLE RING AND Engineering and Capital Improvements

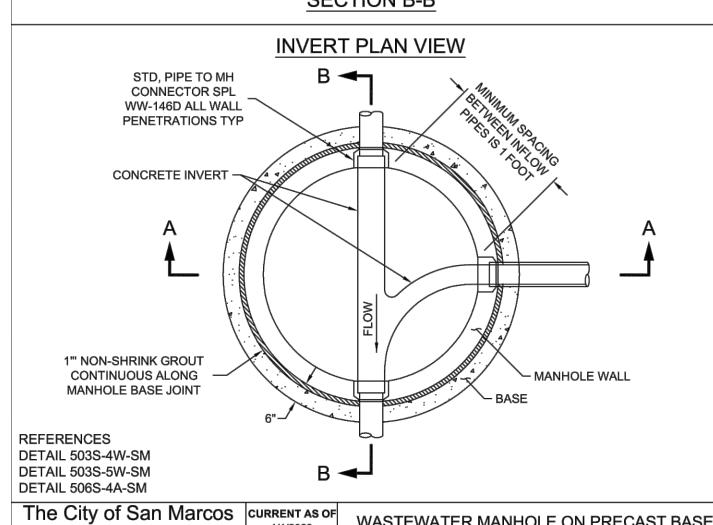
ADDITED USE OF THIS STANDARD

THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE

**COVER 32" - UNBOLTED** 

503S-4W-SM





OF THIS STANDARD.

1/1/2023

6/1/2018

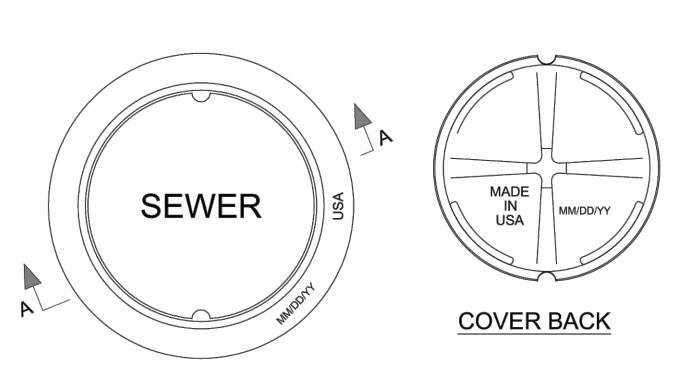
ADOPTED

Engineering and Capital Improvements

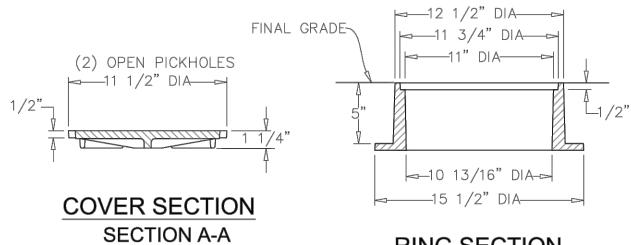
RECORD COPY SIGNED BY

LAURIE MOYER, P.E.

WASTEWATER MANHOLE ON PRECAST BASE THE ARCHITECT/ENGINEER ASSUMES 506S-10-SM RESPONSIBILITY FOR APPROPRIATE USE 2 OF 2



## **PLAN VIEW**



1. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

**RING SECTION SECTION A-A** 

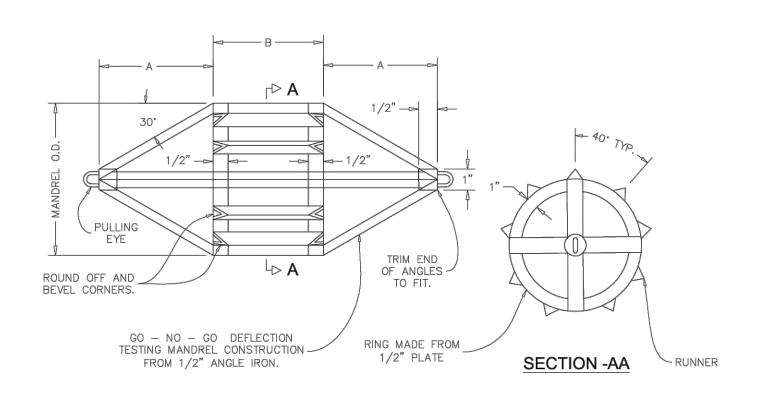
The City of San Marcos Engineering and Capital Improvements CLEANOUT RING AND COVER

RECORD COPY SIGNED BY

6/30/2014

RESPONSIBILITY FOR APPROPRIATE
USE OF THIS STANDARD

THE ARCHITECT/ENGINEER ASSUMES
RESPONSIBILITY FOR APPROPRIATE
USE OF THIS STANDARD



		DI	MENSIO	N	
PIPE SIZE	Α	В	MANDREL O.D.	PIPE O.D.	WALL THINNESS
6" SDR 26	3.5"	5.0"	5.503"	6.275"	0.214"
8" SDR 26	4.5"	6.0"	7.366"	8.400"	0.323"
10" SDR 26	5.5"	7.5"	9.207"	10.500"	0.404"
12" SDR 26	7.0"	9.0"	10.961"	12.500"	0.481"

15" SDR 26 | 9.0" | 11.5" | 13.418" | 15.300" | 0.588"

- 1. AFTER WELDING IS COMPLETED, TRUE THE OUTSIDE DIAMETER DIMENSION. FOR THE
- FULL LENGTH OF "B" TO 0.010". 2. MANDREL OD MUST BE EQUAL TO 95% OF THE ID OF THE PIPE
- 3. ADJUSTABLE MANDREL NOT ACCEPTABLE. 4. REFERENCE THE PIPE MANUFACTURER'S SPECIFICATIONS FOR MANDREL SIZE AND
- SUPPLY CALCULATED DIMENSIONS IN A SUBMITTAL.
- 5. A PROVING RING IS REQUIRED. 6. MANDREL WILL HAVE AN ODD NUMBER OF RUNNERS (9 OR MORE).

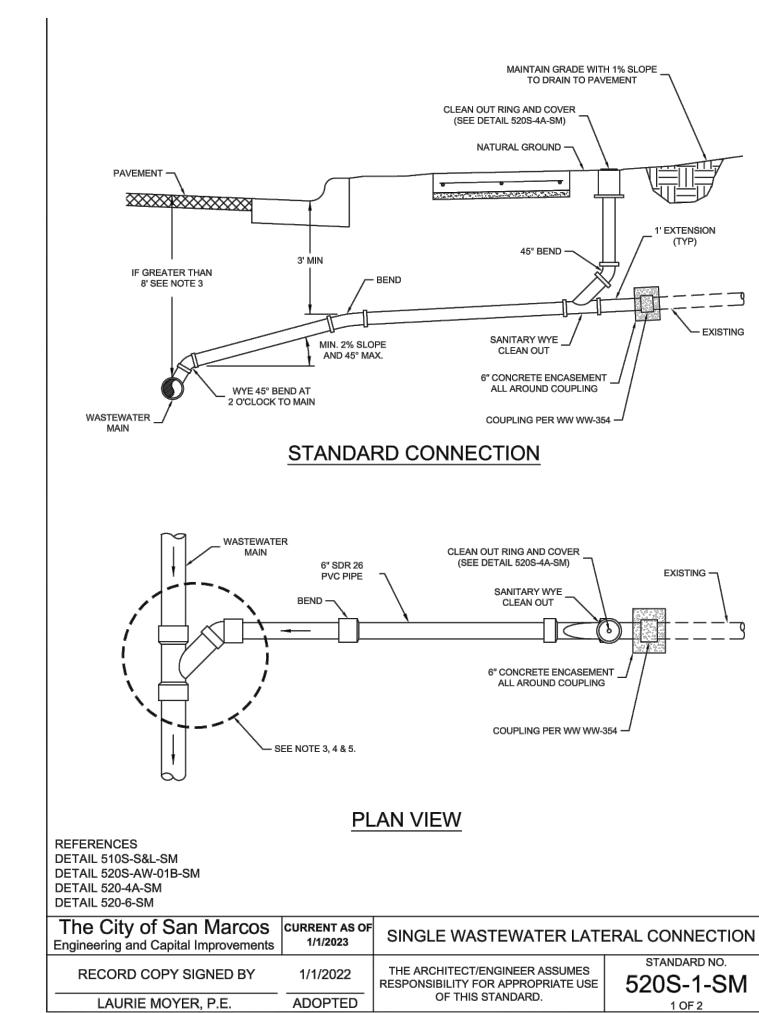
The City of San Marcos | CURRENT AS OF Engineering and Capital Improvements THE ARCHITECT/ENGINEER ASSUMES 510S-PM-SN RESPONSIBILITY FOR APPROPRIATE RECORDED COPY SIGNED BY 2-15-2015 ABBBTER | USE OF THIS STANDARD

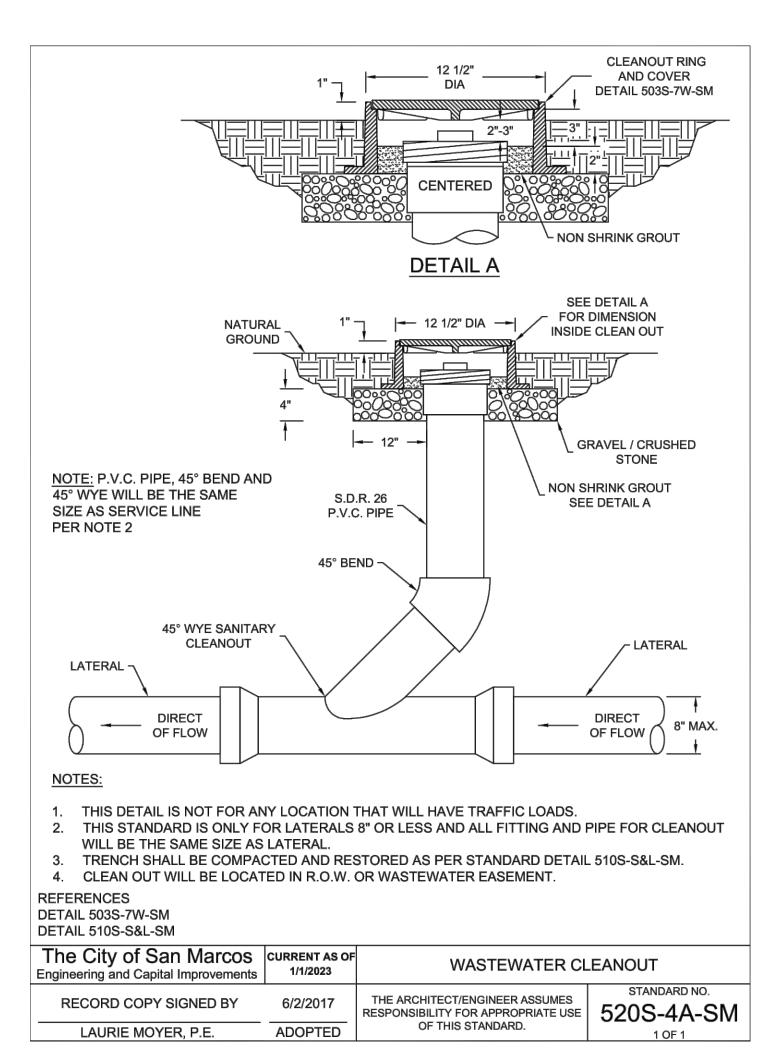
OF 7 Ś 9 TAIL DE 出

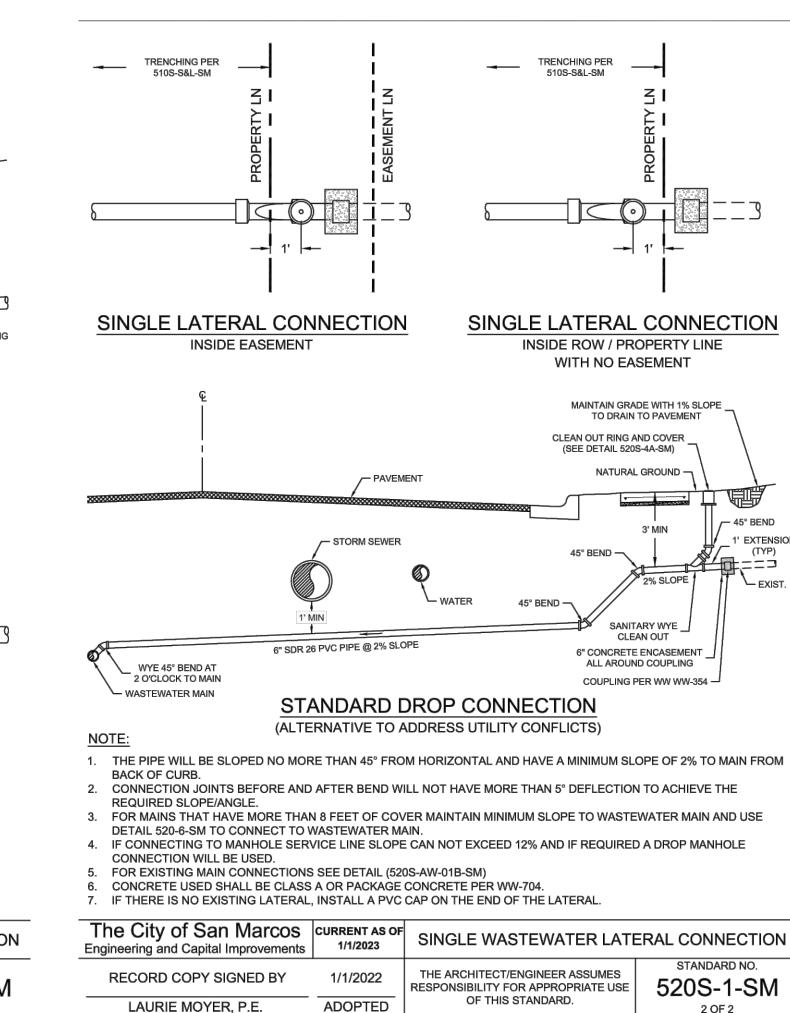
JAMIE D. HORA DATE: OCTOBER 31, 2023 DESIGN | DRAWN | DC

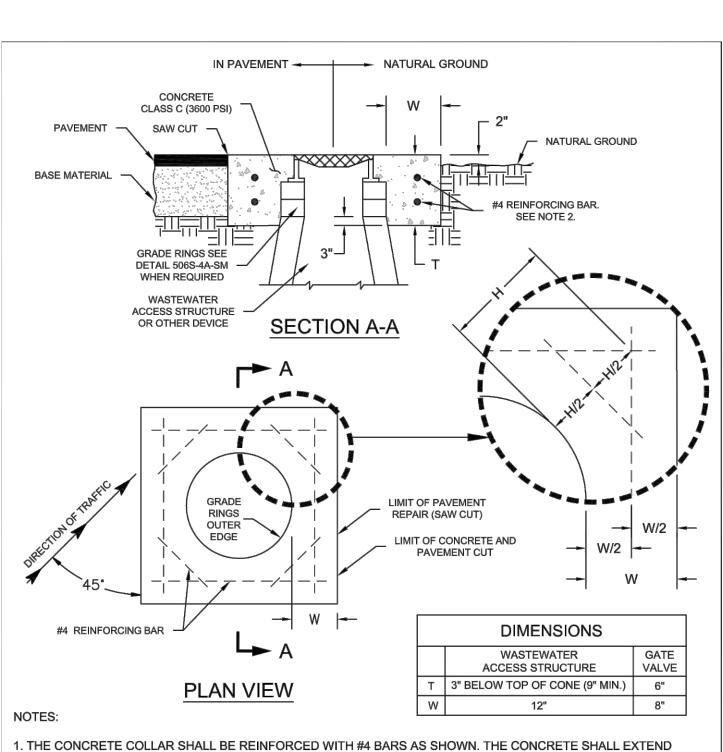
JOB No. **005956-01-113** SHEET

56 OF 60









2. REBAR WILL BE PLACED IN TWO LAYERS. FIRST LAYER (1/3 T) FROM TOP OF COLLAR AND SECOND LAYER (1/3 T) T) FROM TOP OF COLLAR. IF (T) IS 12" OR LESS ONE LAYER OF REBAR WILL BE USED, PLACED MID POINT

RECONSTRUCTION AND REAPING PROJECTS ARE INCLUDED IN DETAIL NO. 506S-3-SM, 506S-8-SM, 506S-8A-SM

CONCRETE RISER COLLAR

THE ARCHITECT/ENGINEER ASSUMES

OF THIS STANDARD.

4. REFER TO TRENCH DETAIL FOR ADDITIONAL BACKFILL REQUIREMENTS WITH APPROPRIATE CONDITIONS.

3. REQUIREMENTS FOR NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENTS IN NEW

5. BOLLARDS REQUIRED IN RURAL AREAS AS OUTLINED IN COSM DETAIL 500S-B-SM

1/1/2022

ADOPTED

TO EDGE OF SAW CUT PAVEMENT EDGE.

BETWEEN TOP AND BOTTOM OF COLLAR.

The City of San Marcos | CURRENT AS OF

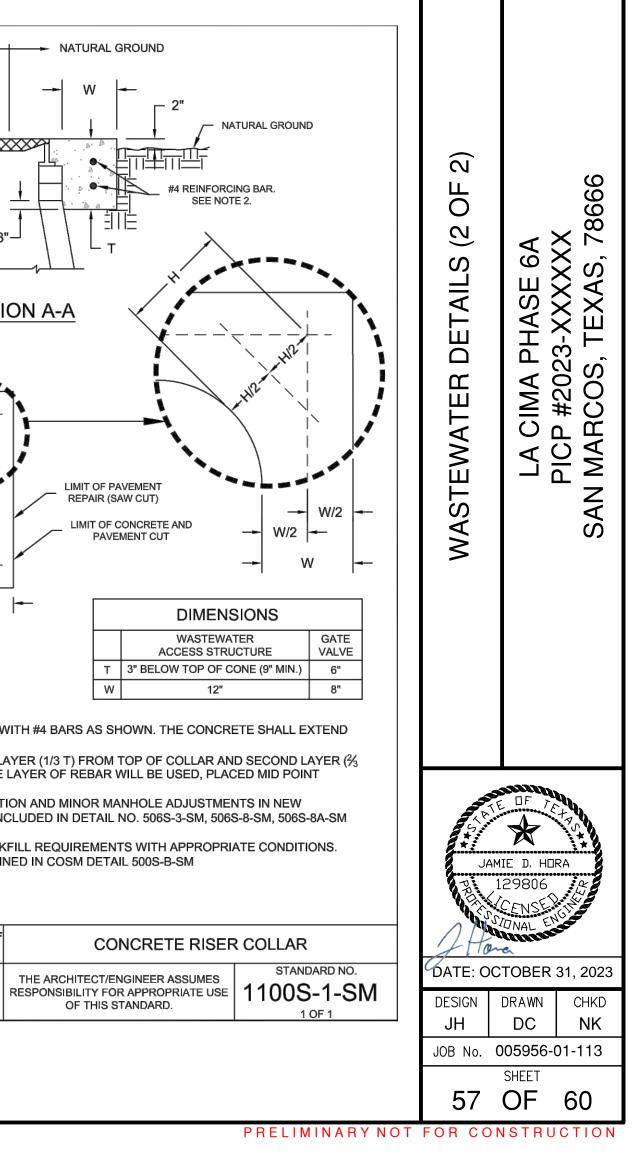
Engineering and Capital Improvements 1/1/2022

RECORD COPY SIGNED BY

LAURIE MOYER, P.E.

AND 506S-10-SM.

DETAIL 500S-B-SM



STANDARD NO.

1 OF 1

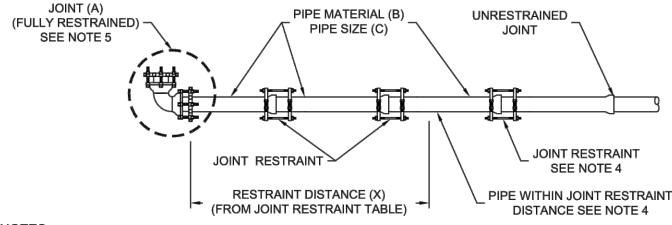
' EXTENSION

STANDARD NO.

520S-1-SM

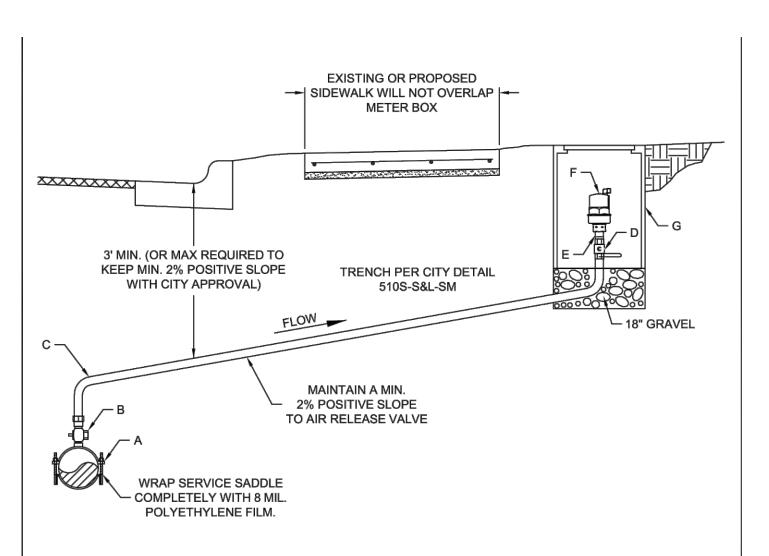
#### TYPICAL RESTRAINT

#### EXAMPLE: JOINT RESTRAINT TABLE JOINT (TYPE) PIPE MATERIAL | PIPE SIZE | RESTRAINT DISTANCE JOINT (A) SEE NOTE 5 MATERIAL (B) SIZE (C) RESTRAINT DISTANCE (X) PIPE MATERIAL (B) UNRESTRAINED PIPE SIZE (C) JOINT



- ALL JOINT RESTRAINTS WILL BE PER CURRENT CITY OF SAN MARCOS STANDARD PRODUCT LIST. 2. ALL BELL JOINTS RESTRAINTS AND METAL PIPES WILL BE WRAPPED IN 8 MIL POLY PER SPL 27D.
- A JOINT RESTRAINT TABLE FOR ALL FITTINGS WILL BE SUBMITTED WITH PLANS. 4. CONTRACTOR SHALL RESTRAIN ALL JOINTS WITHIN THE REQUIRED RESTRAINT DISTANCE PLUS
- THE NEXT JOINT OUTSIDE THE REQUIRED RESTRAINT DISTANCE. 5. JOINT RESTRAINT TABLE MUST INCLUDE ALL JOINTS AND FITTINGS THAT RESTRICT THE FLOW OF WATER THAT ARE IN THE PLAN SET INCLUDING BUT NOT LIMITED TO: (BENDS, TEES, CROSSES,
- VALVES, DEAD ENDS, REDUCERS...ETC) 6. PIPES SECTION AND JOINTS THAT ARE RESTRAINED SHALL HAVE A ADHESIVE TAPE TO THE TOP OF THE PIPE AND JOINTS PER SPL ITEM WW-597A ALONG THE FULL LENGTH OF THE RESTRAINT PIPE SECTION.

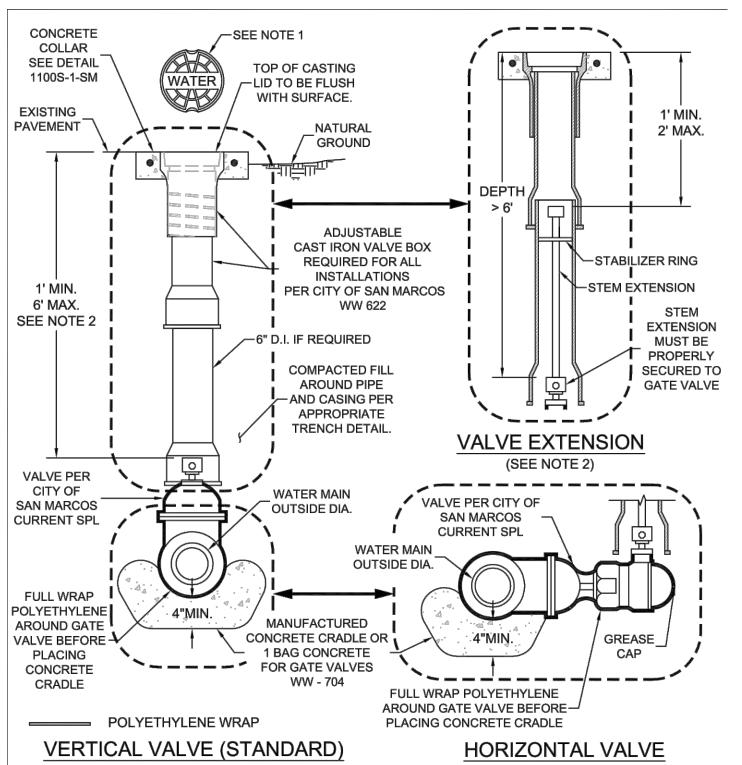
The City of San Marcos Engineering and Capital Improvements		PIPE RESTRAINT BELL JOINTS	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 510S-PR-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



	1 INCH TAP MATERIAL LIST							
LABEL	ITEM	SIZE						
*A	APPROVED TAPPING SADDLE/SLEEVE.	PER SPL						
В	CORPORATION STOP (COMPRESSION-TYPE FITTING)	1"						
**C	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65 (MAINTAIN POSITIVE SLOPE TO AIR RELEASE VALVE)	1"						
D	BRASS BALL VALVE WITH LEVER HANDLE	1"						
E	BRASS NIPPLE THREADED	1"						
F	AIR RELEASE VALVE PER CURRENT CITY OF SAN MARCOS SPL	PER SPL						
G	METER BOX FOR VALVE PER CURRENT SPL	PER SPL						

\* SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM. \*\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	1" AIR RELEASE VALVE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511S-1A-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1

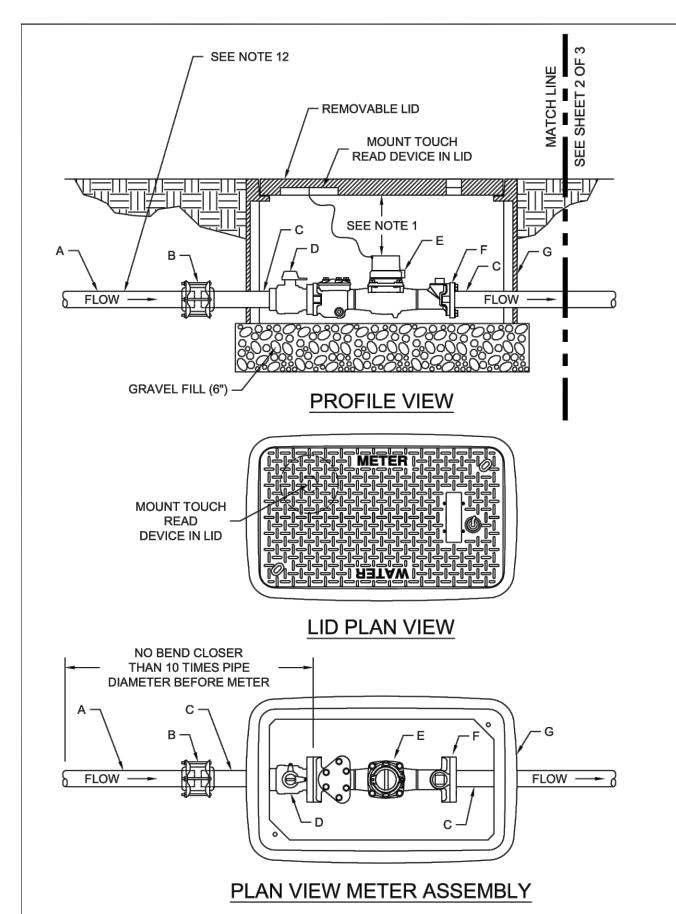


#### 1. LID MUST SAY "WATER" FOR A WATERLINE, "SEWER" FOR NONPOTABLE LINES OR "RECLAIM" FOR RECLAIMED WATER. REFER TO SPL WW 622.

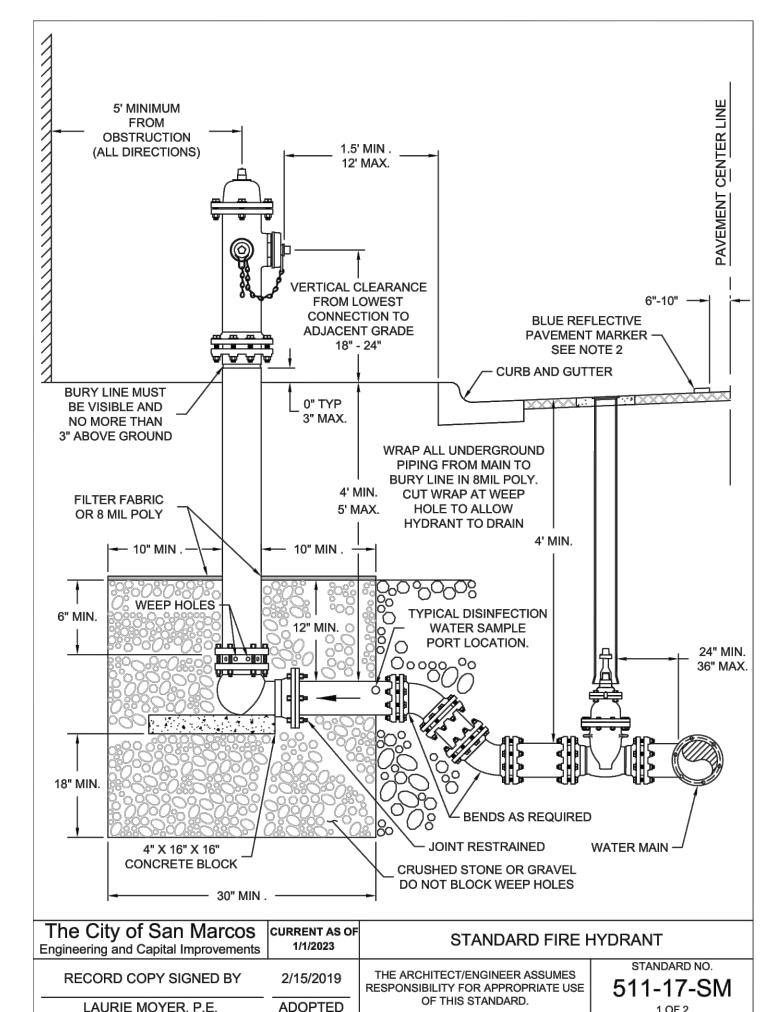
2. IF DEPTH EXCEEDS 6', A SINGLE VALVE EXTENSION IS REQUIRED. VALVE EXTENSION CAN NOT BE STACKED.

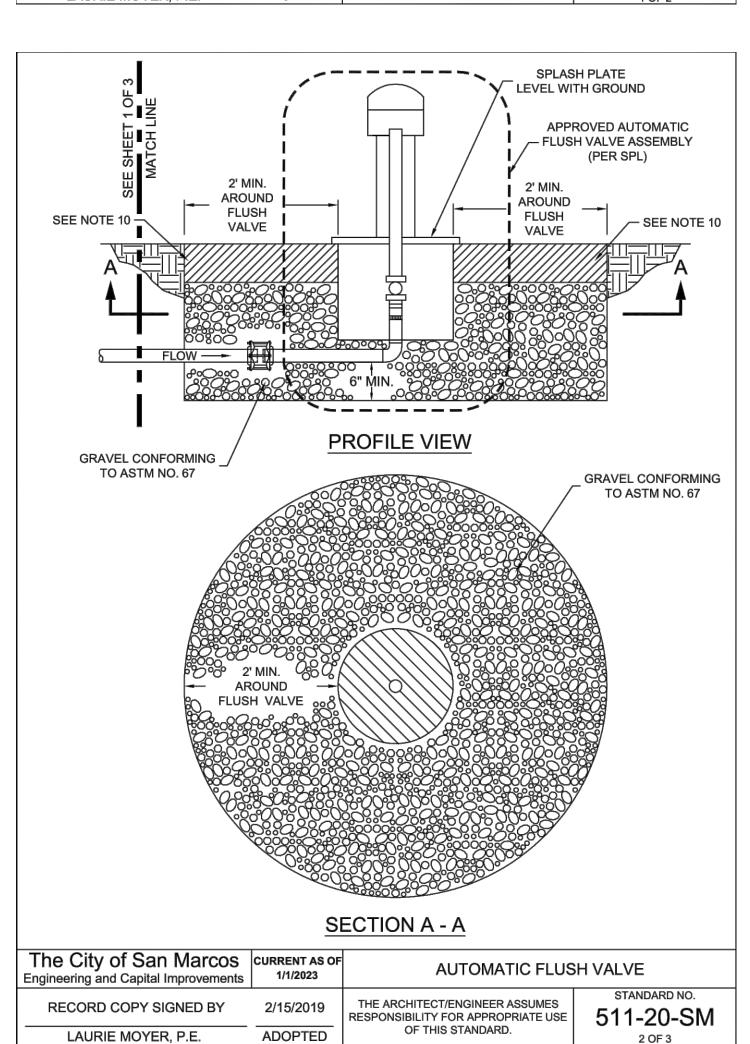
#### REFERENCES DETAIL 1100S-1-SM

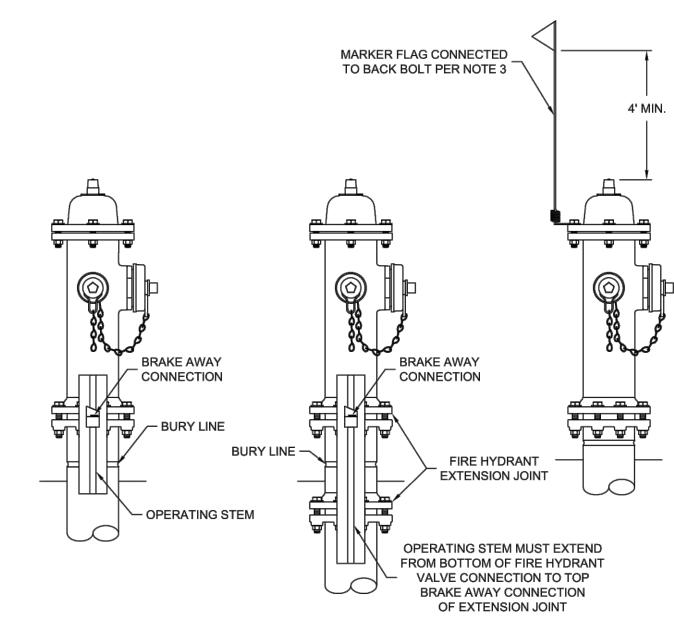
The City of San Marcos Engineering and Capital Improvements			VE 2" - 24"
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511S-7-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	AUTOMATIC FLUSH VALVE	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 3







1. PUBLIC HYDRANTS SHALL BE FACTORY PAINTED WITH BRIGHT ALUMINUM BASED SILVER PAINT

- AND PRIVATE HYDRANTS SHALL BE PAINTED RED. 2. A BLUE REFLECTIVE PAVEMENT MARKER MUST BE PLACED WITH EVERY FIRE HYDRANT
- ADJACENT TO A ROADWAY 6"-10" OFF CENTER LINE OF ROAD ON FIRE HYDRANT SIDE.
- FIRE HYDRANTS OUTSIDE ROW SHALL HAVE MARKING FLAGS IN RURAL AREAS. FIRE HYDRANT MUST GO ON PAVEMENT SIDE OF FENCE, OR FENCE MUST BE REBUILT AROUND
- FIRE HYDRANT TO ALLOW ACCESS FROM PAVEMENT TO FIRE HYDRANT.
- FIRE HYDRANT MAY ONLY MINIMALLY OBSTRUCT SIDEWALK AT EITHER EDGE NO OBJECT THAT WILL OBSTRUCT MAINTENANCE OR USE OF THE FIRE HYDRANT WILL BE LOCATED WITH IN 5 FEET OF THE FIRE HYDRANT INCLUDING BUT NOT LIMITED TO (TREES,
- FENCES, TELEPHONE POLE, DUMPSTER, PERMANENT/NONPERMANENT STRUCTURES,...ETC.). FIRE HYDRANT ASSEMBLY MUST BE PER CURRENT CITY OF SAN MARCOS STANDARD PRODUCT

#### REFERENCES DETAIL 520S-WMT-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	STANDARD FIRE I	HYDRANT
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511-17-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 2

	MATERIALS	
LABEL	ITEM	SIZE
Α	SUPPLY PIPE SCH. 80 FULLY RESTRAINED PER STANDARD PRODUCT LIST NO. WW-587	2"
В	RESTRAINT DRESSING COUPLINGS - MAXI-GRIP OR APPROVED EQUIVALENT PER STANDARD PRODUCT LIST NO. WW-587B	2"
С	BRASS NIPPLES-THREADED X THREADED	2"
D	BRONZE BALL VALVE WITH LOCK WINGS THREADED BY FLANGE PER STANDARD PRODUCT LIST NO. WW-68	2"
E	WATER METER PER STANDARD PRODUCT LIST NO. WW-144 WATER METERS	2"
F	METER FLANGE ADAPTOR	2"
G	METER BOX PER STANDARD PRODUCT LIST NO. WW-145A HDPE METER BOXES	REQUIRE

REFERENCES

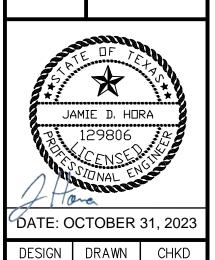
- TOP OF METER BOX SHALL BE 1" ABOVE GRADE AFTER REVEGETATION OR FLUSH WITH PAVEMENT SURFACE. METER BOX WILL BE LOCATED BEHIND BACK CURB, OUT OF SIDEWALK OR TRAFFIC LOADED AREA.
- FOR PIPES AND FITTINGS OUTSIDE THE METER BOX SHALL BE EMBEDDED AND BACKFILLED PER DETAIL 510S-S&L-SM WITHIN THE ROW OR EASEMENT.
- WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX. 4. TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 520S-WMT-SM WITH A 2" TAP TO THE
- IF THE METER BOX IS SET AFTER THE METER IS INSTALLED, SIDE NOTCHES IN THE BOX TO
- BE FILLED WITH MORTAR AFTER INSTALLATION OF PIPE.
- PIPES AND FITTINGS TO BE AS SHOWN PER DETAIL.
- FOR APPROVED METER TYPE CALL THE WATER & WASTEWATER UTILITIES DEPT. AT

AUTOMATIC FLUSH VALVE ASSEMBLY.

- NO BY PASS REQUIRED. PIPE AND METER IN METER BOX WILL MATCH THE DEPTH OF THE CONNECTION PIPE TO THE
- 10. FOR NATURAL GROUND USE 6" OF TOP SOIL AND REVEGETATE PER CITY SPECIFICATIONS.
- 11. INSTALLATION OF AUTOMATIC FLUSH VALVE ASSEMBLY TO BE INSTALLED ACCORDING TO
- THE MANUFACTURER'S SPECIFICATION/KIT. 12. AUTOMATIC FLUSH VALVE SHALL CONNECT TO THE MAIN PER DETAIL 520S-WMT-SM. TEMPORARY AUTOMATIC FLUSH VALVE FOR THE PURPOSE OF A FUTURE MAIN EXTENSION SHALL CONNECT

TO THE END OF THE MAIN USING A 8 INCH M.J. X 2 INCH THREAD DUCTILE IRON ECCENTRIC
REDUCER IN PLACE OF A TAP AS SHOWN ON DETAIL 520S-WMT-SM. FOR MAINS LARGER THAN 8 INCHES A CAP WILL BE USED IN PLACE OF A REDUCER WITH A 2 INCH THREAD CONNECTION
PORT.

	DETAIL 510S-S&L-SM DETAIL 520S-WMT-SM			
	The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	AUTOMATIC FLUS	SH VALVE
	RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511-20-SM
ı	LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	3 OF 3

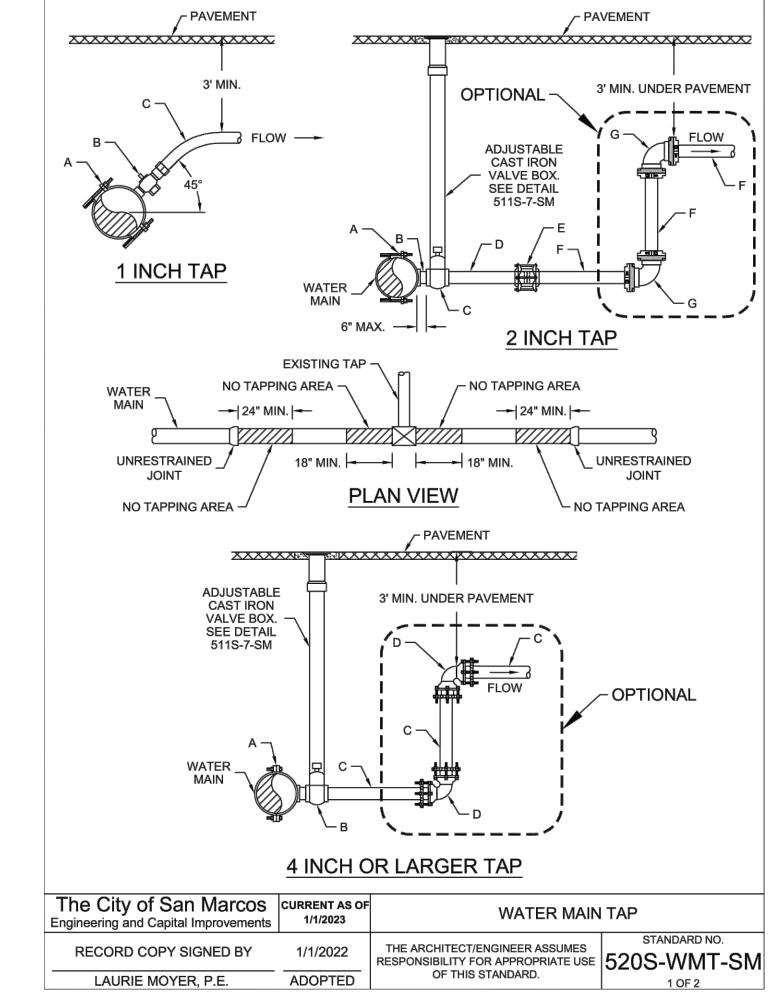


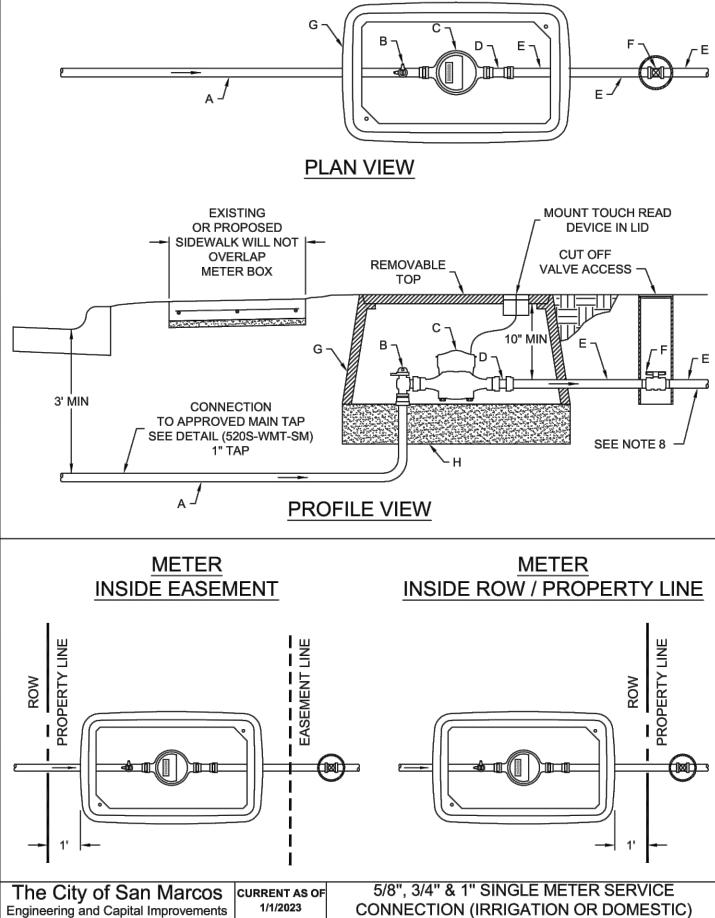
DET

PRELIMINARY NOT FOR CONSTRUCTION

2 OF 2

DC JOB No. **005956-01-113** SHEET 58 OF 60





THE ARCHITECT/ENGINEER ASSUMES

OF THIS STANDARD.

RESPONSIBILITY FOR APPROPRIATE USE

520S-11-SM

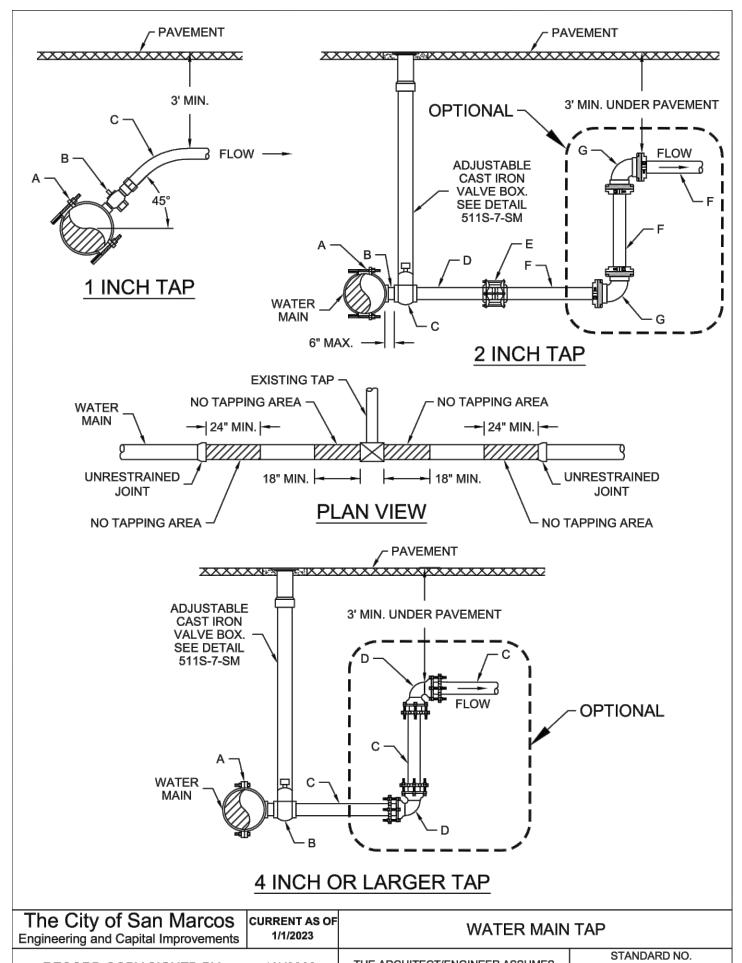
1 OF 2

1/1/2020

ADOPTED

RECORD COPY SIGNED BY

LAURIE MOYER, P.E.



LAURIE MOYER, P.E. LABEL

REFERENCES

DETAIL 510S-S&L-SM DETAIL 511S-7-SM

The City of San Marcos | CURRENT AS OF

Engineering and Capital Improvements

RECORD COPY SIGNED BY

MATERIALS METER SIZE ITEMS 5/8" 3/4" TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65 APPROVED ANGLE METER STOP WITH PADLOCK WING. (FORD TYPE Q COMPRESSION FITTING OR APPROVED 5/8" 3/4" EQUIVALENT.) PER STANDARD PRODUCT LIST NO. WW-68 WATER METER PER STANDARD PRODUCT LIST NO. WW-144 3/4" WATER METER COUPLING - CONNECTION SWIVEL NUT 5/8" | 3/4" | 1" CUSTOMER YARD PIPE - AS SPECIFIED REQUIRED CUSTOMER CUT - OFF VALVE IN VALVE BOX AND LID REQUIRED METER BOX AND LID PER STANDARD PRODUCT LIST NO. REQUIRED WW-145A HDPE METER BOXES H 6" COMPACTED SAND REQUIRED

1 INCH TAP MATERIAL LIST

\* SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM. \*\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

2 INCH TAP MATERIAL LIST

TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY FEMALE/FEMALE)

RESTRAINT DRESSING COUPLINGS - MAXI-GRIP OR APPROVED EQUIVALENT

4 INCH AND LARGER TAP MATERIAL LIST

MAIN SIZE CAN NOT BE LESS THAN OR EQUAL TO TAP. TEE PER SPL NO. WW-27B MAY BE USED WITH

ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST.

3" SERVICE AND FIRE LINES WILL USE A 4" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.

WHEN A TAP IS PROPOSED ON AN EXISTING ASBESTOS CEMENT (AC) PIPE THE CONTRACTOR WILL REPLACE THE AC PIPE SEGMENT WITH AN APPROVED PVC PIPE PER CITY STANDARD PRODUCT LIST (SPL). NEW PIPE WILL BE CONNECTED TO THE EXISTING AC PIPE WITH A WIDE RANGE COUPLING ADAPTOR PER CITY SPL.

\*A APPROVED TAPPING SADDLE PER SPL NO. WW-264/WW-256

APPROVED EQUIVALENT PER SPL NO. WW-68

A APPROVED TAPPING SADDLE PER SPL NO. WW-264

F SUPPLY PIPE SCH. 80 FULLY RESTRAINED PER SPL NO. WW-587

TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY M.J.

SUPPLY PIPE C900 PER SPL NO. WW-308A OR DUCTILE IRON

\* WHEN CONDITIONS ALLOW 45° BENDS ARE PREFERRED OVER 90° BENDS

DUCTILE IRON 90° BEND - MEGALUG RESTRAINT, OR APPROVED EQUIVALENT PER SPL NO. WW-27B AND NO.

ENGINEERING DEPARTMENT APPROVAL FOR SIZE ON SIZE CONNECTION.

6. 1.5" WILL USE A 2" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.

1/1/2022

ADOPTED

BACKFILL AND EMBEDMENT WILL BE PER CITY DETAIL 510-S&L-SM.

APPROVED EQUIVALENT PER SPL NO. WW-587B

A APPROVED TAPPING SLEEVE PER SPL NO. WW-244

X M.J.) WITH VALVE BOX DETAIL 511S-7-SM

PER SPL NO. WW-27 FULLY RESTRAINED

DUCTILE IRON 90° BEND - HARCO-KNUCKLE JOINT RESTRAINT, OR

WITH VALVE BOX DETAIL 511S-7SM D GALVANIZED NIPPLE-THREADED X THREADED

B GALVANIZED NIPPLE-THREADED

PER SPL NO. WW-587B

LABEL

CORPORATION STOP. FORD TYPE Q COMPRESSION FITTING OR

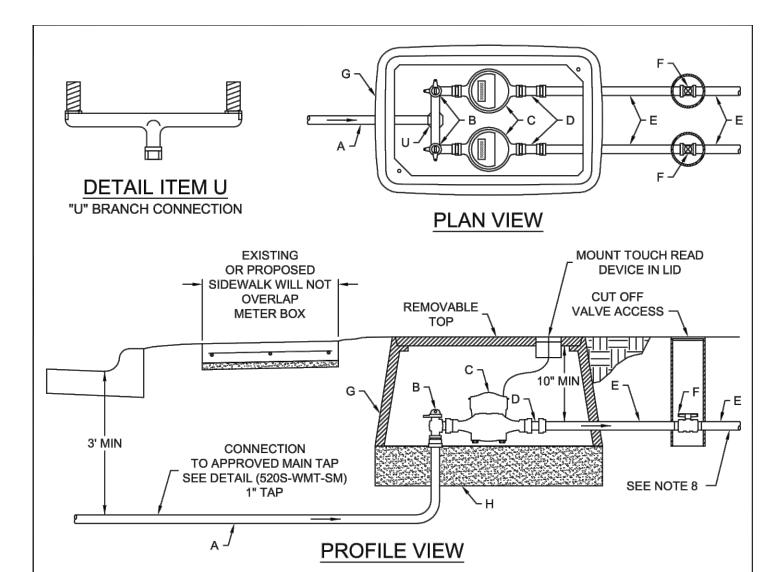
\*\*C TUBING PER SPL NO. TYPE K COPPER WW-613 OR POLYETHYLENE WW-65

\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

- 1. TOP OF METER BOX SHALL BE 1" ABOVE GRADE AFTER REVEGETATION OR FLUSH WITH PAVEMENT SURFACE. METER BOX WILL BE LOCATED BEHIND BACK CURB, OUT OF SIDEWALK OR TRAFFIC LOADED AREA. 2. FOR PIPES AND FITTINGS OUTSIDE THE METER BOX SHALL BE EMBEDDED AND BACKFILLED
- PER DETAIL 510S-S&L-SM WITHIN THE ROW OR EASEMENT.
- WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX. TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 510S-WMT-SM WITH A 1" TAP TO THE MAIN.
- CUT-OFF VALVE AND CONNECTION TO YARD PIPING TO BE SUBMITTED FOR APPROVAL.
- METERS TO BE SUPPLIED BY CONTRACTOR FOR COMMERCIAL ACCOUNTS.
- ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST.
- 8. SERVICE LINE TO APPROVED BACKFLOW PREVENTER FOR NONE SINGLE FAMILY RESIDENTIAL LOTS WHEN REQUIRED.

REFERENCES DETAIL 510S-S&L-SM DETAIL 520S-WMT-SM

The City of San Marcos gineering and Capital Improvements	CURRENT AS OF 1/1/2023	5/8", 3/4" & 1" SINGLE M CONNECTION (IRRIGATIO	
RECORD COPY SIGNED BY	RESPONSIBILITY FOR APPROPRIA	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 520S-11-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 2



**METER METER** INSIDE ROW / PROPERTY LINE INSIDE EASEMENT 5/8", & 3/4" DUEL METER SERVICE The City of San Marcos | CURRENT AS OF CONNECTIONS (IRRIGATION OR DOMESTIC) Engineering and Capital Improvements

1/1/2020

ADOPTED

RECORD COPY SIGNED BY

LAURIE MOYER, P.E.

THE ARCHITECT/ENGINEER ASSUMES

RESPONSIBILITY FOR APPROPRIATE USE

OF THIS STANDARD.

LADEL	METE	METER SIZE		
LABEL ITEMS		5/8"	3/4"	
* A	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65	1"	1"	
В	APPROVED ANGLE METER STOP WITH PADLOCK WING. (FORD TYPE Q COMPRESSION FITTING OR APPROVED EQUIVALENT.) PER STANDARD PRODUCT LIST NO. WW-68	5/8"	3/4"	
С	WATER METER PER STANDARD PRODUCT LIST NO. WW-144	5/8"	3/4"	
D	WATER METER COUPLING - CONNECTION SWIVEL NUT	5/8"	3/4"	
E	E CUSTOMER YARD PIPE - AS SPECIFIED			
F	CUSTOMER CUT - OFF VALVE IN VALVE BOX AND LID	REQL	JIRED	
G	REQUIRED			
H 6" COMPACTED SAND			REQUIRED	
U	"U" BRANCH CONNECTION (COMPRESSION - TYPE FITTING) PER STANDARD PRODUCT LIST NO. WW-68	1" x ¾"	1" x ¾"	

### NOTES:

- TOP OF METER BOX SHALL BE 1" ABOVE GRADE AFTER REVEGETATION OR FLUSH WITH PAVEMENT SURFACE. METER BOX WILL BE LOCATED BEHIND BACK CURB, OUT OF SIDEWALK OR TRAFFIC LOADED AREA.
- 2. FOR PIPES AND FITTINGS OUTSIDE THE METER BOX SHALL BE EMBEDDED AND BACKFILLED
- PER DETAIL 510S-S&L-SM WITHIN THE ROW OR EASEMENT WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX.
- TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 510S-WMT-SM WITH A 1" TAP TO THE MAIN.
- CUT-OFF VALVE AND CONNECTION TO YARD PIPING TO BE SUBMITTED FOR APPROVAL. METERS TO BE SUPPLIED BY CONTRACTOR FOR COMMERCIAL ACCOUNTS.
- ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST.
- SERVICE LINE TO APPROVED BACKFLOW PREVENTER FOR NONE SINGLE FAMILY RESIDENTIAL LOTS WHEN REQUIRED.

REFERENCES DETAIL 510S-S&L-SM DETAIL 520S-WMT-SM

STANDARD NO.

520S-9-SM

5/8", & 3/4" DUEL METER SERVICE The City of San Marcos | CURRENT AS OF CONNECTIONS (IRRIGATION OR DOMESTIC) Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY 520S-9-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. ADOPTED LAURIE MOYER, P.E.

(2 4 & X **DETAILS** Щ JAMIE D. HORA

SIZE

REQUIRED

SIZE

REQUIRED

SERVICE SIZE

4" 6" 8" 10"

8"

REQUIRED

6"

6"

WATER MAIN TAP

RESPONSIBILITY FOR APPROPRIATE USE 520S-WMT-SM

THE ARCHITECT/ENGINEER ASSUMES

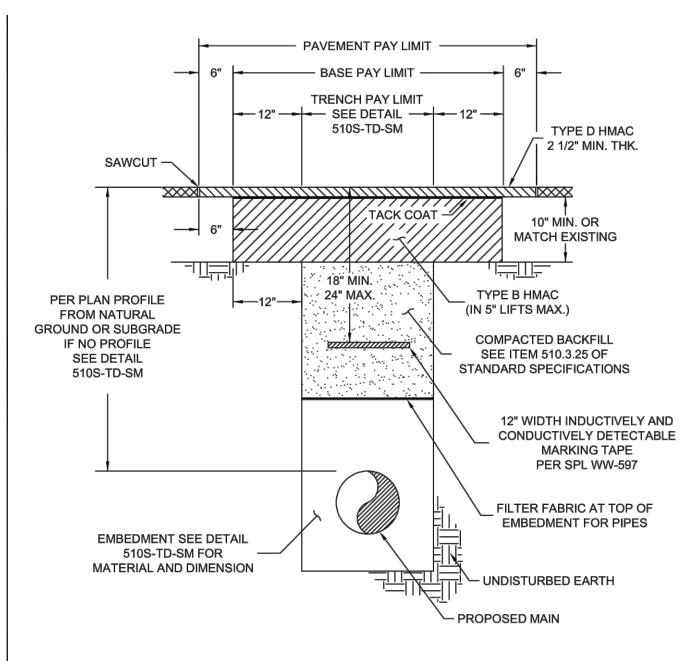
OF THIS STANDARD.

STANDARD NO.

DATE: OCTOBER 31, 2023 DESIGN DRAWN

DC

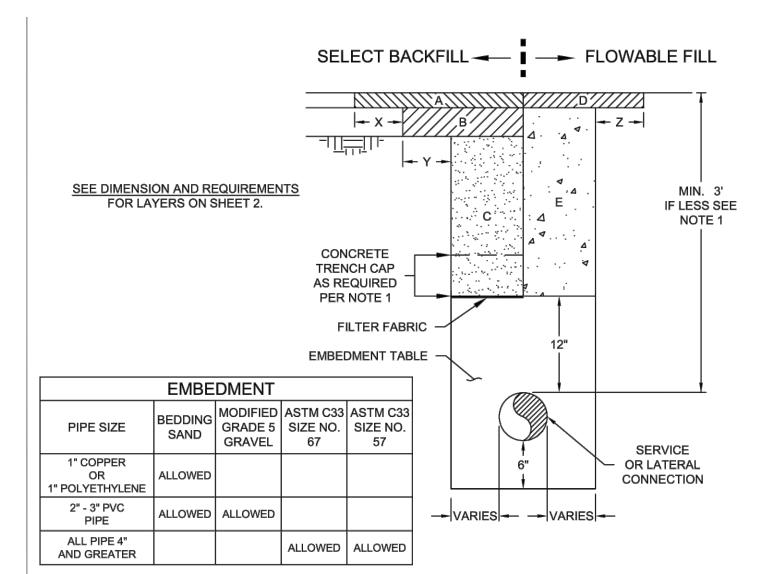
JOB No. **005956-01-113** SHEET 59 OF 60



- 1. THE EXISTING PAVED SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
- 2. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, SEE DETAIL 510S-3T-SM. 3. ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND
- 4. ROAD BASE AND SURFACE MATERIALS IN THE TRENCH CUT SHALL BE REPLACED IN KIND OF EQUAL THICKNESS, OR MINIMUM BASE THICKNESS OF 10", WHICHEVER IS GREATER.

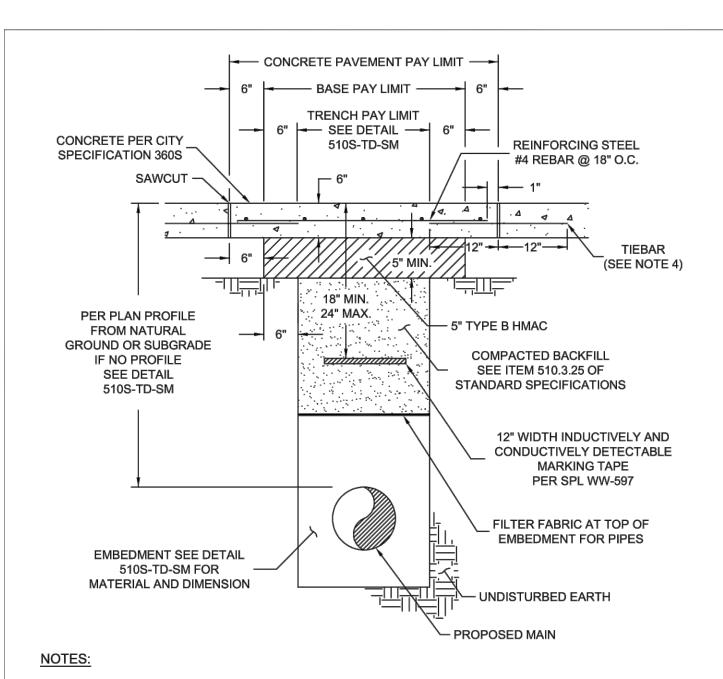
#### REFERENCES DETAIL 510S-TD-SM DETAIL 510S-3T-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TYPICAL TRENCH WITH F	PAVED SURFACE
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 510S-3-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



- WHEN DEPTH OF COVER IS LESS THAN 3' FROM EXISTING OR PROPOSED SURFACE A CONCRETE TRENCH CAP WILL BE INSTALLED WITH A MINIMUM THICKNESS OF 6" CLASS A (3000 PSI) CONCRETE PLACED ABOVE EMBEDMENT AS DEPICTED IN THIS DETAIL. THICKNESS WILL BE DETERMINED BY ENGINEER AND NOT BE LESS THAN A MINIMUM OF 6". WHEN DEPTH OF COVER IS 3' OR GREATER FROM EXISTING OR PROPOSED SURFACE A FILTER FABRIC WILL BE INSTALLED ABOVE ALL EMBEDMENT EXCEPT BEDDING SAND.
- 2. RESTORE ALL DISTURBED SURFACES ABOVE AND SURROUNDING THE TRENCH TO EXISTING CONDITION AND ELEVATION. RESTORATION WORK IS SUBSIDIARY TO SERVICE LATERAL WORK.

The City of San Marcos	CURRENT AS OF	SERVICE AND LATERAL	CONNECTION
Engineering and Capital Improvements	1/1/2023	TRENCH DE	TAIL
DECORD CORY CICKED BY	4/4/0000	THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO.
RECORD COPY SIGNED BY  LAURIE MOYER, P.E.	1/1/2020	RESPONSIBILITY FOR APPROPRIATE USE	510S-S&L-SM
	ADOPTED	OF THIS STANDARD.	1 OF 2



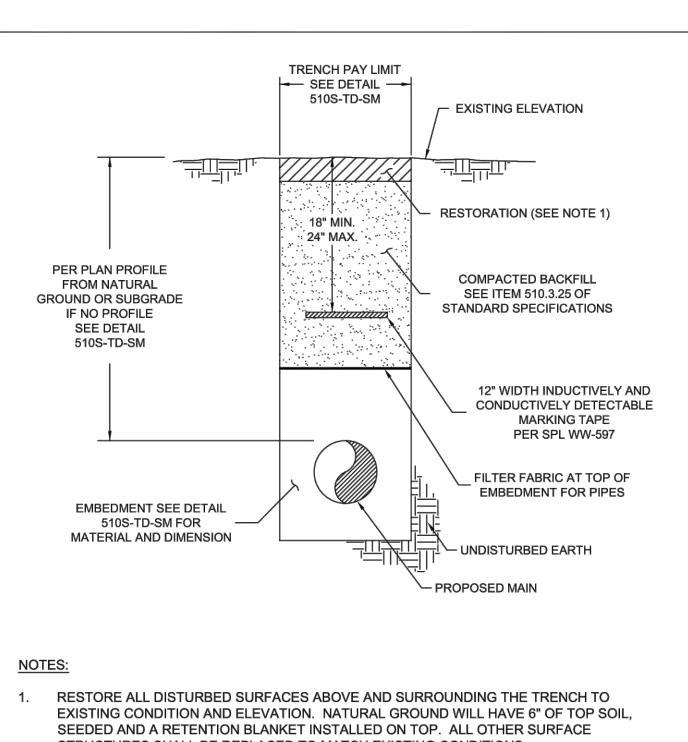
- 1. THE EXISTING PAVED SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
- IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE SEE DETAIL 510S-3T-SM. 3 ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH MINIMUM OF 6" OF BASE OR MATCH EXISTING THICKNESS, WHICHEVER IS
- 4. TIEBARS WILL BE A 24" #4 REBAR PLACED EVERY 18" MID DEPTH OF EXISTING CONCRETE ON ALL SIDES OF TRENCH OR PER INSPECTORS RECOMMENDATION.

#### REFERENCES DETAIL 510S-TD-SM DETAIL 510S-3T-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TYPICAL TRENCH WITH CON	ICRETE PAVEMENT
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 510S-3C-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1

	SELECT BACKFILL						
		CONCRETE PAVEMENT X = 6", Y = 6"	OUT OF PAVEMENT X = 0 , Y = 0				
A (SEE NOTE 1)	TYPE D HMAC MATCH EXISTING ASPHALT THICKNESS 2.5" MIN.	3,600 PSI CONCRETE MATCH EXISTING THICKNESS 6" MIN. WITH #4 REBAR 18"O.C. BOTH WAYS. 24" TIE BAR 18 O.C. 12" INTO EXISTING PAVEMENT.	NATURAL GROUND WILL HAVE 6" OF TOP SOIL, SEEDED AND A RETENTION BLANKET INSTALLED ON TOP. ALL OTHER SURFACE STRUCTURES SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.				
В	TYPE B HMAC MATCH EXISTING BASE THICKNESS 10" MIN.	TYPE B HMAC MATCH EXISTING BASE THICKNESS 5" MIN.	IN AND NEAR FLOOD PLAIN OF ALL STREAMS AND WATERCOURSES, UNDER OR ADJACENT TO UTILITIES, STRUCTURES, TWO FEET FROM PAVEMENT ETC. SELECT BACKFILL WILL BE COMPACTED TO NO LESS THAN 95% NOR MORE THAN 102% OF THE DENSITY ACCORDING TO TEX. 114E AT A MOISTURE CONTENT OF -2% TO +3% OF OPTIMUM, UNLESS OTHERWISE DIRECTED BY CITY. ALL OTHER LOCATIONS WILL BE COMPACTED TO 90% OF MAX DENSITY.				
С	LESS THAN 95% DENSITY ACC	LL WILL BE COMPACTED TO NO NOR MORE THAN 102% OF THE CORDING TO TEX. 114E AT A ENT OF -2% TO +3% OF OPTIMUM.					
		FLOWABLE F	ILL				
	ASPHALT PAVEMENT Z = 6"  CONCRETE PAVEMENT Z = 6"		OUT OF PAVEMENT Z = 0				
D (SEE NOTE 1)	(SEE ASPHALT WITH #4 REBAR 18"O.C. BOTH		NATURAL GROUND WILL HAVE 6" OF TOP SOIL, SEEDED AND A RETENTION BLANKET INSTALLED ON TOP. ALL OTHER SURFACE STRUCTURES SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.				
E		FLOWABLE FILL PER CITY	402S SPECIFICATION.				

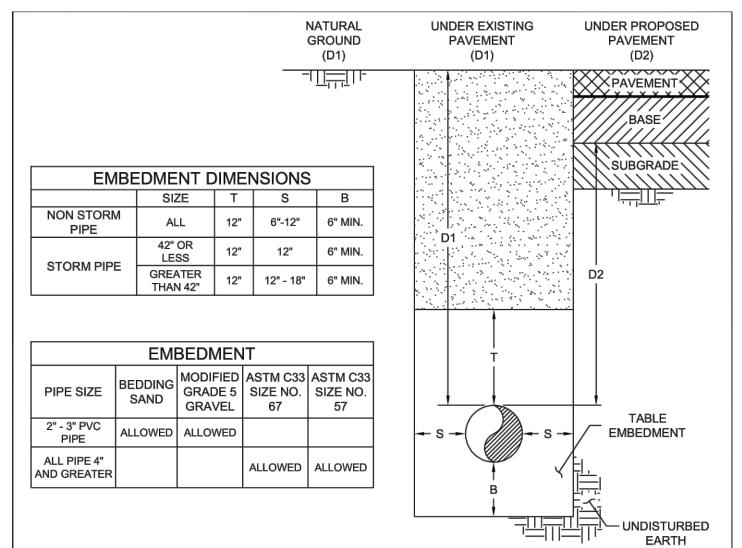
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	F SERVICE AND LATERAL CONNECTION TRENCH DETAIL	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-S&L-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



STRUCTURES SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.

#### REFERENCES DETAIL 510S-TD-SM

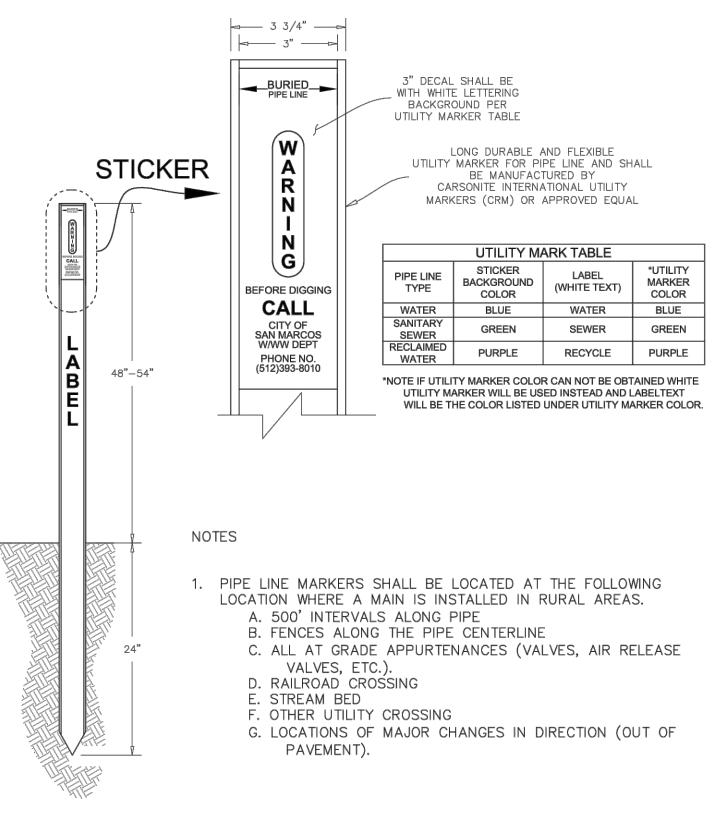
The City of San Marcos Engineering and Capital Improvements			IRAL GROUND
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 510S-5-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



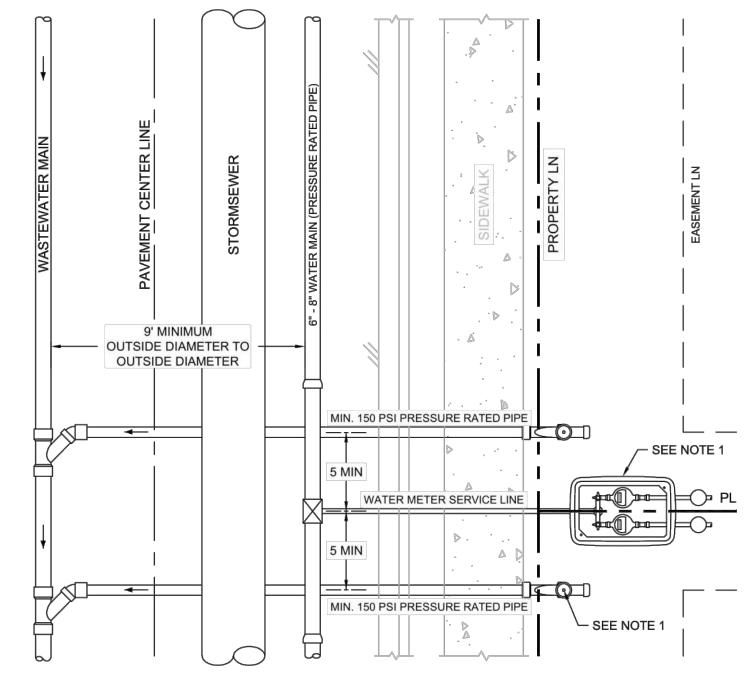
MINIMUM DEPTH OF COVER						
PIPE TYPE	SIZE	(D1) UNDER PAVEMENT	(D1) NATURAL GROUND	(D1) LESS THAN 3' OF COVER	(D2 - NOTE 2) UNDER PROPOSED ROAD	
WATER	12" OR LESS	48" MIN.	36" MIN.	24" MIN. AND USE CONCRETE FLOWABLE FILL DETAIL	36" BELOW BASE	
WATER	16" OR GREATER	48" MIN.	48" MIN.	NOT ALLOWED	48" BELOW BASE	
WASTEWATER	ALL	60" MIN.	36" MIN.	DUCTILE IRON WILL BE USED. FLOWABLE FILL DETAIL WHERE EROSION MAY OCCUR	48" MIN. BELOW BASE	
RECLAIMED WATER	ALL	48" MIN.	36" MIN.	24" MIN. AND USE CONCRETE FLOWABLE FILL DETAIL	36" MIN. BELOW BASE	
STORM	ALL	MANUFACTURER'S SPECIFICATION MINIMUM AND MAXIMUM DEPTH OF COVER WILL USED FOR STORM PIPES				

- 1. ALL MEASUREMENTS ARE FROM OUTSIDE PIPE DIAMETER.
- 2. FOR TABLE "MINIMUM DEPTH OF COVER" COLUMN "UNDER PROPOSED ROAD" IF D1 FROM COLUMN "UNDER PAVEMENT" PLACES THE PIPE LOWER THAN D2. THEN D1 FROM "UNDER PAVEMENT" WILL BE
- USED FOR MINIMUM DEPTH OF COVER. REFERENCE APPROPRIATE 510 PIPE TRENCH DETAILS FOR PAYMENT LIMITS. THIS DETAIL IS FOR

DIMENSIONAL PURPOSES ONLY	Υ.		
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	UTILITY TRENCH DI	MENSIONS
RECORD COPY SIGNED BY	1/23/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-TD-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



The City of S Engineering and Ca			PIPE LINE MARKER		
RECORDED COPY	SIGNED BY	7-10-2015	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE HOSE OF THIS STANDARD	510S-M-SM	
	INE	ATED PIPE)			



## MINIMUM SEPARATION REQUIREMENT OF SERVICES

FOR WATER METER AND WASTEWATER CLEANOUT SEE STANDARD DETAILS 520S-1-SM & 520S-9-SM. 2. THE DETAIL ABOVE SHOWS MINIMUM SEPARATION REQUIREMENTS FOR A TYPICAL SUBDIVISION.

REFERENCES DETAIL 520S-9-SM DETAIL 520S-1-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WATER SERVICE & WASTE CONNECTION AT SAI	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 520-AW-01A-S
I WISIE WAYES SE	ABABTER	OF THIS STANDARD.	I

DETAIL ENERAL JAMIE D. HORA DATE: OCTOBER 31, 2023

OF 60 PRELIMINARY NOT FOR CONSTRUCTION

DESIGN | DRAWN |

DC

JOB No. **005956-01-113** SHEET

### PROJECT ADDRESS:

THIS PROJECT IS LOCATED SOUTH OF CENTERPOINT ROAD AND CENTRAL PARK LOOP IN SAN MARCOS, HAYS

#### FLOODPLAIN:

THIS PROPERTY DOES NOT FALL WITHIN THE 100 YEAR FLOODPLAIN AS SHOWN ON THE HAYS COUNTY FEMA FIRM MAPS 48209C0369F EFFECTIVE AS OF SEPTEMBER 2, 2005.

#### AQUIFER NOTE:

THIS PROJECT IS IN THE EDWARDS AQUIFER RECHARGE ZONE.

#### TCEQ WPAP AND SCS APPROVAL:

THIS SITE CURRENTLY HAS WPAP & SCS SUBMITTALS PENDING REVIEW BY TCEQ.

#### **GENERAL NOTES:**

- 1. CONTRACTOR SHALL CALL (512) 353-7728 FOR ALL CITY OF SAN MARCOS INSPECTIONS.
- 2. RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN ACCEPTING THESE PLANS, THE CITY OF SAN MARCOS MUST RELY UPON THE ADEQUACY OF
- 3. THIS PROJECT IS SUBJECT TO TCEQ'S TPDES SWPPP REGULATIONS PER TEXAS WATER CODE CHAPTER 26. IF NOT ALREADY DONE, HAVE A TX PE, CPESC, OR QPSWPPP DEVELOP/AMEND A PROJECT-SPECIFIC SWPPP AND SEEK APPLICABLE TPDES PERMIT TXR150000 COVERAGE IMMEDIATELY PER TXR150000 PARTS I-III AND CITY CODE SECTION 86.529(B)(2) OR 86.529(C)(3). A HARD-COPY OF THE SWPPP, INCLUDING FULL-SIZE SITE MAP, MUST BE AVAILABLE AT THE PRE-CON MEETING, KEPT ONSITE, AND UPDATED TO MATCH SITE CONDITIONS DURING THE PROJECT.
- 4. ALL CONSTRUCTION SHOULD COMPLY WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
- 5. ALL CONSTRUCTION SHOULD COMPLY WITH CITY OF SAN MARCOS CONSTRUCTION DETAILS AND CONSTRUCTION NOTES FOR MATERIAL AND INSTALLATION GUIDELINES.
- 6. THIS PROJECT IS SUBJECT TO TPDES REGULATIONS.
- 7. CONTRACTOR SHALL CEASE CONSTRUCTION AND NOTIFY THE CITY OF SAN MARCOS, TEXAS SHPO, AND STATE ARCHAEOLOGIST IF IN SITU CULTURAL DEPOSITS ARE ENCOUNTERED.

#### WATER QUALITY POND

UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION AND/OR WATER QUALITY STRUCTURAL CONTROL(S), AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS. ANY SUCH STRUCTURAL CONTROL(S) BUILT WITHIN THE CITY OF SAN MARCOS MUST MAINTAIN COMPLIANCE WITH THE CITY'S MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) AND APPLICABLE MS4 ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY, A CITY EASEMENT MUST BE SHOWN AROUND ALL STRUCTURAL CONTROLS INCLUDING A MAINTENANCE COVENANT WITHIN THE CITY LIMITS.

#### **BENCHMARKS**:

ELEVATION = 839.48'

MAGNAIL W/ WASHER SET IN ROCK OUTCROP GRID NORTHING = 13875703.74, GRID EASTING = 2287016.42'

BM 005956-98 80D NAIL SET GRID NORTHING = 13869237.76', GRID EASTING = 2283165.61' **ELEVATION = 835.23'** 

BM 005956-99 1/2" IRON ROD WITH CAP STAMPED (BCG) SET GRID NORTHING = 13876234.17', GRID EASTING = 2290012.80'

SUBMITTED FOR APPROVAL BY:



11/13/2023 DATE

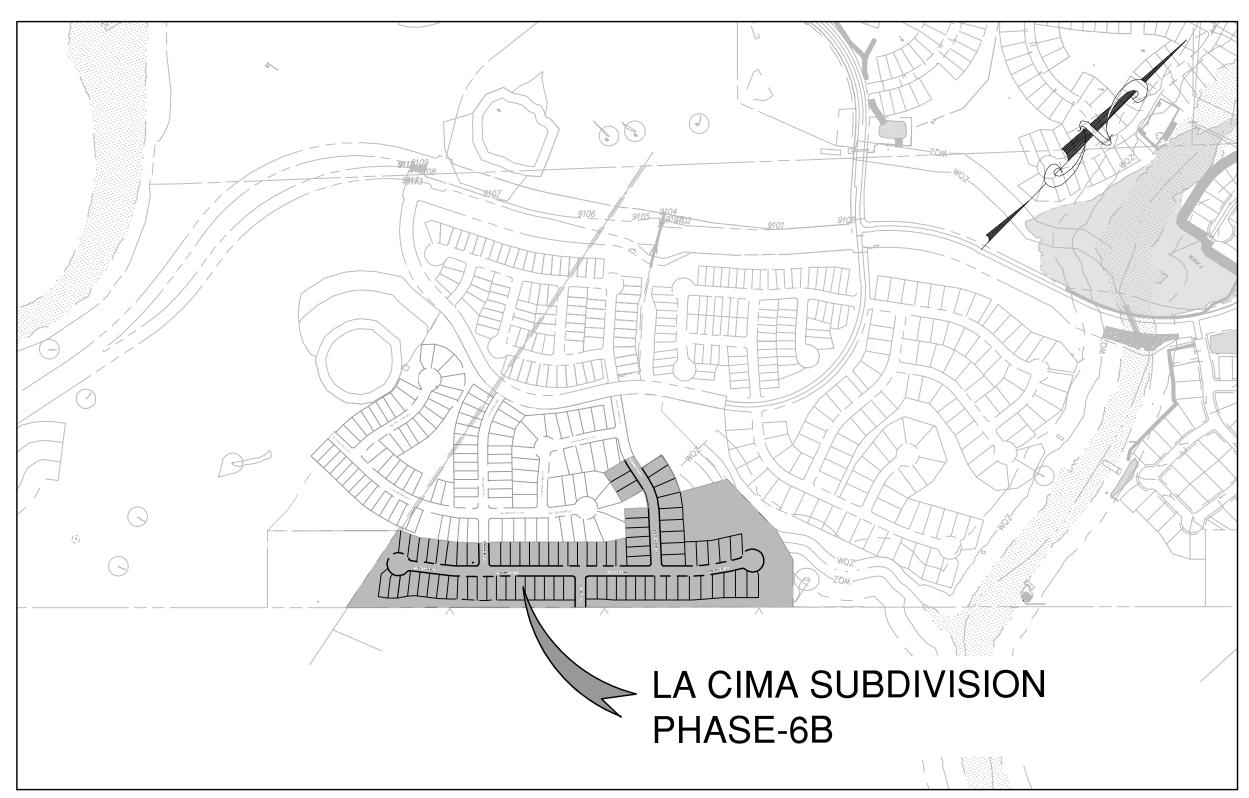
JAMIE D. HORA, P.E. (#129806)

### REVISIONS / CORRECTIONS

NUMBER	DESCRIPTION	REVISE (R) ADD (A) VOID (V) SHEET NO.'S	TOTAL # SHEETS IN PLAN SET	NET CHANGE IMPERVIOUS COVER (SQ. FT.)	TOTAL IMPERVIOUS COVER (SQ. FT.)/%	CITY OF SAN MARCOS APPROVAL DATE	DATE IMAGED

# LA CIMA PHASE 6B

SAN MARCOS, HAYS COUNTY, TEXAS PERMIT NO. 2023-XXXXX WPP-PH2 PERMIT NO. XXXXXXX



LOCATION MAP N.T.S.

OWNER: LCSM PH4, LLC. 303 Colorado Street, Suite 2300 Austin, Texas 78701 [Tel] 512-457-8000

### **ENGINEER:**

## BOWMAN

151 Stagecoach Trail, Suite 130 San Marcos, Texas 78666 [Tel] 512.327.1180 [Fax] 512.327.4062

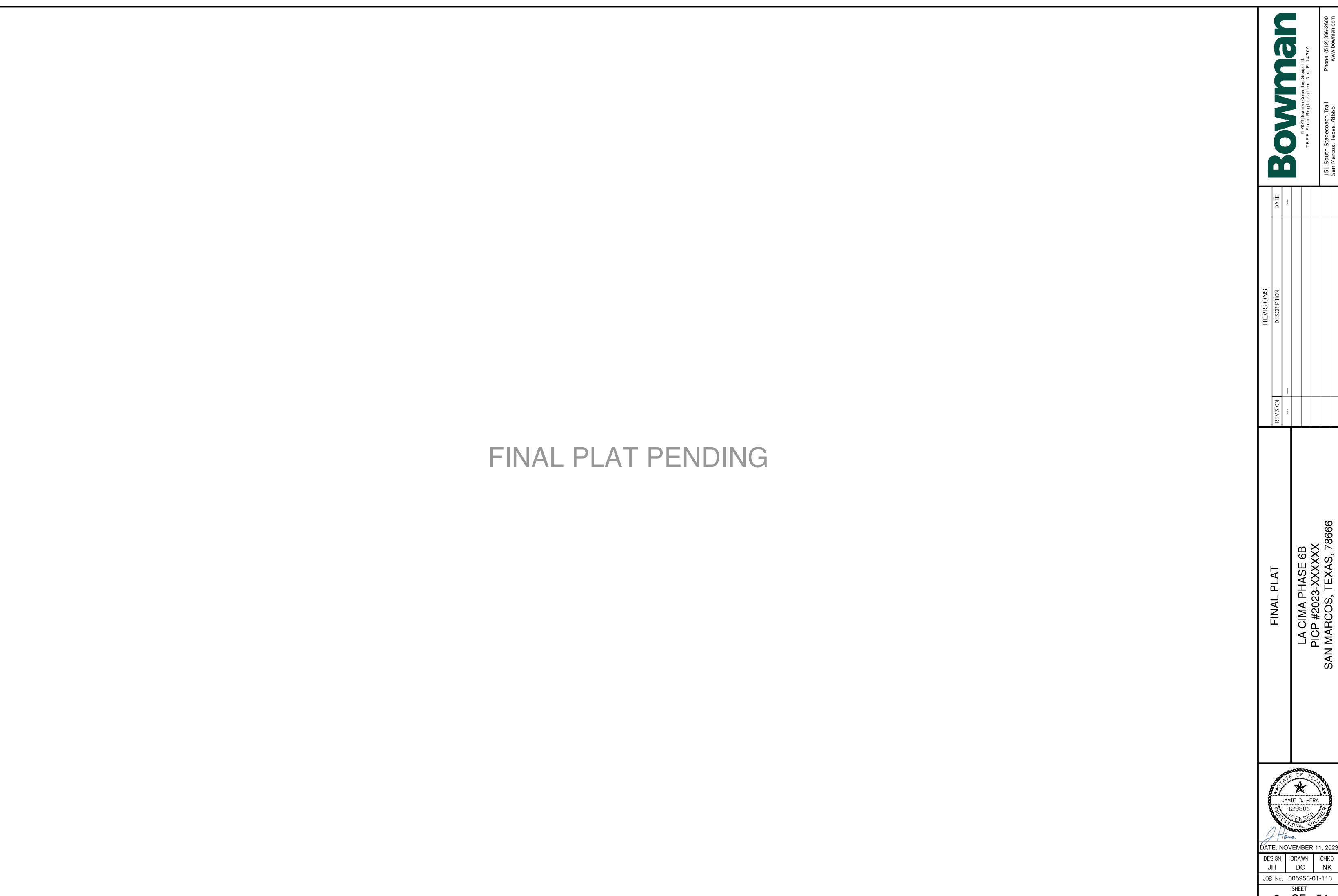
SURVEYOR:

DOUCET 7401 B. HIGHWAY 71 W. Suite 160 Austin, Texas 78735 [Tel] 512.583.2600 www.doucetengineers.com



	Sheet List Table
Sheet Number	Sheet Title
1	COVER SHEET
2	FINAL PLAT
3	GENERAL NOTES (1 OF 2)
4	GENERAL NOTES (2 OF 2)
5	SWPPP
6	TREE LIST
7	EXISTING CONDITIONS & DEMOLITION PLAN
8	PROPOSED CONDITIONS PLAN
9	EROSION & SEDIMENTATION CONTROL PLAN (1 OF 2)
10	EROSION & SEDIMENTATION CONTROL PLAN (2 OF 2)
11	GRADING PLAN (2 OF 2)
12	GRADING PLAN (2 OF 2)
13	PLAN & PROFILE - BASKET GRASS DRIVE
14	PLAN & PROFILE - PENSTEMON VIEW
15	PLAN & PROFILE - CRABAPPLE COURT (1 OF 3) PLAN & PROFILE - CRABAPPLE COURT (2 OF 3)
16	PLAN & PROFILE - CRABAPPLE COURT (2 OF 3)  PLAN & PROFILE - CRABAPPLE COURT (3 OF 3)
17	INTERSECTION PLAN
18 19	SIGNAGE & STRIPING PLAN
20	PHOTOMETRIC PLAN
21	WATER QUALITY POND 4
22	VFS DETAIL & BMP CALCULATIONS 1 0F 2
23	BMP CALCULATIONS 2 OF 2
24	WATER QUALITY POND DETAILS 1 OF 2
25	WATER QUALITY POND DETAILS 2 OF 2
26	INLET DRAINAGE AREA MAP
27	OVERALL STORM DRAIN PLAN
28	DRAINAGE CALLCULATIONS
29	STORM DRAIN F AND LATERALS F
30	STORM DRAIN F AND LATERALS F
31	STORM DRAIN G LATERALS G AND H LATERAL H
32	STORM DRAIN F AND LATERALS F
33	WASTEWATER PLAN
34	WASTEWATER LN A PLAN & PROFILE (1 OF 3)
35	WASTEWATER LN A PLAN & PROFILE (2 OF 3)
36	WASTEWATER LN A PLAN & PROFILE (3 OF 3)
37	WASTEWATER LN B PLAN & PROFILE
38	WATER LINE PLAN
39	EROSION AND SEDIMENT CONTROL DETAILS
40	ROADWAY CROSS SECTION
41	STREET LIGHT DETAILS
42	STREET DETAILS (1 OF 3)
43	STREET DETAILS (2 OF 3)
44	STREET DETAILS (3 OF 3)
45	TRAFFIC CONTROL DETAILS (1 OF 2)
46	TRAFFIC CONTROL DETAILS (2 OF 2)
47	STORM DRAIN DETIALS (1 OF 3)
48	STORM DRAIN DETIALS (2 OF 3)
49	STORM DRAIN DETIALS (3 OF 3)
50	WASTEWATER DETAILS (1 OF 2)
51	WASTEWATER DETAILS (2 OF 2)
52	WATER LINE DETAILS (1 OF 2)
53	WATER LINE DETAILS (2 OF 2)

**GENERAL UTILITY DETAILS** 



2 OF 54

#### **CITY OF SAN MARCOS DEVELOPMENT SERVICES CONSTRUCTION REQUIREMENTS AND NOTES**

Revised Date: 01-01-2022 The following City of San Marcos (COSM) requirements supersede. as a minimum requirement, any and all non "redline" comments, specifications, or details listed on the plan.

#### Plan Review and Revisions

1. The owner, contractor and representatives are responsible for complying with the most current local, state and federal laws, rules and ordinances.

- 2. The COSM review does not authorize any violations of details. specification, standard products ordinances or laws of the COSM. No code violations listed, drawn, or described in this plan, and/or otherwise installed, manufactured or built, are "approved" by the
- 3. A copy of COSM approved plans and any approved revisions bearing a review seal from the COSM must be available on-site at all
- 4. During construction, plan changes or revisions must be uploaded into MyPermitNow for staff review prior to the changes being made. Final Certificate of Occupancy or Certificate of Acceptance will NOT be issued until all changes have been documented and approved.
- COSM adopted codes with local amendments:
  - International Building Code -2015 International Energy Code - 2009/2015 International Plumbing Code-2015 National Electric Code -2014 International Mechanical Code-2015 International Fire Code -2015 International Fuel Gas Code-2015 San Marcos Land Development Code (as amended) Smart Code (as amended) Code SMTX (as amended)
- International Swimming Pool and Spa Code-2015

**Accessory-Permits and Activities** 

## Neither the review of these plans, nor the issuance of a Building or

International Property Maintenance Code-2015

- Site Plan Permit, authorizes accessory permits. The owner is responsible for completing the following accessory permits or activities: (verify with the department or division listed below, even if depicted within this plan by the design professional):
  - Addressing (Permit Center) - Assignment of Building Numbers (Permit Center)
  - Controlled Access Gates (Fire Prevention ) - Any Fire Protection System [fire alarm, sprinkler, hood
- system] (Fire Prevention) - Any Storage Tanks (Fire Prevention)
- High Piled Combustible Stock (Fire Prevention) - Any Sign and/or Sign Standard (Permit Center)
- Irrigation (Permit Center) - Fence (Permit Center)
- On-Site Sewage Facilities (OSSF's) (Code Compliance)
- Commercial Swimming pools, spa, & Public Interactive Water Feature (PIWF's) (Permit Center/Code Compliance)
- Backflow Prevention Devices (Water Department)
- Street Closure/Traffic Control Plans (Public - Services-Transportation Division)
- Right of Way "ROW" (Public Services-Transportation Division) EPA or TCEQ permits (State/Permit Center) - Floodplain Permit (Permit Center)
- Any portion of work, including, but not limited to, traffic control, which lies in Texas Department of Transportation (TxDOT), Union Pacific Railroad (UPRR) or County property or right of way, shall be permitted and approved by that authority. All required permits shall be secured by the owner or contractor from COSM and any other appropriate authority. A copy of all permit must be on site and available to City Inspector on request.
- 3. Contractor shall notify the Engineering Department (512-393-8130) and setup a consultation with Engineering Inspector at least 2 weeks before connection with the City water/wastewater system.
- 4. Contractor shall submit a road closure permit application and setup a consultation with Engineering Inspector Engineering Department (512-393-8130) at least 2 weeks before any lane or road closure.

### General Construction Notes

- 1. Pre-Construction Meeting Site and/or Building contractor(s) is/are responsible for scheduling a pre-construction meeting with COSM inspector(s) by contacting the Permit Center (512-805-2630) prior to any site work, including demolition. For Public Improvement Construction Projects (PICP's) contact the Engineering Department at (512-393-8130) at capital\_imp\_info@sanmarcostx.gov.
- 2. Site Requirements The general contractor, owner, and subcontractors are responsible for maintaining a safe and clean work
- 3. Any reference in this section to water, wastewater, electric or other public utility is meant to refer to the utility of certification or Authority Having Jurisdiction.
- 4. Pre-Construction Video A video in Windows media format or equivalent of the complete site conditions for all Public Improvement Construction Projects (and as requested for Site Plan Projects) is
- 5. <u>Inspections</u> Inspections can be scheduled with the respective divisions by contacting them at:

required <u>prior</u> to construction. Provide a copy to the COSM upon

- Building Inspections Fire Prevention/Inspections Site Final Inspections Engineering Inspections PICP Inspections Code Compliance
  - www.mypermitnow.org www.mypermitnow.org sitefinal@sanmarcostx.gov 512-393-8130 512-393-8130 512-393-8440 (Food, Pool permits, etc...)
- 6. Trash Approved trash containment must be provided for each lot under construction. Commercial solid waste haulers servicing construction sites must hold a permit from the Community Enhancement Initiatives Manager and are subject to commercial solid waste hauler fees.
- 7.  $\underline{\text{Open Burning}}$  Burning is prohibited in the COSM limits.
- 8. Blasting Blasting is prohibited in the COSM limits.

- Construction Noise-Construction noise, declared a nuisance under COSM ordinance, is not permitted between 9:00 p.m. and 7:00 a.m.
- 10. Weekend and Holiday work Weekend and Holiday work is not allowed within a public right- of- way without prior approval.
- 11. Facilities Maintained portable bathroom facilities must be provided with a minimum of one bathroom unit per one and two family residential lots. All construction sites are required to provide one bathroom unit per ten construction persons on the job.
- 12. Access Temporary access driveways on the job site (aka stabilized construction entrances/exits) must comply with the current City detail, including curb protection. No mud, rock, or debris permitted on any off site roadway. The general contractor and/or owner are responsible for immediately removing any debris on roadways caused by construction.
- 13. Combustible Construction -An all-weather surfaced roadway and working fire hydrant(s) are required to be installed on property prior to the construction of combustible material. Road base alone is not
- 14. Safety The general contractor, subcontractors and the owner are responsible for maintaining a safe construction operation at all times. All federal OSHA and state details, as well as local codes, shall be adhered to during the construction phase.
- 15. Address The site, separate buildings, electrical disconnects, and/or temporary construction trailers must have an address visible from the street or roadway.
- 16. Required Postings All COSM and State permits must be posted facing the street or roadway (where practical). Permanent marker is not an approved marking device.
- 17. Form Survey Requirements- Prior to requesting a foundation inspection by the Building Inspector, a Form Survey must be completed by a State Registered Land Surveyor validating building location to COSM setback requirements.
- 18. Floodplain Elevation Certificates Where and when required, a "Building Under Construction" Elevation Certificate must be completed by a State Registered Land Surveyor (or State Registered Engineer or Architect) on FEMA form expiring Nov 2018 and submitted to the Permit Center at least 36 hours prior to foundation pouring to allow time for review and acceptance. A Land Surveyor's "Finished Construction" Elevation Certificate must also be submitted to and accepted by the Floodplain Administrator before Temporary "Certificate of Occupancy" will be issued.
- 19. If any geologic or manmade environmental feature is discovered during construction, notify Texas Commission on Environmental Quality (TCEQ) and the COSM Development Services within 24 hours or as soon as practicable. The contractor is required to provide compliance documentation as applicable.
- 20. EPA/TCEQ Any required EPA or TCEQ permit(s) is/are separate permit(s) and the responsibility of the contractor. Provide a copy of such permit(s) to the Permit Center.
- Abandoned wells must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter 76. A plugging report must be submitted (by a licensed water well driller) to the TDLR Water Well Drillers Program, Austin Texas. If a well is intended for use, it must comply with 16 TAC.
- 22. Any tree 9" in diameter or larger at 4.5' above natural grade is considered "regulated". Please refer to the LDC and technical manuals for tree survey, preservation and mitigation requirements. Also refer to the Design & Construction Guide for the tables and tree protection standard details as noted in #25.
- 23. All product submittals for Public Improvements Construction Proiects shall be submitted to the COSM (after approval by the Design Engineer) in PDF format and approved by the COSM prior to construction.
- 24. Prior to COSM acceptance of the project, all graded and disturbed areas are to be at least 70% re-vegetated with no large bare areas (greater than 3' diameter) in accordance with COSM and project specifications.
- 25. On the COSM's Design & Construction Guide webpage, located under Engineering & Capital Improvements, the following documents can be found: These Development Construction Requirements and Notes, Detail Design Criteria, Specifications and Details, Standard Product List, Modification to Austin/TxDOT Standard Specifications, Tree Preservation and Mitigation Tables, Landscape Calculation Table, Parking Table.
- 26. TX 811(811) must be used to locate all existing utilities for the contractor. Once locates are provided, it is the contractor's responsibility to retain these locations. Repeat locates within 14 days will be charged to the contractor.
- 27. Appropriate erosion controls and tree protection measures shall be in place prior to any site disturbance.
- 28. Fire extinguisher is required on all construction sites. Minimum of one per site, per floor at each stairwell or each storage shed. 2A1OBC minimum size (51bs).
- 29. Standpipe system required for any construction over 30 feet in height. Required to maintained within one floor of top construction floor. Approved lighted stairway access required.
- 30. Construction site required to be kept clean, travel paths clear and stored combustible pile spread out.
- 31. Fire watches are required to be approved prior to implementing (does not apply for hot work). (Fire Prevention at 512-393-8480)
- 32. Hot work permit(s) required as per Chapter 38 of Fire Code.
- 33. If building is designed with an automatic sprinkler system, the system must be installed, inspected and operational before occupying building (includes furniture and staff).
- 34. All work in the right-of-way or COSM easement will be constructed and restored in accordance to current COSM details and specifications.

### Public Rights-of-Way

- 1. Where there is a conflict between the drawings and the COSM specifications and details, the more stringent shall apply. In no case is a contractor or owner authorized to construct, build or develop in contrast with adopted COSM codes, standards or details.
- Location of existing lines is approximate. The contractor shall verify the location and elevation of utilities prior to beginning construction. Conflicts with the proposed work should be brought to

- the attention of the Engineer of Record and the project inspector immediately. It shall be the contractor's responsibility to repair any damages made as a result of construction at the contractor's expense.
- 3. The contractor shall not attempt to determine locations by scaling from plans. While every attempt has been made to prepare these plans to scale, the Engineer of record should be consulted if clarifications are needed.
- 4. Emergency Telephone Numbers (numbers may change contractor should verify numbers)
- Tx 811 (formerly DigTess) Police - Fire - EMS TX DOT 512-353-1061 512-754-5223 Century Telephone 1-800-464-7928 Southwestern Bell Gas Company 1-800-427-7142 855-578-5500 Spectrum 800-218-5725 Grande 512-245-2108 and/or 245-2508 University 888-554-4732 Pedernales Electric 800-949-4414 Bluebonnet Electric

SM Electric Utilities

SM Water/WW Utilities

5. The contractor is responsible for acquiring any temporary construction easements for the project. Documentation shall be provided to the Permit Center.

512-393-8313

512-393-8010

- 6. The contractor shall be responsible for relocating any COSM water and wastewater utility lines and service taps where required. The contractor shall be responsible for relocating any COSM traffic facilities where required at the contractor's expense.
- 7. Contractor shall keep driveways open and accessible during construction. Underground utilities crossing commercial driveways shall be installed such that a minimum 10' traffic lane is kept open at all times. Spoilage material shall not be mounded more than 18" high adjacent to a driveway or intersection.
- 8. No construction operation relative to installation of utilities, including stockpiling of excavated materials, shall be permitted within the limits of existing pavements carrying traffic on state highways or COSM roads and streets unless specifically authorized in writing by the respective Authority Having Jurisdiction.
- The contractor shall develop and submit a traffic control plan, which will show both daytime and nighttime operations during various phases of construction. The plan must be submitted to mypermitnow.org for review at least 14 days before construction begins. The plan must be approved before construction begins. The contractor shall designate a person who will be accessible on a 24hour basis and responsible for the maintenance of the traffic control devices. This 24-hour contact number must be posted visible to the street on the job site and provided to the Public Services-Transportation Division. The contractor is responsible for furnishing the traffic control devices described in the plan and all costs associated with installation, maintenance and removal.
- Any damage caused to any existing COSM water/wastewater, or storm sewer infrastructure will be repaired by the contractor to the satisfaction of the COSM at the contractor's expense prior to the Certificate of Occupancy or Certificate of Acceptance being issued.
- 11. When work is performed on private property or easements, all lawn grass, shrubbery, flowers, site utilities (including irrigation systems), trees and fences in the way of the work shall be removed. protected and replaced to their original condition and position upon completion of the work. All property monuments disturbed during construction shall be restored by a Registered Professional Land Surveyor at the contractor's expense.
- 12. The contractor must provide a Proof of Destination and truck route documents for trucks used to deliver or remove material or spoils from the job site upon request by inspectors.
- 13. All valves, manholes, SMEU electrical facilities and other appurtenances must remain accessible to COSM crews AT ALL TIMES during construction. These appurtenances shall also be raised to final grade, if within the project limits.
- 14. All assets constructed within the COSM's right-of-way must be submitted to the COSM with GPS coordinates at the end of each project. Coordinates will be submitted for all assets (including directional changes, valves, manholes, format, on the NAO 1983 State Plane Texas South Central FIPS 4204 Feet Coordinate System. All coordinates will be submitted in grid units. The required file type for coordinate data submission is \*txt format.
- 15. The right-of-way will be kept clean at all times. Daily and sometimes more frequent sweeping may be required. A citation will be issued if the right-of-way is not kept clean. Do NOT wash, sweep or otherwise cause construction soil or debris to be deposited into any storm water drainage or conveyance system.
- 16. The Owner shall coordinate temporary relocation of mailboxes with the San Marcos Postmaster. Final location shall be in accordance with the local post office requirements.
- 17. All permanent pavement markings should be Type I and Type II per COSM specifications and details.
- 18. Any traffic changes, including signs, signals and/or pavement markings shall be the responsibility of the contractor.
- 19. All Material Testing shall follow the schedule below:

CITY OF SAN MARCOS TESTING SCHEDULE		
Description:	*Rate:	
Soils:		
Standard Proctor - Trench Backfill	Per Material Source	
Standard Proctor - Raw Subgrade	Per Material Source or Street	
Densities - Trench Backfill**	Per 200 LF Pipe per lift	
Densities - Cement Stabilizer	Per 200 LF Pipe	
Backfill Densities - Raw	Per 100 LF Street per lift	
Subgrade** Densities - Driveways	Per 5 Driveways	
Base:		
Sieve Analysis	Per 300 LF Street	
Atterbergs Limits	Per 300 LF Street	
Modified Proctor	Per Material Change	
Densities of Compacted Base**	Per 300 LF Street per lift	
Wet Ball Mill Test	Per Material Source	
Triaxial Test	Per Material Source	
Hot-Mix Asphalt Concrete (HMAC):		
Extraction, Sieve Analysis	Per 500 Tons or Day	
Lab Density & Stability	Per 500 Tons or Day	

Per 500 Tons or Day

Per 300 LF Street

Per 300 LF Street

Per 300 LF Street

Continuous as Needed

Theoretical Density (Rice Method)

Temperature - During Lay-Down

% Theoretical Density - In Place

Thickness - In Place

% Air Voids - In Place

2. When a tap is proposed on an existing Asbestos Cement (AC) pipe the contractor will replace the AC pipe segment with an approve PVC pipe per City Standard Product List (SPL). If the proposed tap is less than 24 inches from an AC pipe joint the replacement of the AC pipe will require addition segments to ensure adequate tap and joint separation. New pipe will be connected to the existing AC pipe with and wide range coupling adaptor per City SPL.

CITY OF SAN MARCOS TESTING SCHEDULE

Air, Slump & Compression - In Place | Per exposed structure

\*\* Testing must be conducted during backfill operations

**Erosion Control and Stormwater Management** 

1. It is unlawful for any general contractor, subcontractor or owner to

allow or cause to be allowed, erosion of material from a construction

2. Appropriate erosion controls and tree protection measures shall be

in place prior to any site disturbance. Site work permitted by a Site

Plan Permit and/or a Demolition Permit cannot begin until erosion

3. All construction-related vehicle parking and activity (including

within the Limits of Construction, with appropriate controls, or

designated parking/access on APPROVED surfaces outside the

employed to prevent erosion; however, these are only minimum

webpage, located under Engineering & Capital Improvements.

5. In the event of unusual site conditions, proximity to any water

may be necessary (on-site or off) to maintain erosion and

water management features at all times.

driveway and sidewalk section.

6. The owner or their designee is responsible for all changes,

bodies and/or weather related events, more stringent requirements

upgrades and continued maintenance of all erosion control and storm

Erosion control measures and storm water management practices

Engineering Inspections is responsible for the inspection of

Public Improvements Construction Projects (PICP) and

infrastructure in the ROW to the property line or easement,

excluding sidewalks and drive ways as noted under the

Planning/Development Services is responsible for the

8. All designs to prevent the erosion of soil and the transport of

inspection of all residential and commercial construction.

sediment and debris from the construction site, or surrounding areas

9. All streets adjacent to the project site must be kept clean of mud.

rocks, trash, and building debris at all times. Daily or more frequent

gutters. During muddy conditions, clean vehicle tires before leaving

throughout the day; sweep roads as soon as possible. Or prevent

streets and of drainage areas impacted by onsite or offsite

construction. The contractor is required to take any necessary

measures to prevent the migration of dust into the air due to

area must be protected per City detail (refer to #4 above).

vehicles from leaving the site during muddy conditions. Migration of

material or sediment from the site will require daily cleanup of paved

10. All storm drain inlets within 200 feet of any permitted construction

11. Dewatering operations must use SWPPP-specified methods only.

vegetated, upland area (away from waterbodies or drainage) or use

another type of filtration prior to discharge EVERY TIME. Refer to the

responsible for continuous (24 hours a day/7 days a week) monitoring

EPA 2017 Construction General Permit, Section 2.4, as applicable.

of erosion control measures to ensure compliance with all federal,

13. Do NOT wash, sweep or otherwise cause construction soil or

debris to be deposited into any storm water drainage or conveyance

14. COSM MS4- Projects with a disturbed area of 1 to <5 acres must

COSM through MyPermitNow prior to construction activity starting.

certified Notice of Intent (NOi) to TCEQ; they must also submit the

COSM through MyPermitNow prior to construction activity starting.

15. Contractor shall provide qualified personnel to perform SWPPP

inspections on projects equal to 1 acre or greater. Qualified personnel

shall have CISEC, CESSWI, or equivalent certification approved by

16. Qualified personnel shall inspect the construction site at least

prepared in accordance with the requirements of the Construction

required by Texas Engineering Practice Act Section 137 and/or a

Certified Professional in Erosion and Sedimentation Control (CPESC).

The SWPPP must be onsite at all times and shall be made available

Water Utility Notes - The requirements stated in most current

version of the Water Distribution System Design Criteria Technical

1. All taps to the COSM water system for private property shall be

General Permit and shall be designed and signed by a licensed

professional engineer (Texas) with competence in this area as

once every seven calendar days. A project-specific SWPPP must be

COSM is the MS4 operator; these submissions to the COSM meet the

Projects with disturbed area of 5+ acres must submit a signed,

signed certified NOi and Large CSN received from TCEQ to the

required initial notification to the MS4 operator. CSN must be

displayed at a construction site in public view prior to the

commencement of construction activities.

to the City of San Marcos upon request.

Manual shall supersede these notes if they conflict.

the MS4.

submit a signed, certified Small Construction Site Notice (CSN) to the

12. The contractor or owner must have a designated person

state, and local laws and regulations.

of the pool of water (rather than the bottom) and discharge to a

If such methods are only general or not applicable, pump from the top

sweeping may be necessary, including the street center/turn lane and

the site and/or remove mud, dust and dirt from public streets regularly

disturbed by construction shall, be maintained by the contractor during

will be inspected by the COSM prior to and during the construction

standards. See construction details on Design & Construction Guide

employee personal vehicles and delivery vehicles) must be located

control and tree protection measures are in place.

\* The above testing rates are only anticipated guidelines. The COSM

reserves the right to require at owner's expense additional testing at

Per 1000 LF C&G

Per underground structure

Per 4000 SF

Per 2500 SF

Per 10 Inlets

Description:

Sidewalk

Curb Inlets

Driveway

', 14 & 28 Day)

Curb and Gutter

the COSM's discretion.

Limits of Construction.

sedimentation control.

construction.

construction activities

Concrete: (Unconfined Compression,

Slump & Compression -In Place

\*\*\* Density will be per COSM details.

- A list of accepted metering devices can be found on the engineering webpage under SPL WW-144. All metering devices shall be located on public right-of-way in easement.
- 4. All water utility lines leading to private property (except some authorized small domestic water lines) shall be provided with a testable back flow prevention device approved by the AWWA and the
- 5. The back-flow prevention device must be located as close as possible to the public right-of- way on private property.
- 6. A backflow prevention device with a low-flow indicator is required on all dedicated fire lines as per COSM details.
- 7. Any bypass to a backflow prevention device must have a testable back flow prevention device at least equivalent to the primary line approved by the AWWA and the COSM

COSM. See detail.

- 9. Accepted Metering Devices See Standard Product List WW-144

Pipe Material	<sup>1</sup> Pipe Sizes	<sup>2</sup> SPL
Copper Tubing	1"	WW-613
Polyethylene Tubing	1"	WW-65
PVC	2"	WW-587
PVC	4",6",8",12"	WW-308
DI	6"	WW-27
PVC	8" or 12"	WW-308 or WW-308A
DI	8" or 12"	WW-27 or WW-27F
PVC	16" or 24"	WW-308C
DI	16" or 24"	WW-27 or WW-27F
	Copper Tubing Polyethylene Tubing PVC PVC DI PVC DI PVC	Copper Tubing 1"  Polyethylene Tubing 1"  PVC 2"  PVC 4",6",8",12"  DI 6"  PVC 8" or 12"  DI 8" or 12"  PVC 16" or 24"

If the required pipe size is not listed; then install the next larger size listed and reduce to the needed size at the meter per the COSM details. See COSM details for more information.

The COSM Standard Products List (SPL) can be found on the engineering

- xception of short Cul-de-Sacs as indicated in the City's Water Distribution ystem Design Criteria Technical Manual
- shall be factory coated aluminum based silver paint. No pre-owned hydrants permitted. 12. All utility lines shall be tested after all appurtenances (hydrants,
- sampling ports, valves, etc.) are installed complete in place and located at final grade. All utility lines shall be tested from gate valve to gate valve at 200 psi for 10 minutes and @ 150 psi for 2 hours. A fire line dedicated for a fire protection system shall be tested @ 200 psi for 2 hrs.
- 13. A licensed underground installer certified by the Texas Commission on Fire Protection must perform underground fire line installation (Fire Sprinkler System). Most plumbers and utility contractors do not meet this criteria! Please verify before construction.
- All utility taps, line installations, extensions, or adaptations in the public right-of- way, up to and including the metering device, for all Public Improvement Construction Projects will be inspected by the Engineering Inspector.

### <u>Private</u>

- All domestic water line installations, extensions, or adaptations on public or private property for all Site Plan Permits, including the
- Private utility lines utilized by any fire protection system (fire line), or utility combo line will be inspected by the Fire Prevention Office.
- All backflow prevention devices will be reviewed by the Backflow Prevention Manager (Public Services-Water Division) prior to
- licensed/certified back flow prevention assembly tester. Test reports shall be on a form as prescribed by the COSM-Public Services Water Division. All testers submitting inspection results must be registered prior to testing devices by the -Public Services Water Division. A copy of the test results are to be submitted to the COSM-Public Services Water Division and the COSM Inspector prior to activation of water prevention device that was inspected and/or tested.
- 16. All water lines leading to private property must provide a of project acceptance. On all dead-end lines and lines not yet tied into a water system, an automatic flush valve shall be installed with an approved water meter. After the pressure tests and bacteriological samples have passed, the Contractor must give notice to the
- from the center of the lowest connection to the adjacent grade.
- 18. Fire hydrant is rejoined within 100 feet of the Fire Department Connection (FDC) is building is equipped with a fire sprinkler system.
- by Fire Code

- complete and has been flushed of all debris.
- considered "out of service" and are required to have a black plastic wrap covering the hydrant. private line.

- 8. It is the responsibility of the owner and contractor to verify the type
- and size of the backflow prevention device with the COSM's Water Services (512)393-8010, for the property served, prior to construction.
- 10. Accepted Utility Line Types (verify use with Inspector) 4. Certain erosion control measures identified by the COSM are to be

036	Tipe Material	Tipe Sizes	GIL
Service lines	Copper Tubing	1"	WW-613
Service lines	Polyethylene Tubing	1"	WW-65
Service lines	PVC	2"	WW-587
Service lines	PVC	4",6",8",12"	WW-308
Fire Hydrant Lead	DI	6"	WW-27
<sup>3</sup> Distribution lines	PVC	8" or 12"	WW-308 or WW-308A
<sup>3</sup> Distribution lines	DI	8" or 12"	WW-27 or WW-27F
Transmission lines	PVC	16" or 24"	WW-308C
Transmission lines	DI	16" or 24"	WW-27 or WW-27F
Note 1			

The minimum distribution system line size is eight (8) inches, with the

- 11. Private property fire hydrants shall be RED Public fire hydrants

- 14. COSM to be given 48-hour notice (required) prior to all testing of utility lines. COSM inspection required for all utility lines.

- valve, and meter will be inspected by a Building Inspector.
- 15. All backflow prevention devices must be tested by a State
- service. A copy of the backflow test is to be attached to the back-flow bacteriological test to the inspector noted in the inspections section above. All bacteriological samplings must be certified within 20 days
- Engineering Inspector for activation of the device. 17. Fire hydrants must be placed or moved to finished elevation after installation per detail 511S-17-SM. Finished elevation is 18" to 24"
- 19. Fire hydrants are required to have a clear area of 5 feet. No plants, trees or obstacles allowed except as impact protection outline

- 20. Fire hydrants are required to be marked with a blue reflective marker in the roadway 6" to 10" off center of the roadway towards the hydrant. On corner lot installation, both roadways are required to be
- 21. The underground contractor must submit a report (on company letterhead) to fireplan@sanmarcostx.gov indicating that the fire line is

22. All fire hydrants that have not been inspected or flushed are

- 23. COSM will not perform the tie-in of a public service line to a
- 24. It is the responsibility of the owner or contractor to tie to the COSM's line from the right-of-way or public easement to the private property line. It is the licensed plumber/utility contractor responsibility to maintain proper slope and connection of system to the public
- 25. Fire hydrants capable of producing the required GPM (based on construction type) must be located within 500 foot of the most remote portion of the building using accessible surfaced roadway for
- 26. Fire hydrants must be operational prior to beginning combustible
- 27. All valves in a COSM right-of-way will be operated by COSM personnel only. The contractor may not operate any COSM owned valve. The general contractor will be fined if a water valve is operated without express written consent of the Water Utility, regardless of who operated the valve.
- 28. Only temporary water meters approved by the COSM are authorized for use on any fire hydrant (public or private).
- 29. Temporary meters may be relocated from one hydrant to another only by Water- Waste/Water personnel.
- 30. A fine will be imposed on operators using fire hydrants without meters, with unapproved meters, or failing to use approved backflow prevention or air gap protection.
- 31. Thrust blocks are not permitted. All fittings shall be mechanically restrained. Bell joints shall be mechanically restrained in accordance with the Engineer of Record's specifications based on site conditions. A joint restraint table, sealed by the Engineer of Record must be submitted with each set of plans. If a joint restraint table is not available, all joints must be mechanically restrained.
- 32. The service address must be posted and visible (as per COSM specifications) from the street prior to the installation of the meter as per Chapter 38 of local ordinances.
- 33. Disinfection sample taps shall be installed at proper locations (not more than 1000-foot intervals) along public water lines. Wastewater - The requirements stated in most current version of
- the Wastewater Collection System Design Criteria Technical Manual shall supersede these notes if they conflict. 1. Required Equipment - The following are the acceptable materials
- for the type of lines or connections shown: Public Sewer Lines - SDR 26 in the COSM right of way (as a minimum). See SPL WW227 &WW-227A
- Private Sewer Lines Schedule 40 or SDR 26 Approved connections -See SPL WW-354

Engineering Inspections is responsible for inspection of all utility taps.

line installations, extensions, and adaptations on all Public Improvement Construction Projects. See 510.3(26) Quality Testing for

Inspection

- 4-psi minimum pressure test on lines

Installed Pipe-of the Modifications of Austin Specifications for

- Lines must be flushed immediately prior to the TV test - TV test on all public lines (copy of video to Engineering Inspections)
- Mandrel test required 30 days after installation Building Inspections is responsible for inspection of all utility taps.
- all residential and commercial construction. Low-pressure air test with 5 PSI on all lines
- Force mains; 5 psi over working pressure with minimum of 50 psi, for 1 hour

service laterals, and private lines on all Site Preparation Projects and

3. All sewer lines shall be tested after all appurtenances are located at final grade.

All services must be six inch minimum and must have clean-outs;

dual services shall have clean- outs on each line located no less than

- six feet apart at the property line. See detail 520s- 1-SM & 520S-3-SM for more details and TCEQ specifications. 5. All manholes to be cored (not chiseled) and lined with products
- from the Standard Products List. See specification 506.5F. Pipe connection to existing manholes and junction boxes for more details.
- 6. All manholes shall be tested per specification 506.6 prior to lining. All manholes are to be lined per SPL 511. 7. The COSM will not perform the tie-in of lines to privately owned and maintained lines or clean- outs. It is the licensed plumber/utility
- contractor responsibility to maintain proper slope, connection and drainage of system to the public connection. 8. Pipe stub-outs must be provided and located in manholes to
- facilitate future expansion. 9. All commercial property must have a wastewater sampling port installed per the COSM's sample port detail 520-4B-SM, and wastewater collection system standard design criteria. The wastewater sampling port must not be located in a drive-thru, traffic

#### lane, or driveway access area. **Driveways and Sidewalks**

- All sidewalks and driveway approaches will be inspected by the
- Engineering Inspections will inspect the following items:

- Engineering Inspections will inspect the following items: - All Commercial project driveway approaches and sidewalks - Any new, extension or addition to a drive on a existing property (Driveway Permit or Infill New Residential) All new subdivision work inclusive of the street, curb, curb cut ramps to a public street, sidewalk and driveway access installed during initial construction prior to COSM acceptance of subdivision
- All Public Improvement Construction Projects
- Building Inspections will inspect the following: - All sidewalk construction and driveway access in development "build-out" after acceptance of subdivision by the COSM.
- 2. Meters, valves, or other obstructions are not permitted in sidewalks or driveways. All meters must be located in a public right-of-way or easement given by the property owner (and legally recorded).
- 3. Meters and other utility obstructions must be relocated by and at the expense of the own e r or contractor.
- 4. Driveway access grade at sidewalk cannot exceed 2%.

All sidewalks and driveways shall meet applicable TAS standards.

## Public Street Construction

coat and/or placed on the prime coat.

- 1. All new street construction in public right-of-way and easements will be inspected by the Engineering Inspectors.
- 2. All street lights shown on the approved construction plans shall be active

prior to project acceptance. If street light service is to be in the COSM's

name, contact San Marcos Electric Utility, (512) 393-8300

- 3. Flexible Base & Sub-grade: Will follow the City specification noted in the 200: Series Subgrade & Base Construction.
- 4. Cutback Asphaltic material (Prime Coat) shall be applied to the completed base course and allowed to set 24 hours before paving the roadway. An Emulsified Asphalt Tack Coat can be used in lieu of the prime
- 5. Asphalt must be at a temperature between 250° F and 350° F when discharged from the mixer and compacted using steel-wheel rollers, vibratory rollers and pneumatic-tire rollers.
- 6. The contractor or their testing technician shall check the density of the compacted asphalt at regular intervals. Samples of the asphalt shall be taken as the asphalt leaves the hopper of the paving machine before compaction and cores shall be taken at these sampling locations. A minimum of 3 samples shall be taken daily unless the total volume is determined to be small enough to warrant taking only one sample.

#### Electric Utility Notes

connection.

- 1. Electrical service will be provided in accordance with SMEU "Rules and Regulations" and "Line Extension Policy" within the PUC designated SMEU service area.
- 2. Electric Service in San Marcos Electric Utility (SMEU) Service Territory:
- A. For non-emergency service, Contact SMEU 48 hours in advance to schedule electric service connection for new service or
- disconnection/reconnection for modified service. i. For Emergency Electric Service contractors may disconnect and reconnect temporary electric service without advanced notice. Contractor must contact SMEU within 24 hours to make permanent electric service
- B. SMEU must receive notification from the COSM Electrical Inspector that the Customer's electrical installation has passed final electrical inspections
- C. SMEU has the right to deny service connection for any identified electrical hazard.

3. For plan review of projects requiring electric service from San Marcos

Electric Utility (SMEU), a minimum of the following items must be provided

to SMEU by the property owner or contractor; a completed Electric Service

Contact San Marcos Electric Utility at 512-393-8300 for detailed plan review

before electric service is connected by SMEU personnel.

- Application, a set of customer drawings including plat drawings showing all easements, scaled elevation drawings for any structures that exceed a single story, and a total connected load estimate (including service voltage requirements).
- submittal requirements. 4. All services shall have a single disconnecting means in an approved

location on the exterior or outside of the building served.

- 5. All electric disconnecting means and meters shall be assessable. 6. At the time of Phase 2 inspection, the meter sockets shall be labeled with 1" x 2" digitally printed vinyl stickers. Disconnect panel(s) shall be labeled with 2" x 4" digitally printed vinyl stickers. Panel must have address numbers, number of panel (ex. 2 of 4) and location of next disconnect panel. Both doors and meter socket must have permanent labeling affixed before
- SMEU will install meters. SMEU may deny meter connection if the required labeling is not present.
- 7. Panel and socket markings are not allowed to be paint or marker. 8. The service mast shall have at least two points of attachment to the building. One point of attachment must be within 12 inches of the service equipment. The service equipment may not be used to meet this
- 9. If electric overhead power lines exist in the project area, Texas Law Article 1436c, prohibits all activities in which persons or equipment may come within six (6) feet of energized overhead power lines and Federal Regulations, Title 29, Part 1910.180(i) and Part 1926.550(a)(15) require a minimum of 10 feet from these facilities. Where Contractor must work near overhead power lines, contact the service provider for the lines to be de-energized and/or moved at Contractor's expense. For non-emergency work, contact SMEU 48 hours in advance to schedule lines to be
- installation requirements San Marcos Electric Utility(SMEU) 512-393-8300 Pedernales Electric Cooperative 888-554-4732 #7525 Bluebonnet Electric Cooperative 800-842-7708 (Ask for Lockhart engineering dept.)

10. Contact the local service provider for information on their specific

de-energized or moved.

NOTE: This document is not meant or designed to be an all-inclusive document. The function of this 'requirements' document is to provide information on issues identified by the COSM inspection staff based on daily field operations and common issues. It is the intent of this document to facilitate the construction process in common overlapping areas between COSM departments and divisions and private contractors. In all cases, contractors, subcontractors and owners are responsible for knowing and utilizing the state, federal, or COSM codes and laws where applicable. No code violations are "approved". COSM signed or reviewed plans are not authorization to violate codes, laws, or ordinances. A copy of plans bearing a seal from Building Inspections and/or the Permit Center is required to be available on-site at all times. Any changes or revisions to these plans must first be submitted to the COSM by the design professional for review and written authorization. A review seal from the COSM must be affixed to these revised plans and they must be available on- site at all times.



THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOW IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES. BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULL RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES

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JAMIE D. HORA DATE: NOVEMBER 11, 202

JOB No. **005956-01-113** 

#### TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

### ORGANIZED SEWAGE COLLECTION SYSTEM GENERAL CONSTRUCTION NOTES

THE FOLLOWING/LISTED "CONSTRUCTION NOTES" ARE INTENDED TO BE ADVISORY IN NATURE ONLY AND DO NOT CONSTITUTE AN APPROVAL OR CONDITIONAL APPROVAL BY THE EXECUTIVE DIRECTOR, NOR DO THIS 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.
- 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.
- 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
- 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.
- 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 REGIONA 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.
- 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.
- 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
- 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
- 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
- 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
- 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.
- 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 C924, 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.
- A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE. 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:

 $(0.085 \times D \times K)$ Equation C.3

Where:

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

(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

Pipe Diameter (inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Length (seconds/loot)
Ó	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	580	199	3.419
15	850	159	5.342
18	1020	133	7,693
71	11.90	114	10.471
24	1360	190	13.676
27	1530	38	17.309
30	1700	30	21.369
33	1870	72	25.856

- (A) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
- (B) 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.
- (C) 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.
- (D) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 38 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
  - (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
- (1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL
- (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
- (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.
- MANDREL DESIGN.
- 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.
- 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
- (2) FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES AND GREATER, OTHER TEST METHODS MAY BE USED TO
- (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.
- 1. 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. 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.
- (A) 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
  - (B) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE
  - TESTING TO ALLOW SATURATION OF THE CONCRETE
  - (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
- 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.

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

#### TCEQ WATER DISTRIBUTION SYSTEM

#### GENERAL CONSTRUCTION NOTES

- 1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290 SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. AT A MINIMUM, CONSTRUCTION FOR PUBLIC WATER SYSTEMS MUST ALWAYS MEET TCEQ'S"RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS."
- 2. ALL NEWLY INSTALLED PIPES AND RELATED PRODUCTS MUST CONFORM TO AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)/NSF INTERNATIONAL STANDARD 61 AND MUST BE CERTIFIED BY AN ORGANIZATION ACCREDITED BY ANSI [§290.44(A)(1)].
- 3. PLASTIC PIPE FOR USE IN PUBLIC WATER SYSTEMS MUST BEAR THE NSF INTERNATIONAL SEAL OF APPROVAL (NSF-PW) AND HAVE AN ASTM DESIGN PRESSURE RATING OF AT LEAST 150 PSI OR A STANDARD DIMENSION RATIO OF 26 OR LESS [§290.44(A)(2)].
- 4. NO PIPE WHICH HAS BEEN USED FOR ANY PURPOSE OTHER THAN THE CONVEYANCE OF DRINKING WATER SHALL BE ACCEPTED OR RELOCATED FOR
- USE IN ANY PUBLIC DRINKING WATER SUPPLY [§290.44(A)(3)]. ALL WATER LINE CROSSINGS OF WASTEWATER MAINS SHALL BE PERPENDICULAR [§290.44(E)(4)(B)]
- 6. WATER TRANSMISSION AND DISTRIBUTION LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. HOWEVER, THE TOP OF THE WATER LINE MUST BE LOCATED BELOW THE FROST LINE AND IN NO CASE SHALL THE TOP OF THE WATER LINE BE LESS THAN 24 INCHES BELOW GROUND SURFACE [§290.44(A)(4)].
- 7. THE MAXIMUM ALLOWABLE LEAD CONTENT OF PIPES, PIPE FITTINGS, PLUMBING FITTINGS, AND FIXTURES IS 0.25 PERCENT [§290.44(B)].
- 8. THE CONTRACTOR SHALL INSTALL APPROPRIATE AIR RELEASE DEVICES WITH VENT OPENINGS TO THE ATMOSPHERE COVERED WITH 16-MESH OR FINER, CORROSION RESISTANT SCREENING MATERIAL OR AN ACCEPTABLE EQUIVALENT [§290.44(D)(1)].
- 9. THE CONTRACTOR SHALL NOT PLACE THE PIPE IN WATER OR WHERE IT CAN BE FLOODED WITH WATER OR SEWAGE DURING ITS STORAGE OR INSTALLATION [§290.44(F)(1)].
- 10. WHEN WATERLINES ARE LAID UNDER ANY FLOWING OR INTERMITTENT STREAM OR SEMI-PERMANENT BODY OF WATER THE WATERLINE SHALL BE INSTALLED IN A SEPARATE WATERTIGHT PIPE ENCASEMENT. VALVES MUST BE PROVIDED ON EACH SIDE OF THE CROSSING WITH FACILITIES TO
- ALLOW THE UNDERWATER PORTION OF THE SYSTEM TO BE ISOLATED AND TESTED [§290.44(F)(2)]. 11. PURSUANT TO 30 TAC §290.44(A)(5), THE HYDROSTATIC LEAKAGE RATE SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY THE
- MOST CURRENT AWWA FORMULAS FOR PVC PIPE, CAST IRON AND DUCTILE IRON PIPE. INCLUDE THE FORMULAS IN THE NOTES ON THE PLANS. THE HYDROSTATIC LEAKAGE RATE FOR POLYVINYL CHLORIDE (PVC) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-605 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

#### $Q = (LD\sqrt{P})/148,000$

- Q = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,
- L = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET,
- D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND
- P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).
- THE HYDROSTATIC LEAKAGE RATE FOR DUCTILE IRON (DI) PIPE AND APPURTENANCES SHALL NOT EXCEED THE AMOUNT ALLOWED OR RECOMMENDED BY FORMULAS IN AMERICA WATER WORKS ASSOCIATION (AWWA) C-600 AS REQUIRED IN 30 TAC §290.44(A)(5). PLEASE ENSURE THAT THE FORMULA FOR THIS CALCULATION IS CORRECT AND MOST CURRENT FORMULA IS IN USE;

#### $L = (SD\sqrt{P})/148,000$

- L = THE QUANTITY OF MAKEUP WATER IN GALLONS PER HOUR,
- S = THE LENGTH OF THE PIPE SECTION BEING TESTED, IN FEET, D = THE NOMINAL DIAMETER OF THE PIPE IN INCHES, AND
- P = THE AVERAGE TEST PRESSURE DURING THE HYDROSTATIC TEST IN POUNDS PER SQUARE INCH (PSI).
- 12. THE CONTRACTOR SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE IN ALL DIRECTIONS OF NINE FEET BETWEEN THE PROPOSED WATERLINE AND WASTEWATER COLLECTION FACILITIES INCLUDING MANHOLES. IF THIS DISTANCE CANNOT BE MAINTAINED, THE CONTRACTOR MUST IMMEDIATELY NOTIFY THE PROJECT ENGINEER FOR FURTHER DIRECTION. SEPARATION DISTANCES, INSTALLATION METHODS, AND MATERIALS UTILIZED MUST MEET §290.44(E)(1)-(4).
- 13. THE SEPARATION DISTANCE FROM A POTABLE WATERLINE TO A WASTEWATER MAIN OR LATERAL MANHOLE OR CLEANOUT SHALL BE A MINIMUM OF NINE FEET. WHERE THE NINE-FOOT SEPARATION DISTANCE CANNOT BE ACHIEVED, THE POTABLE WATERLINE SHALL BE ENCASED IN A JOINT OF AT LEAST 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG AND TWO NOMINAL SIZES LARGER THAN THE NEW CONVEYANCE. THE SPACE AROUND THE CARRIER PIPE SHALL BE SUPPORTED AT FIVE-FOOT INTERVALS WITH SPACERS OR BE FILLED TO THE SPRINGLINE WITH WASHED SAND. THE ENCASEMENT PIPE SHALL BE CENTERED ON THE CROSSING AND BOTH ENDS SEALED WITH CEMENT GROUT OR MANUFACTURED SEALANT [§290.44(E)(5)].
- 14. FIRE HYDRANTS SHALL NOT BE INSTALLED WITHIN NINE FEET VERTICALLY OR HORIZONTALLY OF ANY WASTEWATER LINE, WASTEWATER LATERAL OR WASTEWATER SERVICE LINE REGARDLESS OF CONSTRUCTION [§290.44(E)(6)].
- 15. SUCTION MAINS TO PUMPING EQUIPMENT SHALL NOT CROSS WASTEWATER MAINS, WASTEWATER LATERALS, OR WASTEWATER SERVICE LINES. RAW WATER SUPPLY LINES SHALL NOT BE INSTALLED WITHIN FIVE FEET OF ANY TILE OR CONCRETE WASTEWATER MAIN, WASTEWATER LATERAL OR WASTEWATER SERVICE LINE [§290.44(E)(7)].
- 16. WATERLINES SHALL NOT BE INSTALLED CLOSER THAN TEN FEET TO SEPTIC TANK DRAINFIELDS [§290.44(E)(8)]
- 17. THE CONTRACTOR SHALL DISINFECT THE NEW WATERLINES IN ACCORDANCE WITH AWWA STANDARD C-651-14OR MOST RECENT. THEN FLUSH AND SAMPLE THE LINES BEFORE BEING PLACED INTO SERVICE. SAMPLES SHALL BE COLLECTED FOR MICROBIOLOGICAL ANALYSIS TO CHECK THE EFFECTIVENESS OF THE DISINFECTION PROCEDURE WHICH SHALL BE REPEATED IF CONTAMINATION PERSISTS. A MINIMUM OF ONE SAMPLE FOR EACH 1,000 FEET OF COMPLETED WATERLINE WILL BE REQUIRED OR AT THE NEXT AVAILABLE SAMPLING POINT BEYOND 1,000 FEET AS DESIGNATED BY THE DESIGN ENGINEER [§290.44(F)(3)].
- 18. DECHLORINATION OF DISINFECTING WATER SHALL BE IN STRICT ACCORDANCE WITH CURRENT AWWA STANDARD C655-09 OR MOST RECENT.

### CONSTRUCTION SEQUENCING

- 1. OBTAIN CITY APPROVED AND STAMPED PLAN SET FOR THE PERMIT (STAMPED PLANS MUST BE ON SITE AT ALL TIMES).
- 2. OBTAIN TCEQ PERMIT FOR EROSION AND SEDIMENTATION PLAN. SWPPP BOOK MUST BE ON SITE AT ALL TIMES AND AVAILABLE TO INSPECTION TO
- VERIFY UPDATES TO EROSION CONTROL LAYOUT.
- 3. CLEAR GIS REVIEW PRE-CONSTRUCTION MEETING REQUIREMENT 4. PRE-CONSTRUCTION MEETING WITH CITY ROW-ENGINEERING INSPECTORS MANAGER.
- SUBMIT PROPOSED PRODUCT TO DEVELOPMENT ENGINEERING FOR APPROVAL. CITY CONFORMATION/COMPLETENESS REVIEW AND ARCHIVING
- REQUIRED.
- 6. INSTALLATION OF EROSION CONTROL PER APPROVED TCEQ PERMIT. 7. CONDUCTION SWPPP INSPECTION PER GOVERNING ENTITIES REQUIREMENT (CITY OF SAN MARCOS WEEKLY INSPECTION REQUIRED FROM A
- 8. MAINTAIN EROSION CONTROL THAT FAIL INSPECTION PRIOR TO NEXT INSPECTION OR NEXT RAIN EVENT

CONTRACTOR REQUEST PRE-WALK WITH CITY ROW/ENGINEERING DEPARTMENT INSPECTOR.

- 9. CONSTRUCT IMPROVEMENT PER APPROVED CITY PLANS.
- 10. CALL FOR INSPECTION AS NEEDED WITH CITY INSPECTOR.
- 11. MAINTAIN CURRENT PLAN SET IF ADDENDUM ARE APPLIED FOR AND APPROVED BY THE CITY. UPDATE SHEETS WITH APPROVED STAMP ADDENDUM SHEET FROM THE CITY PERMIT.
- 14. CONTRACTOR COMPLETES WORK LIST ITEM FROM PRE-WALK AND DEVELOPER ENGINEER SUBMITS RECORD DRAWING TO THE CITY FOR

13. CONTRACTOR, DEVELOPER ENGINEER, AND CITY INSPECTOR CONDUCT PRE-WALK TO VERIFY ALL ITEMS ON THE PLANS ARE INSTALLED.

- 15. 70% REVEGETATION AND DENSITY MUST BE ESTABLISHED. (CITY MS4 ORDINANCES DOES NOT ALLOW SOIL RETENTION BLANKET TO COUNT AS
- 16. REMOVAL OF SEDIMENT CONTROLS ON INSPECTOR CONFORMATION OF REVEGETATION. 17. CITY INSPECTOR SETS UP FINAL WALK THROUGH WITH ALL CITY DEPARTMENTS. CONTRACTOR AND DEVELOPMENT ENGINEERING MUST BE
- SUBMIT CLOSE-OUT PACKET TO CITY FOR REVIEW/APPROVAL OF ALL REQUIREMENTS HAVING BEEN COMPLETED.
- 19. ISSUANCE OF CITY CERTIFICATE OF ACCEPTANCE.



THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULL RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES

2 OF 9 (2)

DATE: NOVEMBER 11, 202 DESIGN | DRAWN | DC NK JOB No. **005956-01-113** 

SHEET

OF

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

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.
- SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN TCEQ-0592 (REV. JULY 15, 2015) PAGE 1 OF 2 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
- 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
- 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. TCEQ-0592 (REV. JULY 15, 2015) PAGE 2 OF 2

#### **GENERAL NOTES:**

- 1. THE CONTRACTOR SHALL COMPLY WITH ALL OF THE REQUIREMENTS SET FORTH IN THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY (TCEQ) "TEXAS POLLUTION DISCHARGE ELIMINATION SYSTEM" (TPDES). INFORMATION ON THE TPDES CONSTRUCTION GENERAL PERMITS MAY BE OBTAINED BY CONTACTING THE TCEQ AT 512-339-2929. INFORMATION IS ALSO AVAILABLE THROUGH TCEQ WEB SITE. DISCLAIMER: INFORMATION CONTAINED IN THIS PARAGRAPH IS BASED UPON THE BEST INFORMATION AVAILABLE AT THE TIME OF PLAN PREPARATION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL NECESSARY FORMS AND DOCUMENTATION AND COMPLY WITH THE PROVISIONS OF THE TPDES.
- 2. THE CONTRACTOR WILL BE REQUIRED TO FOLLOW BEST MANAGEMENT PRACTICES AND TO USE AND MAINTAIN SEDIMENTATION AND WATER POLLUTION CONTROL
- 3. THE CONTRACTOR SHALL PROVIDE THE OWNER 48 HOURS NOTICE PRIOR TO DISTURBING ANY VEGETATION OR BEGINNING ANY SITE PREPARATION IN ADVANCE OF THE EARTHWORK OPERATION. THE 48 HOUR NOTICE PROVIDES THE OWNER THE REQUIRED TIME TO FILE AND POST THE "NOTICE OF INTENT" (NOI) WITH THE TCEQ.
- 4. THE CONTRACTOR SHALL NOT RECEIVE FINAL PAYMENT FOR THE PROJECT UNTIL THE UNPAVED AREAS HAVE ACHIEVED 95% VEGETATIVE COVER WITH PERMANENT GRASSES, AND THE OWNER HAS FILED THE "NOTICE OF TERMINATION" (NOT) WITH THE
- 5. IN AREAS THAT HAVE ACHIEVED 95% VEGETATIVE COVER (WHEN COMPARED TO THE SURROUNDING, UNDISTURBED, VEGETATIVE COVER), THE CONTRACTOR MAY REMOVE AND REUSE ANY TEMPORARY EROSION CONTROL DEVICES (THAT ARE IN REASONABLE CONDITION) ON OTHER LOCATIONS IN THE DEVELOPMENT. ADDITIONAL SEEDING MAY BE REQUIRED TO VEGETATE THE AREAS WHERE THE STRUCTURAL CONTROLS WERE
- 6. PRIOR TO ACCEPTANCE AND FINAL PAYMENT, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL DEVICES.
- 7. ALL TEMPORARY EROSION CONTROL DEVICES SHALL BE PLACED PRIOR TO CONSTRUCTION IN ANY AREA, OR AS SOON AS PRACTICAL.
- 8. THE CONTRACTOR SHALL PROVIDE FOR ALL INTERIM DRAINAGE ON THE PROJECT. THE INTERIM DRAINAGE SHALL ENSURE THAT ALL RUNOFF IS CHANNELED TO THE TEMPORARY CONTROL DEVICES.
- 9. THE CONTRACTOR SHALL TAKE THE STEPS NECESSARY TO ENSURE THAT ALL CONSTRUCTION TRAFFIC LEAVING THE PROJECT SHALL NOT TRACK MUD OR OTHER DEBRIS ONTO ANY ROADWAY, PUBLIC STREET OR ANY ROADWAY WITHIN THE DEVELOPMENT. SHOULD MUD OR OTHER DEBRIS BE TRACKED ONTO ANY ROADWAY, THE CONTRACTOR SHALL TAKE IMMEDIATE STEPS TO REMOVE IT TO THE SATISFACTION OF THE OWNER AND/OR ANY REGULATORY AUTHORITY.
- 10. TEMPORARY CONSTRUCTION ENTRANCES SHALL BE UTILIZED WHERE NECESSARY.
- 11. SPRINKLING OF ROADWAYS SHALL BE REQUIRED TO CONTROL DUST. 12. THE CONTRACTOR SHALL MODIFY, AS NECESSARY, ANY TEMPORARY EROSION
- CONTROL DEVICES SO THAT THEY SERVE THEIR INTENDED PURPOSE.
- 13. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY EROSION DEVICES TO A CONDITION SIMILAR TO THAT OF WHEN IT WAS ORIGINALLY INSTALLED. 14. THE CONTRACTOR SHALL KEEP ALL TEMPORARY EROSION CONTROL DEVICES FREE OF
- SILT AND/OR ANY OTHER MATERIAL THAT MAY ACCUMULATE. REMOVAL SHALL OCCUR AS SOON AS PRACTICAL AFTER A RAINFALL. IN NO INSTANCE SHALL SILT BE PERMITTED TO ACCUMULATE TO A DEPTH ABOVE, OR IN EXCESS OF 50% OF THE DESIGN CAPACITY
- 15. AS REQUIRED BY THE OWNER, THE CONTRACTOR SHALL ACCOMPANY THE OWNER DURING THE INSPECTION OF THE EROSION CONTROL DEVICES TO DISCUSS MODIFICATIONS TO ENSURE THE DEVICES SERVE THEIR INTENDED PURPOSE.
- 16. THE CONTRACTOR SHALL PROTECT ALL AREAS (TREES AND MATURE VEGETATION). WHETHER WITHIN OR OUTSIDE OF THE ACTUAL LIMITS OF CONSTRUCTION. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION AS GOOD AS, OR BETTER THAN, THAT PRESENT PRIOR TO THE CONSTRUCTION.
- 17. ALL CONSTRUCTION AND CONSTRUCTION EQUIPMENT SHALL REMAIN WITHIN THE ESTABLISHED STREET RIGHT OF WAY AND DRAINAGE EASEMENTS UNLESS THE OWNER HAS GRANTED PRIOR AUTHORIZATION.
- 18. IN THE EVENT THE CONTRACTOR ESTABLISHES A YARD ON THE PROJECT. HE SHALL BE RESPONSIBLE FOR ESTABLISHING HIS OWN STORM WATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REQUIREMENTS THEREOF.
- 19. THE CONTRACTOR SHALL KEEP THE DEVELOPMENT FREE FROM LITTER.

#### SITE DESCRIPTION

RUNOFF: 0.75

A) THE PROJECT SHALL CONSIST OF THE CONSTRUCTION UTILITY IMPROVEMENTS

B) SEQUENCE OF MAJOR ACTIVITIES: -INSTALLATION OF EROSION/ SEDIMENTATION CONTROLS. -INSTALLATION OF UNDERGROUND UTILITIES. -REVEGETATION OF DISTURBED AREAS. -REMOVAL AND PROPER DISPOSAL OF EROSION/SEDIMENTATION CONTROLS ONCE PERMANENT VEGETATION IS ESTABLISHED.

C) ESTIMATE OF SITE AREA: TOTAL SIZE: ± 23.00 AC TOTAL DISTURBED AREA: ± 7.73 AC D) ESTIMATED RUNOFF COEFFICIENTS FOR THE 100 YEAR STORM AND DESCRIPTION OF

E) LOCATION MAP (COVER SHEET)

F) THERE IS NO INDUSTRIAL ACTIVITY OTHER THAN CONSTRUCTION ACTIVITIES

### G) RECEIVING WATERS:

RUNOFF FROM THE SITE DISCHARGES TO THE SOUTH-SOUTHWEST TOWARDS AN UNNAMED TRIBUTARY TO YORK CREEK, WHICH FLOWS TO THE SAN MARCOS RIVER, AND THEN TO THE GUADALUPE RIVER, AND ULTIMATELY TO THE GULF OF MEXICO.

DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED IMMEDIATELY UNLESS ACTIVITIES ARE SCHEDULED TO RESUME AND DO SO WITHIN FOURTEEN (14) DAYS THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL

TEMPORARY AND PERMANENT EROSION CONTROL MEASURES.

#### REQUIREMENTS

THE FOLLOWING RECORDS SHALL BE KEPT BY THE CONTRACTOR, WITH THE SWPPP: -DATES WHEN MAJOR GRADING ACTIVITIES OCCUR -DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY CEASE -DATES WHEN CONSTRUCTION ACTIVITIES PERMANENTLY CEASE

THE SWPPP SHALL BE AMENDED WHEN:

-DATES WHEN STABILIZATION MEASURES ARE INITIATED

-THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE SYSTEM OR SITE -INSPECTIONS INDICATE THE PLAN IS NOT MEETING THE DESIRED OBJECTIVES

THE OWNER/OPERATOR SHALL POST A NOTICE NEAR THE MAIN ENTRANCE OF THE CONSTRUCTION SITE WITH THE FOLLOWING INFORMATION: -TPDES PERMIT NUMBER OR A COPY OF THE NOI IF THE PERMIT NUMBER HAS NOT YET BEEN ASSIGNED

-THE NAME AND TELEPHONE NUMBER OF A LOCAL CONTACT PERSON

-A BRIEF DESCRIPTION OF THE PROJECT -THE LOCATION OF THE SWPPP

#### STABILIZATION / REVEGETATION NOTES

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).

2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE TCEQ TECHNICAL GUIDANCE MANUAL AND THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN.

3. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH THE CITY OF SAN MARCOS STANDARDS 610S-1-SM AND 610-S-2-SM AND/OR 610S-4-SM.

4. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER/PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES AND PRIOR TO BEGINNING ANY SITE PREPARATION WORK.

5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER OR ENVIRONMENTAL SPECIALIST. MINOR CHANGES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES.

6. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.

7. PRIOR TO FINAL ACCEPTANCE, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED, ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN APPROVED SPOIL DISPOSAL SITES.

8. ALL WORK MUST STOP IF A VOID IN THE ROCK SUBSTRATE IS DISCOVERED WHICH IS; ONE SQUARE FOOT IN TOTAL AREA; BLOWS AIR FROM WITHIN THE SUBSTRATE AND/OR CONSISTENTLY RECEIVES WATER DURING ANY RAIN EVENT. AT THIS TIME IT IS THE RESPONSIBILITY OF THE PROJECT MANAGER TO IMMEDIATELY CONTACT A TCEQ INSPECTOR FOR FURTHER INVESTIGATION.

- 9. PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW.
  - A. A MINIMUM OF SIX INCHES OF TOPSOIL SHALL BE PLACED IN ALL DRAINAGE CHANNELS (EXCEPT ROCK) AND BETWEEN THE CURB AND RIGHT-OF-WAY LINE.
  - B. RESEEDING SHALL IMMEDIATELY FOLLOW TOP SOILING WITH THE FOLLOWING MIXTURE OF GRASSES AT THE FOLLOWING RATES OF APPLICATION:

5.0 LBS/ACRE TREATED "TOP GUN" BUFFALO GRASS 10.0 LBS/ACRE TEXAS BLUEBONNETS 4.0 LBS/ACRE PRAIRIE VERBENAS 0.5 LBS/ACRE GREENTHREAD 1.0 LBS/ACRE PLAINS COREOPSIS 0.5 LBS/ACRE TOTAL SEEDING RATE\* 21.0 LBS/ACRE

\* PERENNIAL RYE GRASS TO BE ADDED TO THE DESCRIBED MIX AT A RATE OF 10 LBS/ACRE WHEN SEEDING BETWEEN OCTOBER 1 AND MARCH 31.

C. FERTILIZER SHALL BE A PELLETED OR GRANULAR SLOW RELEASE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1 POUND

D. FERTILIZER SHALL BE A WATER SOLUBLE FERTILIZER WITH AN ANALYSIS OF 15-15-15 AT A RATE OF 1.5 POUNDS PER 1000 SF.

- E. MULCH TYPE USED SHALL BE HAY, STRAW OR MULCH APPLIED AT A RATE OF 45 POUNDS PER 1000 SF, WITH SOIL TACKIFIER AR A RATE OF 1.4 POUNDS PER 1000 SF
- F. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX INCHES. THE IRRIGATION SHALL OCCUR AT TEN-DAY INTERVALS DURING THE FIRST TWO MONTHS RAINFALL OCCURRENCES OF  $\frac{1}{2}$  INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK

G. RESTORATION SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1½ INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

H. WHEN REQUIRED, NATIVE GRASS SEEDING SHALL COMPLY WITH REQUIREMENTS OF THE CITY OF SAN MARCOS STANDARDS AND SPECIFICATIONS.

10. ANNUAL GRASSES SUCH AS RYE GRASS WILL NOT BE ACCEPTED AS PERMANENT VEGETATION

11. ALL DISTURBED AREAS TO BE STABILIZED BY VEGETATION OR STRUCTURE.

12. DEVELOPER INFORMATION:

OWNER: OWNER'S REPRESENTATIVE RESPONSIBLE FOR PLAN ALTERATIONS: LCSM PH. 4, LLC BOWMAN 303 COLORADO STREET, SUITE 2300 1120 S. CAPITAL OF TEXAS HWY, BUILDING 3, SUITE 220 AUSTIN, TEXAS 78701 AUSTIN, TEXAS 78746 (TEL) 512-327-1180 (TEL) 512-457-8000

13. ALL REVEGETATION IN THE ROW AND EASEMENTS SHALL CONFORM TO CITY SPECIFICATIONS 601S-609S

#### **INSPECTIONS**

QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS THAT HAVE NOT BEEN FINALLY STABILIZED, STORAGE AREAS, STRUCTURAL CONTROLS, AND AREAS WHERE CONSTRUCTION AND OTHER VEHICLES LEAVE THE SITE AT LEAST ONCE EVERY SEVEN (7) DAYS AND WITHIN TWENTY-FOUR (24) HOURS OF THE END OF A STORM EVENT OF 1/2 INCHES OR GREATER.

DISTURBED AREAS SHALL BE INSPECTED FOR EVIDENCE OF, OR POTENTIAL FOR, SEDIMENT ENTERING THE

AFTER THE INSPECTIONS, THE SWPPP SHALL BE MODIFIED AS NECESSARY TO INCLUDE ADDITIONAL BMP'S (BEST MANAGEMENT PRACTICES) DESIGNED TO CORRECT DEFICIENCIES IDENTIFIED.

REVISIONS (MODIFICATIONS) SHALL BE COMPLETED WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE

INSPECTION, IF POSSIBLE IMPLEMENT BEFORE NEXT STORM EVENT.

IF EXISTING BMP'S NEED TO BE MODIFIED OR ADDITIONAL BMP'S ARE REQUIRED, IMPLEMENTATIONS SHALL BE COMPLETED PRIOR TO THE NEXT ANTICIPATED STORM EVENT OR AS SOON AS PRACTICAL.

A REPORT SUMMARIZING THE SCOPE OF THE INSPECTION, NAME(S) AND QUALIFICATIONS OF PERSONNEL MAKING THE INSPECTION, THE DATE(S) OF THE INSPECTIONS, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWPPP SHALL BE MADE AND RETAINED AS PART OF THE SWPPP FOR AT LEAST THREE (3) YEARS FROM THE DATE THE "NOTICE OF TERMINATION" (NOT) IS SUBMITTED.

THE OBSERVATIONS SHOULD INCLUDE: -SEDIMENT DISCHARGES FROM THE SITE -LOCATION OF BMP'S THAT SHOULD BE MAINTAINED -LOCATION OF BMP'S THAT WERE INADEQUATE -LOCATION WHERE ADDITIONAL BMP'S SHALL BE INSTALLED

WHERE AN INSPECTION DOES NOT INDICATE THAT MODIFICATIONS TO EXISTING BMP'S ARE NECESSARY OR ADDITIONAL BMP'S ARE REQUIRED, A REPORT SHALL BE PREPARED WITH A CERTIFICATION THAT THE FACILITY IS IN COMPLIANCE WITH THE SWPPP AND THE TPDES PERMIT.

#### STANDARD PERMIT CONDITIONS

1. THE PERMITTEE HAS A DUTY TO COMPLY WITH ALL PERMIT CONDITIONS. FAILURE TO COMPLY WITH ANY PERMIT CONDITION IS A VIOLATION OF THE PERMIT AND STATUTES UNDER WHICH IT WAS ISSUED, AND IS GROUNDS FOR ENFORCEMENT ACTION, FOR TERMINATING COVERAGE UNDER THIS GENERAL PERMIT, OR FOR REQUIRING A DISCHARGER TO APPLY FOR AND OBTAIN AN INDIVIDUAL TPDES PERMIT.

2. AUTHORIZATION UNDER THIS GENERAL PERMIT MAY BE SUSPENDED OR REVOKED FOR CAUSE. FILING A NOTICE OF PLANNED CHANGES OR ANTICIPATED NON-COMPLIANCE BY THE PERMITTEE DOES NOT STAY ANY PERMIT CONDITION. THE PERMITTEE MUST FURNISH TO THE EXECUTIVE DIRECTOR, UPON REQUEST AND WITHIN A REASONABLE TIME, ANY INFORMATION NECESSARY FOR THE EXECUTIVE DIRECTOR TO DETERMINE WHETHER CAUSE EXISTS FOR REVOKING, SUSPENDING, OR TERMINATING AUTHORIZATION UNDER THIS PERMIT. ADDITIONALLY, THE PERMITTEE MUST PROVIDE TO THE EXECUTIVE DIRECTOR, UPON REQUEST, COPIES OF ALL RECORDS THAT THE PERMITTEE IS REQUIRED TO MAINTAIN AS A CONDITION OF THIS GENERAL PERMIT.

3. IT IS NOT A DEFENSE FOR A DISCHARGER IN AN ENFORCEMENT ACTION THAT IT WOULD HAVE BEEN NECESSARY TO HALT OR REDUCE THE PERMITTED ACTIVITY TO MAINTAIN COMPLIANCE WITH THE PERMIT CONDITIONS.

4. INSPECTION AND ENTRY SHALL BE ALLOWED UNDER TEXAS WATER CODE CHAPTERS 26-28, HEALTH AND SAFETY CODE §§ 361.032-361.033 AND 361.037, AND 40 CODE OF FEDERAL REGULATIONS (CFR) § 122.41(i). THE STATEMENT IN TEXAS WATER CODE § 26.014 THAT COMMISSION ENTRY OF A FACILITY SHALL OCCUR ACCORDING TO AN ESTABLISHMENT'S RULES AND REGULATIONS CONCERNING SAFETY, INTERNAL SECURITY, AND FIRE PROTECTION IS NOT GROUNDS FOR DENIAL OR RESTRICTION OF ENTRY TO ANY PART OF THE FACILITY OR SITE, BUT MERELY DESCRIBES THE COMMISSION'S DUTY TO OBSERVE APPROPRIATE RULES AND REGULATIONS DURING AN INSPECTION.

5. THE DISCHARGER IS SUBJECT TO ADMINISTRATIVE, CIVIL, AND CRIMINAL PENALTIES, AS APPLICABLE. UNDER TEXAS WATER CODE §§ 26.136, 26.212, AND 26.213 FOR VIOLATIONS INCLUDING BUT NOT LIMITED TO

a. NEGLIGENTLY OR KNOWINGLY VIOLATING CWA, §§ 301, 302, 306, 307, 308, 318, OR 405, OR ANY CONDITION OR LIMITATION IMPLEMENTING ANY SECTIONS IN A PERMIT ISSUED UNDER CWA § 402, OR ANY REQUIREMENT IMPOSED IN A PRETREATMENT PROGRAM APPROVED UNDER CWA, §§ 402(a)(3) OR 402(b)(8);

b. KNOWINGLY MAKING ANY FALSE STATEMENT, REPRESENTATION, OR CERTIFICATION IN ANY RECORD OR OTHER DOCUMENT SUBMITTED OR REQUIRED TO BE MAINTAINED UNDER A PERMIT, INCLUDING MONITORING REPORTS OR REPORTS OF COMPLIANCE OR NONCOMPLIANCE.

6. ALL REPORTS AND OTHER INFORMATION REQUESTED BY THE EXECUTIVE DIRECTOR MUST BE SIGNED BY THE PERSON AND IN THE MANNER REQUIRED BY 30TAC § 305.128 (RELATING TO SIGNATORIES TO REPORTS).

7. AUTHORIZATION UNDER THIS GENERAL PERMIT DOES NOT CONVEY PROPERTY OR WATER RIGHTS OF ANY SORT AND DOES NOT GRANT ANY EXCLUSIVE PRIVILEGE.

X SILT FENCES X PERMANENT VEGETATION \_\_\_\_\_ HAY BALES X ROCK BERMS \_ CELLULOSE FIBER MULCHING \_\_\_\_\_ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES \_\_\_\_\_ VEGETATIVE BUFFER STRIPS X PROTECTION OF TREES \_ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES \_\_\_\_\_ DIVERSION DIKE AND SWALE COMBINATION PROTECTION OF MATURE VEGETATION BRUSH BERMS GEOTEXTILES CONCRETE FLUMES \_\_\_\_\_ SOD STABILIZATION

\_\_\_\_\_ SEDIMENT TRAPS \_\_\_\_\_ SEDIMENT BASINS \_\_\_ STONE OUTLET STRUCTURES CURB AND GUTTERS

 $_{ullet}^{\chi}$  STABILIZED (ROCK) CONSTRUCTION ENTRANCES

\_\_\_\_\_ VELOCITY CONTROL DEVICES X INLET PROTECTION

\_\_\_\_X STORM SEWERS

STRUCTURAL PRACTICES

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

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOW IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULL RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES

STABILIZATION PRACTICES

X TEMPORARY VEGETATION

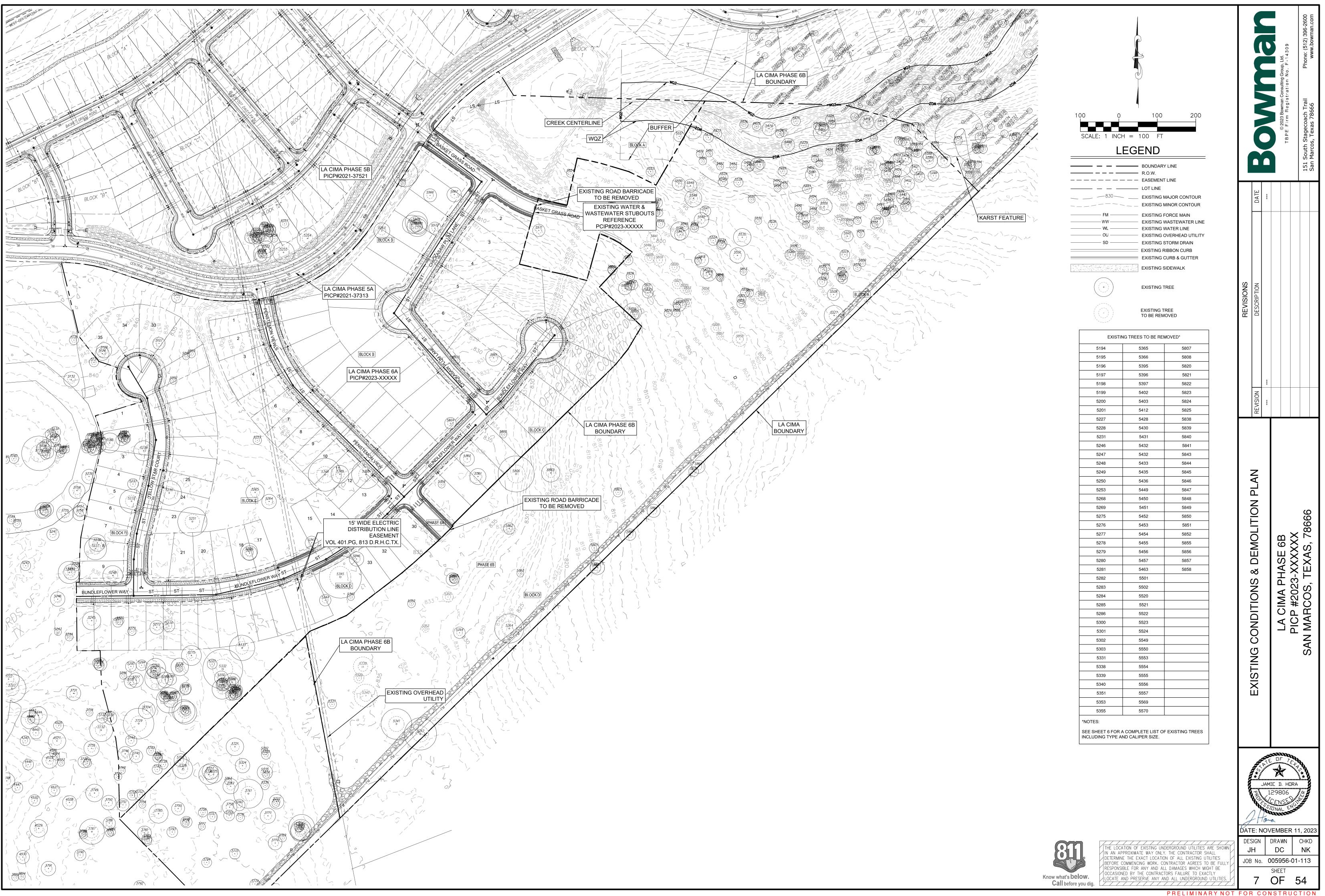
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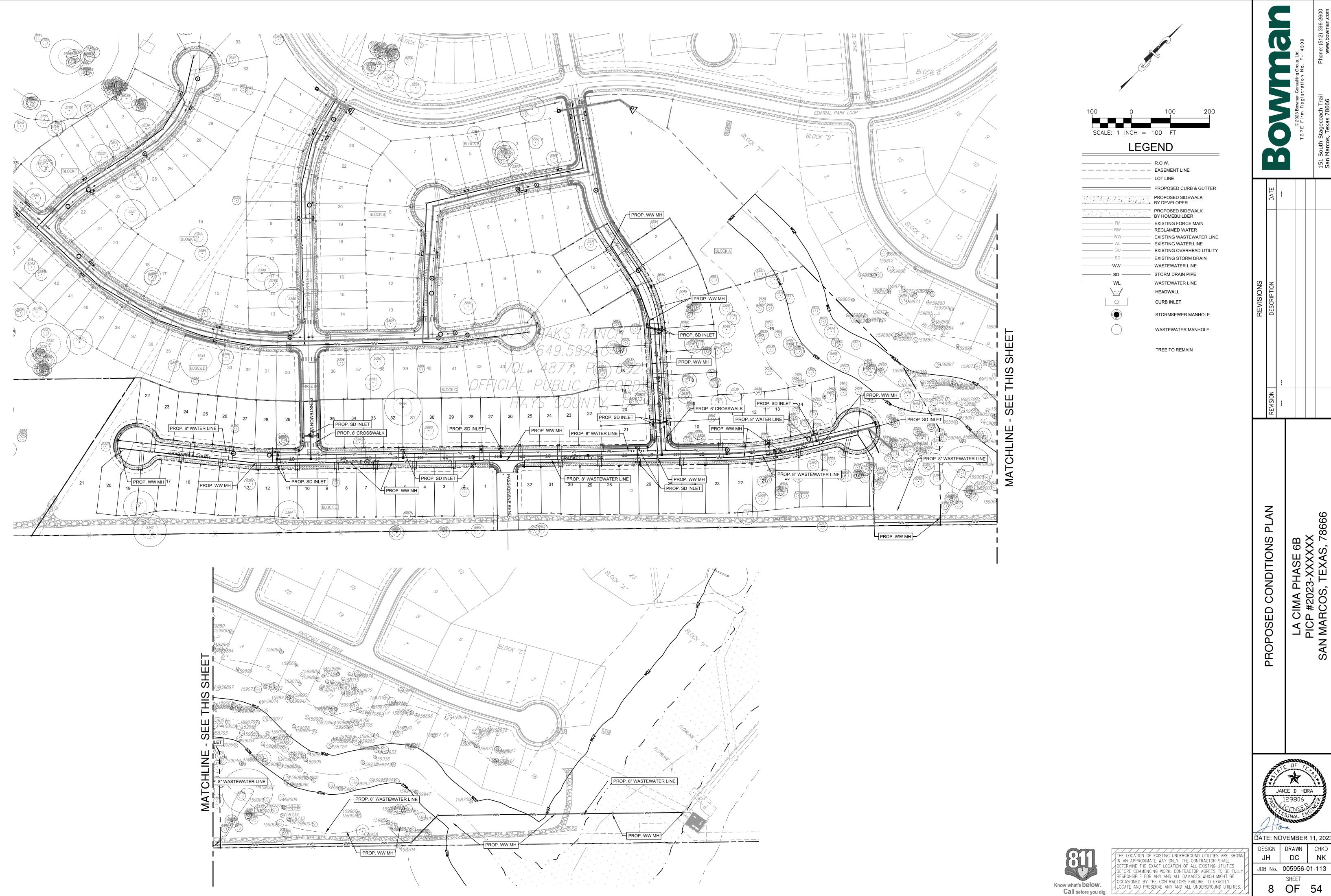
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JAMIE D. HORA DATE: NOVEMBER 11, 2023

DESIGN DRAWN DC NK JOB No. **005956-01-113** 

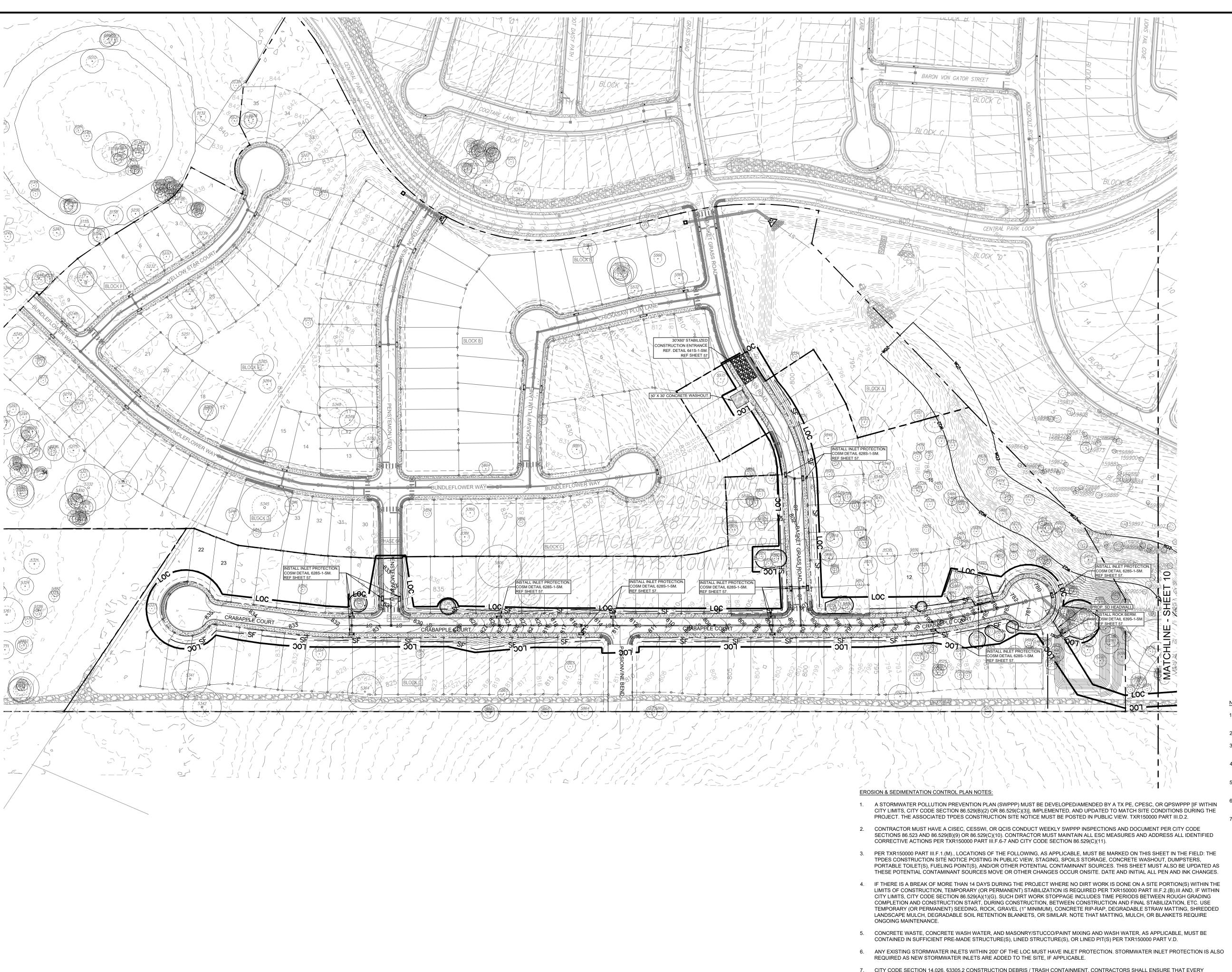
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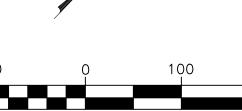


PRELIMINARY NOT FOR CONSTRUCTION

JOB No. **005956-01-113** SHEET 8 OF 54



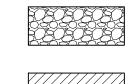




## **LEGEND**

SCALE: 1 INCH = 100 FT

	DRODOGED D O W
	PROPOSED R.O.W.
	PROPOSED LOT LINE
	EASEMENT LINE
	PROPOSED CURB & GUTTER
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
830	PROPOSED MAJOR CONTOU
	PROPOSED MINOR CONTOUR
LOC	LIMITS OF CONSTRUCTION
SFSF	PROPOSED SILT FENCE
	INLET PROTECTION



STAGING / SPOILS AREA

STABILIZED CONSTRUCTION



CONCRETE WASHOUT



PROPOSED ROCK BERM

	TREE PROTECTION		
SUMMARY OF EROSION & SEDIMENTATION CONTROL			
ITEM	QUANTITIES		

EROSION & SEDIMENTATION CONTROL				
ITEM	QUANTITIES			
SILT FENCE	3,765 LF			
ROCK BERM	30 LF			
NLET PROTECTION	16 EA			
TREE PROTECTION	1,581 LF			
CONCRETE WASHOUT	1 EA			
STABILIZED CONSTRUCTION ENTRANCE	1 EA			

LIMITS OF CONSTRUCTION = 7.729 AC. REFERENCE SEQUENCE OF CONSTRUCTION ON SHEET 4.

1. STOCK PILE AREA SHALL HAVE MAX SLOPE OF 3:1, AND THE MAXIMUM HEIGHT SHALL NOT EXCEED 8 FEET.

- 2. GRASS SEEDING SHALL BE TPDES REQUIREMENTS.
- 3. POND AND OTHER SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH SOIL RETENTION BLANKETS, OR EQUIVALENT BMP.
- 4. BACK OF CURB SILT FENCE MAY BE INSTALLED IN LIEU OF VEGETATING SINGLE FAMILY LOTS.
- 5. SILT FENCE MUST BE INSTALLED PERPENDICULAR TO THE DIRECTION OF FLOW, ELSE PROVIDE J-HOOKS AS SHOWN IN COSM DETAIL 642S-1-SM IN SHEET 39.
- SEE TREE LIST SHEET 6 AND EXISTING CONDITIONS SHEET 7 FOR TREES TO BE
- TREE PROTECTION SHALL BE A MINIMUM OF 4' HIGH, PLACED PER THE COSM DETAILS 610S-1-SM AND 610-2-SM.



Call before you dig.

CONSTRUCTION, REMODEL, REPAIR, OR RENOVATION SITE HAS A METHOD OF CONTAINMENT FOR CONSTRUCTION DEBRIS AND TRASH. THE CONTRACTOR SHALL ENSURE THAT CONSTRUCTION DEBRIS AND TRASH ARE REMOVED FROM THE SITE ON A REGULAR BASIS SO

FREE OF DIRT, MUD, ROCKS AND OTHER CONSTRUCTION DEBRIS AT ALL TIMES. DIRT, GRAVEL, ETC., SHALL NOT BE SWEPT, WASHED, OR

SITES AS SOON AS POSSIBLE. WHILE ONSITE, ALL PILES MUST BE MINIMIZED IN HEIGHT, VOLUME AND FOOTPRINT, AND IN NO CASE SHALL

PILES EXCEED EIGHT FEET IN HEIGHT. SEEDING OR COVERING OF UNDISTURBED PORTIONS OF SPOILS PILES IS REQUIRED IF THE PILES

CITY CODE SECTION 14.026, §3305.5 SPOILS PILES. ALL SPOILS PILES SHALL BE UTILIZED ON SITE OR REMOVED FROM CONSTRUCTION

WILL NOT BE INCREASED OR DECREASED FOR MORE THAN 14 CALENDAR DAYS, AS SPECIFIED IN TPDES CONSTRUCTION GENERAL

PERMIT, REGARDLESS OF THE SIZE OF THE SITE AND/OR PILE. IN NO CASE SHALL SITE AND/OR BUILDING FINAL INSPECTIONS BE

8. CITY CODE SECTION 14.026, §3305.4 STREET CLEANING. ADJACENT STREETS TO THE CONSTRUCTION SITE SHALL BE MAINTAINED AND

THAT THE SITE IS MAINTAINED IN A CLEAN, SANITARY, AND SAFE CONDITION AT ALL TIMES.

OTHERWISE DEPOSITED INTO UNPROTECTED STORM WATER CONVEYANCE SYSTEMS.

APPROVED UNTIL ALL SPOILS PILES HAVE BEEN REMOVED FROM CONSTRUCTION SITES.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES

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<b>G</b>	E D. HOR 29806 ENSE DNAL EN	W. C.
DATE: NOV	EMBER	11, 202

DESIGN DRAWN

DC

JOB No. **005956-01-113** 

SHEET

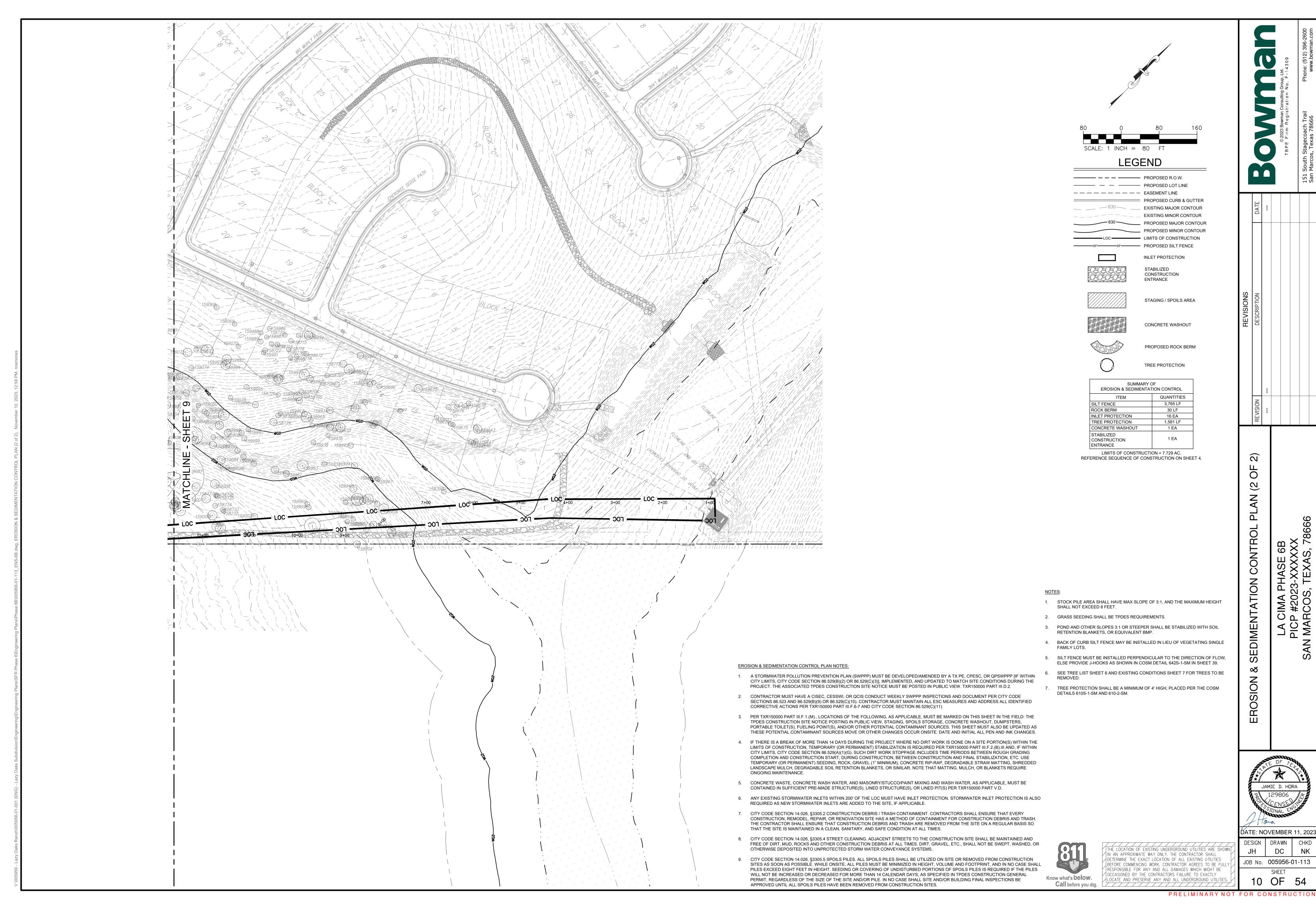
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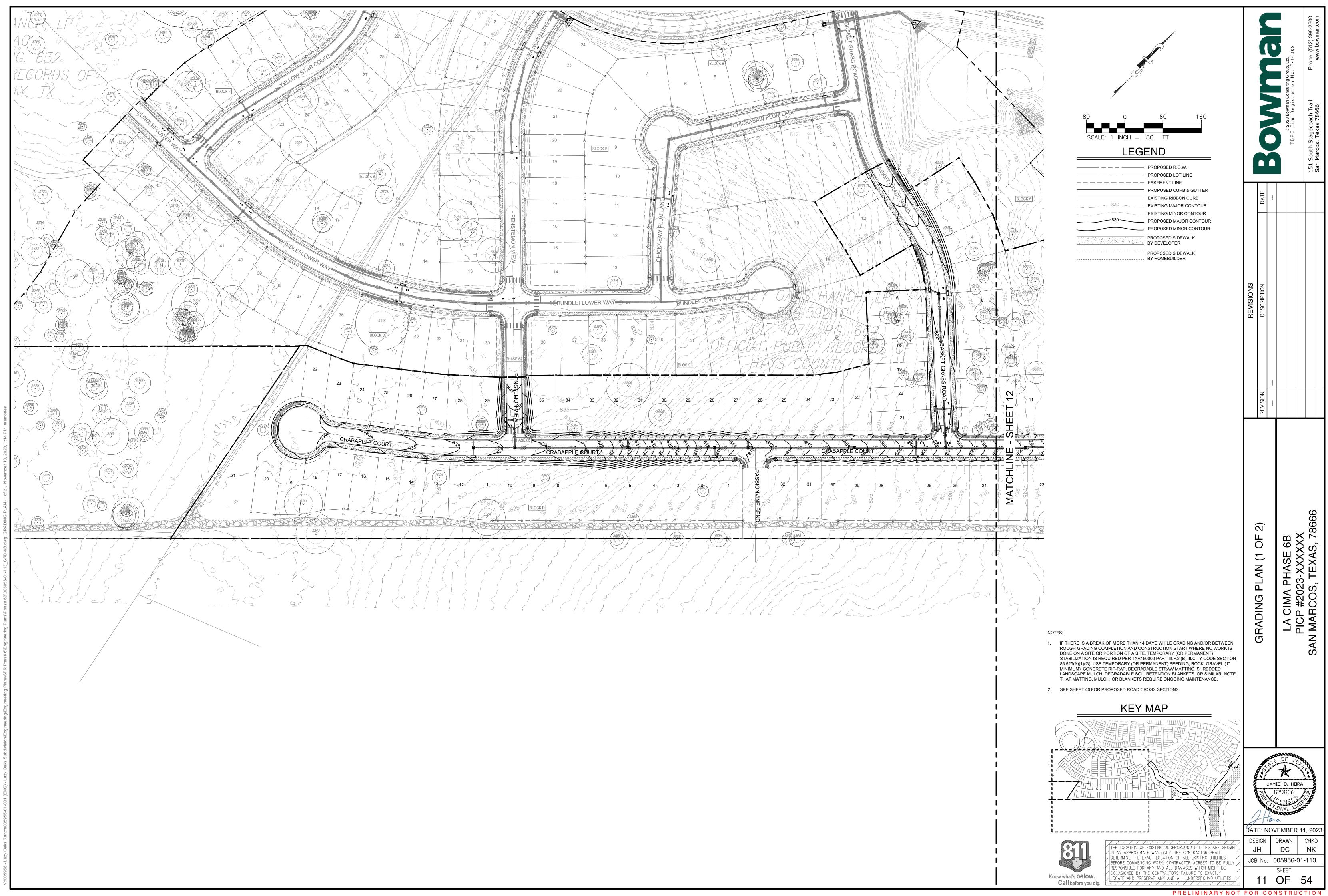
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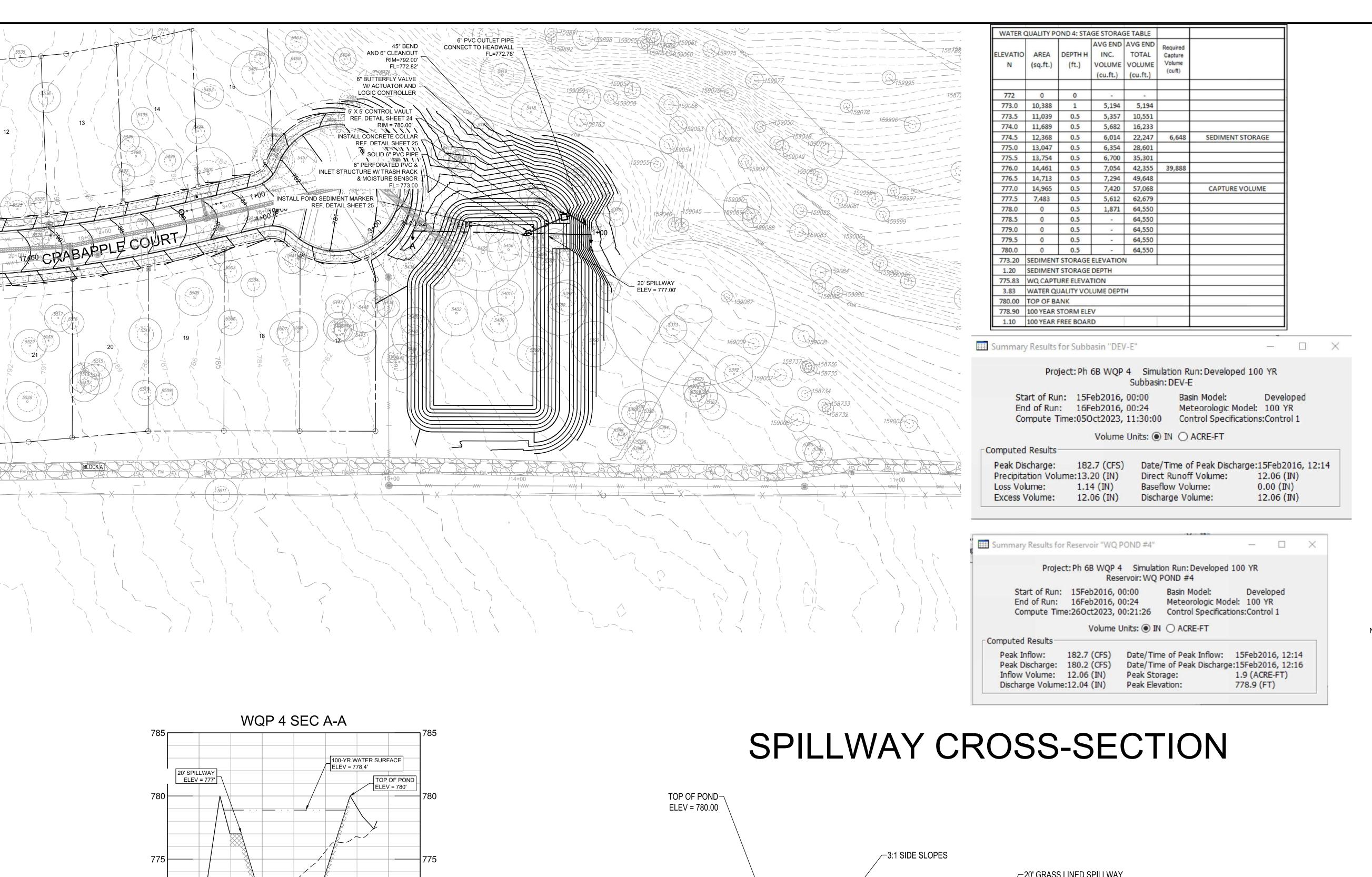
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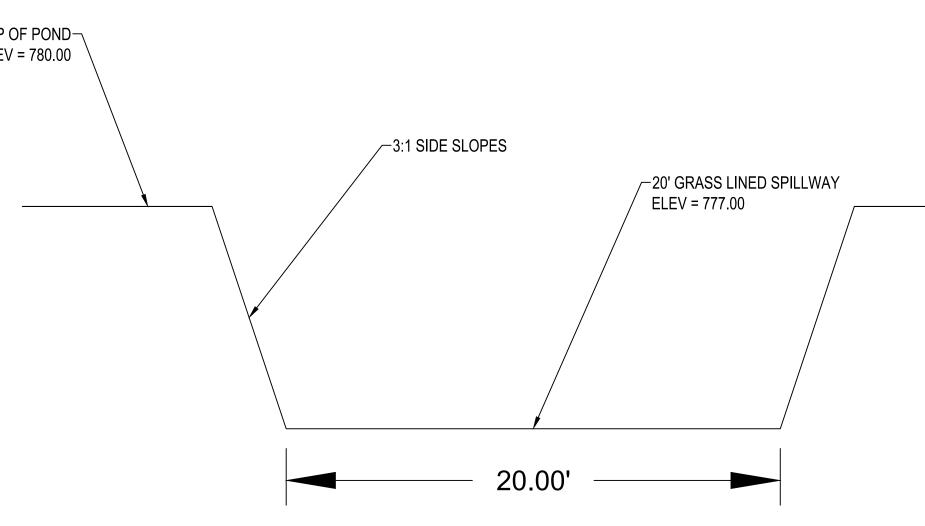
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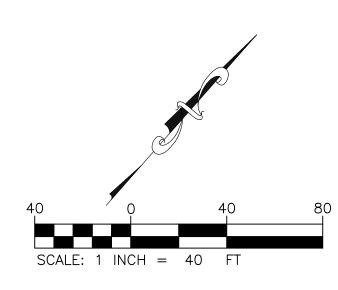
10 OF 54







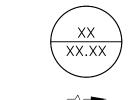




## LEGEND

- PROPERTY BOUNDARY

PROPOSED R.O.W.
PROPOSED LOT LINE
PROPOSED LOT LINE
PROPOSED CURB & GUTTER
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
PROPOSED MAJOR CONTOUR
PROPOSED MINOR CONTOUR
PROPOSED DRAINAGE AREA
TIME OF CONCENTRATION
BERM
SWALE



FLOW ARROW

HEADWALL

JUNCTION BOX

DRAINAGE AREA IDENTIFIER



CURB INLET

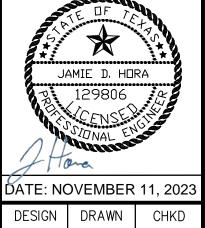
AREA INLET

NOTES

1. WATER QUALITY POND CONTROL PANEL SHALL BE A
2-KNOB SYSTEM: ONE, FOR THE VALVE WITH 3
SETTINGS: OPEN, CLOSED, AND AUTO, THE SECOND,
SHALL BE AN AUTO VALVE SETTING WITH TWO
SETTINGS: WATER QUALITY AND TEST MODE. THE
TEST MODE SHALL OPEN AND CLOSE THE VALVE ON A
1 MINUTE CYCLE. LIGHTS TO INDICATE THE VALVE IS
OPEN OR CLOSED SHOULD BE ADDED TO THE

- CONTROL PANEL.

  2. CONTRACTOR SHALL PROVIDE SUBMITTAL TO ENGINEER FOR WATER QUALITY POND CONTROL
- THE WATER QUALITY POND CONTROL PANEL SHALL ADHERE TO TCEQ REQUIREMENTS FOR BATCH



POND



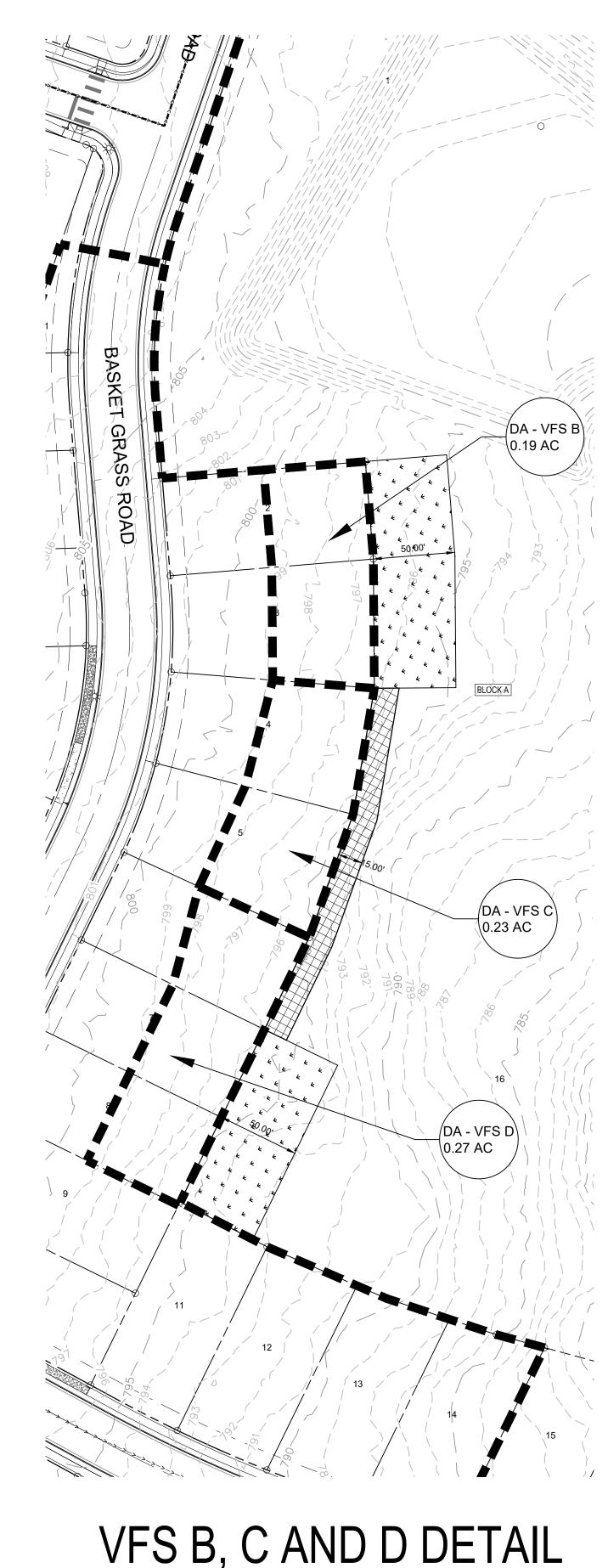
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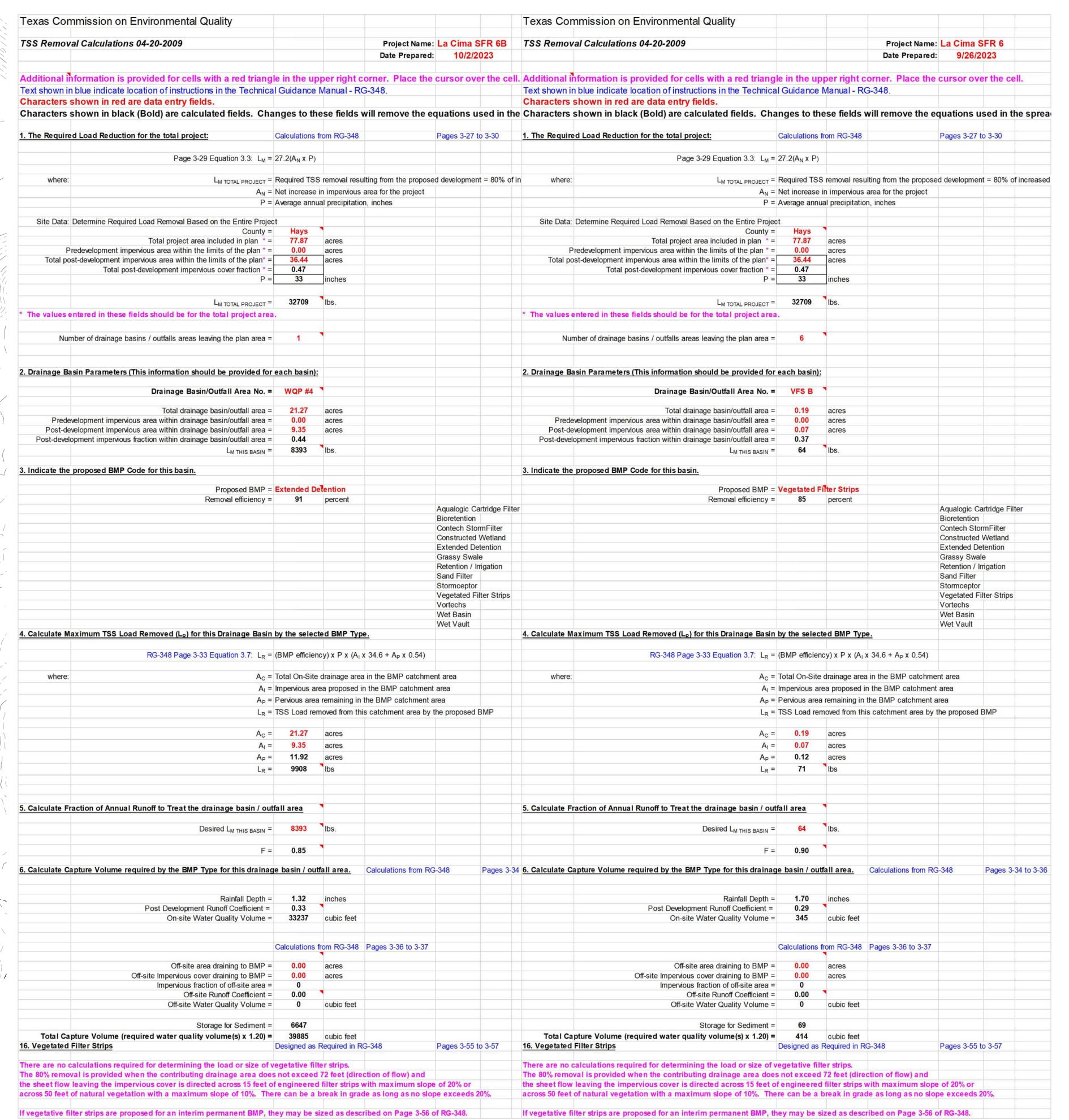
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JOB No. 005956-01-113

SHEET

21 OF 54

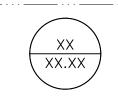






## LEGEND

PROPERTY BOUNDARY
PROPOSED R.O.W.
PROPOSED LOT LINE
EASEMENT LINE
PROPOSED CURB & GUTTER
EXISTING MAJOR CONTOUR
EXISTING MINOR CONTOUR
PROPOSED MAJOR CONTOUR
PROPOSED MINOR CONTOUR
PROPOSED DRAINAGE AREA
TIME OF CONCENTRATION



DRAINAGE AREA IDENTIFIER

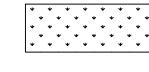
FLOW ARROW



HEADWALL
CURB INLET



AREA INLET
JUNCTION BOX

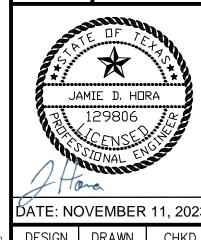


NATURAL VEGETATED FILTER STRIP



Know what's **below**.

ENGINEERED VEGETATED FILTER STRIP



CALCULATIONS

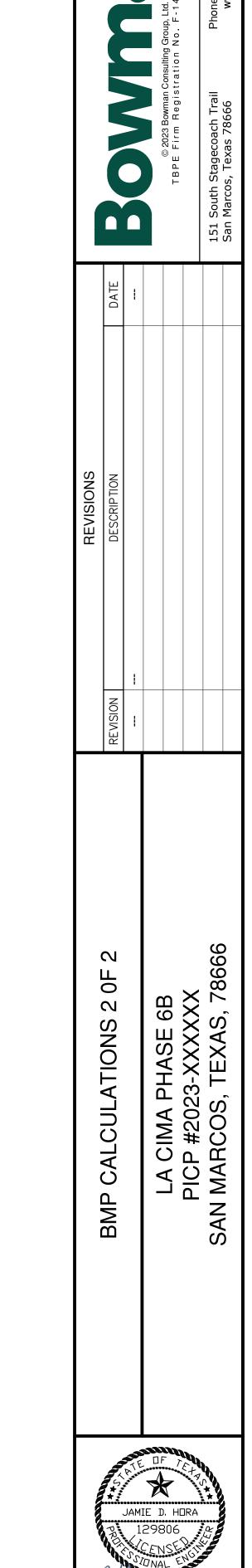
DETAIL

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

JH	DC	NK
JOB No.	005956-0	01-113
	SHEET	
22	OF	54

Texas Cor	nmission on Environmental Quality						
TSS Remov	al Calculations 04-20-2009			Project Name: Date Prepared:			
	nformation is provided for cells with a red triang				cursor ove	er the c	ell.
	<mark>shown in red are data entry fields.</mark> shown in black (Bold) are calculated fields.  Cha	anges to the	se fields	will remove the e	quations u	sed in t	he spre
	ed Load Reduction for the total project:	Calculations fr			Pages 3-27 to		12.50
		27 2/A × D					
	Page 3-29 Equation 3.3: L <sub>M</sub> =	SE 33					
where:	and the state of t		70 - 0.00 - 0.00 0 0 0 0 0 0 0 0 0 0 0 0	Ilting from the propose area for the project	d developmen	t = 80% (	of increas
		Average annua	STATE OF THE PARTY	CONTROL SECTION AND ADDRESS OF THE PROPERTY OF			
Site Data:	Determine Required Load Removal Based on the Entire Project						
	County =  Total project area included in plan * =		acres				
	redevelopment impervious area within the limits of the plan * = st-development impervious area within the limits of the plan* =		acres acres				
	Total post-development impervious cover fraction * = P =		inches				
The values	L <sub>M TOTAL PROJECT</sub> =  entered in these fields should be for the total project area		lbs.				
Nur	mber of drainage basins / outfalls areas leaving the plan area =	6					
. Drainage Ba	asin Parameters (This information should be provided for	each basin):					
	Drainage Basin/Outfall Area No. =	VFS C					
<u> </u>	Total drainage basin/outfall area =		acres				
Post-de	evelopment impervious area within drainage basin/outfall area = evelopment impervious area within drainage basin/outfall area =	0.07	acres				
Post-devel	opment impervious fraction within drainage basin/outfall area = $L_{M THIS BASIN}$ =	The second second	lbs.				
Indicate the	proposed BMP Code for this basin.						
. muicate the							
	Proposed BMP = Removal efficiency =	The Charles of the Ch	percent				
					Aqualogic Ca Bioretention		lter
					Contech Stor		
					Extended De Grassy Swale		
					Retention / In Sand Filter		
					Stormceptor		
					Vegetated Fill Vortechs	Iter Strips	
					Wet Basin Wet Vault		
. Calculate M	aximum TSS Load Removed (L <sub>R</sub> ) for this Drainage Basin	by the selecte	d BMP Typ	<u>e.</u>			
	RG-348 Page 3-33 Equation 3.7: L <sub>R</sub> =	(BMP efficience	y) x P x (A <sub>1</sub>	x 34.6 + A <sub>P</sub> x 0.54)			
where:	A <sub>C</sub> =	Total On-Site	drainage area	a in the BMP catchme	nt area		
			5.1 17	n the BMP catchment the BMP catchment a			
	20.5			is catchment area by t		ВМР	
	A <sub>C</sub> =	0.23	acres				
	A <sub>1</sub> =	0.07	acres				
	$A_P = L_R = L_R = L_R$		acres lbs				
. Calculate Fi	raction of Annual Runoff to Treat the drainage basin / out	tfall area					
	Desired L <sub>M THIS BASIN</sub> =	64	lbs.				
	F =	0.89					
. Calculate C	apture Volume required by the BMP Type for this drainag		all area.	Calculations from RG	G-348	Pages 3	-34 to 3-3
111							
	Rainfall Depth = Post Development Runoff Coefficient =	1.60 0.26	inches				
	On-site Water Quality Volume =		cubic feet				
		Calculations fr	om RG-348	Pages 3-36 to 3-37			
	Off-site area draining to BMP =		acres				
	Off-site Impervious cover draining to BMP = Impervious fraction of off-site area =	0	acres				
	Off-site Runoff Coefficient = Off-site Water Quality Volume =	0.00	cubic feet				
	Storage for Sediment =	70					
Total Ca 6. Vegetated	pture Volume (required water quality volume(s) x 1.20) =		cubic feet	G-348	Pages 3-55 to	0.3-57	
					, ages 0-00 (	5 5-51	
he 80% remo	calculations required for determining the load or size of val is provided when the contributing drainage area doe	s not exceed	72 feet (dire	Control of the contro			
	leaving the impervious cover is directed across 15 feet of natural vegetation with a maximum slope of 10%. The			the state of the s		20%.	
f vegetative fi	Iter strips are proposed for an interim permanent BMP, t	hey may be siz	zed as desc	ribed on Page 3-56 o	of RG-348.		
	•						

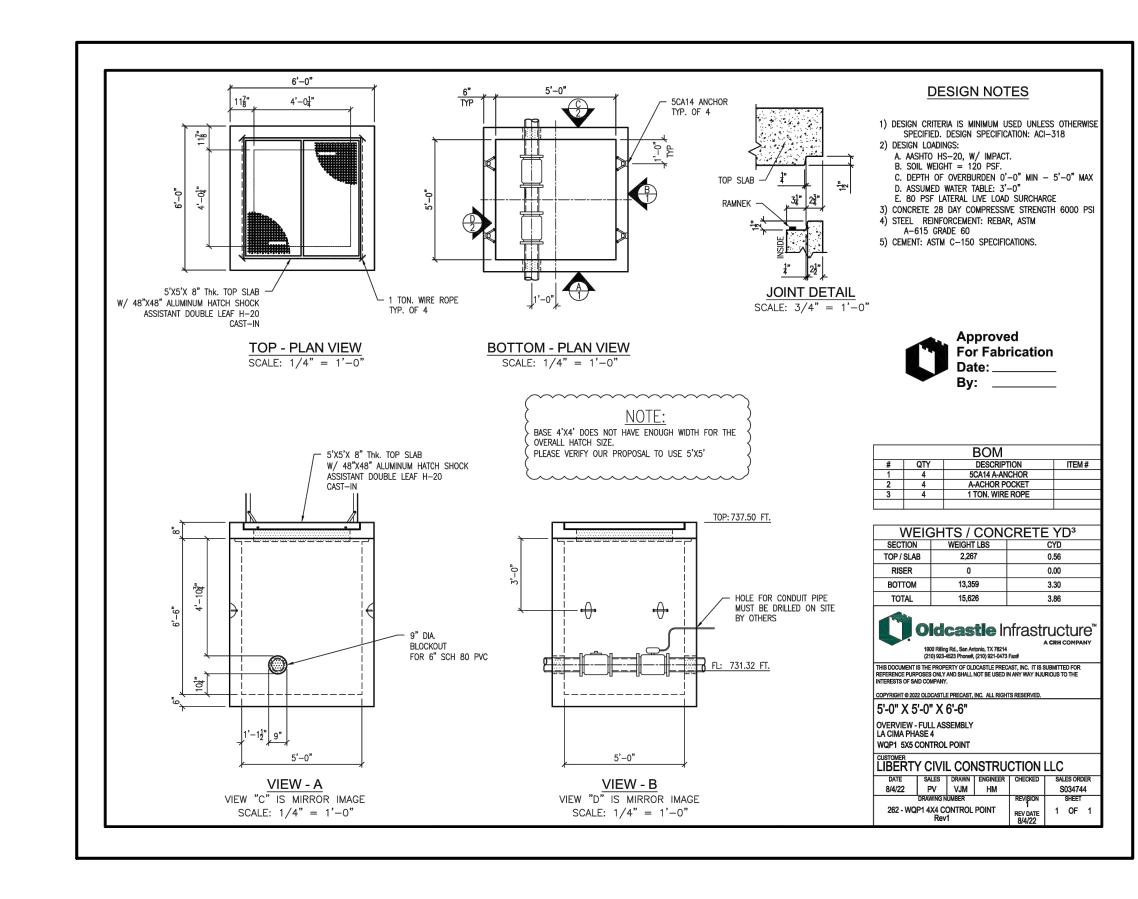
TSS Remov	al Calculations 04-20-2009			Project Name: Date Prepared:	THE RESERVE OF THE PARTY OF THE	
Additional i	nformation is provided for cells with a red triang	le in the up	per right c	orner. Place the	cursor ove	er the
Text shown in	n blue indicate location of instructions in the Technica					
	shown in red are data entry fields.	nace to the	sco fields	will romove the e	guations u	cod in
Cilaracters	shown in black (Bold) are calculated fields. Cha	inges to the	ese lielus	will remove the e	quations u	seu III
1. The Require	ed Load Reduction for the total project:	Calculations fi	rom RG-348		Pages 3-27 t	o 3-30
	Page 3-29 Equation 3.3: L <sub>M</sub> =	27 2(A., v D)				
	r age 3-29 Equation 3.3. E <sub>M</sub> =	21.2(AN X F)				
where:	(COMMON PROCESSION CONTRACTOR CON		203-1100-100-100-100-100-100-100-100-100-	Iting from the propose	d developmen	t = 80%
		Net increase i Average annua		area for the project		
			ar preorpitatio	ii, iiiones		
Site Data:	Determine Required Load Removal Based on the Entire Projection  County =					
	Total project area included in plan *=	77.87	acres			
	redevelopment impervious area within the limits of the plan * = st-development impervious area within the limits of the plan* =		acres			
	Total post-development impervious cover fraction * =	0.47				
	P =	33	inches			
	L <sub>M</sub> TOTAL PROJECT =	32709	lbs.			
* The values	entered in these fields should be for the total project area					
Nur	mber of drainage basins / outfalls areas leaving the plan area =	6				
2. Drainage Ba	asin Parameters (This information should be provided for	each basin):				
	Drainage Basin/Outfall Area No. =	VFS D				
Prede	Total drainage basin/outfall area = velopment impervious area within drainage basin/outfall area =		acres			
Post-de	velopment impervious area within drainage basin/outfall area =	0.11	acres			
Post-devel	opment impervious fraction within drainage basin/outfall area = $L_{M THIS BASIN}$ =	0202	lbs.			
	-M IIIS BASIN		135.			
3. Indicate the	proposed BMP Code for this basin.					
	Proposed BMP =	A CONTRACTOR OF THE PARTY OF TH	ter Strips			
	Removal efficiency =	85	percent		Aqualogic Ca	ntridae F
					Bioretention	1
					Contech Stor	
					Extended De	tention
					Grassy Swal Retention / Ir	
					Sand Filter	ilgation
					Stormceptor Vegetated Fi	lter Strin
					Vortechs	iter ottip
					Wet Basin Wet Vault	
4. Calculate M	aximum TSS Load Removed (L <sub>R</sub> ) for this Drainage Basin	by the select	ed BMP Typ	<u>e.</u>	.,,	
	RG-348 Page 3-33 Equation 3.7: L <sub>R</sub> =	(PMD officient	WY D v (A	× 34.6 ± A × 0.54)		
	NG-546 Page 5-55 Equation 5.7. ER =	(DIVIF ellicient	2y) X F X (A)	X 34.0 + Ap X 0.34)		
where:				in the BMP catchme		
				n the BMP catchment		
			25.0	the BMP catchment a s catchment area by t		BMP
	A <sub>C</sub> =		acres			
	$A_{l} = A_{p} = A_{p}$	Section Page	acres			
	L <sub>R</sub> =	318198	lbs			
5. Calculate Fi	raction of Annual Runoff to Treat the drainage basin / out	fall area	1			
		96	lbs.			
	Desired Ly 700 pages =		0.00000			
	Desired L <sub>M THIS BASIN</sub> =	TOO.ST	_			
	Desired L <sub>M THIS BASIN</sub> =					Pages
		0.90	fall area.	Calculations from RG	G-348	
	F =	0.90	fall area.	Calculations from RG	5-348	
	F =	0.90 ge basin / out	fall area.	Calculations from RG	G-348	
	F =  apture Volume required by the BMP Type for this drainag  Rainfall Depth =  Post Development Runoff Coefficient =	0.90 ge basin / outf	inches	Calculations from RG	3-348	
	F =  apture Volume required by the BMP Type for this drainag  Rainfall Depth =	0.90 ge basin / outf		Calculations from RG	3-348	
	F =  apture Volume required by the BMP Type for this drainag  Rainfall Depth =  Post Development Runoff Coefficient =	0.90 ge basin / outf 1.70 0.31 508	inches cubic feet		3-348	
	F =  apture Volume required by the BMP Type for this drainag  Rainfall Depth =  Post Development Runoff Coefficient =	0.90 ge basin / outf	inches cubic feet		3-348	
	F =  apture Volume required by the BMP Type for this drainag  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =	0.90  1.70 0.31 508  Calculations f	inches cubic feet rom RG-348 acres		G-348	
	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site area draining to BMP =  Off-site Impervious cover draining to BMP =	0.90  1.70 0.31 508  Calculations for 0.00 0.00	inches cubic feet rom RG-348		G-348	
	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site area draining to BMP =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =	0.90  1.70 0.31 508  Calculations fi 0.00 0.00 0.00	inches cubic feet rom RG-348 acres acres		G-348	
	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site area draining to BMP =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =	0.90  1.70 0.31 508  Calculations fi 0.00 0.00 0.00	inches cubic feet rom RG-348 acres		3-348	
	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site area draining to BMP =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =	0.90  1.70 0.31 508  Calculations fi  0.00 0.00 0 0.00 0	inches cubic feet rom RG-348 acres acres		G-348	
6. Calculate C	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =  Off-site Water Quality Volume =  Storage for Sediment =  pture Volume (required water quality volume(s) x 1.20) =	0.90  1.70 0.31 508  Calculations fi  0.00 0.00 0 102 610	inches  cubic feet  rom RG-348  acres  acres  cubic feet	Pages 3-36 to 3-37		
6. Calculate C	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =  Off-site Water Quality Volume =  Storage for Sediment =  pture Volume (required water quality volume(s) x 1.20) =	0.90  1.70 0.31 508  Calculations fi 0.00 0.00 0 0.00 0 102	inches  cubic feet  rom RG-348  acres  acres  cubic feet	Pages 3-36 to 3-37	Pages 3-55 t	o 3-57
Total Ca 16. Vegetated There are no o	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =  Off-site Water Quality Volume =  Storage for Sediment =  pture Volume (required water quality volume(s) x 1.20) =  Filter Strips  Calculations required for determining the load or size of volume in the size of volume	0.90  1.70 0.31 508  Calculations fi 0.00 0.00 0 102 610 Designed as F	inches  cubic feet  rom RG-348  acres  cubic feet  cubic feet  cubic feet  Required in R	Pages 3-36 to 3-37  G-348		o 3-57
Total Ca 16. Vegetated There are no o	F =  apture Volume required by the BMP Type for this drainage  Rainfall Depth =  Post Development Runoff Coefficient =  On-site Water Quality Volume =  Off-site Impervious cover draining to BMP =  Impervious fraction of off-site area =  Off-site Runoff Coefficient =  Off-site Water Quality Volume =  Storage for Sediment =  pture Volume (required water quality volume(s) x 1.20) =  Filter Strips	0.90  1.70 0.31 508  Calculations fi 0.00 0.00 0 102 610 Designed as First exceed	inches  cubic feet  rom RG-348  acres  acres  cubic feet  cubic feet  Required in R  er strips.  72 feet (dire	Pages 3-36 to 3-37  G-348  ction of flow) and	Pages 3-55 t	o 3-57

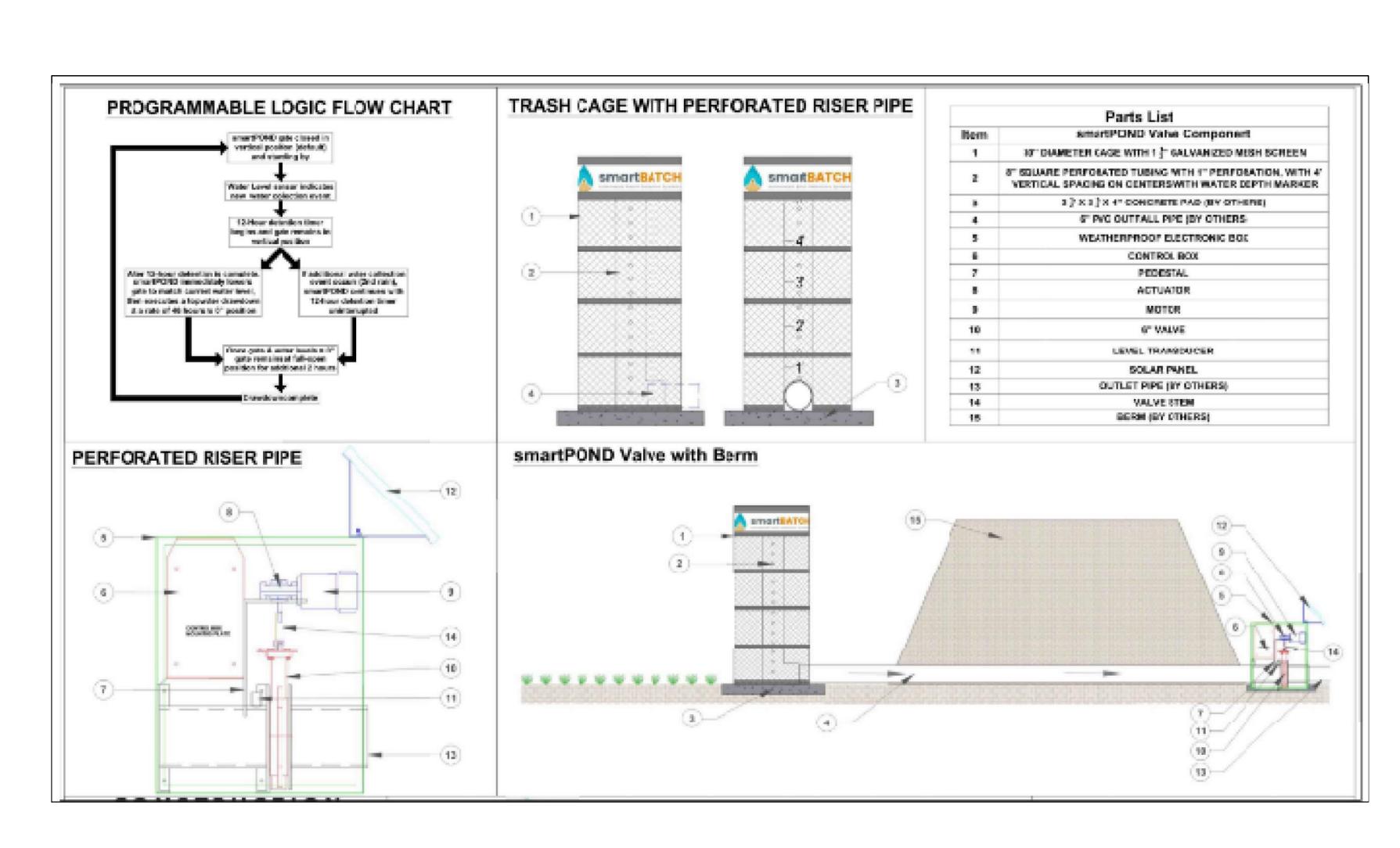


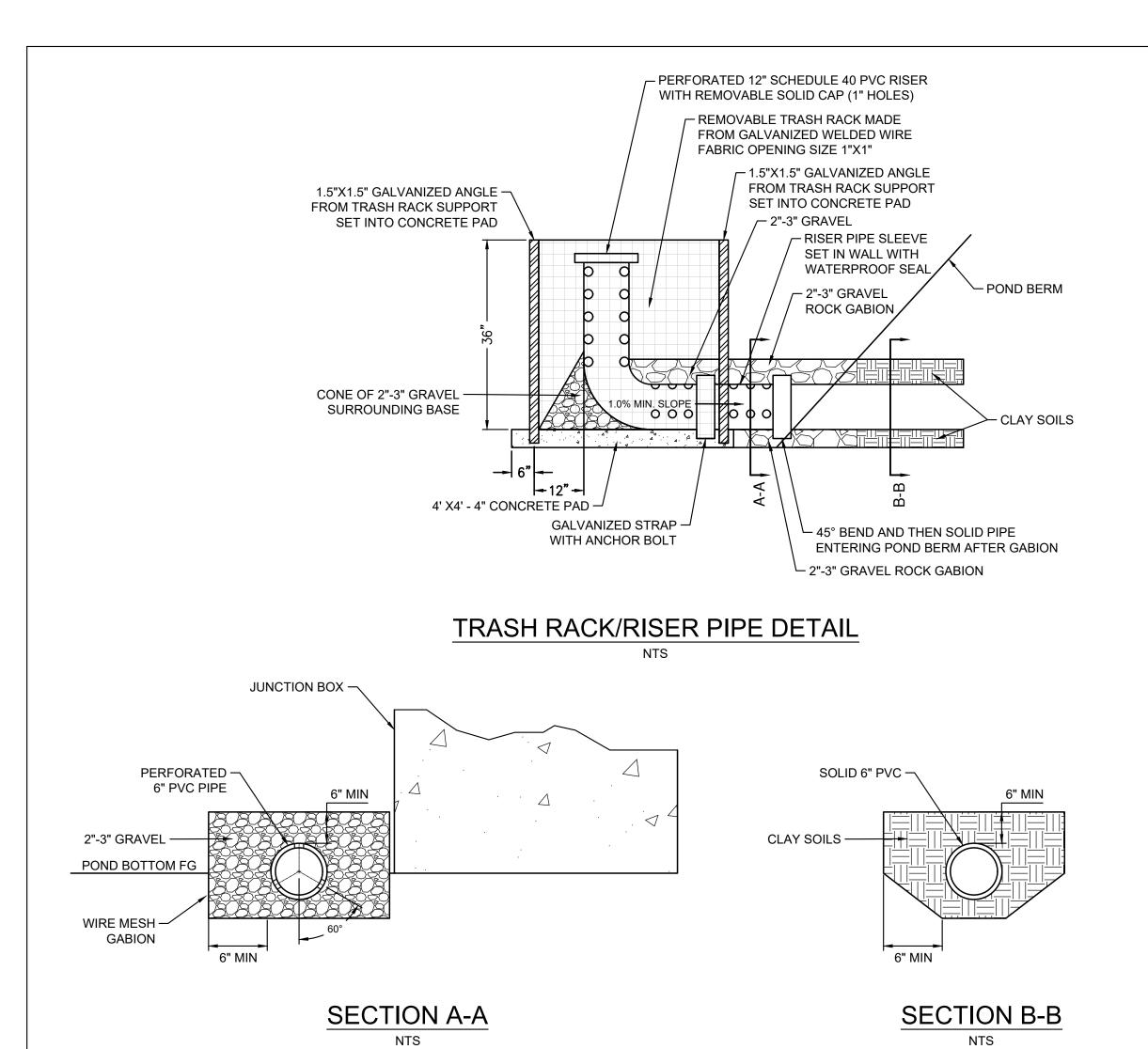


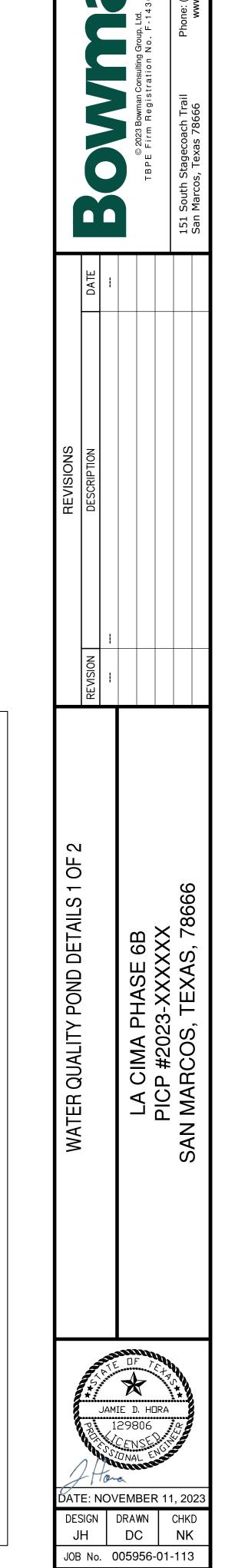
THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

DATE: NOVEMBER 11, 2023 DESIGN DRAWN CHKD DC NK JOB No. **005956-01-113** SHEET 23 OF 54

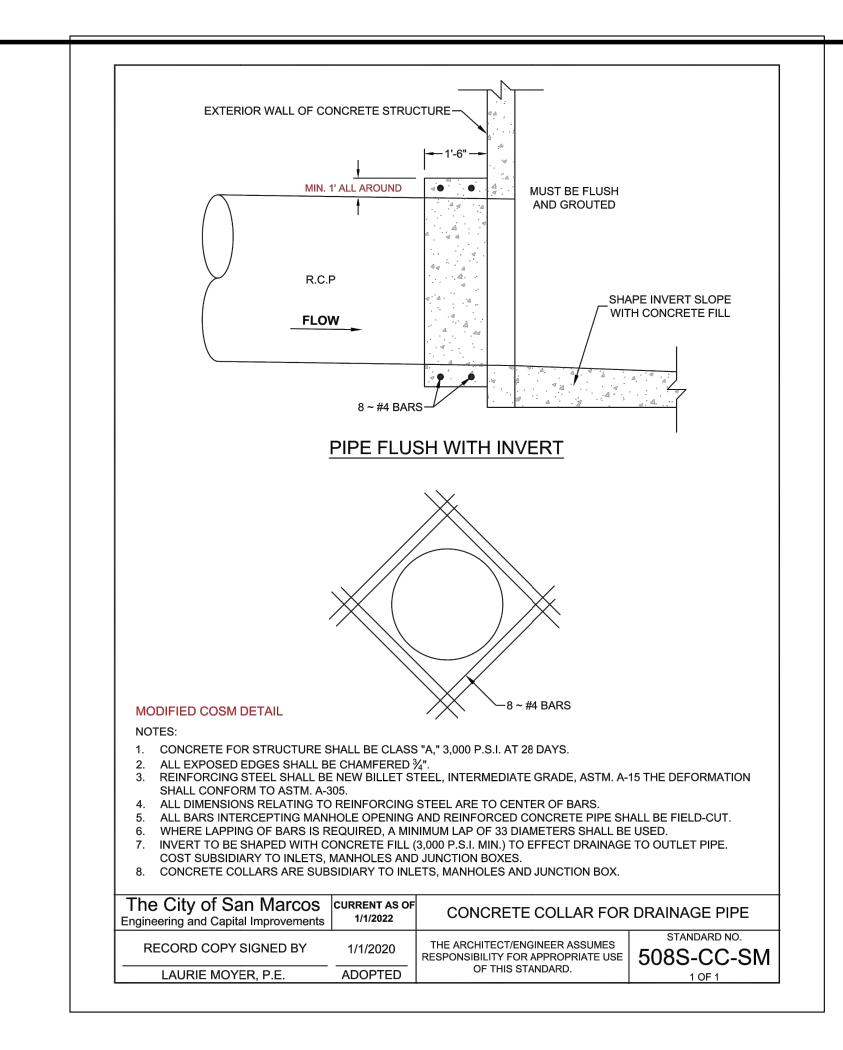


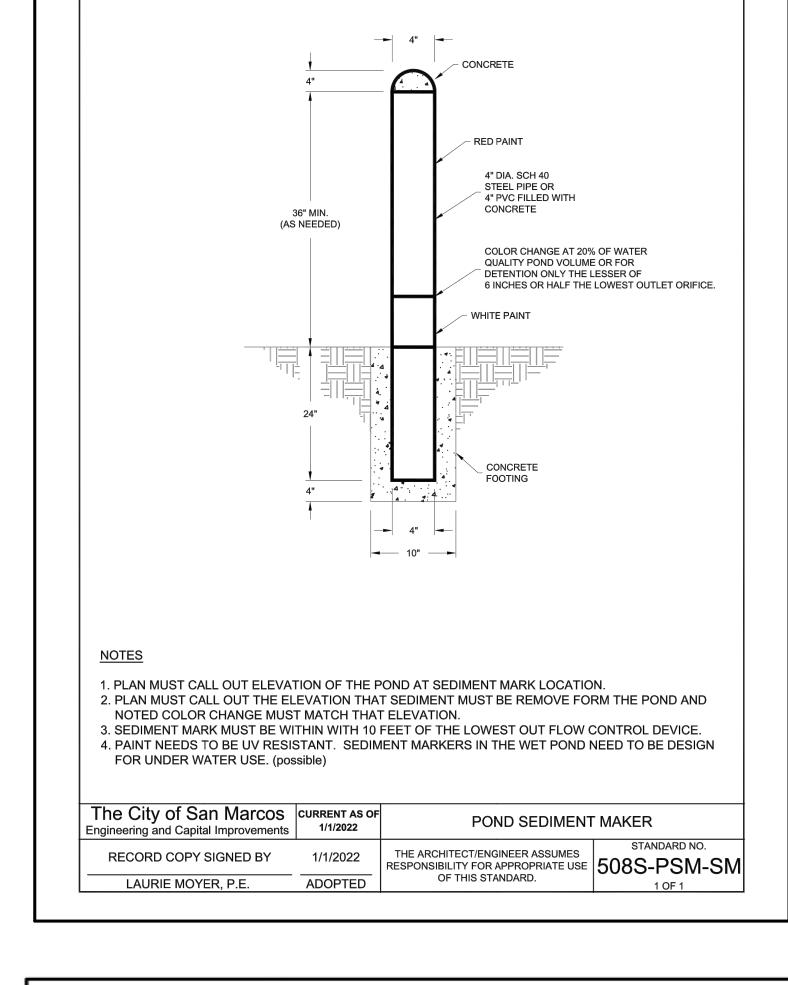






SHEET





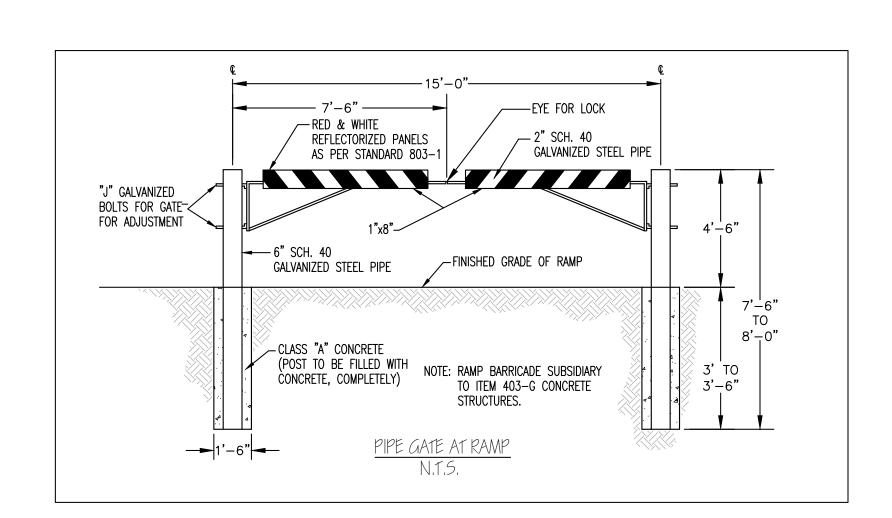
## Clay Liner specification:

Clay liners to be a minimum 12" thick (compacted). Clay to meet the following minimum requirements;

## Table 3-6 Clay Liner Specifications (COA, 2004)

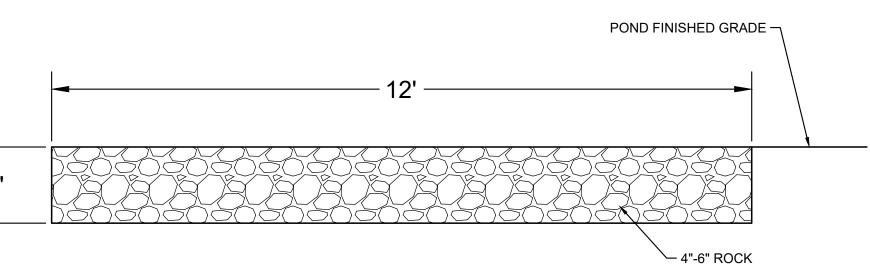
Property	Test Method	Unit	Specification
Permeability	ASTM D-2434	cm/sec	1 x 10 <sup>-6</sup>
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor
			Density

## **CLAY POND LINER - SPECIFICATION**



## NOTES:

- 1. POND VALVE AND CONTROLS SHALL BE SMARTPOND AUTOMATED DETENTION SYSTEM SYSTEM AS MANUFACTURED BY CONVERCENT WATER TECHNOLOGIES OR APPROVED EQUAL.
- 2. VALVE AND CONTROLS SYSTEM
  - 2.1. SHALL INCLUDE PERFORATED RISER AND TRASH CAGE.
  - 2.2. SHALL BE 12 VDC WITH SOLAR CHARGED 12 VDC BATTERY.
  - 2.3. ALL WIRING SHALL BE INSTALLED IN CONDUIT AND BURIED. CONTACT ENGINEER FOR ADDITIONAL CONTROLLER SCHEMATICS.
  - 2.4. CONTRACTOR SHALL TEST AND VERIFY POND IS FUNCTIONING AS DESIGNED PRIOR TO ACCEPTANCE CONTRACTOR SHALL SUBMIT LIST OF CONTROL PANEL COMPONENTS AND OPERATIONS MANUAL TO ENGINEER.
- 3. CONTRACTOR SHALL PROVIDE SUBMITTAL TO ENGINEER FOR WATER QUALITY POND
- CONTROL PANEL.
- 4. THE WATER QUALITY POND CONTROL PANEL SHALL ADHERE TO TCEQ REQUIREMENTS FOR BATCH DETENTION.



12' MAINTENANCE ACCESS RAMP

DATE: NOVEMBER 11, 2023

DESIGN DRAWN CHKD

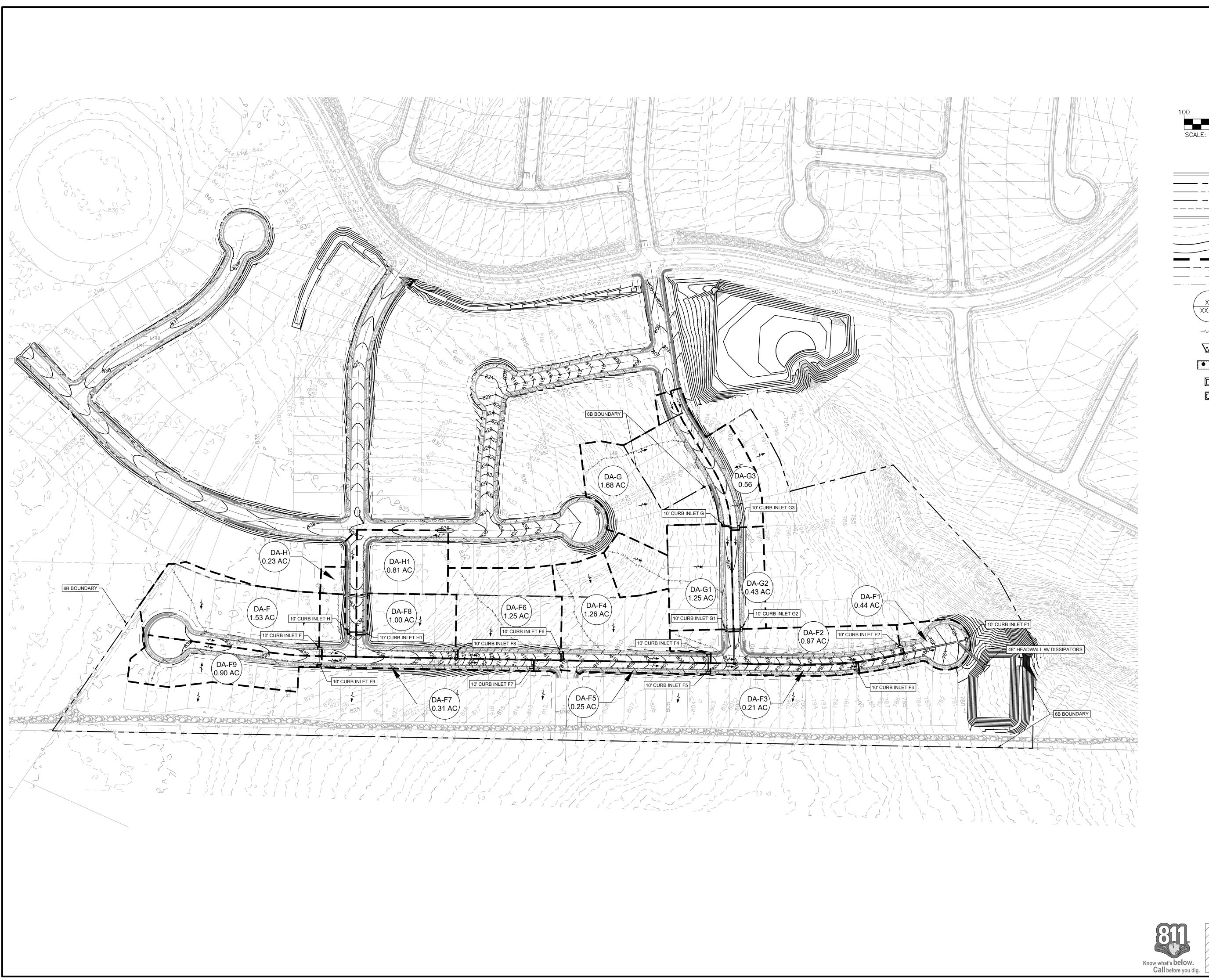
JH DC NK

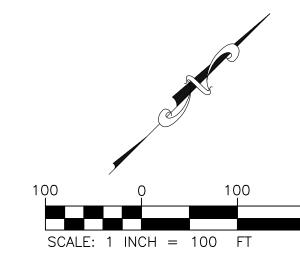
JOB No. 005956-01-113

SHEET

POND DETAILS

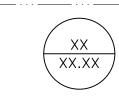
WATER QUALITY





## LEGEND

	PROPERTY BOUNDARY
	PROPOSED R.O.W.
	PROPOSED LOT LINE
	EASEMENT LINE
	PROPOSED CURB & GUTTER
830	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
830 —	PROPOSED MAJOR CONTOU
	PROPOSED MINOR CONTOU
	PROPOSED DRAINAGE AREA
<del></del>	TIME OF CONCENTRATION
	BERM
	014141 =



DRAINAGE AREA IDENTIFIER





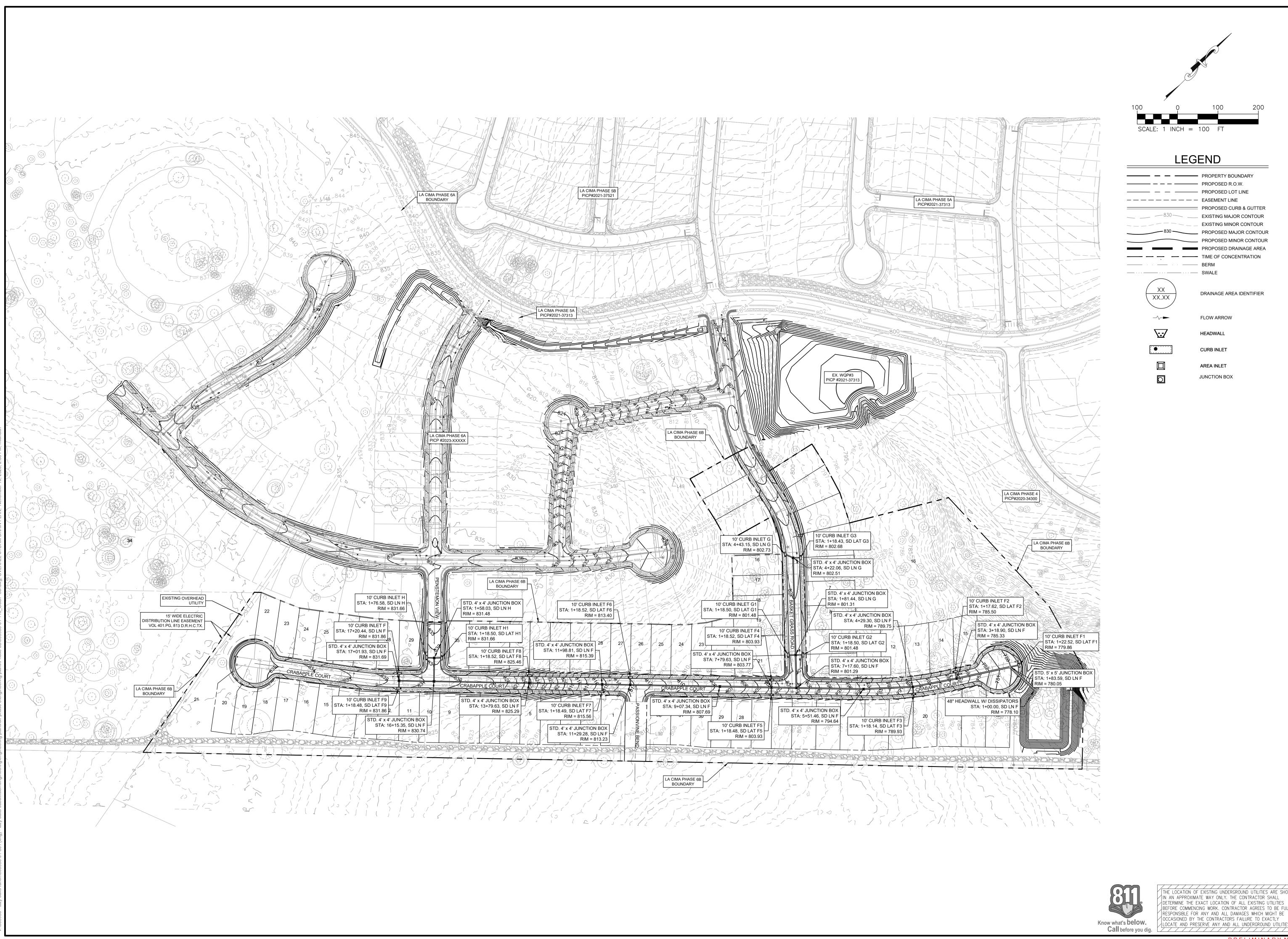


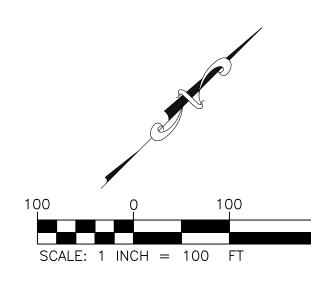
AREA INLET JUNCTION BOX

REVISIONS	DESCRIPTION	1			
	REVISION	-			

DATE: NOVEMBER 11, 2023 THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

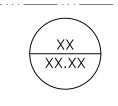
DESIGN DRAWN CHKD DC NK JOB No. **005956-01-113** SHEET 26 OF 54





## **LEGEND**

	PROPERTY BOUNDARY
	PROPOSED R.O.W.
	PROPOSED LOT LINE
	EASEMENT LINE
	PROPOSED CURB & GUTTER
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
830	PROPOSED MAJOR CONTOL
	PROPOSED MINOR CONTOU
	PROPOSED DRAINAGE AREA
<del></del>	TIME OF CONCENTRATION
	BERM



DRAINAGE AREA IDENTIFIER



FLOW ARROW

HEADWALL

**CURB INLET** 

AREA INLET JUNCTION BOX

DRAIN

STORM

OVERALL

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES
BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY

DATE: NOVEMBER 11, 2023 DESIGN DRAWN DC JOB No. **005956-01-113** SHEET 27 OF 54

			L	A CIMA PH	6B Impervi	ous Cover Calcu	lations			
Drainage Area Basin	Area (sf)	Area (ac)	Area (sq mi)	Lot Max Impervious Cover (%)	Roof/Lot Impervious Cover (sf)	Sidewalks and Driveways - ROW Concrete (sf)	Roadway - Asphalt (sf)	Open Area - Grass (sf)	Impervious Cover (sf)	Impervious Cover (%)
DA-F	66,574	1.53	0.0024	50%	44,180	2,281	9,404	10,709	55,865	84%
DA-F9	39,181	0.90	0.0014	50%	25,370	2,290	9,443	2,078	37,103	95%
DA-F7	13,400	0.31	0.0005	50%	0	2,565	8,549	2,286	11,115	83%
DA-F8	43,585	1.00	0.0016	50%	33,476	1,751	6,949	1,408	42,176	97%
DA-F6	54,439	1.25	0.0020	50%	47,809	1,250	4,255	1,126	53,313	98%
DA-F5	11,055	0.25	0.0004	50%	0	1,841	7,544	1,669	9,385	85%
DA-F4	54,779	1.26	0.0020	50%	45,471	1,775	5,951	1,582	53,196	97%
DA-G	54,284	1.25	0.0019	50%	31,224	1,248	4,254	17,559	36,725	68%
DA-G1	73,181	1.68	0.0026	50%	47,395	1,715	6,050	18,022	55,159	75%
DA-G3	24,340	0.56	0.0009	50%	14,612	1,825	6,246	1,656	22,684	93%
DA-H	9,937	0.23	0.0004	50%	3,758	1,093	4,141	945	8,992	90%
DA-H1	35,318	0.81	0.0013	50%	23,646	2,142	7,750	1,780	33,538	95%
DA-F1	19,365	0.44	0.0007	50%	2,753	2,585	11,691	2,336	17,029	88%
DA-F2	42,378	0.97	0.0015	50%	28,197	2,618	10,056	1,507	40,871	96%
DA-F3	9,315	0.21	0.0003	50%	0	1,775	5,960	1,581	7,735	83%
DA-G2	18,579	0.43	0.0007	50%	12,200	1,205	4,091	1,083	17,495	94%

				LA CI	MA PH 6	4 Inlet Calcula	ations - 100 Y	ear Storm				
Inlet ID	Drainage Area	Inlet Type	Length of Inlet (ft)	Long. Slope (%)	Q100 (cfs)	Peak Flow Including Bypass	Peak Flow Intercepted by Inlet	Peak Flow Bypassing Inlet	Inlet Accepting Bypass Flow	Depth in Gutter (ft)	Ponding Width (ft)	Inlet Efficiency
F	DA-F	ON GRADE	10.00	1.10%	11.15	4.12	7.02	0.00	_	1.80	57.60	100%
F9	DA-F9	ON GRADE	10.00	1.10%	8.24	2.31	5.93	0.00	_	1.87	59.84	100%
F7	DA-F7	ON GRADE	10.00	6.00%	2.82	1.86	3.56	0.00	F9	0.72	23.04	100%
F8	DA-F8	ON GRADE	10.00	6.00%	11.48	14.63	7.15	7.48	F	1.45	46.40	49%
F6	DA-F6	ON GRADE	10.00	2.50%	16.63	22.99	10.41	12.58	F8	1.84	58.88	45%
F5	DA-F5	ON GRADE	10.00	2.50%	3.26	1.59	4.30	0.00	F7	2.11	67.52	100%
F4	DA-F4	ON GRADE	10.00	2.50%	16.22	27.55	11.15	16.40	F2	2.11	67.52	40%
G	DA-G	ON GRADE	10.00	0.50%	13.38	4.51	8.87	0.00	-	1.37	43.84	100%
G1	DA-G1	ON GRADE	10.00	0.50%	19.36	11.85	12.13	0.00	G	1.54	49.28	100%
G3	DA-G3	ON GRADE	10.00	0.50%	7.72	1.32	6.40	0.00		1.07	34.24	100%
Н	DA-H	ON GRADE	10.00	2.50%	2.74	0.14	2.60	0.00	_	1.77	56.64	100%
H1	DA-H1	ON GRADE	10.00	2.50%	11.28	5.16	2.60	2.56	_	1.33	42.56	50%
F1	DA-F1	ON GRADE	10.00	0.50%	5.87	23.12	15.43	7.69	F2	1.61	51.52	67%
F2	DA-F2	ON GRADE	10.00	4.00%	12.04	28.80	10.16	18.64	F4	1.19	38.08	35%
F3	DA-F3	ON GRADE	10.00	4.00%	2.71	10.20	6.90	3.30	F5	1.64	52.48	68%
G2	DA-G2	ON GRADE	10.00	0.50%	4.17	0.29	4.80	0.00	G3	1.23	39.36	100%

	LA CIMA PH 6B Developed Conditions C-Values													
Drainage Area Basin	Total Area (sf)	Concrete/Roof (sf) Including Sidewalk		Asp	Asphalt		Grass: (Condition and %)		Composite C-Values					
		Area (sf)	%	Area (sf)	%	Area (sf)	%	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr	500-yr
DA-F	66,574	46,461	70%	9,404	14%	10,709	16%	0.67	0.72	0.75	0.80	0.84	0.89	0.93
DA-F9	39,181	27,660	71%	9,443	24%	2,078	5%	0.72	0.77	0.80	0.85	0.89	0.94	0.98
DA-F7	13,400	2,565	19%	8,549	64%	2,286	17%	0.66	0.70	0.74	0.78	0.82	0.87	0.92
DA-F8	43,585	35,228	81%	6,949	16%	1,408	3%	0.73	0.78	0.81	0.86	0.90	0.95	0.99
DA-F6	54,439	49,059	90%	4,255	8%	1,126	2%	0.74	0.79	0.82	0.87	0.91	0.96	0.99
DA-F5	11,055	1,841	17%	7,544	68%	1,669	15%	0.67	0.71	0.74	0.79	0.83	0.88	0.93
DA-F4	54,779	47,246	86%	5,951	11%	1,582	3%	0.73	0.78	0.81	0.86	0.90	0.95	0.99
DA-G	54,284	32,471	60%	4,254	8%	17,559	32%	0.60	0.64	0.67	0.72	0.76	0.80	0.86
DA-G1	73,181	49,110	67%	6,050	8%	18,022	25%	0.64	0.68	0.71	0.76	0.80	0.84	0.89
DA-G3	24,340	16,437	68%	6,246	26%	1,656	7%	0.71	0.76	0.79	0.84	0.88	0.93	0.97
DA-H	9,937	4,851	49%	4,141	42%	945	10%	0.70	0.74	0.78	0.83	0.86	0.91	0.96
DA-H1	35,318	25,788	73%	7,750	22%	1,780	5%	0.72	0.77	0.80	0.85	0.89	0.94	0.98
DA-F1	19,365	5,338	28%	11,691	60%	2,336	12%	0.68	0.72	0.76	0.81	0.85	0.90	0.95
DA-F2	42,378	30,814	73%	10,056	24%	1,507	4%	0.73	0.78	0.81	0.86	0.90	0.95	0.98
DA-F3	9,315	1,775	19%	5,960	64%	1,581	17%	0.66	0.70	0.74	0.78	0.82	0.87	0.93
DA-G2	18,579	13,404	72%	4,091	22%	1,083	6%	0.72	0.77	0.80	0.85	0.89	0.94	0.97

	LA CIMA PH 6B Inlet Calculations - 25 Year Storm											
Inlet ID	Drainage Area	Inlet Type	Length of Inlet (ft)	Long. Slope (%)	Q25 (cfs)	Peak Flow Including Bypass	Peak Flow Intercepted by Inlet	Peak Flow Bypassing Inlet	Inlet Accepting Bypass Flow	Depth in Gutter (ft)	Ponding Width (ft)	Inlet Efficiency
F	DA-F	ON GRADE	10.00	1.10%	8.74	2.61	6.13	0.00	_	1.64	52.48	100%
F9	DA-F9	ON GRADE	10.00	1.10%	6.48	1.34	5.14	0.00	-	1.70	54.40	100%
F7	DA-F7	ON GRADE	10.00	6.00%	2.21	0.82	2.84	0.00	F9	0.64	20.48	100%
F8	DA-F8	ON GRADE	10.00	6.00%	8.98	9.51	6.11	3.40	F	0.96	30.72	64%
F6	DA-F6	ON GRADE	10.00	2.50%	12.94	14.92	8.86	6.06	F8	1.45	46.40	59%
F5	DA-F5	ON GRADE	10.00	2.50%	2.53	0.47	3.21	0.00	F7	1.79	57.28	100%
F4	DA-F4	ON GRADE	10.00	2.50%	12.63	17.79	9.45	8.34	F2	1.85	59.20	53%
G	DA-G	ON GRADE	10.00	0.50%	10.43	2.74	7.69	0.00	-	1.27	40.64	100%
G1	DA-G1	ON GRADE	10.00	0.50%	15.07	7.48	10.40	0.00	G	1.23	39.36	100%
G3	DA-G3	ON GRADE	10.00	0.50%	5.98	0.58	5.40	0.00	_	0.90	28.80	100%
Н	DA-H	ON GRADE	10.00	2.50%	2.14	0.02	2.12	0.00	-	1.50	48.00	100%
H1	DA-H1	ON GRADE	10.00	2.50%	8.74	3.39	5.35	0.00	-	0.89	28.48	100%
F1	DA-F1	ON GRADE	10.00	0.50%	4.55	12.54	12.37	0.17	F2	1.26	40.32	99%
F2	DA-F2	ON GRADE	10.00	4.00%	9.39	18.08	8.51	9.57	F4	1.08	34.56	47%
F3	DA-F3	ON GRADE	10.00	4.00%	2.10	5.16	5.45	0.00	F5	0.90	28.80	100%
G2	DA-G2	ON GRADE	10.00	0.50%	3.27	0.01	3.67	0.00	G3	1.01	32.32	100%

							LA CIM	A PH 6B -	Rational	Method (	Calculatio	ns								
		ADEA			SHEET	FLOW	SHALLOW CONCENTRATED FLOW CHA			CHANNEL FLOW						Increm	TC			
BASIN		AREA		L	n	S	Tc	L	n	S	Tc	L	n	S	D	V	Tc	тс	Total	Lag
	sf	ac	sq mi	ft	n	%	min	ft	n	%	min	ft	n	%	R	fps	min	min	min	min
DA-F	66574	1.53	0.0024	100	0.150	0.29%	18.6	107	0.15	1.32%	1.0	241	0.015	1.12%	0.10	2.26	1.8	21.4	21.4	12.8
DA-F9	39181	0.90	0.0014	68	0.150	0.39%	12.1	0	0.15	0.50%	0.0	372	0.015	1.10%	0.10	2.24	2.8	14.9	14.9	8.9
DA-F7	13400	0.31	0.0005	100	0.150	1.11%	10.9	56	0.15	1.09%	0.6	347	0.015	4.38%	0.10	4.48	1.3	12.7	12.7	7.6
DA-F8	43585	1.00	0.0016	100	0.150	2.71%	7.6	82	0.15	4.01%	0.4	198	0.015	2.56%	0.10	3.42	1.0	9.0	9.0	5.4
DA-F6	54439	1.25	0.0020	100	0.150	6.81%	5.3	185	0.15	7.51%	0.7	41	0.015	2.51%	0.10	3.39	0.2	6.2	6.2	3.7
DA-F5	11055	0.25	0.0004	21	0.150	6.18%	1.6	0	0.15	0.50%	0.0	391	0.015	2.59%	0.10	3.44	1.9	3.5	5.0	3.0
DA-F4	54779	1.26	0.0020	100	0.150	8.93%	4.7	148	1.15	4.88%	0.7	247	0.015	2.79%	0.10	3.57	1.1	6.6	6.6	3.9
DA-G	54284	1.25	0.0019	100	0.150	9.60%	4.6	165	0.15	6.62%	0.7	213	0.015	1.10%	0.10	2.24	1.6	6.8	6.8	4.1
DA-G1	73181	1.68	0.0026	100	0.150	9.53%	4.6	205	0.15	5.90%	0.9	83	0.015	0.52%	0.10	1.54	0.9	6.4	6.4	3.8
DA-G3	24340	0.56	0.0009	0	0.150	0.50%	0.0	0	0.15	0.50%	0.0	362	0.015	6.02%	0.10	5.25	1.1	1.1	5.0	3.0
DA-H	9937	0.23	0.0004	21	0.150	0.15%	7.0	0	0.15	0.50%	0.0	188	0.015	1.67%	1.10	13.68	0.2	7.3	7.3	4.4
DA-H1	35318	0.81	0.0013	18	0.150	1.92%	2.3	0	0.15	0.50%	0.0	400	0.015	1.14%	2.10	17.39	0.4	2.6	5.0	3.0
DA-F1	19365	0.44	0.0007	58	0.150	4.57%	4.0	0	0.15	0.50%	0.0	243	0.015	3.15%	3.10	37.48	0.1	4.1	5.0	3.0
DA-F2	42378	0.97	0.0015	100	0.150	3.67%	6.7	89	0.15	3.86%	0.5	358	0.015	4.03%	4.10	51.08	0.1	7.3	7.3	4.4
DA-F3	9315	0.21	0.0003	21	0.150	4.48%	1.8	0	0.15	0.50%	0.0	326	0.015	3.97%	5.10	58.64	0.1	1.9	5.0	3.0
DA-G2	18579	0.43	0.0007	54	0.150	0.21%	13.0	0	0.15	0.50%	0.0	185	0.015	0.50%	6.10	23.45	0.1	13.1	13.1	7.9

(Project Name) Riprap Sizing - with Dissipators  Based on the City of Austin Specification 591S Gradation Table										
Location	Pipe Segments	Pipe and Headwall Size	Height of Flow	100yr Velocity After HW (FPS)	Calculated D-50 (in)	D-50 (in)	Class	Thickness (in)		
44" Headwall	SD LN F P1	44	1.64	2.09	0.58	6	1	12		

Conduit Laber	(in)	Flow	Velocity	Flow	Velocity
		(cfs)	(fps)	(cfs)	(fps)
SD LAT F1 P1	24	12.37	5.62	15.43	5.8
SD LAT F2 P1	21	8.51	5.12	10.16	5.28
SD LAT F3 P1	18	5.45	4.59	6.9	3.9
SD LAT F4 P1	21	9.45	3.93	11.15	4.64
SD LAT F5 P1	18	3.21	1.81	4.3	2.43
SD LAT F6 P1	21	8.86	5.16	10.41	4.33
SD LAT F7 P1	18	2.84	3.92	3.56	4.16
SD LAT F8 P1	18	6.11	4.69	7.15	4.79
SD LAT F9 P1	18	5.14	2.91	5.93	3.36
SD LAT G1 P1	24	10.4	5.42	12.13	5.6
SD LAT G2 P1	18	3.67	4.19	4.8	4.47
SD LAT G3 P1	18	5.4	4.58	6.4	4.73
SD LAT H1 P1	18	5.35	4.58	6.12	4.69
SD LN F P1	44	62.91	8.44	74.89	8.66
SD LN F P2	33	56.54	13.84	67	14.24
SD LN F P3	30	51.58	14.66	61.08	15.02
SD LN F P4	30	48.83	13.24	57.62	13.47
SD LN F P5	30	49.04	14.52	57.86	14.93
SD LN F P6	30	32.8	10.9	38.61	11.28
SD LN F P7	30	25.64	10.28	29.93	10.68
SD LN F P8	24	25.81	12.4	30.13	12.76
SD LN F P9	24	20.72	9.67	24.18	9.94
SD LN F P10	21	18.65	11.41	21.57	11.71
SD LN F P11	21	14.69	10.83	16.93	11.18
SD LN F P12	18	10.42	9.92	11.98	10.23
SD LN F P13	18	6.13	3.47	7.02	3.97
SD LN G P1	30	21.27	8.43	25.15	8.78
SD LN G P2	24	12.55	5.64	14.6	5.77
SD LN G P5	21	7.69	5.02	8.87	5.17
SD LN H P1	21	6.86	6.35	7.98	6.6
SD LN H P2	21	2.12	3.58	2.6	3.79
SD LN A P14	36	25.12	6.78	33.09	7.22
SD LN A P15	36	25.16	6.78	33.13	7.23
SD LN A P16	30	16.06	6.06	21.59	6.47
SD LN A P17	30	16.14	6.07	21.68	6.48
SD LN A P18	30	16.14	6.07	21.78	6.49
SD LN A P19	30	16.25	6.08	21.81	6.49
SD LN A P20	30	12.13	8.42	16.11	9.11
SD LN A P21	24	13.99	7.58	17.81	7.98
SD LN A P21	24 24	14.03	7.58	17.87	7.98
SD LN A P22 SD LN A P23	24 24	5.24	4.56	6.86	4.9
SD LN A P24	24	5.29	4.56	6.92	4.91
SD LN A P25	24	5.32	4.57	6.96	4.91
SD LN A P26	18	4.47	9.44	5.74	10.13
SD LN A P26 SD LN A P27	18	4.47	9.44	5.75	10.13
SD LN A P27	24	7.26	4.97	8.86	5.22
SD LN B P3	24	7.26	4.97	8.86 8.94	5.23
SD LN B P5	24 24	7.33	4.98	9.08	5.25
SD LN B P7	24	7.43	5.01	9.06	5.26
SD LN C P1	18	3.81	4.23	<u>9.14</u> 5.42	4.59
20 FIN C B1	18	3.81			<del> </del>
כם ואוכ מז	18		5.14	4.32	5.65
SD LN C P3	. 18	1.92	7.59	2.71	8.39
SD LN C1 P1		1 20 5		27.21	5.54
SD LN C1 P1 SD LN D P2	30	20.5	5.62		244
SD LN C1 P1 SD LN D P2 SD LN D P4	30 24	8.19	7.68	9.86	3.14
SD LN C1 P1 SD LN D P2 SD LN D P4 SD LN D P6	30 24 24	8.19 8.25	7.68 7.69	9.86 9.93	8.09
SD LN C1 P1 SD LN D P2 SD LN D P4 SD LN D P6 SD LN D P8	30 24 24 24	8.19 8.25 8.28	7.68 7.69 7.7	9.86 9.93 9.96	8.09 8.09
SD LN C1 P1 SD LN D P2 SD LN D P4 SD LN D P6	30 24 24	8.19 8.25	7.68 7.69	9.86 9.93	8.09

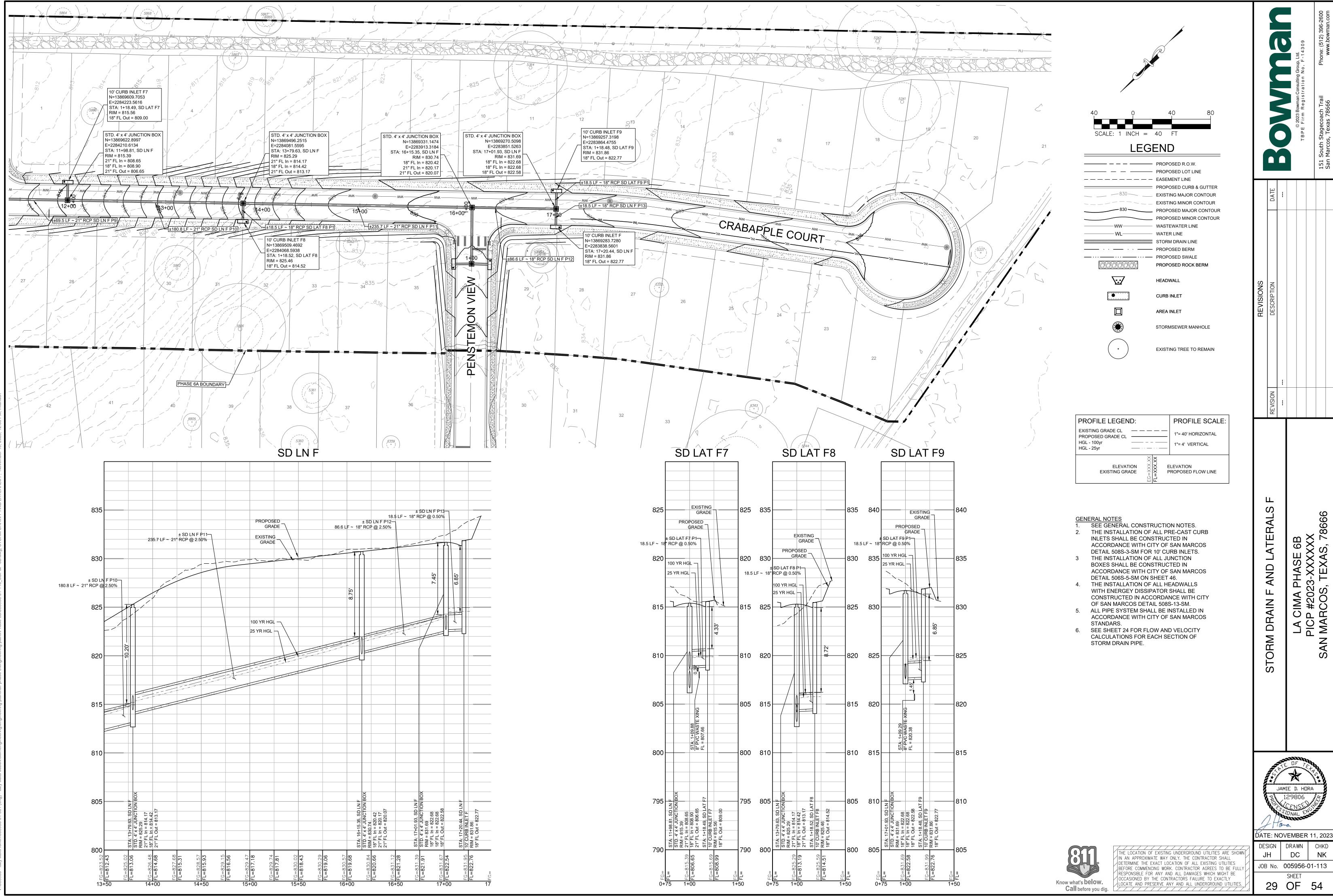


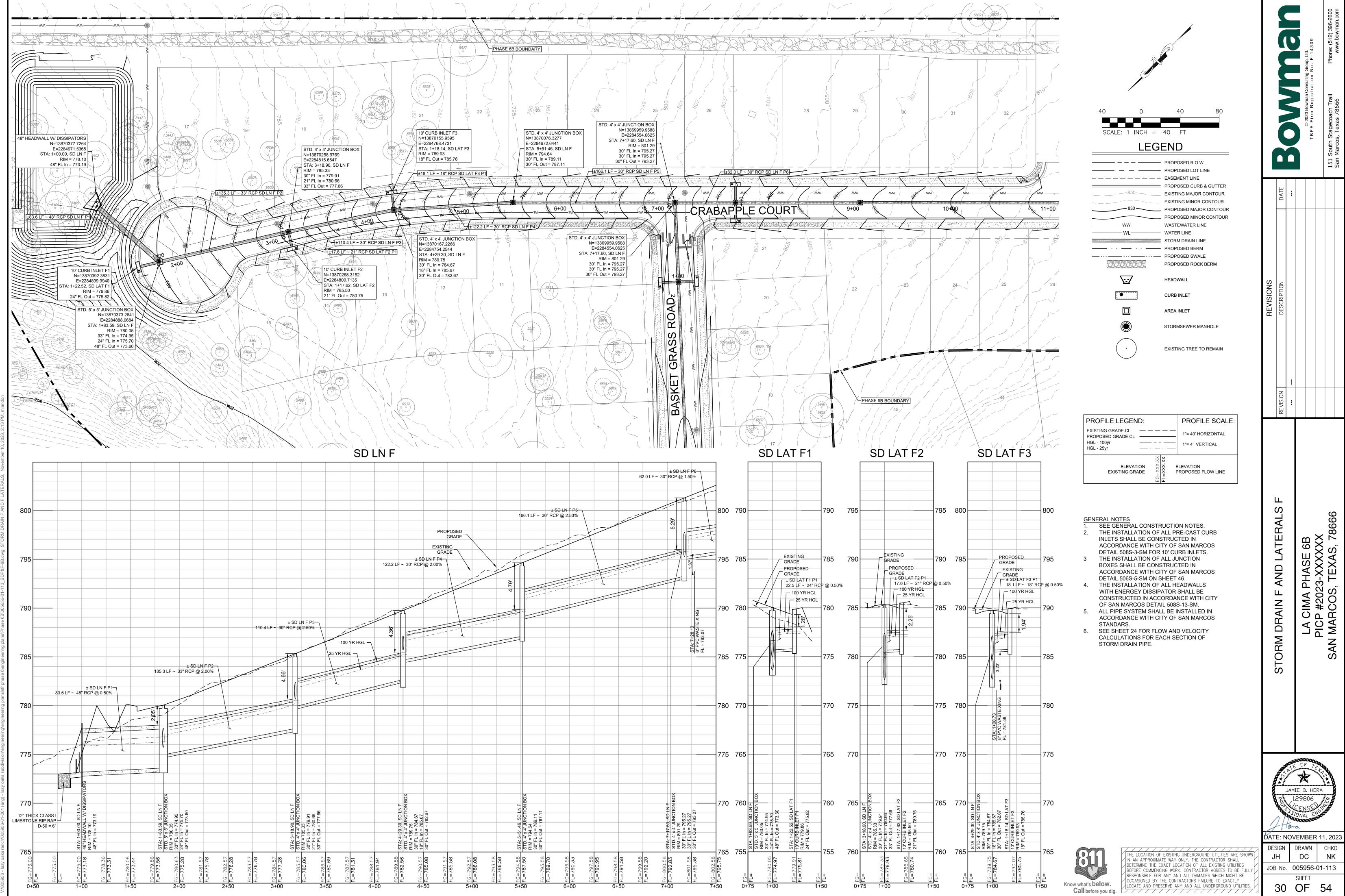
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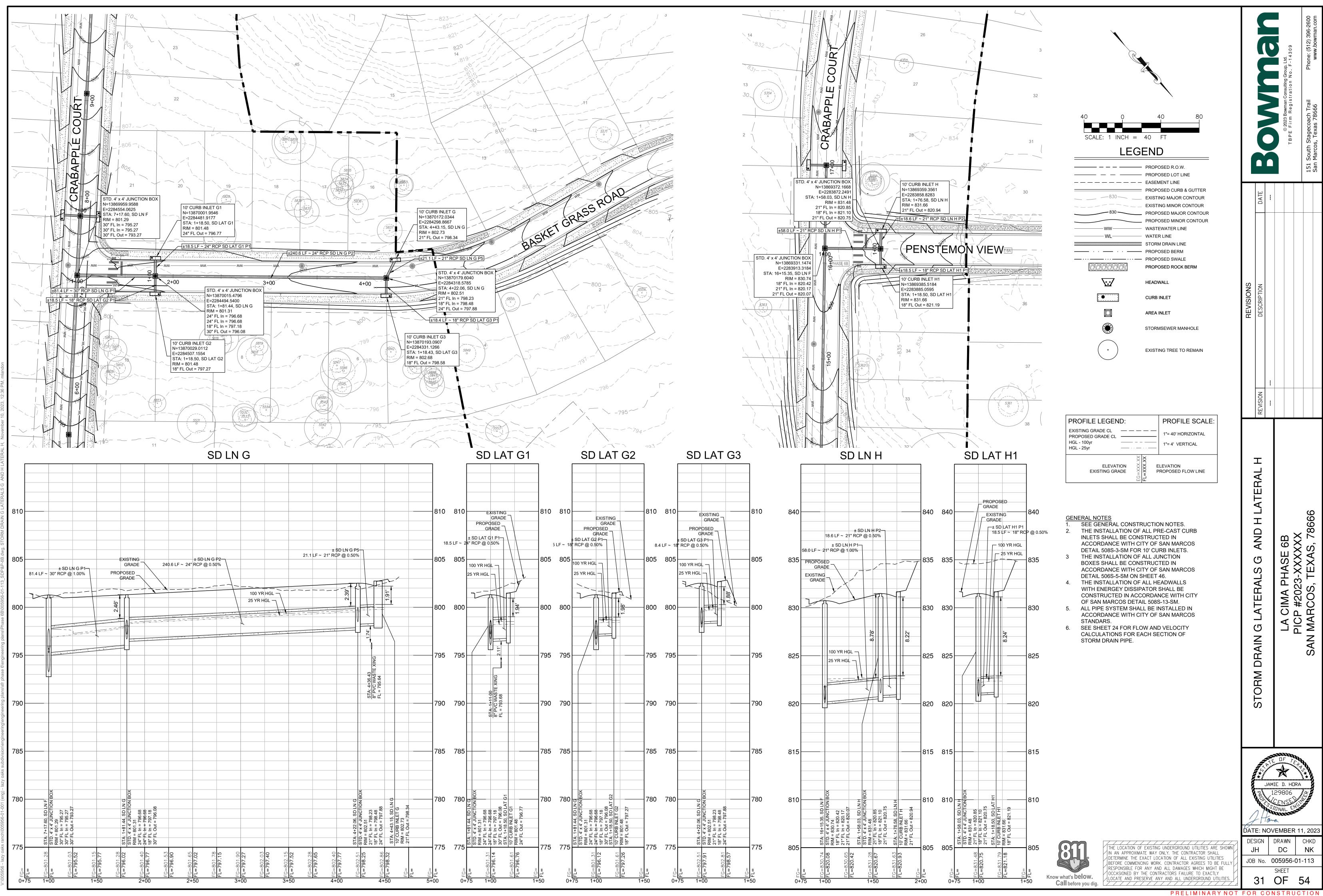
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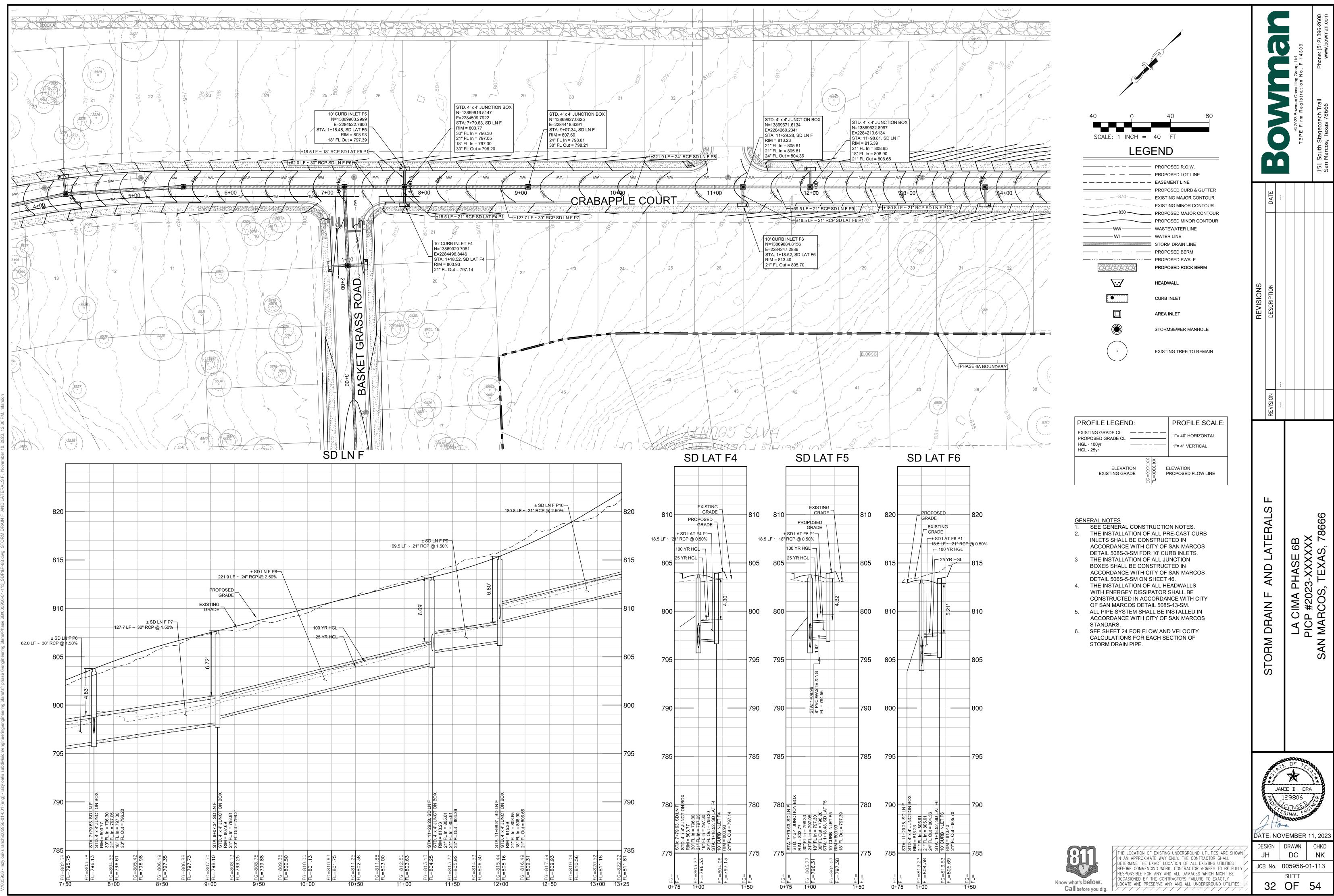
JOB No. 005956-01-113 SHEET 28 OF 54

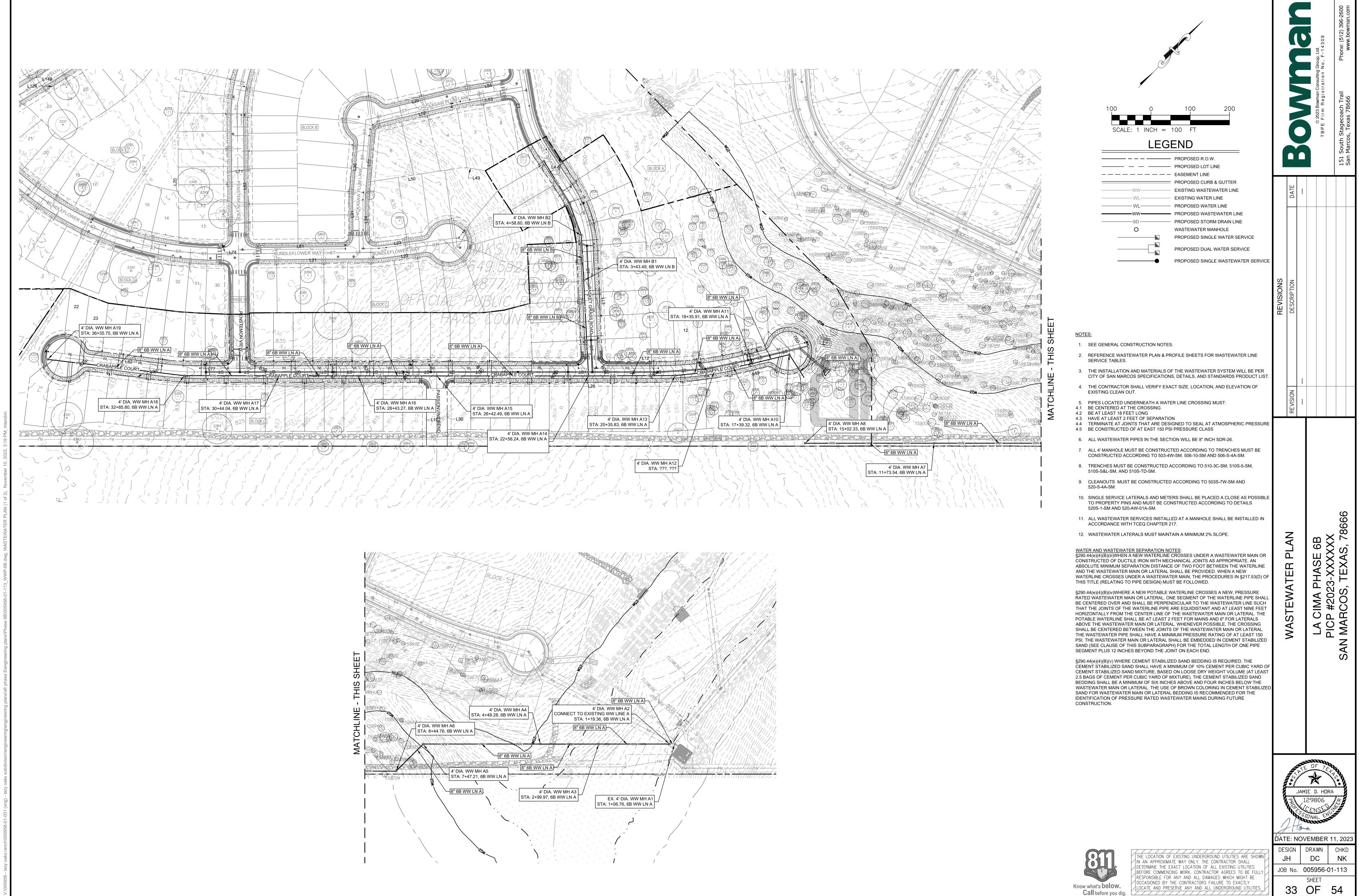
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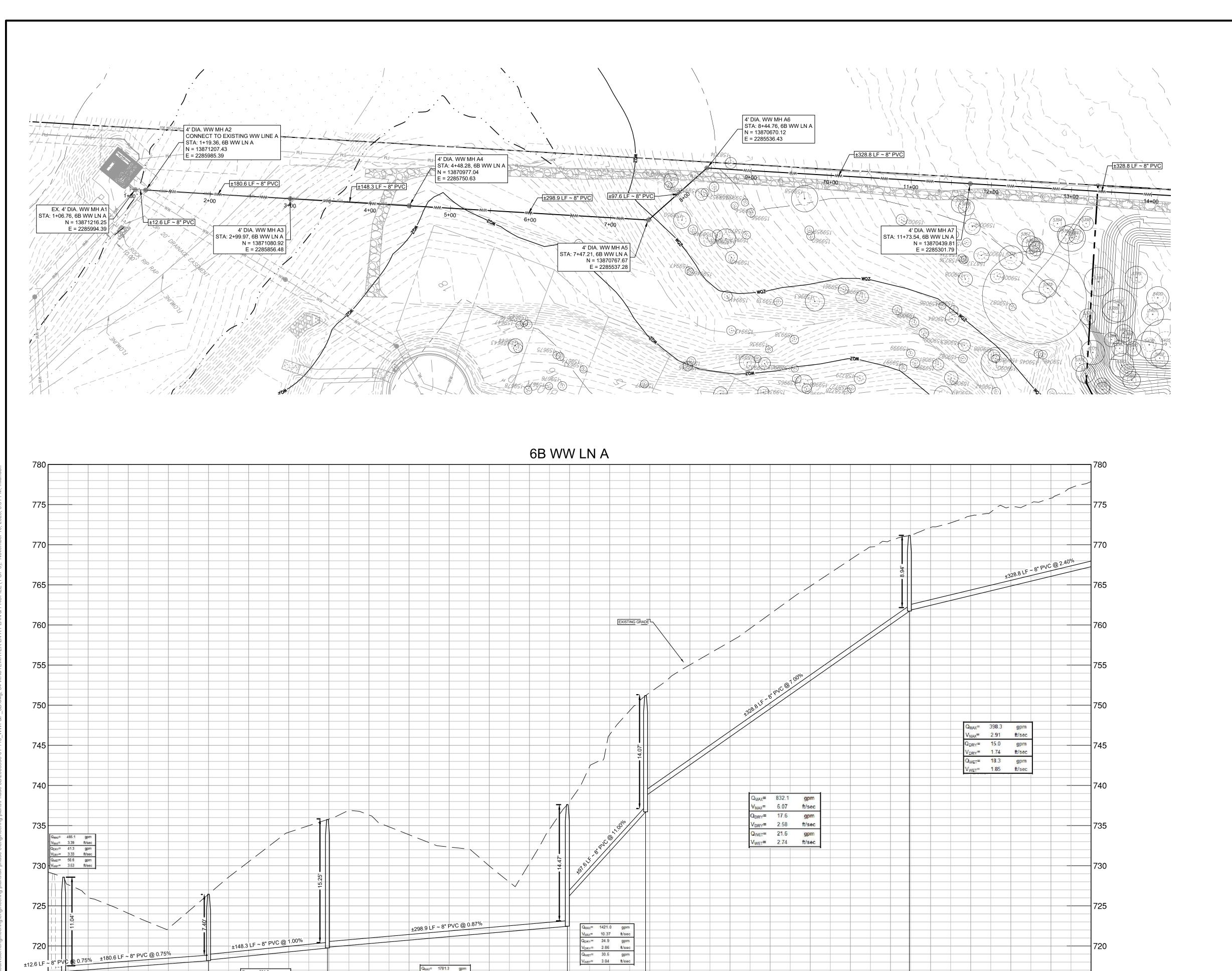




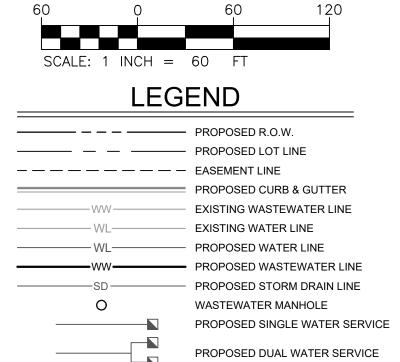












PROPOSED SINGLE WASTEWATER SERVICE

PROFILE LEGEND:	PROFILE SCALE
EXISTING GRADE CL —————	1"= 40' HORIZONTAL
PROPOSED GRADE CL ————	1"= 4' VERTICAL
	ELEVATION PROPOSED FLOW LINE

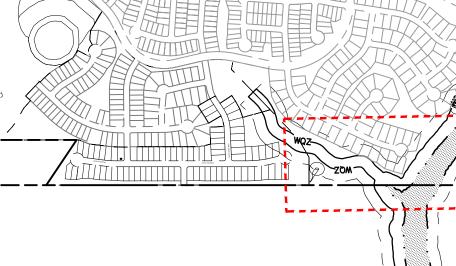
#### NOTES:

- SEE GENERAL CONSTRUCTION NOTES.
- 2. REFERENCE WASTEWATER PLAN & PROFILE SHEETS FOR WASTEWATER LINE SERVICE TABLES.
- 3. THE INSTALLATION AND MATERIALS OF THE WASTEWATER SYSTEM WILL BE PER CITY OF SAN MARCOS SPECIFICATIONS, DETAILS, AND STANDARDS PRODUCT LIST.
- 4. THE CONTRACTOR SHALL VERIFY EXACT SIZE, LOCATION, AND ELEVATION OF EXISTING CLEAN OUT.
- 5. PIPES LOCATED UNDERNEATH A WATER LINE CROSSING MUST:
- 4.1 BE CENTERED AT THE CROSSING 4.2 BE AT LEAST 18 FEET LONG
- 4.3 HAVE AT LEAST 2 FEET OF SEPARATION
- 4.4 TERMINATE AT JOINTS THAT ARE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE 4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS
- 6. ALL WASTEWATER PIPES IN THE SECTION WILL BE 8" INCH SDR-26.
- 7. ALL 4' MANHOLE MUST BE CONSTRUCTED ACCORDING TO TRENCHES MUST BE CONSTRUCTED ACCORDING TO 503-4W-SM, 506-10-SM AND 506-S-4A-SM.
- 8. TRENCHES MUST BE CONSTRUCTED ACCORDING TO 510-3C-SM, 510S-5-SM, 510S-S&L-SM, AND
- 9. CLEANOUTS MUST BE CONSTRUCTED ACCORDING TO 503S-7W-SM AND 520-S-4A-SM.
- 10. SINGLE SERVICE LATERALS AND METERS SHALL BE PLACED A CLOSE AS POSSIBLE TO PROPERTY PINS AND MUST BE CONSTRUCTED ACCORDING TO DETAILS 520S-1-SM AND 520-AW-01A-SM.
- 11. ALL WASTEWATER SERVICES INSTALLED AT A MANHOLE SHALL BE INSTALLED IN ACCORDANCE WITH TCEQ CHAPTER 217.
- 12. WASTEWATER LATERALS MUST MAINTAIN A MINIMUM 2% SLOPE.

DUCTILÈ ÎRÔN WITH MECHANICAL JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF TWO FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

\$290.44(e)(4)(B)(iv)WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST 2 FEET FOR MAINS AND 6" FOR LATERALS ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

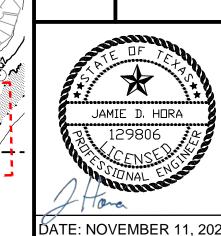
§290.44(e)(4)(B)(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.



**KEY MAP** 



THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL
DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES
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DESIGN DRAWN

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JOB No. **005956-01-113** 

SHEET

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PROFILE

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PLAN

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TEWATER

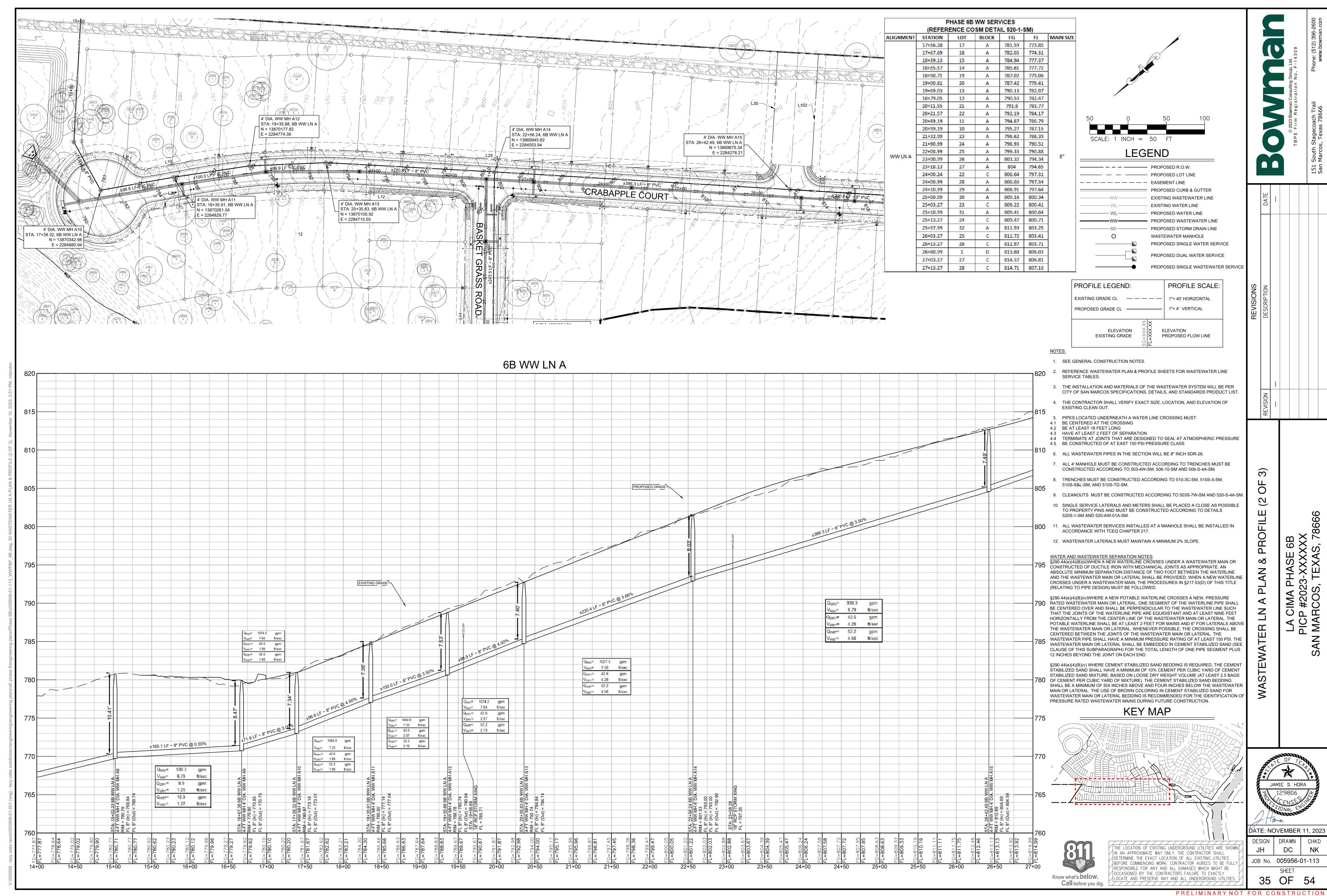
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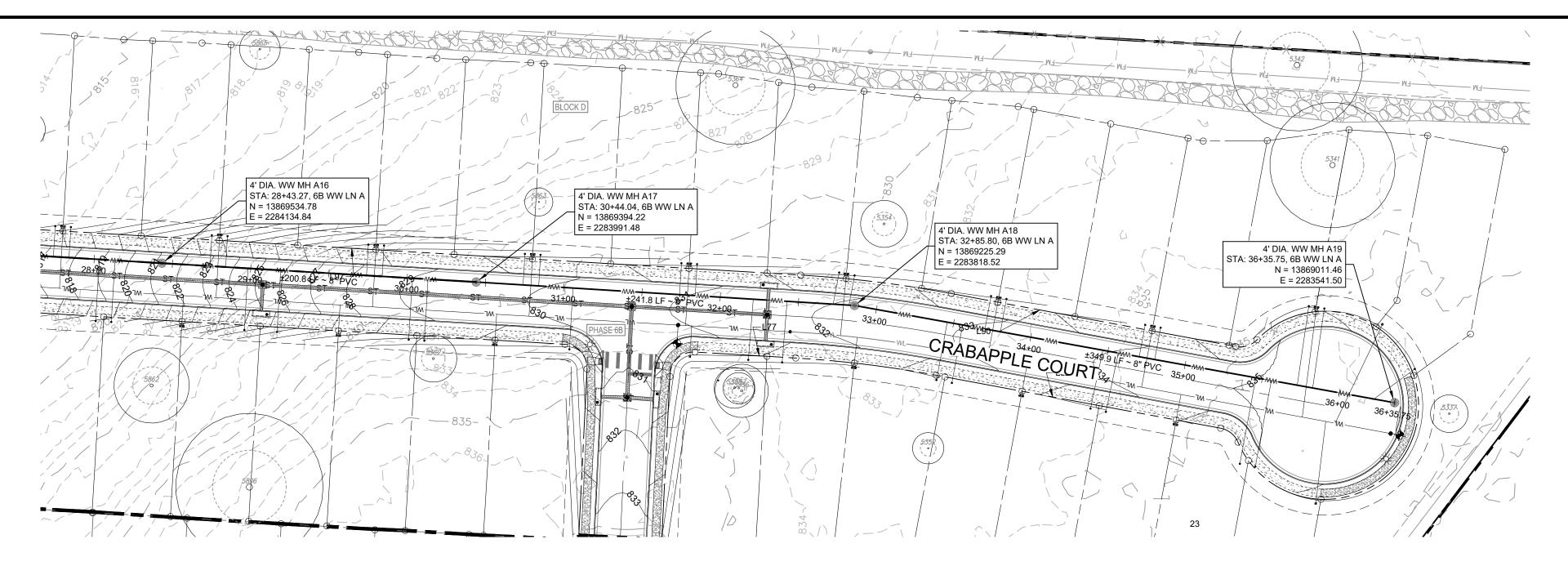
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LA CIMA PHASE 6E PICP #2023-XXXXXX) I MARCOS, TEXAS, 7

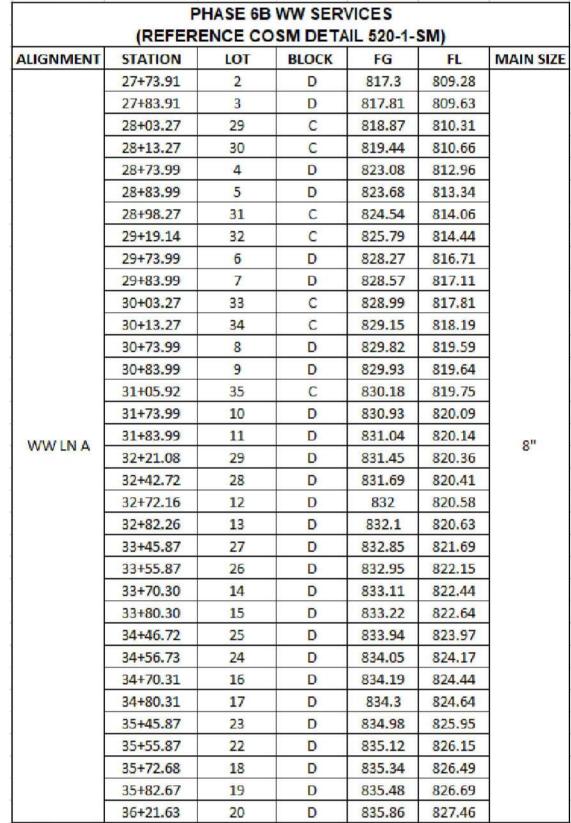
PRELIMINARY NOT FOR CONSTRUCTION

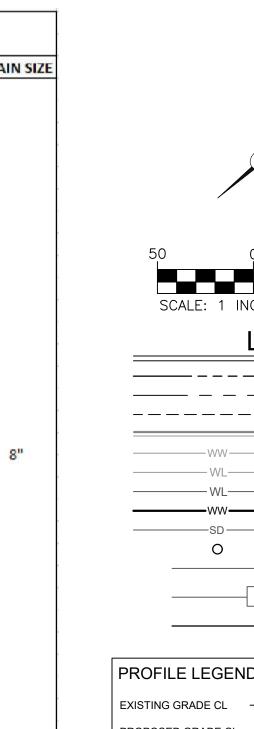
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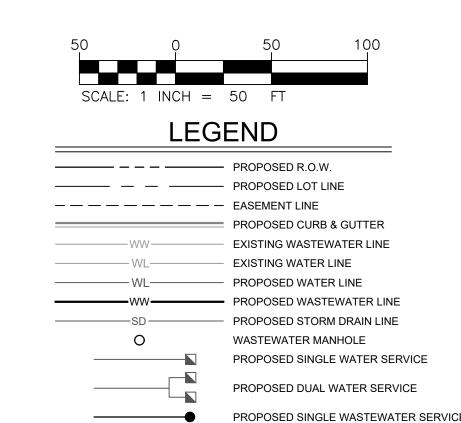




						6B WW										
					E	XISTING GRADE		PROPOSED							_	
																7 7
				5.5.				10.80				±349.9 LF ~ 8" F	ovc @ 2.00%			
					±241.8	LF ~ 8" PVC @ 0.50%	Y									
	8.92	±200.81F - 8" PVC @ 3.7	5%									V <sub>MAX</sub> = 8 Q <sub>DRY</sub> = 4 V <sub>DRY</sub> = 2 Q <sub>WET</sub> = 8	59.6 gpm 5.54 ft/sec 12.6 gpm 1.38 ft/sec 12.2 gpm			
±200.8 LF - 8" PVC @ 3.50%		Q <sub>MAX</sub> = 1040.1 V <sub>MAX</sub> = 7.59	gpm ft/sec		Q <sub>MAX</sub> = V <sub>MAX</sub> = Q <sub>DRY</sub> = V <sub>DRY</sub> = Q <sub>WET</sub> =	2.77 ft/sec 42.6 gpm 2.38 ft/sec						V <sub>WET</sub> = 2	2.53 ft/sec			
		Q <sub>DRY</sub> = 42.6 V <sub>DRY</sub> = 2.38 Q <sub>WET</sub> = 52.2 V <sub>WET</sub> = 2.53	gpm ft/sec gpm ft/sec		V <sub>WET</sub> =	2.53 ft/sec										
Q <sub>MAX</sub> =         1004.8         gpm           V <sub>MAX</sub> =         7.33         ft/sec           Q <sub>DRY</sub> =         42.6         gpm           V <sub>DRY</sub> =         3.63         ft/sec           Q <sub>WET</sub> =         52.2         gpm           V <sub>WET</sub> =         3.86         ft/sec	ω							ω								
	STA: 28+43.27 6B WW LN A 4-FT WW MH 4' DIA. WW MH A16 RIM = 821.25 FL 8" (In) = 811.72 FL 8" (Out) = 811.72			STA: 30+44.04 6B WW LN A 4-FT WW MH 4' DIA. WW MH A17 RIM = 829.49 FL 8" (In) = 819.44 FL 8" (Out) = 819.34			ORM XING	STA: 32+85.80 6B WW LN A 4-FT WW MH 4' DIA. WW MH A18 RIM = 832.14 FL 8" (In) = 820.75	820.65							
7 4 8 m 8 2 m			7 0 0 +		<u> </u>		4 STA: 32+30.58 18" R¢P STORM > FL = 822.73			4 + 0		202	2 2 2			
FG=815.44 FL=815.44 FG=816.58 FL=816.58 FG=817.43 FG=817.43 FG=817.43	FG=819.33 FL=819.33 FL=820.40 FC=820.40 FG=822.10 FL=822.10	FC=823.10 FL=823.10 FC=825.06 FL=825.06 FC=827.15 FC=827.15	FG=828.81 FL=828.81 FG=829.40 FL=829.40 FG=829.54	FL=829.54 FC=829.64 FL=829.64 FC=829.62 FL=829.62	FG=829.97 FL=829.97 FG=830.24 FG=830.24	FG=831.08 FG=831.08 FL=831.08	FG=831.54 FL=831.54 FG=831.94 FL=831.94	FG=832.11 FL=832.11 FG=832.07 FG=832.07	FG=832.34 FL=832.34	FG=832.64 FL=832.80 FG=832.80 FG=832.80	FG=833.02 FL=833.02	FG=833.33 FL=833.33 FG=833.80 FL=833.80	FG=834.36 FL=834.36 FG=834.47	FL=834.47 FG=834.91 FL=834.91	FC=835.47 FL=835.47 FC=835.50 FC=835.50	FC=835.82 FL=835.82 FC=835.69 FC=835.69







PROFILE LEGEND:		PROFILE SCALE:
EXISTING GRADE CL — -		1"= 40' HORIZONTAL
PROPOSED GRADE CL ——		1"= 4' VERTICAL
ELEVATION EXISTING GRADE	$\triangle IX$	ELEVATION ROPOSED FLOW LINE

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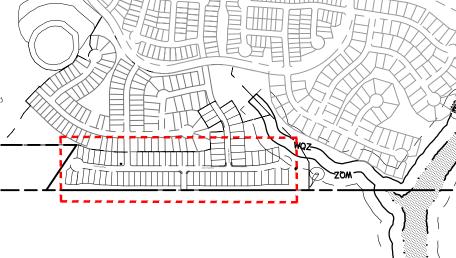
### WATER AND WASTEWATER SEPARATION NOTES:

§290.44(e)(4)(B)(iii)WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR CONSTRUCTED OF DUCTILE IRON WITH MECHANICAL JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF TWO FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

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§290.44(e)(4)(B)(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.

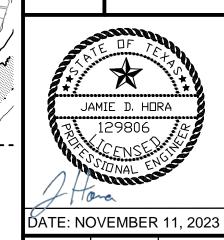




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DESIGN DRAWN

DC

JOB No. **005956-01-113** 

SHEET

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PROFILE

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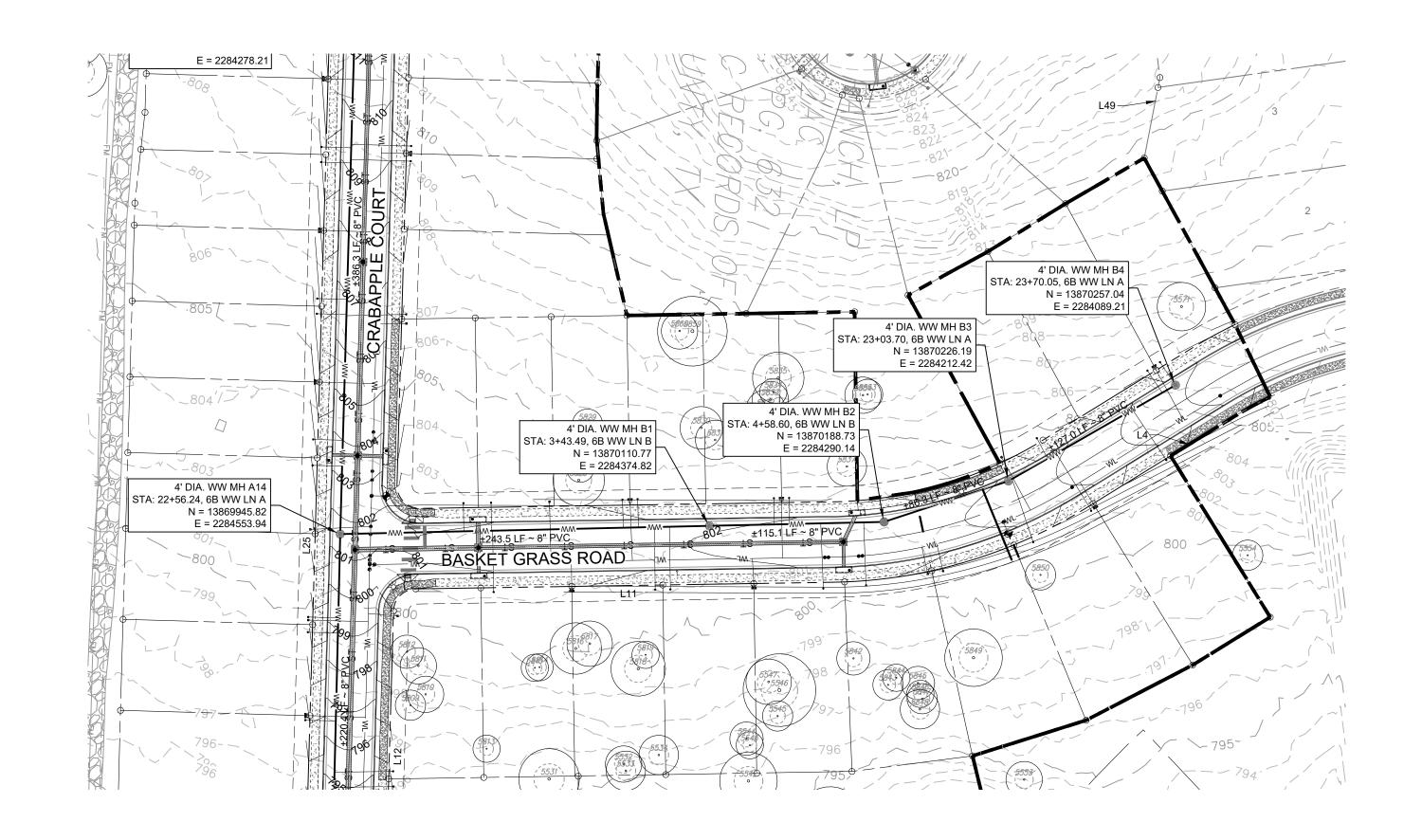
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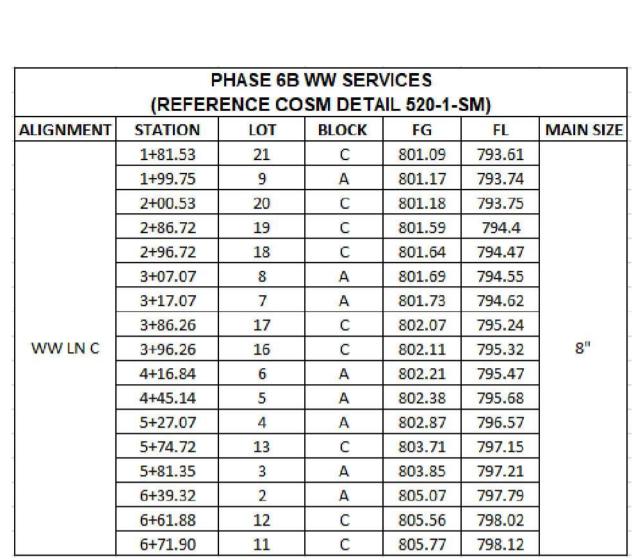
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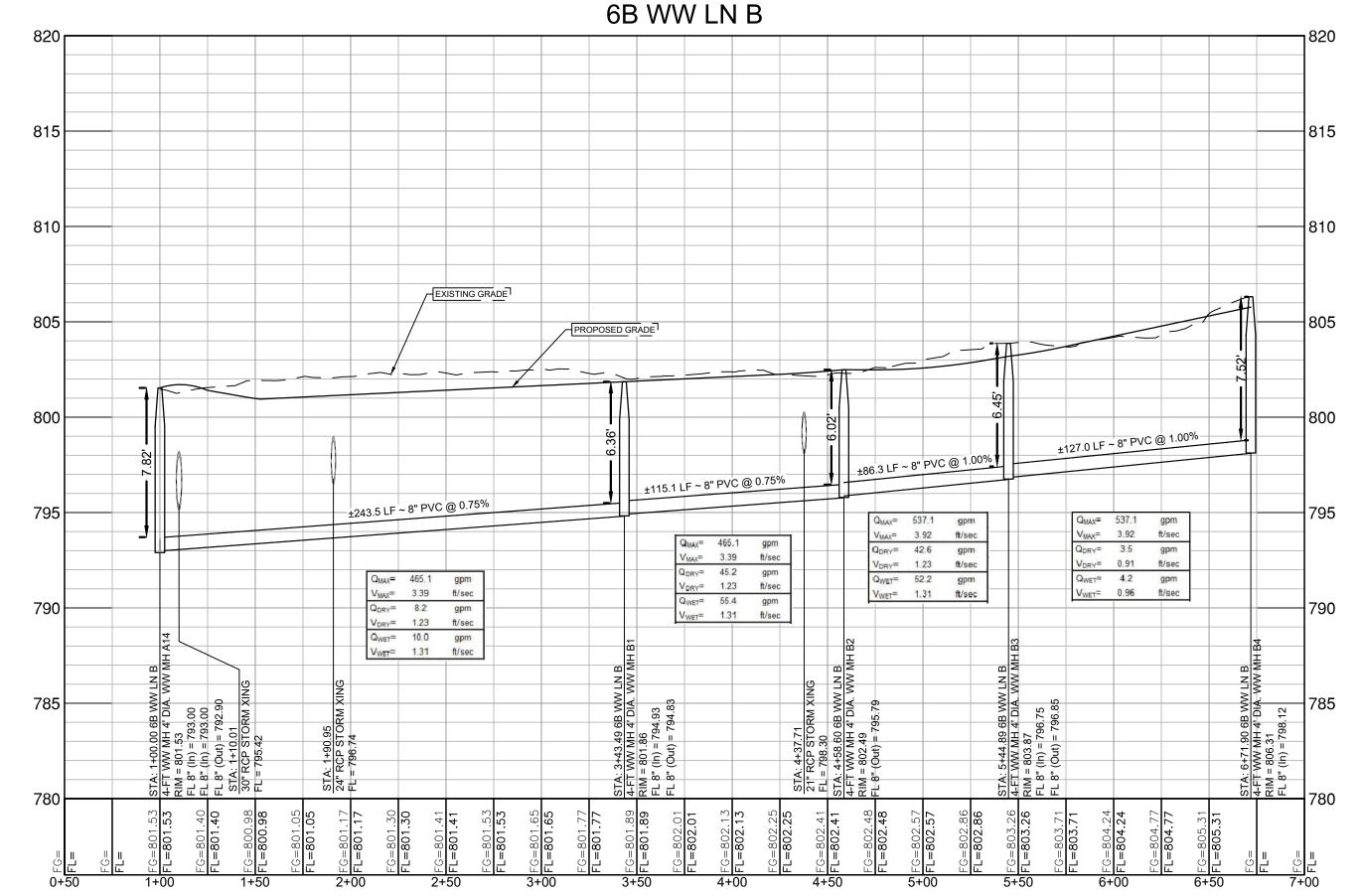
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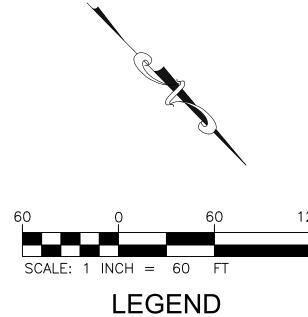
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SAN









SCALE: 1 INCH = 60 FT

LEGEND

PROPOSED R.O.W.
PROPOSED LOT LINE
EASEMENT LINE
PROPOSED CURB & GUTTER
EXISTING WASTEWATER LINE
EXISTING WATER LINE
WL PROPOSED WATER LINE
PROPOSED WASTEWATER LINE
PROPOSED WASTEWATER LINE
PROPOSED STORM DRAIN LINE
O WASTEWATER MANHOLE
PROPOSED SINGLE WATER SERVICE
PROPOSED DUAL WATER SERVICE

PROPOSED SINGLE WASTEWATER SERVICE

PROFILE LEGEND:		PROFILE SCALE
EXISTING GRADE CL — —		1"= 40' HORIZONTAL
PROPOSED GRADE CL		1"= 4' VERTICAL
	~ l	
ELEVATION EXISTING GRADE		ELEVATION PROPOSED FLOW LINE

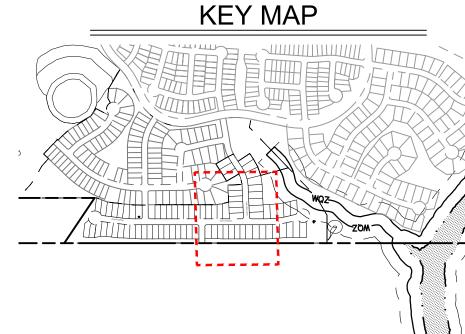
#### NO.

- 1. SEE GENERAL CONSTRUCTION NOTES.
- 2. REFERENCE WASTEWATER PLAN & PROFILE SHEETS FOR WASTEWATER LINE SERVICE TABLES.
- 3. THE INSTALLATION AND MATERIALS OF THE WASTEWATER SYSTEM WILL BE PER CITY OF SAN MARCOS SPECIFICATIONS, DETAILS, AND STANDARDS PRODUCT LIST.
- 4. THE CONTRACTOR SHALL VERIFY EXACT SIZE, LOCATION, AND ELEVATION OF EXISTING CLEAN OUT.
- 5. PIPES LOCATED UNDERNEATH A WATER LINE CROSSING MUST:
- 4.1 BE CENTERED AT THE CROSSING4.2 BE AT LEAST 18 FEET LONG
- 4.3 HAVE AT LEAST 2 FEET OF SEPARATION4.4 TERMINATE AT JOINTS THAT ARE DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE
- 4.4 TERMINATE AT JOINTS THAT ARE DESIGNED TO SEAL AT ATMOSPHERIC PRESSUR
  4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS
- 6. ALL WASTEWATER PIPES IN THE SECTION WILL BE 8" INCH SDR-26.
- 7. ALL 4' MANHOLE MUST BE CONSTRUCTED ACCORDING TO TRENCHES MUST BE CONSTRUCTED ACCORDING TO 503-4W-SM, 506-10-SM AND 506-S-4A-SM.
- 8. TRENCHES MUST BE CONSTRUCTED ACCORDING TO 510-3C-SM, 510S-5-SM, 510S-S&L-SM, AND 510S-TD-SM.
- 9. CLEANOUTS MUST BE CONSTRUCTED ACCORDING TO 503S-7W-SM AND 520-S-4A-SM.
- 10. SINGLE SERVICE LATERALS AND METERS SHALL BE PLACED A CLOSE AS POSSIBLE TO PROPERTY PINS AND MUST BE CONSTRUCTED ACCORDING TO DETAILS 520S-1-SM AND 520-AW-01A-SM.
- ALL WASTEWATER SERVICES INSTALLED AT A MANHOLE SHALL BE INSTALLED IN ACCORDANCE WITH TCEQ CHAPTER 217.
- 12. WASTEWATER LATERALS MUST MAINTAIN A MINIMUM 2% SLOPE.

WATER AND WASTEWATER SEPARATION NOTES: §290.44(e)(4)(B)(iii)WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN OR CONSTRUCTED OF DUCTILE IRON WITH MECHANICAL JOINTS AS APPROPRIATE. AN ABSOLUTE MINIMUM SEPARATION DISTANCE OF TWO FOOT BETWEEN THE WATERLINE AND THE WASTEWATER MAIN OR LATERAL SHALL BE PROVIDED. WHEN A NEW WATERLINE CROSSES UNDER A WASTEWATER MAIN, THE PROCEDURES IN §217.53(D) OF THIS TITLE (RELATING TO PIPE DESIGN) MUST BE FOLLOWED.

§290.44(e)(4)(B)(iv)WHERE A NEW POTABLE WATERLINE CROSSES A NEW, PRESSURE RATED WASTEWATER MAIN OR LATERAL, ONE SEGMENT OF THE WATERLINE PIPE SHALL BE CENTERED OVER AND SHALL BE PERPENDICULAR TO THE WASTEWATER LINE SUCH THAT THE JOINTS OF THE WATERLINE PIPE ARE EQUIDISTANT AND AT LEAST NINE FEET HORIZONTALLY FROM THE CENTER LINE OF THE WASTEWATER MAIN OR LATERAL. THE POTABLE WATERLINE SHALL BE AT LEAST 2 FEET FOR MAINS AND 6" FOR LATERALS ABOVE THE WASTEWATER MAIN OR LATERAL. WHENEVER POSSIBLE, THE CROSSING SHALL BE CENTERED BETWEEN THE JOINTS OF THE WASTEWATER MAIN OR LATERAL. THE WASTEWATER PIPE SHALL HAVE A MINIMUM PRESSURE RATING OF AT LEAST 150 PSI. THE WASTEWATER MAIN OR LATERAL SHALL BE EMBEDDED IN CEMENT STABILIZED SAND (SEE CLAUSE OF THIS SUBPARAGRAPH) FOR THE TOTAL LENGTH OF ONE PIPE SEGMENT PLUS 12 INCHES BEYOND THE JOINT ON EACH END.

§290.44(e)(4)(B)(v) WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE, BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE WASTEWATER MAIN OR LATERAL. THE USE OF BROWN COLORING IN CEMENT STABILIZED SAND FOR WASTEWATER MAIN OR LATERAL BEDDING IS RECOMMENDED FOR THE IDENTIFICATION OF PRESSURE RATED WASTEWATER MAINS DURING FUTURE CONSTRUCTION.





Call before you dig.

THE LOCATION OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

WASTEWATER LN B PLAN & F

WASTEWATER LN B PLAN & F

LA CIMA PHASE 6B

PICP #2023-XXXXXX

SAN MARCOS, TEXAS, 78

DATE: NOVEMBER 11, 202

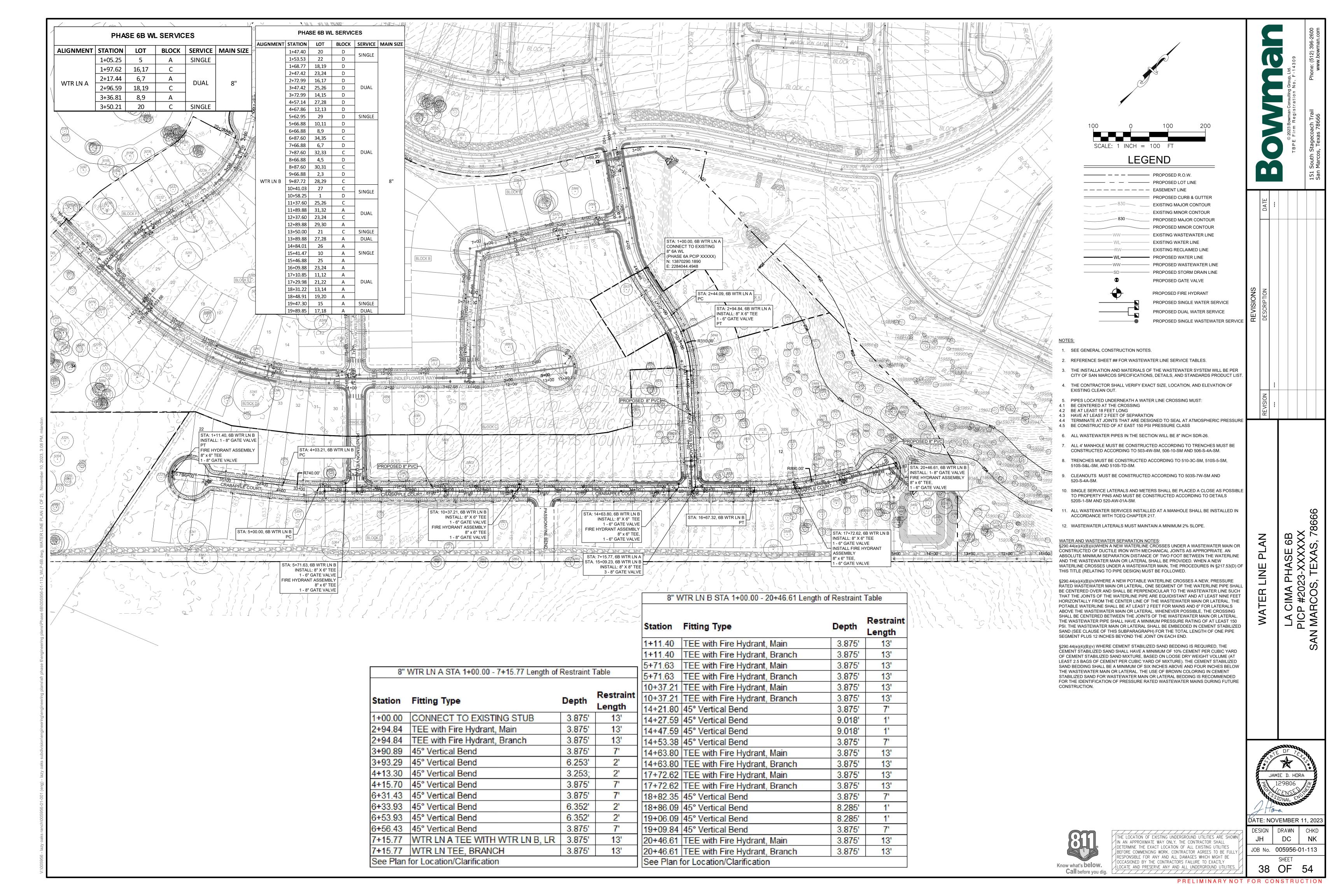
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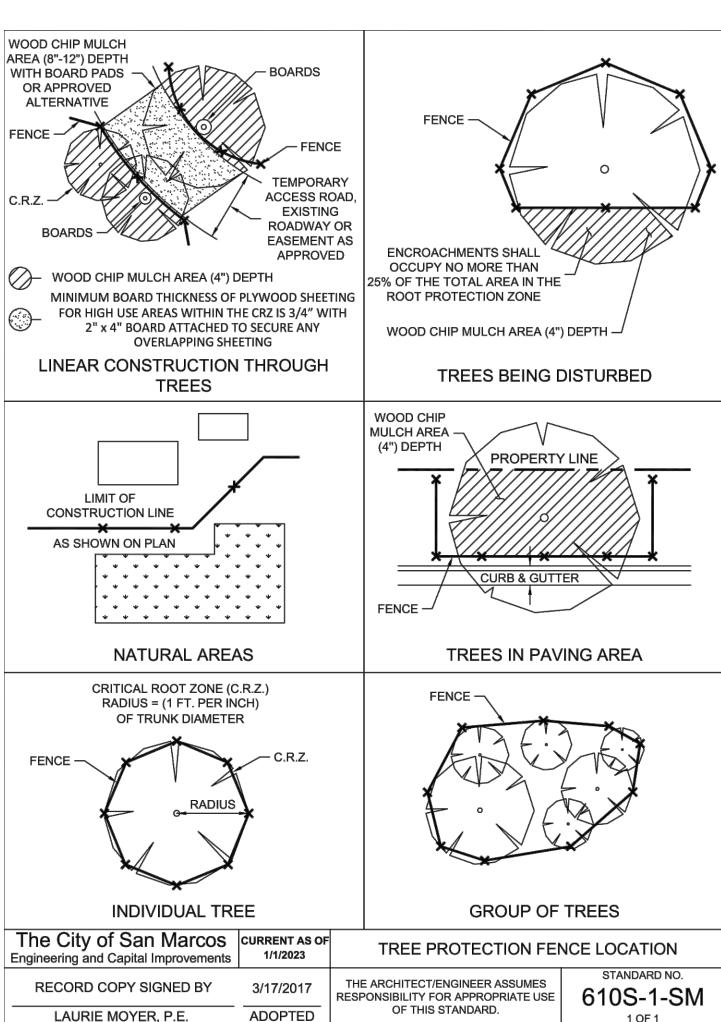
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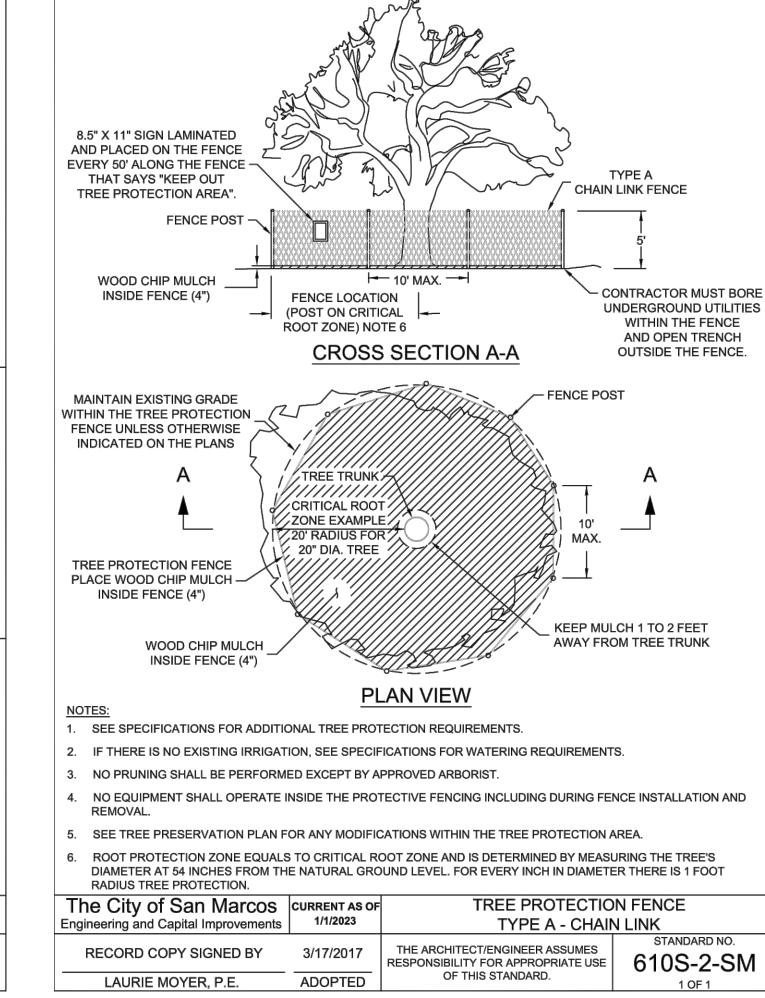
SHEET

DESIGN DRAWN

PROFIL







2" x 4" WELDED WIRE BACKING SUPPORT

6" OF SILT

**SECTION A-A** 

A MINIMUM OF 1'.

MAX. ALLOWED

STEEL FENCE POST

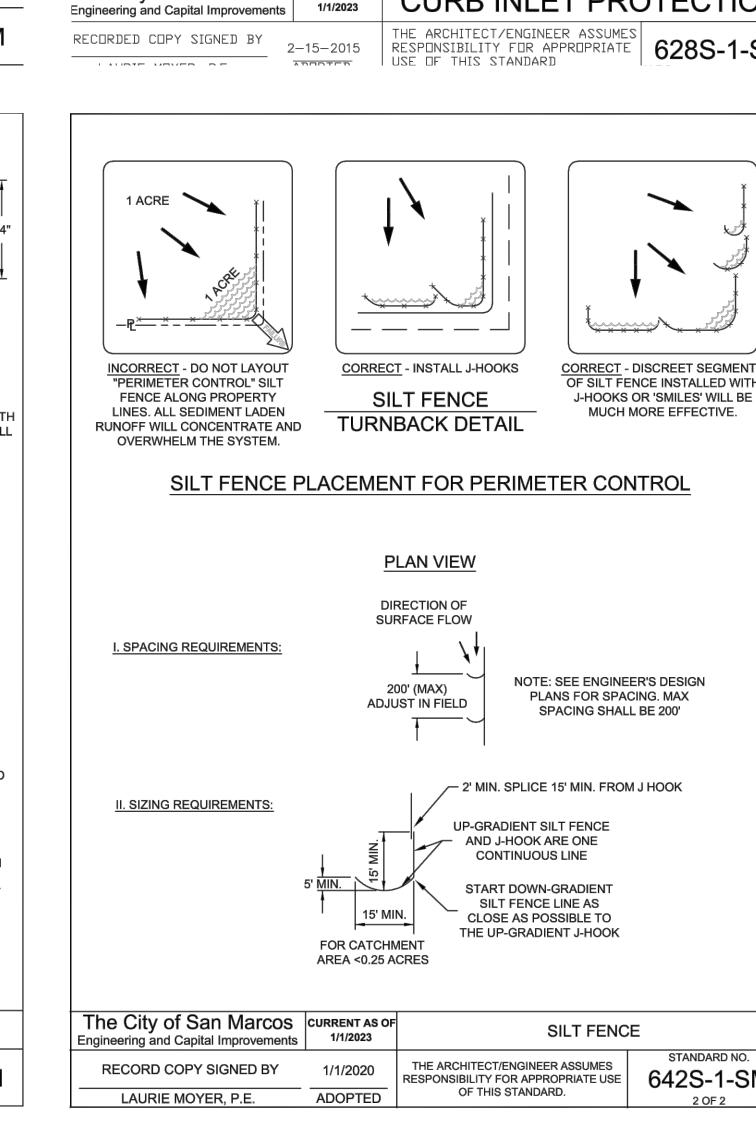
MAX. 6' SPACING

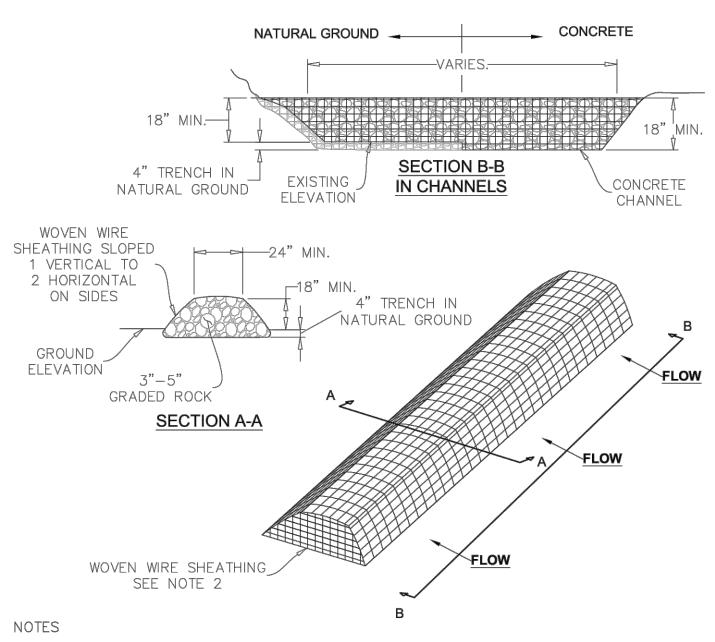
MIN. 1' EMBEDMENT

FOR FABRIC (12.5 GA. WIRE)

1 OF 1

SILT FENCE FABRIC-





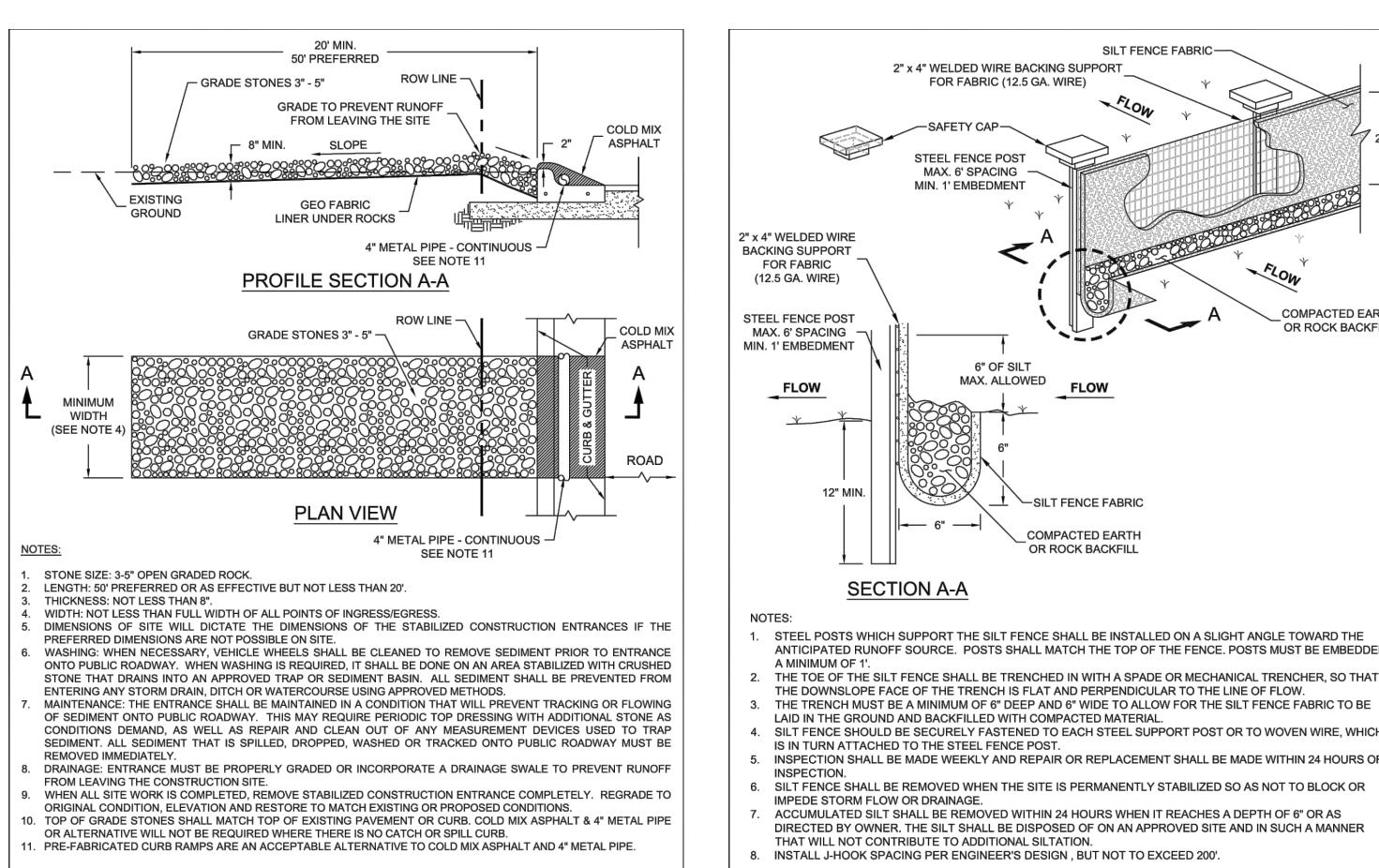
1. USE ONLY OPEN GRADED ROCK 3"-5" IN DIAMETER.

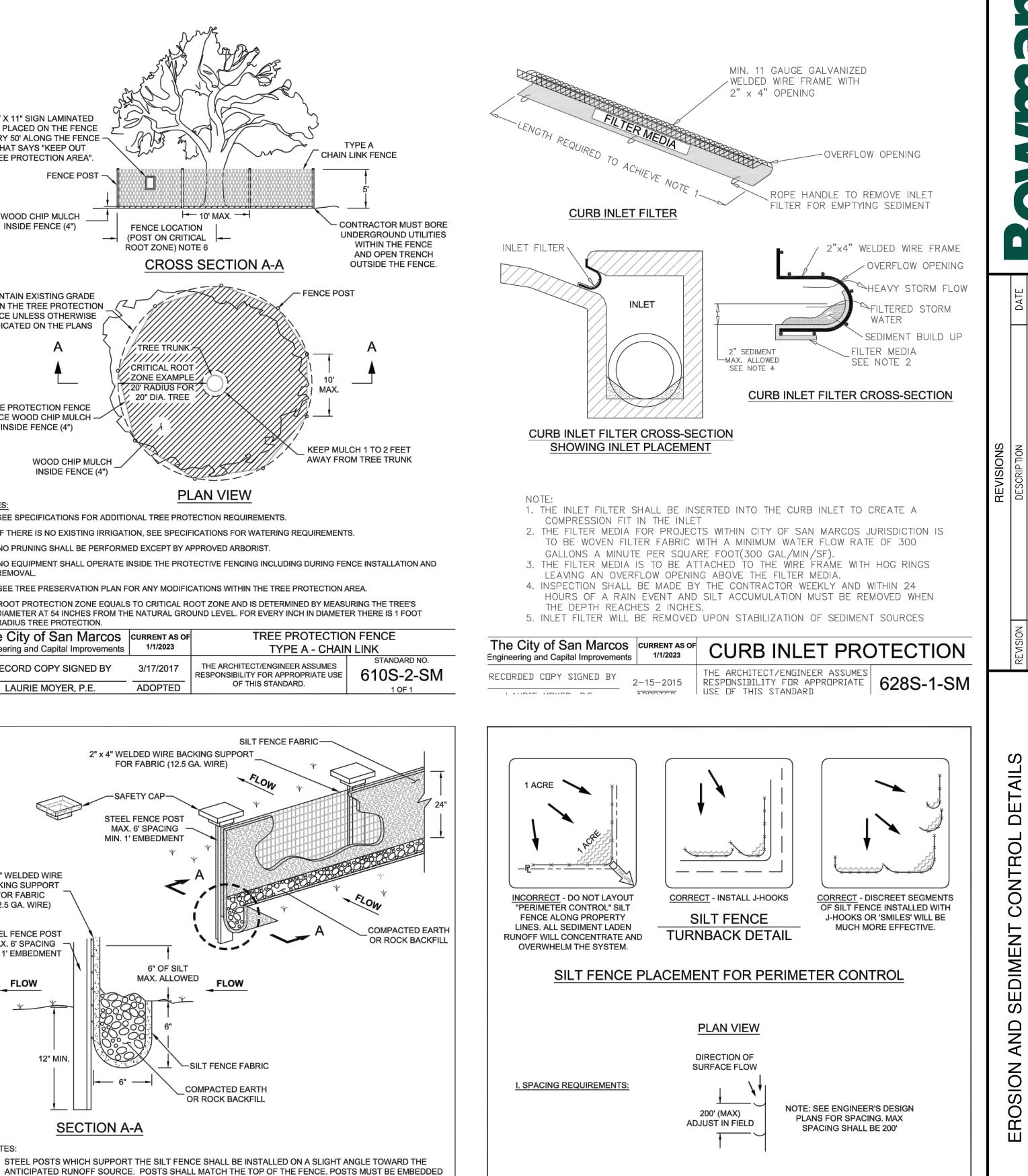
- 2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM
- 1" OPENINGS AND MINIMUM WIRE DIAMETER OF 20 GAUGE. 3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG
- THE ROCKS, WASHOUT CONSTRUCTION, TRAFFIC DAMAGE, ETC. 4. WHEN SILT REACHES A DEPTH EQUAL TO 6", THE SILT WILL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CREATE A
- SILTATION PROBLEM. DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS. 6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	<b>ROCK BERM</b>	DETAIL
RECORDED COPY SIGNED BY	8/4/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE	639S-1-SM

ADDDTED USE OF THIS STANDARD

The City of San Marcos | CURRENT AS OF STABILIZED CONSTRUCTION ENTRANCE Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY 641S-1-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. LAURIE MOYER, P.E. ADOPTED 1 OF 1





THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.

-SILT FENCE FABRIC

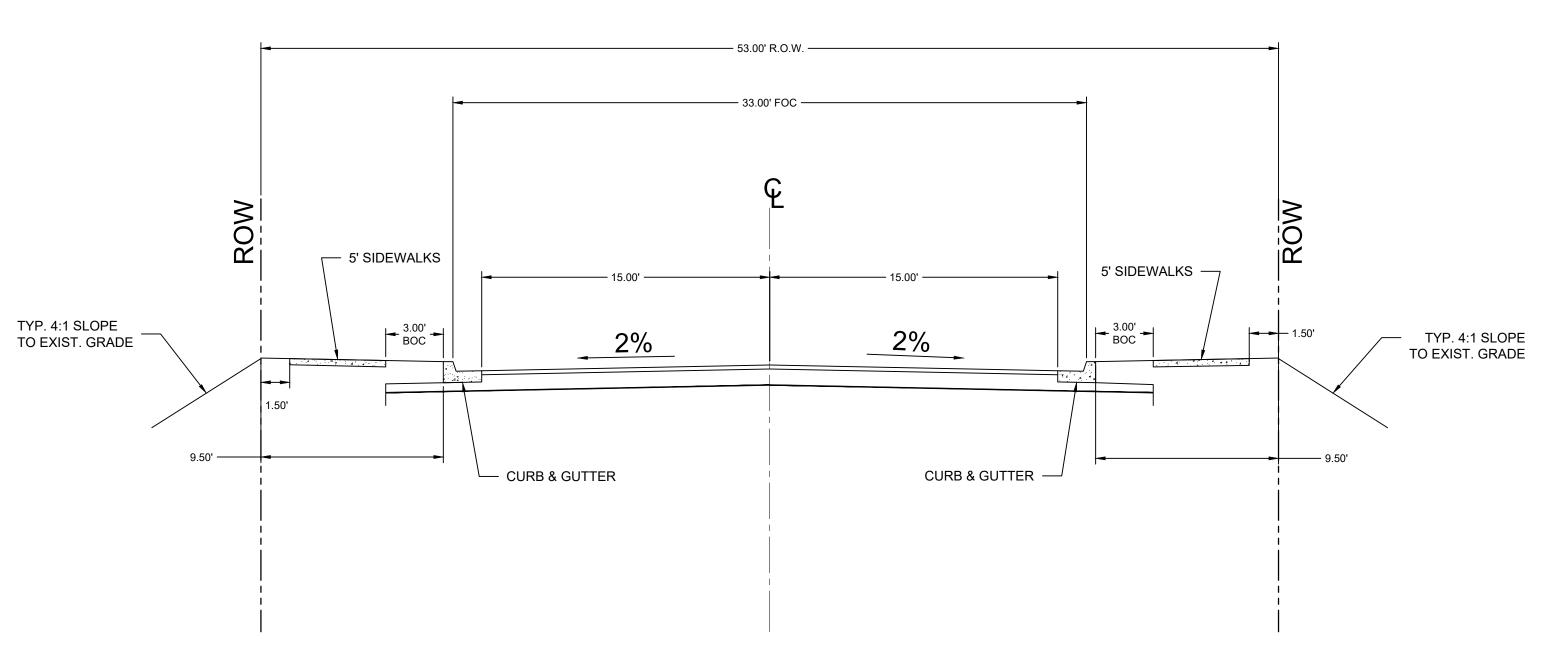
COMPACTED EARTH

OR ROCK BACKFILL

CONTROL

 $\overline{\mathbb{S}}$ 

1 6B ×



RESIDENTIAL STREET (LOW TRAFFIC)
BOWMAN PHASES

PESCRIPTION

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TBPE Firm Registration No. F-14309
San Marchs Taxas 7866
www. bowman com

NOIS					
REVISION					
HOADWAY CHOSS SECTION		٠.	PICP #2023-XXXXXX	SAN MARCOS TEXAS 78666	

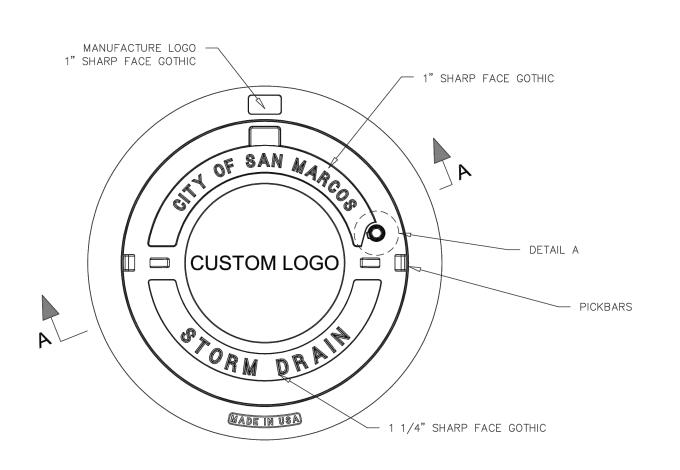
 DATE: NOVEMBER 11, 202

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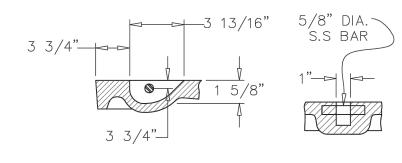
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 JOB No. 005956-01-113

SHEET 40 OF 54



# LID AND FRAME **PLAN VIEW**





PICKBAR DETAIL

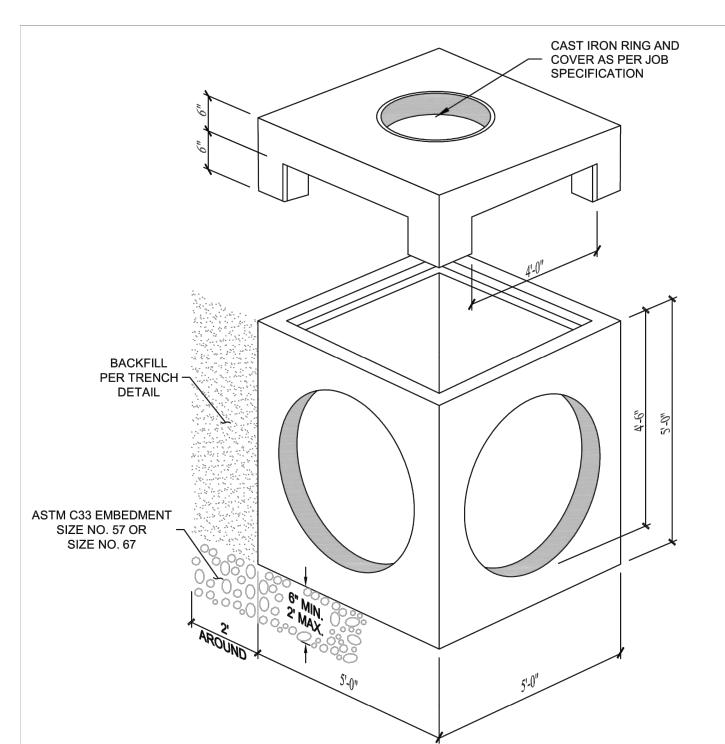
**CUSTOM LOGO** 

The City of San Marcos
Engineering and Capital Improvements

CURRENT AS OF 1/1/2023

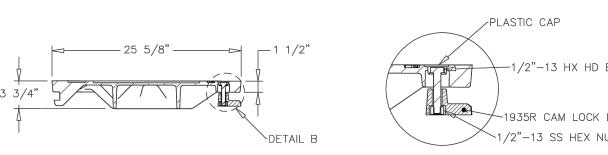
STORM DRAIN CURB INLET RING AND COVER 25 5/8" UNBOLTED

Engineering and Capital Improvements THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY 6/5/2014 RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD 503S-2S-SM LAUDIE MOVED DE

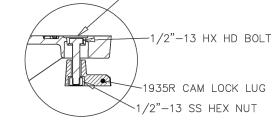


- REBAR PLACEMENT WILL BE PER MANUFACTURERS RECOMMENDATION. IF POSSIBLE TRAFFIC LOADS DESIGN MUST MEET HS-20 MINIMUM BEARING CAPACITY. CAST IN PLACE MUST BE SUBMITTED & SEALED BY DESIGN **ENGINEER**
- ALL CUT STEEL SHALL BE REPLACED WITH ADDITIONAL DIAGONAL BARS OF THE SAME DIAMETER. INLET RING AND COVER SHALL BE IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD 503S-2S-SM.
- 4. CONCRETE COVERAGE OF STEEL SHALL BE 2" MIN. AT ALL SURFACES.
- 5. ALL MEASUREMENTS ARE MINIMUM UNLESS OTHERWISE NOTED. CONSULT MANUFACTURER BEFORE HANDLING.
- 7. DRILL 3" DEEP HOLES (5/8" DIA.) AT 12" O.C.

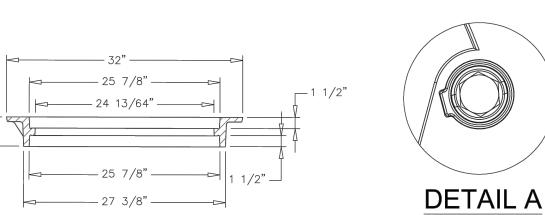
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PRECAST 4-SIDED AREA INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 508S-9-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	3 OF 3



# LID SECTION VIEW **SECTION A-A**



**DETAIL B** 



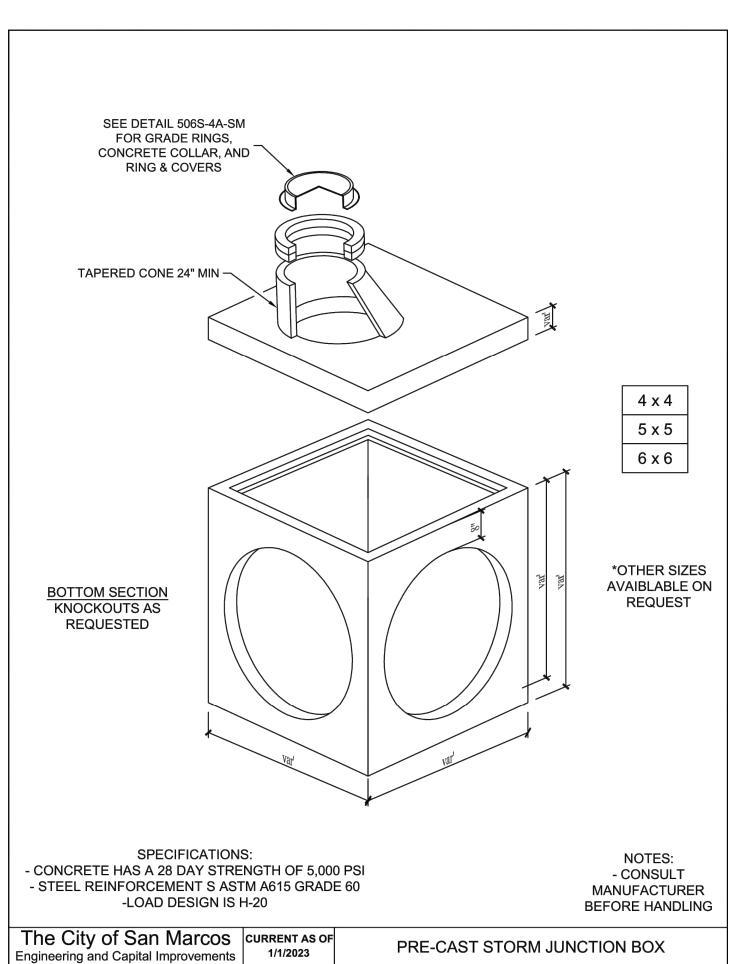
# FRAME SECTION VIEW **SECTION A-A**

MA	TERIALS
LID	DUCTILE IRON
FRAME	GRAY IRON

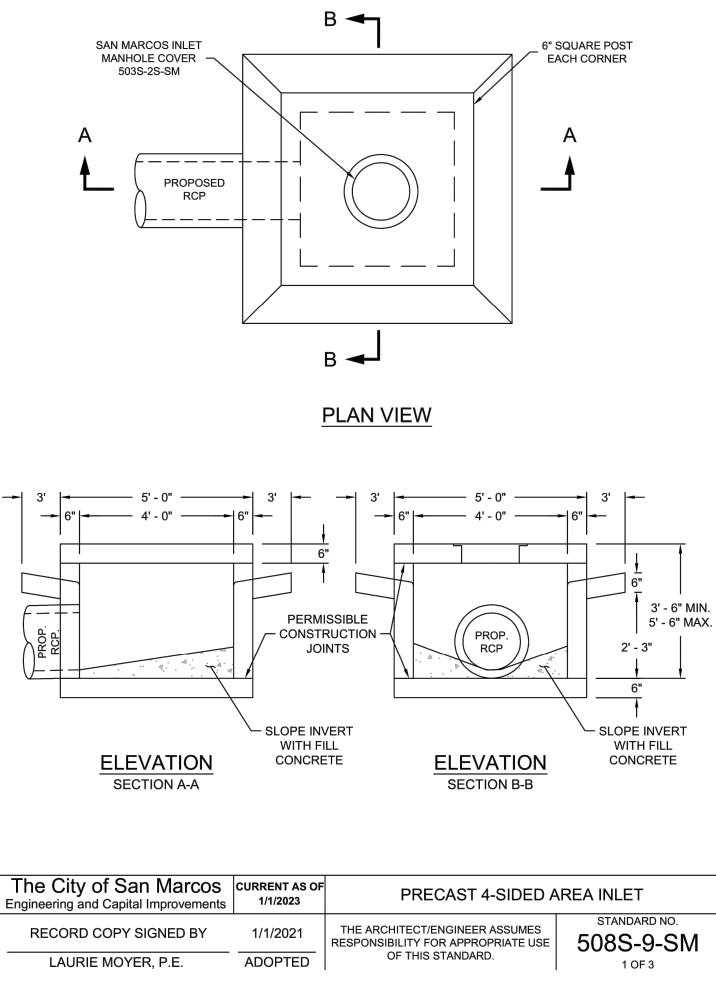
### NOTE:

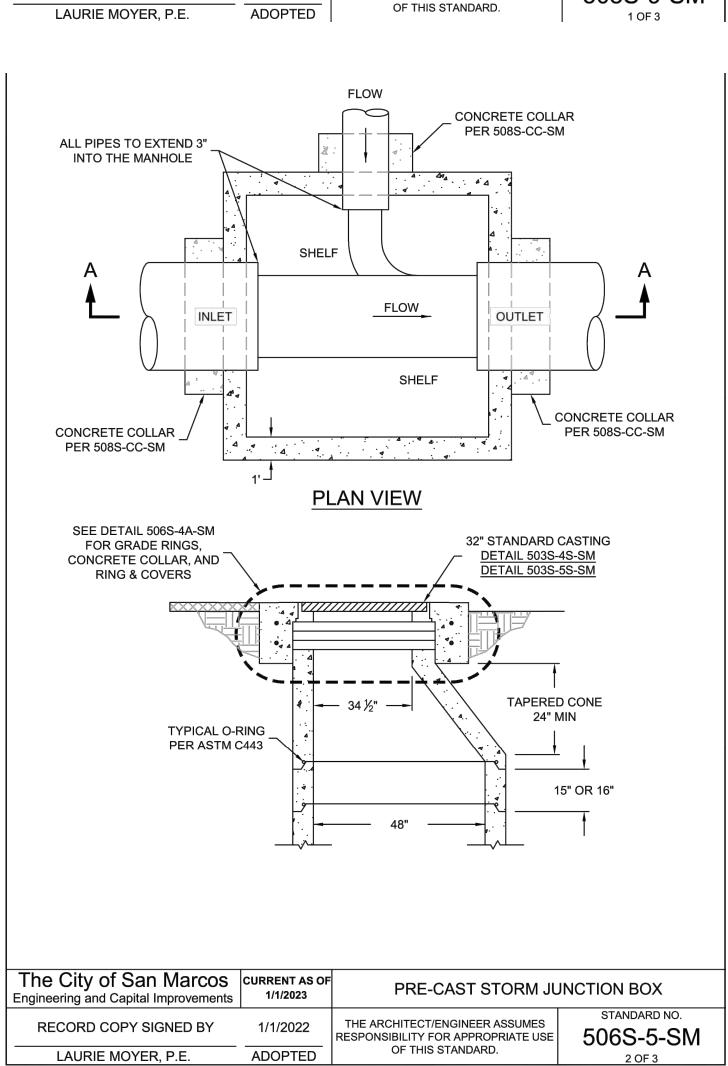
- 1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
- 2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

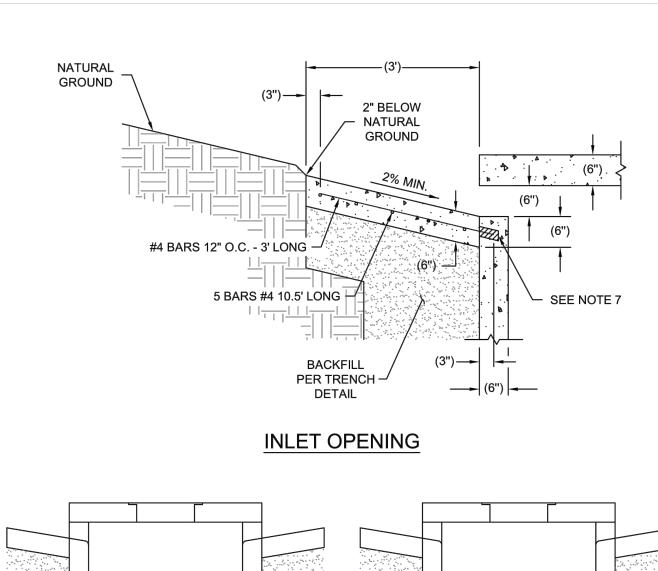
			SHT 2 OF 2
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	STORM DRAIN CURB INI COVER 25 5/8" UN	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	

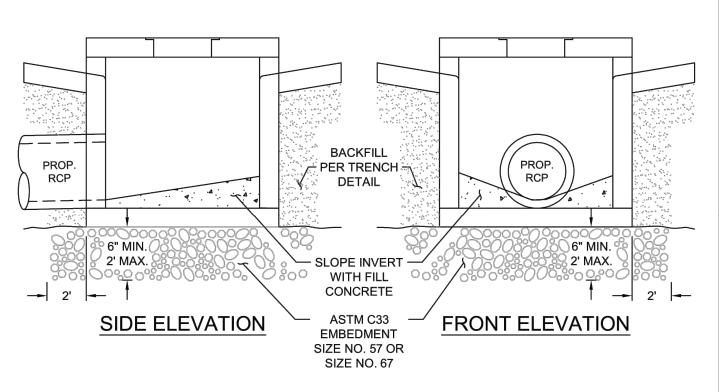


The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PRE-CAST STORM JUNCTION BOX		
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 506S-5-SM	
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 3	

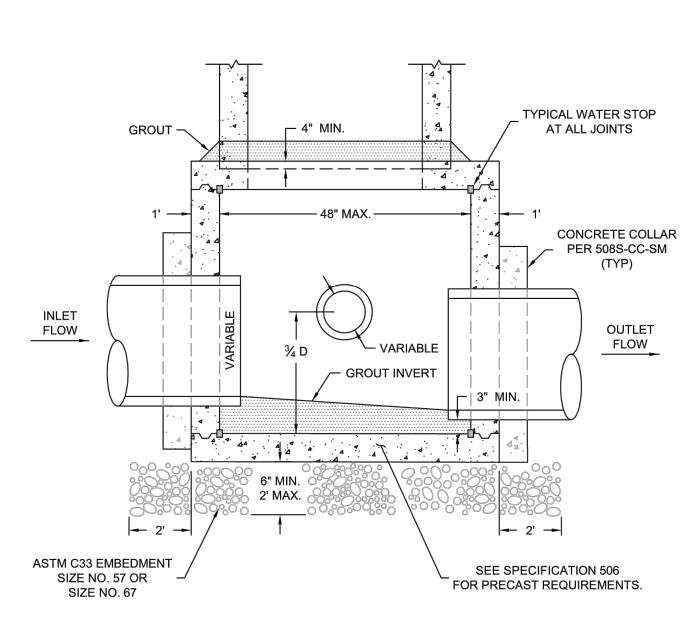






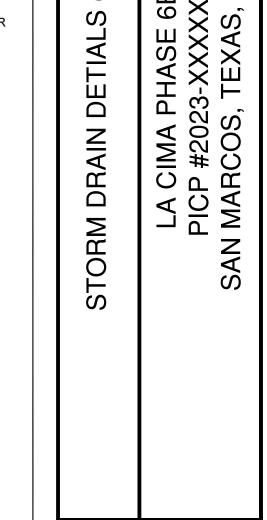


The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023		
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 508S-9-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 3



# **SECTION A-A**

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PRE-CAST STORM JUNCTION BOX	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 506S-5-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	3 OF 3

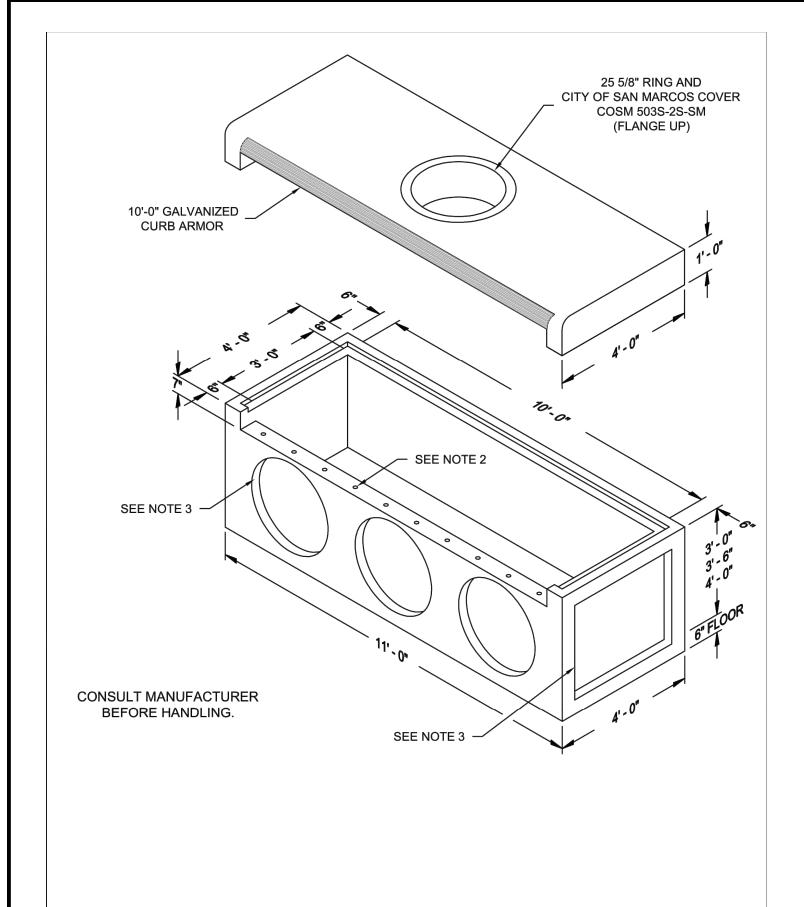


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DATE: NO	DVEMBER	11, 2023
DATE: NO	DVEMBER DRAWN	11, 2023 CHKD

SHEET 47 OF 54



TYPICAL PRE-CAST CURB INLET

REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60. BAR BENDING AND PLACEMENT SHALL COMPLY WITH LATEST ACI STANDARDS. DESIGN BASED ON AASHTO HS 20 LOADING.

5. THE CONTRACTOR MAY PROPOSE ALTERNATE PROCEDURES FOR THE CONSTRUCTION OF INLETS, INCLUDING CAST IN PLACE UNITS. PLANS FOR SUCH SHALL BE SUBMITTED TO THE ENGINEER

DRILL 6" DEEP HOLES (5/8" DIA.) AT 12" O.C. ON 3'-6" AND 4'-0" BASES. HOLES SHALL BE DRILLED IN THE FIELD PER THE DIRECTION OF THE CITY INSPECTOR ON 3'-0" BASES.

7. PAYMENT FOR INLET AT THE CONTRACT PRICE SHALL INCLUDE THE TRANSITION CURB, IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD INLET DESIGN.

3A. 30" DIA. TWKO'S ON FRONT AND REAR OF 10'-0" INLETS. 36"W x 30"H TWKO'S ON BOTH END WALLS OF 10'-0" INLETS.

8. INVERT OF INLET SHALL BE SLOPED 1:20 WITH FILL CONCRETE BY CONTRACTOR, SHAPED AS "V" SECTION.

9. THIS STANDARD COMPLIES WITH COSM STANDARD SPECIFICATIONS ITEM NO. 508S.

10. IF A 5' INLET IS USED; IT SHALL BE PLACED UPSTREAM OF THE 10' INLET.

4. CHAMFER ALL EXPOSED EDGES (3/4").

FOR REVIEW AND APPROVAL BEFORE CONSTRUCTION.

6. ALL CONCRETE SHALL BE CLASS "C" AS PER ITEM 403S.

3B. 54" W x 30"H TWKO'S ON FRONT AND REAR OF 5'-0" INLETS. 36" W x 30"H TWKO'S ON BOTH END WALLS OF 5'-0" INLETS.

THE ARCHITECT/ENGINEER ASSUMES

RESPONSIBILITY FOR APPROPRIATE USE

STANDARD NO.

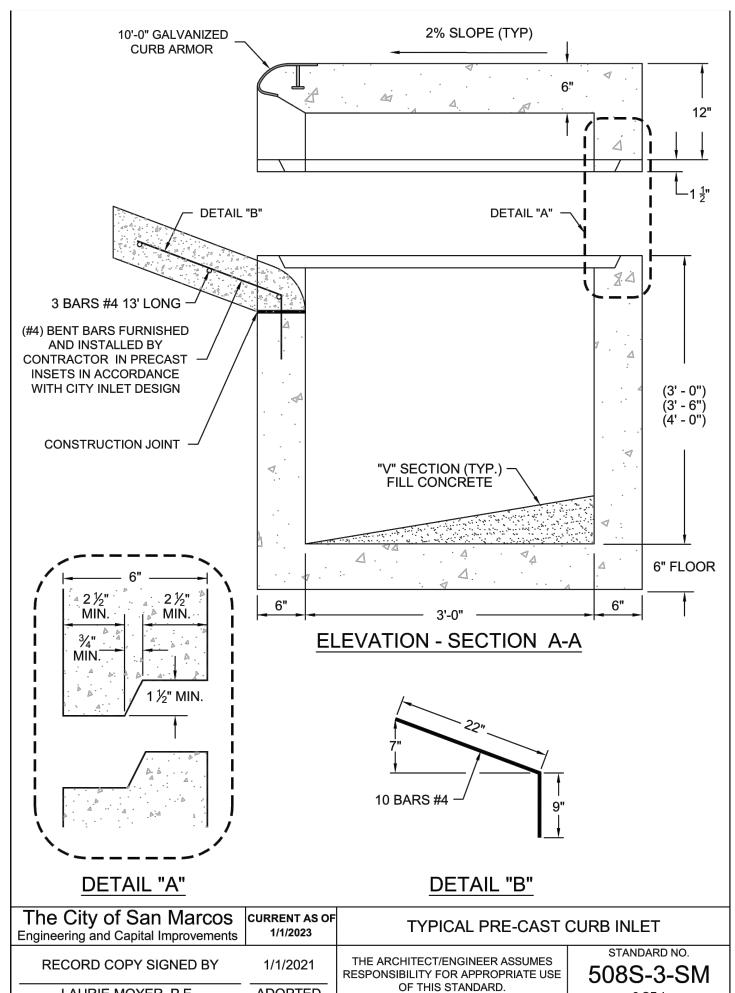
508S-3-SM

The City of San Marcos | CURRENT AS OF

1/1/2021

Engineering and Capital Improvements

RECORD COPY SIGNED BY



The City of San Marcos | CURRENT AS O

SHAUN CONDOR, P.E. ADOPTED

DUEL PRE-CAST CURB INLETS

RESPONSIBILITY FOR APPROPRIATE

508S-3A-SN

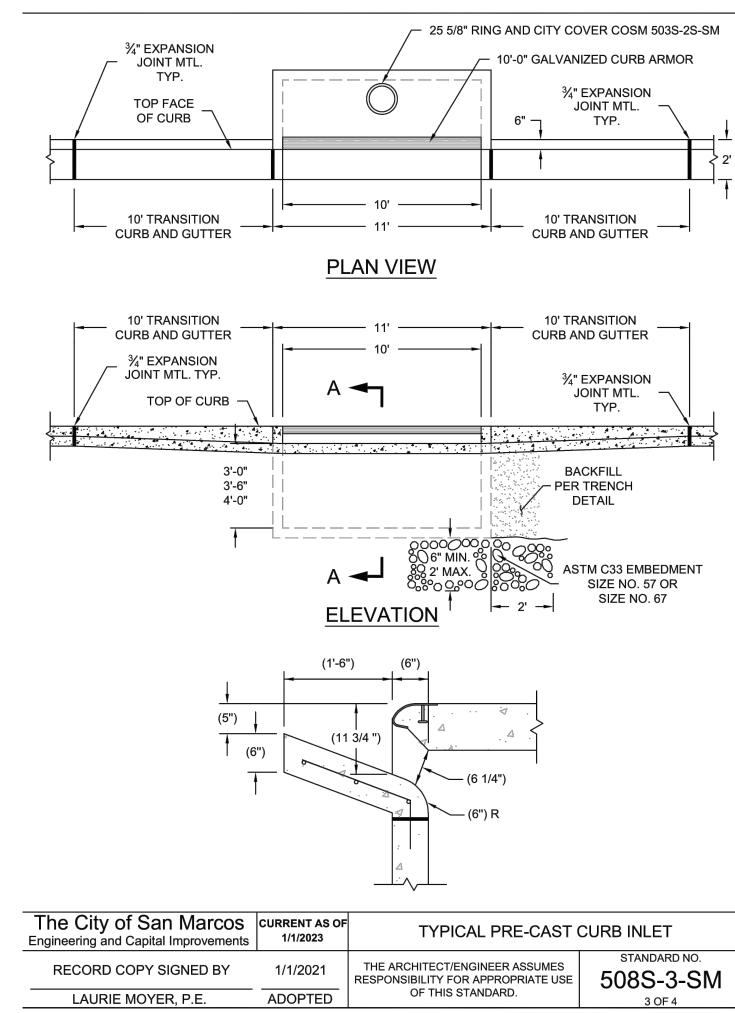
3/16/2022

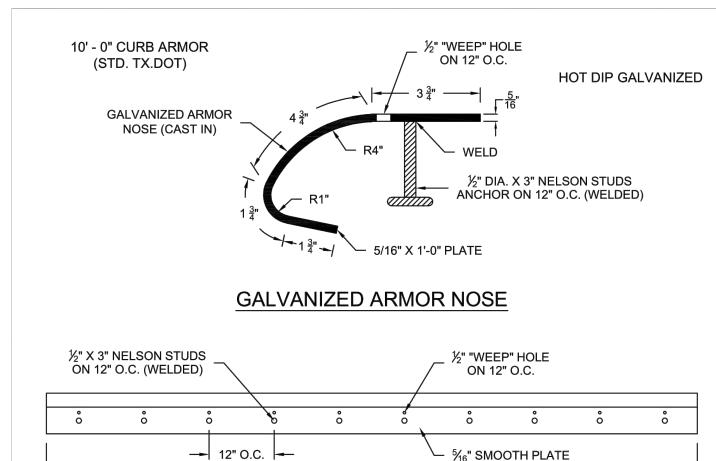
Engineering and Capital Improvements

RECORD COPY SIGNED BY

THE ARCHITECT/ENGINEER ASSUMES

USE OF THIS STANDARD.





# **GALVANIZED ARMOR NOSE PLAN VIEW**

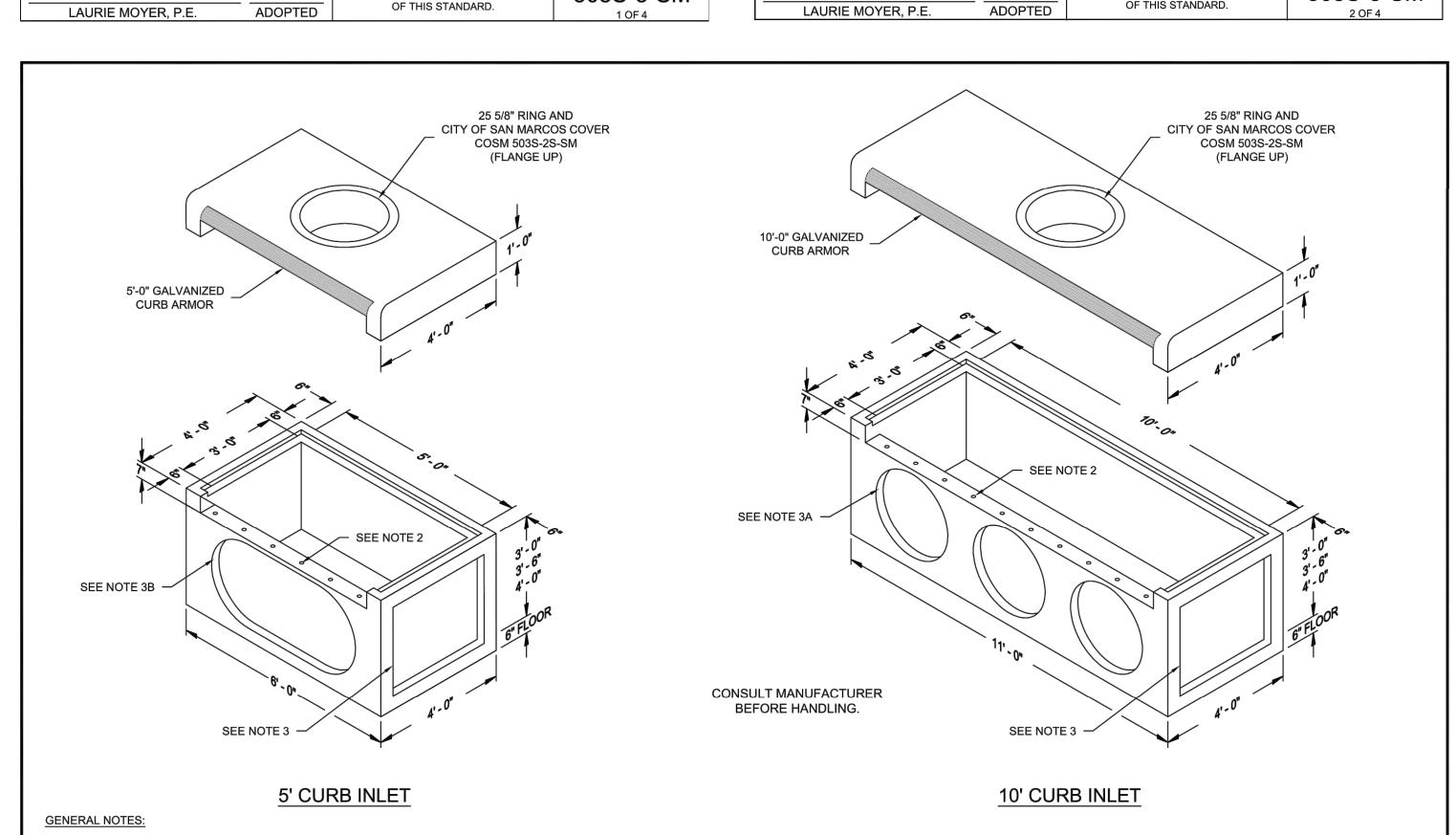
### **GENERAL NOTES:**

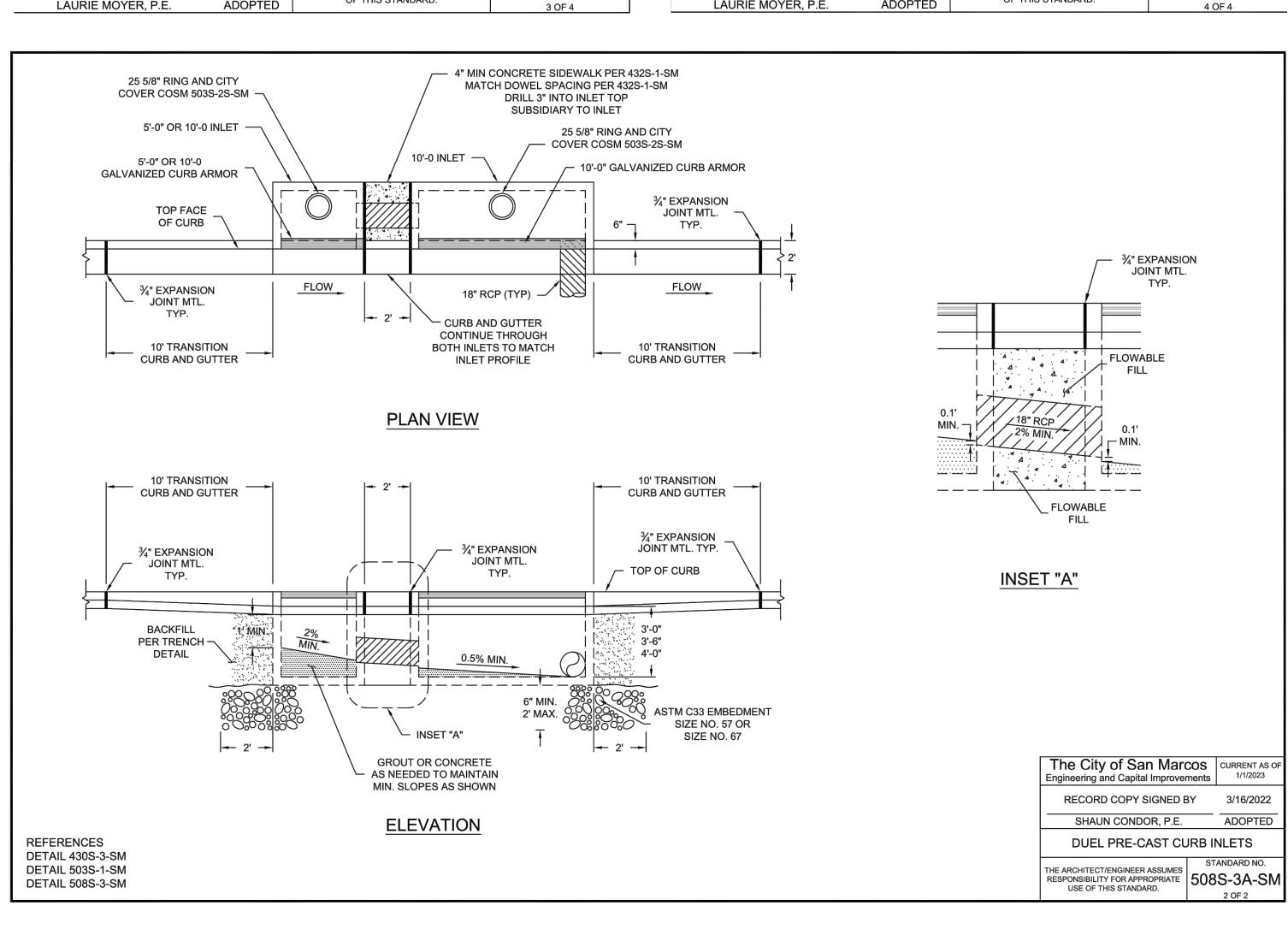
- 1. REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60. BAR BENDING AND PLACEMENT SHALL COMPLY WITH LATEST ACI STANDARDS. DESIGN BASED ON AASHTO HS 20 LOADING.
- 2. DRILL 6" DEEP HOLES (5/8" DIA.) AT 12" O.C. ON 3'-6" AND 4'-0" BASES. HOLES SHALL BE DRILLED IN THE FIELD
- PER THE DIRECTION OF THE CITY INSPECTOR ON 3'-0" BASES. 3. 30" DIA. TWKO'S ON FRONT AND REAR OF 10'-0" INLETS. 36"W X 30"H TWKO'S ON BOTH END WALLS OF 10'-0"
- 4. CHAMFER ALL EXPOSED EDGES (3/4").
- 5. THE CONTRACTOR MAY PROPOSE ALTERNATE PROCEDURES FOR THE CONSTRUCTION OF INLETS, INCLUDING CAST IN PLACE UNITS. PLANS FOR SUCH SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL BEFORE CONSTRUCTION.
- 6. ALL CONCRETE SHALL BE CLASS "C" AS PER ITEM 403S. 7. PAYMENT FOR INLET AT THE CONTRACT PRICE SHALL INCLUDE THE TRANSITION CURB, IN ACCORDANCE WITH
- CITY OF SAN MARCOS STANDARD INLET DESIGN.
- 8. INVERT OF INLET SHALL BE SLOPED 1:20 WITH FILL CONCRETE BY CONTRACTOR, SHAPED AS "V" SECTION. 9. THIS STANDARD COMPLIES WITH COSM STANDARD SPECIFICATIONS ITEM NO. 508S.

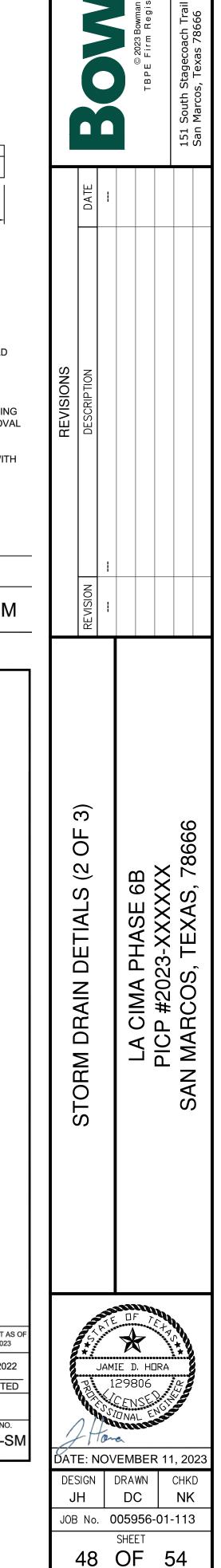
REFERENCES DETAIL 430S-3-SM

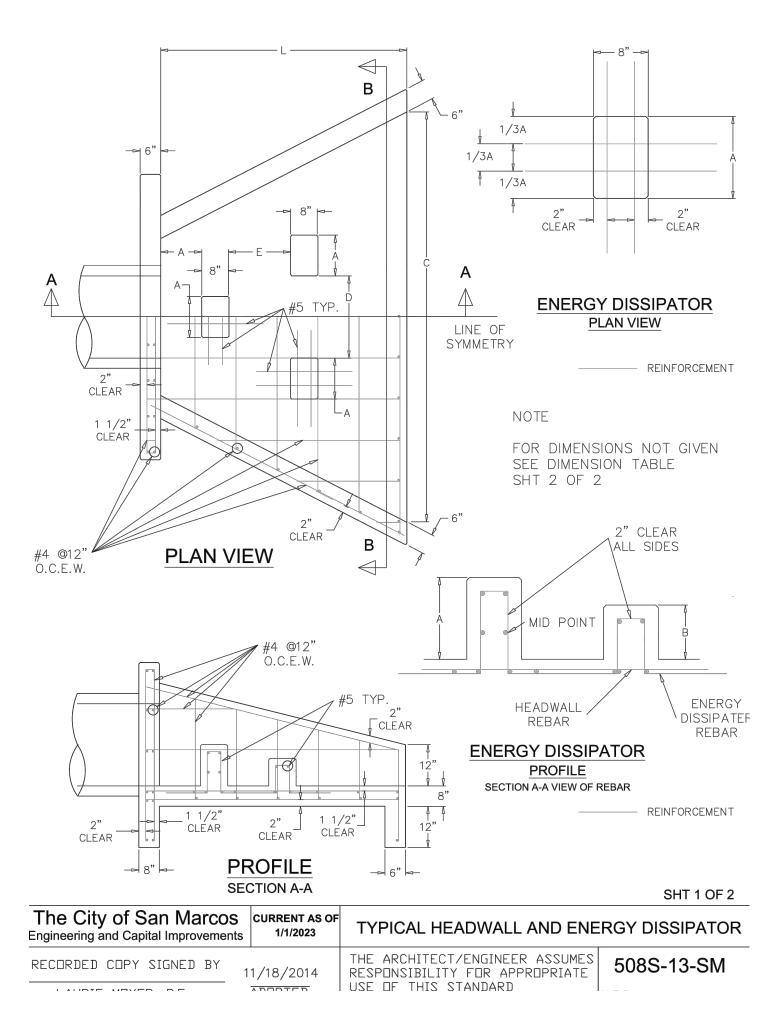
DETAIL 503S-1-SM

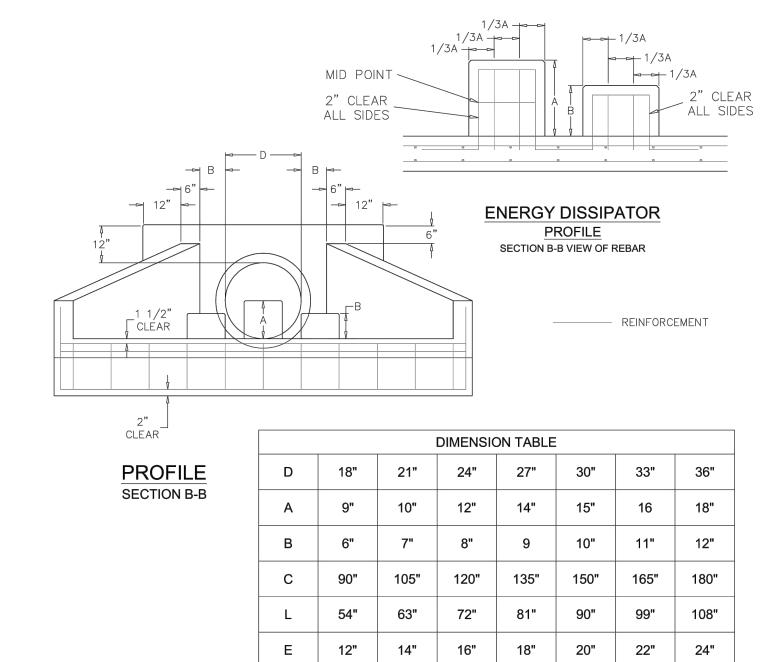
The City of San Marcos CURRENT AS OF TYPICAL PRE-CAST CURB INLET Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY 1/1/2021 508S-3-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. ADOPTED LAURIE MOYER, P.E.











1. ALL CONCRETE SHALL BE TYPE "C" PER SPEC. 403S

CHAMFER ALL EXTERNAL VISIBLE CORNERS.

3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY. 4. DISCHARGE VELOCITIES GREATER THAN 6 FEET/SECOND AFTER DISSIPATOR

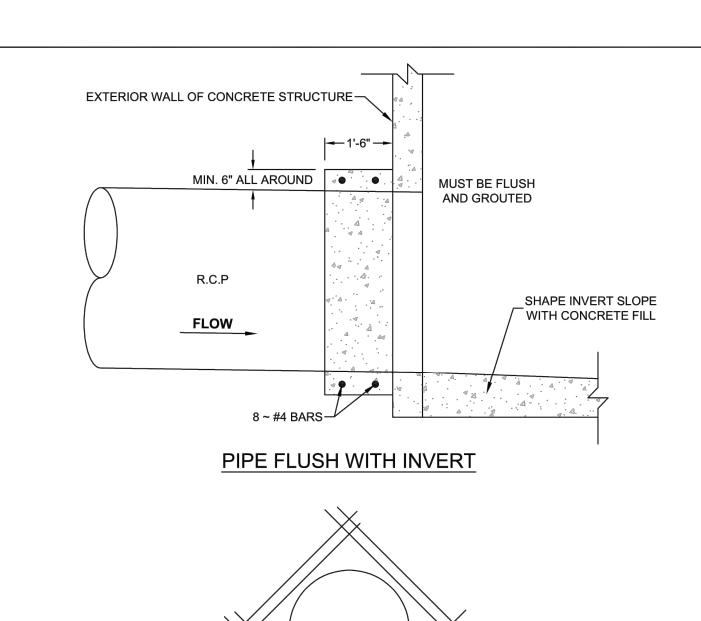
ALSO REQUIRE ROCK OUTLET PROTECTION. 5. DETAIL IS NOT FOR PIPES WITH EXIT VELOCITIES EXCEEDING 15 FEET PER

6. ALL SPACING FOR CAST-IN-PLACE HEADWALLS AND DISSIPATORS.

7. ANY WALL THICKER THEN 6" WILL BE DOUBLE MATTED WITH

REINFORCEMENT REBAR.

The City of San Marcos CURRENT AS OF TYPICAL HEADWALL AND ENERGY DISSIPATOR Engineering and Capital Improvements 1/1/2023 THE ARCHITECT/ENGINEER ASSUMES 708S-13-SM RESPONSIBILITY FOR APPROPRIATE TI/10/2014 | RESPUNSIBILITY FOR APP



NOTES:

LAURIE MOYER, P.E.

SHT 2 OF 2

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. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.

INVERT TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE.

COST SUBSIDIARY TO INLETS, MANHOLES AND JUNCTION BOXES. 8. CONCRETE COLLARS ARE SUBSIDIARY TO INLETS, MANHOLES AND JUNCTION BOX.

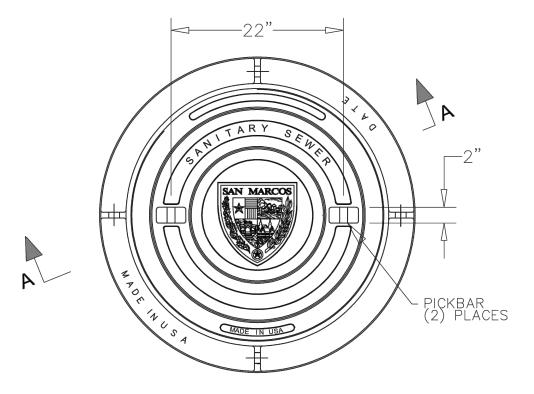
ADOPTED

The City of San Marcos | CURRENT AS OF CONCRETE COLLAR FOR DRAINAGE PIPE Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY RESPONSIBILITY FOR APPROPRIATE USE 508S-CC-SM

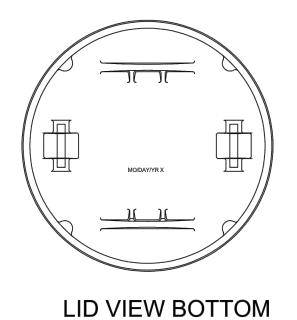
OF THIS STANDARD.

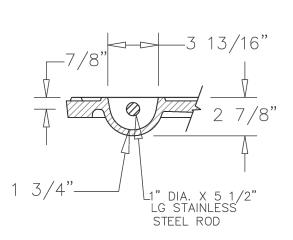
STORM DRAIN DETIALS (3 OF 3)

DESIGN DRAWN
JH DC JOB No. **005956-01-113** SHEET 49 OF 54



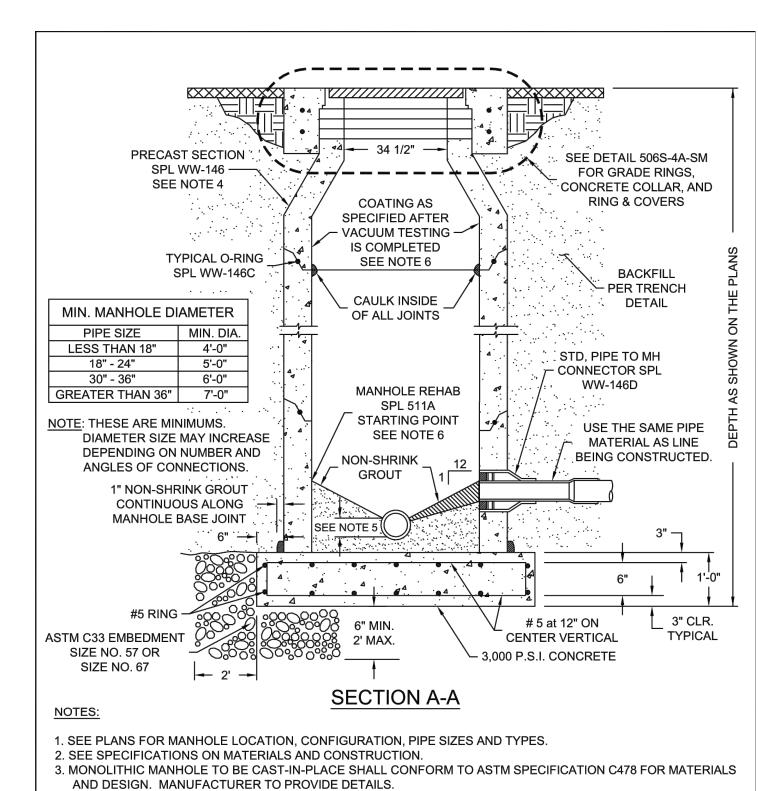
# FRAME AND LID PLAN **VIEW**





PICKB	AR D	<b>ETAIL</b>

			SHT 1 OF 2
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SANITARY SEWER MANH COVER 32" - UNB	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE	503S-4W-SM
LAUDTE MOVED DE	<u> </u>	USE OF THIS STANDARD	l



## **OUTSIDE PAVEMENT**

IN PAVEMENT

/— SEE DETAIL 1100S-1-SM

**EXISTING ASPHALT** 

OR CONCRETE

HDPE MANHOLE

ADJUSTMENT RINGS

PER SPL WW-703

MAXIMUM HEIGHT

ALLOWED PER 506.5.I.2.

1/2" x 4 1/2" ZINC PLATED CARBON STEEL

POWER-STUD + SD1 WEDGE EXPANSION

ANCHOR MFR # 7423SD1-PWR

3" RADIUS OR AS DIRECTED BY

— CLASS A CONCRETE (SEE NOTE 4)

COSM INSPECTOR

2 1/4"

1. IF MANHOLE IS WITHIN THE 100-YEAR FLOODPLAIN, USE BOLTED AND GASKET LIDS.

MANHOLE RING AND COVER PER SPL WW-219

MINIMUM BUTYL RUBBER
SEALANT CONTINUOUS, PLACED IN
SEALANT CONTINUOUS, PLACED IN
SEALANT CONTINUOUS, PLACED IN

1/2" x 1/2"

RECOMMENDATIONS.

MANHOLE LINER STOP AT

FIRST GRADE RING

FOR WASTEWATER MANHOLES

MANHOLE CONE SECTION —

MANHOLE RING AND COVER

MANHOLE LINER STOP AT FIRST GRADE RING

FOR WASTEWATER MANHOLES

MANHOLE CONE SECTION -

PER SPL WW-219

- 2. DIMENSION B = (6"-12" TO FINISH GRADE) FOR MANHOLE LOCATED IN THE 100-YR FLOOD PLAN. = (2"-12" TO FINISH GRADE) FOR MANHOLE OUTSIDE THE 100-YR FLOOD PLAN.
- 3. MANUFACTURES SHALL VERIFY DIMENSION AGAINST RING AND COVER SPECIFIED.
- 4. INSPECTOR MAY APPROVE THE USE OF CONCRETE BAG PER SPL WW-704 AT THE INSPECTORS DISCRETION.
- REFERENCES **DETAIL 1100S-1-SM**

_	DETAIL TIOOS TOW			
	The City of San Marcos	CURRENT AS OF	MINOR MANHOLE AD	JUSTMENT &
_	Engineering and Capital Improvements	1/1/2023	NEW MANHOLE CON	STRUCTION
		4/4/0000	THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO.
	RECORD COPY SIGNED BY	1/1/2020	RESPONSIBILITY FOR APPROPRIATE USE	506S-4A-SM
	LAURIE MOYER P.E.	ADOPTED	OF THIS STANDARD.	1.05.1

### The City of San Marcos CURRENT AS OF WASTEWATER MANHOLE ON PRECAST BASE Engineering and Capital Improvements STANDARD NO. RECORD COPY SIGNED BY THE ARCHITECT/ENGINEER ASSUMES 506S-10-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. LAURIE MOYER, P.E. **ADOPTED**

MANHOLE REHABILITATION - COAT PER SPL 511A; EXCLUDING THE BOTTOM AND INVERT.

5. DEPTH OF U CHANNEL WILL BE 3/4 THE DIAMETER OF PIPES 24" OR LESS AND WILL BE THE DIAMETER OF PIPES

4. MANHOLES FOR MAINS 24" AND LARGER SHALL HAVE ECCENTRIC RISER SECTIONS.

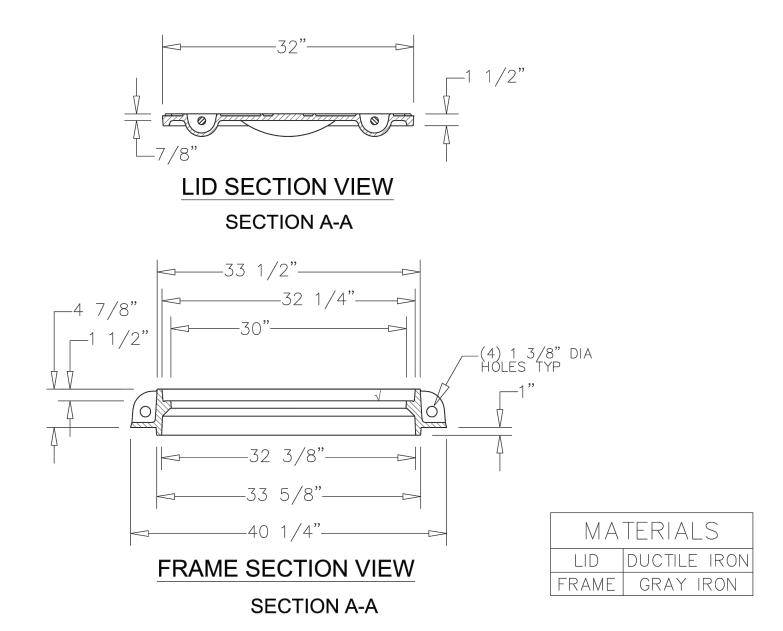
AT TOP OF MANHOLE: SEE DETAIL 506S-4A-SM FOR END LOCATION AT GRADE RINGS.

NEW MANHOLES - COAT PER SPL 511; INCLUDING THE BOTTOM AND INVERT.

6. MANHOLE COATING LIMITS - COAT ALL OF THE MANHOLE WALLS.

GREATER THEN 24".

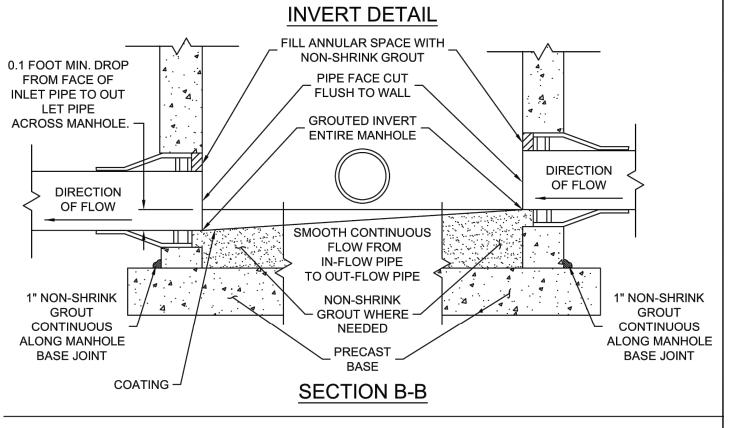
AT BOTTOM OF MANHOLE:

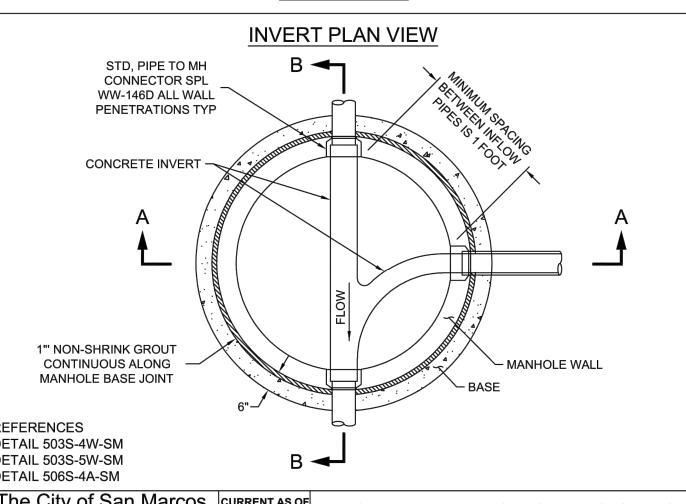


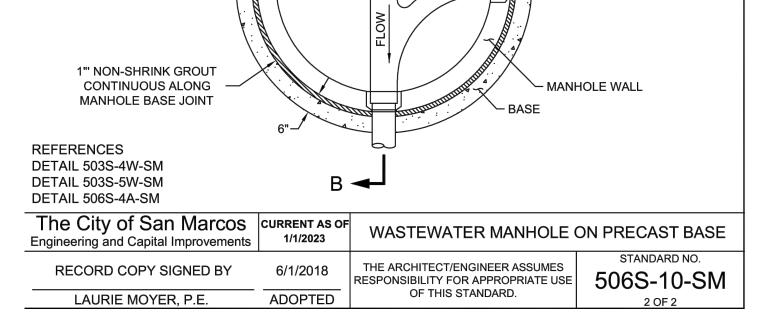
### NOTE:

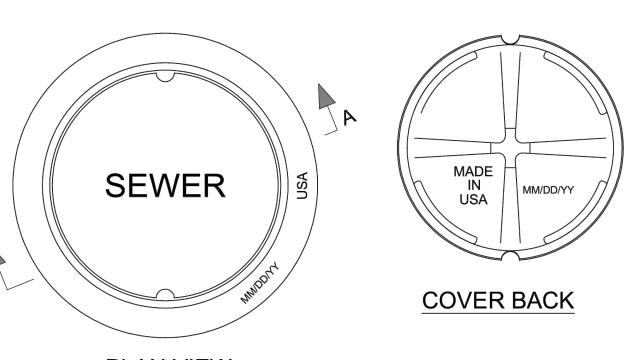
- 1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
- 2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

			SHT 2 OF 2
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SANITARY SEWER MANH COVER 32" - UNB	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-4W-SM

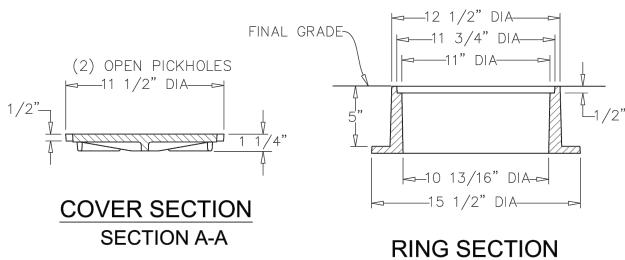








**PLAN VIEW** 



1. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

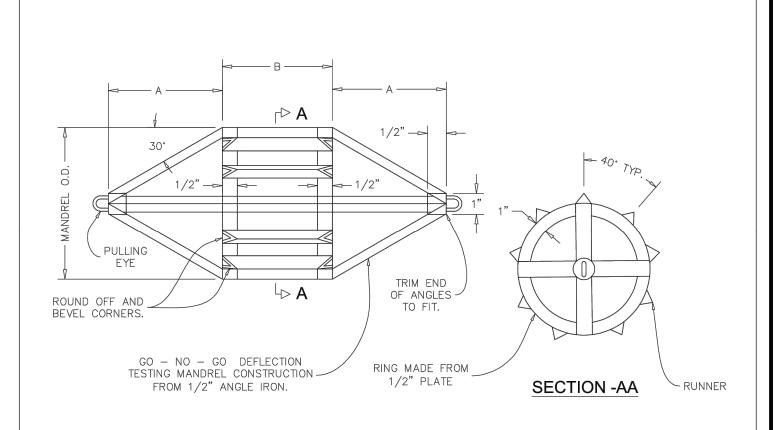
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**SECTION A-A** 

The City of San Marcos Engineering and Capital Improvements CLEANOUT RING AND COVER

THE ARCHITECT/ENGINEER ASSUMES
RESPONSIBILITY FOR APPROPRIATE
USE OF THIS STANDARD

THE ARCHITECT/ENGINEER ASSUMES
RESPONSIBILITY FOR APPROPRIATE
USE OF THIS STANDARD



DIMENSION							
PIPE SIZE	Α	В	MANDREL O.D.	PIPE O.D.	WALL THINNESS		
6" SDR 26	3.5"	5.0"	5.503"	6.275"	0.214"		
8" SDR 26	4.5"	6.0"	7.366"	8.400"	0.323"		
10" SDR 26	5.5"	7.5"	9.207"	10.500"	0.404"		
12" SDR 26	7.0"	9.0"	10.961"	12.500"	0.481"		
15" SDR 26	9.0"	11.5"	13.418"	15.300"	0.588"		

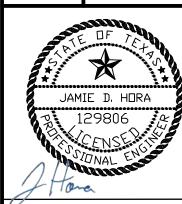
- 1. AFTER WELDING IS COMPLETED, TRUE THE OUTSIDE DIAMETER DIMENSION. FOR THE
- FULL LENGTH OF "B" TO 0.010".
- 2. MANDREL OD MUST BE EQUAL TO 95% OF THE ID OF THE PIPE ADJUSTABLE MANDREL NOT ACCEPTABLE.
- 4. REFERENCE THE PIPE MANUFACTURER'S SPECIFICATIONS FOR MANDREL SIZE AND
- SUPPLY CALCULATED DIMENSIONS IN A SUBMITTAL. 5. A PROVING RING IS REQUIRED.
- 6. MANDREL WILL HAVE AN ODD NUMBER OF RUNNERS (9 OR MORE).

1	The City of San Marcos Engineering and Capital Improvement	ts 1/1/2023		MAN[	DRE		
-	RECORDED COPY SIGNED BY	2-15-2015	THE ARCHITECT/ENGIN		510S	-PM-	-SN
	LAURIE MOYER, P.E.	ADOPTED	USE OF THIS STANDA	RD	N.T.S.	STANDARD	DETA

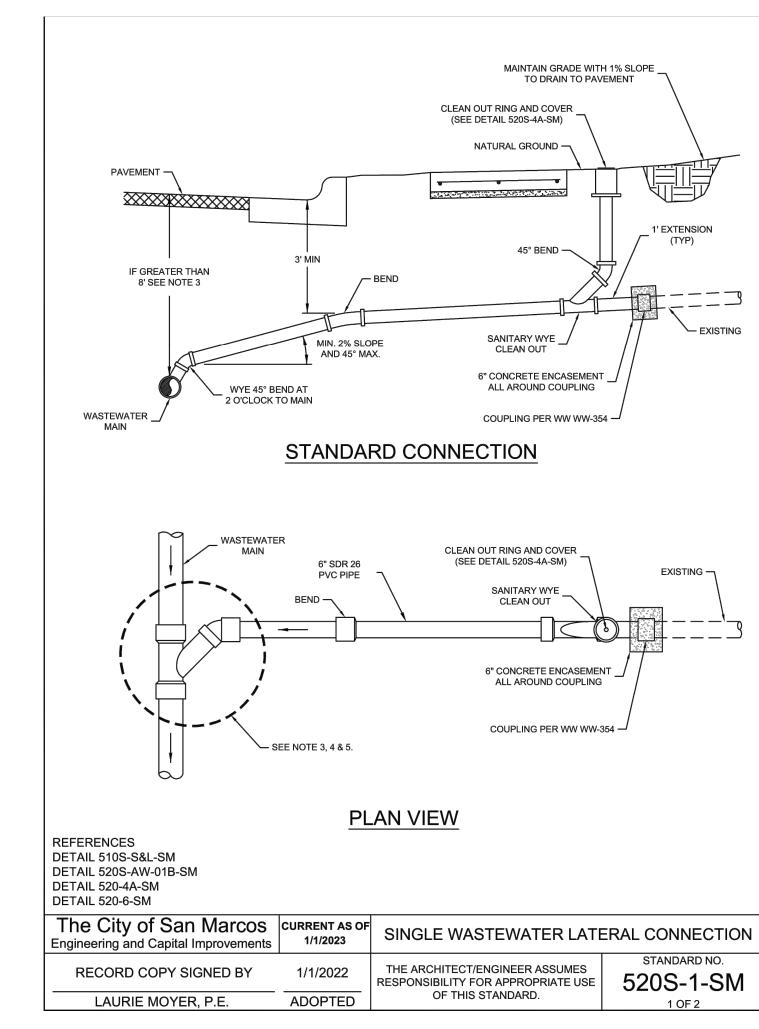
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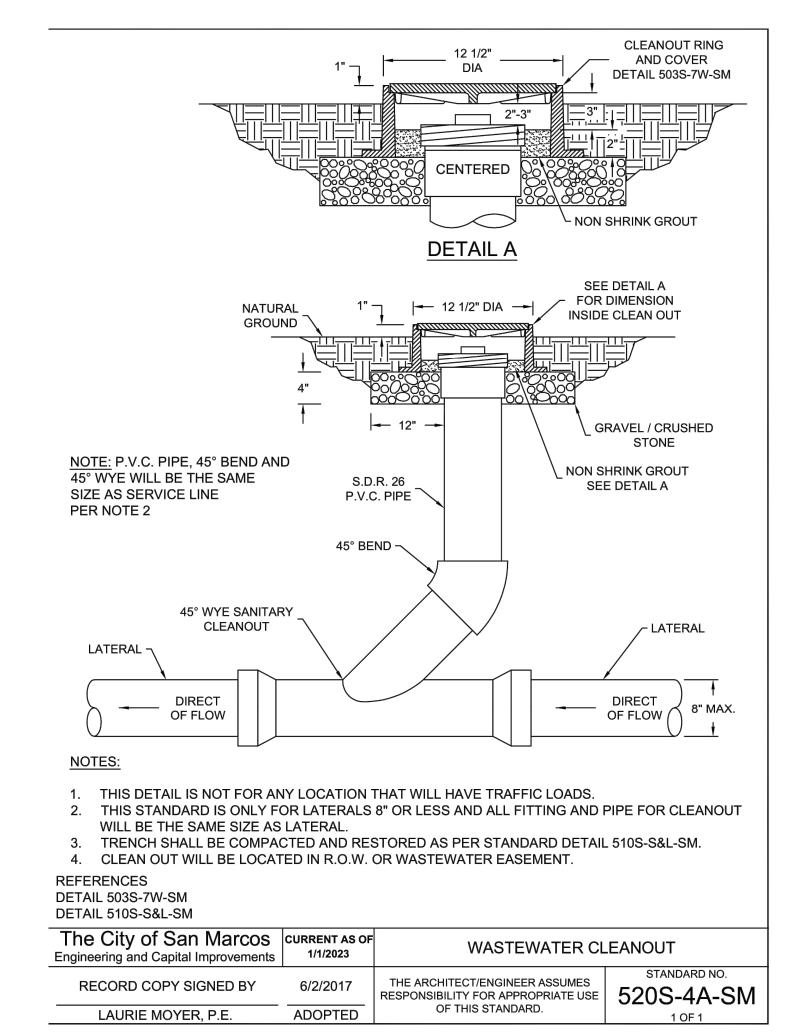
7 9 DE CIMA P #202 Щ

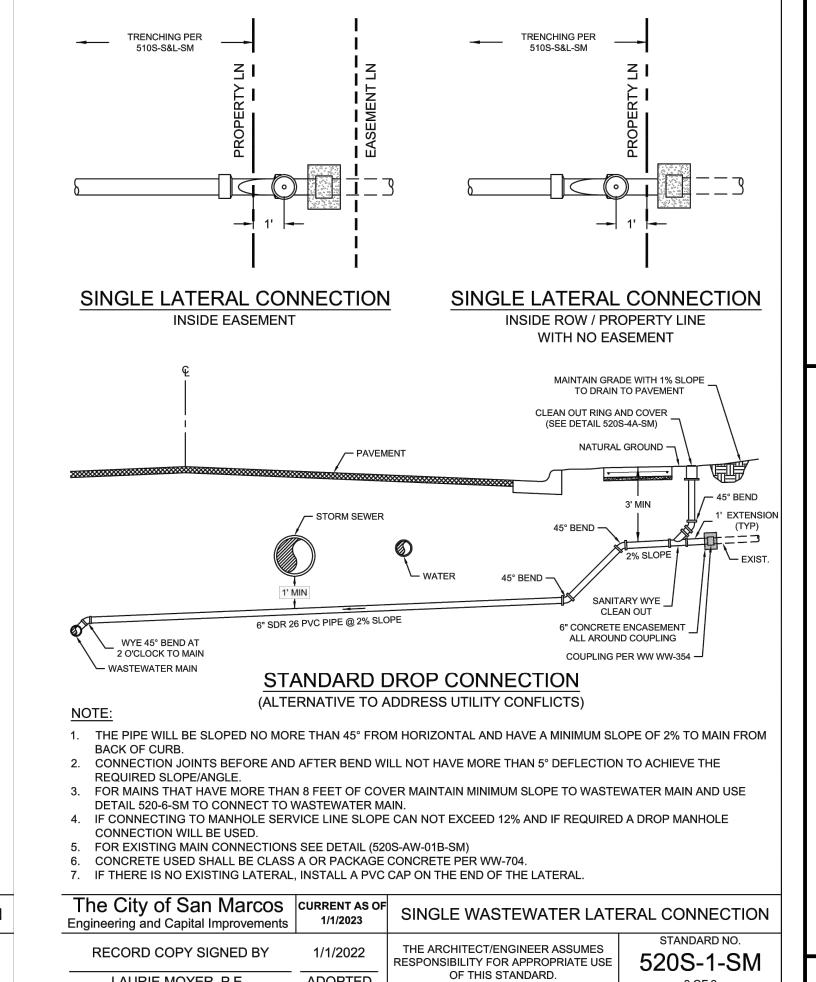
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ATE: NOVEMBER 11, 202 DESIGN | DRAWN DC JOB No. 005956-01-113 SHEET 50 OF 54

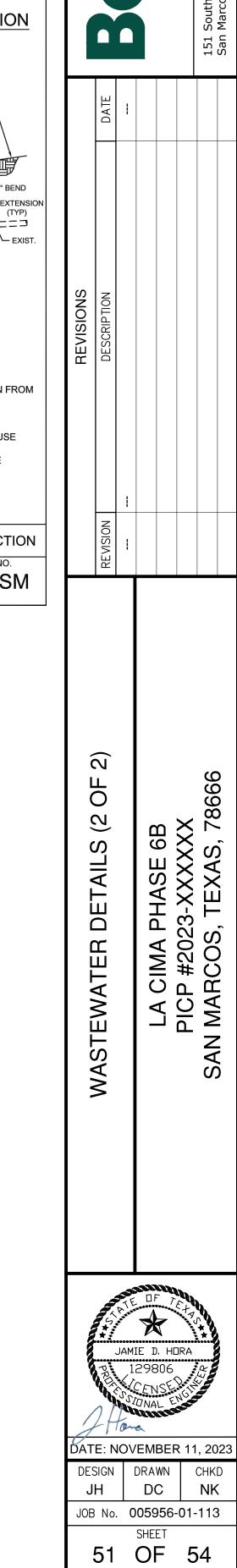




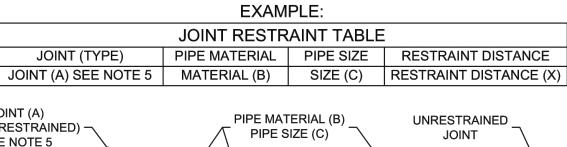


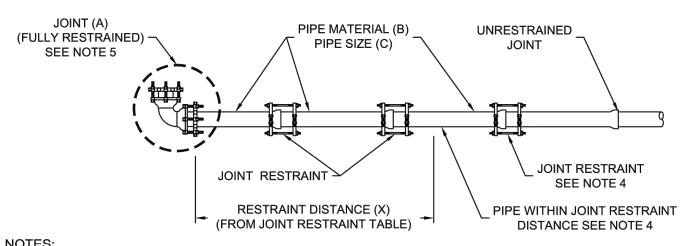
ADOPTED

LAURIE MOYER, P.E.



## TYPICAL RESTRAINT

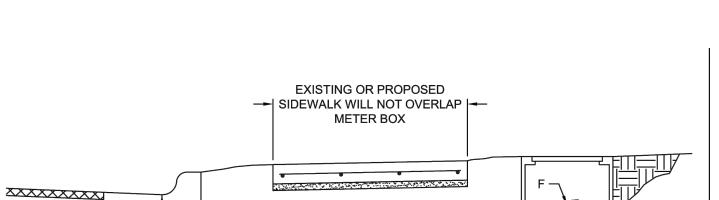


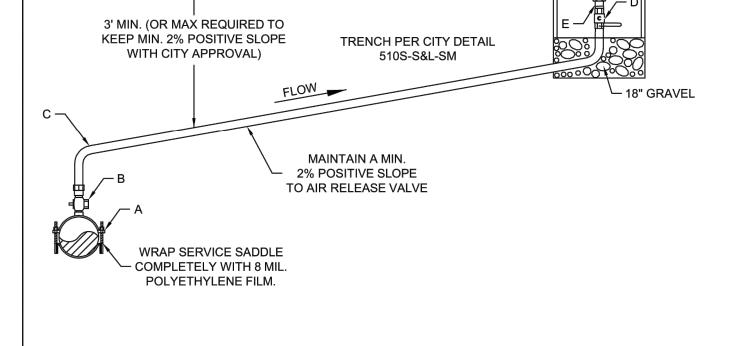


- ALL JOINT RESTRAINTS WILL BE PER CURRENT CITY OF SAN MARCOS STANDARD PRODUCT LIST. 2. ALL BELL JOINTS RESTRAINTS AND METAL PIPES WILL BE WRAPPED IN 8 MIL POLY PER SPL 27D.
- 3. A JOINT RESTRAINT TABLE FOR ALL FITTINGS WILL BE SUBMITTED WITH PLANS. 4. CONTRACTOR SHALL RESTRAIN ALL JOINTS WITHIN THE REQUIRED RESTRAINT DISTANCE PLUS THE NEXT JOINT OUTSIDE THE REQUIRED RESTRAINT DISTANCE.
- 5. JOINT RESTRAINT TABLE MUST INCLUDE ALL JOINTS AND FITTINGS THAT RESTRICT THE FLOW OF WATER THAT ARE IN THE PLAN SET INCLUDING BUT NOT LIMITED TO: (BENDS, TEES, CROSSES, VALVES, DEAD ENDS, REDUCERS...ETC)
- 6. PIPES SECTION AND JOINTS THAT ARE RESTRAINED SHALL HAVE A ADHESIVE TAPE TO THE TOP OF THE PIPE AND JOINTS PER SPL ITEM WW-597A ALONG THE FULL LENGTH OF THE RESTRAINT PIPE SECTION.

	The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PIPE RESTRAINT BE	ELL JOINTS
			THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO
RECORD COPY SIGNED BY		2/15/2019	THE ARCHITECT/ENGINEER ASSUMES	E400 DD

RESPONSIBILITY FOR APPROPRIATE USE 510S-PR-SM OF THIS STANDARD. LAURIE MOYER, P.E.

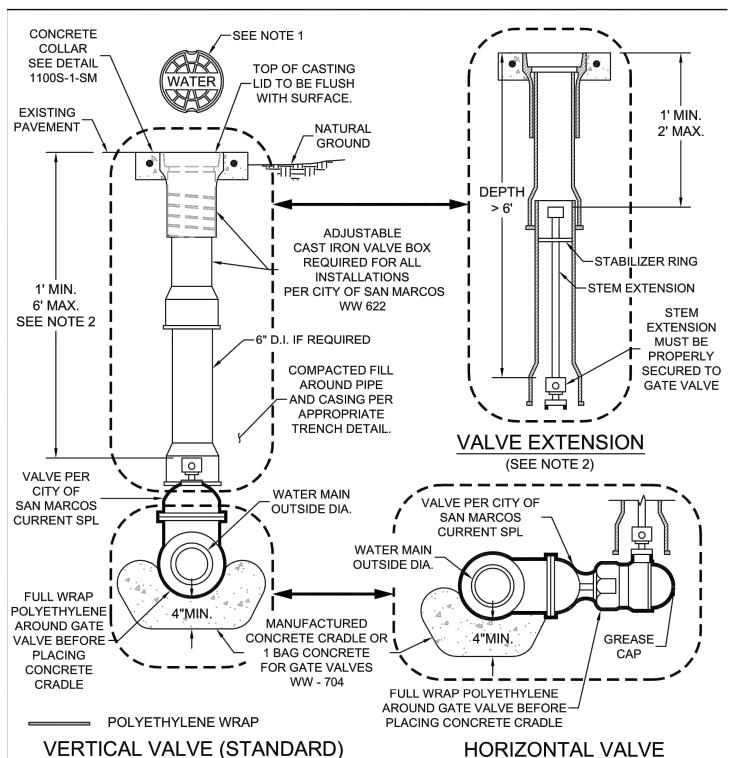




1 INCH TAP MATERIAL LIST				
LABEL	ITEM	SIZE		
*A	APPROVED TAPPING SADDLE/SLEEVE.	PER SPL		
В	CORPORATION STOP (COMPRESSION-TYPE FITTING)	1"		
**C	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65 (MAINTAIN POSITIVE SLOPE TO AIR RELEASE VALVE)	1"		
D	BRASS BALL VALVE WITH LEVER HANDLE	1"		
E	BRASS NIPPLE THREADED	1"		
F	AIR RELEASE VALVE PER CURRENT CITY OF SAN MARCOS SPL	PER SPL		
G	METER BOX FOR VALVE PER CURRENT SPL	PER SPL		

\* SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM. \*\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	1" AIR RELEASE VALVE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511S-1A-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



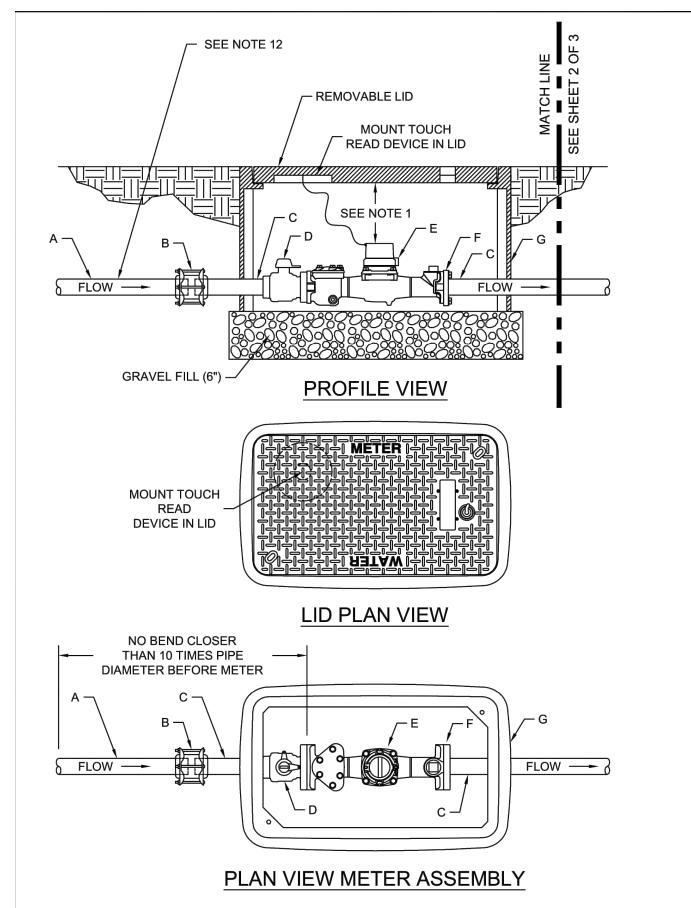
VERTICAL VALVE (STANDARD)

1. LID MUST SAY "WATER" FOR A WATERLINE, "SEWER" FOR NONPOTABLE LINES OR "RECLAIM" FOR RECLAIMED WATER. REFER TO SPL WW 622.

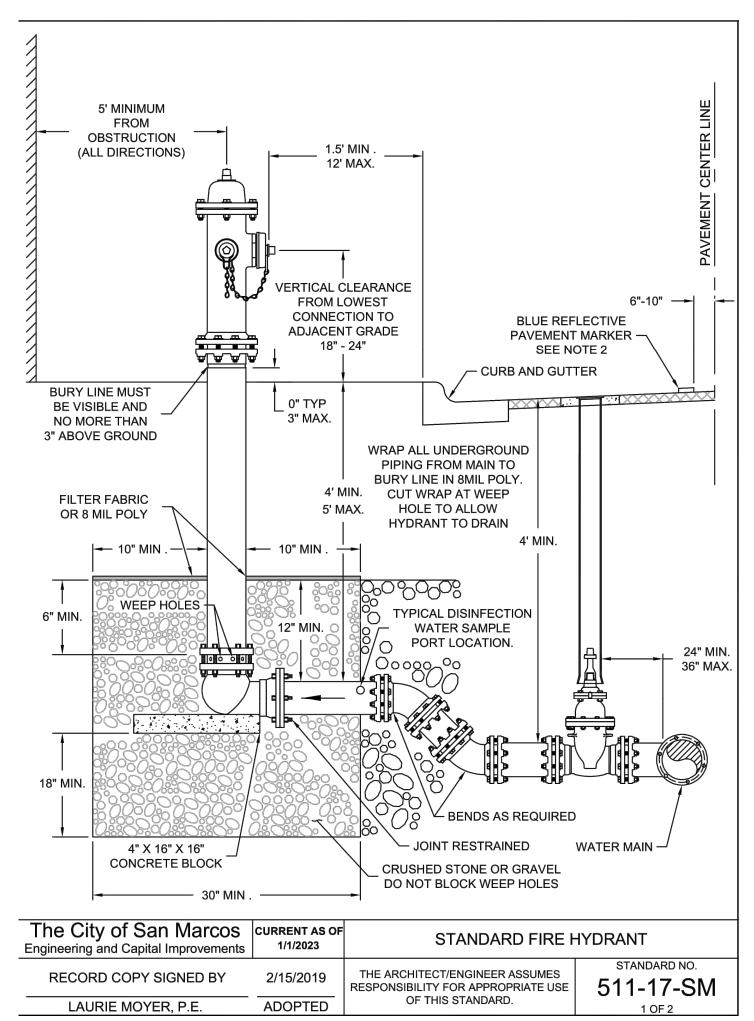
2. IF DEPTH EXCEEDS 6', A SINGLE VALVE EXTENSION IS REQUIRED. VALVE EXTENSION CAN NOT BE STACKED.

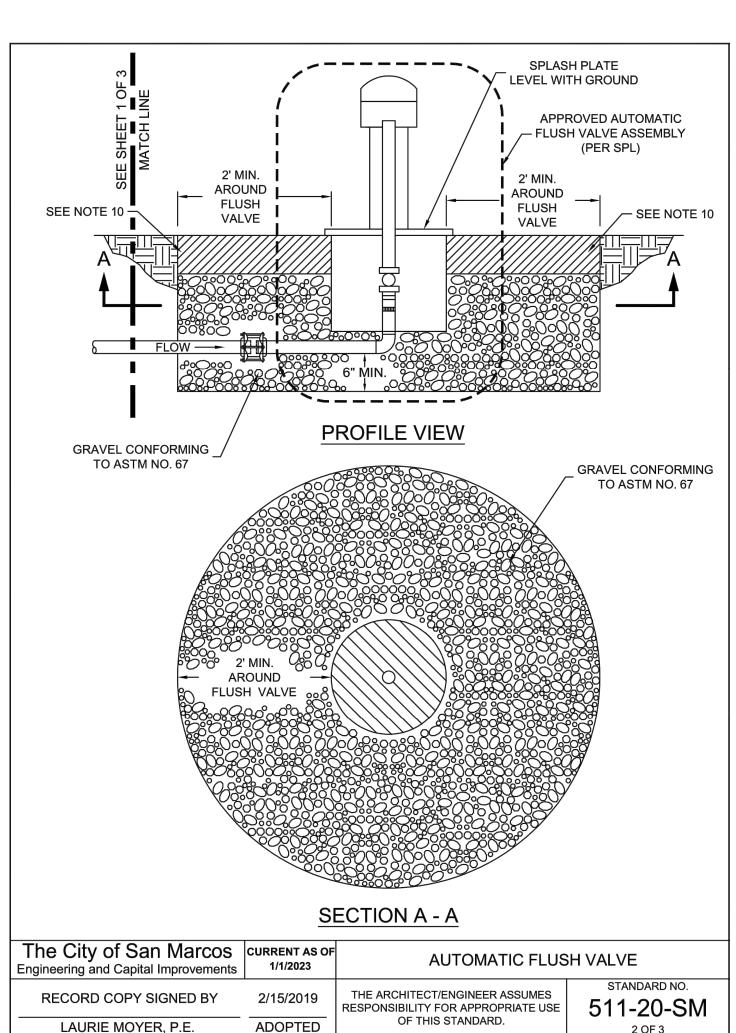
### REFERENCES DETAIL 1100S-1-SM

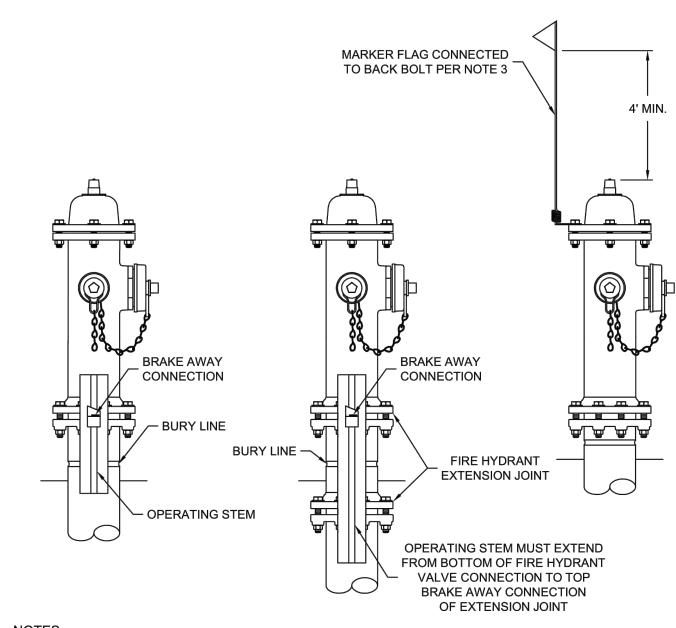
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TYPICAL GATE VALVE 2" - 24"	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 511S-7-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	AUTOMATIC FLUS	SH VALVE
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 3







1. PUBLIC HYDRANTS SHALL BE FACTORY PAINTED WITH BRIGHT ALUMINUM BASED SILVER PAINT AND PRIVATE HYDRANTS SHALL BE PAINTED RED.

- 2. A BLUE REFLECTIVE PAVEMENT MARKER MUST BE PLACED WITH EVERY FIRE HYDRANT
- ADJACENT TO A ROADWAY 6"-10" OFF CENTER LINE OF ROAD ON FIRE HYDRANT SIDE. FIRE HYDRANTS OUTSIDE ROW SHALL HAVE MARKING FLAGS IN RURAL AREAS.
- 4. FIRE HYDRANT MUST GO ON PAVEMENT SIDE OF FENCE, OR FENCE MUST BE REBUILT AROUND
- FIRE HYDRANT TO ALLOW ACCESS FROM PAVEMENT TO FIRE HYDRANT. FIRE HYDRANT MAY ONLY MINIMALLY OBSTRUCT SIDEWALK AT EITHER EDGE
- 6.  $\,\,$  NO OBJECT THAT WILL OBSTRUCT MAINTENANCE OR USE OF THE FIRE HYDRANT WILL BE LOCATED WITH IN 5 FEET OF THE FIRE HYDRANT INCLUDING BUT NOT LIMITED TO (TREES,
- FENCES, TELEPHONE POLE, DUMPSTER, PERMANENT/NONPERMANENT STRUCTURES,...ETC.). FIRE HYDRANT ASSEMBLY MUST BE PER CURRENT CITY OF SAN MARCOS STANDARD PRODUCT

# REFERENCES

DETAIL 520S-WMT-SM

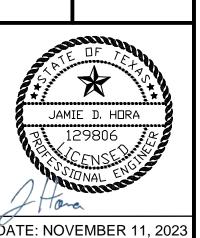
The City of San Marcos Engineering and Capital Improvements		STANDARD FIRE H	HYDRANT
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 511-17-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 2

	MATERIALS					
LABEL	ITEM	SIZE				
Α	SUPPLY PIPE SCH. 80 FULLY RESTRAINED PER STANDARD PRODUCT LIST NO. WW-587	2"				
В	RESTRAINT DRESSING COUPLINGS - MAXI-GRIP OR APPROVED EQUIVALENT PER STANDARD PRODUCT LIST NO. WW-587B	2"				
С	BRASS NIPPLES-THREADED X THREADED	2"				
D	BRONZE BALL VALVE WITH LOCK WINGS THREADED BY FLANGE PER STANDARD PRODUCT LIST NO. WW-68	2"				
Е	WATER METER PER STANDARD PRODUCT LIST NO. WW-144 WATER METERS	2"				
F	METER FLANGE ADAPTOR	2"				
G	METER BOX PER STANDARD PRODUCT LIST NO. WW-145A HDPE METER BOXES	REQUIRE				

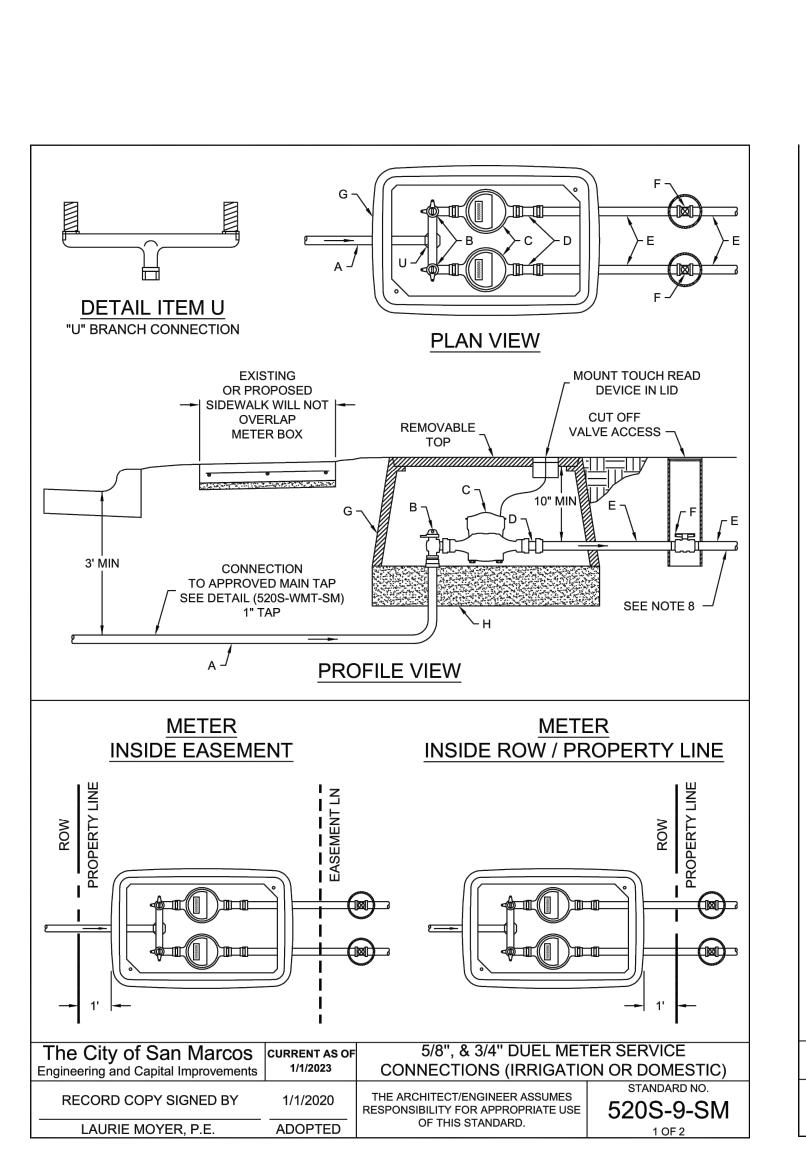
- TOP OF METER BOX SHALL BE 1" ABOVE GRADE AFTER REVEGETATION OR FLUSH WITH PAVEMENT SURFACE. METER BOX WILL BE LOCATED BEHIND BACK CURB, OUT OF SIDEWALK OR TRAFFIC LOADED AREA.
- FOR PIPES AND FITTINGS OUTSIDE THE METER BOX SHALL BE EMBEDDED AND BACKFILLED PER DETAIL 510S-S&L-SM WITHIN THE ROW OR EASEMENT.
- WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX. 4. TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 520S-WMT-SM WITH A 2" TAP TO THE
- IF THE METER BOX IS SET AFTER THE METER IS INSTALLED, SIDE NOTCHES IN THE BOX TO
- BE FILLED WITH MORTAR AFTER INSTALLATION OF PIPE.
- PIPES AND FITTINGS TO BE AS SHOWN PER DETAIL. FOR APPROVED METER TYPE CALL THE WATER & WASTEWATER UTILITIES DEPT. AT
- (512)393-8010.
- NO BY PASS REQUIRED. PIPE AND METER IN METER BOX WILL MATCH THE DEPTH OF THE CONNECTION PIPE TO THE AUTOMATIC FLUSH VALVE ASSEMBLY.
- 10. FOR NATURAL GROUND USE 6" OF TOP SOIL AND REVEGETATE PER CITY SPECIFICATIONS.
- 11. INSTALLATION OF AUTOMATIC FLUSH VALVE ASSEMBLY TO BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATION/KIT.
- 12. AUTOMATIC FLUSH VALVE SHALL CONNECT TO THE MAIN PER DETAIL 520S-WMT-SM. TEMPORARY AUTOMATIC FLUSH VALVE FOR THE PURPOSE OF A FUTURE MAIN EXTENSION SHALL CONNECT TO THE END OF THE MAIN USING A 8 INCH M.J. X 2 INCH THREAD DUCTILE IRON ECCENTRIC REDUCER IN PLACE OF A TAP AS SHOWN ON DETAIL 520S-WMT-SM. FOR MAINS LARGER THAN 8 INCHES A CAP WILL BE USED IN PLACE OF A REDUCER WITH A 2 INCH THREAD CONNECTION

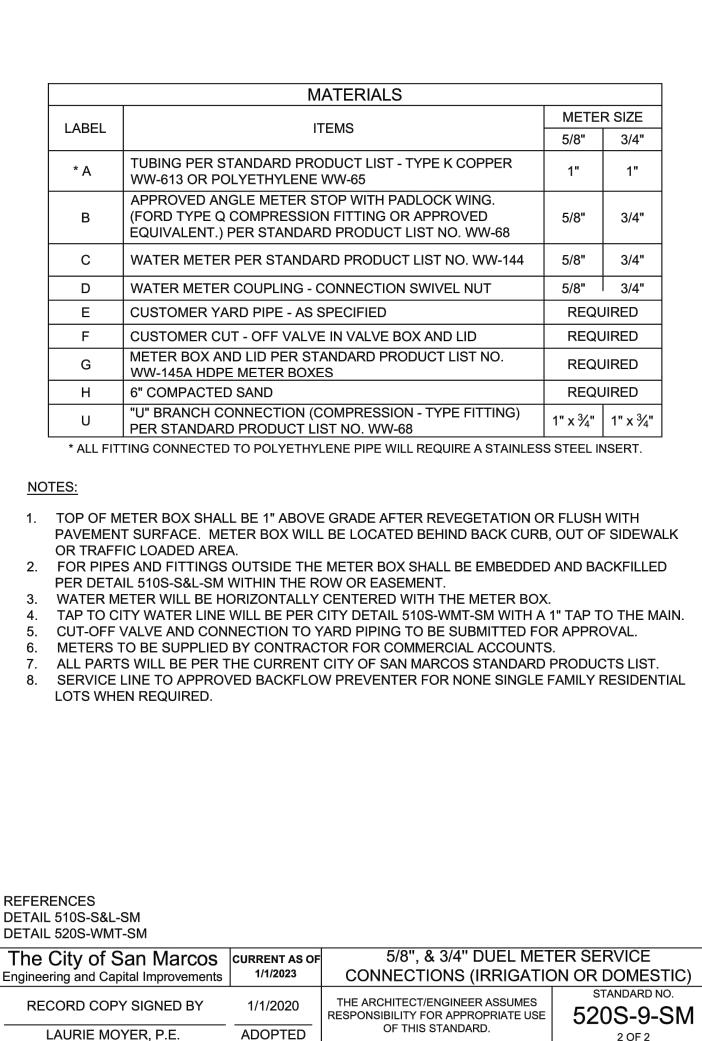
REFERENCES
DETAIL 510S-S&L-SM
REFERENCES DETAIL 510S-S&L-SM DETAIL 520S-WMT-SM

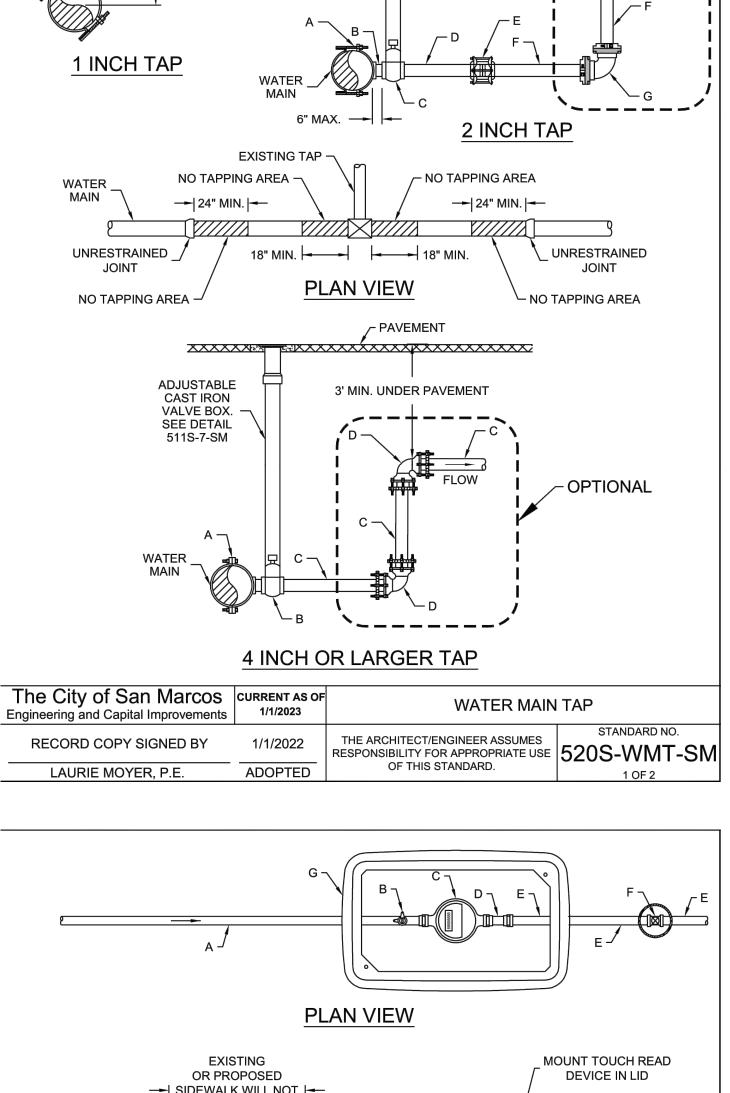
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	AUTOMATIC FLUSH VALVE	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	3 OF 3



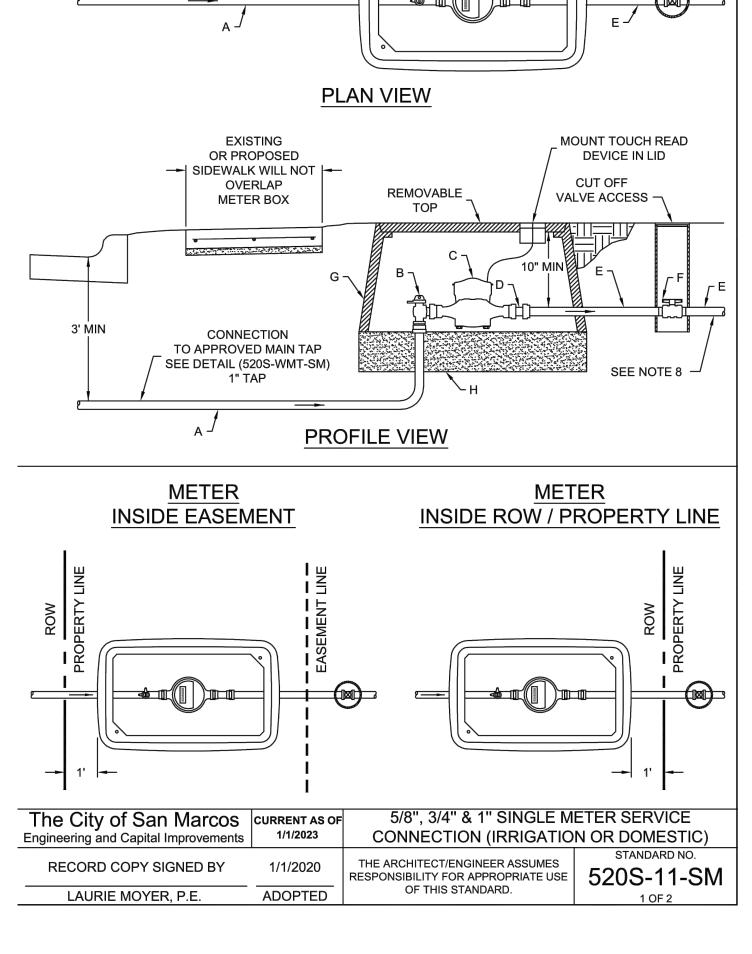
DESIGN | DRAWN DC JOB No. **005956-01-113** SHEET 52 OF 54







**ADJUSTABLE** CAST IRON · VALVE BOX. SEE DETAIL 3' MIN. UNDER PAVEMENT



1 INCH TAP MATERIAL LIST						
LABEL	ITEM	SIZE				
*A	APPROVED TAPPING SADDLE PER SPL NO. WW-264/WW-256	REQUIRED				
В	CORPORATION STOP. FORD TYPE Q COMPRESSION FITTING OR APPROVED EQUIVALENT PER SPL NO. WW-68	1"				
**C	TUBING PER SPL NO. TYPE K COPPER WW-613 OR POLYETHYLENE WW-65	1"				

\* SERVICE SADDLES SHALL BE WRAPPED COMPLETELY WITH 8 MIL. POLYETHYLENE FILM. \*\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

	2 INCH TAP MATERIAL LIST						
LABEL	ITEM	SIZE					
Α	APPROVED TAPPING SADDLE PER SPL NO. WW-264	REQUIRED					
В	GALVANIZED NIPPLE-THREADED	2"					
С	TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY FEMALE/FEMALE) WITH VALVE BOX DETAIL 511S-7SM	2"					
D	GALVANIZED NIPPLE-THREADED X THREADED	2"					
E	RESTRAINT DRESSING COUPLINGS - MAXI-GRIP OR APPROVED EQUIVALENT PER SPL NO. WW-587B	2"					
F	SUPPLY PIPE SCH. 80 FULLY RESTRAINED PER SPL NO. WW-587	2"					
G	DUCTILE IRON 90° BEND - HARCO-KNUCKLE JOINT RESTRAINT, OR APPROVED EQUIVALENT PER SPL NO. WW-587B	2"					

4 INCH AND LARGER TAP MATERIAL LIST						
LADEL	ITEM		SERVIC	CE SIZE		
LABEL	ITEM	4"	6"	8"	10"	
Α	APPROVED TAPPING SLEEVE PER SPL NO. WW-244	R	EQUIRE	D		
В	TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY M.J. X M.J.) WITH VALVE BOX DETAIL 511S-7-SM	4"	6"	8"	10"	
С	SUPPLY PIPE C900 PER SPL NO. WW-308A OR DUCTILE IRON PER SPL NO. WW-27 FULLY RESTRAINED	4"	6"	8"	10"	
*D	DUCTILE IRON 90° BEND - MEGALUG RESTRAINT, OR APPROVED EQUIVALENT PER SPL NO. WW-27B AND NO. WW-27A	4"	6"	8"	10"	

\* WHEN CONDITIONS ALLOW 45° BENDS ARE PREFERRED OVER 90° BENDS

- MAIN SIZE CAN NOT BE LESS THAN OR EQUAL TO TAP. TEE PER SPL NO. WW-27B MAY BE USED WITH ENGINEERING DEPARTMENT APPROVAL FOR SIZE ON SIZE CONNECTION.
- BACKFILL AND EMBEDMENT WILL BE PER CITY DETAIL 510-S&L-SM.
- 3" SERVICE AND FIRE LINES WILL USE A 4" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.
- ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST. WHEN A TAP IS PROPOSED ON AN EXISTING ASBESTOS CEMENT (AC) PIPE THE CONTRACTOR WILL REPLACE
- THE AC PIPE SEGMENT WITH AN APPROVED PVC PIPE PER CITY STANDARD PRODUCT LIST (SPL). NEW PIPE WILL BE CONNECTED TO THE EXISTING AC PIPE WITH A WIDE RANGE COUPLING ADAPTOR PER CITY SPL.

6. 1.5" WILL USE A 2" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.

### REFERENCES DETAIL 510S-S&L-SM

DETAIL 511S-7-SM

The City of San Marcos CURRENT AS OF WATER MAIN TAP Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY 1/1/2022 RESPONSIBILITY FOR APPROPRIATE USE 520S-WMT-SM OF THIS STANDARD. ADOPTED LAURIE MOYER, P.E.

	MATERIALS			
LABEL	ITEMS	M	IETER SIZ	E
LADEL	TIEMS	5/8"	3/4"	1"
* A	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65	1"	1"	1"
В	APPROVED ANGLE METER STOP WITH PADLOCK WING. (FORD TYPE Q COMPRESSION FITTING OR APPROVED EQUIVALENT.) PER STANDARD PRODUCT LIST NO. WW-68	5/8"	3/4"	1"
С	WATER METER PER STANDARD PRODUCT LIST NO. WW-144	5/8"	3/4"	1"
D	WATER METER COUPLING - CONNECTION SWIVEL NUT	5/8"	3/4"	1"
E	CUSTOMER YARD PIPE - AS SPECIFIED	F	REQUIRED	)
F	CUSTOMER CUT - OFF VALVE IN VALVE BOX AND LID	F	REQUIRED	)
G	METER BOX AND LID PER STANDARD PRODUCT LIST NO. WW-145A HDPE METER BOXES	F	REQUIRED	)
Н	6" COMPACTED SAND	F	REQUIRED	)

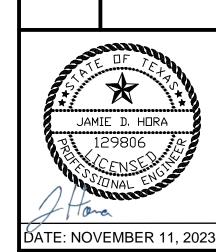
\* ALL FITTING CONNECTED TO POLYETHYLENE PIPE WILL REQUIRE A STAINLESS STEEL INSERT.

- 1. TOP OF METER BOX SHALL BE 1" ABOVE GRADE AFTER REVEGETATION OR FLUSH WITH PAVEMENT SURFACE. METER BOX WILL BE LOCATED BEHIND BACK CURB, OUT OF SIDEWALK OR TRAFFIC LOADED AREA.
- 2. FOR PIPES AND FITTINGS OUTSIDE THE METER BOX SHALL BE EMBEDDED AND BACKFILLED PER DETAIL 510S-S&L-SM WITHIN THE ROW OR EASEMENT.
- WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX.
- TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 510S-WMT-SM WITH A 1" TAP TO THE MAIN. CUT-OFF VALVE AND CONNECTION TO YARD PIPING TO BE SUBMITTED FOR APPROVAL.
- METERS TO BE SUPPLIED BY CONTRACTOR FOR COMMERCIAL ACCOUNTS
- ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST. 8. SERVICE LINE TO APPROVED BACKFLOW PREVENTER FOR NONE SINGLE FAMILY RESIDENTIAL
- LOTS WHEN REQUIRED.

DETAIL 510S-S&L-SM

REFERENCES

DETAIL 520S-WMT-SM 5/8", 3/4" & 1" SINGLE METER SERVICE The City of San Marcos | CURRENT AS OF CONNECTION (IRRIGATION OR DOMESTIC) Engineering and Capital Improvements THE ARCHITECT/ENGINEER ASSUMES 1/1/2020 RECORD COPY SIGNED BY 520S-11-SM RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. LAURIE MOYER, P.E. ADOPTED



DESIGN DRAWN

JΗ

OF

(2)

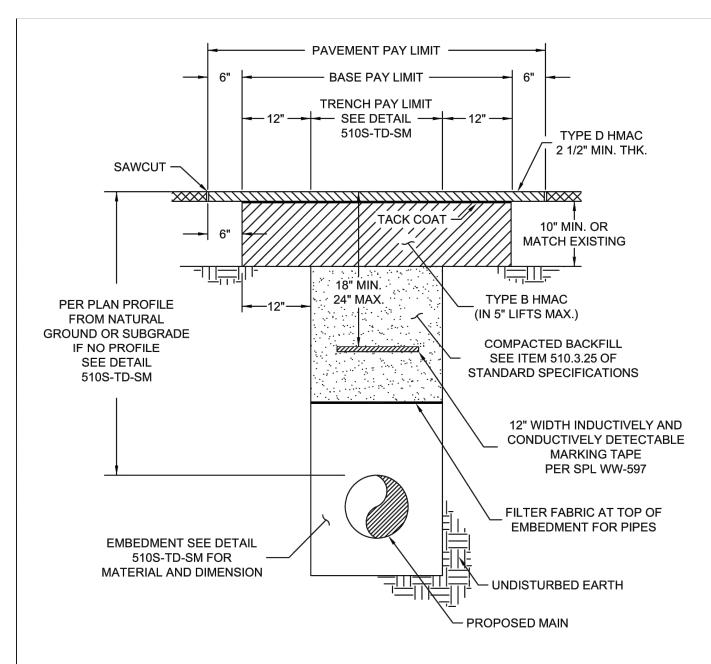
**DETAILS** 

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JOB No. 005956-01-113 SHEET 53 OF 54

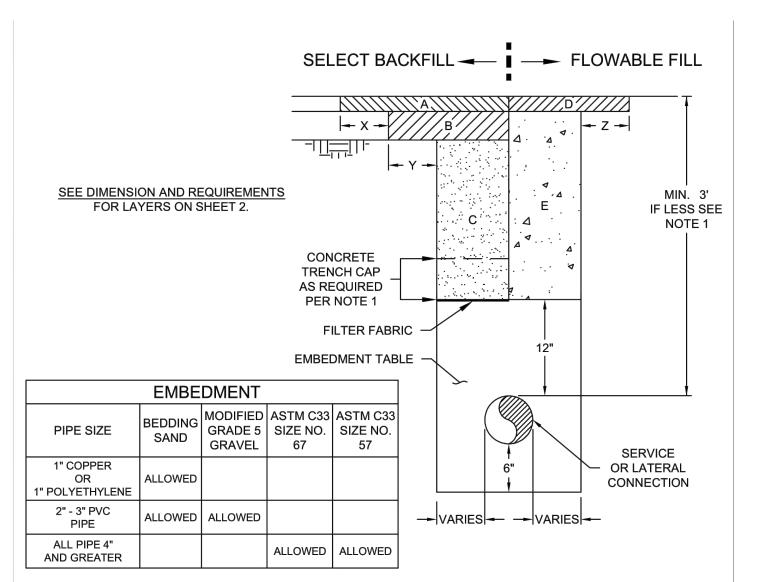
DC



- 1. THE EXISTING PAVED SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
- IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE, SEE DETAIL 510S-3T-SM. 3. ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND
- 4. ROAD BASE AND SURFACE MATERIALS IN THE TRENCH CUT SHALL BE REPLACED IN KIND OF EQUAL THICKNESS, OR MINIMUM BASE THICKNESS OF 10", WHICHEVER IS GREATER.

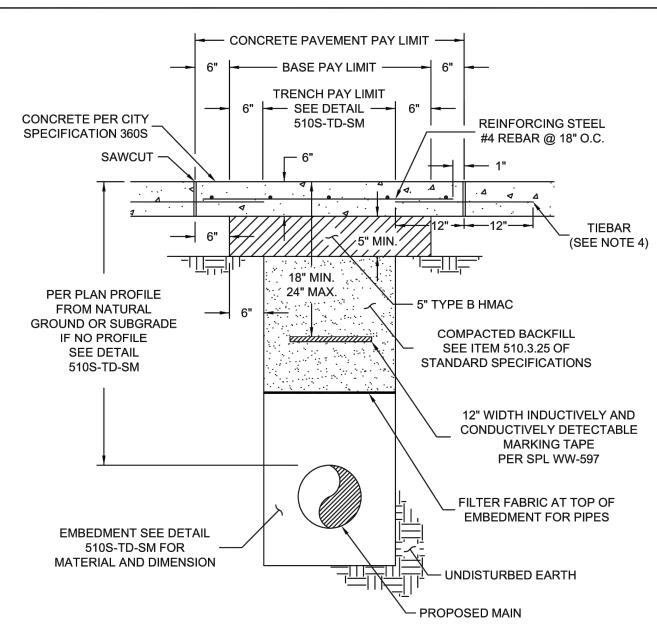
### REFERENCES DETAIL 510S-TD-SM DETAIL 510S-3T-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TYPICAL TRENCH WITH F	PAVED SURFACE
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 510S-3-SM
LAURIE MOYER P.E.	ADOPTED	OF THIS STANDARD.	1051



- WHEN DEPTH OF COVER IS LESS THAN 3' FROM EXISTING OR PROPOSED SURFACE A CONCRETE TRENCH CAP WILL BE INSTALLED WITH A MINIMUM THICKNESS OF 6" CLASS A (3000 PSI) CONCRETE PLACED ABOVE EMBEDMENT AS DEPICTED IN THIS DETAIL. THICKNESS WILL BE DETERMINED BY ENGINEER AND NOT BE LESS THAN A MINIMUM OF 6". WHEN DEPTH OF COVER IS 3' OR GREATER FROM EXISTING OR PROPOSED SURFACE A FILTER FABRIC WILL BE INSTALLED ABOVE ALL EMBEDMENT EXCEPT BEDDING SAND.
- 2. RESTORE ALL DISTURBED SURFACES ABOVE AND SURROUNDING THE TRENCH TO EXISTING CONDITION AND ELEVATION. RESTORATION WORK IS SUBSIDIARY TO SERVICE LATERAL WORK.

The City of San Marcos	CURRENT AS OF	SERVICE AND LATERAL	CONNECTION
Engineering and Capital Improvements	1/1/2023	TRENCH DE	TAIL
DECORD CODY CLONED BY	4/4/0000	THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO.
RECORD COPY SIGNED BY	1/1/2020	RESPONSIBILITY FOR APPROPRIATE USE	510S-S&L-SM
LAURIE MOYER P.E.	ADOPTED	OF THIS STANDARD.	1 OF 2



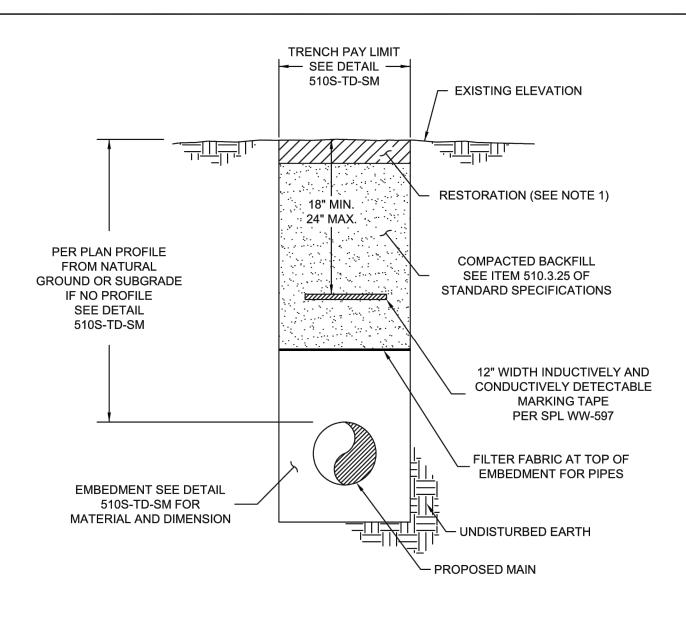
- 1. THE EXISTING PAVED SURFACE SHALL BE SAW CUT IN A STRAIGHT LINE A MINIMUM OF 12" WIDER THAN THE UNDISTURBED SIDES OF THE TRENCH, SYMMETRICAL ABOUT THE CENTER LINE OF THE EXCAVATION.
- 2. IF EXCAVATION AREA IS OPEN FOR TEMPORARY PUBLIC USE SEE DETAIL 510S-3T-SM. 3 ALL DAMAGED AREAS OF PAVEMENT OUTSIDE THE TRENCH CUT SHALL BE REMOVED AND REPLACED WITH MINIMUM OF 6" OF BASE OR MATCH EXISTING THICKNESS, WHICHEVER IS
- 4. TIEBARS WILL BE A 24" #4 REBAR PLACED EVERY 18" MID DEPTH OF EXISTING CONCRETE ON ALL SIDES OF TRENCH OR PER INSPECTORS RECOMMENDATION.

### REFERENCES DETAIL 510S-TD-SM DETAIL 510S-3T-SM

The City of San Marcos CURRENT AS OF TYPICAL TRENCH WITH CONCRETE PAVEMENT Engineering and Capital Improvements STANDARD NO. THE ARCHITECT/ENGINEER ASSUMES RECORD COPY SIGNED BY RESPONSIBILITY FOR APPROPRIATE USE 510S-3C-SM OF THIS STANDARD. LAURIE MOYER, P.E.

SELECT BACKFILL							
	ASPHALT PAVEMENT X = 6", Y = 6"	CONCRETE PAVEMENT $X = 6$ ", $Y = 6$ " OUT OF PAVEMENT $X = 0$ , $Y = 0$					
A (SEE NOTE 1)	EE ASPHALT THICKNESS 2.5" WAYS. 24" TIE BAR 18 O.C. 12" INTO EXISTING PAVEMENT.  TYPE B HMAC MATCH EXISTING TYPE B HMAC MATCH		MATCH EXISTING EXISTING THICKNESS 6" MIN.  ASPHALT WITH #4 REBAR 18"O.C. BOTH INSTALLED ON TOP. ALL OTHER SUR THICKNESS 2.5" WAYS. 24" TIE BAR 18 O.C. 12" STRUCTURES SHALL BE REPLACED TO		NATURAL GROUND WILL HAVE 6" OF TOP SO SEEDED AND A RETENTION BLANKET INSTALLED ON TOP. ALL OTHER SURFACE STRUCTURES SHALL BE REPLACED TO MATO EXISTING CONDITIONS.		
В			IN AND NEAR FLOOD PLAIN OF ALL STREAM AND WATERCOURSES, UNDER OR ADJACEN TO UTILITIES, STRUCTURES, TWO FEET FRO PAVEMENT ETC. SELECT BACKFILL WILL BE COMPACTED TO NO LESS THE PENSITY.				
C LESS THAN 95% NO DENSITY ACCOR		LL WILL BE COMPACTED TO NO NOR MORE THAN 102% OF THE CORDING TO TEX. 114E AT A ENT OF -2% TO +3% OF OPTIMUM.	MORE THAN 102% OF THE DENSITY ACCORDING TO TEX. 114E AT A MOISTUF CONTENT OF -2% TO +3% OF OPTIMUM UNLESS OTHERWISE DIRECTED BY CITY. OTHER LOCATIONS WILL BE COMPACTED 90% OF MAX DENSITY.				
		FLOWABLE F	ILL				
	ASPHALT PAVEMENT Z = 6"	CONCRETE PAVEMENT Z = 6"	OUT OF PAVEMENT Z = 0				
D MATCH EXISTING (SEE ASPHALT )		3,600 PSI CONCRETE MATCH EXISTING THICKNESS 6" MIN. WITH #4 REBAR 18"O.C. BOTH WAYS. 24" TIE BAR 18 O.C. 12" INTO EXISTING PAVEMENT.	NATURAL GROUND WILL HAVE 6" OF TOP SO SEEDED AND A RETENTION BLANKET INSTALLED ON TOP. ALL OTHER SURFACE STRUCTURES SHALL BE REPLACED TO MATO EXISTING CONDITIONS.				
E FLOWABLE FILL PER CITY 402S SPECIFICATION.							

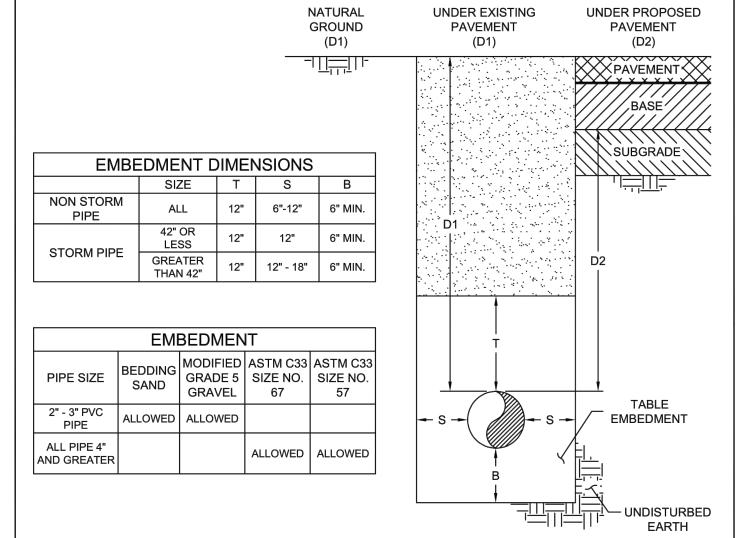
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SERVICE AND LATERAL CONNECTION TRENCH DETAIL		
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 510S-S&L-SM	
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	2 OF 2	



RESTORE ALL DISTURBED SURFACES ABOVE AND SURROUNDING THE TRENCH TO EXISTING CONDITION AND ELEVATION. NATURAL GROUND WILL HAVE 6" OF TOP SOIL, SEEDED AND A RETENTION BLANKET INSTALLED ON TOP. ALL OTHER SURFACE STRUCTURES SHALL BE REPLACED TO MATCH EXISTING CONDITIONS.

### REFERENCES DETAIL 510S-TD-SM

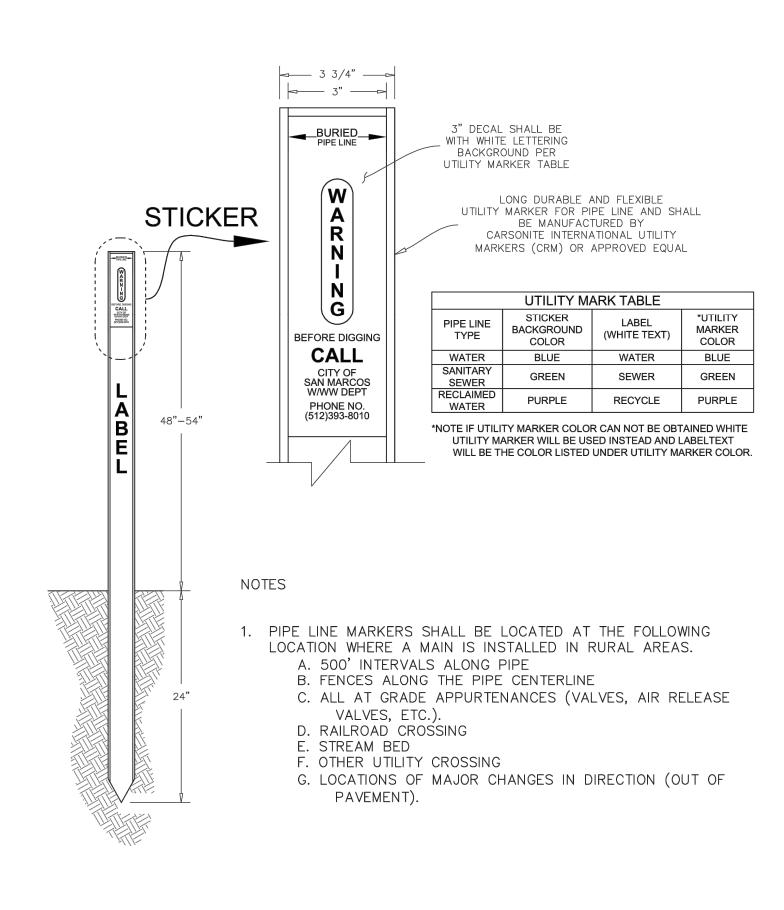
DET/ (IE 0100 1B OW			
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TRENCH DETAIL NATU	RAL GROUND
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	standard no. 510S-5-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1

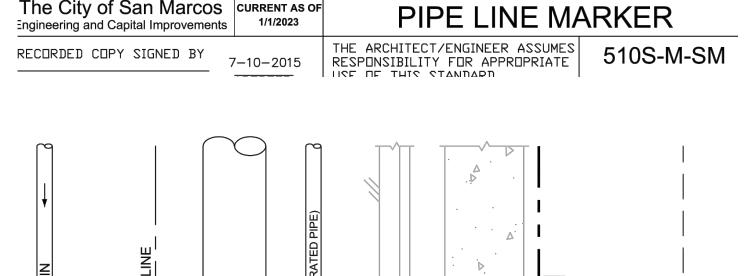


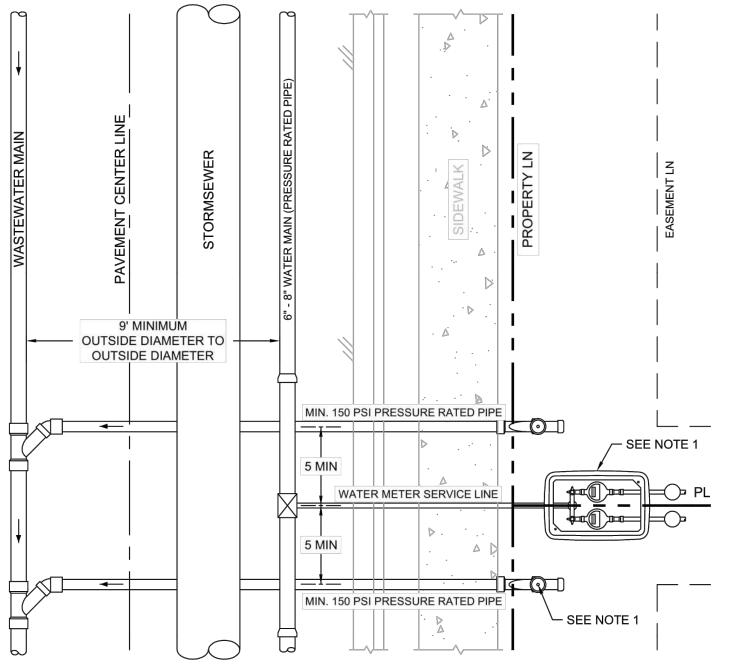
MINIMUM DEPTH OF COVER								
PIPE TYPE	SIZE	(D1) UNDER PAVEMENT	(D1) NATURAL GROUND	(D1) LESS THAN 3' OF COVER	(D2 - NOTE 2) UNDER PROPOSED ROAD			
WATER	12" OR LESS	48" MIN.	36" MIN.	24" MIN. AND USE CONCRETE FLOWABLE FILL DETAIL	36" BELOW BASE			
WATER	16" OR GREATER	48" MIN.	48" MIN.	NOT ALLOWED	48" BELOW BASE			
WASTEWATER	ALL	60" MIN.	36" MIN.	DUCTILE IRON WILL BE USED. FLOWABLE FILL DETAIL WHERE EROSION MAY OCCUR	48" MIN. BELOW BASE			
RECLAIMED WATER	ALL	48" MIN.	36" MIN.	24" MIN. AND USE CONCRETE FLOWABLE FILL DETAIL	36" MIN. BELOW BASE			
STORM	ALL	MANUFACTURER'S SPECIFICATION MINIMUM AND MAXIMUM DEPTH OF COVER WILL BE USED FOR STORM PIPES						

- 1. ALL MEASUREMENTS ARE FROM OUTSIDE PIPE DIAMETER. 2. FOR TABLE "MINIMUM DEPTH OF COVER" COLUMN "UNDER PROPOSED ROAD" IF D1 FROM COLUMN "UNDER PAVEMENT" PLACES THE PIPE LOWER THAN D2. THEN D1 FROM "UNDER PAVEMENT" WILL BE
- USED FOR MINIMUM DEPTH OF COVER. REFERENCE APPROPRIATE 510 PIPE TRENCH DETAILS FOR PAYMENT LIMITS. THIS DETAIL IS FOR

DIMENSIONAL PURPOSES ONL	Υ.		
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	UTILITY TRENCH DI	MENSIONS
RECORD COPY SIGNED BY	1/23/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE	STANDARD NO. 510S-TD-SM
LAURIE MOYER, P.E.	ADOPTED	OF THIS STANDARD.	1 OF 1







# MINIMUM SEPARATION REQUIREMENT OF SERVICES

FOR WATER METER AND WASTEWATER CLEANOUT SEE STANDARD DETAILS 520S-1-SM & 520S-9-SM. 2. THE DETAIL ABOVE SHOWS MINIMUM SEPARATION REQUIREMENTS FOR A TYPICAL SUBDIVISION.

REFERENCES DETAIL 520S-9-SM DETAIL 520S-1-SM

The City of San Marcos	CURRENT AS OF	WATER SERVICE & WASTE	EWATER SERVICE
Engineering and Capital Improvements	1/1/2023	CONNECTION AT SAI	ME LOT LINE
	0/4/0040	THE ARCHITECT/ENGINEER ASSUMES	STANDARD NO.
RECORD COPY SIGNED BY	6/1/2018	RESPONSIBILITY FOR APPROPRIATE USE	520-AW-01A-S
LAUDIE MOVED DE	ADADTED	OF THIS STANDARD.	

DETAIL ENERAL JAMIE D. HORA ATE: NOVEMBER 11, 202 DESIGN DRAWN

DC

JOB No. **005956-01-113** SHEET

### Attachment G - Inspection, Maintenance, Repair and Retrofit Plan

### **Vegetative Filter Strip**

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 ensure the health of the plants including:

- Pest Management. An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.
- Seasonal Mowing and Lawn Care. If the filter strip is made up of turf grass, it should be
  mowed as needed to limit vegetation height to 18 inches, using a mulching mower (or removal
  of clippings). If native grasses are used, the filter may require less frequent mowing, but a
  minimum of twice annually. Grass clippings and brush debris should not be deposited on
  vegetated filter strip areas. Regular mowing should also include weed control practices,
  however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass
  can be maintained without using fertilizers because runoff usually contains sufficient nutrients.
  Irrigation of the site can help assure a dense and healthy vegetative cover.
- Inspection. Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.
- Debris and Litter Removal. Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.
- Sediment Removal. Sediment removal is not normally required in filter strips, since the
  vegetation normally grows through it and binds it to the soil. However, sediment may
  accumulate along the upstream boundary of the strip preventing uniform overland flow.
   Excess sediment should be removed by hand or with flat-bottomed shovels.
- Grass Reseeding and Mulching. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots

and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Corrective maintenance, such as weeding or replanting should be done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting, and during particularly dry periods, particularly as the vegetation is initially established.

### **Batch Detention Basins**

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

- Inspections. Inspections should take place a minimum of twice a year. One inspection should take place during wet weather to determine if the basin is meeting the target detention time of 12 hours and a drawdown time of no more than 48 hours. The remaining inspections should occur between storm events so that manual operation of the valve and controller can be verified. The level sensor in the basin should be inspected and any debris or sediment in the area should be removed. The outlet structure and the trash screen should be inspected for signs of clogging. Debris and sediment should be removed from the orifice and outlet(s) as described in previous sections. Debris obstructing the valve should be removed. During each inspection, erosion areas inside and downstream of this BMP should be identified and repaired/revegetated immediately.
- Mowing. The basin, basin side-slopes, and embankment of the basin must be mowed to
  prevent woody growth and control weeds. A mulching mower should be used, or the grass
  clippings should be caught and removed. Mowing should take place at least twice a year, or
  more frequently if vegetation exceeds 18 inches in height. More frequent mowing to maintain
  aesthetic appeal may be necessary in landscaped areas.
- Litter and Debris Removal. Litter and debris removal should take place at least twice a year,
  as part of the periodic mowing operations and inspections. Debris and litter should be removed
  from the surface of the basin. Particular attention should be paid to floatable debris around
  the outlet structure. The outlet should be checked for possible clogging or obstructions and
  any debris removed.
- Erosion control. The basin side slopes and embankment all may periodically suffer from slumping and erosion. To correct these problems, corrective action, such as regrading and revegetation, may be necessary. Correction of erosion control should take place whenever required based on the periodic inspections.
- Nuisance Control. Standing water or soggy conditions may occur in the basin. Some standing water may occur after a storm event since the valve may close with 2 to 3 inches of water in the basin. Some flow into the basin may also occur between storms due to spring flow and residential water use that enters the storm sewer system. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.).

- Structural Repairs and Replacement. With each inspection, any damage to structural
  elements of the basin (pipes, concrete drainage structures, retaining walls, etc.) should be
  identified and repaired immediately. An example of this type of repair can include patching of
  cracked concrete, sealing of voids, removal of vegetation from cracks and joints. The various
  inlet/outlet structures in a basin will eventually deteriorate and must be replaced.
- Sediment Removal. A properly designed batch detention basin will accumulate quantities of
  sediment over time. The accumulated sediment can detract from the appearance of the facility
  and reduce the pollutant removal performance of the facility. The sediment also tends to
  accumulate near the outlet structure and can interfere with the level sensor operation.
  Sediment shall be removed from the basin at least every 5 years, when sediment depth
  exceeds 6 inches, when the sediment interferes with the level sensor or when the basin does
  not drain within 48 hours. Care should be taken not to compromise the basin lining during
  maintenance.
- Logic Controller. The Logic Controller should be inspected as part of the twice yearly investigations. Verify that the external indicators (active, cycle in progress) are operating properly by turning the controller off and on, and by initiating a cycle by triggering the level sensor in the basin. The valve should be manually opened and closed using the open/close switch to verify valve operation and to assist in inspecting the valve for debris. The solar panel should be inspected and any dust or debris on the panel should be carefully removed. The controller and all other circuitry and wiring should be inspected for signs of corrosion, damage from insects, water leaks, or other damage. At the end of the inspection, the controller should be reset.

Date

10-21-2022

LCSM Ph. 4, LLC 303 Colorado St. Suite 2300 Austin, TX. 78701

512-457-8000

# Attachment H - Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs

### **Attachment I – Measures for Minimizing Surface Stream Contamination**

All flows from the proposed streets and residential development will be treated by the vegetative filter strips and batch detention ponds before being directed to any surface streams. The proposed Permanent BMPs TSS removal will exceed the requirements of TCEQ 80% and the City of San Marcos 89%.

Detailed calculations are shown within the construction plans.

# 8 - TCEQ - 0599 Attachments

Agent Authorization Form

### **Agent Authorization Form**

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

	Bryan Lee	
	Print Name	
	Owner	
	Title - Owner/President/Other	
of	LCSM PH 4, LLC Corporation/Partnership/Entity Name	
have authorized	Margaret Hickok Print Name of Agent/Engineer	
of	Bowman Consulting Group, LTD 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		<u>/のより-レルソス</u> Date	
THE STATE OF TEXOS §			
County of Travis §			
BEFORE ME, the undersigned to me to be the person whose me that (s)he executed same f	name is subscribed to the	foregoing instrument, a	known nd acknowledged to l.
GIVEN under my hand and sea	al of office on this 314 day	of Oddor, 2003.	
COREY J. SMITH Notary Public, State of Texas Notary ID# 12848118-7 My Commission Expires 02-24-2026	NOTARY PUBLIC  Con  Typed or Printed Nar	ey Smith me of Notary	

MY COMMISSION EXPIRES: 3-24-26

# 9 - TCEQ - 0574 Attachments

Application Fee Form

# **Application Fee Form**

### **Texas Commission on Environmental Quality**

Name of Proposed Regulated Entity: LCSM Ph. 4, LLC

Regulated Entity Location: The project site is loacted south of La Cima Phase 5A, 5B, and Central

regulated Entity Education. The pro	cet site is loacie	d 30util Ol La	Cirria i riase SA, SB, and Certif
Park Loop in San Marcos, Hays	County, Texas.		
Name of Customer: Bryan Lee			
Contact Person: Margaret Hickok		Phone: 512-3	327-1180
Customer Reference Number (if iss	ued):CN_CN6058	368074 368074	<del></del>
Regulated Entity Reference Numbe	r (if issued):RN :	111615928	
Austin Regional Office (3373)			
	Travis		Williamson
San Antonio Regional Office (3362)	_		
Bexar	Medina		Uvalde
Comal	Kinney		
Application fees must be paid by ch	eck, certified ch	eck, or mone	order, payable to the <b>Texas</b>
<b>Commission on Environmental Qua</b>			
form must be submitted with your			
Austin Regional Office		San Antor	nio Regional Office
Mailed to: TCEQ - Cashier		_	Delivery to: TCEQ - Cashier
Revenues Section			rk 35 Circle
Mail Code 214			A, 3rd Floor
P.O. Box 13088		Austin, Tک	
Austin, TX 78711-3088		(512)239-	
	_	-	

### Site Location (Check All That Apply):

Recharge 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	55.02 Acres	\$ 6,500.00
Water Pollution Abatement Plan, Contributing Zone		
Plan: Non-residential	Acres	\$
Sewage Collection System	7,690 L.F.	\$ 3845.00
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$_

Contributing Zone

Signature:

Transition Zone

Date: 9/22/2023

## **Application Fee Schedule**

**Texas Commission on Environmental Quality** 

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

### Water Pollution Abatement Plans and Modifications

**Contributing Zone Plans and Modifications** 

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

Organized Sewage Collection Systems and Modifications

organized sewage concerion systems and	Cost per Linear	Minimum Fee-
Project	Foot	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** 

=210011011011 01 111110 1104000	
Project	Fee

Project	Fee
Extension of Time Request	\$150

# 10 - TCEQ - 10400 Attachments

Core Data Form



TCEQ Use Only

# **TCEQ Core Data Form**

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

### **SECTION I: General Information**

		•	hecked please d				•	ith tha n	regram applicatio	n l	
			•						rogram applicatio	n.)	
	•	ta Form should b e Number (if iss	e submitted with					Other	Entity Deference	Mumber (i	if inqued)
2. Customer CN 6058		e Number (II iss		ollow this lin or CN or RN Central Re	number	s in			Entity Reference 15928	e Number (i	T ISSueu)
<b>SECTION</b>	II: Cu	stomer Info	ormation								
4. General C	ustomer l	nformation	5. Effective Da	ate for Cus	stomer	Inform	atior	Update	es (mm/dd/yyyy)	7/23/2	2021
<ul> <li>New Customer</li> <li>□ Change in Regulated Entity Ownership</li> <li>□ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)</li> </ul>											
The Custo	mer Nan	ne submitted	here may be	updated	autoi	matica	ally	based	on what is cu	rrent and	active with the
Texas Sec	retary of	State (SOS)	or Texas Con	nptroller	of Pu	ıblic /	lcco	unts (	CPA).		
6. Customer	Legal Nar	ne (If an individua	l, print last name fi	rst: eg: Doe,	John)		<u>If</u>	new Cus	stomer, enter previ	ous Custome	er below:
LCSM PH 4, LLC											
_			8. TX State Ta 320766379		ts)			. <b>Federa</b> 5-388	al Tax ID (9 digits) 6915	10. DUN	S Number (if applicable)
11. Type of Customer: Corporation					Individu	ual		Par	rtnership: 🔲 Gener	al 🛛 Limited	
		County  Federal			Sole Pr	roprieto	rship		Other:		
<b>12. Number</b> €					nd highe		1		endently Owned	and Opera	ted?
14. Custome	r Role (Pro	posed or Actual) -	- as it relates to the				his fo	rm. Pleas	se check one of the	following	
Owner Occupatio	nal Licens	☐ Operation	tor ensible Party		wner & oluntary	•		plicant	⊠Other: DI	EVELOPE.	R
	303 Co	olorado St Su	iite 2300								
15. Mailing Address:			-								
Addices.	City	Austin	-	State	TX		ZIP	7870	01	ZIP + 4	4653
16. Country	Mailing In	formation (if outsi	de USA)			17. E-	Mail	Address	S (if applicable)		
									ougg@nd-aus	stin.com>	>
18. Telephor	ne Number	•	1	9. Extensi	on or C	ode			20. Fax Numbe	<b>r</b> (if applical	ole)
( 512 ) 457-8000											
SECTION	III: Re	egulated En	ntity Inforn	nation							
21. General I	Regulated	Entity Informat	i <b>on</b> (If 'New Reg	ulated Entit	ty" is se	lected	below	this for	m should be acco	mpanied by	a permit application)
☐ New Reg	ulated Enti	ty 🔀 Update	to Regulated En	tity Name	□ (	Jpdate	to Re	gulated	Entity Information		
_		•	•	•	ed in c	order	to m	eet TC	EQ Agency D	ata Stand	lards (removal
			as Inc, LP, or								
	-	,	of the site where the	he regulated	l action i	is taking	place	.)			
LA CIMA	PHASI	E 6 & 8									

TCEQ-10400 (02/21) Page 1 of 3

	Central	Park Loop	and '	West Cente	erpoint I	Roa	ıd							
23. Street Address of the Regulated Entity:														
(No PO Boxes)	City	San Marc - ETJ	os	State	TX	Z	IP	786	66	ZIF	P + 4			
24. County		-1	1			ı				•		1		
	E	nter Physical I	ocat	ion Description	on if no st	reet	address	s is pro	vided.					
25. Description to Physical Location:	This pro	oject site is l	ocat	ed south of	f La Cin	na I	Phase 5	5A, 5]	B, and C	Centra	l Park	Loop.		
26. Nearest City								State			Near	rest ZIP Code		
San Marcos								TX			786	666		
<b>27.</b> Latitude (N) In Decimal: 29.8842 <b>28.</b> Longitude (W) In Decimal: -98.0048														
Degrees	Degrees Minutes Seconds					es			Minutes			Seconds		
29		53		03			98			00		17		
29. Primary SIC Code (4 digits) 30. Secondary SIC Code (4 digits)					<b>31. Prima (</b> 5 or 6 digit	•	NAICS C	ode	<b>32. S</b> (5 or 6		ary NAI	CS Code		
1521 1623					236115				237	110				
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)														
Single Family Resi	dential													
24 Mailing				,	303 Color	ado	St Suite	2300						
34. Mailing Address:														
Address.	City Austin State				TX	TX ZIP 78701					ZIP + 4 4653			
35. E-Mail Address				Do	ug Goss	<do< td=""><td>ugg@nd</td><td>-austir</td><td>n.com&gt;</td><td>·</td><td></td><td></td></do<>	ugg@nd	-austir	n.com>	·				
36. Telepho	one Numbe	r	1	37. Extensio	n or Code	ode 38. Fax Number (if applicable)								
( 512 ) 4	102-1790								(	) .	-			
9. TCEQ Programs and ID orm. See the Core Data Form				write in the per	mits/registra	ation	numbers	that will	be affected	l by the ι	updates	submitted on this		
☐ Dam Safety	☐ Distric	ts	$\boxtimes$	⊠ Edwards Aquifer			☐ Emissions Inventory Air			☐ Industrial Hazardous Waste				
Municipal Solid Waste	☐ New S	Source Review Air		] OSSF		L	☐ Petroleum Storage Tank				PWS			
Sludge	Storm	Water		Title V Air			Tires			Used Oil				
☐ Voluntary Cleanup ☐ Waste Water ☐ Wastewa			] Wastewater A	griculture	Г	Water F	Rights			Other:				
SECTION IV: Pre	parer I	nformation	<u>1</u>											
40. Name: Jamie Hora, P.E. 41. Title: Project Manager														
42. Telephone Number	43. Ext./Cod	de 44. Fa	ax Nu	mber	45. E-N	lail <i>i</i>	Address	}						
(210) 298-1600		(	)		jhora	<u>@</u> b	owmaı	n.con	1					
SECTION V. And														
SECTION V. Aut	<u>horized</u>	Signature	!											

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:	Bowman Consulting	Job Title:	Project Manager		
Name (In Print):	Margaret Hickok, P.E.			Phone:	(512) 672-8978

TCEQ-10400 (02/21) Page 2 of 3 Signature: Date: 11/14/2023

TCEQ-10400 (02/21) Page 3 of 3