Water Pollution Abatement Plan &
Organized Sewage Collection System Application

La Cima- Phase 8

Prepared for:

LCSM PH 4, LLC

303 Colorado St, Ste. 2300

Austin, TX 78701

Prepared by:

Bowman

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

DECEMBER 4, 2024

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

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  Attachment A - Road Map
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  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
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  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
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  Attachment E - Request to Seal Features (if sealing a feature)
  Attachment F - Construction Plans
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  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**
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1 – TCEQ - 20705 Attachments

Edwards Aquifer Application Cover Page

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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.

3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.

4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

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

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.

6. If the geologic assessment was completed before October 1, 2004 and the site contains "possibly sensitive" features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

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

2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

clearly marked, features identified in the geologic assessment should be flagged, roadways marked and the alignment of the Sewage Collection System and manholes should be staked at the time the application is submitted. If the site is not marked the application may be returned.

3. We evaluate the application for technical completeness and contact the applicant and agent via Notice of Deficiency (NOD) to request additional information and identify technical deficiencies. There are two deficiency response periods available to the applicant. There are 14 days to resolve deficiencies noted in the first NOD. If a second NOD is issued, there is an additional 14 days to resolve deficiencies. If the response to the second notice is not received, is incomplete or inadequate, or provides new information that is incomplete or inadequate, the application must be withdrawn or will be denied. Please note that because the technical review is underway, whether the application is withdrawn or denied **the application fee will be forfeited**.
4. The program has 90 calendar days to complete the technical review of the application. If the application is technically adequate, such that it complies with the Edwards Aquifer rules, and is protective of the Edwards Aquifer during and after construction, an approval letter will be issued. Construction or other regulated activity may not begin until an approval is issued.

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: La Cima -Phase 8						**2. Regulated Entity No.:**			
3. Customer Name: LCSM PH 4, LLC						**4. Customer No.: CN605868074**			
5. Project Type: **(Please circle/check one)**	New		~~Modification~~			~~Extension~~		~~Exception~~	
6. Plan Type: **(Please circle/check one)**	WPAP	~~CZP~~	SCS	~~UST~~	~~AST~~	~~EXP~~	~~EXT~~	Technical Clarification	Optional Enhanced Measures
7. Land Use: **(Please circle/check one)**	Residential		~~Non-residential~~			**8. Site (acres):**			69.13
9. Application Fee:	$10,681.5		**10. Permanent BMP(s):**			Batch Detention Ponds			
11. SCS (Linear Ft.):	8,363		**12. AST/UST (No. 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 Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City X San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence ___Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

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

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Bobby Ross
Print Name of Customer/Authorized Agent
Signature of Customer/Authorized Agent Date

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

2 – TCEQ - 0587 Attachments

General Information Form

General Information Form

Texas Commission on Environmental Quality

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

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

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

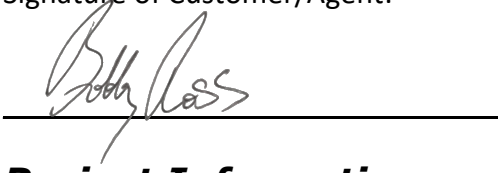
Signature

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

Print Name of Customer/Agent: Bobby Ross

Date: 11/1/2024

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: LA CIMA PHASE 8
2. County: Hays
3. Stream Basin: Guadalupe River Basin
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Bryan W. Lee
   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-ausin.com

8. Agent/Representative (If any):

   Contact Person: Bobby Ross
   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: bobbyross@bowman.com

9. Project Location:

   ☐ The project site is located inside the city limits of _____.
   ☒ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of San Marcos, TX.
   ☐ The project site is not located within any city's limits or ETJ.

10. ☒ The location of the project site is described below. The description provides sufficient detail and clarity so that the TCEQ's Regional staff can easily locate the project and site boundaries for a field investigation.

    The project site is located south of Central Park Loop and to the east of La Cima Phase 6 in San Marcos, Hays County, Texas.

11. ☒ **Attachment A – Road Map**. A road map showing directions to and the location of the project site is attached. The project location and site boundaries are clearly shown on the map.

12. ☒ **Attachment B - USGS / Edwards Recharge Zone Map**. A copy of the official 7 ½ minute USGS Quadrangle Map (Scale: 1" = 2000') of the Edwards Recharge Zone is attached. The map(s) clearly show:

    ☒ Project site boundaries.
    ☒ USGS Quadrangle Name(s).
    ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
    ☒ Drainage path from the project site to the boundary of the Recharge Zone.

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned**. Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☒ Survey staking will be completed by this date: _____

14. ☒ **Attachment C – Project Description**. Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:

    ☒ Area of the site
    ☒ Offsite areas
    ☒ Impervious cover
    ☒ Permanent BMP(s)
    ☒ Proposed site use
    ☒ Site history
    ☒ Previous development
    ☒ Area(s) to be demolished

15. Existing project site conditions are noted below:

    ☐ Existing commercial site
    ☐ Existing industrial site
    ☐ Existing residential site
    ☐ Existing paved and/or unpaved roads
    ☒ Undeveloped (Cleared)
    ☐ Undeveloped (Undisturbed/Uncleared)
    ☐ Other: _____

Prohibited Activities

16. ☒ I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:

    (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);

    (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

    (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

    (4) The use of sewage holding tanks as parts of organized collection systems; and

    (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

    (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

17. ☒ I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:

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

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:

☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
☒ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
☐ For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
☐ A request for an exception to any substantive portion of the regulations related to the protection of water quality.
☐ A request for an extension to a previously approved plan.

19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ TCEQ cashier
☒ Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
☐ San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

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

21. ☒ No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.

Attachment A – Road Map

V:\005956 - Lazy Oaks Ranch\005956-01.001 (ENG) - Lazy Oaks Subdivision\Engineering\Docs\Applications\TCEQ\WPAP-SCS - Phase 8\Working Folder\2. General Info\Attachment A. Road Map.dwg, ATTACHMENT A - ROAD MAP, December 04, 2024, 4:06 PM, mcarrion

LA CIMA SUBDIVISION
PHASE 8

WEST CENTERPOINT RD

WEST CENTERPOINT RD (FUTURE)

WPAP SITE BOUNDARY
69.13 ACRES

BLOCK A
BLOCK B
BLOCK C
BLOCK D
BLOCK E
BLOCK A1

NIGHTSHADE LOOP
RUNDLE FLOWER WAY
PAWPAW DRIVE
PINYON PINE TRAIL
GERMANDER BEND
DALEA TERRACE

ZOM
WQZ

LEGEND

LA CIMA PHASE 8

300 0 300 400

SCALE: 1 INCH = 300 FT

LA CIMA PHASE 8
WPAP ATTACHMENT A - ROAD MAP

Bowman

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807 Las Cimas Parkway ▪ Suite 350 ▪ Austin, Texas 78746
Phone: (512) 327-1180 ▪ Fax: (512) 327-4062 ▪ www.bowman.com
TBPE Firm Registration No. F-14309

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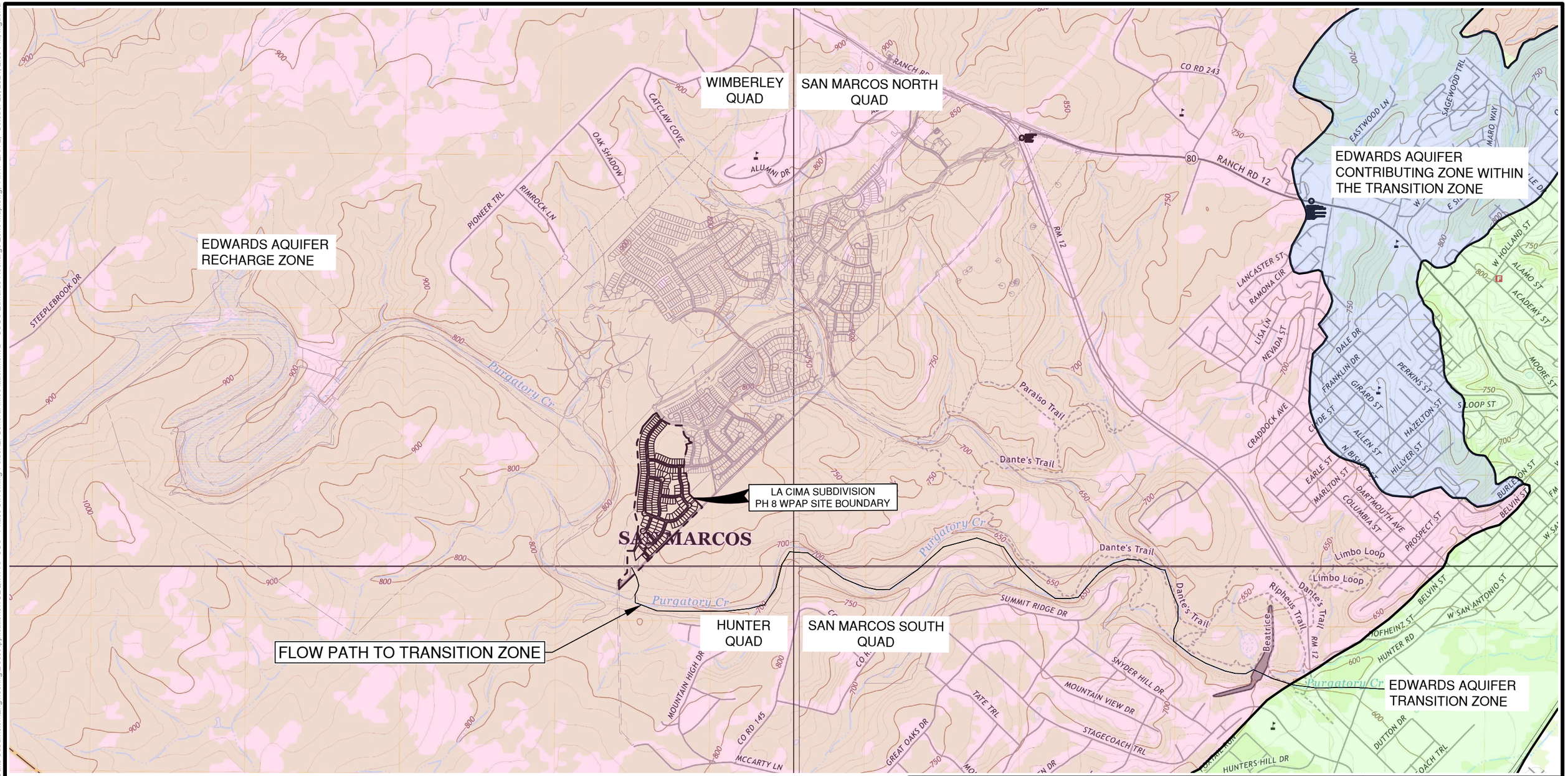
PRELIMINARY NOT FOR CONSTRUCTION

Attachment B – USGS/Edwards Aquifer Recharge Zone Map



LEGEND

- EDWARDS AQUIFER RECHARGE ZONE
- EDWARDS AQUIFER TRANSITION ZONE
- EDWARDS AQUIFER CONTRIBUTING ZONE
- LA CIMA PHASE 8 BOUNDARY

LA CIMA PHASE 8

ATTACHMENT B - USGS / EDWARDS RECHARGE ZONE

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Phone: (512) 327-1180 ▪ Fax: (512) 327-4062 ▪ www.bowman.com
TBPE Firm Registration No. F-14309

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PRELIMINARY NOT FOR CONSTRUCTION

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Docs\Applications\TCEQ\WPAP-SCS - Phase 8\Working Folder\2. General Info\Attachment B - USGS Edwards Recharge Zone Map.dwg, 11x17 EXH L, October 23, 2024, 2:00 PM, mguerra

Attachment C – Project Description

TCEQ-0587

Attachment C – Project Description

This WPAP and SCS application covers a total area of approximately 68.97 Acres per the Phase 8 Preliminary Plat boundary.

The project is single family residential which includes utility improvements, residential roads and drainage improvements to serve La Cima Phase 8. There are no areas being demolished as part this SCS as the area is currently undeveloped and vacant. Approximately 29.14 acres of impervious cover is being proposed for the residential roads, sidewalks, and homes for La Cima Phase 8. 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. Both ponds, WQP 8A and WQP 8B can be found in the construction plans included in this application.

Project Information:

Limits of Construction	=	33.57 Acres
Project Site Area	=	69.13 Acres
Total Impervious cover	=	29.14 Acres
	=	42.15%
Total Length of Wastewater	=	8,363 LF

Total water quality volumes for onsite & offsite for:

WQP 8A	=	137,222 CF
WQP 8B	=	29,305 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 (Revised July 2024)

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, P.G.

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 (Revised July 2024)

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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

Appendix B – Figures Showing Buffers with 1-Foot Topographic Contours

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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. #691), 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 11 November 2021, SWCA returned to evaluate three features encountered by TCEQ staff.

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%.

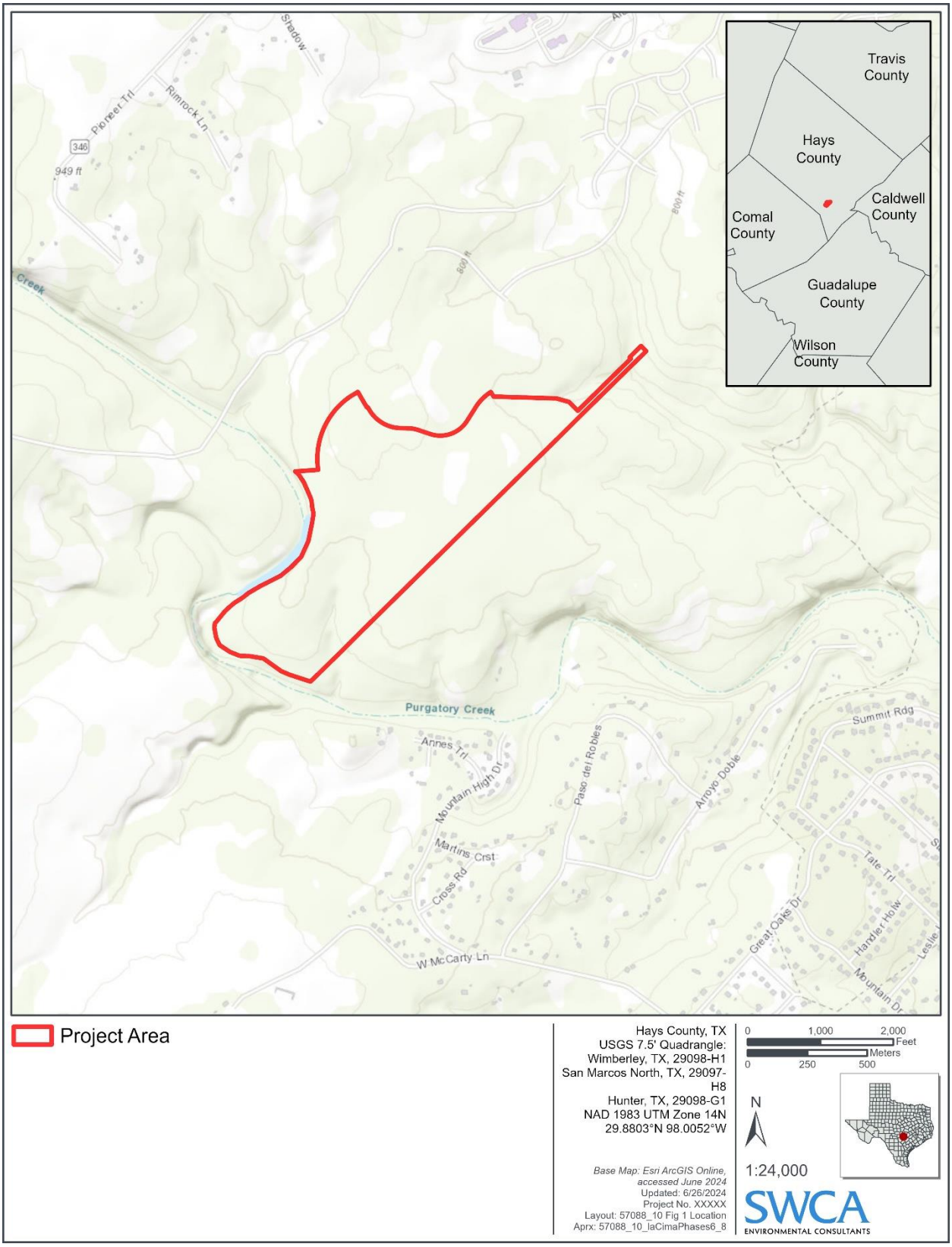


Figure 1. Project location.

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 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 N45ºE, 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 solution cavity. Due to the presence of organic infilling, the probability of rapid infiltration is high.

S-240 Feature S-240 is a solution cavity. Due to the presence of organic infilling, the probability of rapid infiltration is high.

S-241 Feature S-241 is a 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 is presented on the Site Geologic Map (Ap. 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.

F-1001 is a non-karst closed depression. The feature is space between two large blocks of rock within the soil profile. Probing of the feature revealed approximately 8 inches of loose organic soil before encountering compact clay infill. The feature appears to be where a tree was previously located, and some animal burrowing has occurred. Due to the lack of karst origin and presence of fine, clay infill the probability of rapid infiltration is low.

Feature F-1002 is a non-karst closed depression that appears to be an animal burrow among roots at the base of an ashe juniper. The feature is limited to the soil profile, and no in situ bedrock is present. Hand excavation and probing revealed that the infill became clay rich with a reddish-brown tint at the depth of approximately 1.5 feet. The feature does not appear to have a karst origin based on the lack of in situ bedrock and presence of clay-rich infill. Therefore, the probability of rapid infiltration is low.

Feature F-1003 is a non-karst closed depression developed along a break in slope where blocks of rock in the soil profile have been shifted and separated by erosion and tree root activity. Animal burrowing has removed soil from between the blocks and potentially from beneath the blocks among tree roots. No evidence of dissolution of in situ bedrock was visible. Due to lack of a karst origin and presence of the feature within the soil profile, the probability of rapid infiltration is low.

TCEQ AND CITY OF SAN MARCOS SENSITIVE 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. Features with point values of 25 points or more, as presented in column 10 are considered sensitive by the City of San Marcos (CoSM). The CoSM categorizes sensitive features as minor, moderate, and major recharge features based on the size of the natural catchment areas of the features. The table below identifies which features are sensitive and whether or not they are minor, moderate, or major recharge features based on CoSM criteria.

Table 1. Feature Sensitivity and Recharge Category Summary

Feature ID	Point Value*	TCEQ Sensitivity Ranking	CoSM Sensitivity Ranking	CoSM Recharge Category
S-222	65	Sensitive	Sensitive	Minor
S-234	55	Sensitive	Sensitive	Minor
S-237	55	Sensitive	Sensitive	Minor
S-238	10	Not Sensitive	Not Sensitive	NA
S-239	55	Sensitive	Sensitive	Minor
S-240	55	Sensitive	Sensitive	Minor
S-241	55	Sensitive	Not Sensitive	NA

S-242	20	Not Sensitive	Not Sensitive	NA
S-243	55	Sensitive	Sensitive	Minor
S-244	10	Not Sensitive	Not Sensitive	NA
S-247	55	Sensitive	Sensitive	Major
S-249	10	Not Sensitive	Not Sensitive	NA
F-62	35	Not Sensitive	Sensitive	Minor

* - Value from Column 9 of TCEQ Geologic Assessment Table (Appendix A, Attachment A).
NA – Not Applicable because the feature is not ranked as sensitive

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.

With the exception of features S-247 and F-62, to address both TCEQ and CoSM buffer requirements for minor recharge features, 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.

Feature F-62 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 within the project limits. The approximate location of this fault is presented on the Site Geologic Map (Appendix A, Attachment D). The potential for recharge associated with this feature is highest where the fault intersects channelized flow. Because no portion of the fault crosses channelized flow within the project limits, and no evidence of enhanced permeability along the fault was observed in the field, no buffer was delineated for this feature within the project limits.

Figures showing the features and buffers with 1-foot topographic contours are included in Appendix B.

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: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. 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

APPENDIX A

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) FORMS

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

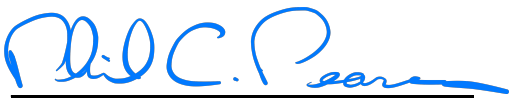
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

Print Name of Geologist: Philip Pearce, P.G. Telephone: 210.877.2847

Date: 7/8/2024 Fax: 210.877.2848

Representing: SWCA Environmental Consultants - TBPG No. 50159 (Name c
TBPG or TBPE registration number)

Signature of Geologist:





Regulated Entity Name: La Cima Phases 6 and 8

Project Information

1. Date(s) Geologic Assessment was performed: August 1, 5, 6, 14, 15, and 20, 2013; September 12, 2019; October 1 and 17, 2019, 11 November, 2021 and October 18, 2022.
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☐ Transition Zone

☐ Contributing Zone within the Transition Zone

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

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
Rumple-Comfort Rubbly association (RUD)	D	<2
Comfor-Rock outcrop complex, 1 to 8 percent slopes (CrD)	D	<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. ☒ The project site and boundaries are clearly shown and labeled on the Site Geologic Map.
11. ☒ Surface geologic units are shown and labeled on the Site Geologic Map.
12. ☒ Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

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

13. ☒ The Recharge Zone boundary is shown and labeled, if appropriate.
14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

    ☐ There are 0 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    - ☐ The wells are not in use and have been properly abandoned.
    - ☐ The wells are not in use and will be properly abandoned.
    - ☐ The wells are in use and comply with 16 TAC Chapter 76.

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

Administrative Information

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

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: La Cima Phases 6 & 8

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
S-222	29.879913°	-98.008895°	C	30	Ked	4	2	10	N45W	0			N	35	65		X	X		Hillside
S-234	29.878411°	-98.009407°	SC	20	Ked	1	0.8	35	N3E	0			N	35	55		X	X		Hillside
S-237	29.877712°	-98.009073°	SC	20	Ked	1	1	5.5	N60W	0			N	35	55		X	X		Hillside
S-238	29.879065°	-98.011347°	CD	5	Ked	2.5	2	1.5	N89W	0			F	5	10	X		X		Hillside
S-239	29.879121°	-98.011361°	SC	20	Ked	2	1.5	3	N90E	0			O	35	55		X	X		Hillside
S-240	29.87926°	-98.012362°	SC	20	Ked	2	2	1.5	N10W	0			O	35	55		X	X		Hillside
S-241	29.877361°	-98.012197°	SC	20	Ked	5	3	1	N10E	0			O,C	35	55		X	X		Hillside
S-242	29.877558°	-98.014132°	CD	5	Ked	6	4	1	N56E	10			F	5	20	X		X		Hillside
S-243	29.876099°	-98.01312°	SF	20	Ked	12	6	2	N8E	0			O,C	35	55		X	X		Hillside
S-244	29.876177°	-98.013021°	CD	5	Ked	6	4	0.5	None	0			F	5	10	X		X		Hillside
S-247	29.882439°	-98.008709°	SH	20	Ked	340	340	3	None	0			C	35	55		X		X	Hillside
S-249	29.883262°	-98.001751°	CD	5	Ked	2	2	1	None	0			F	5	10	X		X		Hillside
F-62	29.884461°	-98.010867°	F	20	Ked	5000+			N45E	10			F	5	35	X		X		Hillside
F-1001	29.884314°	-98.000417°	CD	5	Ked	0.75	2.5	1.3	-	0			F	5	10	X		X		Hillside
F-1002	29.877812°	-98.008065°	CD	5	Ked	1.3	1.5	1.6	-	0			F	5	10	X		X		Hillside
F-1003	29.884989°	-97.99963°	CD	5	Ked	2	3.5	2.5	-	0			F	5	10	X		X		Hillside

* DATUM: NAD 83

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

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

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

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

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

Date 7/8/2024

Sheet 1 of 1



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

ATTACHMENT B

STRATIGRAPHIC COLUMN

Stratigraphic Column

Note: The shaded areas represent the lithology that outcrops on the property.[1]

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	
				Buda Limestone; 40-50 feet thick	
				Del Rio Clay; 40-50 feet thick	
Lower Cretaceous	I	Edwards Aquifer		Georgetown Formation	10-40 feet thick
	II		Edwards Group	Person Formation; 170-200 feet thick	Cyclic and Marine member, undivided
	III				Leached and Collapsed member, undivided
	IV				Regional Dense member
	V			Kainer Formation; 260-310 feet thick	Grainstone member
	VI				Kirschberg Evaporite member
	VII				Dolomitic member
	VIII				Basal Nodular member
	Lower Confining Units			Upper member of Glen Rose Formation; 350-500 feet thick	

[1] Blome, C.D., 2005, Geologic map of the Edwards aquifer recharge zone, south-central-Texas. U.S. Geological Survey SIM-2873, scale1:2000,000.

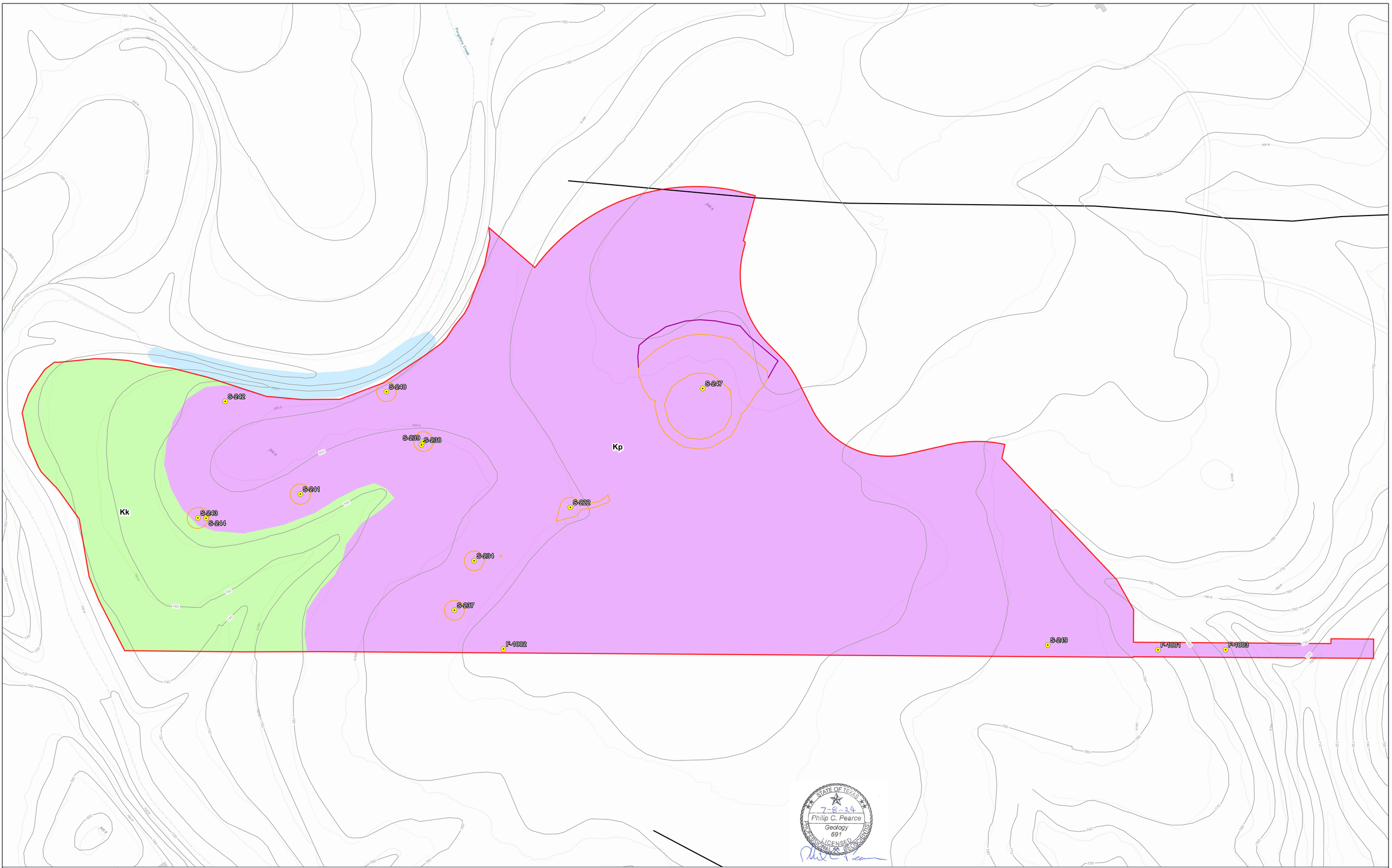
ATTACHMENT C

NARRATIVE DESCRIPTION OF SITE GEOLOGY

PLEASE REFER TO SECTION 3.0 OF THIS REPORT

ATTACHMENT D

SITE GEOLOGIC MAP AND SOILS MAP



LA CIMA PHASE 10 GA
Geologic Assessment
1 inch = 200 feet

SWCA
ENVIRONMENTAL CONSULTANTS

- Geologic or Man-made Feature
- Fault
- Feature Buffer (City of San Marcos)
- Feature Buffer (TCEQ)
- USGS Contour Line
- Project Area

Geology
- Cretaceous Edwards Keiner formation
- Cretaceous Edwards Person formation

Hays County, TX
USGS 7.5' Quadrangle:
Wimberley, TX, 29099-H1
San Marcos North, TX, 29097-H8

NAD 1983 UTM Zone 14N

[Credits: Data Sources If Needed]

Base Map: ESRI ArcGIS Online, accessed June 2024

Updated: 6/27/2024
Project No. 57088.10
File:57088_10 Fig 3 Geologic Assessment Landscape

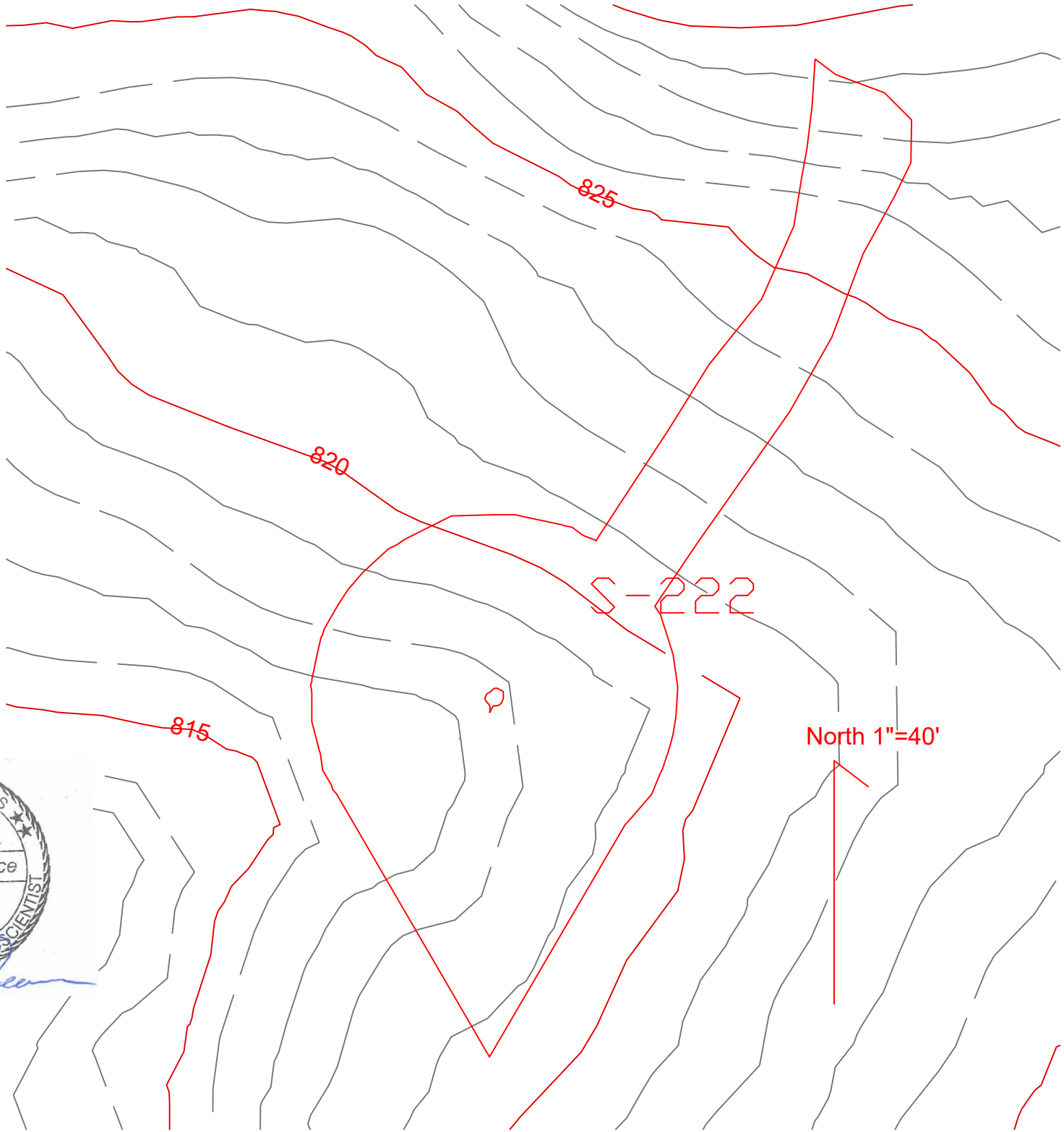
1:2,400

0 100 200 Feet
0 25 50 Meters

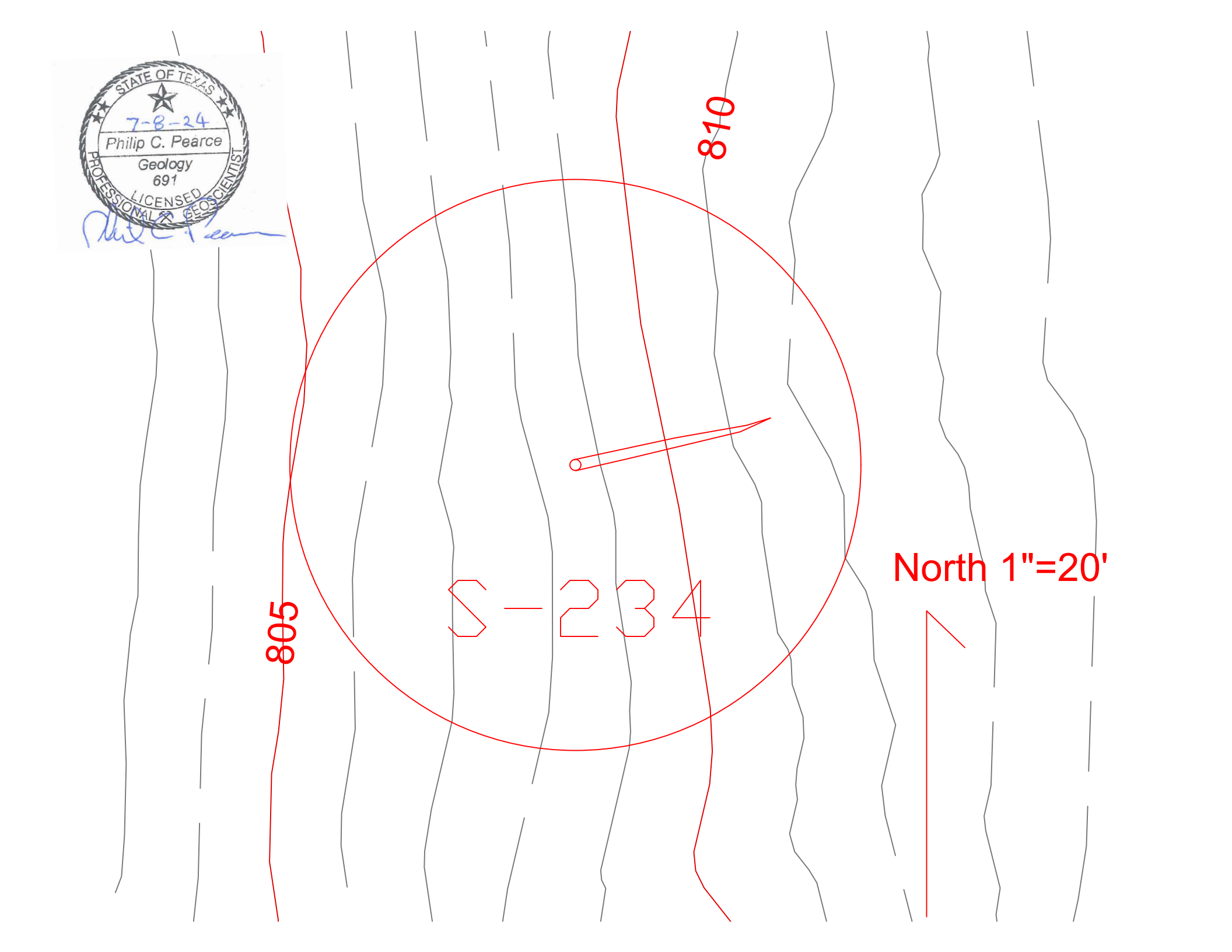

Soil Unit Type within Project Area
CrD - Comfort-Rock outcrop complex, 1 to 8 percent slopes
RUD - Rumple-Comfort, rubbly association, 1 to 8 percent slopes
RUD
ErG
CrD
RUD
Or
CrD
Annes Trl
Mountain High Dr
Paso del Robles
Arroyo Doble
RUD
Martins Crst
Project Area
Soil Unit
Hays County, TX
USGS 7.5' Quadrangle:
Wimberley, TX, 29098-H1
San Marcos North, TX, 29097-H8
Hunter, TX, 29098-G1
NAD 1983 UTM Zone 14N
29.8803°N 98.0072°W
0 750 1,500
Feet
0 190 380
Meters
N
1:18,000
Base Map: Esri ArcGIS Online, accessed June 2024
Updated: 6/26/2024
Project No. XXXXX
Layout: 57088_10 Fig 2 Soils Aprx: 57088_10_laCimaPhases6_8
SWCA
ENVIRONMENTAL CONSULTANTS

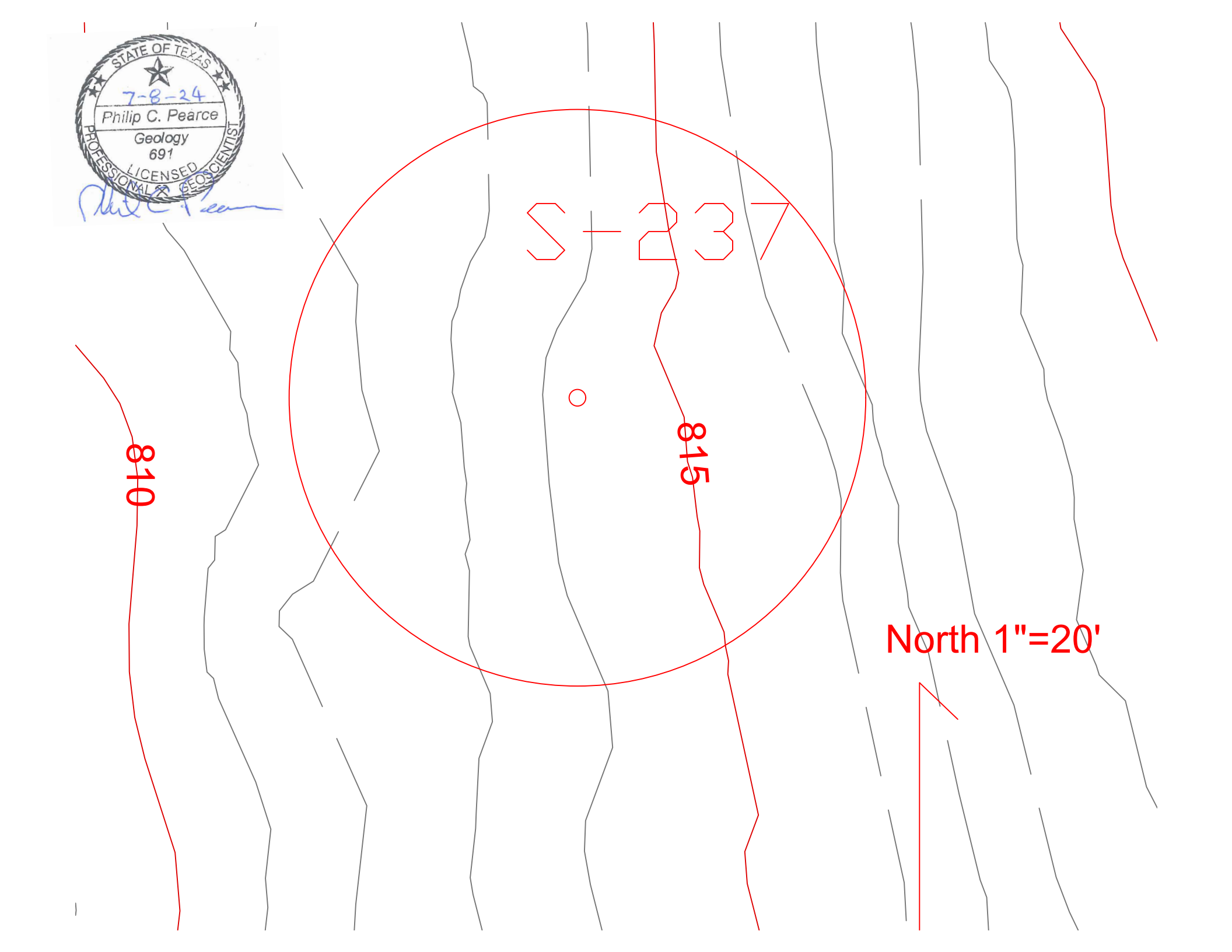
APPENDIX B

BUFFER FIGURES



STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST


STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST
810
805
S-234
North 1"=20'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7-8-24
Philip C. Pearce
Geology
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LICENSED
PROFESSIONAL GEOSCIENTIST
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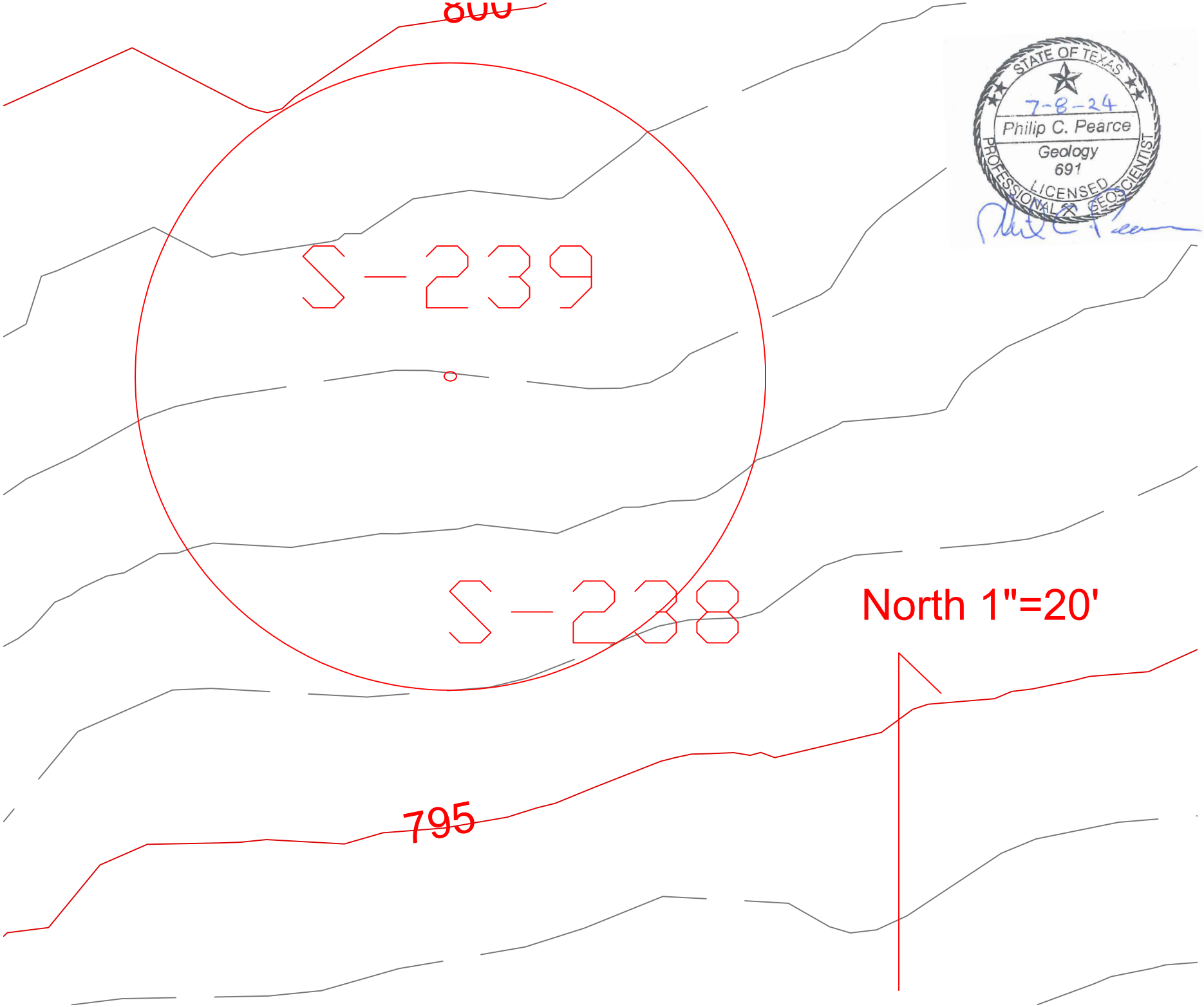
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STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
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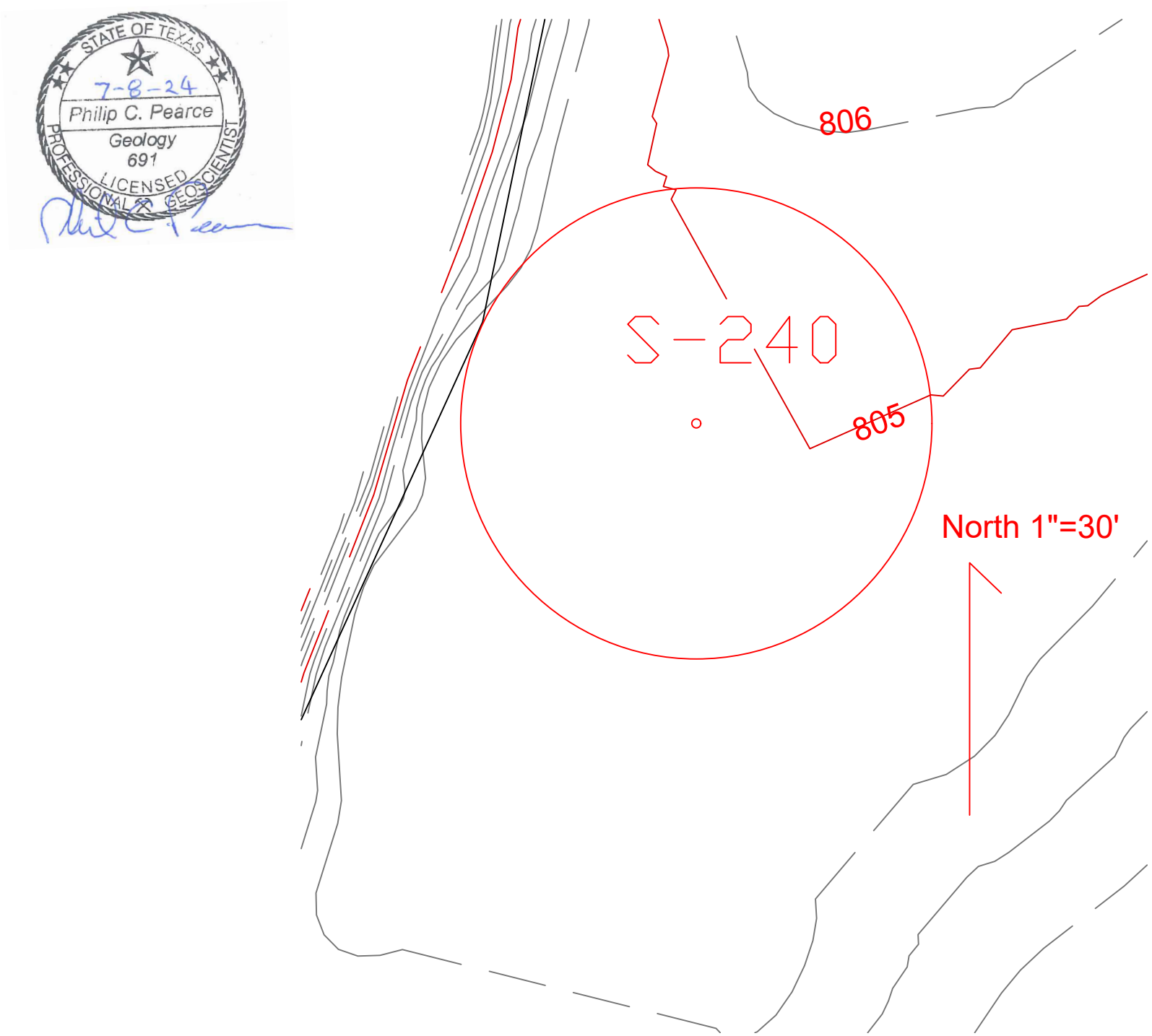
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Philip C. Pearce
Geology
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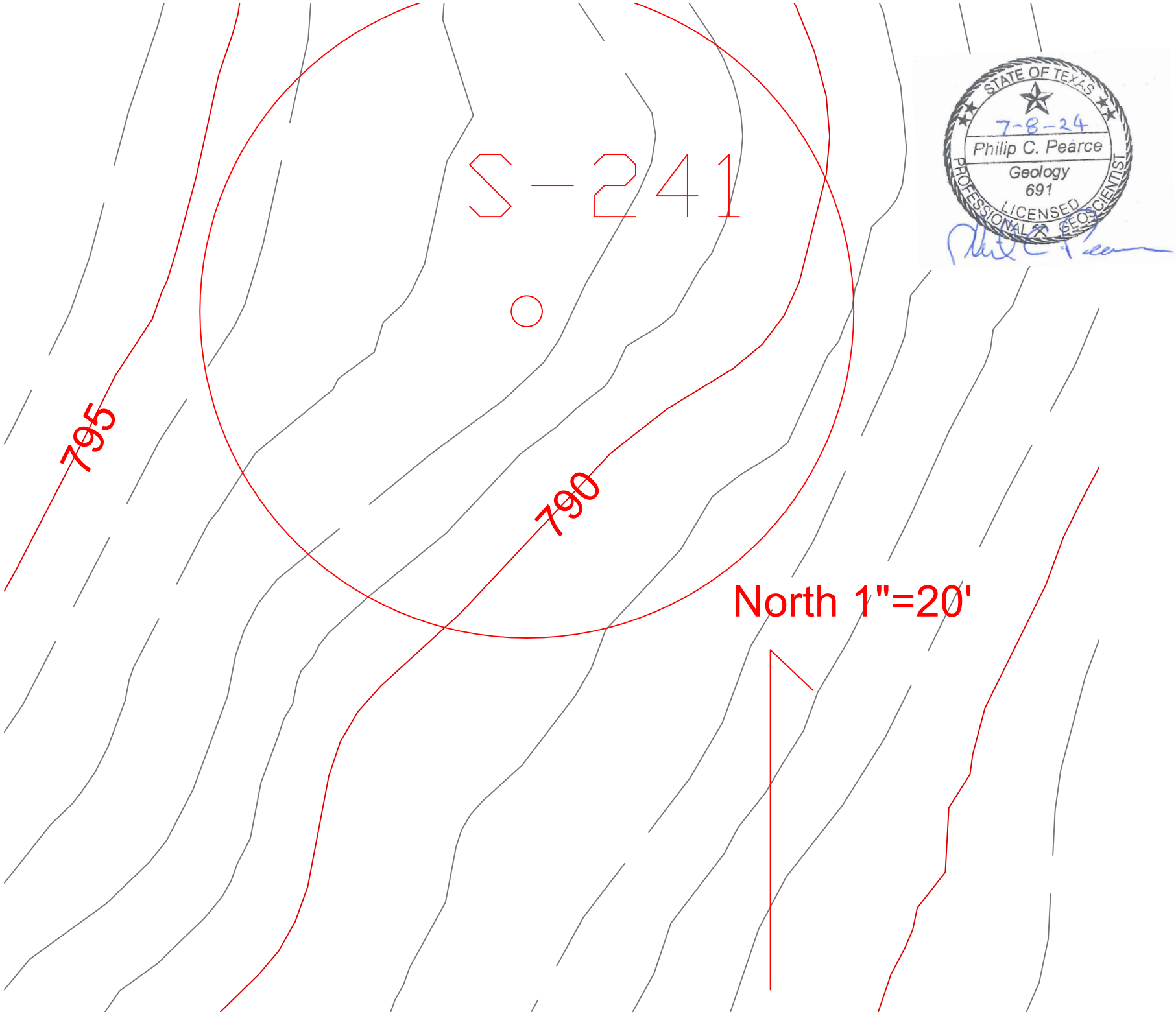
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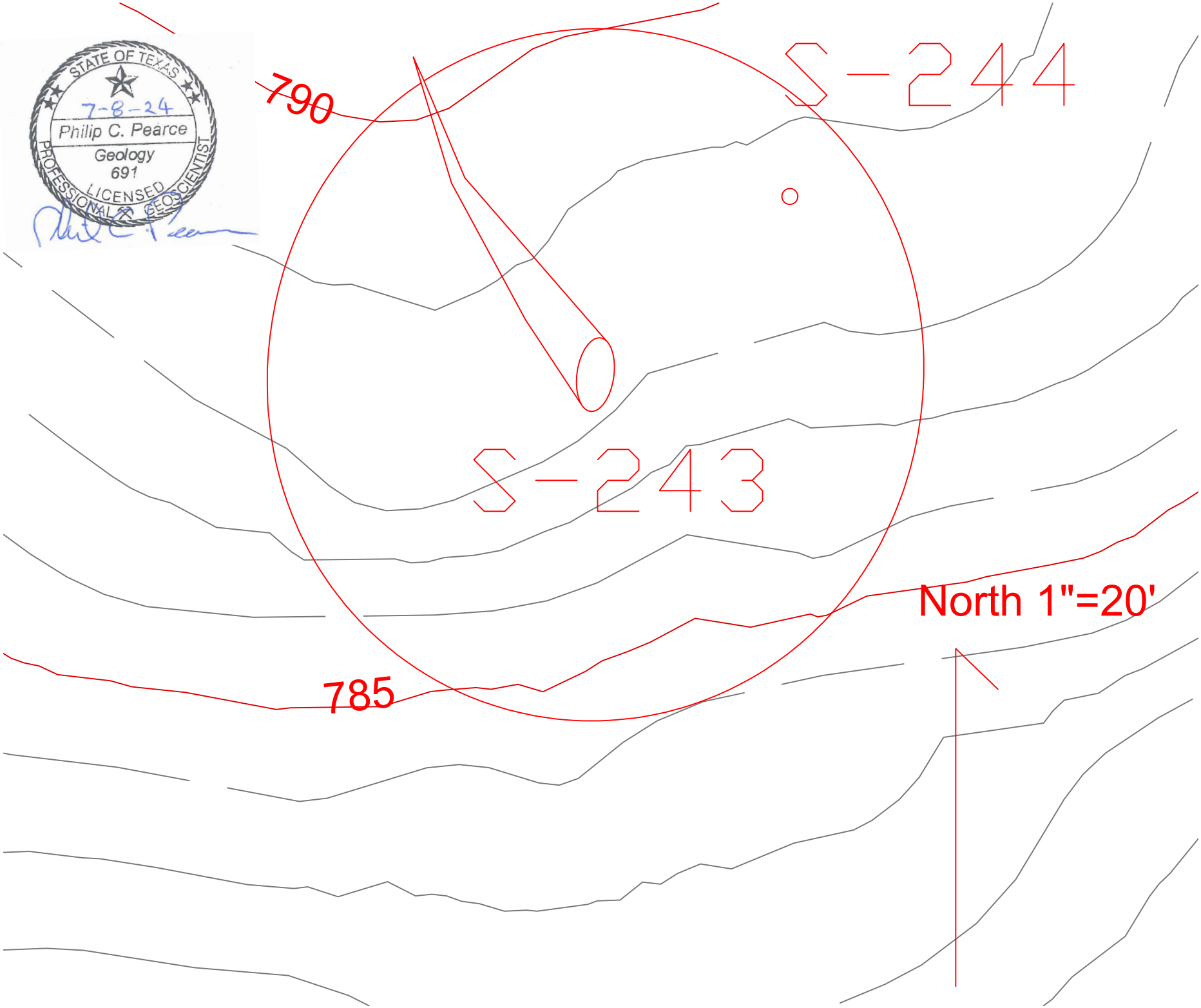
STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST


STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST
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S-244
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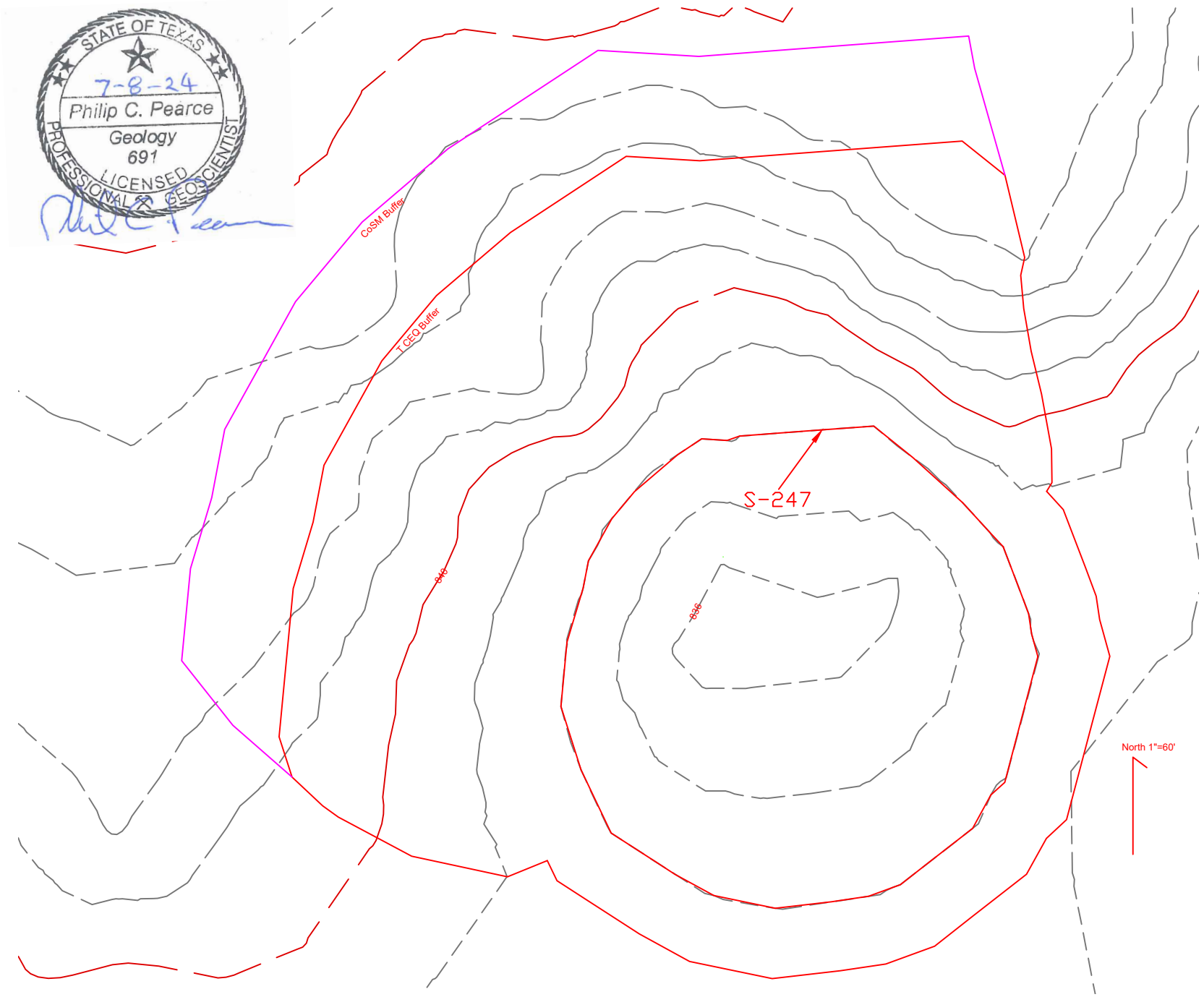
North 1"=20'


STATE OF TEXAS
7-8-24
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST
CoSM Buffer
TCEQ Buffer
S-247
940
936
North 1"=60'

4– TCEQ - 0582 Attachments

Organized Sewage Collection System Plan

Bowman
bowman.com

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 8

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: Bryan W Lee
   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: Bobby Ross
   Texas Licensed Professional Engineer's Number: 149399
   Entity: Bowman Consulting Group, LTD
   Mailing Address: 151 Stagecoach Trail, Suite 130
   City, State:San Marcos, TX Zip: 78666
   Telephone:737-221-8262; ext. 8962 Fax:_____
   Email Address:bobbyross@bowman.com

Project Information

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

   ☒ Residential: Number of single-family lots: 170
   ☐ Multi-family: Number of residential units: _____
   ☐ Commercial
   ☐ Industrial
   ☐ Off-site system (not associated with any development)
   ☐ Other: _____

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

100% Domestic	15,534 gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day

   Total gallons/day: 15,534

6. Existing and anticipated infiltration/inflow is _____ gallons/day. This will be addressed by: installation and specification as city of San Marcos details.

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

   ☐ The WPAP application for this development was approved by letter dated _____. A copy of the approval letter is attached.
   ☒ The WPAP application for this development was submitted to the TCEQ on 10/31/2024, but has not been approved.
   ☐ A WPAP application is required for an associated project, but it has not been submitted.
   ☐ There is no associated project requiring a WPAP application.

8. Pipe description:

Table 1 - Pipe Description

Pipe Diameter(Inches)	*Linear Feet (1)*	*Pipe Material (2)*	*Specifications (3)*
8	5372.62	PVC SDR 26	ASTM D3034
12	2991	PVC SDR 26	ASTM D3034

Total Linear Feet: 8363.62

(1) Linear feet - Include stub-outs and double service connections. Do not include private service laterals.
(2) Pipe Material - If PVC, state SDR value.
(3) Specifications - ASTM / ANSI / AWWA specification and class numbers should be included.

9. The sewage collection system will convey the wastewater to the COSM (name) Treatment Plant. The treatment facility is:

   ☒ Existing
   ☐ Proposed

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

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

11. ☒ No force main(s) and/or lift station(s) are associated with this sewage collection system.

   ☐ A force main(s) and/or lift station(s) is associated with this sewage collection system and the **Lift Station/Force Main System Application** form (TCEQ-0624) is included with this application.

Alignment

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

13. ☒ There are no deviations from straight alignment in this sewage collection system without manholes.

   ☐ **Attachment B - Justification and Calculations for Deviation in Straight Alignment without Manholes**. A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.

   ☐ For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

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

Table 2 - Manholes and Cleanouts

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

Table 2 - Manholes and Cleanouts

Phase	Line	Shown on Sheet	Station	Manhole or Cleanout?
8	WW LINE A	49 OF 81	10+98.76	MANHOLE
8	WW LINE B	56 OF 82	30+59.39'	MANHOLE
8	WW LINE B	56 OF 83	27+82.26	MANHOLE
8	WW LINE B	55 OF 84	26+58.88'	MANHOLE
8	WW LINE B	55 OF 85	25+25.52'	MANHOLE
8	WW LINE B	55 OF 86	24+07.56'	MANHOLE
8	WW LINE A	52 OF 87	40+48.45'	MANHOLE
8	WW LINE B	55 OF 88	21+33.36'	MANHOLE
8	WW LINE A	52 OF 89	35+42.18'	MANHOLE
8	WW LINE A	52 OF 90	38+30.23'	MANHOLE
8	WW LAT A	52 OF 91	1+96.08	MANHOLE
8	WW LINE A	52 OF 92	37+00.66'	MANHOLE
8	WW LINE C	56 OF 93	1+46.46'	MANHOLE
8	WW LINE A	51 OF 94	33+00.90'	MANHOLE
8	WW LINE A	50 OF 95	25+45.60'	MANHOLE
8	WW LINE A	50 OF 96	26+58.52'	MANHOLE
8	WW LINE B	54 OF 97	19+06.84'	MANHOLE
8	WW LINE A	50 OF 98	28+08.19'	MANHOLE
8	WW LINE A	50 OF 99	29+14.04'	MANHOLE
8	WW LINE A	50 OF 100	23+16.84'	MANHOLE
8	WW LINE A	51 OF 101	31+25.90'	MANHOLE
8	WW LINE D	57 OF 102	11+39.44'	MANHOLE
8	WW LINE D	57 OF 103	10+34.63'	MANHOLE
8	WW LINE A	50 OF 104	22+34.25'	MANHOLE
8	WW LINE E	58 OF 105	3+74.38'	MANHOLE
8	WW LINE A	50 OF 106	21+51.89'	MANHOLE
8	WW LINE A	50 OF 107	20+64.60'	MANHOLE
8	WW LINE B	54 OF 108	15+59.10'	MANHOLE
8	WW LINE D	57 OF 109	6+95.50'	MANHOLE
8	WW LINE A	49 OF 110	17+89.02'	MANHOLE
8	WW LINE D	57 OF 111	5+38.03'	MANHOLE
8	WW LINE A	49 OF 112	16+84.83'	MANHOLE
8	WW LINE D	57 OF 113	3+85.35'	MANHOLE
8	WW LINE D	57 OF 114	3+06.93'	MANHOLE
8	WW LINE D	57 OF 115	2+30.64'	MANHOLE
8	WW LINE B	53 OF 116	8+65.26'	MANHOLE
8	WW LINE B	54 OF 117	12+59.10'	MANHOLE
8	WW LINE B	54 OF 118	10+17.19'	MANHOLE
8	WW LINE B	53 OF 119	6+08.00'	MANHOLE
8	WW LINE B	49 OF 120	5+37.38'	MANHOLE
8	WW LINE B	49 OF 121	14+15.68	MANHOLE
8	WW LINE A	49 OF 122	13+40.38'	MANHOLE
8	WW LINE A	49 OF 123	12+34.72'	MANHOLE
8	WW LINE B	53 OF 124	3+52.57'	MANHOLE
8	WW LINE A	49 OF 125	10+58.24	MANHOLE
8	WW LINE A	48 OF 126	7+80.15'	MANHOLE
8	WW LINE A	48 OF 127	9+01.99'	MANHOLE
8	WW LINE A	48 OF 128	5+00.25'	MANHOLE
8	WW LINE A	48 OF 129	3+45.53'	MANHOLE
8	WW LINE A	48 OF 130	1+43.19'	MANHOLE
8	WW LINE A	48 OF 131	1+00.00	MANHOLE (EXISTING)

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

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

Pipe Diameter (inches)	Max. Manhole Spacing (feet)
6 - 15	500
16 - 30	800
36 - 48	1000
≥54	2000

☐ **Attachment C – Justification for Variance from Maximum Manhole Spacing**. The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.

17. ☐ All manholes will be monolithic, cast-in-place concrete.

☒ The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

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

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

Site Plan Scale: 1" = 100'.

19. ☒ The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.

20. Lateral stub-outs:

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

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

Table 3 - 100-Year Floodplain

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

23. 5-year floodplain:

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

Table 4 - 5-Year Floodplain

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

24. ☒ Legal boundaries of the site are shown.

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

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

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

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

Table 5 - Water Line Crossings

Line	*Station or Closest Point*	*Crossing or Parallel*	*Horizontal Separation Distance*	*Vertical Separation Distance*
PH 8 WW LN A	29+34.38	CROSSING	PERPENDICULAR	1.45'
PH 8 WW LN C	1+20.00	CROSSING	PERPENDICULAR	1.60'

27. Vented Manholes:

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

Table 6 - Vented Manholes

Line	*Manhole*	*Station*	*Sheet*

Line	*Manhole*	*Station*	*Sheet*

28. Drop manholes:

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

Table 7 - Drop Manholes

Line	*Manhole*	*Station*	*Sheet*

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

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

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

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

31. Minimum flow velocity (From Appendix A)

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

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

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

Table 8 - Flows Greater Than 10 Feet per Second

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

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

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

Administrative Information

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

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

Table 9 - Standard Details

Standard Details	*Shown on Sheet*
Lateral stub-out marking **[Required]**	of
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	78 of 81 (Ph8)
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	of
Typical trench cross-sections **[Required]**	81 of 81 (Ph8)
Bolted manholes **[Required]**	78 of 81 (PH8)
Sewer Service lateral standard details **[Required]**	78 of 81 (Ph8)
Clean-out at end of line **[Required, if used]**	78 of 81 (Ph8)
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	78 of 81 (Ph8) of
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	78 of 81 (Ph8)

Standard Details	*Shown on Sheet*
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	78 of 81 (Ph 8)
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	77 of 61 (Ph 8)

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.

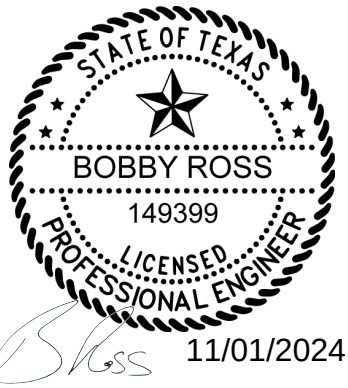
Signature

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: Bobby Ross, P.E./Bowman Consulting

Date: 10/31/2024

Place engineer's seal here:



Signature of Licensed Professional Engineer: 11/01/2024



Appendix A-Flow Velocity Table

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

Table 10 - Slope Velocity

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

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

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

Figure 1 - Manning's Formula

Where:

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

Attachment A – SCS Engineering Design Report

TCEQ Engineering Design Report

For

La Cima Phase 8



October 2024

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

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PVC PIPE STANDARDS

The American Society for Testing and Materials (ASTM) also known as ASTM International (Reference: www.astm.org) governs the manufacturing specifications for Polyvinyl Chloride (PVC) pipes, including the dimension ratio and water pressure allowable for use of each pipe, through its D-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 ASTM D-3034)			
Size (in)	**O.D. (in)**	**Calc I.D. (in)**	**Thickness (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):	**6.53**
Maximum Pipe Depth (Cover) used (feet):	**17.40**

Type I, Grade I, Polyvinyl Chloride (PVC) Specifications:
Size of Pipe: 12.00 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)	11.538
Outer Diameter (inch):	12.5
Wall Thickness (inch):	0.481
Mean Pipe Diameter (in) = (Outer Diameter - Thickness)	12.019
Approximate Trenching Width (feet):	3.04
Minimum Pipe Depth (Cover) used (feet):	**1.60**
Maximum Pipe Depth (Cover) used (feet):	**15.39**

Proposed Waste Water Usage: **41,850.00 GPD**

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

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

A = Cross-Sectional Area, (ft2)	=	0.328
S = Slope, decimal, minimum used	=	0.005
R_h = hydraulic radius	=	0.162

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

Q_{full} = 0.786 CFS

0.065 < 0.786

Design meets TCEQ Guidelines

MINIMUM AND MAXIMUM GRADES FOR PIPES (30 TAC §217.53(l)(2)(A))

Minimum and Maximum Pipe Slopes		
Size of Pipe	Minimum Slope (%)	Maximum Slope (%)
6	0.5	12.35
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
>39	*	*
* For pipes larger than 39 inches in diameter, the slope is determined by Manning's formula to maintain a velocity greater than **2.0 feet per second and less than 10.0 feet per second** when flowing full.		

MINIMUM AND MAXIMUM VELOCITY FOR THE PROPOSED SYSTEM:

So, using 8.00 inch PVC Pipe:

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

V = velocity (ft/sec)	=	(solve)
n = Manning's coefficient	=	0.013
Calc. Inner Diameter (in)	=	7.754
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)	=	0.005

Minimum Slope Used (%): **0.50**

V_{min} = 2.40 ft/sec

2.40 **>** **2.00** ft/sec

Design meets TCEQ Guidelines

Maximum Slope Used (%): **5.50**

V_{max} = 7.97 ft/sec

7.97 **<** **10.00** ft/sec

Design meets TCEQ Guidelines

So, using 12.00 inch PVC Pipe:

V = velocity (ft/sec)	=	(solve)
n = Manning's coefficient	=	0.013

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

Calc. Inner Diameter (in)	=	11.538
A = Cross-Sectional Area, ft^2	=	0.726
Wp = Wetted Perimeter, ft	=	3.021
R_h = hydraulic radius, A/Wp	=	0.240
S = slope (ft/ft)	=	0.005

Minimum Slope Used (%): **0.50**

V_{min} = 2.40 ft/sec

2.40 **>** **2.00** ft/sec

Design meets TCEQ Guidelines

Maximum Slope Used (%): **6.85**

V_{max} = 8.89 ft/sec

8.89 **<** **10.00** ft/sec

Design meets TCEQ Guidelines

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

Soil type-pipe bedding material (Unified Classification System)	E' for Degree of Compaction of Bedding, in pounds per square inch			
	Dumped	Slight <85% Proctor, <40% relative density	Moderate 85%-95% Proctor, 40%-70% relative density	High, >95% Proctor, >70% relative density
(1)	(2)	(3)	(4)	(5)
Fine-grained Soils (LL>50[b]) Soils with medium to high plasticity CH, MH, CH-MH	No data available; consult a competent soils engineer; Otherwise use E'=0			
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with less than 25% coarse-grained particles	50	200	400	1000
Fine-grained Soils (LL<50) Soils with medium to no plasticity, CL, ML, ML-CL,with more than 25% coarse-grained particles	100	400	1000	2000
Coarse-grained Soils with Fines GM, GC, SM, SC[c] contains more than 12% fines				
Coarse-grained Soils with Little or no Fines GW, GP, SW, SP[c] contains less than 12% fines	200	1000	2000	3000
Crushed Rock	1000	3000	3000	3000
Accuracy in Terms of Percentage Deflection	± 2	± 2	± 1	± 0.5

Taken from: Howard, Amster K. "Soil Reaction for Buried Flexible Pipe"
U.S. Bureau of Reclamation, Denver, CO and the American Society of Civil Engineers.

Modulus of Soil Reaction for the in-situ soil is determined to be = 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 Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

Pipe Embedment Material						E', psi (kPa) for Degree of Embedment Compaction				
ASTM D 2321*		ASTM D 2487		AASHTO M43 Notation	Min. Std. Proctor Density (%)	Lift Placement Depth	Dumped	Slightly < 85%	Moderate 85% - 95%	High > 95%
Class	Description	Notation	Description							
IA	Open-graded, clean manufactured aggregates	N/A	Angular crushed stone or rock, crushed gravel, crushed slag; large voids with little or no fines	5 56	Dumped	18" (0.45 m)	1000 (6,900)	3000 (20,700)	3000 (20,700)	3000 (20,700)
IB	Dense-graded, clean manufactured, processed aggregates	N/A	Angular crushed stone or other Class IA material and stone/sand mixtures; little or no fines							
II	Clean, coarse-grained soils	GW	Well-graded gravel, gravel/sand mixtures; little or no fines	57 6 67	85%	12" (0.30 m)	N/R	1000 (6,900)	2000 (13,800)	3000 (20,700)
		GP	Poorly graded gravel, gravel/sand mixtures; little or no fines							
		SW	Well-graded sands, gravelly sands; little or no fines							
		SP	Poorly graded sands, gravelly sands; little or no fines							
III	Coarse-grained soils with fines	GM	Silty gravels, gravel/sand/silt mixtures	Gravel and sand with <10% fines	90%	9" (0.20 m)	N/R	N/R	1000 (6,900)	2000 (13,800)
		GC	Clayey gravels, gravel/sand/clay mixtures							
		SM	Silty sands, sand/silt mixtures							
		SC	Clayey sands, sand/clay mixtures							

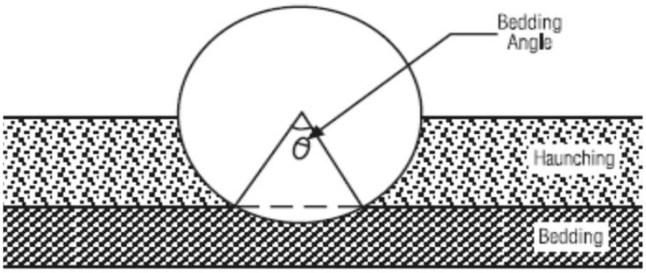
NOTE:

Per TCEQ guidelines, a contractor is allowed to use ASTM D 2321 Bedding Class 1A, 1B, II, or III at no less than 85% percent compaction. To grant the contractor its ability to make the proper judgment of which bedding class to use, the calculations provided in this Engineering Design Report reflect the use of **Bedding Class III, at 85%-95%** compaction, with an E' value of 1000 psi. This provides the "worst case" scenario for the SCS line. All other Bedding Class options will provide an improved value for the zeta factor as well as pipe deflection.

For Bedding Class III, 85%-95% Compaction, E_b = 1000 psi

PIPE BEDDING ANGLE

As Published on Figure 8 and Table 5, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pgs 18-19.



Bedding Constant Values

Bedding Angle, degrees	Bedding Constant
0	0.110
30	0.108
45	0.105
60	0.102
90	0.096
120	0.090
180	0.083

LIVE LOAD DETERMINATION

Source: AASHTO H20 and E80 Loads and as Published on Table 4, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 14.

Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²			Height of Cover (ft)	Live Load Transferred to Pipe, lb/in²		
	Highway H20[1]	Railway E80[2]	Airport [3]		Highway H20[1]	Railway E80[2]	Airport [3]
1	12.50			14	*	4.17	3.06
2	5.56	26.39	13.14	16	*	3.47	2.29
3	4.17	23.61	12.28	18	*	2.78	1.91
4	2.78	18.40	11.27	20	*	2.08	1.53
5	1.74	16.67	10.09	22	*	1.91	1.14
6	1.39	15.63	8.79	24	*	1.74	1.05
7	1.22	12.15	7.85	26	*	1.39	*
8	0.69	11.11	6.93	28	*	1.04	*
10	*	7.64	6.09	30	*	0.69	*
12	*	5.56	4.76	35	*	*	*
				40	*	*	*

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

PRISM LOAD DETERMINATION

Also referred to as the 'dead' load, the prism load is the pressure acting on the pipe by the weight of the soil column above a given section of the pipe. The following prism load columns are industry standards as referenced from Table 3, Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 13.

Table 3
Prism Load Soil Pressure (lbs/in²)

Height of Cover (ft)	Soil Unit Weight (lb/ft³)				
	100	110	120	125	130
1	0.69	0.76	0.83	0.87	0.90
2	1.39	1.53	1.67	1.74	1.81
3	2.08	2.29	2.50	2.60	2.71
4	2.78	3.06	3.33	3.47	3.61
5	3.47	3.82	4.17	4.34	4.51
6	4.17	4.58	5.00	5.21	5.42
7	4.86	5.35	5.83	6.08	6.32
8	5.56	6.11	6.67	6.94	7.22
9	6.25	6.88	7.50	7.81	8.13
10	6.94	7.64	8.33	8.68	9.03
11	7.64	8.40	9.17	9.55	9.93
12	8.33	9.17	10.00	10.42	10.83
13	9.03	9.93	10.83	11.28	11.74
14	9.72	10.69	11.67	12.15	12.64
15	10.42	11.46	12.50	13.02	13.54
16	11.11	12.22	13.33	13.89	14.44
17	11.81	12.99	14.17	14.76	15.35
18	12.50	13.75	15.00	15.63	16.25
19	13.19	14.51	15.83	16.49	17.15
20	13.89	15.28	16.67	17.36	18.06
21	14.58	16.04	17.50	18.23	18.96
22	15.28	16.81	18.33	19.10	19.86
23	15.97	17.57	19.17	19.97	20.76
24	16.67	18.33	20.00	20.83	21.67
25	17.36	19.10	20.83	21.70	22.57
26	18.06	19.86	21.67	22.57	23.47
27	18.75	20.63	22.50	23.44	24.38
28	19.44	21.39	23.33	24.31	25.28
29	20.14	22.15	24.17	25.17	26.18
30	20.83	22.92	25.00	26.04	27.08
31	21.53	23.68	25.83	26.91	27.99
32	22.22	24.44	26.67	27.78	28.89
33	22.92	25.21	27.50	28.65	29.79
34	23.61	25.97	28.33	29.51	30.69
35	24.31	26.74	29.17	30.38	31.60
36	25.00	27.50	30.00	31.25	32.50
37	25.69	28.26	30.83	32.12	33.40
38	26.39	29.03	31.67	32.99	34.31
39	27.08	29.79	32.50	33.85	35.21
40	27.78	30.56	33.33	34.72	36.11
41	28.47	31.32	34.17	35.59	37.01
42	29.17	32.08	35.00	36.46	37.92
43	29.86	32.85	35.83	37.33	38.82
44	30.56	33.61	36.67	38.19	39.72
45	31.25	34.38	37.50	39.06	40.63
46	31.94	35.14	38.33	39.93	41.53
47	32.64	35.90	39.17	40.80	42.43
48	33.33	36.67	40.00	41.67	43.33
49	34.03	37.43	40.83	42.53	44.24
50	34.72	38.19	41.67	43.40	45.14

Note that the Prism Loads are calculated based upon the Marston Theory of Loads, developed by Professor Anson Marston, circa 1913, and is calculated using the formula:

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

This formula determines the earth load on a flexible pipe and is regarded as a conservative approach to determining the dead load placed upon a buried flexible pipe.

At maximum burial depth of 17.40 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) =	208.80	in
	H	=	Depth of burial, feet, from ground surface to top of pipe		
	B'	=	Empirical coefficient of elastic support		
	E_b	=	Modulus of soil reaction for the bedding material (psi)		
	E	=	Modulus of elasticity of the pipe material (psi)		
	I	=	Moment of inertia of the pipe, per linear inch of pipe (in^3)		
	t	=	Pipe wall thickness (in)		
	D	=	Mean Pipe Diameter (in) D =	8.077	in

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

$$B' = \frac{4(h^2 + Dh)}{1.5(2h + D)^2} \qquad I = \left(\frac{t^3}{12}\right) = \left(\frac{inches^3}{in_{linear}}\right) =$$

$$B' = \frac{181136}{271801} = 0.666 \qquad I = \frac{0.0336983}{12} = 0.0028$$

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

$$q_a = \frac{1}{FS} * \sqrt{32 * R_w * B' * E_b * \left(E * \frac{I}{D^3}\right)}$$ Where,

$$R_W = 1 - 0.33\,(h_w / h)$$

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

$$q_a = \mathbf{85.29} \quad \mathbf{psi}$$

BUCKLING PRESSURE (INSTALLED CONDITION)

Where:	q_P	=	Pressure applied to pipe under installed conditions (psi)		
	γ_W	=	Specific Weight of Water = 0.0361 (pci)		
	γ_S	=	Specific Weight of Soil (pcf)		
	W_c	=	Vertical Soil Load on the pipe per unit length (lb/in)		
	L_L	=	Live load as determined from chart		
	hw	=	Height of Groundwater above pipe, typically = 0		
	D	=	Mean Pipe Diameter (in)	D =	8.077 in
	t	=	Pipe Wall Thickness (in)	t =	0.323 in

The Vertical Soil Load can be calculated using Equation 6.6 of Uni-Bell's Handbook of PVC Pipe , Ch VI Superimposed Loads on Buried Pipe, Pg 183

$$W_c = H \times \gamma_s \times (D + t)$$

Where: γ_S = 115 Value taken from: Assumed Worst Case Scenario

$$W_C = \left[\ 17.40\ \right]\left[\ 12\ \text{in/ft}\ \right]\left[\ 115.00\ \right]\left[\frac{1\ \text{ft}^3}{1728\ \text{in}^3}\right]\left[\ 8.40\ \right]$$

W_C = 116.73 lb/in

At Max Pipe Depth (H) of 17.40 ft

Using the Equation on Pg 114 of Moser, A.P., Buried Pipe Design. 2nd Ed., McGraw-Hill, Pressure Applied to Pipe under installed conditions at its deepest installed depth (Note, since hw = 0, the Water Buoyancy Factor (Rw) = 1) is calculated to be:

$$q_p = \gamma_w h_w + R_w\left(\frac{W_c + L_L}{D}\right) \quad \text{and } L_L = \quad 0 \qquad R_W = 1 - 0.33\,(h_w / h)$$

$$q_P = \quad 0.0361 \times 0 + 1 \times \left[\frac{116.73}{8.077}\right]$$

$$q_P = \quad \mathbf{14.45} \quad \mathbf{psi}$$

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 $in.^2/ft$

γ_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 Plastic Pipe Design Manual published by Vylon Pipe, Pg 14 the Wall Crushing due to compressive stress can be found using the following:

$$P_c = \frac{T}{A}$$ 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_y:

$$P_c = \frac{\frac{\gamma_s * H}{144} D}{2A}$$ Rearranging this equation, it becomes: $$2AP_c = \frac{\gamma_s * H}{144} D$$

And simplifies to: $$288AP_c = \gamma_s HD$$

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

$$244P_c = \gamma_s HL$$

Solving for H, the equation becomes:

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

(Continued on next page)

Using this equation, and converting all units, solve for “height” of the soil column, or in other words, the depth of burial of the PVC pipe:

$$H = \frac{\left[24 \right] \left[4000 \right] \left[0.323 \times 12 \right]}{115 \times 8.4} = \mathbf{385.19}$$

H = 385.19 feet

Note: The resulting Wall Crushing will occur at a greater depth than the deepest burial depth of the proposed SCS lines, therefore pipe design is acceptable.

DEFLECTION ANALYSIS: LEONHARDT'S ZETA FACTOR

The Leonhardt's Zeta Factor Equation can be calculated using Equation 7.32 of Uni-Bell's Handbook of PVC Pipe , Ch VII Design of Buried PVC Pipe, Pg 268

Where:	Do	=	Pipe Outer Diameter, in =	8.400
	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

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

where,

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

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

Substituting f into the zeta equation:

$$zeta = \frac{1.44}{[1.180]\ [0.260]\ [1.000]}$$

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:

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

Where:	PS	=	Pipe Stiffness, for SDR-26 PVC (psi) = 115 p	115	psi
	C	=	Conversion factor =	0.8	
	RSC	=	Ring Stiffness Constant		
	D	=	Mean Pipe Diameter (in), D =	8.077	in

The RSC can be supplied by the manufacturer or calculated by rearranging Equation B.1

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

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

$$RSC = 139.267$$

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

Where:	%ΔY/D	=	Predicted % vertical deflection under load			
	P	=	Prism Load, psi			
	K	=	Bedding angle constant, Assumed to =	0.096		
	W'	=	Live Load, psi, =	0	At max depth (ft) :	17.40
	DR	=	Dimension Ratio=	26		
	E	=	Modulus of tensile elasticity of the pipe material, psi			
	E'	=	Modulus of Soil Reaction (zeta x Eb) =	1000.00		
	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:

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

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 Deflection: the Pipe/Soil Mechanism, UNI-TR-1-97, Published by the Uni-Bell PVC Pipe Association (Pgs 28-30):

Where:	$\in_h$	=	Maximum Pipe Strain due to Hoop Stress, in/in	
	P	=	Pressure on the pipe (Live + Prism Loads), psi	
	E	=	Modulus of Elasticity of the Pipe, psi	
	t	=	Pipe Wall thickness (in) =	0.323
	D	=	Pipe Diameter, Outer (in) =	8.400

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

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

$$\frac{[\ 0.00\ +\ 12.22\ ]\times\ 8.400}{2\ \times\ 0.323\ \times\ 400{,}000} = \textbf{3.972E-04}\ \frac{\text{in}}{\text{in}}$$

(*Continued on following page)*

Where:	$\in_f$	=	Maximum Pipe Strain due to Ring Deflection, in/in	
	ΔY	=	Change in vertical pipe diameter under load, in, (numerator in the deflection equation, but in decimal form)	
	t	=	Pipe Wall thickness (in) =	0.323
	D	=	Pipe Diameter, Outer (in) =	8.400
	DR	=	Dimension Ratio, PVC Pipe=	26

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

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

$$\in_{total} = \mathbf{0.0420} \frac{\text{in}}{\text{in}}$$

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.

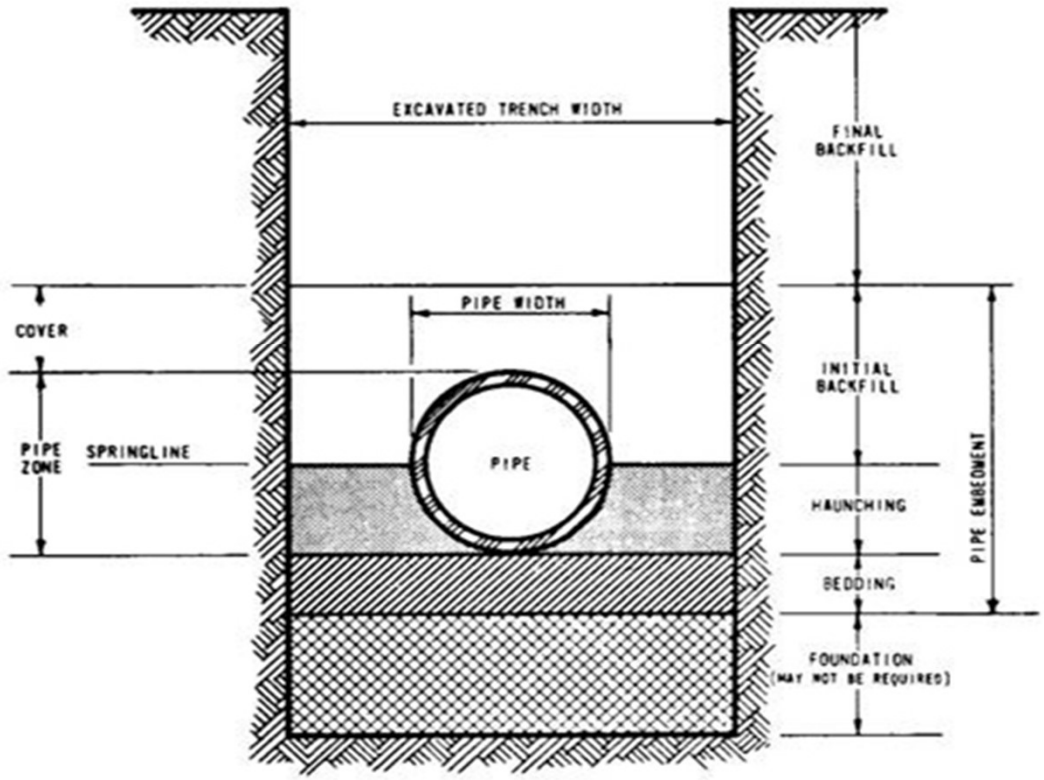
b. Compaction.
    1. Compaction of an embedment envelope must meet the manufacturer's recommendations for the collection system pipe used in a project.
    2. Compaction of an embedment envelope must provide the modulus of soil reaction for the bedding material necessary to ensure a wastewater collection 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 81 OF 81 La Cima Ph 8

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. - Maximum Manhole Spacing

Pipe Diameter	Maximum Manhole
6-15	500
18-30	800
36-48	1000
54 or larger	2000

h. Tunnels are exempt from manhole spacing requirements because of construction constraints. **(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)**

l. Manholes must meet the following requirements for covers, inlets, and bases.

1. Manhole Covers

A. A manhole where personnel entry is anticipated requires at least a 30 inch diameter clear opening. (**Covers to have 32" Openings per 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

La Cima Phase 8 Wastewater Calculations

Assumptions		
San Marcos Design Standards:		
Avg WW Flow	100	gal/day/capita
ADWF	225	gal/day/LUE
Infiltration	750	gal/day/acre
n	0.013	Manning's Coefficient
Capacity Requirements		
PWWF	85%	of total capacity
PDWF	65%	of total capacity
Equations:		
V_full = (1.49/n)*Rh^(2/3)*S^(1/2)		
PWWF (gal/day) = PDWF (gal/day)+ I/I (gal/day)		
PDWF (gal/day) = ADWF (gal/day/LUE)*LUEs*PF		
PF = (18+0.139*F^0.5)/(4+0.139*F^0.5)		
PWWF (gal/day) = ADWF*PF +I/I		

LUE Definition
1 Dwelling Unit = 1 LUE (Living Unit Equivalent)
1 LUE = 225 gal/day

Design		
Pipe Type	SDR 26	
8" Inner Diameter*	7.754	inches
12" Inner Diameter*	11.538	inches
15" Inner Diameter*	14.124	inches
18" Inner Diameter*	17.174	inches
Phase 7W Area	262	acres
Phase 7E Area	53	acres
Phases 3C&3D Area	45	acres
Phase 8 Area	69	acres
*Ref. JM Eagle Gravity Sewer Specs.		

Conversion Factors		
Minutes	1440	per day
gal/minute	448.8	*cfs
Capacity at <100% full, see chart right		
Depth at Qmax	0.9	of total D
Amax / Afull	0.949	
Vmax / Vfull	1.16	
Qmax / Qfull	1.08	

Equations Used (in Order)
Area = PI()*(D/2)^2
Rh = Area / Wetted Perimeter
V_full = (1.49/n)(Rh^0.67)(S^0.5)
Q_full = V_max*Area
Sewershed Area = (total area / total LUE's)*AccLUE
F (in gpm) = AccLUE*ADWF/(1440min/day)
I/I = Infiltration * Accum. Area / (1440 min/day)

Definitions	
ADWF	Avg Dry Weather Flow
I/I	Inflow / Infiltration
PWWF	Peak Wet Weather Flow
PDWF	Peak Dry Weather Flow
LUE's	Living Unit Equivalents
AccLUE	Accumulated LUE's
F	Average WW Flow (gal/min
d	Depth of Water
D	Diameter
Q_max	Flow at Capacity
Rh	Hydraulic Radius

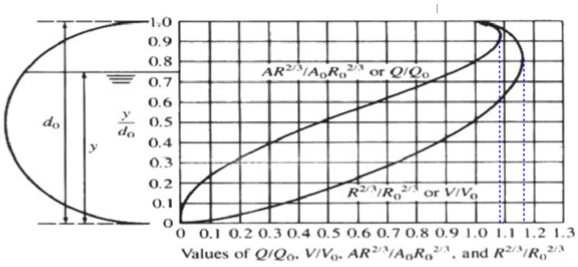


Figure 4-5 Flow characteristics of a circular section assuming constant n value

Name of WW Line	Pipe Run		Pipe Size (See Options, Above)	Inside Diameter	Slope	LUE's per run	Accum. LUE's	Area per run	Accum. Area	Full Pipe Area	Area at Capacity	Rh (full)	Manning's n	V_full	Q_full	V_max	Q_max		F	PF	I/I	PDWF (Q_dry)		PWWF (Q_wet)		% Full (based on Q/Qmax in GPM)		V_dry	V_wet
	From	To	in	ft	%			acres	acres	sf	sf	ft		fps	cfs	fps	gpm	cfs	gpm		gpm	gpm	cfs	gpm	cfs	PDWF	PWWF	fps	fps
A	A25	A24	8	0.646	0.70%	10	10	2	2.31	0.33	0.31	0.16	0.013	2.83	0.93	3.28	449.4	1.001	0.7	4.40	1.2	7	0.02	8	0.02	2%	2%	1.07	1.12
A	A24	A23	8	0.646	0.80%	3	3	1	1.18	0.33	0.31	0.16	0.013	3.02	0.99	3.51	480.4	1.070	0.2	4.45	0.6	2	0.00	3	0.01	0%	1%	0.76	1.17
A	A23	A22	8	0.646	1.95%	6	9	2	2.84	0.33	0.31	0.16	0.013	4.72	1.55	5.47	750.0	1.671	0.6	4.41	1.5	6	0.01	8	0.02	1%	1%	1.44	1.46
A	A22	A21	8	0.646	1.77%	4	15	1	5.19	0.33	0.31	0.16	0.013	4.50	1.47	5.21	714.6	1.592	1.0	4.38	2.7	10	0.02	13	0.03	1%	2%	1.64	1.77
A	A21	A19	8	0.646	3.52%	1	16	1	6.04	0.33	0.31	0.16	0.013	6.34	2.08	7.35	1007.7	2.245	1.1	4.38	3.1	11	0.02	14	0.03	1%	1%	2.13	2.27
A	A19	A18	8	0.646	0.50%	5	21	1	7.54	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	1.5	4.36	3.9	14	0.03	18	0.04	4%	5%	1.14	1.25
A	A18	A17	8	0.646	0.50%	3	24	1	8.72	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	1.7	4.35	4.5	16	0.04	21	0.05	4%	5%	1.26	1.38
A	A17	A16	8	0.646	0.50%	6	30	2	10.38	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	2.1	4.33	5.4	20	0.05	26	0.06	5%	7%	1.33	1.44
A	A16	A15	8	0.646	0.50%	1	31	1	11.23	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	2.2	4.33	5.8	21	0.05	27	0.06	6%	7%	1.35	1.47
A	A15	A14	8	0.646	0.50%	7	38	2	13.05	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	2.6	4.31	6.8	26	0.06	32	0.07	7%	9%	1.44	1.54
A	A14	A13	8	0.646	2.65%	10	48	2	15.36	0.33	0.31	0.16	0.013	5.50	1.80	6.38	874.3	1.948	3.3	4.29	8.0	32	0.07	40	0.09	4%	5%	2.73	2.95
A	A13	A12	8	0.646	4.75%	4	52	1	16.70	0.33	0.31	0.16	0.013	7.36	2.42	8.54	1170.6	2.608	3.6	4.28	8.7	35	0.08	44	0.10	3%	4%	3.44	3.70
A	A12	A11	8	0.646	2.12%	0	52	1	17.39	0.33	0.31	0.16	0.013	4.92	1.61	5.71	782.0	1.742	3.6	4.28	9.1	35	0.08	44	0.10	4%	6%	2.59	2.76
A	A11	A10	8	0.646	3.22%	4	56	1	18.73	0.33	0.31	0.16	0.013	6.06	1.99	7.03	963.8	2.147	3.9	4.28	9.8	37	0.08	47	0.11	4%	5%	3.05	3.28
A	A10	A9	8	0.646	2.41%	4	60	1	20.07	0.33	0.31	0.16	0.013	5.25	1.72	6.08	833.8	1.858	4.2	4.27	10.5	40	0.09	50	0.11	5%	6%	2.81	3.01
A	A9	A8.1	8	0.646	7.25%	7	67	2	21.89	0.33	0.31	0.16	0.013	9.10	2.98	10.55	1446.2	3.222	4.7	4.26	11.4	45	0.10	56	0.12	3%	4%	4.25	4.56
A	A8.1	A8	8	0.646	3.03%	3	70	1	23.07	0.33	0.31	0.16	0.013	5.88	1.93	6.82	934.9	2.083	4.9	4.25	12.0	46	0.10	59	0.13	5%	6%	3.17	3.40
A	A8	A7.1	8	0.646	5.50%	4	74	1	24.41	0.33	0.31	0.16	0.013	7.92	2.60	9.19	1259.6	2.807	5.1	4.24	12.7	49	0.11	62	0.14	4%	5%	3.99	4.26
A	A7.1	A7	8	0.646	7.90%	3	77	1	25.58	0.33	0.31	0.16	0.013	9.50	3.11	11.02	1509.6	3.364	5.3	4.24	13.3	51	0.11	64	0.14	3%	4%	4.57	4.90
A	A7	A6.1	8	0.646	4.55%	0	77	1	26.27	0.33	0.31	0.16	0.013	7.21	2.36	8.36	1145.7	2.553	5.3	4.24	13.7	51	0.11	65	0.14	4%	6%	3.76	4.04
A	A6.1	A6	12	0.962	3.00%	0	77	1	27.65	0.73	0.69	0.24	0.013	7.64	5.55	8.86	2688.2	5.990	5.3	4.24	14.4	51	0.11	65	0.15	2%	2%	4.22	4.50
A	A6	A5	12	0.962	0.50%	0	77	1	28.34	0.73	0.69	0.24	0.013	3.12	2.26	3.62	1097.5	2.445	5.3	4.24	14.8	51	0.11	66	0.15	5%	6%	2.13	2.27
A	A5	A4	12	0.962	0.50%	0	77	1	29.03	0.73	0.69	0.24	0.013	3.12	2.26	3.62	1097.5	2.445	5.3	4.24	15.1	51	0.11	66	0.15	5%	6%	2.13	2.28
A	A4	A3	12	0.962	0.50%	0	77	1	29.72	0.73	0.69	0.24	0.013	3.12	2.26	3.62	1097.5	2.445	5.3	4.24	15.5	51	0.11	66	0.15	5%	6%	2.13	2.28
A	A3	A2	12	0.962	0.53%	0	77	1	30.41	0.73	0.69	0.24	0.013	3.21	2.33	3.72	1129.9	2.518	5.3	4.24	15.8	51	0.11	67	0.15	5%	6%	2.17	2.33
A	A2	A1	8	0.646	0.50%	0	77	1	31.10	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	5.3	4.24	16.2	51	0.11	67	0.15	13%	18%	2.13	2.34
A	A1.1	A22	8	0.646	1.00%	2	2	1	1.01	0.33	0.31	0.16	0.013	3.38	1.11	3.92	537.1	1.197	0.1	4.46	0.5	1	0.00	2	0.00	0%	0%	0.68	0.81
B	B15	B14	8	0.646	1.00%	12	12	3	2.63	0.33	0.31	0.16	0.013	3.38	1.11	3.92	537.1	1.197	0.8	4.39	1.4	8	0.02	10	0.02	2%	2%	1.26	1.34
B	B14	B13	8	0.646	0.50%	3	15	1	3.81	0.33	0.31	0.16	0.013	2.39	0.78	2.77	379.8	0.846	1.0	4.38	2.0	10	0.02	12	0.03	3%	3%	1.05	1.12
B	B13	B12	8	0.646	1.50%	7	22	2	5.63	0.33	0.31	0.16	0.013	4.14	1.36	4.80	657.8	1.466	1.5	4.36	2.9	15	0.03	18	0.04	2%	3%	1.75	1.85
B	B12	B11	8	0.646	2.00%	4	26	1	6.97	0.33	0.31	0.16	0.013	4.78	1.57	5.54	759.6	1.692	1.8	4.34	3.6	18	0.04	21	0.05	2%	3%	2.04	2.15
B	B11	B10	8	0.646	0.59%	10	36	2	9.28	0.33	0.31	0.16	0.013	2.60	0.85	3.01	412.5	0.919	2.5	4.32	4.8	24	0.05	29	0.06	6%	7%	1.45	1.54
B	B10	B9	12	0.962	6.85%	8	44	2	11.96	0.73	0.69	0.24	0.013	11.54	8.38	13.39	4062.1	9.051	3.1	4.30	6.2	30	0.07	36	0.08	1%	1%	3.49	3.68
B	B9	B8	12	0.962	4.39%	13	57	3	14.75	0.73	0.69	0.24	0.013	9.24	6.71	10.72	3251.9	7.246	4.0	4.27	7.7	38	0.08	46	0.10	1%	1%	3.18	3.38
B	B8	B7	12	0.962	5.11%	12	69	3	17.39	0.73	0.69	0.24	0.013	9.97	7.24	11.56	3508.4	7.817	4.8	4.25	9.1	46	0.10	55	0.12	1%	2%	3.57	3.76
B	B7	B6	12	0.962	1.30%	8	77	2	19.37	0.73	0.69	0.24	0.013	5.03	3.65	5.83	1769.6	3.943	5.3	4.24	10.1	51	0.11	61	0.14	3%	3%	2.28	2.40
B	B6	B5	12	0.962	1.00%	0	77	1	20.06	0.73	0.69	0.24	0.013	4.41	3.20	5.12	1552.0	3.458	5.3	4.24	10.4	51	0.11	61	0.14	3%	4%	2.08	2.19
B	B5	B4	12	0.962	0.50%	6	118	2	32.91	0.73	0.69	0.24	0.013	3.12	2.26	3.62	1097.5	2.445	8.2	4.18	17.1	77	0.17	94	0.21	7%	9%	3.97	4.23
B	B4	B3	12	0.962	4.80%	2	120	1	33.93	0.73	0.69	0.24	0.013	9.66	7.02	11.21	3400.4	7.577	8.3	4.18	17.7	78	0.17	96	0.21	2%	3%	2.44	2.59
B	B3	B2	12	0.962	4.85%	2	122	1	34.94	0.73	0.69	0.24	0.013	9.71	7.05	11.27	3418.0	7.616	8.5	4.18	18.2	80	0.18	98	0.22	2%	3%	4.11	4.39
B	B2	B6.1	12	0.962	5.59%	0	122	1	35.63	0.73	0.69	0.24	0.013	10.43	7.57	12.09	3669.5	8.176	8.5	4.18	18.6	80	0.18	98	0.22	2%	3%	4.34	4.61
B	B1	A6.1	12	0.962	4.80%	0	0	1	0.69	0.73	0.69	0.24	0.013	9.66	7.02	11.21	3400.4	7.577	0.0	4.50	0.4	0	0.00	0	0.00	0%	0%	4.11	4.40
C	C1	B10	12	0.962	0.50%	0	0	1	0.69	0.73	0.69	0.24	0.013	3.12	2.26	3.62	1097.5	2.445	0.0	4.50	0.4	0	0.00	0	0.00	0%	0%	0.61	0.61
D	D7	D6	8	0.646	2.60%	4	4	1	1.34	0.33	0.31	0.16	0.013	5.45	1.79	6.32	866.0	1.930	0.3	4.44	0.7	3	0.01	3	0.01	0%	0%	1.31	1.30
D	D6	D5	8	0.646	2.60%	11	15	2	3.81	0.33	0.31	0.16	0.013	5.45	1.79	6.32	866.0	1.930	1.0	4.38	2.0	10	0.02	12	0.03	1%	1%	1.90	1.99
D	D5	D4	8	0.646	1.30%	4	28	1	7.30	0.33	0.31	0.16	0.013	3.85	1.26	4.47	612.4	1.364	1.9	4.34	3.8	19	0.04	23	0.05	3%	4%	1.79	1.89
D	D4	D3	8	0.646	2.00%	5	33	1	8.80	0.33	0.31	0.16	0.013	4.78	1.57	5.54	759.6	1.692	2.3	4.33	4.6	22	0.05	27	0.06	3%	4%	2.17	2.31
D	D3	D2	8	0.646	2.00%	2	35	1	9.81	0.33	0.31	0.16	0.013	4.78	1.57	5.54	759.6	1.692	2.4	4.32	5.1	24	0.05	29	0.06	3%	4%	2.23	2.35
D	D2	D1	8	0.646	4.00%	0	35	1	10.50	0.33	0.31	0.16	0.013	6.76	2.22	7.84	1074.2	2.393	2.4	4.32	5.5	24	0.05	29	0.06	2%	3%	2.84	3.00
D	D1	B5	8	0.646	6.54%	0	35	1	11.19	0.33	0.31	0.16	0.013	8.64	2.83	10.02	1373.5	3.060	2.4	4.32	5.8	24	0.05	29	0.07	2%	2%	3.39	3.57
E	E1	D5	8	0.646	3.00%	9	9	2	2.15	0.33	0.31	0.16	0.013	5.85	1.92	6.79	930.3	2.073	0.6	4.41	1.1	6	0.01	7	0.02	1%	1%	1.68	1.76

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.

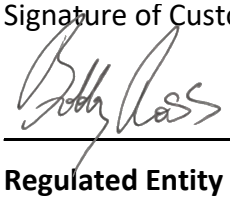
Signature

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: Bobby Ross

Date: 11/1/2024

Signature of Customer/Agent



Regulated Entity Name: LA CIMA PHASE 8

Regulated Entity Information

1. The type of project is:

   ☒ Residential: Number of Lots:198
   ☐ Residential: Number of Living Unit Equivalents:_____
   ☐ Commercial
   ☐ Industrial
   ☐ Other:_____

2. Total site acreage (size of property):69.13

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 =	29.14

Total Impervious Cover 29.14 **÷ Total Acreage** 69.13 **X 100 =** 42.15**% Impervious Cover**

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

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

For Road Projects Only

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

7. Type of project:

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

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

   ☐ Concrete
   ☐ Asphaltic concrete pavement
   ☐ Other: _____

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

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

10. Length of pavement area: _____ feet.

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

11. ☐ A rest stop will be included in this project.

    ☐ A rest stop will not be included in this project.

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

100% Domestic	47,700 Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day

TOTAL gallons/day 47,700

15. Wastewater will be disposed of by:

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

☐ **Attachment C - Suitability Letter from Authorized Agent**. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

☐ Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

☒ Sewage Collection System (Sewer Lines):

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

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

☐ The SCS was previously submitted on_____.

☒ The SCS was submitted with this application.

☐ The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

☒ The sewage collection system will convey the wastewater to the La Cima Lift Station #2 (name) Treatment Plant. The treatment facility is:

☒ Existing.
☐ Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 150'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☒ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA FIRM MAP 48209C0369F (9/2/2005)

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

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

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

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

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

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

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

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

22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.

23. ☒ Areas of soil disturbance and areas which will not be disturbed.

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

25. ☒ Locations where soil stabilization practices are expected to occur.

26. ☒ Surface waters (including wetlands).

    ☐ N/A

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

    ☐ There will be no discharges to surface water or sensitive features.

28. ☒ Legal boundaries of the site are shown.

Administrative Information

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

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

TCEQ-0584

Attachment A – Factors Affecting 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

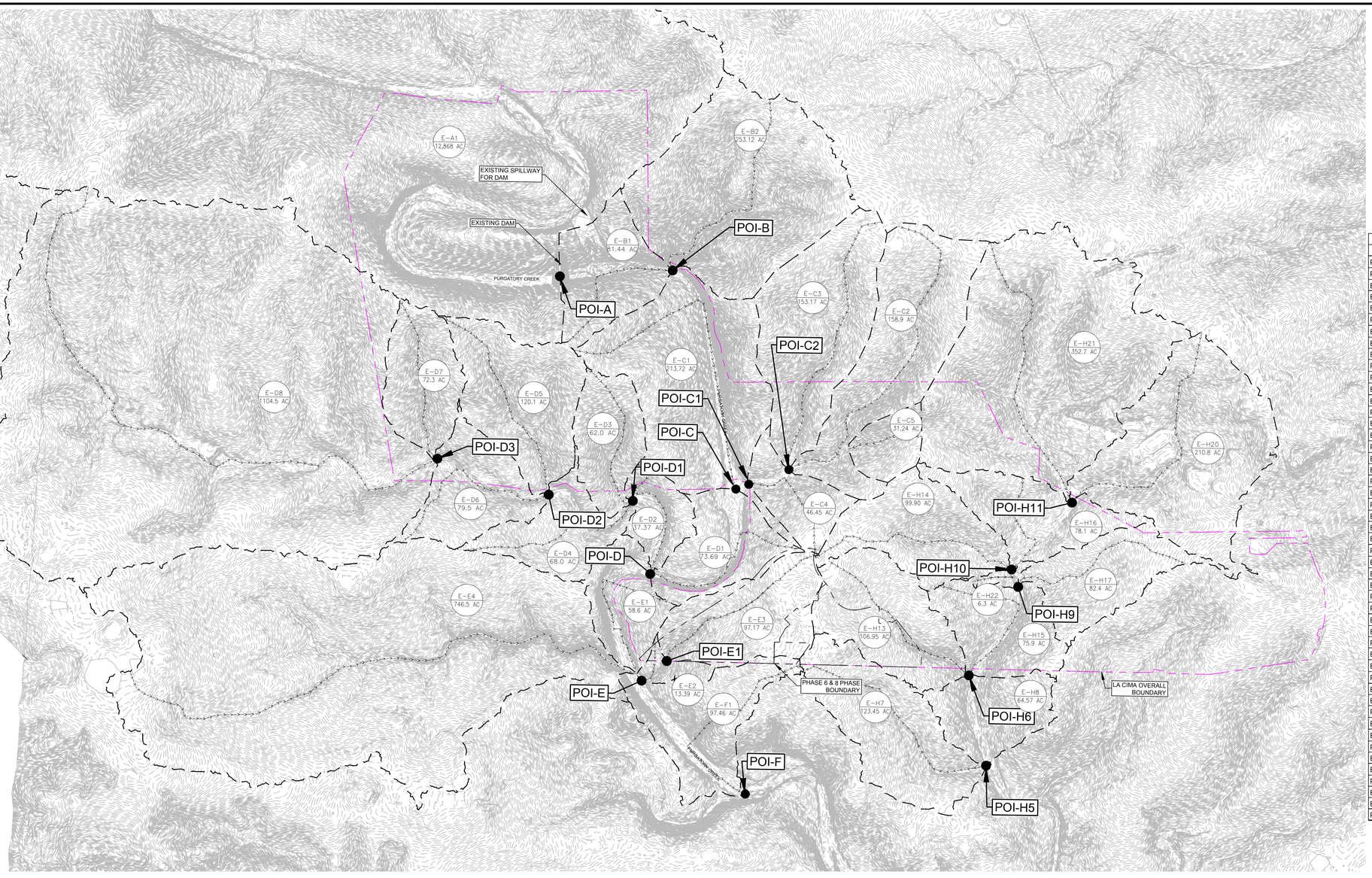
Attachment B – Volume and Character of Storm Water

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



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SCALE: 1 INCH = 1000 FT

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	2140	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	0.02	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	0.12	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	0.01	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	0.12	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	0.10	117	254	363	573.3
POI-H5	1201.07	1.88	1821.1	3911.3	5581.1	8786.8

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 CONTOUR
- PROPOSED MINOR CONTOUR
- EXISTING DRAINAGE AREA
- TIME OF CONCENTRATION
- XX / XX.XX DRAINAGE AREA IDENTIFIER
- POI-B DETENTION STUDY-POINT OF ANALYSIS

EXHIBIT A

OVERALL EXISTING DRAINAGE AREA MAP
LA CIMA PHASE SUBDIVISION

Bowman

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TBPE Firm Registration No. F-14309

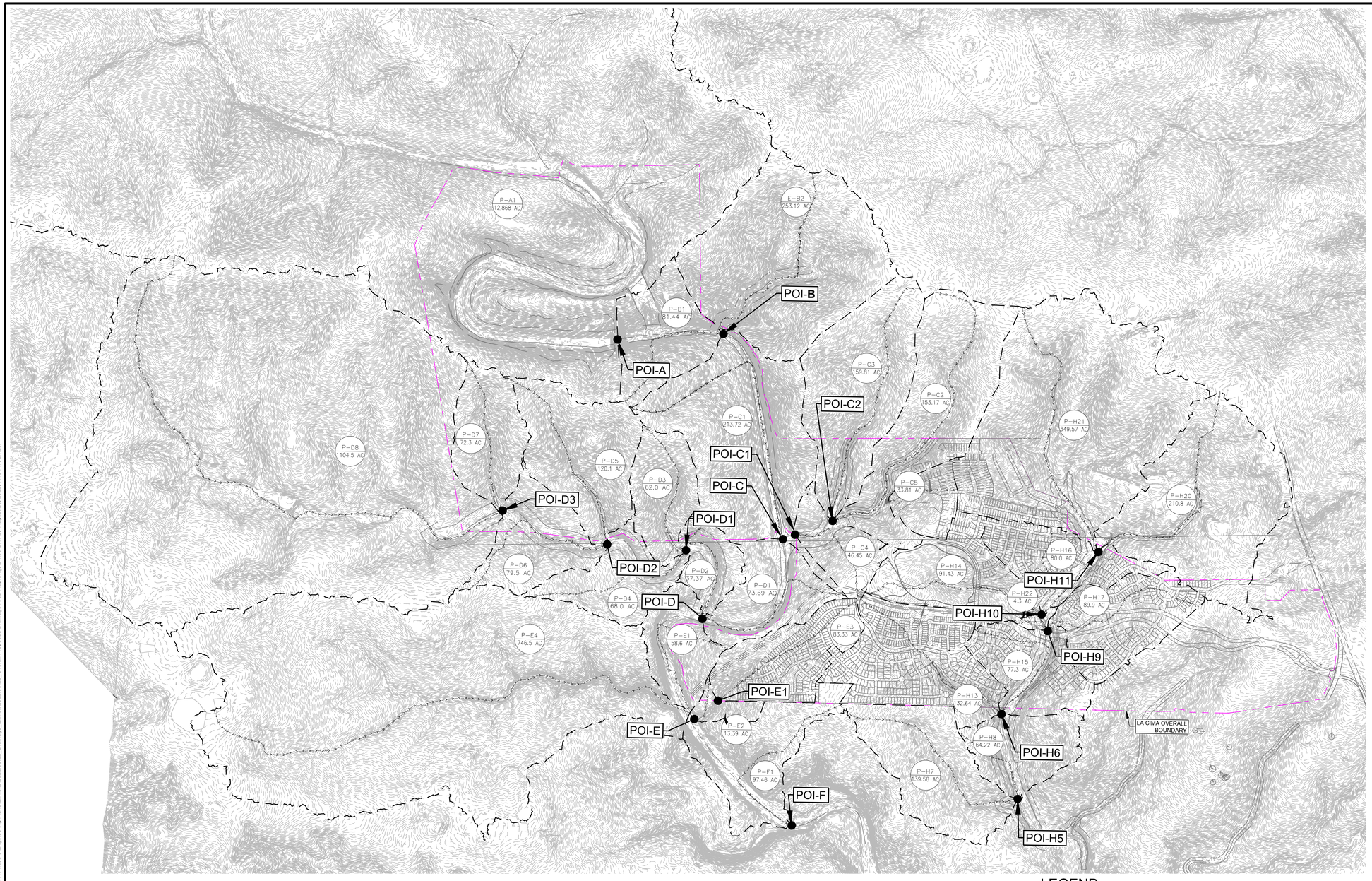
THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW, MARK-UP, AND/OR DRAFTING UNDER THE AUTHORITY OF NICHOLAS G. KEHL, P.E. #104450 ON AUGUST 25, 2022. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

August 25, 2022

SHEET 1 OF 2

PRELIMINARY NOT FOR CONSTRUCTION

P:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 6\Engineering Plans\Exhibits\2022.08.22_Drainage_Exhibit\2022.08.22_Overall Existing Drainage Area Map.dwg, 24x36 SHT 2, August 25, 2022, 6:12 PM, amast



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SCALE: 1 INCH = 1000 FT

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	20.11	385.1	1168.8	6813.2	21111.4
POI-A	12868	20.11	385.1	1168.8	6813.2	21111.4
P-A1	12868	20.11	6771.3	14605.6	20891.8	33025.1
P-B2	253.12	0.40	441.9	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	918.1
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	629.1
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	167.4	356.5	507.2	795.8
POI-F	16426.56	25.67	4712.3	10036.5	14292.1	23048.9
POI-E1	83.33	0.13	123.9	234.5	321.9	490
P-E1	58.60	0.09	91.8	196.5	279.8	439.7
P-E2	13.39	0.02	21.5	51	75.3	122.6
POI-E	16329.10	25.52	4588.5	9763.8	13894.1	22999.5
P-H21	349.57	0.55	621.3	1268.7	1784.9	2777.1
P-H20	210.80	0.33	351.8	729	1025.7	1593.3
POI-H11	560.37	0.88	969	1991.8	2802.7	4356.7
P-H14	91.43	0.14	166.5	323.9	447.2	683.1
P-H16	80.00	0.13	206.7	358.6	477.3	705.3
POI-H10	731.80	1.15	1338.4	2669.5	3721.3	5737.3
Regional Detention Pond CP	731.80	1.15	561.9	721.4	2015	5033.6
P-H17	89.90	0.14	171	328.7	453	691.1
P-H22	4.30	0.01	13.7	27.2	37.9	58.4
POI-H9	826.00	1.30	687	989.2	2295.7	5700.7
P-H13	132.64	0.20	301.1	541.5	767.3	1149.4
P-H15	77.30	0.12	142.5	283.4	395.6	611.4
POI-H6	1035.94	1.62	1080.8	1772.9	2849.7	7126.7
P-H7	139.58	0.18	181.4	402.7	709.5	1127.8
P-H8	64.22	0.10	97	211.5	302.9	478.6
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
Develped	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*

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 CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED DRAINAGE AREA
- TIME OF CONCENTRATION
- XX / XX.XX DRAINAGE AREA IDENTIFIER
- POI-B DETENTION STUDY-POINT OF ANALYSIS

EXHIBIT B

OVERALL PROPOSED DRAINAGE AREA MAP
LA CIMA PHASE SUBDIVISION

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.

Bowman

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TBPE Firm Registration No. F-14309

August 25, 2022

SHEET 2 OF 2

PRELIMINARY NOT FOR CONSTRUCTION

P-005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 6\Engineering Plans\Exhibits\2022.08.22_Drainage_Exhibit\2022.08.22_Overall Proposed Drainage Area Map.dwg, 24x36 SHT 2, August 25, 2022, 7:19 PM, amast

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.

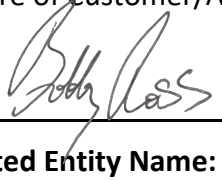
Signature

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: Bobby Ross

Date: 11/1/2024

Signature of Customer/Agent:



Regulated Entity Name: LA CIMA PHASE 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.

☐ Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.

☐ Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.

☒ Fuels and hazardous substances will not be stored on the site.

2. ☒ **Attachment A - Spill Response Actions**. A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.

3. ☒ Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.

4. ☒ **Attachment B - Potential Sources of Contamination**. A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

5. ☒ **Attachment C - Sequence of Major Activities**. A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.

   ☐ For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.

   ☒ For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.

6. ☒ Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: 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.

☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.

11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations**. Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.

☒ N/A

12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.

13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.

14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).

15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.

16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

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

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

18. ☒ Records must be kept at the site of the dates when major grading activities occur, the dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

19. ☒ Stabilization practices must be initiated as soon as practicable where construction activities have temporarily or permanently ceased.

Administrative Information

20. ☒ All structural controls will be inspected and maintained according to the submitted and approved operation and maintenance plan for the project.

21. ☒ If any geologic or manmade features, such as caves, faults, sinkholes, etc., are discovered, all regulated activities near the feature will be immediately suspended. The appropriate TCEQ Regional Office shall be immediately notified. Regulated activities must cease and not continue until the TCEQ has reviewed and approved the methods proposed to protect the aquifer from any adverse impacts.

22. ☒ Silt fences, diversion berms, and other temporary erosion and sediment controls will be constructed and maintained as appropriate to prevent pollutants from entering sensitive features discovered during construction.

Attachment A – 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 spread widely.

(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.

(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.

(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.

(3) Notification should first be made by telephone and followed up with a written report.

(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.

(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at : http://www.tceq.texas.gov/response/

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the 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 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:

- Submit written notice of construction to TCEQ regional office at least 48 hours prior to the start of any regulated activities.
- Install Temporary BMPs
- Clearing and grubbing of vegetation
- Removal of existing pavement

Subdivision Construction (Approximately 33.57 ac. to be disturbed):

- Excavate for roadway improvements
- Utility trenching and installation, including water, wastewater, and storm sewers.
- Final grading in right-of-ways
- Grading for Water quality ponds
- Install Paving/Infrastructure
- Revegetate all disturbed areas

Attachment D – Temporary Best Management Practices and Measures

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) installation of inlet protection, b) the erection of silt fences along the downgradient boundary of the construction activities, c) installation of rock berms with silt fence covering downgradient from areas of concentrated stormwater flow, d) installation of stabilized construction entrances to reduce the dispersion of sediment from the site, and e) 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 staging areas
- 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) inspection and maintenance of inlet protection, (3) storage areas for evidence of leakage from the exposed stored materials, (4) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (5) vehicle exit point for evidence of off-site sediment tracking, (6) vehicle storage areas for signs of leaking equipment or spills, and (7) concrete truck rinse-out pit for signs of potential failure. Deficiencies noted during the inspection will be corrected and documented within seven (8) calendar days following the inspection or before the next anticipated storm event if practicable.

SWPPP Inspection Report

Project Name:_____ **Date of Inspection:** _____

Inspection Frequency: (Every 7 Days, 14 Days, or Post Rain)_____

Post Significant Rainfall: N/A / Rainfall Amount:_____

Is inspector qualified to perform inspections? Yes

Are inspector qualifications present in SWPPP? Yes

Was 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 in compliance during the inspection.

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 all terms are acceptable and the project site is in compliance with SWPPP.

_____ _____

Inspector's Name Inspector's Signature

_____ _____

Name of Owner/Operator (Firm) Date

SWPPP Inspection Report

Project Milestone Dates

Date when major site grading activities begin:

Construction Activity	Date

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

Construction Activity	Date

Dates when stabilization measures are initiated:

Stabilization Activity	Date

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 l be re-disturbed 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.	**NO**
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.

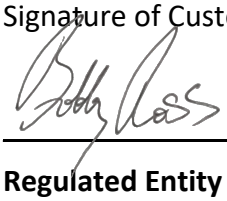
Signature

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: Bobby Ross

Date: 11/1/2024

Signature of Customer/Agent



Regulated Entity Name: LA CIMA PHASE 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.

   ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.
   ☒ The site will be used for low density single-family residential development but has more than 20% impervious cover.
   ☐ The site will not be used for low density single-family residential development.

5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

   ☐ **Attachment A - 20% or Less Impervious Cover Waiver**. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
   ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
   ☒ The site will not be used for multi-family residential developments, schools, or small business sites.

6. ☒ **Attachment B - BMPs for Upgradient Stormwater**.

☐ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.

☒ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.

☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.

7. ☒ **Attachment C - BMPs for On-site Stormwater**.

☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.

☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.

8. ☒ **Attachment D - BMPs for Surface Streams**. A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.

☐ N/A

9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.

☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.

☐ **Attachment E - Request to Seal Features**. A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.

10. ☒ **Attachment F - Construction Plans**. All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:

☒ Design calculations (TSS removal calculations)

☒ TCEQ construction notes

☒ All geologic features

☒ All proposed structural BMP(s) plans and specifications

☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan**. A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:

    ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
    ☒ Signed by the owner or responsible party
    ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
    ☒ A discussion of record keeping procedures

    ☐ N/A

12. ☐ **Attachment H - Pilot-Scale Field Testing Plan**. Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.

    ☒ N/A

13. ☒ **Attachment I -Measures for Minimizing Surface Stream Contamination**. A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.

    ☐ N/A

Responsibility for Maintenance of Permanent BMP(s)

Responsibility for maintenance of best management practices and measures after construction is complete.

14. ☒ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.

    ☐ N/A

15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.

    ☐ N/A

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

N/A

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 8, will be treated by 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 is 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

N/A

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

LA CIMA PHASE 8

SAN MARCOS, HAY COUNTY, TEXAS
PERMIT NO. 2024-XXXXX
WPP-PH2 PERMIT NO. XXXXXX

PROJECT ADDRESS:

THIS PROJECT IS LOCATED SOUTH OF CENTRAL PARK LOOP, EAST OF CENTERPOINT ROAD WITHIN THE LA CIMA SUBDIVISION IN SAN MARCOS, HAYS COUNTY, TEXAS.

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:

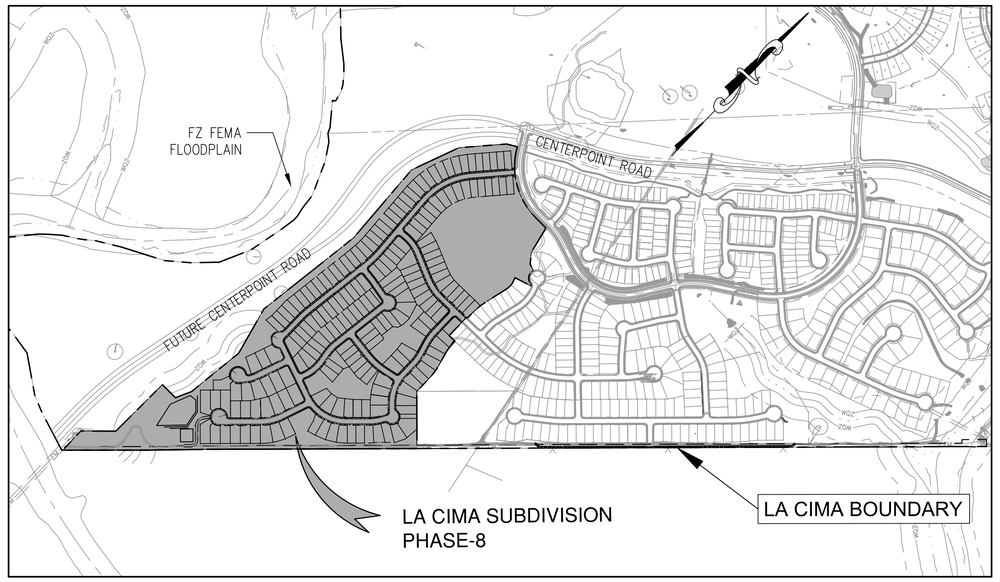
THIS PROJECT IS IN THE EDWARDS AQUIFER RECHARGE ZONE.

TCEQ WPAP AND SCS APPROVAL:

THE WPAP AND SCS APPLICATION FOR THIS SITE IS CURRENTLY UNDER REVIEW WITH TCEQ.. PLEASE REFERENCE EDWARDS AQUIFER PROTECTION PROGRAM ID NO. #### & RN ####.

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 THE WORK OF THE DESIGN ENGINEER.
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.
8. CLEARING OF WOODY VEGETATION IN AREAS OF GOLDEN-CHEEKED WARBLER HABITAT SHOULD BE COMPLETED DURING THE MONTHS FROM AUGUST THROUGH FEBRUARY, FROM MARCH 1 TO JULY 31, SUCH WORK MUST CEASE SINCE GOLDEN-CHEEKED WARBLERS MAY HAVE RETURNED TO THE AREA TO NEST. CLEARING AND CONSTRUCTION IS NOT AUTHORIZED BETWEEN FEBRUARY 28 AND JULY 31 WITH THE FOLLOWING EXCEPTIONS:
   - A) A BIRD-MONITORING SURVEY CONDUCTED DURING THE BREEDING SEASON USING U.S FISH AND WILDLIFE SERVICE (USFWS) PROTOCOLS DEMONSTRATES THAT NO BIRDS ARE LOCATED WITHIN 300 FEET OF THE PROJECT BOUNDS (THE SURVEY AND THE PLANNED ACTIVITY MUST TAKE PLACE IN THE SAME YEAR AND ARE ONLY VALID FOR THAT SUBJECT YEAR
   - B) CONSTRUCTION ACTIVITIES, BUT NOT CLEARING OF ANY VEGETATION, THAT BEGAN DURING THE NON BREEDING SEASON AND ARE PERFORMED IN A REASONABLY PROMPT AND EXPEDITIOUS MANNER MAY CONTINUE,
   - C) CONSTRUCTION ACTIVITIES THAT DO NOT INVOLVE THE REMOVAL OF POTENTIAL HABITAT MAY CONTINUE IF THE ACTIVITY IS MORE THAN 300 FEET AWAY FROM POTENTIAL HABITAT. THE SURVEY AND PLANNED ACTIVITY MUST TAKE PLACE IN THE SAME YEAR AND ARE ONLY VALID FOR THAT SUBJECT YEAR.



LOCATION MAP
N.T.S

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.

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

Sheet List Table

Sheet Number	Sheet Title
1	COVER SHEET
2	FINAL PLAT
3	GENERAL NOTES
4	GENERAL NOTES
5	SWPPP
6	TREE LIST
7	EXISTING CONDITIONS AND DEMO PLAN
8	OVERALL PROPOSED CONDITIONS PLAN
9	EROSION & SEDIMENT CONTROL PLAN
10	GRADING PLAN (1 OF 3)
11	GRADING PLAN (2 OF 3)
12	GRADING PLAN (3 OF 3)
~~13~~	~~BUNDLEFLOWER WAY PLAN & PROFILE~~
~~14~~	~~NIGHTSHADE ROAD PLAN & PROFILE (1 OF 5)~~
~~15~~	~~NIGHTSHADE ROAD PLAN & PROFILE (2 OF 5)~~
~~16~~	~~NIGHTSHADE ROAD PLAN & PROFILE (3 OF 5)~~
~~17~~	~~NIGHTSHADE ROAD PLAN & PROFILE (4 OF 5)~~
~~18~~	~~NIGHTSHADE ROAD PLAN & PROFILE (5 OF 5)~~
~~19~~	~~DALEA TERRACE PLAN & PROFILE~~
~~20~~	~~GERMANDER BEND PLAN & PROFILE~~
~~21~~	~~PINYON PINE TRAIL PLAN & PROFILE~~
~~22~~	~~PAWPAW DRIVE PLAN & PROFILE (1 OF 2)~~
~~23~~	~~PAWPAW DRIVE PLAN & PROFILE (2 OF 2)~~
~~24~~	~~INTERSECTION PLAN (1 OF 3)~~
~~25~~	~~INTERSECTION PLAN (2 OF 3)~~
~~26~~	~~INTERSECTION PLAN (3 OF 3)~~
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29	EXISTING WATERSHED MAP
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37	STORM SEWER LN B, LAT A10-A11 PLAN & PROFILE
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39	STORM SEWER LAT C1-C4 PLAN & PROFILE
40	STORM SEWER LN D PLAN & PROFILE
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52	WASTEWATER LINE A PLAN & PROFILE (5 OF 5)
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77	WASTEWATER DETAILS (1 OF 2)
78	WASTEWATER DETAILS (2 OF 2)
79	WATER DETAILS (1 OF 2)
80	WATER DETAILS (2 OF 2)
81	GENERAL UTILITY DETAILS

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.
STE. 160
Austin, Texas 78735
[Tel] 512.583.2600
www.doucetengineers.com

SUBMITTED FOR APPROVAL BY:

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

BOBBY ROSS, P.E. (#149399)

11/01/2024
DATE

Bowman
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TBPE Firm Registration No. F-14309

LA CIMA - SFR PHASE 8

005856 - Lazy Oaks Ranch\005856-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005856-01-11a_COVR.dwg, 1 COVER SHEET, October 31, 2024, 1:42 PM

FINAL PLAT PENDING

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_PLAT.dwg, FINAL PLAT, October 31, 2024, 1:42 PM, mcarrion

REVISIONS

REVISION	DESCRIPTION	DATE
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Bowman
TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

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FINAL PLAT

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
2 OF 81

FOR PERMIT

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 COSM.

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 times.

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

1. 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 site.

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 required prior to construction. Provide a copy to the COSM upon request.

5. Inspections - Inspections can be scheduled with the respective divisions by contacting them at:

Building Inspections	www.mypermitnow.org
Fire Prevention/Inspections	www.mypermitnow.org
Site Final Inspections	sitefinal@sanmarcostx.gov
Engineering Inspections	512-393-8130
PICP Inspections	512-393-8130
Code Compliance	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. 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.

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.

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 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.

2. 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)	811
Police - Fire - EMS	911
TX DOT	512-353-1061
Century Telephone	512-754-5223
Southwestern Bell	1-800-464-7928
Gas Company	1-800-427-7142
Spectrum	855-578-5500
Grande	800-218-5725
University	512-245-2108 and/or 245-2508
Pedernales Electric	888-554-4732
Bluebonnet Electric	800-949-4414
SM Electric Utilities	512-393-8313
SM Water/WW Utilities	512-393-8010

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

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.

9. 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 24-hour 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.

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
Theoretical Density (Rice Method)	Per 500 Tons or Day
Temperature - During Lay-Down	Continuous as Needed
Thickness - In Place	Per 300 LF Street
% Air Voids - In Place	Per 300 LF Street
% Theoretical Density - In Place	Per 300 LF Street

CITY OF SAN MARCOS TESTING SCHEDULE	
Description:	*Rate:
Concrete: (Unconfined Compression, 7, 14 & 28 Day)	
Curb and Gutter	Per 1000 LF C&G
Sidewalk	Per 4000 SF
Driveway	Per 2500 SF
Curb Inlets	Per 10 Inlets
Air, Slump & Compression - In Place	Per exposed structure
Slump & Compression -In Place	Per underground structure

* The above testing rates are only anticipated guidelines. The COSM reserves the right to require at owner's expense additional testing at the COSM's discretion.
** Testing must be conducted during backfill operations
*** Density will be per COSM details.

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 site.

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 control and tree protection measures are in place.

3. All construction-related vehicle parking and activity (including employee personal vehicles and delivery vehicles) must be located within the Limits of Construction, with appropriate controls, or designated parking/access on APPROVED surfaces outside the Limits of Construction.

4. Certain erosion control measures identified by the COSM are to be employed to prevent erosion; however, these are only minimum standards. See construction details on Design & Construction Guide webpage, located under Engineering & Capital Improvements.

5. In the event of unusual site conditions, proximity to any water bodies and/or weather related events, more stringent requirements may be necessary (on-site or off) to maintain erosion and sedimentation control.

6. The owner or their designee is responsible for all changes, upgrades and continued maintenance of all erosion control and storm water management features at all times.

7. Erosion control measures and storm water management practices will be inspected by the COSM prior to and during the construction process:

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 driveway and sidewalk section.

Planning/Development Services is responsible for the inspection of all residential and commercial construction.

8. All designs to prevent the erosion of soil and the transport of sediment and debris from the construction site, or surrounding areas disturbed by construction shall, be maintained by the contractor during construction.

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 sweeping may be necessary, including the street center/turn lane and gutters. During muddy conditions, clean vehicle tires before leaving the site and/or remove mud, dust and dirt from public streets regularly 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 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 construction activities.

10. All storm drain inlets within 200 feet of any permitted construction area must be protected per City detail (refer to #4 above).

11. Dewatering operations must use SWPPP-specified methods only. If such methods are only general or not applicable, pump from the top of the pool of water (rather than the bottom) and discharge to a vegetated, upland area (away from waterbodies or drainage) or use another type of filtration prior to discharge EVERY TIME. Refer to the EPA 2017 Construction General Permit, Section 2.4, as applicable.

12. The contractor or owner must have a designated person responsible for continuous (24 hours a day/7 days a week) monitoring of erosion control measures to ensure compliance with all federal, state, and local laws and regulations.

13. Do NOT wash, sweep or otherwise cause construction soil or debris to be deposited into any storm water drainage or conveyance system.

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. Projects with disturbed area of 5+ acres must submit a signed, 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. COSM is the MS4 operator; these submissions to the COSM meet 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.

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 the MS4.

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 General Permit and shall be designed and signed by a licensed professional engineer (Texas) with competence in this area as 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 to the City of San Marcos upon request.

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

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

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.

3. 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 COSM. See detail.

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.

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

10. Accepted Utility Line Types (verify use with Inspector)

Use	Pipe Material	[1] Pipe Sizes	[2] 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
[3] Distribution lines	PVC	8" or 12"	WW-308 or WW-308A
[3] 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
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.

Note 2
The COSM Standard Products List (SPL) can be found on the engineering webpage.

Note 3
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 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.

14. COSM to be given 48-hour notice (required) prior to all testing of utility lines. COSM inspection required for all utility lines.

Public

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.

Private

- 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 installation.

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 S115-17-SM. Finished elevation is 18" to 24" 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.

19. Fire hydrants are required to have a clear area of 5 feet. No plants, trees or obstacles allowed except as impact protection outline by Fire Code

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 marked.

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 connection.

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 measurement.

26. Fire hydrants must be operational prior to beginning combustible construction.

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

2. Inspection

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 moredetails.

- 4-psi minimum pressure test on lines

- 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, 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

- Force mains; 5 psi over working pressure with minimum of 50 psi, for 1 hour

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

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 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

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

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%.

5. All sidewalks and driveways shall meet applicable TAS standards.

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

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 connection.

B. SMEU must receive notification from the COSM Electrical Inspector that the Customer's electrical installation has passed final electrical inspections before electric service is connected by SMEU personnel.

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 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.

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 requirement.

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.

Bowman
© 2021 Bowman Consulting Group, Ltd.
TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS

REVISION	DESCRIPTION	DATE
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GENERAL NOTES

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
3 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_GEN.dwg, 3 GENERAL NOTES, October 31, 2024 - 1:42 PM, mcarrion

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

EDWARDS AQUIFER PROTECTION PROGRAM CONSTRUCTION NOTES - LEGAL DISCLAIMER

THE FOLLOWING/LISTED "CONSTRUCTION NOTES" ARE INTENDED TO BE ADVISORY IN NATURE ONLY AND DO NOT CONSTITUTE AN APPROVAL OR CONDITIONAL APPROVAL BY THE EXECUTIVE DIRECTOR, NOR DO THEY CONSTITUTE A COMPREHENSIVE LISTING OF RULES OR CONDITIONS TO BE FOLLOWED DURING CONSTRUCTION. FURTHER ACTIONS MAY BE REQUIRED TO ACHIEVE COMPLIANCE WITH TCEQ REGULATIONS FOUND IN TITLE 30, TEXAS ADMINISTRATIVE CODE, CHAPTERS 213 AND 217, AS WELL AS LOCAL ORDINANCES AND REGULATIONS PROVIDING FOR THE PROTECTION OF WATER QUALITY. ADDITIONALLY, NOTHING CONTAINED IN THE FOLLOWING/LISTED "CONSTRUCTION NOTES" RESTRICTS THE POWERS OF THE EXECUTIVE DIRECTOR, THE COMMISSION OR ANY OTHER GOVERNMENTAL ENTITY TO PREVENT, CORRECT, OR CURTAIL ACTIVITIES THAT RESULT OR MAY RESULT IN POLLUTION OF THE EDWARDS AQUIFER OR HYDROLOGICALLY CONNECTED SURFACE WATERS. THE HOLDER OF ANY EDWARDS AQUIFER PROTECTION PLAN CONTAINING "CONSTRUCTION NOTES" IS STILL RESPONSIBLE FOR COMPLIANCE WITH TITLE 30, TEXAS ADMINISTRATIVE CODE, CHAPTERS 213 OR ANY OTHER APPLICABLE TCEQ REGULATION, AS WELL AS ALL CONDITIONS OF AN EDWARDS AQUIFER PROTECTION PLAN THROUGH ALL PHASES OF PLAN IMPLEMENTATION. FAILURE TO COMPLY WITH ANY CONDITION OF THE EXECUTIVE DIRECTOR'S APPROVAL, WHETHER OR NOT IN CONTRADICTION OF ANY "CONSTRUCTION NOTES," IS A VIOLATION OF TCEQ REGULATIONS AND ANY VIOLATION IS SUBJECT TO ADMINISTRATIVE RULES, ORDERS, AND PENALTIES AS PROVIDED UNDER TITLE 30, TEXAS ADMINISTRATIVE CODE § 213.10 (RELATING TO ENFORCEMENT). SUCH VIOLATIONS MAY ALSO BE SUBJECT TO CIVIL PENALTIES AND INJUNCTION. THE FOLLOWING/LISTED "CONSTRUCTION NOTES" IN NO WAY REPRESENT AN APPROVED EXCEPTION BY THE EXECUTIVE DIRECTOR TO ANY PART OF TITLE 30 TEXAS ADMINISTRATIVE CODE, CHAPTERS 213 AND 217, OR ANY OTHER TCEQ APPLICABLE REGULATION.

1. THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.
3. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
4. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED SCS APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF AN SCS APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.
7. SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY WILL BE PROTECTED FROM INUNDATION AND STREAM VELOCITIES WHICH COULD CAUSE EROSION AND SCOURING OF BACKFILL. THE TRENCH MUST BE CAPPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, OR THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.
8. BLASTING PROCEDURES FOR PROTECTION OF EXISTING SEWER LINES AND OTHER UTILITIES WILL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION CRITERIA. SAND IS NOT ALLOWED AS BEDDING OR BACKFILL IN TRENCHES THAT HAVE BEEN BLASTED. IF ANY EXISTING SEWER LINES ARE DAMAGED, THE LINES MUST BE REPAIRED AND RETESTED.
9. ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATERTIGHT SIZE ON SIZE RESILIENT CONNECTORS ALLOWING FOR DIFFERENTIAL SETTLEMENT. IF MANHOLES ARE CONSTRUCTED WITHIN THE 100-YEAR FLOODPLAIN, THE COVER MUST HAVE A GASKET AND BE BOLTED TO THE RING. WHERE GASKETED MANHOLE COVERS ARE REQUIRED FOR MORE THAN THREE MANHOLES IN SEQUENCE OR FOR MORE THAN 1500 FEET, ALTERNATE MEANS OF VENTING WILL BE PROVIDED. BRICKS ARE NOT AN ACCEPTABLE CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.

   THE DIAMETER OF THE MANHOLES MUST BE A MINIMUM OF FOUR FEET AND THE MANHOLE FOR ENTRY MUST HAVE A MINIMUM CLEAR OPENING DIAMETER OF 30 INCHES. THESE DIMENSIONS AND OTHER DETAILS SHOWING COMPLIANCE WITH THE COMMISSION'S RULES CONCERNING MANHOLES AND SEWER LINE/MANHOLE INVERTS DESCRIBED IN 30 TAC §217.55 ARE INCLUDED ON PLAN SHEET ___ OF ___.

   IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.
10. WHERE WATER LINES AND NEW SEWER LINE ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, OR WATER LINES NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).
11. WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER: _____.

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

    SPECIFIC CARE MUST BE TAKEN TO ENSURE THAT THE JOINT IS PLACED IN THE CENTER OF THE TRENCH AND PROPERLY BEDDED IN ACCORDANCE WITH 30 TAC §217.54.
12. NEW SEWAGE COLLECTION SYSTEM LINES MUST BE CONSTRUCTED WITH STUB OUTS FOR THE CONNECTION OF ANTICIPATED EXTENSIONS. THE LOCATION OF SUCH STUB OUTS MUST BE MARKED ON THE GROUND SUCH THAT THEIR LOCATION CAN BE EASILY DETERMINED AT THE TIME OF CONNECTION OF THE EXTENSIONS. SUCH STUB OUTS MUST BE MANUFACTURED WYES OR TEES THAT ARE COMPATIBLE IN SIZE AND MATERIAL WITH BOTH THE SEWER LINE AND THE EXTENSION. AT THE TIME OF ORIGINAL CONSTRUCTION, NEW STUB-OUTS MUST BE CONSTRUCTED SUFFICIENTLY TO EXTEND BEYOND THE END OF THE STREET PAVEMENT. ALL STUB-OUTS MUST BE SEALED WITH A MANUFACTURED CAP TO PREVENT LEAKAGE. EXTENSIONS THAT WERE NOT ANTICIPATED AT THE TIME OF ORIGINAL CONSTRUCTION OR THAT ARE TO BE CONNECTED TO AN EXISTING SEWER LINE NOT FURNISHED WITH STUB OUTS MUST BE CONNECTED USING A MANUFACTURED SADDLE AND IN ACCORDANCE WITH ACCEPTED PLUMBING TECHNIQUES.

    IF NO STUB-OUT IS PRESENT AN ALTERNATE METHOD OF JOINING LATERALS IS SHOWN IN THE DETAIL ON PLAN SHEET __ OF __ (FOR POTENTIAL FUTURE LATERALS).

    THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS
    ON PLAN SHEET ___ OF ___ AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET ___ OF ___.
13. TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC §217.54. THE BEDDING AND BACKFILL FOR FLEXIBLE PIPE MUST COMPLY WITH THE STANDARDS OF ASTM D-2321, CLASSES IA, IB, II OR III. RIGID PIPE BEDDING MUST COMPLY WITH THE REQUIREMENTS OF ASTM C 12 (ANSI A 106.2) CLASSES A, B OR C.
14. SEWER LINES MUST BE TESTED FROM MANHOLE TO MANHOLE. WHEN A NEW SEWER LINE IS CONNECTED TO AN EXISTING STUB OR CLEAN-OUT, IT MUST BE TESTED FROM EXISTING MANHOLE TO NEW MANHOLE. IF A STUB OR CLEAN-OUT IS USED AT THE END OF THE PROPOSED SEWER LINE, NO PRIVATE SERVICE ATTACHMENTS MAY BE CONNECTED BETWEEN THE LAST MANHOLE AND THE CLEANOUT UNLESS IT CAN BE CERTIFIED AS CONFORMING WITH THE PROVISIONS OF 30 TAC §213.5(C)(3)(E).
15. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.57. THE ENGINEER MUST RETAIN COPIES OF ALL TEST RESULTS WHICH MUST BE MADE AVAILABLE TO THE EXECUTIVE DIRECTOR UPON REQUEST. THE ENGINEER MUST CERTIFY IN WRITING THAT ALL WASTEWATER LINES HAVE PASSED ALL REQUIRED TESTING TO THE APPROPRIATE REGIONAL OFFICE WITHIN 30 DAYS OF TEST COMPLETION AND PRIOR TO USE OF THE NEW COLLECTION SYSTEM. TESTING METHOD WILL BE:

    (a) FOR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR A LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:
    (1) *LOW PRESSURE AIR TEST.*
    (A) A LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-828, ASTM 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.
    (i) A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
    (ii) ONCE THE PRESSURE IS STABILIZED, THE MINIMUM TIME ALLOWABLE FOR THE PRESSURE TO DROP FROM 3.5 PSI GAUGE TO 2.5 PSI GAUGE IS COMPUTED FROM THE FOLLOWING EQUATION:

    Equation C.3 $$T = \frac{(0.085 \times D \times K)}{Q}$$

    Where:

    T = time for pressure to drop 1.0 pound per square inch gauge in seconds
    K = 0.000419 X D X L, but not less than 1.0
    D = average inside pipe diameter in inches
    L = length of line of same size being tested, in feet
    Q = rate of loss, 0.0015 cubic feet per minute per square foot internal

    (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/foot)*
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

    (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 LEVEL.
    (C) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE, OR AT LEAST TWO FEET ABOVE EXISTING GROUNDWATER LEVEL, WHICHEVER IS GREATER.
    (D) FOR CONSTRUCTION WITHIN A 25-YEAR FLOOD PLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARAGRAPH (C) OF THIS PARAGRAPH.
    (E) IF THE QUANTITY OF INFILTRATION OR EXFILTRATION EXCEEDS THE MAXIMUM QUANTITY SPECIFIED, AN OWNER SHALL UNDERTAKE REMEDIAL ACTION IN ORDER TO REDUCE THE INFILTRATION OR EXFILTRATION TO AN AMOUNT WITHIN THE LIMITS SPECIFIED. AN OWNER SHALL RETEST A PIPE FOLLOWING A REMEDIATION ACTION.

    (b) IF A GRAVITY COLLECTION PIPE IS COMPOSED OF FLEXIBLE PIPE, DEFLECTION TESTING IS ALSO REQUIRED. THE FOLLOWING PROCEDURES MUST BE FOLLOWED:
    (1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.
    (A) *MANDREL SIZING.*
    (i) A RIGID MANDREL MUST HAVE AN OUTSIDE DIAMETER (OD) NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER (ID) OR AVERAGE ID OF A PIPE, AS SPECIFIED IN THE APPROPRIATE STANDARD BY THE ASTMS, AMERICAN WATER WORKS ASSOCIATION, UNI-BELL, OR AMERICAN NATIONAL STANDARDS INSTITUTE, OR ANY RELATED APPENDIX.
    (ii) IF A MANDREL SIZING DIAMETER IS NOT SPECIFIED IN THE APPROPRIATE STANDARD, THE MANDREL MUST HAVE AN OD EQUAL TO 95% OF THE ID OF A PIPE. IN THIS CASE, THE ID OF THE PIPE, FOR THE PURPOSE OF DETERMINING THE OD OF THE MANDREL, MUST EQUAL BE THE AVERAGE OUTSIDE DIAMETER MINUS TWO MINIMUM WALL THICKNESSES FOR OD CONTROLLED PIPE AND THE AVERAGE INSIDE DIAMETER FOR ID CONTROLLED PIPE.
    (iii) ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
    (B) *MANDREL DESIGN.*
    (i) A RIGID MANDREL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED. (II) A MANDREL MUST HAVE NINE OR MORE ODD NUMBER OF RUNNERS OR LEGS.
    (iii) A BARREL SECTION LENGTH MUST EQUAL AT LEAST 75% OF THE INSIDE DIAMETER OF A PIPE.
    (iv) EACH SIZE MANDREL MUST USE A SEPARATE PROVING RING.
    (C) *METHOD OPTIONS.*
    (i) AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.
    (ii) A TEST MAY NOT USE TELEVISION INSPECTION AS A SUBSTITUTE FOR A DEFLECTION TEST.
    (iii) IF REQUESTED, THE EXECUTIVE DIRECTOR MAY APPROVE THE USE OF A DEFLECTOMETER OR A MANDREL WITH REMOVABLE LEGS OR RUNNERS ON A CASE-BY-CASE BASIS.
    (2) FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES AND GREATER, OTHER TEST METHODS MAY BE USED TO DETERMINE VERTICAL DEFLECTION.
    (3) A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2% DEFLECTION.
    (4) AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
    (5) GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
    (6) IF A PIPE SECTION FAILS A DEFLECTION TEST, AN OWNER SHALL CORRECT THE PROBLEM AND CONDUCT A SECOND TEST AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS.

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 ONE HOUR.
   (B) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
   (2) VACUUM TESTING.
   (A) TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
   (B) NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
   (C) STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
   (D) AN OWNER SHALL USE A MINIMUM 60 INCH/LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
   (E) A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
   (F) THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
   (G) A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
   (H) A MANHOLE PASSES THE TEST IF AFTER 2.0 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.

2. ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §213.5(C)(3)(I). AFTER INSTALLATION OF AND, PRIOR TO COVERING AND CONNECTING A PRIVATE SERVICE LATERAL TO AN EXISTING ORGANIZED SEWAGE COLLECTION SYSTEM, A TEXAS LICENSED PROFESSIONAL ENGINEER, TEXAS REGISTERED SANITARIAN, OR APPROPRIATE CITY INSPECTOR MUST VISUALLY INSPECT THE PRIVATE SERVICE LATERAL AND THE CONNECTION TO THE SEWAGE COLLECTION SYSTEM, AND CERTIFY THAT IT IS CONSTRUCTED IN CONFORMITY WITH THE APPLICABLE PROVISIONS OF THIS SECTION. THE OWNER OF THE COLLECTION SYSTEM MUST MAINTAIN SUCH CERTIFICATIONS FOR FIVE YEARS AND FORWARD COPIES TO THE APPROPRIATE REGIONAL OFFICE UPON REQUEST. CONNECTIONS MAY ONLY BE MADE TO AN APPROVED SEWAGE COLLECTION SYSTEM.

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

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

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 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√P)/148,000

    WHERE:

    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√P)/148,000

    WHERE:

    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

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

EDWARDS AQUIFER PROTECTION PROGRAM CONSTRUCTION NOTES – LEGAL DISCLAIMER

THE FOLLOWING/LISTED "CONSTRUCTION NOTES" ARE INTENDED TO BE ADVISORY IN NATURE ONLY AND DO NOT CONSTITUTE AN APPROVAL OR CONDITIONAL APPROVAL BY THE EXECUTIVE DIRECTOR (ED), NOR DO THEY CONSTITUTE A COMPREHENSIVE LISTING OF RULES OR CONDITIONS TO BE FOLLOWED DURING CONSTRUCTION. FURTHER ACTIONS MAY BE REQUIRED TO ACHIEVE COMPLIANCE WITH TCEQ REGULATIONS FOUND IN TITLE 30, TEXAS ADMINISTRATIVE CODE (TAC), CHAPTERS 213 AND 217, AS WELL AS LOCAL ORDINANCES AND REGULATIONS PROVIDING FOR THE PROTECTION OF WATER QUALITY. ADDITIONALLY, NOTHING CONTAINED IN THE FOLLOWING/LISTED "CONSTRUCTION NOTES" RESTRICTS THE POWERS OF THE ED, THE COMMISSION OR ANY OTHER GOVERNMENTAL ENTITY TO PREVENT, CORRECT, OR CURTAIL ACTIVITIES THAT RESULT OR MAY RESULT IN POLLUTION OF THE EDWARDS AQUIFER OR HYDROLOGICALLY CONNECTED SURFACE WATERS.

THE HOLDER OF ANY EDWARDS AQUIFER PROTECTION PLAN CONTAINING "CONSTRUCTION NOTES" IS STILL RESPONSIBLE FOR COMPLIANCE WITH TITLE 30, TAC, CHAPTERS 213 OR ANY OTHER APPLICABLE TCEQ REGULATION, AS WELL AS ALL CONDITIONS OF AN EDWARDS AQUIFER PROTECTION PLAN THROUGH ALL PHASES OF PLAN IMPLEMENTATION. FAILURE TO COMPLY WITH ANY CONDITION OF THE ED'S APPROVAL, WHETHER OR NOT IN CONTRADICTION OF ANY "CONSTRUCTION NOTES," IS A VIOLATION OF TCEQ REGULATIONS AND ANY VIOLATION IS SUBJECT TO ADMINISTRATIVE RULES, ORDERS, AND PENALTIES AS PROVIDED UNDER TITLE 30, TAC § 213.10 (RELATING TO ENFORCEMENT). SUCH VIOLATIONS MAY ALSO BE SUBJECT TO CIVIL PENALTIES AND INJUNCTION. THE FOLLOWING/LISTED "CONSTRUCTION NOTES" IN NO WAY REPRESENT AN APPROVED EXCEPTION BY THE ED TO ANY PART OF TITLE 30 TAC, CHAPTERS 213 AND 217, OR ANY OTHER TCEQ APPLICABLE REGULATION

1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.
2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.
3. IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.
4. NO TEMPORARY OR PERMANENT HAZARDOUS SUBSTANCE STORAGE TANK SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.
5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.
6. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.
7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN 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.
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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 DEVICES AS REQUIRED.
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 TCEQ.
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 REMOVED.
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 OF THE DEVICE.
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 PERMANENT VEGETATION IS ESTABLISHED.

C) ESTIMATE OF SITE AREA:
TOTAL SIZE: ± 79.65 AC
TOTAL DISTURBED AREA: ± 34.51 AC
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.

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
-DATES WHEN STABILIZATION MEASURES ARE INITIATED

THE SWPPP SHALL BE AMENDED WHEN:
-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:

BLUE GRAMA	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 PER 1000 SF.

   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) 512-457-8000	(TEL) 512-327-1180

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 ½ INCHES OR GREATER.

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

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 THE FOLLOWING:

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.

STRUCTURAL PRACTICES		STABILIZATION PRACTICES	
X	SILT FENCES	X	TEMPORARY VEGETATION
	HAY BALES	X	PERMANENT VEGETATION
X	ROCK BERMS		CELLULOSE FIBER MULCHING
	DIVERSION, INTERCEPTOR, OR PERIMETER DIKES		VEGETATIVE BUFFER STRIPS
	DIVERSION, INTERCEPTOR, OR PERIMETER SWALES	X	PROTECTION OF TREES
	DIVERSION DIKE AND SWALE COMBINATION		PROTECTION OF MATURE VEGETATION
	BRUSH BERMS		GEOTEXTILES
	CONCRETE FLUMES		SOD STABILIZATION
X	STABILIZED (ROCK) CONSTRUCTION ENTRANCES		
	SEDIMENT TRAPS		
	SEDIMENT BASINS		
X	STONE OUTLET STRUCTURES CURB AND GUTTERS		
X	STORM SEWERS		
	VELOCITY CONTROL DEVICES		
X	INLET PROTECTION		

811 Know what's below. 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.

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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SWPPP

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 5 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SWPPP.dwg, 8 SWPPP, October 31, 2024, 1:42 PM, mcarrion

La Cima Phase B Tree Mitigation Table

Tree Identifier	Species	Classification	Caliper (inches)								Total Caliper (inches)	Status (Phase Removed or Preserved)	Location	Mitigation (Caliper inches)
3659.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3660.00	LVO	Type 1 - Protected	17.00	34.00	12.00	10.00					34.00	Preserved	Outside ROW	
3661.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3662.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3663.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
3664.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3665.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
3666.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
3667.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3668.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3669.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3670.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3671.00	LVO	Type 1 - Protected	30.00	30.00	11.00	9.00					30.00	Preserved	Outside ROW	
3672.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
3673.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3674.00	LVO	Type 1 - Protected	13.00	26.00	9.00	8.00					26.00	Preserved	Outside ROW	
3675.00	LVO	Type 1 - Protected	15.00	30.00	11.00	8.00					30.00	Preserved	Outside ROW	
3676.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3677.00	LVO	Type 1 - Protected	18.00	36.00	13.00	10.00					36.00	Preserved	Outside ROW	
3678.00	LVO	Type 1 - Protected	18.00								18.00	Preserved	Outside ROW	
3679.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3680.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3681.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3682.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3683.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3684.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3685.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3686.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3687.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3688.00	LVO	Type 1 - Protected	14.00	28.00	11.00	6.00					28.00	Remove	In ROW	28.00
3689.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3690.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3691.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3692.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3693.00	LVO	Type 1 - Protected	15.00	30.00	11.00	8.00					30.00	Preserved	Outside ROW	
3694.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3695.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3696.00	LVO	Type 1 - Protected	16.00	32.00	12.00	9.00					32.00	Preserved	Outside ROW	
3697.00	LVO	Type 1 - Unprotected	17.00	34.00	14.00	7.00					34.00	Preserved	Outside ROW	
3698.00	LVO	Type 1 - Unprotected	10.00	20.00							20.00	Preserved	Outside ROW	
3699.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3700.00	LVO	Type 1 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
3701.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
3702.00	LVO	Type 2 - Unprotected	10.00	20.00							20.00	Preserved	Outside ROW	
3703.00	LVO	Type 2 - Unprotected	15.00	30.00							30.00	Preserved	Outside ROW	
3704.00	LVO	Type 2 - Unprotected	10.00	20.00							20.00	Preserved	Outside ROW	
3705.00	LVO	Type 2 - Unprotected	14.00	28.00	10.00	8.00					28.00	Preserved	Outside ROW	
3706.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
3707.00	LVO	Type 1 - Protected	15.00	30.00							30.00	Preserved	Outside ROW	
3709.00	LVO	Type 1 - Protected	24.00	48.00	17.00	13.00					48.00	Preserved	Outside ROW	
3710.00	LVO	Type 1 - Protected	18.00	36.00							36.00	Preserved	Outside ROW	
3711.00	LVO	Type 1 - Protected	19.00	38.00							38.00	Preserved	Outside ROW	
3712.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
3713.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
3714.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
3715.00	LVO	Type 1 - Protected	12.00	24.00	10.00	4.00					24.00	Remove	In ROW	24.00
3716.00	LVO	Type 1 - Protected	16.00	32.00	11.00	6.00	4.00				32.00	Remove	In ROW	32.00
3717.00	LVO	Type 1 - Protected	15.00	30.00	11.00	8.00					30.00	Preserved	Outside ROW	
3718.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
3719.00	LVO	Type 1 - Protected	26.00	52.00	19.00	14.00					52.00	Preserved	Outside ROW	
3720.00	LVO	Type 1 - Protected	26.00	52.00	18.00	16.00					52.00	Preserved	Outside ROW	
3721.00	LVO	Type 1 - Protected	19.00	38.00							38.00	Preserved	Outside ROW	
3722.00	LVO	Type 1 - Protected	28.00	56.00							56.00	Preserved	Outside ROW	
3723.00	LVO	Type 2 - Unprotected	37.00	74.00	30.00	14.00					74.00	Preserved	Outside ROW	
3724.00	LVO	Type 2 - Unprotected	18.00	36.00							36.00	Preserved	Outside ROW	
3725.00	LVO	Type 1 - Protected	19.00	38.00							38.00	Preserved	Outside ROW	
3726.00	LVO	Type 1 - Protected	19.00	38.00							38.00	Preserved	Outside ROW	
3730.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
3731.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3732.00	LVO	Type 1 - Protected	30.00	60.00	16.00	14.00	10.00	4.00			60.00	Preserved	Outside ROW	
3733.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside ROW	
3734.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3735.00	LVO	Type 1 - Protected	20.00	40.00	16.00	8.00					40.00	Preserved	Outside ROW	
3736.00	LVO	Type 1 - Protected	16.00	32.00	11.00	11.00					32.00	Preserved	Outside ROW	
3737.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
3747.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3749.00	LVO	Type 1 - Protected	23.00	46.00							46.00	Preserved	Outside ROW	
3750.00	LVO	Type 1 - Protected	19.00	38.00							38.00	Preserved	Outside ROW	
3784.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3785.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
3786.00	LVO	Type 1 - Protected	16.00	32.00							32.00	Preserved	Outside ROW	
3787.00	LVO	Type 1 - Protected	33.00	66.00	17.00	16.00	12.00	9.00			66.00	Preserved	Outside ROW	
3788.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
3789.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3790.00	LVO	Type 1 - Protected	15.00	30.00							30.00	Remove	In ROW	30.00
3791.00	LVO	Type 1 - Protected	19.00	38.00	13.00	12.00					38.00	Preserved	Outside ROW	
3792.00	LVO	Type 1 - Unprotected	15.00	30.00							30.00	Preserved	Outside ROW	
3795.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
3796.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
3797.00	LVO	Type 2 - Unprotected	12.00	24.00	9.00	6.00					24.00	Preserved	Outside ROW	
3798.00	LVO	Type 1 - Protected	13.00	26.00	9.00	8.00					26.00	Preserved	Outside ROW	
3799.00	LVO	Type 1 - Protected	12.00	24.00	9.00	6.00					24.00	Preserved	Outside ROW	
3800.00	LVO	Type 1 - Protected	22.00	44.00							44.00	Preserved	Outside ROW	
3801.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Remove	In ROW	24.00
3802.00	LVO	Type 1 - Protected	16.00	32.00							32.00	Remove	In ROW	32.00
3803.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
3804.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
3805.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4193.00	LVO	Type 1 - Protected	23.00	46.00	11.00	10.00	8.00	7.00	46.00		46.00	Preserved	Outside ROW	
4194.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4195.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4196.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4197.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4198.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4199.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4200.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4201.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4202.00	LVO	Type 1 - Protected	16.00	32.00	11.00	10.00					32.00	Preserved	Outside ROW	
4203.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4204.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4205.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4206.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4207.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4208.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4209.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4210.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4211.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4212.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
4213.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4214.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4215.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4216.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
4217.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4218.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4219.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4220.00	LVO	Type 1 - Protected	16.00	32.00	11.00	10.00					32.00	Preserved	Outside ROW	
4221.00	LVO	Type 1 - Protected	13.00	26.00	10.00	6.00					26.00	Preserved	Outside ROW	
4222.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4223.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4224.00	LVO	Type 1 - Protected	13.00	26.00	10.00	6.00					26.00	Preserved	Outside ROW	
4225.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4226.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
4227.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4228.00	LVO	Type 2 - Unprotected	12.00	24.00							24.00	Preserved	Outside ROW	
4229.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4230.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside ROW	
4231.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4232.00	LVO	Type 1 - Protected	22.00	44.00	17.00	10.00					44.00	Preserved	Outside ROW	
4234.00	LVO	Type 1 - Protected	14.00	28.00	10.00	9.00					28.00	Preserved	Outside ROW	
4235.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4236.00	LVO	Type 1 - Protected	15.00	30.00	10.00	11.00					30.00	Preserved	Outside ROW	
4237.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4238.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4239.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4240.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4241.00	LVO	Type 2 - Unprotected	17.00	34.00	14.00	6.00					34.00	Preserved	Outside ROW	
4242.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
4243.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
4244.00	LVO	Type 2 - Unprotected	16.00	32.00							32.00	Preserved	Outside ROW	
4245.00	LVO	Type 2 - Unprotected	13.00	26.00							26.00	Preserved	Outside ROW	
4246.00	LVO	Type 1 - Protected	20.00	40.00							40.00	Preserved	Outside ROW	
4247.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4248.00	LVO	Type 1 - Protected	17.00	34.00	12.00	10.00					34.00	Preserved	Outside ROW	
4249.00	LVO	Type 1 - Protected	17.00	34.00	13.00	8.00					34.00	Preserved	Outside ROW	
4250.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4251.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside ROW	
4252.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside ROW	
4253.00	LVO	Type 1 - Protected	16.00	32.00	12.00	8.00					32.00	Preserved	Outside ROW	
4254.00	LVO	Type 1 - Protected	20.00	40.00							40.00	Preserved	Outside ROW	
4284.00	LVO	Type 1 - Protected	20.00	40.00							40.00	Preserved	Outside ROW	
4285.00	LVO	Type 1 - Protected	28.00	56.00							56.00	Preserved	Outside ROW	
4286.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4305.00	LVO	Type 1 - Protected	15.00	30.00							30.00	Preserved	Outside ROW	
4306.00	LVO	Type 1 - Protected	26.00	52.00							52.00	Preserved	Outside ROW	
4307.00	LVO	Type 2 - Unprotected	19.00	38.00							38.00	Preserved	Outside ROW	
4308.00	LVO	Type 2 - Unprotected	12.00	24.00							24.00	Remove	In ROW	24.00
4309.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
4310.00	LVO	Type 2 - Unprotected	17.00	34.00	13.00	8.00					34.00	Preserved	Outside ROW	
4311.00	LVO	Type 2 - Unprotected	22.00	44.00	13.00	10.00	9.00				44.00	Preserved	Outside ROW	
4312.00	LVO	Type 2 - Unprotected	21.00	42.00	12.00	10.00	9.00				42.00	Preserved	Outside ROW	
4313.00	LVO	Type 2 - Unprotected	13.00	26.00							26.00	Preserved	Outside ROW	
4314.00	LVO	Type 2 - Unprotected	13.00	26.00							26.00	Remove	In ROW	26.00
4315.00	LVO	Type 2 - Unprotected	12.00	24.00							24.00	Remove	In ROW	24.00
4316.00	CDE	Type 2 - Unprotected	17.00	34.00							34.00	Preserved	Outside ROW	
4317.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4318.00	LVO	Type 1 - Protected	15.00	30.00							30.00	Preserved	Outside ROW	
4319.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4320.00	LVO	Type 1 - Protected	20.00	40.00							40.00	Preserved	Outside ROW	
4321.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4322.00	LVO	Type 1 - Protected	16.00	32.00							32.00	Preserved	Outside ROW	
4323.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4324.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4325.00	LVO	Type 2 - Unprotected	18.00	36.00							36.00	Preserved	Outside ROW	
4326.00	LVO	Type 2 - Unprotected	19.00	38.00	14.00	11.00					38.00	Preserved	Outside ROW	
4327.00	CDE	Type 2 - Unprotected	24.00	48.00	14.00	12.00	5.00	4.00			48.00	Remove	In ROW	48.00
4328.00	CDE	Type 2 - Unprotected	14.00	28.00	10.00	9.00					28.00	Preserved	Outside ROW	
4329.00	LVO	Type 2 - Unprotected	12.00	24.00							24.00	Preserved	Outside ROW	
4330.00	LVO	Type 2 - Unprotected	15.00	30.00							30.00	Preserved	Outside ROW	
4331.00	LVO	Type 2 - Unprotected	15.00	30.00	11.00	9.00					30.00	Preserved	Outside ROW	
4332.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
4333.00	LVO	Type 1 - Protected	33.00	66.00	16.00	13.00	12.00	10.00	66.00		66.00	Preserved	Outside ROW	
4335.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4336.00	LVO	Type 2 - Unprotected	21.00	42.00	15.00	13.00					42.00	Preserved	Outside ROW	
4337.00	LVO	Type 2 - Unprotected	23.00	46.00	16.00	14.00					46.00	Preserved	Outside ROW	
4338.00	LVO	Type 1 - Protected	14.00	28.00	10.00	8.00					28.00	Preserved	Outside ROW	
4339.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4340.00	CDE	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4341.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside ROW	
4342.00	LVO	Type 1 - Protected	18.00	36.00							36.00	Preserved	Outside ROW	
4343.00	LVO	Type 1 - Protected	16.00	32.00							32.00	Preserved	Outside ROW	
4344.00	LVO	Type 1 - Protected	15.00	30.00							30.00	Remove	In ROW	30.00
4345.00	LVO	Type 1 - Protected	21.00	42.00	15.00	12.00					42.00	Preserved	Outside ROW	
4346.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4354.00	LVO	Type 1 - Protected	28.00	56.00	18.00	14.00	7.00				56.00	Preserved	Outside ROW	
4355.00	LVO	Type 1 - Unprotected	9.00	18.00							18.00	Preserved	Outside ROW	
4356.00	LVO	Type 2 - Unprotected	17.00	34.00							34.00	Preserved	Outside ROW	
4357.00	LVO	Type 2 - Unprotected	24.00	48.00	18.00	13.00					48.00	Remove	In ROW	48.00
4358.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4359.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4360.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4361.00	RDO	Type 2 - Unprotected	17.00	34.00							34.00	Preserved	Outside ROW	
4362.00	RDO	Type 2 - Unprotected	21.00	42.00	15.00	12.00					42.00	Preserved	Outside ROW	
4363.00	RDO	Type 2 - Unprotected	12.00	24.00							24.00	Preserved	Outside ROW	
4364.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4365.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4366.00	RDO	Type 2 - Unprotected	18.00	36.00	13.00	10.00					36.00	Preserved	Outside ROW	
4367.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4368.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4369.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4370.00	CDE	Type 1 - Protected	14.00	28.00	9.00	6.00	5.00				28.00	Preserved	Outside ROW	
4371.00	LVO	Type 1 - Protected	11.00	22.00							22.00	Preserved	Outside ROW	
4372.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4373.00	LVO	Type 1 - Protected	14.00	28.00	11.00	7.00					28.00	Preserved	Outside ROW	
4374.00	LVO	Type 1 - Protected	17.00	34.00	10.00	6.00	5.00	5.00	34.00		34.00	Remove	In ROW	34.00
4375.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Remove	In ROW	18.00
4376.00	LVO	Type 1 - Protected	12.00	24.00	9.00	7.00					24.00	Remove	In ROW	24.00
4377.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4378.00	LVO	Type 2 - Unprotected	14.00	28.00							28.00	Preserved	Outside ROW	
4379.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
4380.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Remove	In ROW	18.00
4381.00	LVO	Type 2 - Unprotected	11.00	22.00							22.00	Preserved	Outside ROW	
4382.00	LVO	Type 2 - Unprotected	14.00	28.00	9.00	6.00	4.00				28.00	Remove	In ROW	28.00
4383.00	LVO	Type 2 - Unprotected	13.00	26.00	10.00	6.00					26.00	Remove	In ROW	26.00
4384.00	LVO	Type 2 - Unprotected	10.00	20.00							20.00	Remove	In ROW	20.00
4385.00	LVO	Type 2 - Unprotected	9.00	18.00							18.00	Remove	In ROW	18.00
4386.00	LVO	Type 2 - Unprotected	16.00	32.00	9.00	8.00	7.00				32.00	Remove	In ROW	32.00
4387.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Remove	In ROW	18.00
4388.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4389.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4390.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4391.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4392.00	LVO	Type 2 - Unprotected	14.00	28.00	13.00	8.00					28.00	Preserved	Outside ROW	
4393.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4394.00	LVO	Type 1 - Protected	10.00	20.00							20.00	Preserved	Outside ROW	
4395.00	LVO	Type 1 - Protected	12.00	24.00							24.00	Preserved	Outside ROW	
4396.00	LVO	Type 1 - Protected	13.00	26.00							26.00	Preserved	Outside ROW	
4397.00	LVO	Type 1 - Protected	25.00	50.00							50.00	Preserved	Outside ROW	
4398.00	LVO	Type 1 - Protected	17.00	34.00							34.00	Preserved	Outside ROW	
4405.00	LVO	Type 1 - Protected	9.00	18.00							18.00	Preserved	Outside ROW	
4406.00	LVO	Type 1 - Protected	14.00	28.00							28.00	Preserved	Outside



150 0 150 300

SCALE: 1 INCH = 150 FT

LEGEND

- BOUNDARY LINE
- R.O.W.
- EASEMENT LINE
- LOT LINE
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- FM EXISTING FORCE MAIN
- WW EXISTING WASTEWATER LINE
- WL EXISTING WATER LINE
- OU EXISTING OVERHEAD UTILITY
- SD EXISTING STORM DRAIN
- EXISTING RIBBON CURB
- EXISTING CURB & GUTTER
- EXISTING SIDEWALK
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- FEMA FLOODPLAIN

*NOTES:

SEE SHEET 6 FOR A COMPLETE LIST OF EXISTING TREES INCLUDING TYPE AND CALIPER SIZE.

LA CIMA PHASE 8 SUMMARY TABLE	
Total Number Of Trees:	705
Total 9"-24" Removed within ROW (No Mitigation Req'd)	906
Total 9"-24" Removed outside ROW	0
Total Greater than 24" Removed within ROW (1:1 Mitigation Req'd)	0
Total Greater than 24" Removed outside ROW	0
Total Inches Preserved 9"-24" (in ROW and O/S only; exluding SF	2388
Total Inches Preserved >24" (in ROW and O/S only; excluding SF	3760
Mitigation Required (inches)	0
Mitigation Provided (inches)(through tree preservation)	6148
Note: ROW includes Right of Way and areas within PUE and Drainage Easements	

NOTES:

BEFORE ANY WORK STARTS, CONTRACTOR MUST ATTEND A PICP PRE-CON MEETING WITH ENGINEERING DEPT STAFF AT THE MUNICIPAL BUILDING. CALL 512-805-2626 TO SCHEDULE. ALL EROSION AND SEDIMENTATION CONTROLS (ESCs), AND TREE PROTECTION FENCE(S) (TPF) IF APPLICABLE, MUST ALSO BE INSTALLED PER COSM STANDARD DETAILS AND THIS CITY APPROVED PLAN [TXR150000 PART III.G.1. AND, IF WITHIN CITY LIMITS, CITY CODE SECTION 86.529.

Know what's below. 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.

Bowman
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151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
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REVISIONS

REVISION	DESCRIPTION	DATE
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EXISTING CONDITIONS AND DEMO PLAN

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 7 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_EXC.dwg, 7 EXISTING CONDITIONS PLAN, October 31, 2024, 4:46 PM, mcarrion



150 0 150 300

SCALE: 1 INCH = 150 FT

LEGEND

- R.O.W.
- EASEMENT LINE
- LOT LINE
- BUILDING SETBACK
- PROPOSED CURB & GUTTER
- PROPOSED SIDEWALK BY DEVELOPER
- PROPOSED SIDEWALK BY HOMEBUILDER
- FM — EXISTING FORCE MAIN
- RW — RECLAIMED WATER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- OU — EXISTING OVERHEAD UTILITY
- SD — EXISTING STORM DRAIN
- WW — WASTEWATER LINE
- SD — STORM DRAIN PIPE
- WL — WASTEWATER LINE
- HEADWALL
- CURB INLET
- STORMSEWER MANHOLE
- WASTEWATER MANHOLE
- TREE TO BE REMOVED

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REVISIONS		
REVISION	DESCRIPTION	DATE
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OVERALL PROPOSED CONDITIONS PLAN

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 8 OF 81

Know what's below. Call before you dig.

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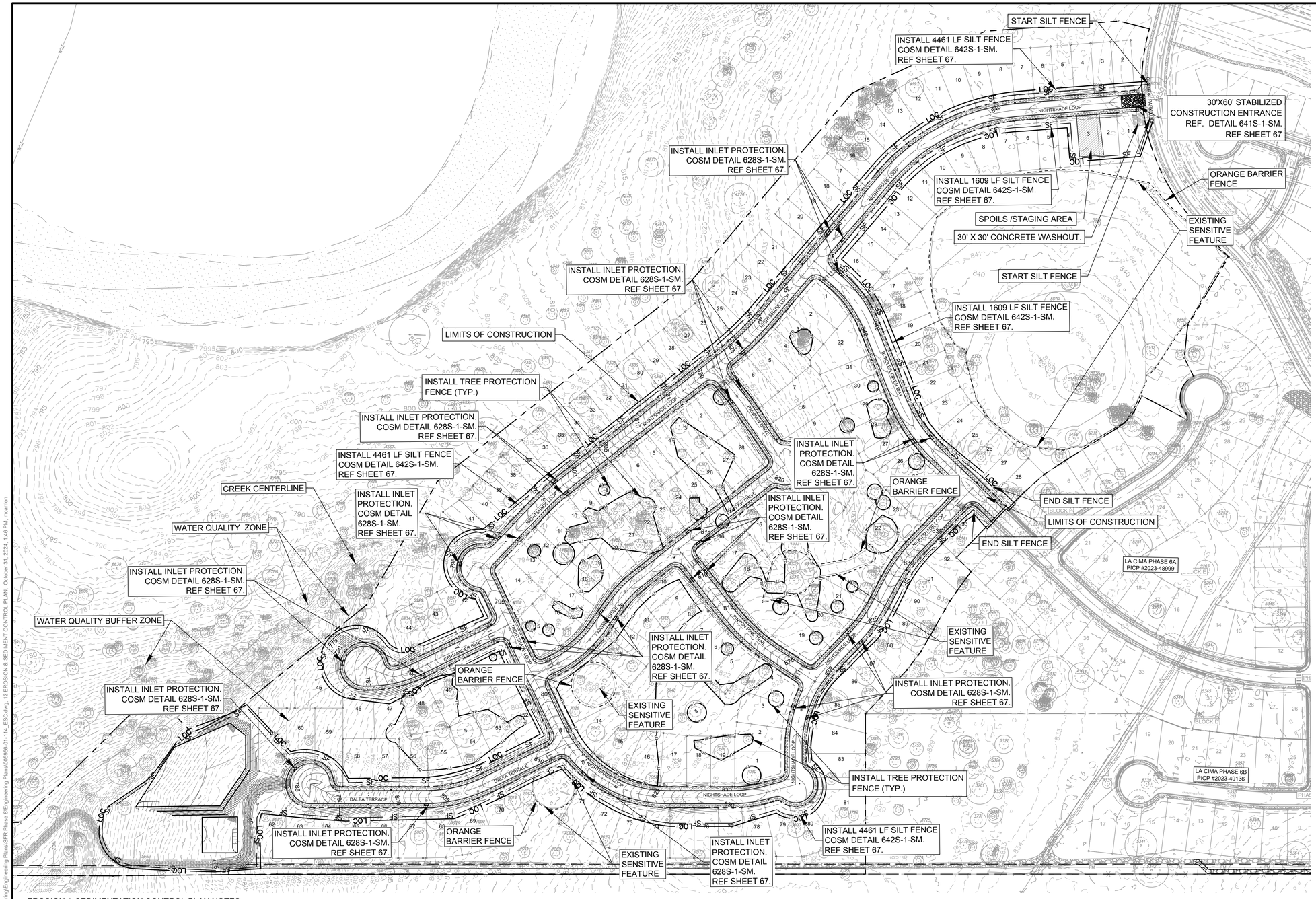
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_OSP.dwg, 8 SCHEMATIC PLAN, October 31, 2024, 1:44 PM, mcarrion



120 0 120 240

SCALE: 1 INCH = 120 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- LOC LIMITS OF CONSTRUCTION
- SF SF PROPOSED SILT FENCE
- INLET PROTECTION
- STABILIZED CONSTRUCTION ENTRANCE
- STAGING / SPOILS AREA
- CONCRETE WASHOUT
- ROCK BERM
- NATURAL VEGETATIVE FILTER STRIP

SUMMARY OF EROSION & SEDIMENTATION CONTROL	
ITEM	QUANTITIES
SILT FENCE	8539 LF
INLET PROTECTION	30 EA
TREE PROTECTION	7000 LF
CONCRETE WASHOUT	1
STABILIZED CONSTRUCTION ENTRANCE	1

LIMITS OF CONSTRUCTION = 33.84 AC.

REFERENCE SEQUENCE OF CONSTRUCTION ON SHEET 4.

NOTES:

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 67
6. SEE TREE LIST SHEET 6 AND EXISTING CONDITIONS SHEET 7 FOR TREES TO BE REMOVED
7. TREE PROTECTION SHALL BE A MINIMUM OF 4' HIGH, PLACED PER THE COSM DETAILS 610S-1-SM AND 610-2-SM
8. AREAS DESIGNATED AS NATURAL VEGETATIVE FILTER STRIPS SHALL BE PROTECTED WITH ORANGE CONSTRUCTION FENCING AND REMAIN UNDISTURBED DURING CONSTRUCTION
8. CLEARING OF WOODY VEGETATION IN AREAS OF GOLDEN-CHEEKED WARBLER HABITAT SHOULD BE COMPLETED DURING THE MONTHS FROM AUGUST THROUGH FEBRUARY, FROM MARCH 1 TO JULY 31, SUCH WORK MUST CEASE SINCE GOLDEN-CHEEKED WARBLERS MAY HAVE RETURNED TO THE AREA TO NEST. CLEARING AND CONSTRUCTION IS NOT AUTHORIZED BETWEEN FEBRUARY 28 AND JULY 31 WITH THE FOLLOWING EXCEPTIONS:
   A) A BIRD-MONITORING SURVEY CONDUCTED DURING THE BREEDING SEASON USING U.S FISH AND WILDLIFE SERVICE (USFWS) PROTOCOLS DEMONSTRATES THAT NO BIRDS ARE LOCATED WITHIN 300 FEET OF THE PROJECT BOUNDS (THE SURVEY AND THE PLANNED ACTIVITY MUST TAKE PLACE IN THE SAME YEAR AND ARE ONLY VALID FOR THAT SUBJECT YEAR
   B) CONSTRUCTION ACTIVITIES, BUT NOT CLEARING OF ANY VEGETATION, THAT BEGAN DURING THE NON BREEDING SEASON AND ARE PERFORMED IN A REASONABLY PROMPT AND EXPEDITIOUS MANNER MAY CONTINUE,
   C) CONSTRUCTION ACTIVITIES THAT DO NOT INVOLVE THE REMOVAL OF POTENTIAL HABITAT MAY CONTINUE IF THE ACTIVITY IS MORE THAN 300 FEET AWAY FROM POTENTIAL HABITAT. THE SURVEY AND PLANNED ACTIVITY MUST TAKE PLACE IN THE SAME YEAR AND ARE ONLY VALID FOR THAT SUBJECT YEAR.

EROSION & SEDIMENTATION CONTROL PLAN NOTES:

1. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MUST BE DEVELOPED/AMENDED BY A TX PE, CPESC, OR QPSWPPP [IF WITHIN CITY LIMITS, CITY CODE SECTION 86.529(B)(2) OR 86.529(C)(3)], IMPLEMENTED, AND UPDATED TO MATCH SITE CONDITIONS DURING THE PROJECT. THE ASSOCIATED TPDES CONSTRUCTION SITE NOTICE MUST BE POSTED IN PUBLIC VIEW. TXR150000 PART III.D.2.
2. CONTRACTOR MUST HAVE A CISEC, CESSWI, OR QCIS CONDUCT WEEKLY SWPPP INSPECTIONS AND DOCUMENT PER CITY CODE SECTIONS 86.523 AND 86.529(B)(9) OR 86.529(C)(10). CONTRACTOR MUST MAINTAIN ALL ESC MEASURES AND ADDRESS ALL IDENTIFIED CORRECTIVE ACTIONS PER TXR150000 PART III.F.6-7 AND CITY CODE SECTION 86.529(C)(11).
3. PER TXR150000 PART III.F.1.(M)., LOCATIONS OF THE FOLLOWING, AS APPLICABLE, MUST BE MARKED ON THIS SHEET IN THE FIELD: THE TPDES CONSTRUCTION SITE NOTICE POSTING IN PUBLIC VIEW, STAGING, SPOILS STORAGE, CONCRETE WASHOUT, DUMPSTERS, PORTABLE TOILET(S), FUELING POINT(S), AND/OR OTHER POTENTIAL CONTAMINANT SOURCES. THIS SHEET MUST ALSO BE UPDATED AS THESE POTENTIAL CONTAMINANT SOURCES MOVE OR OTHER CHANGES OCCUR ONSITE. DATE AND INITIAL ALL PEN AND INK CHANGES.
4. IF THERE IS A BREAK OF MORE THAN 14 DAYS DURING THE PROJECT WHERE NO DIRT WORK IS DONE ON A SITE PORTION(S) WITHIN THE LIMITS OF CONSTRUCTION, TEMPORARY (OR PERMANENT) STABILIZATION IS REQUIRED PER TXR150000 PART III.F.2.(B).III AND, IF WITHIN CITY LIMITS, CITY CODE SECTION 86.529(A)(1)(G). SUCH DIRT WORK STOPPAGE INCLUDES TIME PERIODS BETWEEN ROUGH GRADING COMPLETION AND CONSTRUCTION START, DURING CONSTRUCTION, BETWEEN CONSTRUCTION AND FINAL STABILIZATION, ETC. USE TEMPORARY (OR PERMANENT) SEEDING, ROCK, GRAVEL (1" MINIMUM), CONCRETE RIP-RAP, DEGRADABLE STRAW MATTING, SHREDDED LANDSCAPE MULCH, DEGRADABLE SOIL RETENTION BLANKETS, OR SIMILAR. NOTE THAT MATTING, MULCH, OR BLANKETS REQUIRE ONGOING MAINTENANCE.
5. CONCRETE WASTE, CONCRETE WASH WATER, AND MASONRY/STUCCO/PAINT MIXING AND WASH WATER, AS APPLICABLE, MUST BE CONTAINED IN SUFFICIENT PRE-MADE STRUCTURE(S), LINED STRUCTURE(S), OR LINED PIT(S) PER TXR150000 PART V.D.
6. ANY EXISTING STORMWATER INLETS WITHIN 200' OF THE LOC MUST HAVE INLET PROTECTION. STORMWATER INLET PROTECTION IS ALSO REQUIRED AS NEW STORMWATER INLETS ARE ADDED TO THE SITE, IF APPLICABLE.
7. CITY CODE SECTION 14.026, §3305.2 CONSTRUCTION DEBRIS / TRASH CONTAINMENT. CONTRACTORS SHALL ENSURE THAT EVERY 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 THAT THE SITE IS MAINTAINED IN A CLEAN, SANITARY, AND SAFE CONDITION AT ALL TIMES.
8. CITY CODE SECTION 14.026, §3305.4 STREET CLEANING. ADJACENT STREETS TO THE CONSTRUCTION SITE SHALL BE MAINTAINED AND FREE OF DIRT, MUD, ROCKS AND OTHER CONSTRUCTION DEBRIS AT ALL TIMES. DIRT, GRAVEL, ETC., SHALL NOT BE SWEPT, WASHED, OR OTHERWISE DEPOSITED INTO UNPROTECTED STORM WATER CONVEYANCE SYSTEMS.
9. CITY CODE SECTION 14.026, §3305.5 SPOILS PILES. ALL SPOILS PILES SHALL BE UTILIZED ON SITE OR REMOVED FROM CONSTRUCTION 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 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 APPROVED UNTIL ALL SPOILS PILES HAVE BEEN REMOVED FROM CONSTRUCTION SITES.

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EROSION & SEDIMENT CONTROL PLAN

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

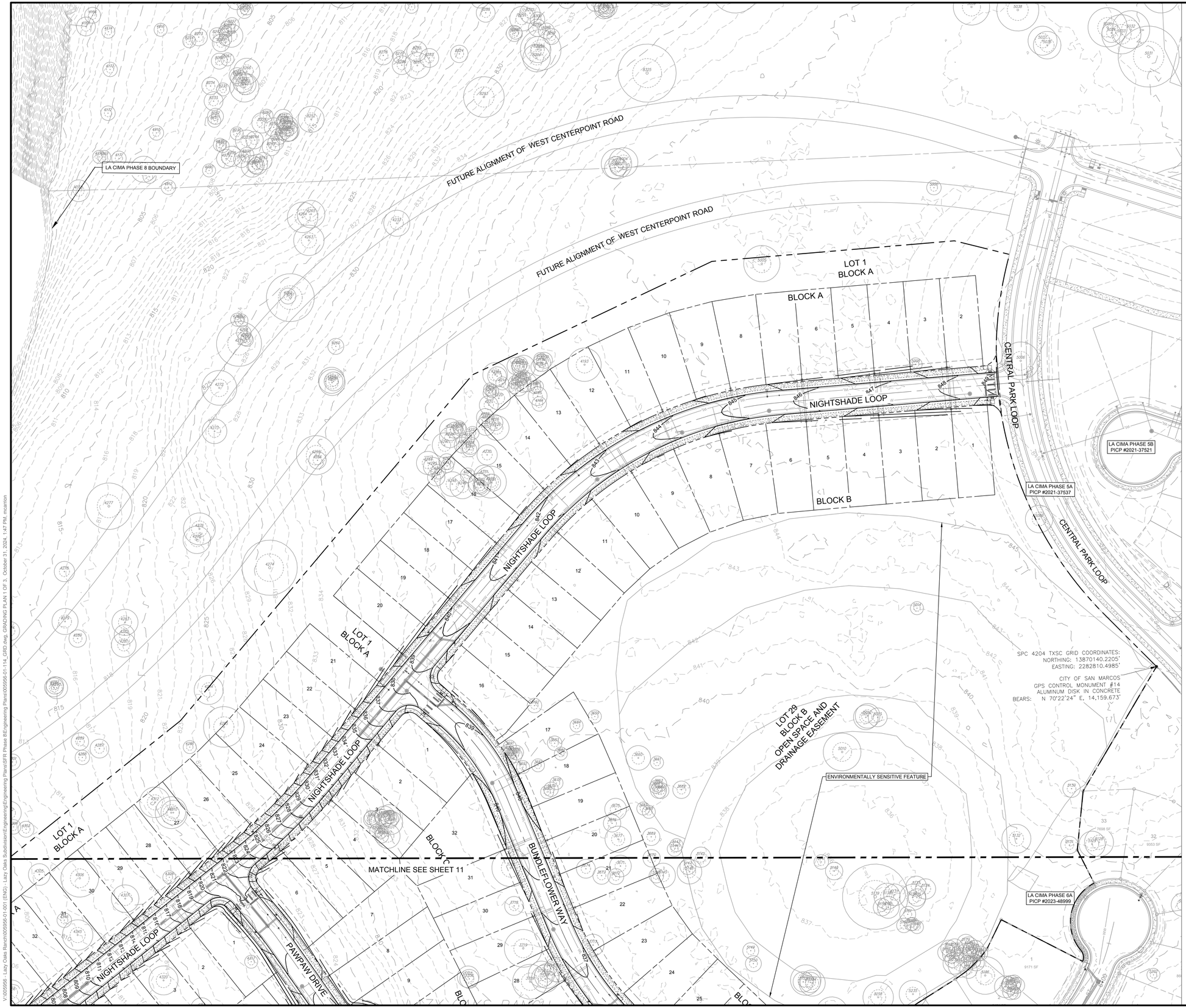
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 9 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_ESC.dwg, 12 EROSION & SEDIMENT CONTROL PLAN, October 31, 2024, 1:46 PM, mcarrion



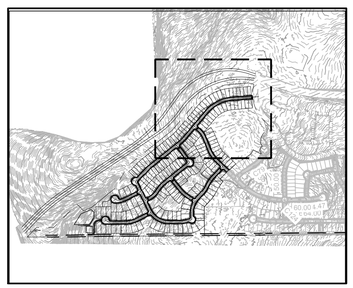
60 0 60 120

SCALE: 1 INCH = 60 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SIDEWALK BY DEVELOPER
- PROPOSED SIDEWALK BY HOMEBUILDER

KEY MAP



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REVISIONS

REVISION	DESCRIPTION	DATE
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GRADING PLAN (1 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

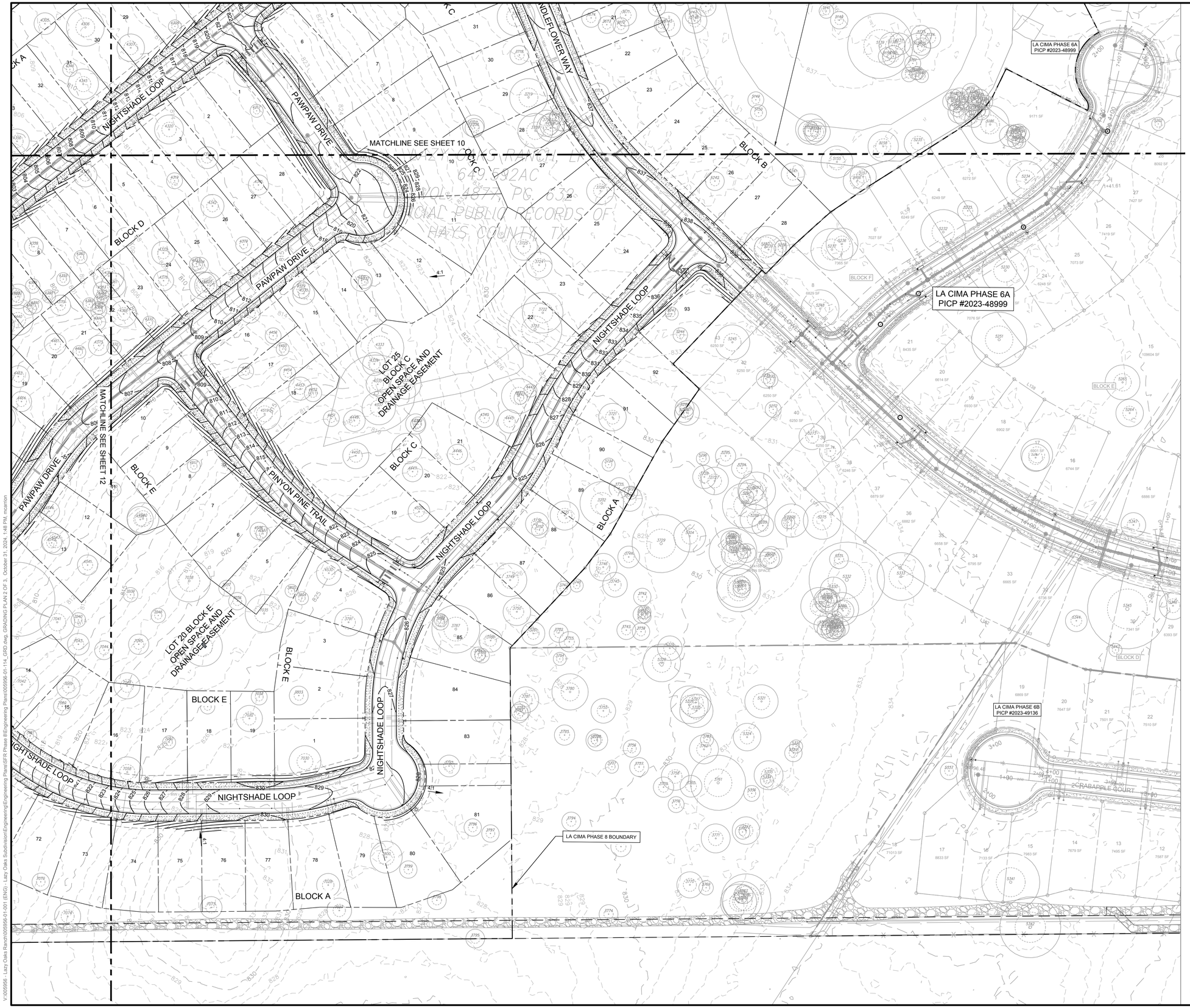
SHEET
10 OF 81

Know what's below. 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.

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_GRD.dwg, GRADING PLAN 1 OF 3, October 31, 2024, 1:47 PM, mcarrion



60 0 60 120

SCALE: 1 INCH = 60 FT

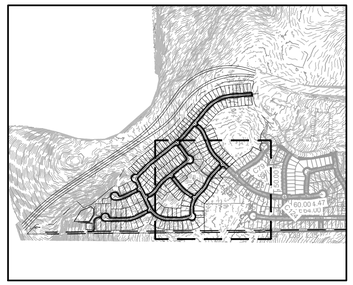
LEGEND

- 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 SIDEWALK BY DEVELOPER
- PROPOSED SIDEWALK BY HOMEBUILDER

NOTES:

1. IF THERE IS A BREAK OF MORE THAN 14 DAYS WHILE GRADING AND/OR BETWEEN ROUGH GRADING COMPLETION AND CONSTRUCTION START WHERE NO WORK IS DONE ON A SITE OR PORTION OF A SITE, TEMPORARY (OR PERMANENT) STABILIZATION IS REQUIRED PER TXR150000 PART III.F.2.(B).III/CITY CODE SECTION 86.529(A)(1)(G). USE TEMPORARY (OR PERMANENT) SEEDING, ROCK, GRAVEL (1" MINIMUM), CONCRETE RIP-RAP, DEGRADABLE STRAW MATTING, SHREDDED LANDSCAPE MULCH, DEGRADABLE SOIL RETENTION BLANKETS, OR SIMILAR. NOTE THAT MATTING, MULCH, OR BLANKETS REQUIRE ONGOING MAINTENANCE.
2. SEE SHEET 68 FOR PROPOSED ROAD CROSS SECTIONS.

KEY MAP



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GRADING PLAN (2 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 11 OF 81

Know what's below. Call before you dig.

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FOR PERMIT

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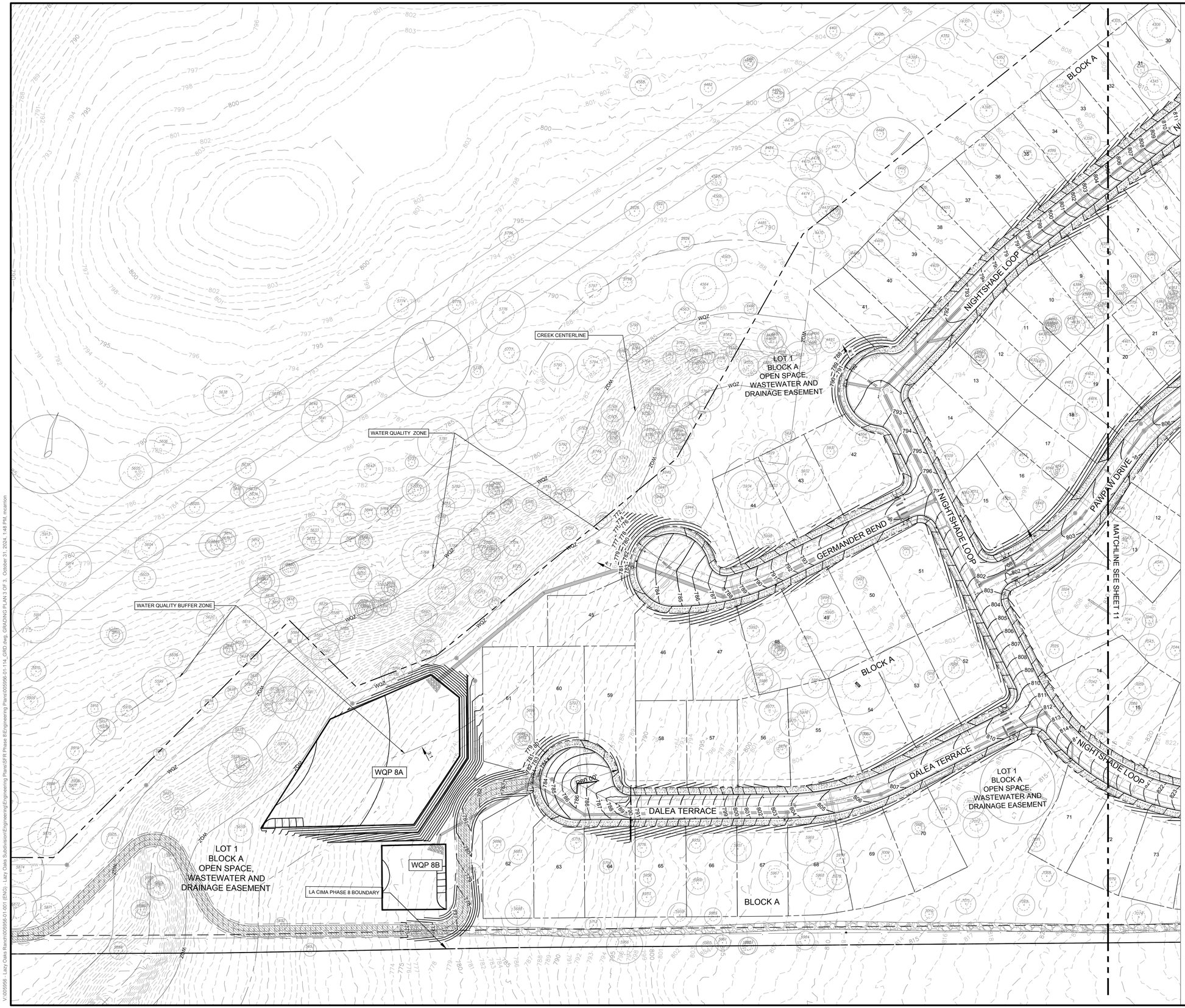


60 0 60 120

SCALE: 1 INCH = 60 FT

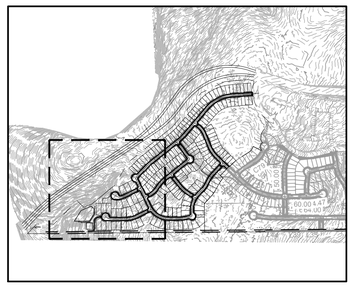
LEGEND

- 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 SIDEWALK BY DEVELOPER
- PROPOSED SIDEWALK BY HOMEBUILDER

NOTES:

1. IF THERE IS A BREAK OF MORE THAN 14 DAYS WHILE GRADING AND/OR BETWEEN ROUGH GRADING COMPLETION AND CONSTRUCTION START WHERE NO WORK IS DONE ON A SITE OR PORTION OF A SITE, TEMPORARY (OR PERMANENT) STABILIZATION IS REQUIRED PER TXR150000 PART III.F.2.(B).III/CITY CODE SECTION 86.529(A)(1)(G). USE TEMPORARY (OR PERMANENT) SEEDING, ROCK, GRAVEL (1" MINIMUM), CONCRETE RIP-RAP, DEGRADABLE STRAW MATTING, SHREDDED LANDSCAPE MULCH, DEGRADABLE SOIL RETENTION BLANKETS, OR SIMILAR. NOTE THAT MATTING, MULCH, OR BLANKETS REQUIRE ONGOING MAINTENANCE.
2. SEE SHEET 68 FOR PROPOSED ROAD CROSS SECTIONS.

KEY MAP



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REVISIONS		
REVISION	DESCRIPTION	DATE
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GRADING PLAN (3 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 12 OF 81

FOR PERMIT

811 Know what's below. 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.

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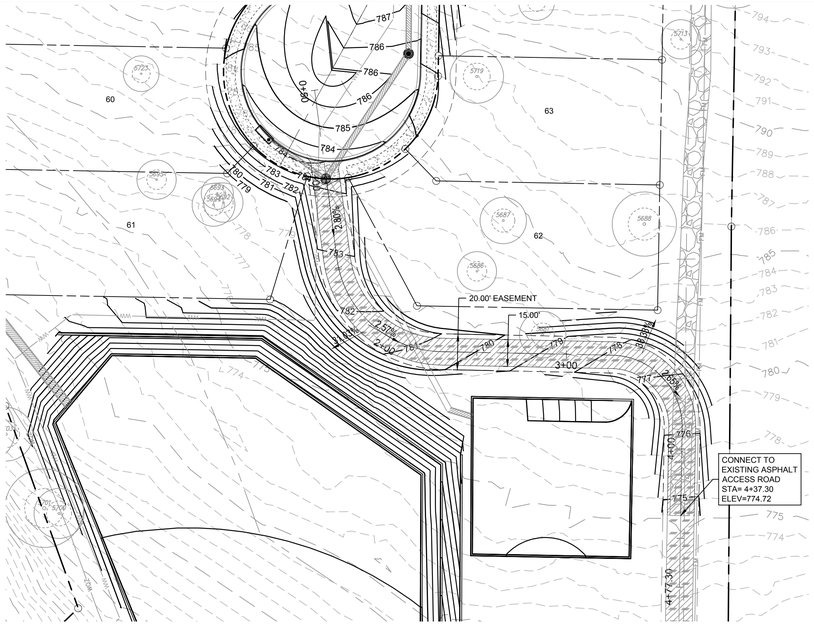

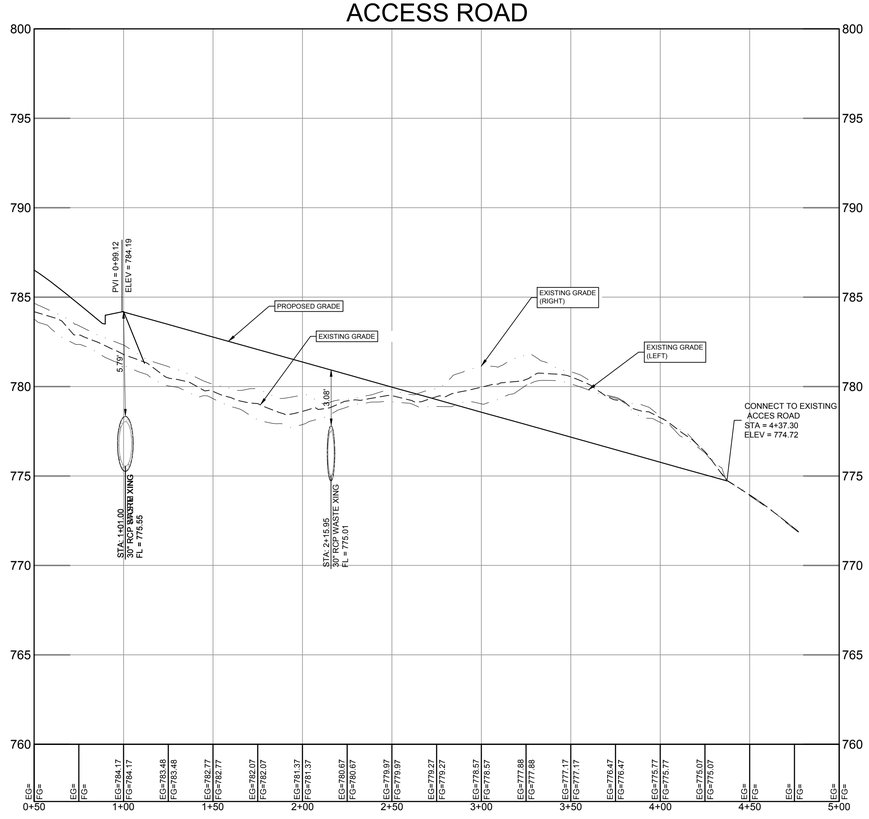



40 0 40 80

SCALE: 1 INCH = 40 FT

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SIDEWALK BY DEVELOPER
- PROPOSED SIDEWALK BY HOMEBUILDER
- IRRIGATION SLEEVES
- BERM
- SWALE
- RETAINING WALL
- TOC TOP OF CURB
- BOC BACK OF CURB
- LP LOW POINT
- LT LEFT OFFSET
- RT RIGHT OFFSET
- PROPOSED FIRE HYDRANT

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL	1"= 40' HORIZONTAL
PROPOSED GRADE CL	1"= 4' VERTICAL
ELEVATION EXISTING GRADE EG=XXX.XX FG=XXX.XX ELEVATION PROPOSED GRADE	
DESIGN SPEED = 25 M.P.H.	

NOTES:

1. SIDEWALK ALONG OPEN SPACE TO BE CONSTRUCTED WITH CIVIL PLANS. SIDEWALK AT INTERSECTIONS AND RAMPS TO BE CONSTRUCTED WITH CIVIL PLANS, RESIDENTIAL SIDEWALK FRONTING LOTS TO BE CONSTRUCTED BY HOME BUILDER.
2. CONTRACTOR SHALL COMPLY WITH GEOTECHNICAL REPORT PREPARED BY MLA LABS, DATED MARCH 2022, REF SHEET ## FOR ROAD CROSS SECTIONS.
3. IRRIGATION SLEEVES 4" AND 6" PVC PIPE. IRRIGATION LINE WITHIN THE SLEEVE MUST BE SEAMLESS.
4. ALL CURVE DATA IS TO FACE OF CURB OR OUTSIDE EDGE OF RIBBON CURB UNLESS OTHERWISE NOTED.
5. TOP OF CURB = CENTERLINE ELEVATION (TYP.) REF. THIS SHEET FOR SPOT GRADES @ PC, & PT, AND RAMPS CROSSINGS.
6. TOP OF CURB ELEVATION LISTED FOR INLETS AT CENTERLINE OF INLET, INSTALL CURB INLETS TO MATCH SLOPE OF ROADWAY (TYP.)
7. ALL DIMENSIONS ARE TAKEN FROM FACE OF CURB UNLESS OTHERWISE NOTED.
8. ALL SIDEWALKS SHALL BE INSTALLED WITH A MAXIMUM RUNNING SLOPE OF 1:20, AND A MAXIMUM CROSS SLOPE OF 1:48.
9. ALL CURB RAMPS SHALL BE INSTALLED WITH A MAXIMUM RUNNING SLOPE OF 1:12, AND A MAXIMUM CROSS SLOPE OF 1:48.
10. ALL CURB RAMPS SHALL BE INSTALLED WITH A LANDING AT THE TOP OF THE RAMP, 5' MINIMUM IN LENGTH AND 5' MINIMUM IN WIDTH, LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 1:48 IN ALL DIRECTIONS.
11. CURB RAMP COUNTERSLOPES OF ADJOINING ROADWAYS AND GUTTERS AT CURB RAMPS SHALL NOT EXCEED 1:20 RUNNING SLOPE, AND 1:48 CROSS SLOPE.
12. WHERE PROVIDED, CURB RAMP FLARES SHALL NOT BE STEEPER THAN 1:10.
13. DETECTABLE WARNINGS SHALL BE INSTALLED AT THE BACK OF CURB, THE FULL WIDTH OF CURB RAMPS.

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ACCESS ROAD PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
27 OF 81

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LA CIMA PHASE 8
WATERSHED MAP - PURGATORY CREEK
2020 InFRM Hydrology Update for CoSM
Truncated HEC-HMS
Model Schematic
San Marcos, Texas

0 500 1,000 2,000 3,000 4,000 US Feet
Reference Scale: 1:24,000

Spatial Reference:
PCS: NAD 1983 State Plane Texas S Central FIPS 4204 Feet
GCS: North American 1983
Datum: North American 1983
Projection: Lambert Conformal Conic
Map Units: Foot US

- Purgatory Creek - HEC-HMS Junctions
- Project Location
- InFRM Subbasins - Purgatory Creek

FEMA Flood Hazard Zones
- Regulatory Floodway
- 1 % Annual Chance Flood Hazard - Zone A
- 0.2 % Annual Chance Flood Hazard - Zone X
- 1 % Annual Chance Flood Hazard - Zone AE

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OVERALL WATERSHED MAP

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
28 OF 81

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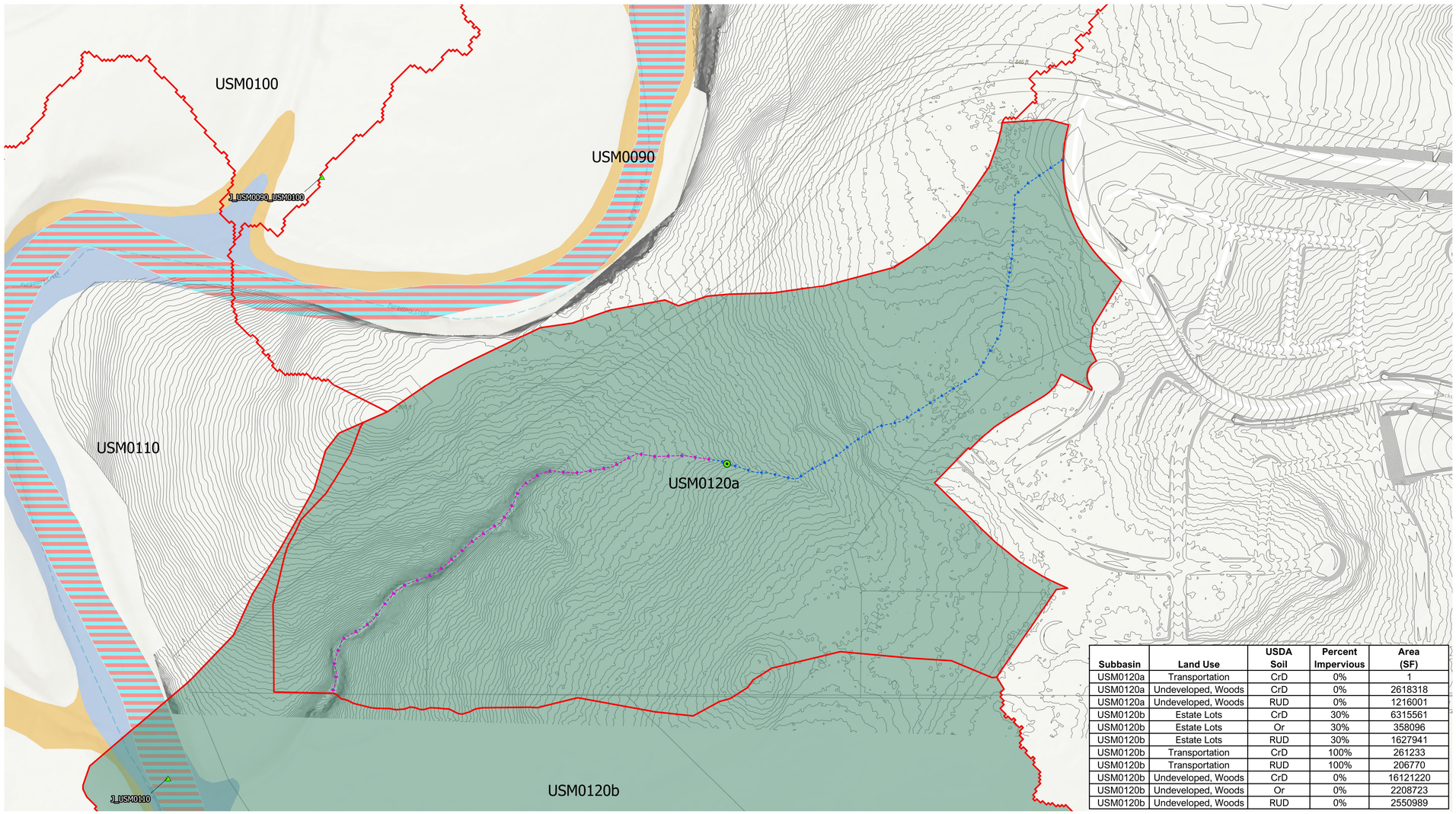
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WATERSHED MAP.dwg, 28 OVERALL WATERSHED MAP, October 31, 2024, 2:00 PM, mcarrion



Subbasin	Land Use	USDA Soil	Percent Impervious	Area (SF)
USM0120a	Transportation	CrD	0%	1
USM0120a	Undeveloped, Woods	CrD	0%	2618318
USM0120a	Undeveloped, Woods	RUD	0%	1216001
USM0120b	Estate Lots	CrD	30%	6315561
USM0120b	Estate Lots	Or	30%	358096
USM0120b	Estate Lots	RUD	30%	1627941
USM0120b	Transportation	CrD	100%	261233
USM0120b	Transportation	RUD	100%	206770
USM0120b	Undeveloped, Woods	CrD	0%	16121220
USM0120b	Undeveloped, Woods	Or	0%	2208723
USM0120b	Undeveloped, Woods	RUD	0%	2550989

Snyder Lag Time - USM0120a											
USACE Fort Worth District Urbanization Curve Method											
Subbasin	L (miles)	L_{ca} (miles)	85%-10% Length (miles)	S_{st} (ft/mile)	$L^*L_{ca}/(S_{st})^{0.5}$	Imp. Cover %	Urban %	Sand %	T_p (hrs)	Adjusted T_p (hrs)	C_p
EC USM0120a	0.61509	0.34488	0.46132	173.173	0.01612	1.00	0.00	21.39	0.219	0.66	0.75

HEC-HMS MODEL EXISTING CONDITIONS PARAMETERS				
SUBBASIN	AREA (SM)	IMPERVIOUS (%)	LAG (HR)	PEAKING COEFFICIENT
USM0010	3.3488	1.46	2.70	0.72
USM0020	3.2587	0.37	2.10	0.72
USM0030	3.3198	0.39	2.76	0.72
USM0040	1.259	0.26	2.16	0.72
USM0050	2.825	0.00	2.88	0.72
USM0060	2.5992	0.30	2.61	0.72
USM0070	0.7879	0.08	1.17	0.72
USM0080	2.5942	0.13	3.39	0.72
USM0090	1.6024	0.61	1.68	0.72
USM0100	2.468	0.00	2.70	0.72
USM0110	1.2572	0.00	1.62	0.72
USM0120a	0.1375	1.00	0.66	0.72
USM0120b	1.0623	10.03	2.28	0.72

LA CIMA PHASE 8
WATERSHED MAP - PURGATORY CREEK
EXISTING CONDITIONS HEC-HMS
Model Schematic
San Marcos, Texas

0 50 100 200 300 400 US Feet
Reference Scale: 1:24,000

Spatial Reference
PCS: NAD 1983 State Plane Texas S Central FIPS 4204 Feet
GCS: North American 1983
Datum: North American 1983
Projection: Lambert Conformal Conic
Map Units: Foot US

- Purgatory Creek - HEC-HMS Junctions
- Subbasin Centroid
- CLFP_Existing
- LFP_Existing
- Existing Conditions Subbasins

LandUse
- Estate Lots
- Undeveloped, Woods
- Transportation
- Undeveloped, Grass

- Existing Contours 1'

FEMA Flood Hazard Zones
- Regulatory Floodway
- 1 % Annual Chance Flood Hazard - Zone A
- 0.2 % Annual Chance Flood Hazard - Zone X
- 1 % Annual Chance Flood Hazard - Zone AE

- HAYS COUNTY PARCELS

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EXISTING WATERSHED MAP

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 29 OF 81

FOR PERMIT

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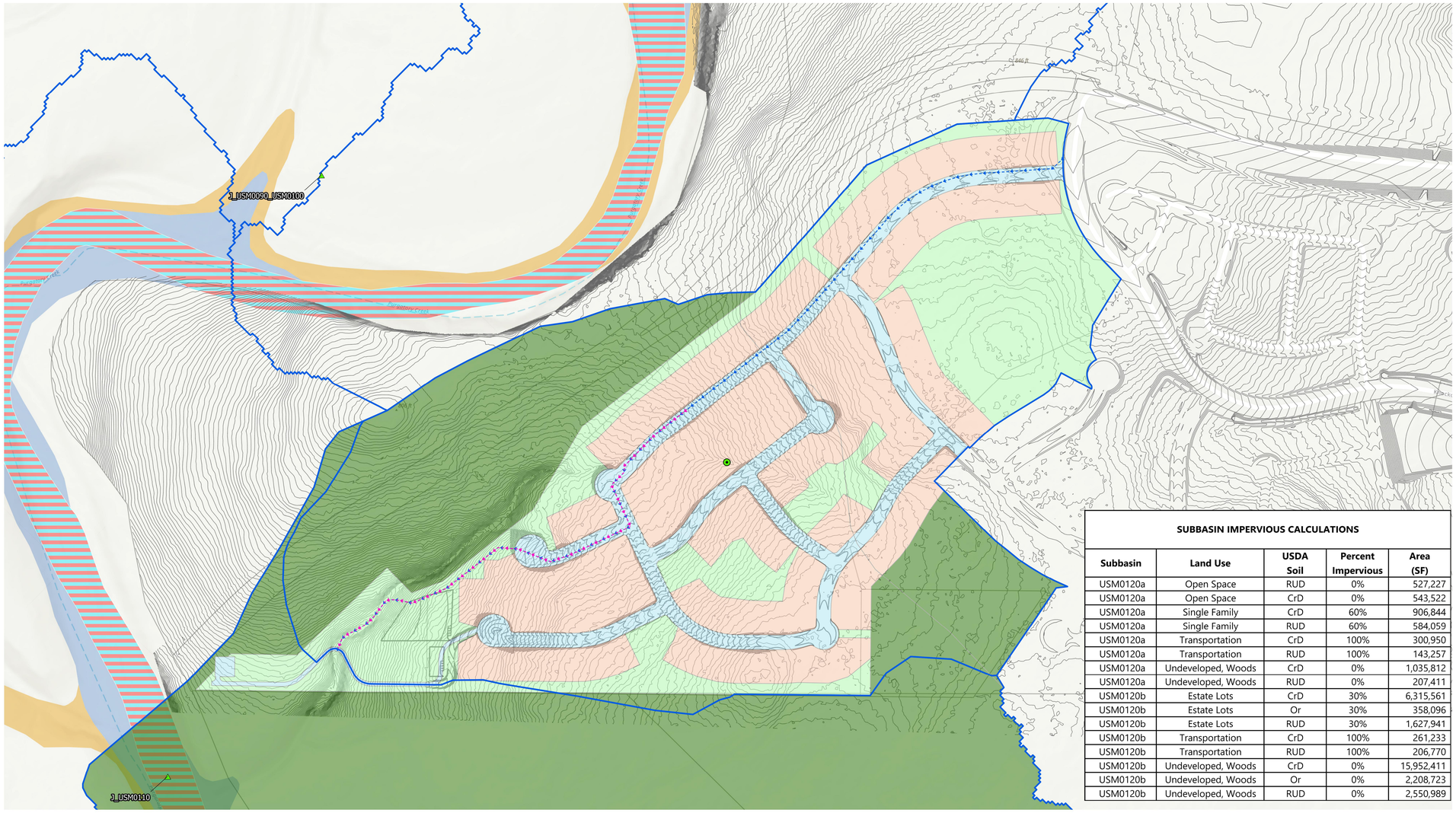

SUBBASIN IMPERVIOUS CALCULATIONS				
Subbasin	**Land Use**	**USDA Soil**	**Percent Impervious**	**Area (SF)**
USM0120a	Open Space	RUD	0%	527,227
USM0120a	Open Space	CrD	0%	543,522
USM0120a	Single Family	CrD	60%	906,844
USM0120a	Single Family	RUD	60%	584,059
USM0120a	Transportation	CrD	100%	300,950
USM0120a	Transportation	RUD	100%	143,257
USM0120a	Undeveloped, Woods	CrD	0%	1,035,812
USM0120a	Undeveloped, Woods	RUD	0%	207,411
USM0120b	Estate Lots	CrD	30%	6,315,561
USM0120b	Estate Lots	Or	30%	358,096
USM0120b	Estate Lots	RUD	30%	1,627,941
USM0120b	Transportation	CrD	100%	261,233
USM0120b	Transportation	RUD	100%	206,770
USM0120b	Undeveloped, Woods	CrD	0%	15,952,411
USM0120b	Undeveloped, Woods	Or	0%	2,208,723
USM0120b	Undeveloped, Woods	RUD	0%	2,550,989

Snyder Lag Time - USM0120a USACE Fort Worth District Urbanization Curve Method										
Subbasin	**L (miles)**	**L_{ca} (miles)**	**85%-10% Length (miles)**	**S_{st} (ft/mile)**	**$L*L_{ca}/(S_{st})^{0.5}$**	**Imp. Cover %**	**Urban %**	**Sand %**	**T_p (hrs)**	**Adjusted T_p (hrs)**	**C_p**
PC USM0120a	0.56308	0.34580	0.42231	182.645	0.01441	30.25	75.00	21.39	0.132	0.40	0.75

HEC-HMS MODEL PROPOSED CONDITIONS PARAMETERS				
SUBBASIN	**AREA (SM)**	**IMPERVIOUS (%)**	**LAG (HR)**	**PEAKING COEFFICIENT**
USM0010	3.3488	1.46	2.70	0.72
USM0020	3.2587	0.37	2.10	0.72
USM0030	3.3198	0.39	2.76	0.72
USM0040	1.259	0.26	2.16	0.72
USM0050	2.825	0.00	2.88	0.72
USM0060	2.5992	0.30	2.61	0.72
USM0070	0.7879	0.08	1.17	0.72
USM0080	2.5942	0.13	3.39	0.72
USM0090	1.5935	0.61	1.68	0.72
USM0100	2.468	0.00	2.70	0.72
USM0110	1.2572	0.00	1.62	0.72
USM0120a	0.1445	30.25	0.40	0.72
USM0120b	1.0642	10.03	2.28	0.72

Summary of Peak Dischcharges - La Cima Phase 8 InFRM Atlas 14 Update HEC-HMS Depth-Area Analysis Simulations												
HEC-HMS MODEL ELEMENT	**PRE-PROJECT PEAK DISCHARGE (CFS)**				**POST-PROJECT PEAK DISCHARGE (CFS)**				**DIFFERENCE (CFS)**			
	2-YR	**10-YR**	**25-YR**	**100-YR**	**2-YR**	**10-YR**	**25-YR**	**100-YR**	**2-YR**	**10-YR**	**25-YR**	**100-YR**
J_USM0120	1008	4256	5894	18672	1007	4230	5860	18666	-2	-26	-35	-6
J_USM0110	861	3582	4958	18225	858	3555	4922	18218	-3	-28	-36	-7
USM0120a	70	243	307	419	136	348	435	578	66	106	127	159
USM0120b	213	773	1058	1574	214	774	1059	1576	0	1	2	1

LA CIMA PHASE 8
WATERSHED MAP - PURGATORY CREEK
PROPOSED CONDITIONS HEC-HMS
Model Schematic
San Marcos, Texas

0 50 100 200 300 400 US Feet
Reference Scale: 1:24,000

Spatial Reference
PCS: NAD 1983 State Plane Texas S Central FIPS 4204 Feet
GCS: North American 1983
Datum: North American 1983
Projection: Lambert Conformal Conic
Map Units: Foot US

- Purgatory Creek - HEC-HMS Junctions
- Subbasin Centroid
- CLFP_Proposed
- LFP_Proposed
- Proposed Conditions Subbasins

LandUse
- Estate Lots
- Open Space
- Single Family
- Transportation
- Undeveloped, Woods

- Existing Contours 1'
- Proposed Contours 1'

FEMA Flood Hazard Zones
- Regulatory Floodway
- 1 % Annual Chance Flood Hazard - Zone A
- 0.2 % Annual Chance Flood Hazard - Zone X
- 1 % Annual Chance Flood Hazard - Zone AE

- HAYS COUNTY PARCELS

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151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
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REVISIONS

REVISION	DESCRIPTION	DATE
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PROPOSED WATERSHED MAP

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
30 OF 81

FOR PERMIT

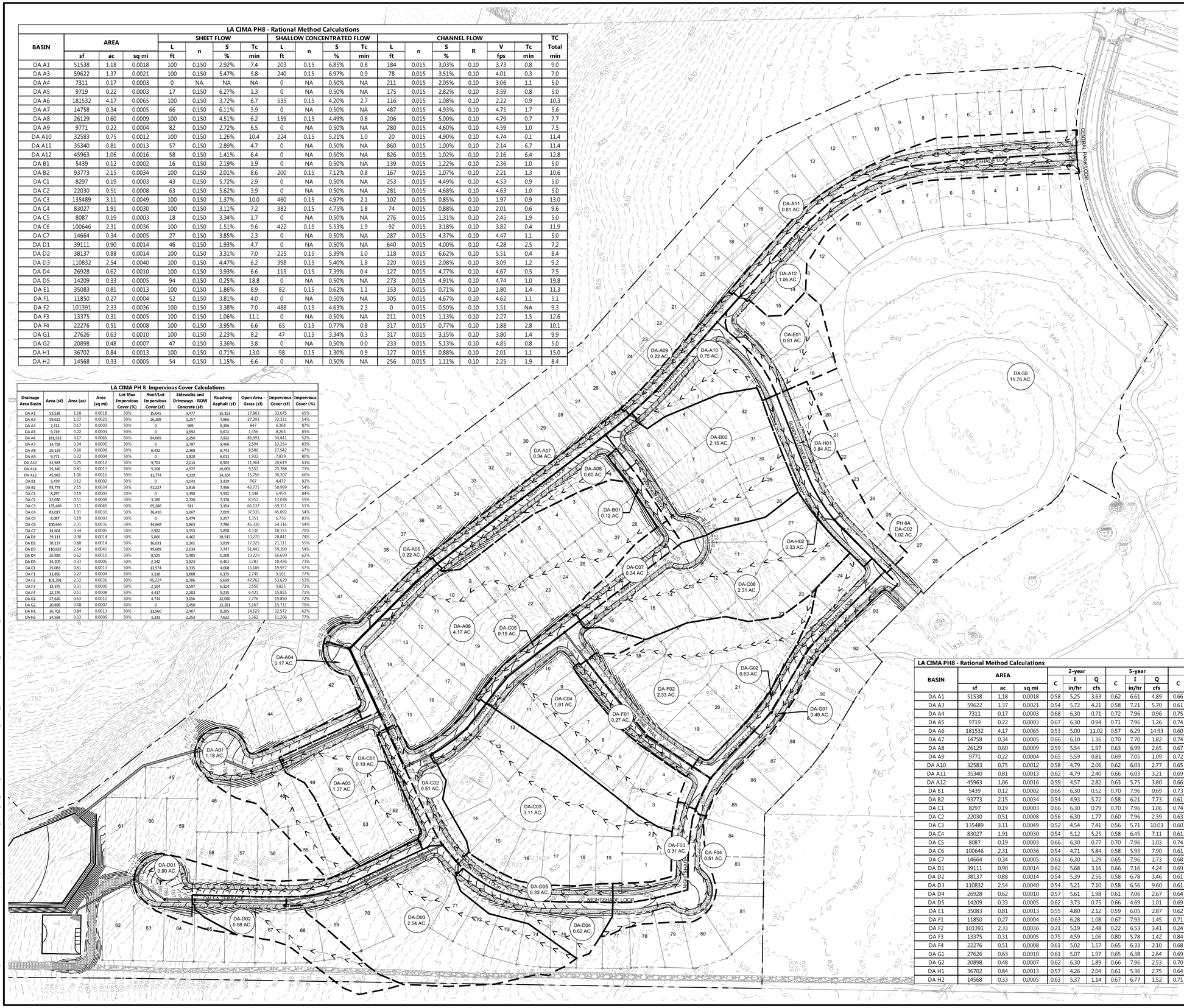
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WATERSHED MAP.dwg, 30 PROPOSED WATERSHED MAP, October 31, 2024, 2:07 PM, mcarrion

LA CIMA PH8 - Rational Method Calculations

BASIN	AREA			SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW						TC Total
				L	n	S	Tc	L	n	S	Tc	L	n	S	R	V	Tc	
	sf	ac	sq mi	ft		%	min	ft		%	min	ft		%		fps	min	min
DA A1	51538	1.18	0.0018	100	0.150	2.92%	7.4	203	0.15	6.85%	0.8	184	0.015	3.03%	0.10	3.73	0.8	9.0
DA A3	59622	1.37	0.0021	100	0.150	5.47%	5.8	240	0.15	6.97%	0.9	78	0.015	3.51%	0.10	4.01	0.3	7.0
DA A4	7311	0.17	0.0003	0	NA	NA	NA	0	NA	0.50%	NA	211	0.015	2.05%	0.10	3.06	1.1	5.0
DA A5	9719	0.22	0.0003	17	0.150	6.27%	1.3	0	NA	0.50%	NA	175	0.015	2.82%	0.10	3.59	0.8	5.0
DA A6	181532	4.17	0.0065	100	0.150	3.72%	6.7	535	0.15	4.20%	2.7	116	0.015	1.08%	0.10	2.22	0.9	10.3
DA A7	14758	0.34	0.0005	66	0.150	6.11%	3.9	0	NA	0.50%	NA	487	0.015	4.93%	0.10	4.75	1.7	5.6
DA A8	26129	0.60	0.0009	100	0.150	4.51%	6.2	159	0.15	4.49%	0.8	206	0.015	5.00%	0.10	4.79	0.7	7.7
DA A9	9771	0.22	0.0004	82	0.150	2.72%	6.5	0	NA	0.50%	NA	280	0.015	4.60%	0.10	4.59	1.0	7.5
DA A10	32583	0.75	0.0012	100	0.150	1.26%	10.4	224	0.15	5.21%	1.0	20	0.015	4.90%	0.10	4.74	0.1	11.4
DA A11	35340	0.81	0.0013	57	0.150	2.89%	4.7	0	NA	0.50%	NA	860	0.015	1.00%	0.10	2.14	6.7	11.4
DA A12	45963	1.06	0.0016	58	0.150	1.41%	6.4	0	NA	0.50%	NA	826	0.015	1.02%	0.10	2.16	6.4	12.8
DA B1	5439	0.12	0.0002	16	0.150	2.19%	1.9	0	NA	0.50%	NA	139	0.015	1.22%	0.10	2.36	1.0	5.0
DA B2	93773	2.15	0.0034	100	0.150	2.01%	8.6	200	0.15	7.12%	0.8	167	0.015	1.07%	0.10	2.21	1.3	10.6
DA C1	8297	0.19	0.0003	43	0.150	5.72%	2.9	0	NA	0.50%	NA	253	0.015	4.49%	0.10	4.53	0.9	5.0
DA C2	22030	0.51	0.0008	63	0.150	5.62%	3.9	0	NA	0.50%	NA	281	0.015	4.68%	0.10	4.63	1.0	5.0
DA C3	135489	3.11	0.0049	100	0.150	1.37%	10.0	460	0.15	4.97%	2.1	102	0.015	0.85%	0.10	1.97	0.9	13.0
DA C4	83027	1.91	0.0030	100	0.150	3.11%	7.2	382	0.15	4.75%	1.8	74	0.015	0.88%	0.10	2.01	0.6	9.6
DA C5	8087	0.19	0.0003	18	0.150	3.34%	1.7	0	NA	0.50%	NA	276	0.015	1.31%	0.10	2.45	1.9	5.0
DA C6	100646	2.31	0.0036	100	0.150	1.51%	9.6	422	0.15	5.53%	1.9	92	0.015	3.18%	0.10	3.82	0.4	11.9
DA C7	14664	0.34	0.0005	27	0.150	3.85%	2.3	0	NA	0.50%	NA	287	0.015	4.37%	0.10	4.47	1.1	5.0
DA D1	39111	0.90	0.0014	46	0.150	1.93%	4.7	0	NA	0.50%	NA	640	0.015	4.00%	0.10	4.28	2.5	7.2
DA D2	38137	0.88	0.0014	100	0.150	3.31%	7.0	225	0.15	5.39%	1.0	118	0.015	6.62%	0.10	5.51	0.4	8.4
DA D3	110832	2.54	0.0040	100	0.150	4.47%	6.2	398	0.15	5.40%	1.8	220	0.015	2.08%	0.10	3.09	1.2	9.2
DA D4	26928	0.62	0.0010	100	0.150	3.93%	6.6	115	0.15	7.39%	0.4	127	0.015	4.77%	0.10	4.67	0.5	7.5
DA D5	14209	0.33	0.0005	94	0.150	0.25%	18.8	0	NA	0.50%	NA	273	0.015	4.91%	0.10	4.74	1.0	19.8
DA E1	35083	0.81	0.0013	100	0.150	1.86%	8.9	82	0.15	0.62%	1.1	153	0.015	0.71%	0.10	1.80	1.4	11.3
DA F1	11850	0.27	0.0004	52	0.150	3.81%	4.0	0	NA	0.50%	NA	305	0.015	4.67%	0.10	4.62	1.1	5.1
DA F2	101391	2.33	0.0036	100	0.150	3.38%	7.0	488	0.15	4.63%	2.3	0	0.015	0.50%	0.10	1.51	NA	9.3
DA F3	13375	0.31	0.0005	100	0.150	1.06%	11.1	0	NA	0.50%	NA	211	0.015	1.13%	0.10	2.27	1.5	12.6
DA F4	22276	0.51	0.0008	100	0.150	3.95%	6.6	65	0.15	0.77%	0.8	317	0.015	0.77%	0.10	1.88	2.8	10.1
DA G1	27626	0.63	0.0010	100	0.150	2.23%	8.2	47	0.15	3.34%	0.3	317	0.015	3.15%	0.10	3.80	1.4	9.9
DA G2	20898	0.48	0.0007	47	0.150	3.36%	3.8	0	NA	0.50%	0.0	233	0.015	5.13%	0.10	4.85	0.8	5.0
DA H1	36702	0.84	0.0013	100	0.150	0.71%	13.0	98	0.15	1.30%	0.9	127	0.015	0.88%	0.10	2.01	1.1	15.0
DA H2	14568	0.33	0.0005	54	0.150	1.15%	6.6	0	NA	0.50%	NA	256	0.015	1.11%	0.10	2.25	1.9	8.4

LA CIMA PH 8 Impervious Cover Calculations

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 A1	51,538	1.18	0.0018	50%	15,045	3,477	15,153	17,863	33,675	65%
DA A3	59,622	1.37	0.0021	50%	26,208	1,257	4,866	27,291	32,331	54%
DA A4	7,311	0.17	0.0003	50%	0	969	5,396	947	6,364	87%
DA A5	9,719	0.22	0.0003	50%	0	1,592	6,672	1,456	8,263	85%
DA A6	181,532	4.17	0.0065	50%	84,669	2,250	7,922	86,691	94,841	52%
DA A7	14,758	0.34	0.0005	50%	0	2,787	9,466	2,504	12,254	83%
DA A8	26,129	0.60	0.0009	50%	6,432	2,368	8,743	8,586	17,542	67%
DA A9	9,771	0.22	0.0004	50%	0	1,828	6,011	1,932	7,839	80%
DA A10	32,583	0.75	0.0012	50%	9,701	2,014	8,905	11,964	20,619	63%
DA A11	35,340	0.81	0.0013	50%	5,208	4,577	16,003	9,552	25,788	73%
DA A12	45,963	1.06	0.0016	50%	11,774	4,329	14,104	15,756	30,207	66%
DA B1	5,439	0.12	0.0002	50%	0	1,043	3,429	967	4,472	82%
DA B2	93,773	2.15	0.0034	50%	41,227	1,816	7,956	42,775	50,999	54%
DA C1	8,297	0.19	0.0003	50%	0	1,358	5,592	1,348	6,950	84%
DA C2	22,030	0.51	0.0008	50%	3,180	2,720	7,178	8,952	13,078	59%
DA C3	135,489	3.11	0.0049	50%	65,286	911	3,154	66,137	69,351	51%
DA C4	83,027	1.91	0.0030	50%	36,416	1,667	7,009	37,935	45,092	54%
DA C5	8,087	0.19	0.0003	50%	0	1,479	5,257	1,351	6,736	83%
DA C6	100,646	2.31	0.0036	50%	44,668	1,863	7,786	46,330	54,316	54%
DA C7	14,664	0.34	0.0005	50%	2,922	1,553	5,858	4,330	10,333	70%
DA D1	39,111	0.90	0.0014	50%	5,866	4,462	18,513	10,270	28,841	74%
DA D2	38,137	0.88	0.0014	50%	16,031	1,261	3,819	17,025	21,111	55%
DA D3	110,832	2.54	0.0040	50%	49,609	2,034	7,747	51,442	59,390	54%
DA D4	26,928	0.62	0.0010	50%	8,525	1,905	6,268	10,229	16,699	62%
DA D5	14,209	0.33	0.0005	50%	2,142	1,823	6,461	3,783	10,426	73%
DA E1	35,083	0.81	0.0013	50%	13,974	1,335	4,668	15,106	19,977	57%
DA F1	11,850	0.27	0.0004	50%	1,138	1,928	6,175	2,749	9,101	77%
DA F2	101,391	2.33	0.0036	50%	46,224	1,706	5,699	47,762	53,629	53%
DA F3	13,375	0.31	0.0005	50%	2,104	1,597	6,124	3,550	9,825	73%
DA F4	22,276	0.51	0.0008	50%	4,437	2,203	9,215	6,421	15,855	71%
DA G1	27,626	0.63	0.0010	50%	4,744	3,056	12,050	7,776	19,850	72%
DA G2	20,898	0.48	0.0007	50%	0	3,450	12,281	5,167	15,731	75%
DA H1	36,702	0.84	0.0013	50%	11,960	2,407	8,205	14,129	22,572	62%
DA H2	14,568	0.33	0.0005	50%	1,331	2,253	7,622	3,362	11,206	77%



100 0 100 200

SCALE: 1 INCH = 100 FT

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
- BERM
- SWALE
- DRAINAGE AREA IDENTIFIER (XX / XX.XX)
- FLOW ARROW
- HEADWALL
- CURB INLET
- AREA INLET
- JUNCTION BOX

LA CIMA PH8 - Rational Method Calculations

BASIN	AREA			2-year			5-year			10-year			25-year			50-year		100-year		
				C	I	Q	C	I	Q	C	I	Q	C	I	Q	I	Q	C	I	Q
	sf	ac	sq mi		in/hr	cfs		in/hr	cfs		in/hr	cfs		in/hr	cfs	in/hr	cfs		in/hr	cfs
DA A1	51538	1.18	0.0018	0.58	5.25	3.63	0.62	6.61	4.89	0.66	7.77	6.05	0.70	9.37	7.81	10.61	9.30	0.79	11.98	11.16
DA A3	59622	1.37	0.0021	0.54	5.72	4.21	0.58	7.21	5.70	0.61	8.49	7.07	0.65	10.26	9.19	11.63	10.98	0.73	13.16	13.24
DA A4	7311	0.17	0.0003	0.68	6.30	0.71	0.72	7.96	0.96	0.75	9.39	1.19	0.80	11.39	1.53	12.94	1.83	0.89	14.70	2.19
DA A5	9719	0.22	0.0003	0.67	6.30	0.94	0.71	7.96	1.26	0.74	9.39	1.56	0.79	11.39	2.02	12.94	2.40	0.88	14.70	2.89
DA A6	181532	4.17	0.0065	0.53	5.00	11.02	0.57	6.29	14.93	0.60	7.39	18.49	0.65	8.91	23.95	10.08	28.58	0.73	11.37	34.37
DA A7	14758	0.34	0.0005	0.66	6.10	1.36	0.70	7.70	1.82	0.74	9.08	2.26	0.78	11.00	2.92	12.48	3.48	0.87	14.16	4.18
DA A8	26129	0.60	0.0009	0.59	5.54	1.97	0.63	6.99	2.65	0.67	8.23	3.28	0.71	9.93	4.24	11.25	5.06	0.80	12.72	6.07
DA A9	9771	0.22	0.0004	0.65	5.59	0.81	0.69	7.05	1.09	0.72	8.30	1.35	0.77	10.03	1.73	11.36	2.06	0.86	12.84	2.47
DA A10	32583	0.75	0.0012	0.58	4.79	2.06	0.62	6.03	2.77	0.65	7.08	3.43	0.69	8.53	4.43	9.65	5.27	0.78	10.87	6.32
DA A11	35340	0.81	0.0013	0.62	4.79	2.40	0.66	6.03	3.21	0.69	7.09	3.97	0.74	8.53	5.11	9.65	6.08	0.82	10.88	7.26
DA A12	45963	1.06	0.0016	0.59	4.57	2.82	0.63	5.75	3.80	0.66	6.75	4.70	0.71	8.12	6.05	9.19	7.20	0.79	10.35	8.62
DA B1	5439	0.12	0.0002	0.66	6.30	0.52	0.70	7.96	0.69	0.73	9.39	0.86	0.78	11.39	1.11	12.94	1.32	0.87	14.70	1.59
DA B2	93773	2.15	0.0034	0.54	4.93	5.72	0.58	6.21	7.73	0.61	7.30	9.57	0.65	8.79	12.39	9.95	14.78	0.74	11.21	17.76
DA C1	8297	0.19	0.0003	0.66	6.30	0.79	0.70	7.96	1.06	0.74	9.39	1.32	0.79	11.39	1.71	12.94	2.03	0.87	14.70	2.45
DA C2	22030	0.51	0.0008	0.56	6.30	1.77	0.60	7.96	2.39	0.63	9.39	2.99	0.67	11.39	3.89	12.94	4.65	0.76	14.70	5.62
DA C3	135489	3.11	0.0049	0.52	4.54	7.41	0.56	5.71	10.03	0.60	6.70	12.41	0.64	8.07	16.07	9.12	19.17	0.72	10.28	23.03
DA C4	83027	1.91	0.0030	0.54	5.12	5.25	0.58	6.45	7.11	0.61	7.58	8.80	0.65	9.14	11.40	10.35	13.60	0.74	11.67	16.35
DA C5	8087	0.19	0.0003	0.66	6.30	0.77	0.70	7.96	1.03	0.74	9.39	1.29	0.79	11.39	1.66	12.94	1.98	0.87	14.70	2.38
DA C6	100646	2.31	0.0036	0.54	4.71	5.84	0.58	5.93	7.90	0.61	6.97	9.78	0.65	8.39	12.66	9.49	15.09	0.73	10.69	18.12
DA C7	14664	0.34	0.0005	0.61	6.30	1.29	0.65	7.96	1.73	0.68	9.39	2.15	0.73	11.39	2.79	12.94	3.33	0.81	14.70	4.02
DA D1	39111	0.90	0.0014	0.62	5.68	3.16	0.66	7.16	4.24	0.69	8.43	5.25	0.74	10.18	6.78	11.54	8.07	0.83	13.05	9.69
DA D2	38137	0.88	0.0014	0.54	5.39	2.56	0.58	6.78	3.46	0.61	7.98	4.29	0.66	9.63	5.56	10.91	6.63	0.74	12.32	7.98
DA D3	110832	2.54	0.0040	0.54	5.21	7.10	0.58	6.56	9.60	0.61	7.72	11.90	0.65	9.31	15.42	10.54	18.40	0.73	11.89	22.14
DA D4	26928	0.62	0.0010	0.57	5.61	1.98	0.61	7.06	2.67	0.64	8.32	3.31	0.69	10.05	4.28	11.39	5.11	0.77	12.87	6.14
DA D5	14209	0.33	0.0005	0.62	3.73	0.75	0.66	4.69	1.01	0.69	5.51	1.24	0.74	6.62	1.60	7.50	1.90	0.83	8.44	2.27
DA E1	35083	0.81	0.0013	0.55	4.80	2.12	0.59	6.05	2.87	0.62	7.10	3.55	0.67	8.55	4.59	9.68	5.47	0.75	10.90	6.57
DA F1	11850	0.27	0.0004	0.63	6.28	1.08	0.67	7.93	1.45	0.71	9.36	1.80	0.76	11.35	2.33	12.89	2.78	0.84	14.64	3.35
DA F2	101391	2.33	0.0036	0.21	5.19	2.48	0.22	6.53	3.41	0.24	7.68	4.32	0.27	9.26	5.71	10.48	6.90	0.31	11.82	8.44
DA F3	13375	0.31	0.0005	0.75	4.59	1.06	0.80	5.78	1.42	0.84	6.79	1.75	0.89	8.17	2.24	9.24	2.66	0.99	10.41	3.18
DA F4	22276	0.51	0.0008	0.61	5.02	1.57	0.65	6.33	2.10	0.68	7.44	2.60	0.73	8.96	3.35	10.14	3.98	0.81	11.43	4.76
DA G1	27626	0.63	0.0010	0.61	5.07	1.97	0.65	6.38	2.64	0.69	7.51	3.27	0.73	9.04	4.21	10.24	5.00	0.82	11.54	5.99
DA G2	20898	0.48	0.0007	0.62	6.30	1.89	0.66	7.96	2.53	0.70	9.39	3.15	0.75	11.39	4.08	12.94	4.87	0.83	14.70	5.87
DA H1	36702	0.84	0.0013	0.57	4.26	2.04	0.61	5.36	2.75	0.64	6.30	3.40	0.69	7.57	4.38	8.57	5.22	0.77	9.64	6.25
DA H2	14568	0.33	0.0005	0.63	5.37	1.14	0.67	6.77	1.52	0.71	7.96	1.89	0.76	9.61	2.43	10.88	2.89	0.84	12.29	3.46

Bowman
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TBPE Firm Registration No.: F-14309
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San Marcos, Texas 78666
Phone: (512) 396-2600
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REVISIONS

REVISION	DESCRIPTION	DATE
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INLET DRAINAGE AREA MAP

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 31 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DAM-INLET.dwg, INLET DRAINAGE AREA MAP, October 31, 2024, 2:02 PM, mcarrion

LA CIMA PHASE 8 BOUNDARY

LA CIMA PHASE 5C PICP #2022-41204

CENTRAL PARK LOOP

NIGHTSHADE LOOP

ENVIRONMENTALLY SENSITIVE FEATURE

FUTURE ALIGNMENT OF WEST CENTERPOINT ROAD

CREEK CENTERLINE

WATER QUALITY ZONE

WATER QUALITY BUFFER ZONE

WQP 8A

WQP 8B

10' CURB INLET A11
STA: ???, ???
RIM = 840.10

STD. 4' DIA. SDMH
STA: 21+86.14, SD LN A
RIM = 838.58

STD. 4' DIA. SDMH
STA: 22+61.14, SD LN A
RIM = 839.94

10' CURB INLET A10
STA: 22+82.93, SD LN A
RIM = 840.22

STD. 4' DIA. SDMH
STA: 18+92.67, SD LN A
RIM = 825.37

10' CURB INLET
STA: 1+49.68, SD LN E
RIM = 838.98

10' CURB INLET A9
STA: 0+69.49, SD LAT A8 & A9
RIM = 825.54

18" 45° BEND
STA: 1+23.50, SD LN E
RIM = 835.53

STD. 4' x 4' JUNCTION BOX
STA: 18+21.07, SD LN A
RIM = 821.80

STD. 4' DIA. SDMH
STA: 19+73.31, SD LN A
RIM = 829.42

10' CURB INLET A8
STA: 1+06.98, SD LAT A8 & A9
RIM = 825.92

STD. 4' DIA. SDMH
STA: 15+78.82, SD LN A
RIM = 810.31

10' CURB INLET B2
STA: 0+68.00, SD LAT B1
RIM = 820.77

STD. 4' DIA. SDMH
STA: 1+93.83, SD LN B
RIM = 821.44

10' CURB INLET A7
STA: 0+68.06, SD LAT A6 & A7
RIM = 797.61

STD. 4' DIA. SDMH
STA: 13+34.00, SD LN A
RIM = 797.44

10' CURB INLET B1
STA: 1+94.01, SD LN B
RIM = 820.77

10' CURB INLET H1
STA: 0+67.75, SD LAT H1
RIM = 837.07

STD. 4' DIA. SDMH
STA: 12+69.34, SD LN A
RIM = 794.40

10' CURB INLET H2
STA: 2+91.47, SD LN H
RIM = 837.05

10' CURB INLET A4
STA: 0+67.99, SD LAT A4
RIM = 791.98

10' CURB INLET C8
STA: 0+68.00, SD LAT C8
RIM = 809.28

STD. 4' DIA. SDMH
STA: 7+88.41, SD LN C
RIM = 809.11

STD. 4' DIA. SDMH
STA: 2+64.87, SD LN H
RIM = 836.90

STD. 4' DIA. SDMH
STA: 7+24.81, SD LN G
RIM = 838.22

10' CURB INLET A5
STA: 0+74.25, SD LAT A5
RIM = 791.73

10' CURB INLET A6
STA: 1+05.01, SD LAT A6 & A7
RIM = 797.80

18"X30" WYE
STA: 11+20.69, SD LN A
RIM = 788.49

STD. 4' x 4' JUNCTION BOX
STA: 7+43.22, SD LN C
RIM = 808.30

STD. 6' DIA. SDMH
STA: 10+54.03, SD LN A
RIM = 792.21

10' CURB INLET C7
STA: 8+07.09, SD LN C
RIM = 809.34

STD. 4' DIA. SDMH
STA: 5+73.09, SD LN C
RIM = 805.73

10' CURB INLET A3
STA: 0+68.00, SD LAT A3
RIM = 792.21

10' CURB INLET F2
STA: 0+68.81, SD LAT F1 & F2
RIM = 810.16

10' CURB INLET C6
STA: 0+68.03, SD LAT C5 & C6
RIM = 804.80

10' CURB INLET C2
STA: 0+68.00, SD LAT C1 & C2
RIM = 798.91

STD. 6' x 6' JUNCTION BOX
STA: 8+85.14, SD LN A
RIM = 797.40

STD. 4' DIA. SDMH
STA: 1+81.51, SD LN F
RIM = 809.77

10' CURB INLET C1
STA: 1+04.77, SD LAT C1 & C2
RIM = 798.90

10' CURB INLET F1
STA: 1+06.62, SD LAT F1 & F2
RIM = 809.94

48" 22.5 ° HORIZONTAL BEND
STA: 3+01.28, SD LN A
RIM = 764.16

STD. 4' DIA. SDMH
STA: 4+74.99, SD LN G
RIM = 830.00

10' CURB INLET
STA: 4+33.03, SD LN A
RIM = 783.65

STD. 4' DIA. SDMH
STA: 4+97.49, SD LN C
RIM = 804.62

10' CURB INLET G2
STA: 0+68.00, SD LAT G1 & G2
RIM = 824.56

STD. 4' DIA. SDMH
STA: 3+06.43, SD LN G
RIM = 825.03

CONNECT TO WATER QUALITY POND 8A
STA: 1+11.41, SD LN A
RIM = 759.41

10' CURB INLET C5
STA: 1+06.49, SD LAT C5 & C6
RIM = 804.90

STD. 4' DIA. SDMH
STA: 2+47.59, SD LN G
RIM = 824.39

STD. 6' DIA. SDMH
STA: 1+63.59, SD LN C
RIM = 798.74

STD. 4' DIA. SDMH
STA: 4+24.67, SD LN C
RIM = 803.52

10' CURB INLET G1
STA: 1+05.19, SD LAT G1 & G2
RIM = 824.57

10' CURB INLET A1
STA: 1+05.00, SD LAT A1
RIM = 791.22

10' CURB INLET C3
STA: 0+67.43, SD LAT C3
RIM = 802.33

STD. 4' DIA. SDMH
STA: 4+04.68, SD LN F
RIM = 820.62

STD. 4' DIA. SDMH
STA: 5+62.00, SD LN A
RIM = 787.58

STD. 6' x 6' JUNCTION BOX
STA: 2+56.01, SD LN C
RIM = 802.51

STD. 6' DIA. SDMH
STA: 3+26.20, SD LN C
RIM = 802.15

STD. 4' x 4' JUNCTION BOX
STA: 5+80.34, SD LN F
RIM = 825.59

10' CURB INLET F3
STA: 0+67.86, SD LAT F3
RIM = 826.55

STD. 4' DIA. SDMH
STA: 6+59.16, SD LN F
RIM = 826.38

10' CURB INLET
STA: 0+68.72, SD LAT D1
RIM = 784.06

STD. 5' DIA. SDMH
STA: 6+38.63, SD LN A
RIM = 791.04

STD. 4' DIA. SDMH
STA: 10+15.14, SD LN D
RIM = 812.32

10' CURB INLET F4
STA: 6+82.23, SD LN F
RIM = 826.69

STD. 4' DIA. SDMH
STA: 4+21.40, SD LN D
RIM = 790.70

10' CURB INLET
STA: 0+67.82, SD LAT D4
RIM = 815.32

CONNECT TO WATER QUALITY POND 8B
STA: 1+07.98, SD LN D
RIM = 777.70

STD. 4' DIA. SDMH
STA: 7+62.24, SD LN D
RIM = 806.52

STD. 4' DIA. SDMH
STA: 10+71.69, SD LN D
RIM = 815.15

STD. 4' DIA. SDMH
STA: 3+52.21, SD LN D
RIM = 785.75

STD. 4' DIA. SDMH
STA: 6+31.40, SD LN D
RIM = 803.69

10' CURB INLET
STA: 10+95.32, SD LN D
RIM = 816.04

10' CURB INLET
STA: 0+83.50, SD LAT D2
RIM = 790.99

10' CURB INLET
STA: 1+06.45, SD LAT D3
RIM = 803.98

LA CIMA PHASE 8 BOUNDARY

120 0 120 240
SCALE: 1 INCH = 120 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WW WASTEWATER LINE
- WL WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

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OVERALL STORM SEWER PLAN

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
32 OF 81

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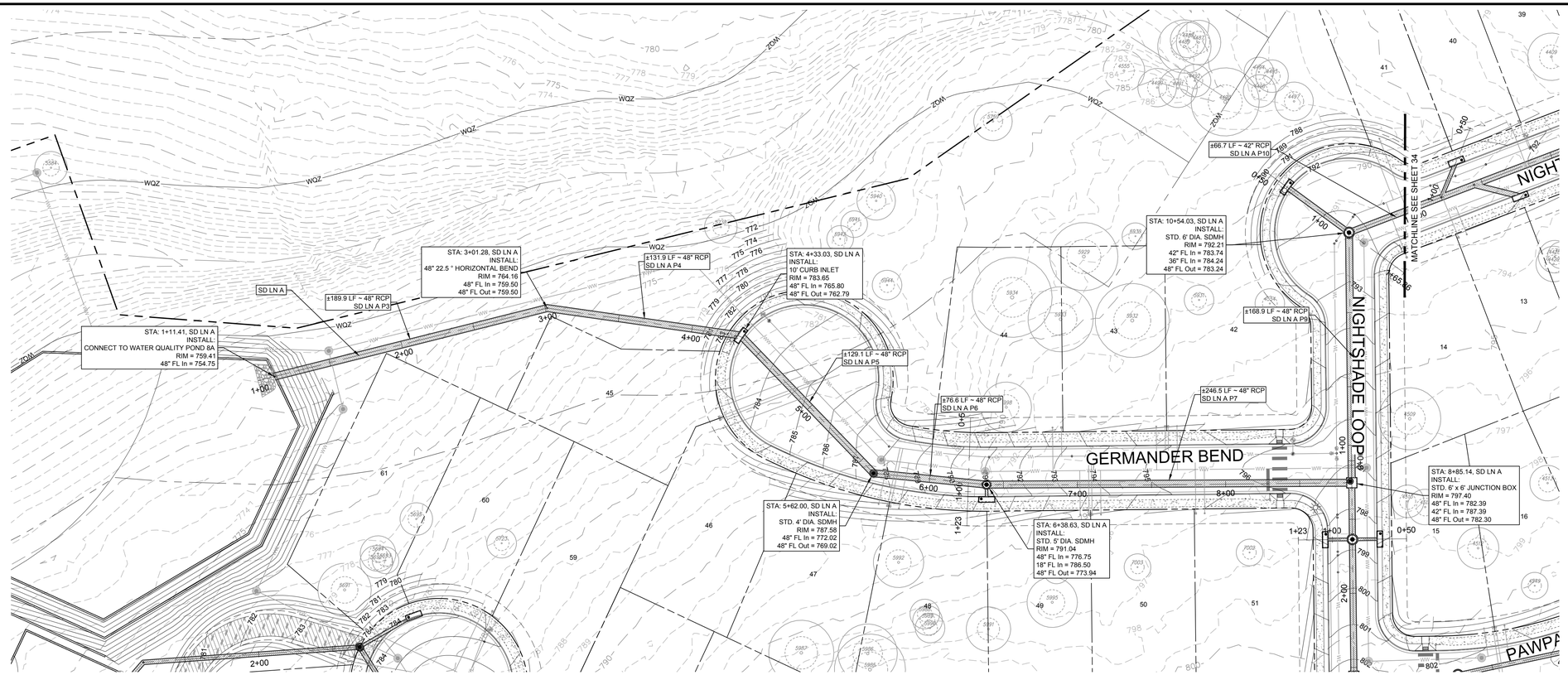
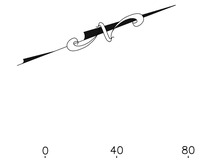
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 32 OVERALL STORM SEWER PLAN, October 31, 2024, 2:04 PM, mcarrion

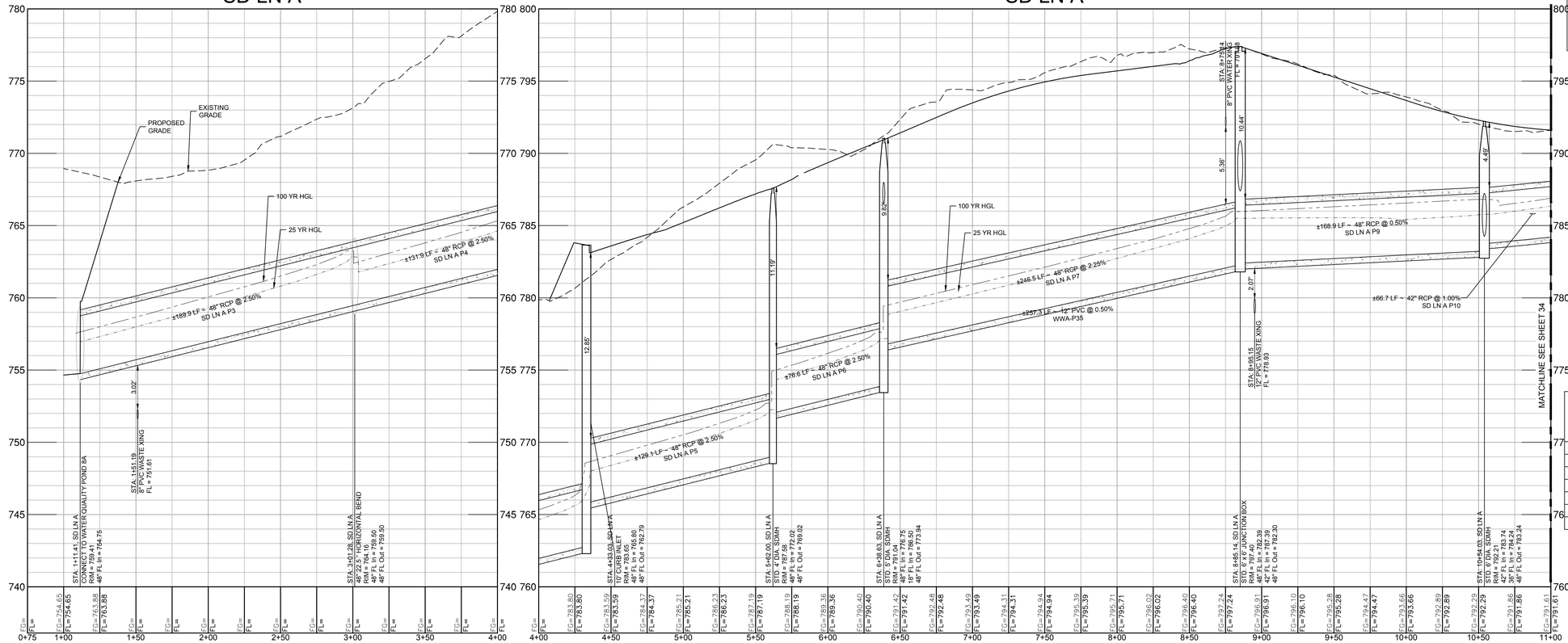




LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL	1"= 40' HORIZONTAL
PROPOSED GRADE CL	1"= 4' VERTICAL
HGL - 100yr	
HGL - 25yr	
ELEVATION EXISTING GRADE — EG=YYY.YY	ELEVATION PROPOSED GRADE — FG=XXX.XX



Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN A P3	48	122.76	18.43	178.54	20.02
SD LN A P4	48	123.14	18.42	179.05	20.01
SD LN A P5	48	115.2	18.12	166.58	19.72
SD LN A P6	48	115.41	18.16	166.86	19.77
SD LN A P7	48	112.79	17.35	163.77	18.87
SD LN A P9	48	70.77	8.76	108.47	9.12
SD LN A P10	42	59.35	10.91	85.2	11.75

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STORM SEWER LN A PLAN & PROFILE (1 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 33 OF 81

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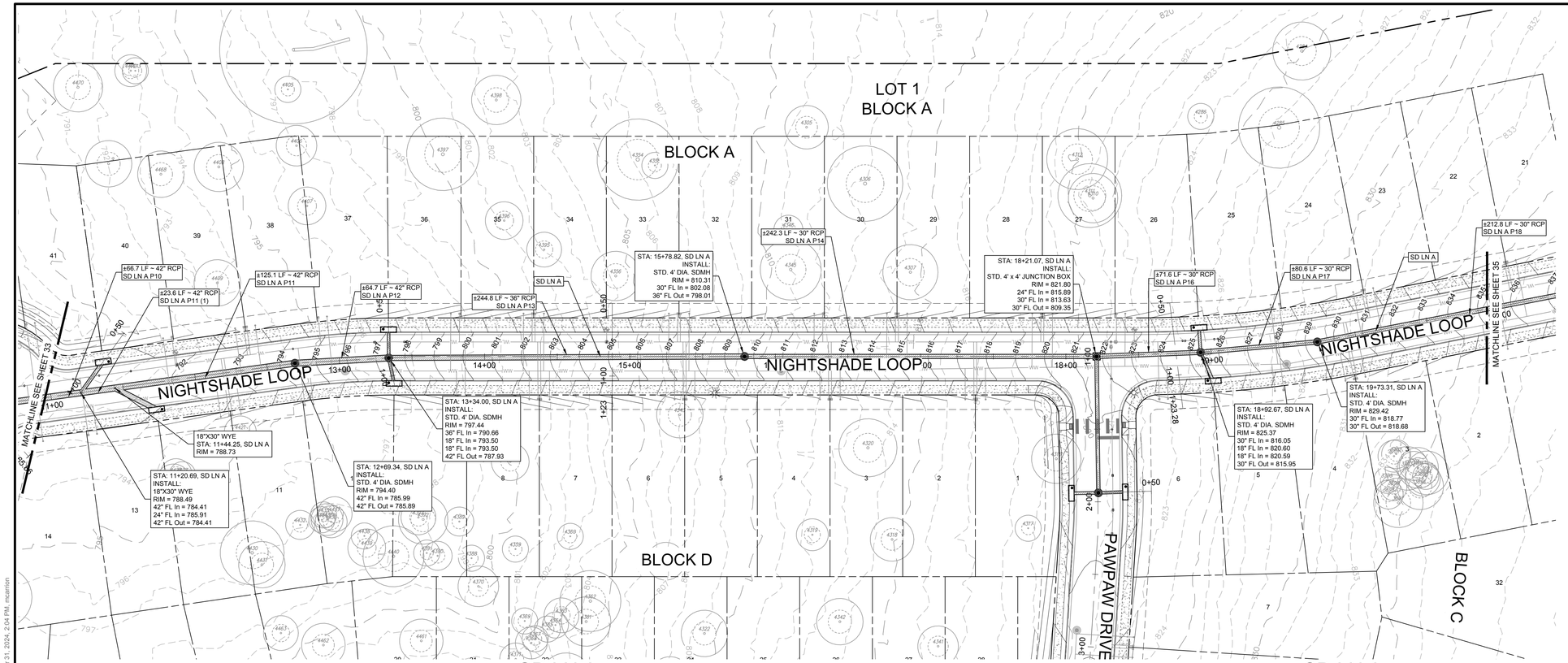
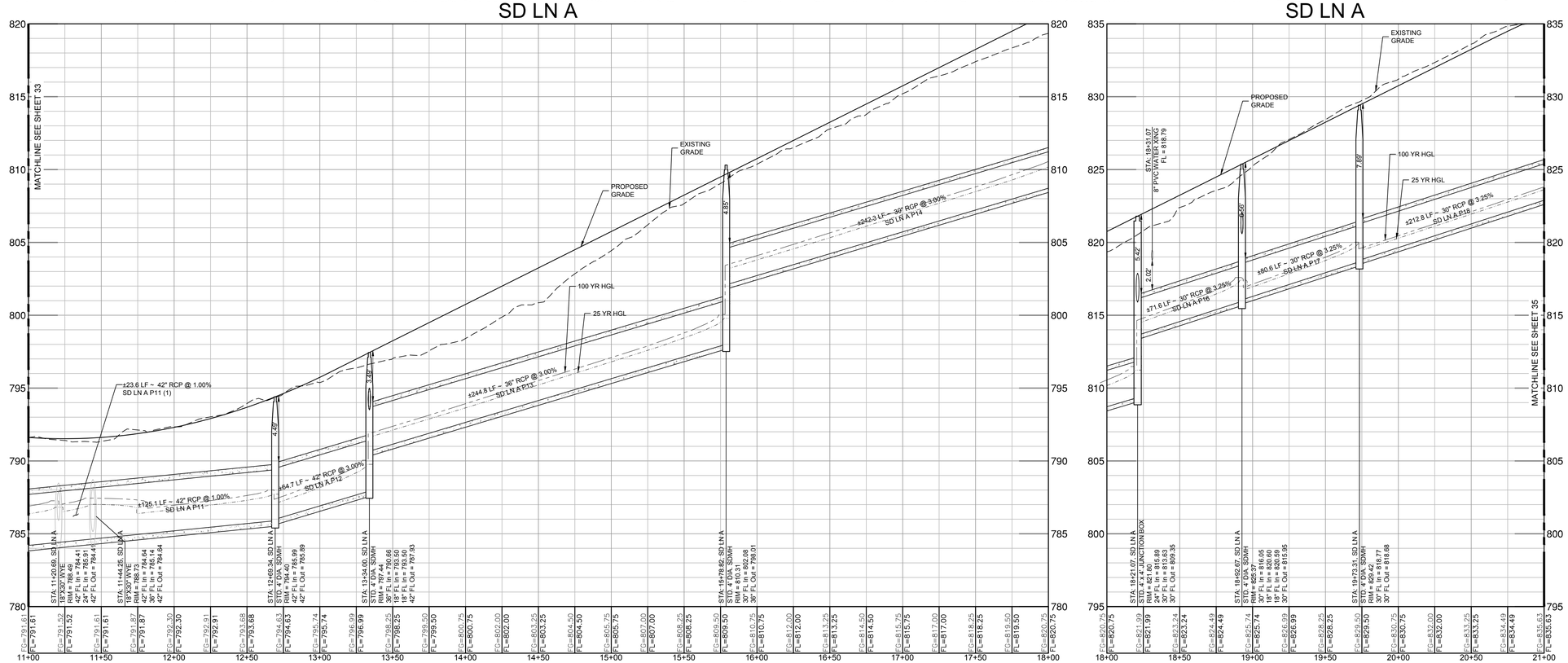
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 33 STORM SEWER LN A PLAN & PROFILE (1 OF 3), October 31, 2024 - 2:04 PM, mcarrion





SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE: FL=YY.YY ELEVATION PROPOSED GRADE: FG=XXX.XX	

Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN A P11 (1)	42	57.7	10.72	82.1	11.54
SD LN A P11	42	34.84	9.5	47.04	10.28
SD LN A P12	42	34.92	14.15	47.15	15.39
SD LN A P13	36	30.06	13.74	40.5	14.9
SD LN A P14	30	30.34	13.9	40.86	14.98
SD LN A P16	30	18.48	12.52	23.65	13.4
SD LN A P17	30	13.05	11.35	16.24	12.07
SD LN A P18	30	13.18	11.38	16.4	12.11

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STORM SEWER LN A PLAN & PROFILE (2 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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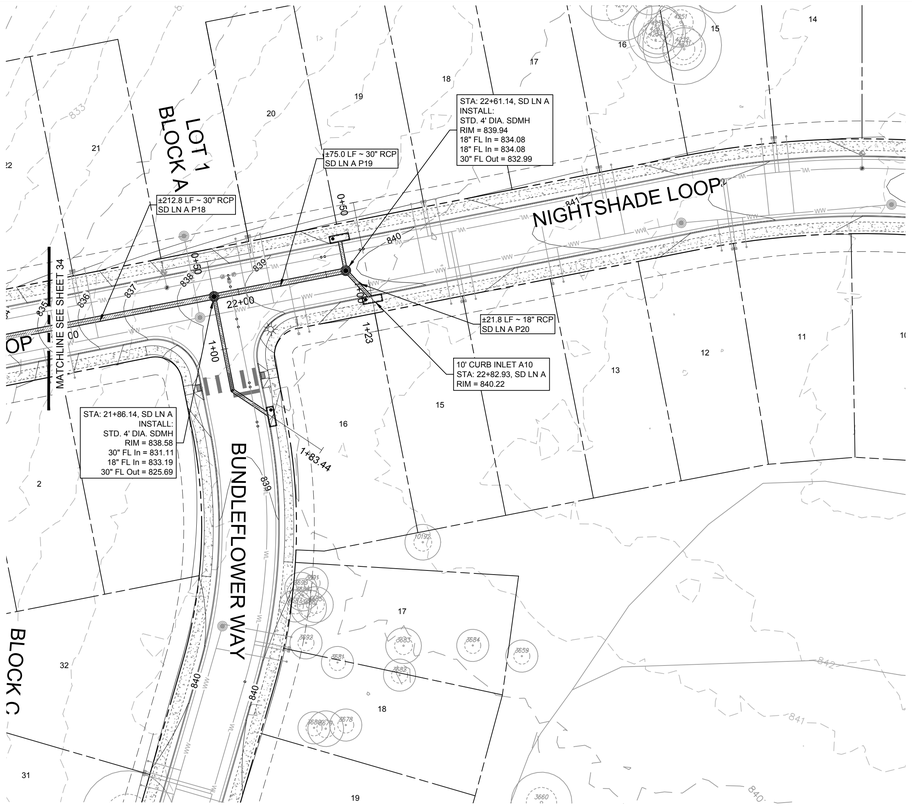

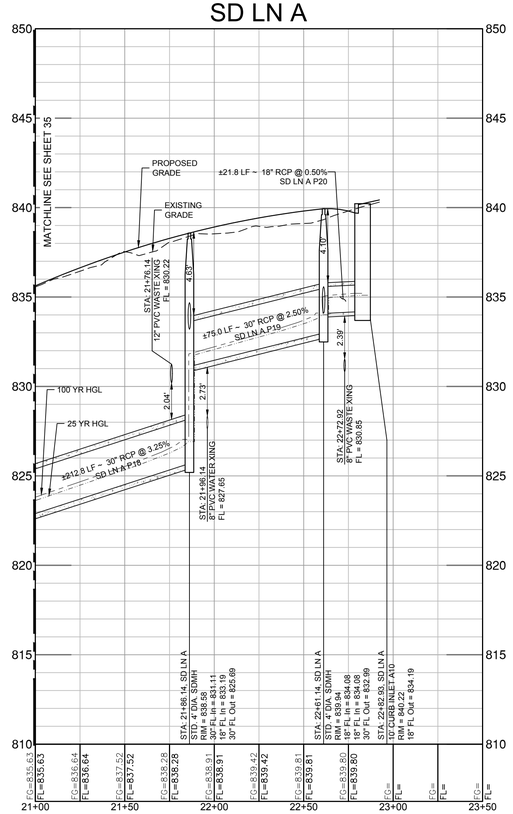



LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE — EG=YXX.XX	ELEVATION PROPOSED GRADE — FG=XXX.XX

Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN A P18	30	13.18	11.38	16.4	12.11
SD LN A P19	30	9.26	9.37	11.45	9.95
SD LN A P20	18	5.05	4.52	6.23	4.71

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STORM SEWER LN A PLAN & PROFILE (3 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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35 OF 81

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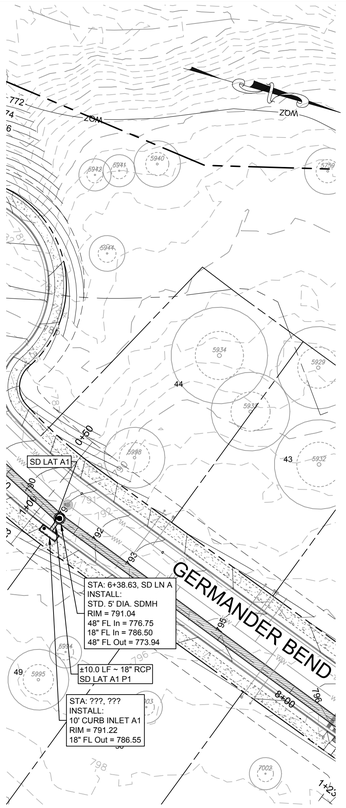
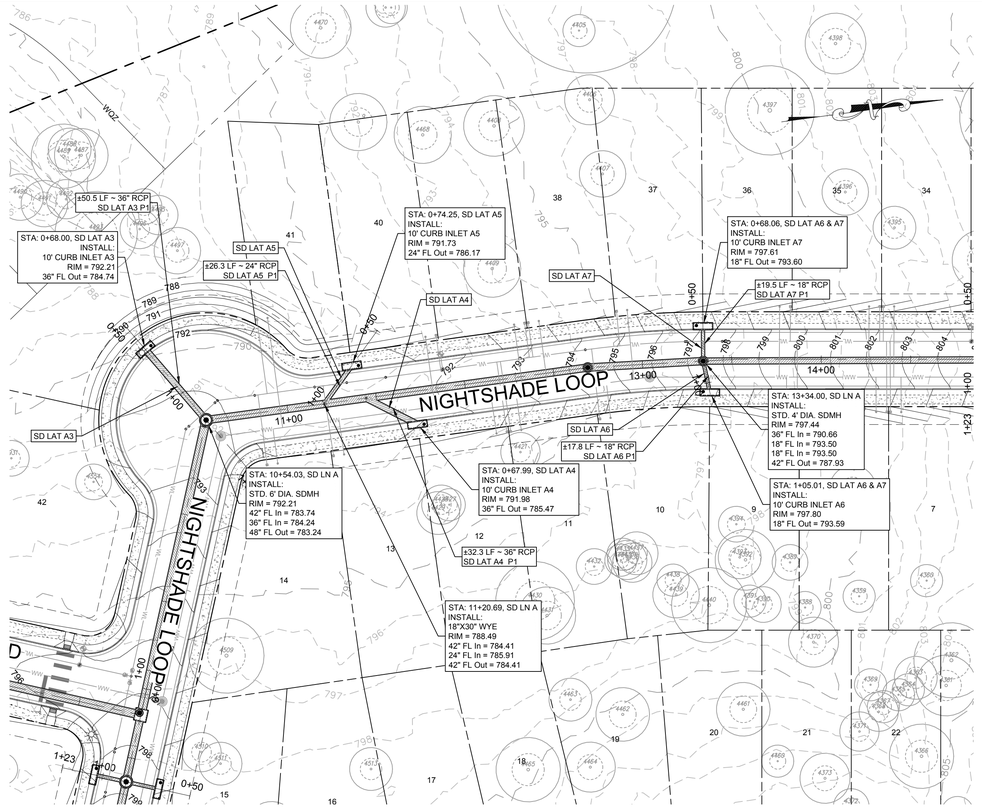
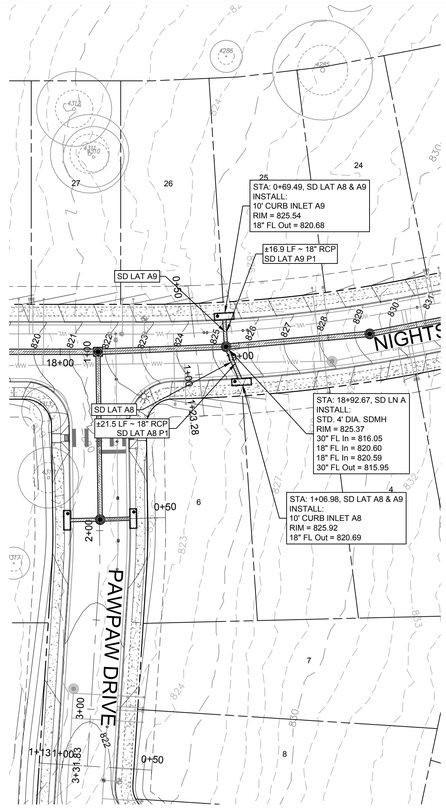
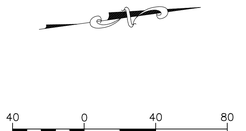




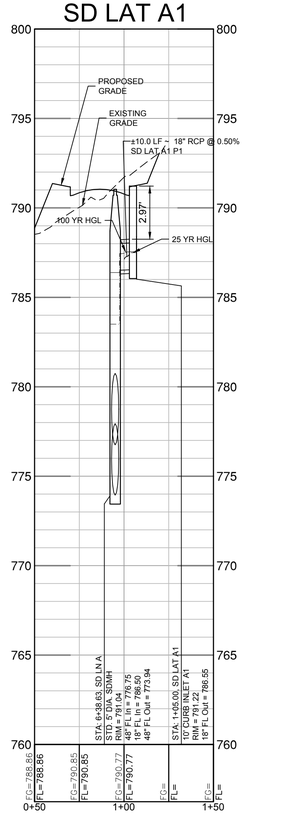


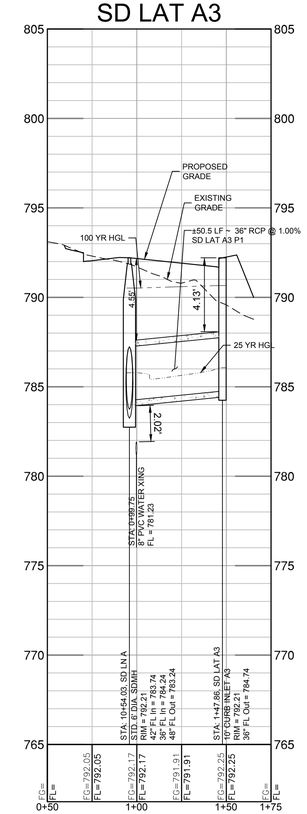


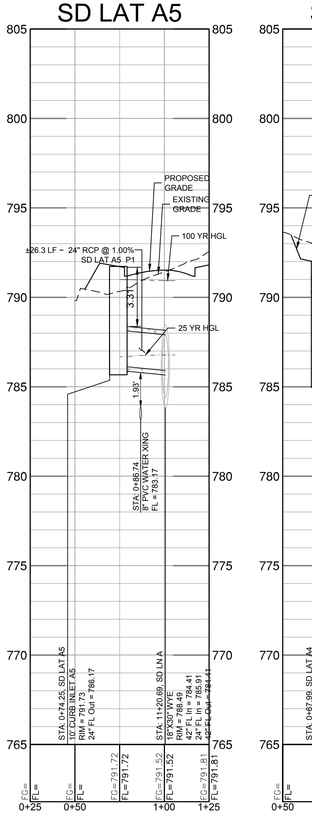
LEGEND

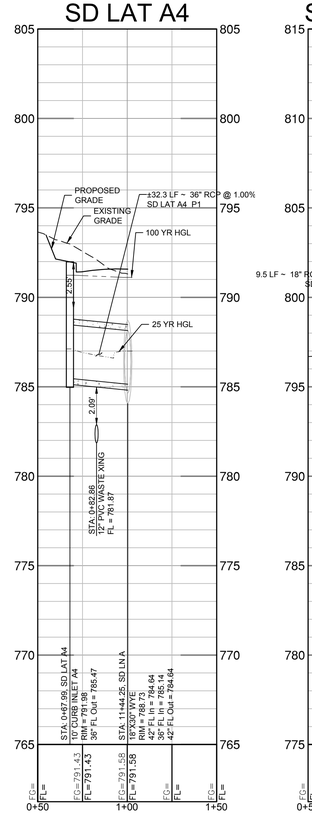
- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WW WASTEWATER LINE
- WL WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

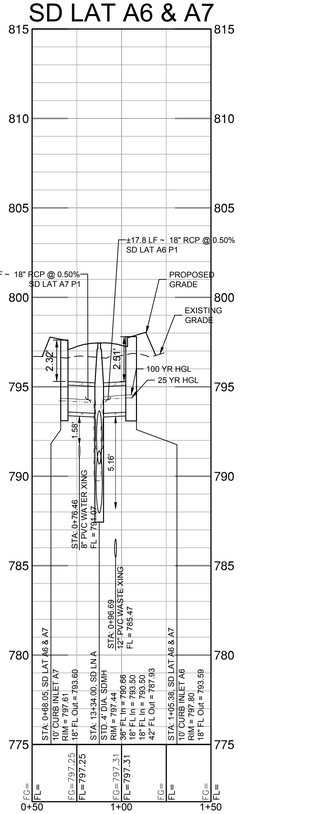
PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE FG=XXX.XX	ELEVATION PROPOSED GRADE FG=XXX.XX

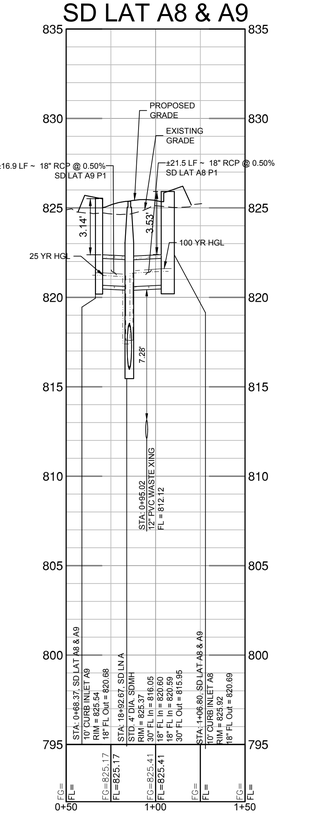












Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LAT A1 P1	18	5.05	4.52	6.1	4.69
SD LAT A3 P1	36	17.24	7.89	35.27	9.53
SD LAT A4 P1	36	26.73	8.98	40.85	9.99
SD LAT A5 P1	24	2.53	4.74	4.76	5.68
SD LAT A6 P1	18	4.14	4.32	5.6	4.62
SD LAT A7 P1	18	2.7	3.87	3.76	4.22
SD LAT A8 P1	18	3.93	4.26	5.2	4.55
SD LAT A9 P1	18	2.3	3.7	3.31	4.08

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REVISION	DESCRIPTION	DATE
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STORM SEWER LAT A1-A9 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
36 OF 81

FOR PERMIT

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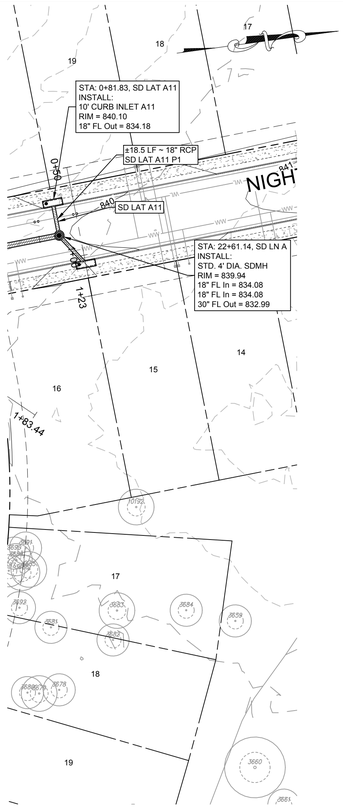
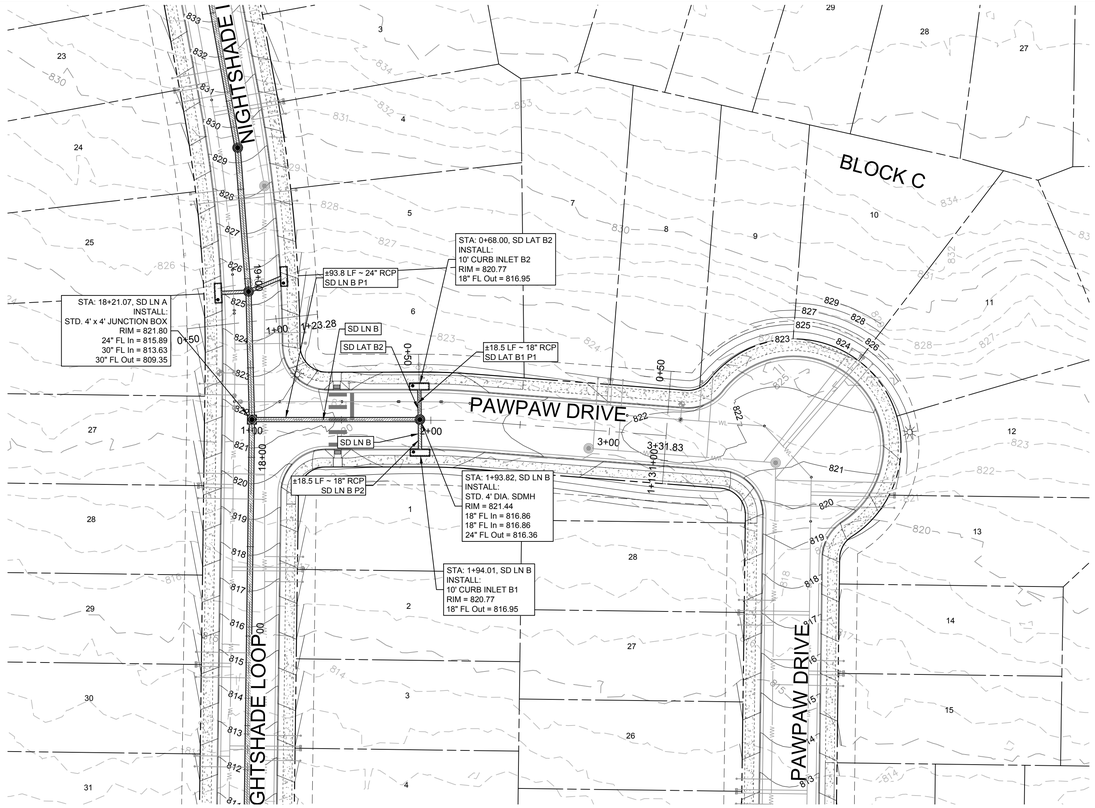
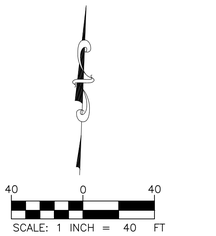


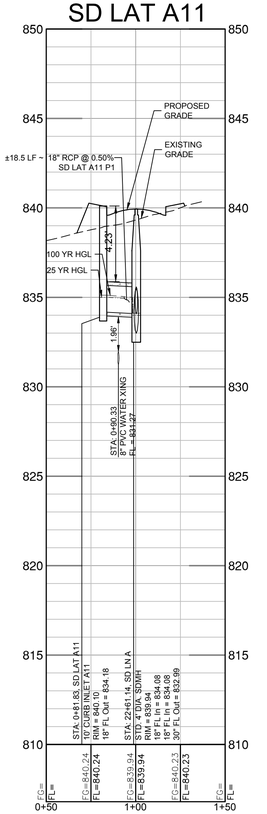


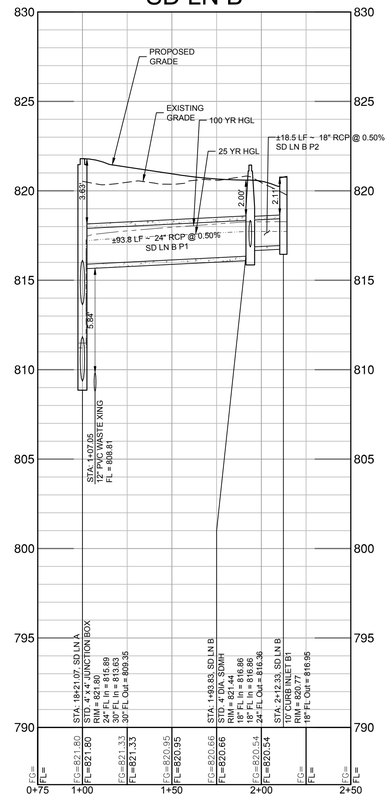


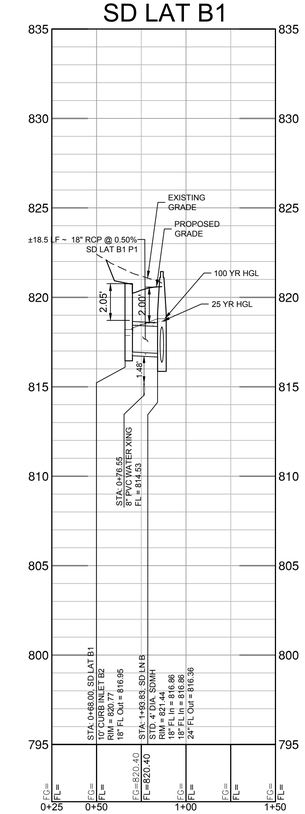
LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE: FG=YYY.YY	ELEVATION PROPOSED GRADE: FG=XXX.XX







Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LAT A11 P1	18	4.44	4.39	5.52	4.6
SD LN B P1	24	13.19	5.69	19.14	6.09
SD LN B P2	18	1.07	2.99	1.55	3.32
SD LAT B1 P1	18	12.38	7.01	17.98	10.18

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STORM SEWER LN B, LAT A10-A11 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 37 OF 81

FOR PERMIT

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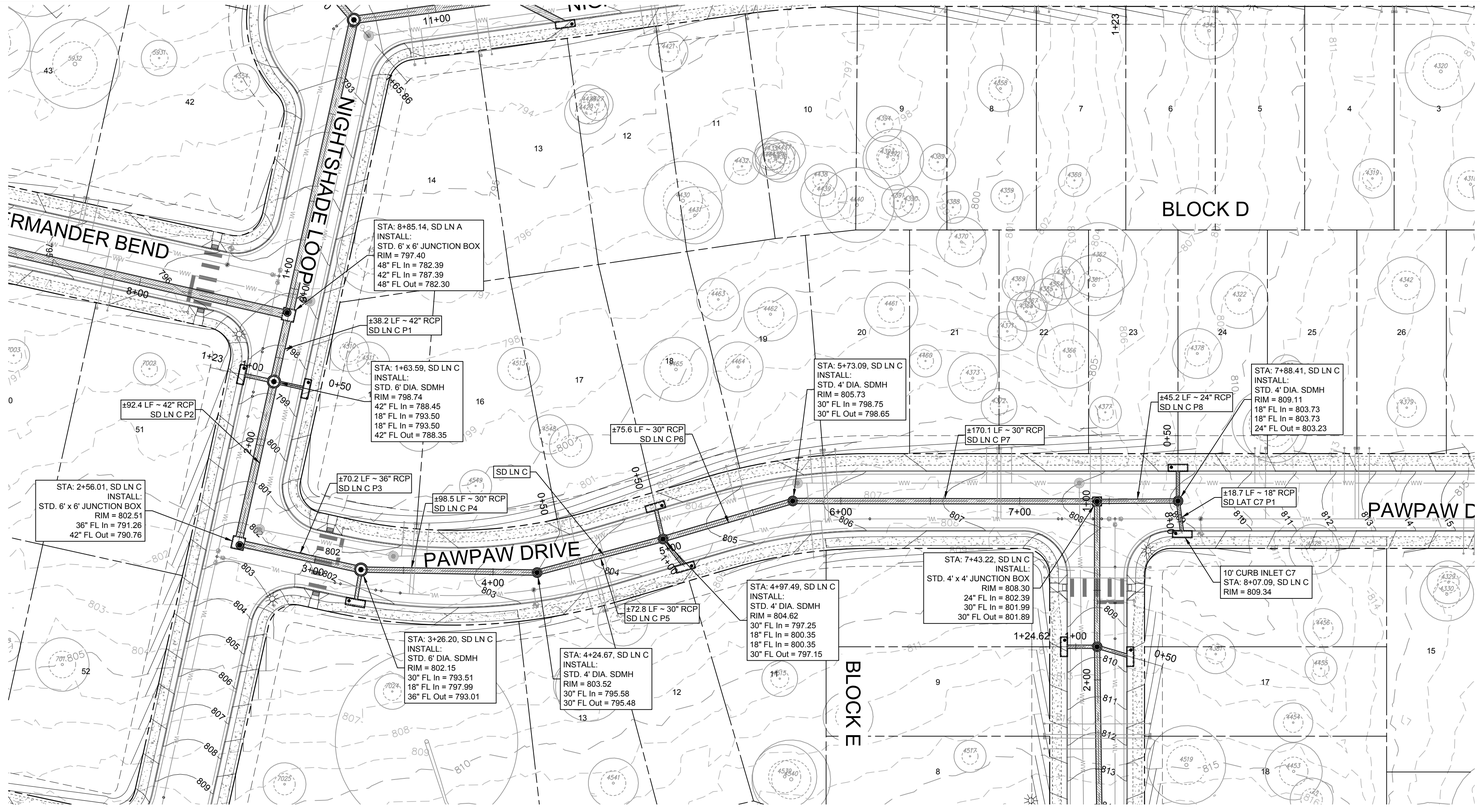

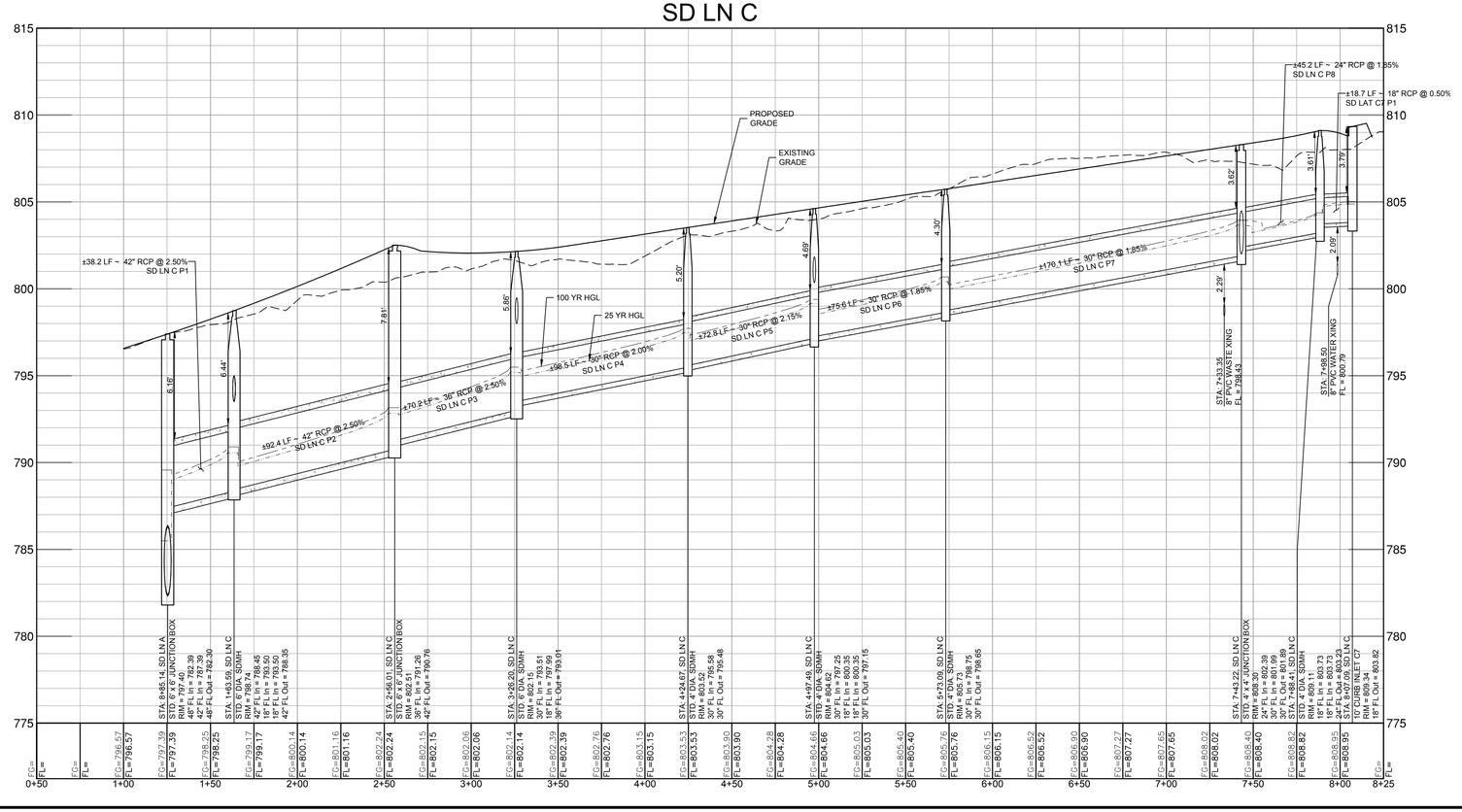

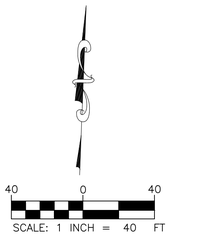

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WW WASTEWATER LINE
- WL WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE — FG=YY.YY	ELEVATION PROPOSED GRADE — FG=XXX.XX

Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN C P1	42	50.44	14.67	67.08	15.83
SD LN C P2	42	44.66	14.19	59.39	15.33
SD LN C P3	36	44.75	14.31	59.51	15.37
SD LN C P4	30	34.87	12.36	46.9	13.15
SD LN C P5	30	34.96	12.71	47.01	13.55
SD LN C P6	30	27.14	11.28	36.77	12.13
SD LN C P7	30	27.32	11.3	37	12.15
SD LN C P8	24	8.51	8.37	10.31	8.82
SD LAT C7 P1	18	6.55	4.74	7.84	4.75

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STORM SEWER LN C PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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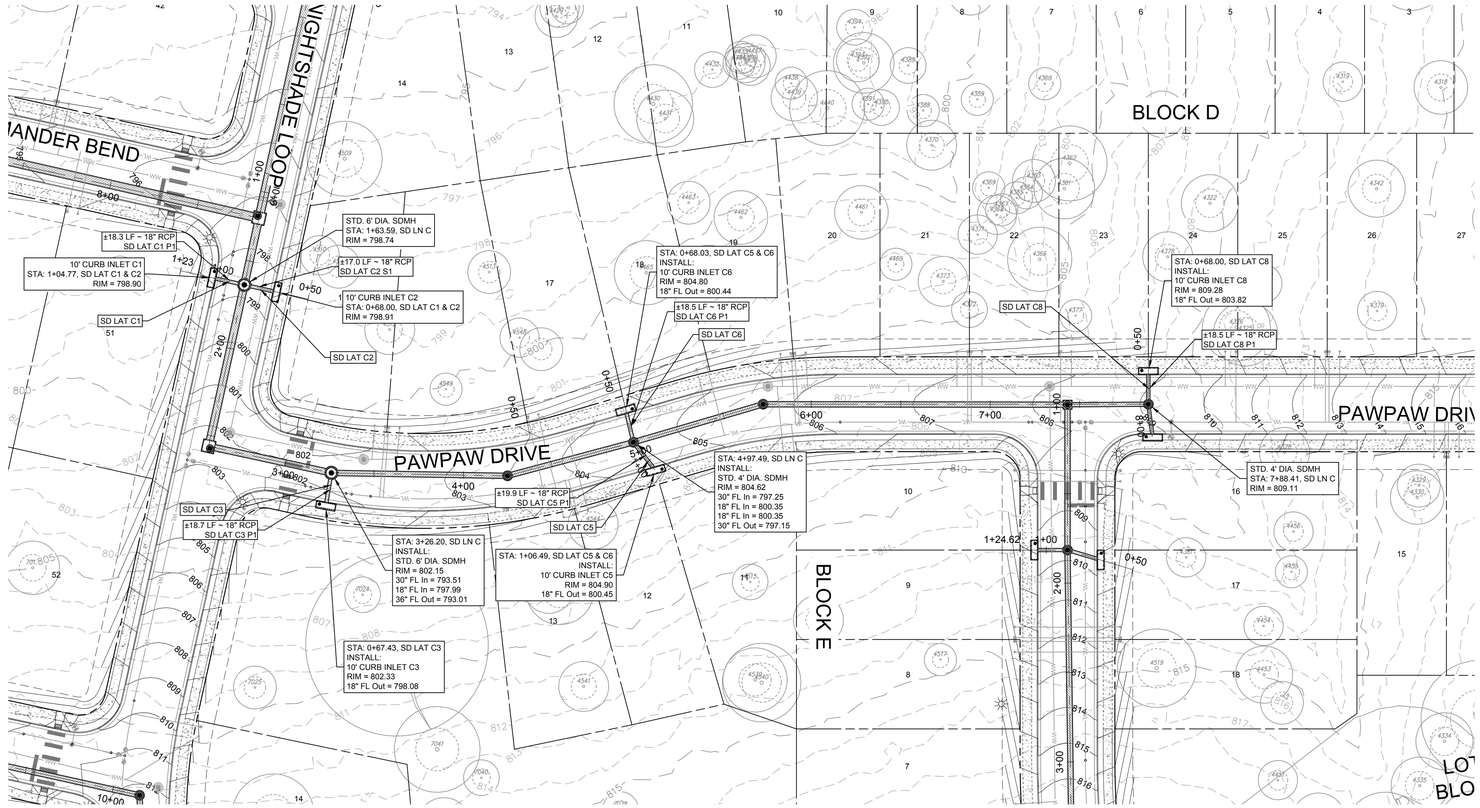
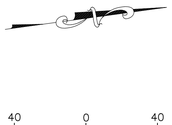
38 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 38 STORM SEWER LN C PLAN & PROFILE, October 31, 2024, 2:09 PM, mcarrion



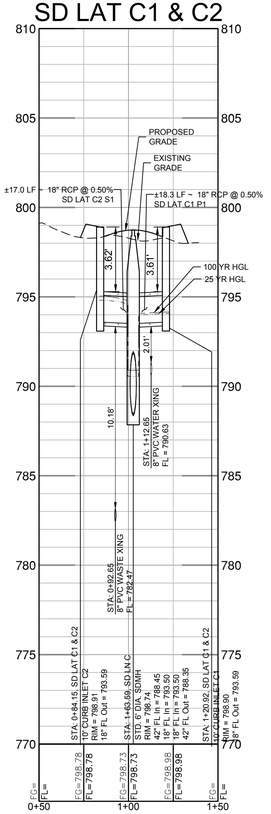


LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL	1"= 40' HORIZONTAL
PROPOSED GRADE CL	1"= 4' VERTICAL
HGL - 100yr	
HGL - 25yr	
ELEVATION EXISTING GRADE	FL=YY.YY FG=XXX.XX ELEVATION PROPOSED GRADE

SD LAT C1 & C2



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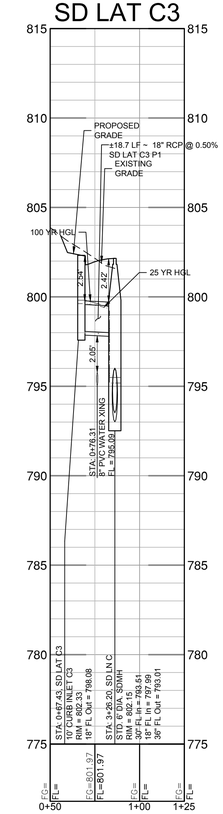
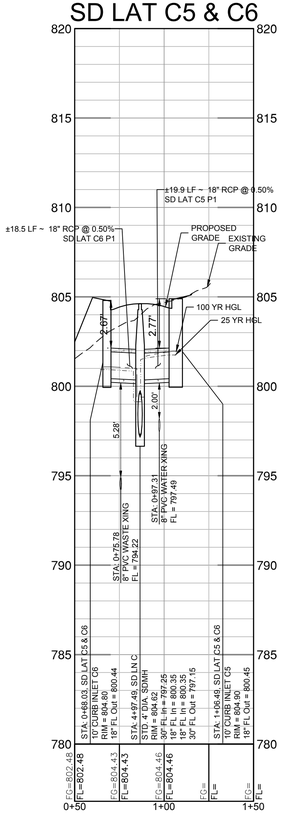
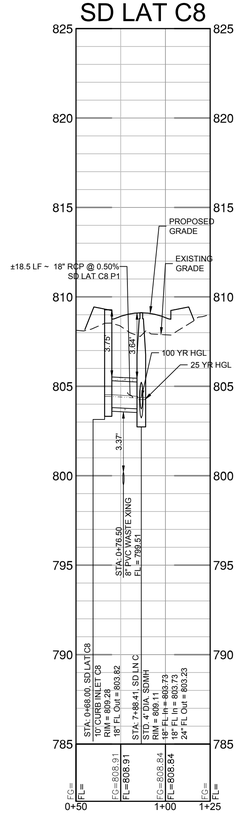


SD LAT C5 & C6



SD LAT C8



Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LAT C1 P1	18	1.72	3.42	2.3	3.71
SD LAT C2 S1	18	8.21	4.65	10.86	6.15
SD LAT C3 P1	18	11.85	6.71	14.9	8.43
SD LAT C5 P1	18	9.01	5.1	11.26	6.37
SD LAT C6 P1	18	1.9	3.51	2.98	3.97
SD LAT C8 P1	18	2.68	3.86	3.43	4.12

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STORM SEWER LAT C1-C4 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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39 OF 81

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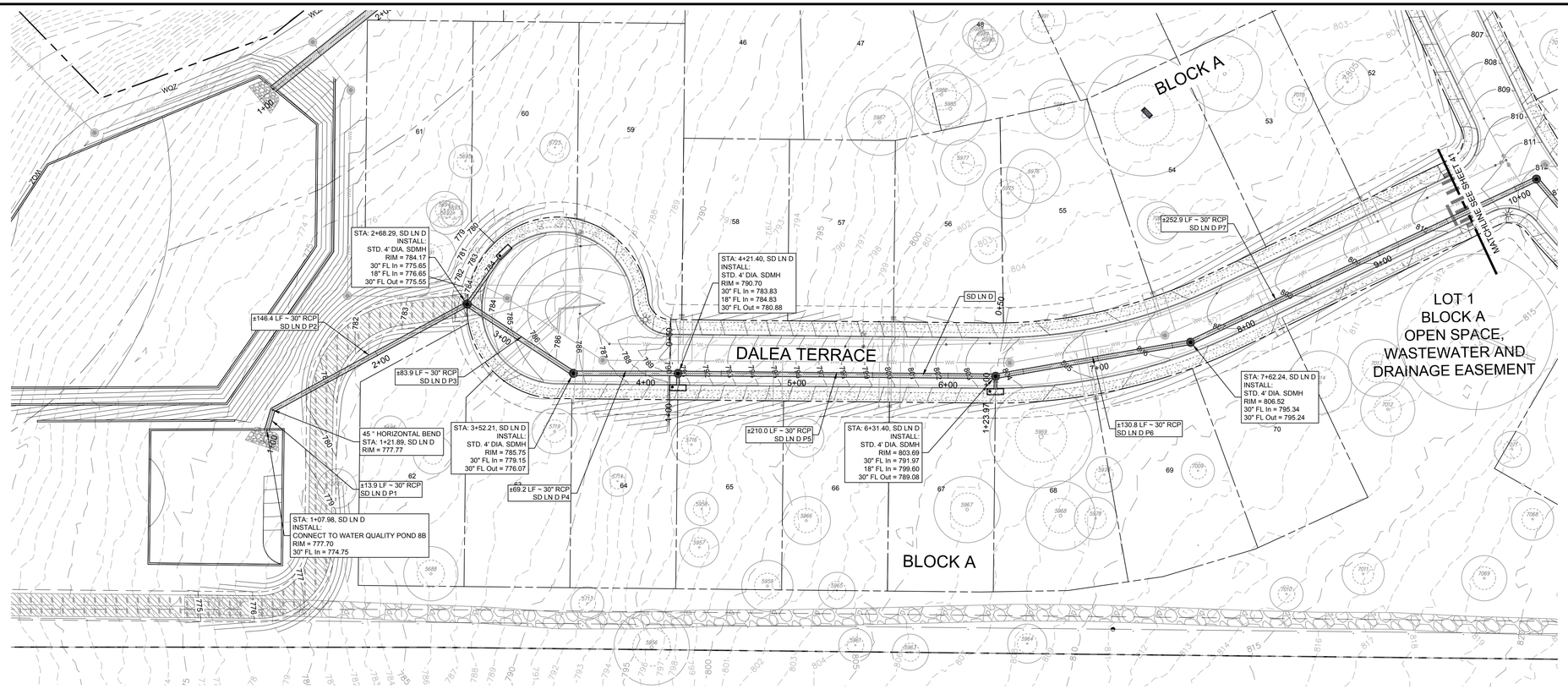
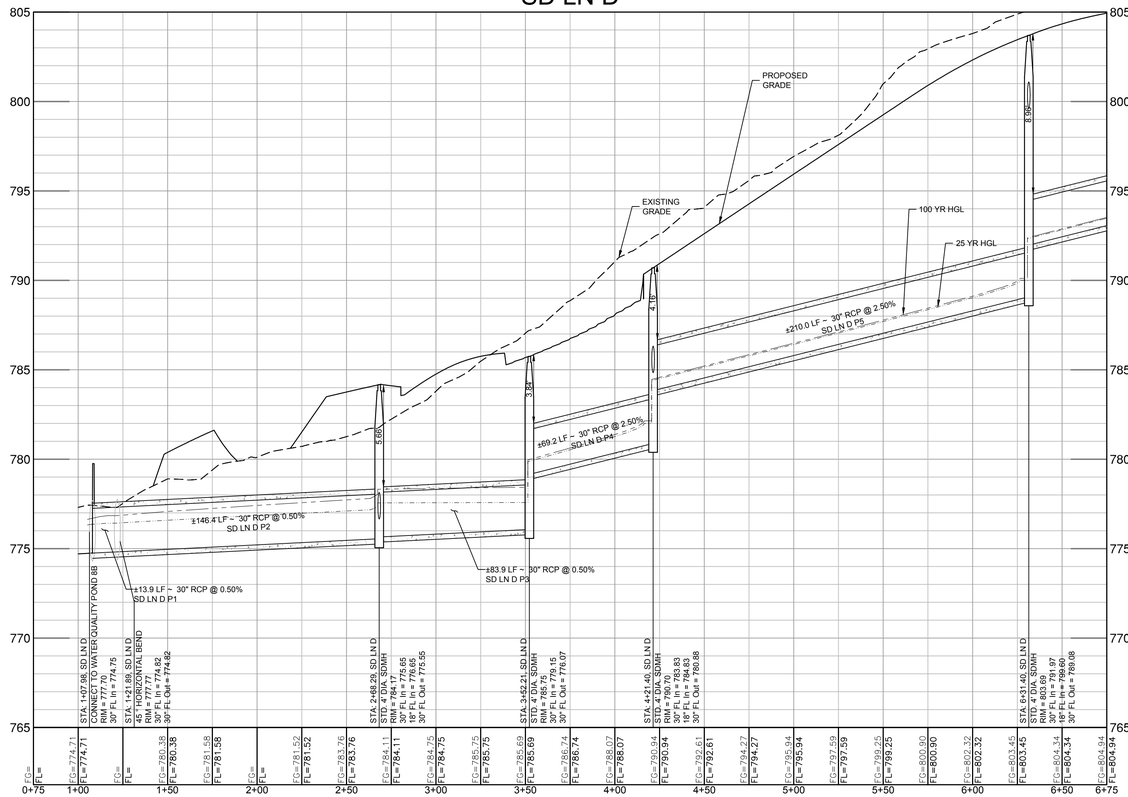


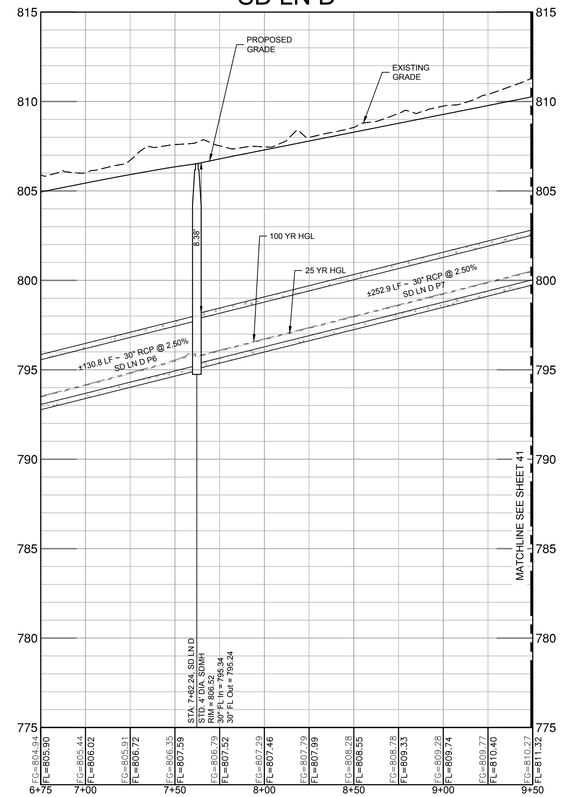
SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE	FG=YXX.YX FG=XXX.XX ELEVATION PROPOSED GRADE





Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN D P1	30	22.59	6.55	32.25	6.57
SD LN D P2	30	22.79	6.54	32.52	6.63
SD LN D P3	30	12.23	5.66	15.09	5.97
SD LN D P4	30	12.26	10.15	15.12	10.77
SD LN D P5	30	8.49	9.13	10.44	9.7
SD LN D P6	30	3.69	7.15	4.68	7.68
SD LN D P7	30	3.75	7.19	4.74	7.71

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STORM SEWER LN D PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
40 OF 81

FOR PERMIT

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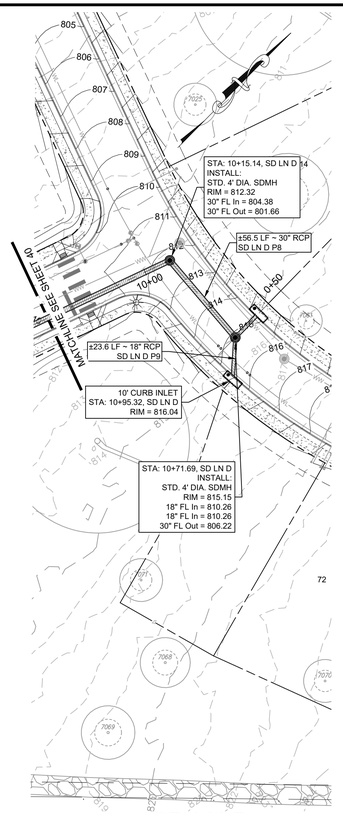
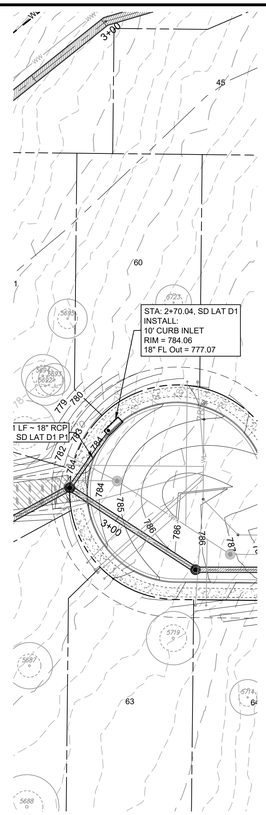
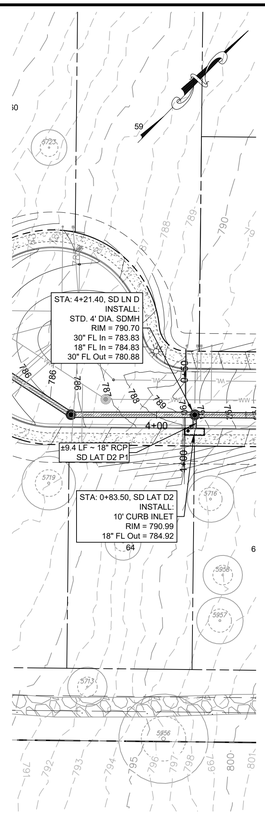
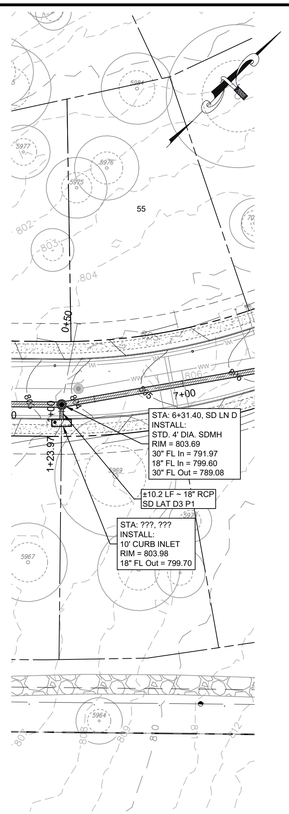
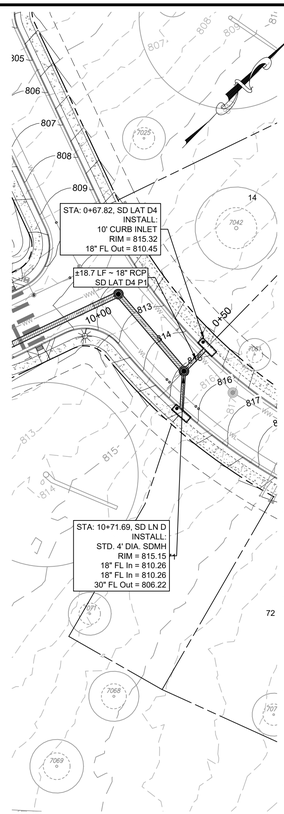
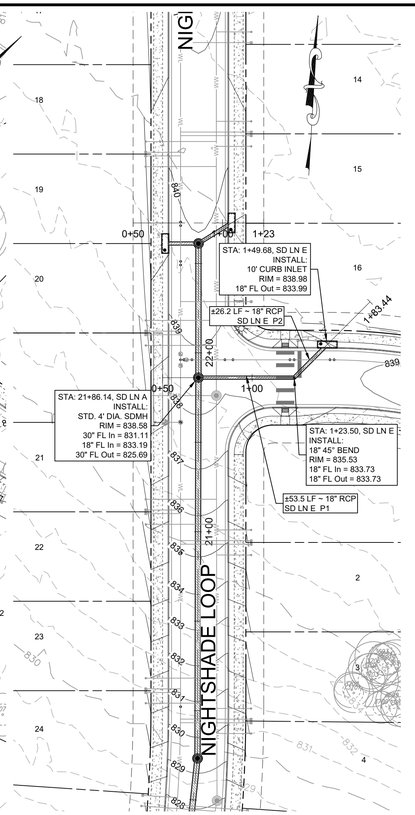












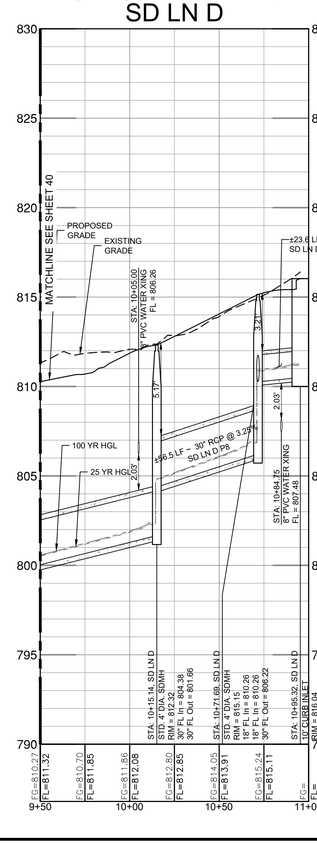
SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE: FG=YYY.YY	ELEVATION PROPOSED GRADE: FG=XXX.XX

SD LN D



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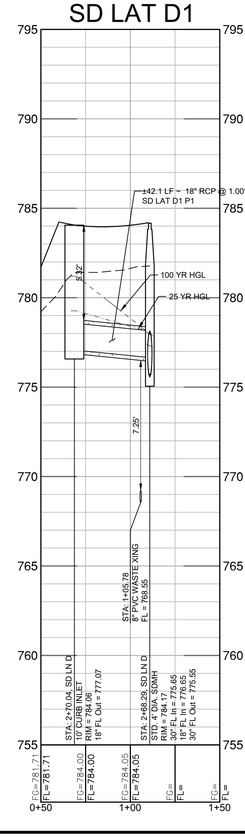

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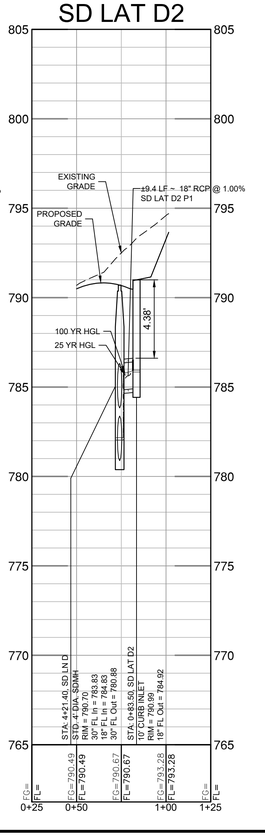

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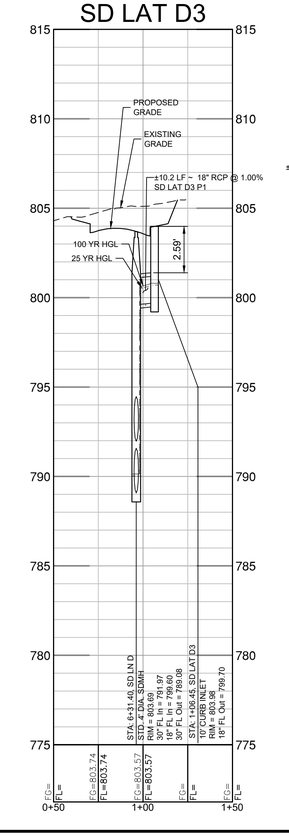

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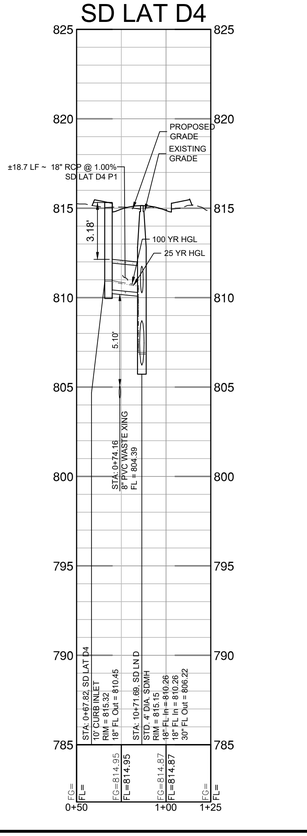
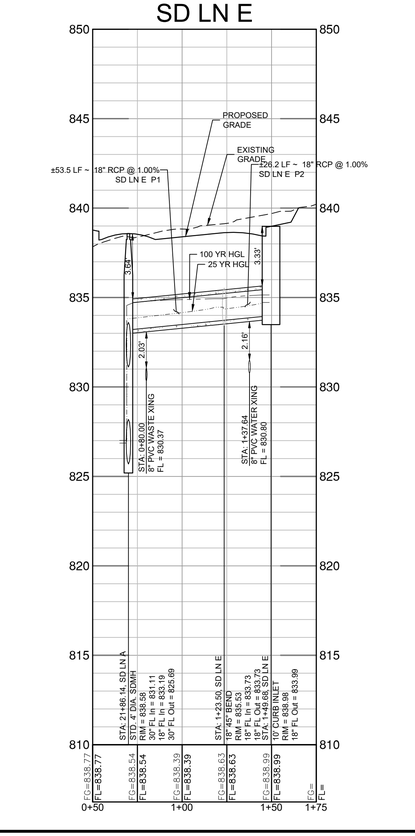


SD LN E



Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN D P8	30	3.76	7.89	4.76	8.46
SD LN D P9	18	3.26	5.24	3.99	5.54
SD LAT D1 P1	18	17.07	9.66	28.18	15.95
SD LAT D2 P1	18	5.8	6.09	7.19	6.4
SD LAT D3 P1	18	6.96	6.35	8.37	6.6
SD LAT D4 P1	18	1.62	4.31	2.14	4.67
SD LN E P1	18	4.2	5.61	5.29	5.96
SD LN E P2	18	4.21	5.61	5.31	5.96

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STORM SEWER LN D & E, LAT D1-D3 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 41 OF 81

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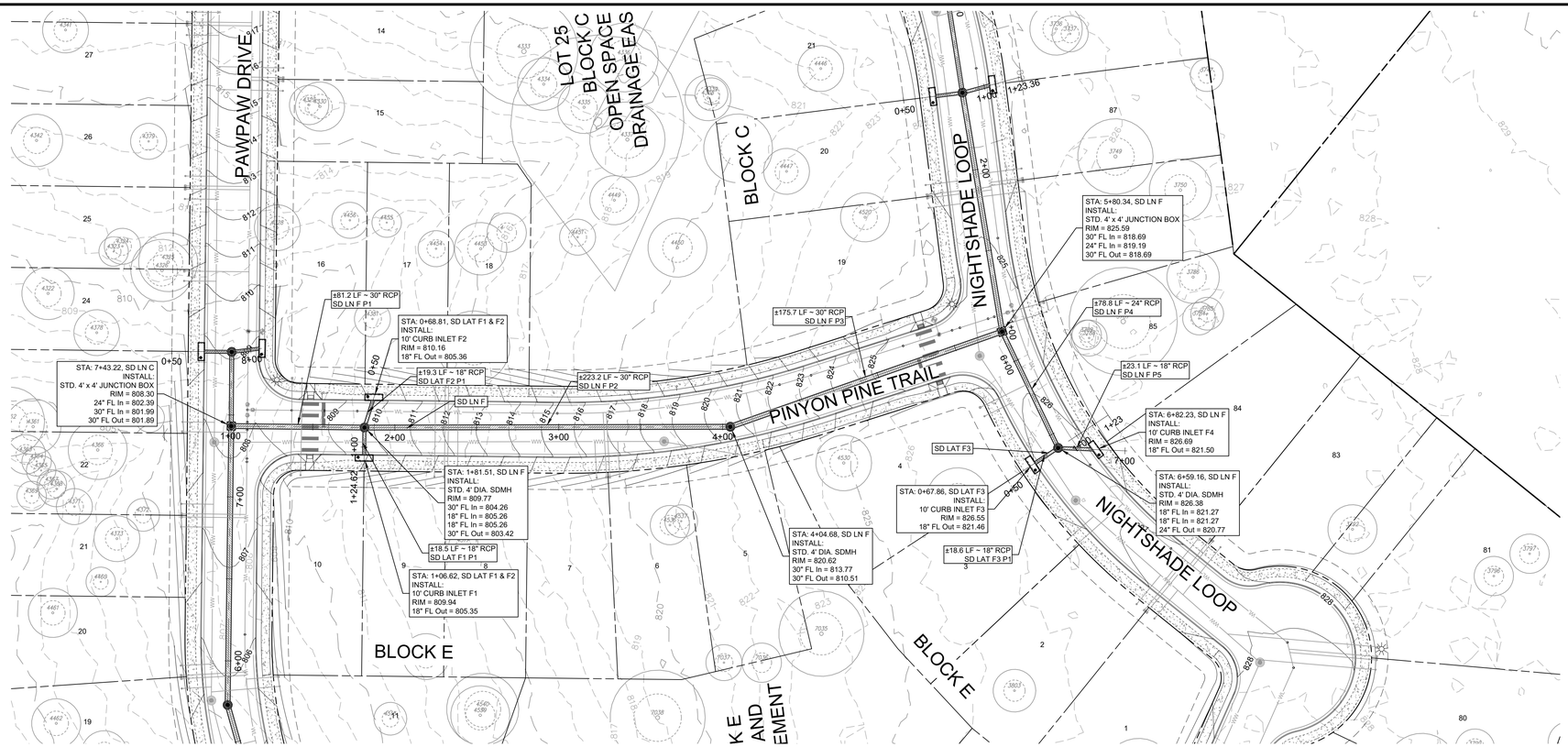
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 41 STORM SEWER LN D & E LAT D1-D3 PLAN & PROFILE, October 31, 2024, 1:47 PM, mgarrra

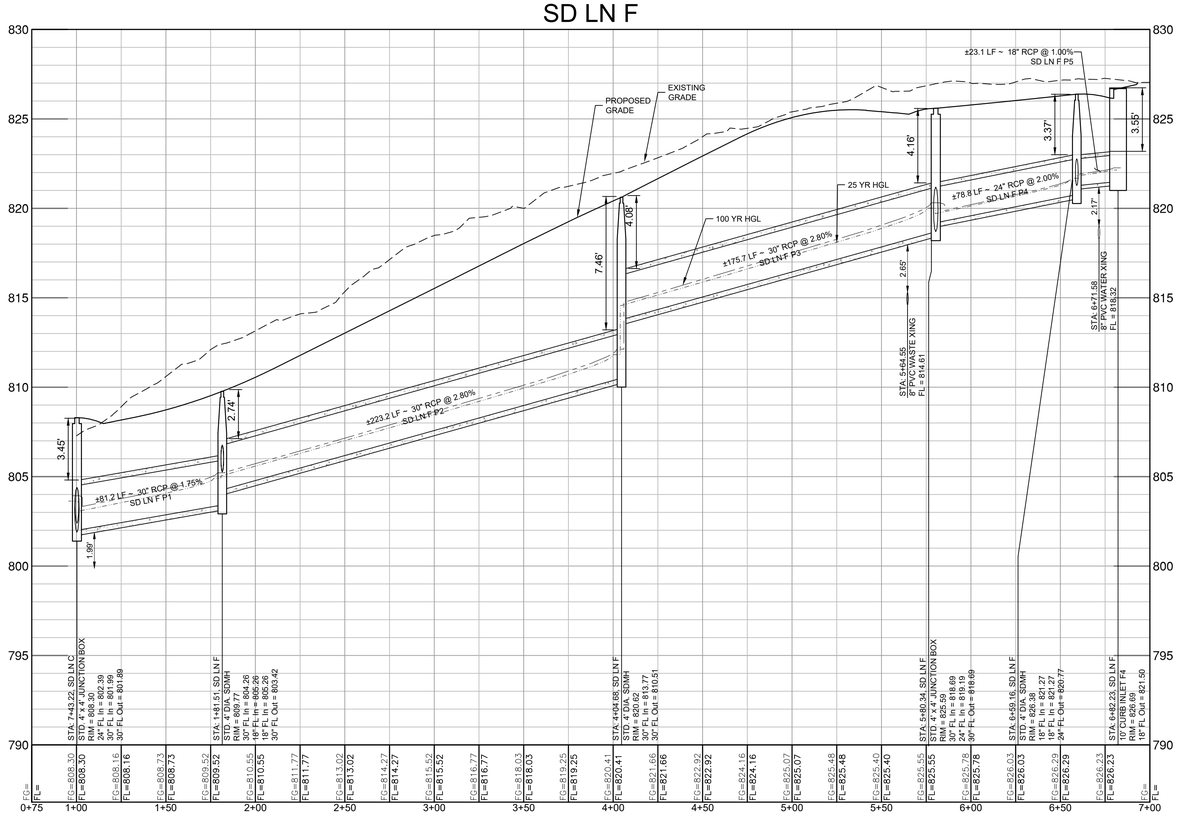


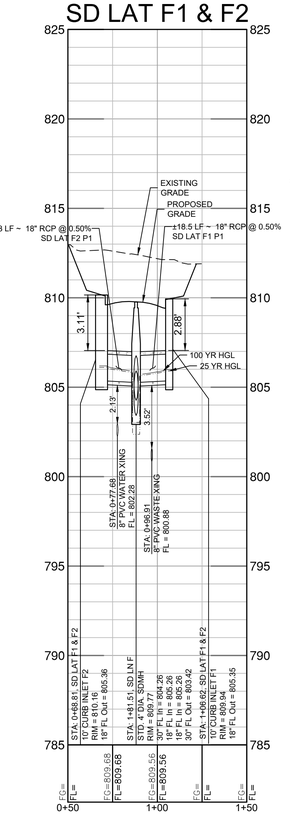


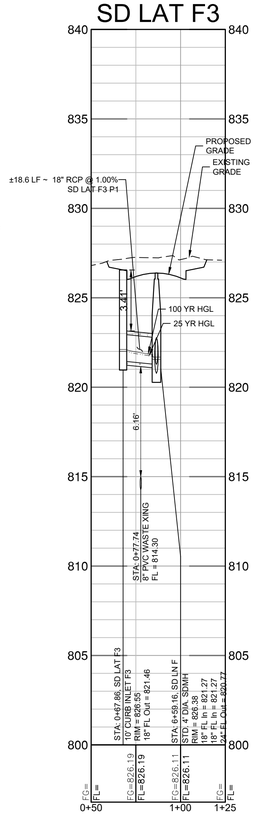
LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE: FG=YYY.YY	ELEVATION PROPOSED GRADE: FG=XXX.XX







Conduit Label	Diameter (in)	25-YR Flow (cfs)	25-YR Velocity (fps)	100-YR Flow (cfs)	100-YR Velocity (fps)
SD LN F P1	30	20.36	10.29	28.46	11.21
SD LN F P2	30	16.18	11.44	23.19	12.62
SD LN F P3	30	16.29	11.46	23.34	12.65
SD LN F P4	24	5.23	7.51	6.98	8.15
SD LN F P5	18	3.26	5.24	4.21	5.61
SD LAT F1 P1	18	2.22	4.72	2.89	5.08
SD LAT F2 P1	18	3.97	5.53	4.88	5.84
SD LAT F3 P1	18	2.27	4.74	3.16	5.2

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STORM SEWER LN F, LATF1-F2 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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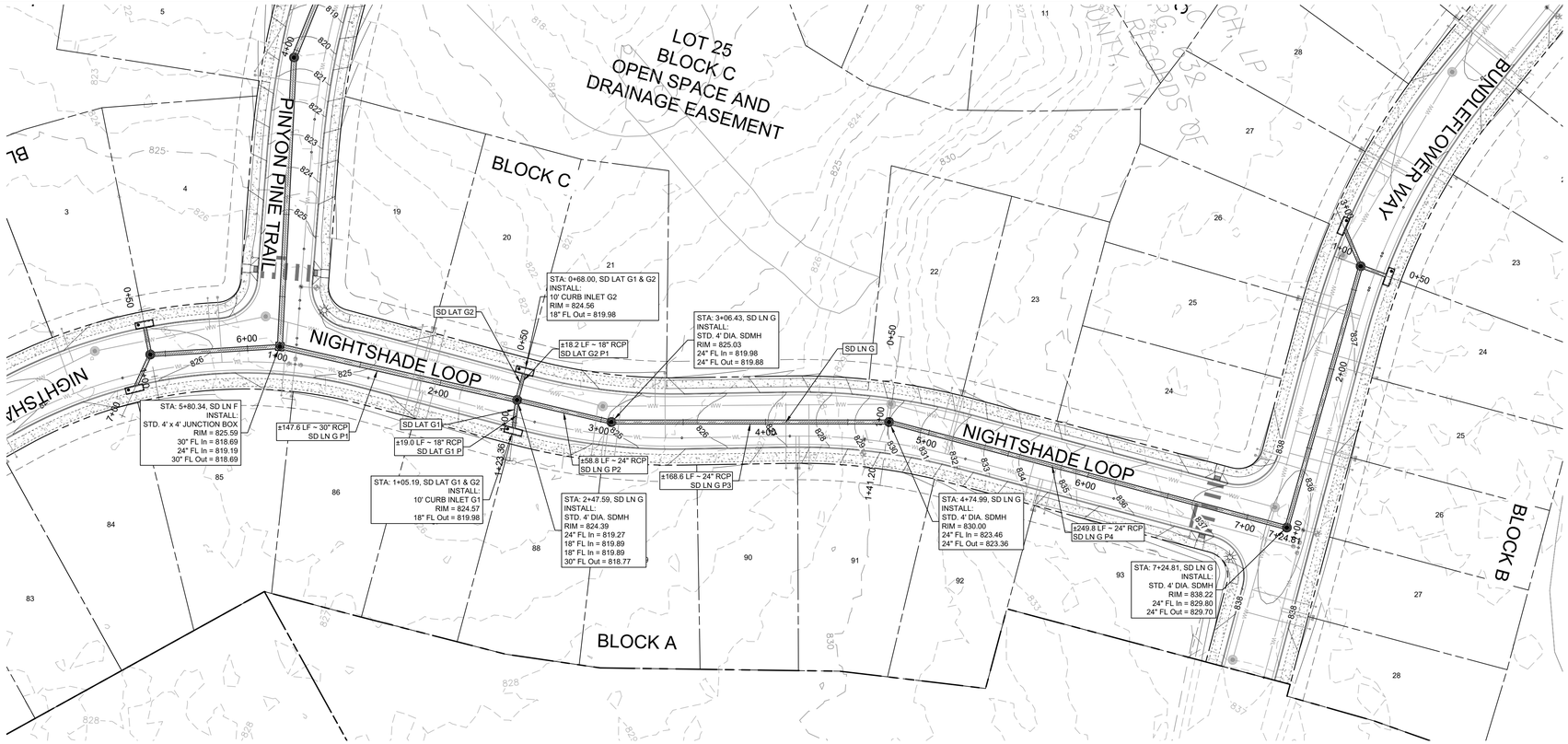
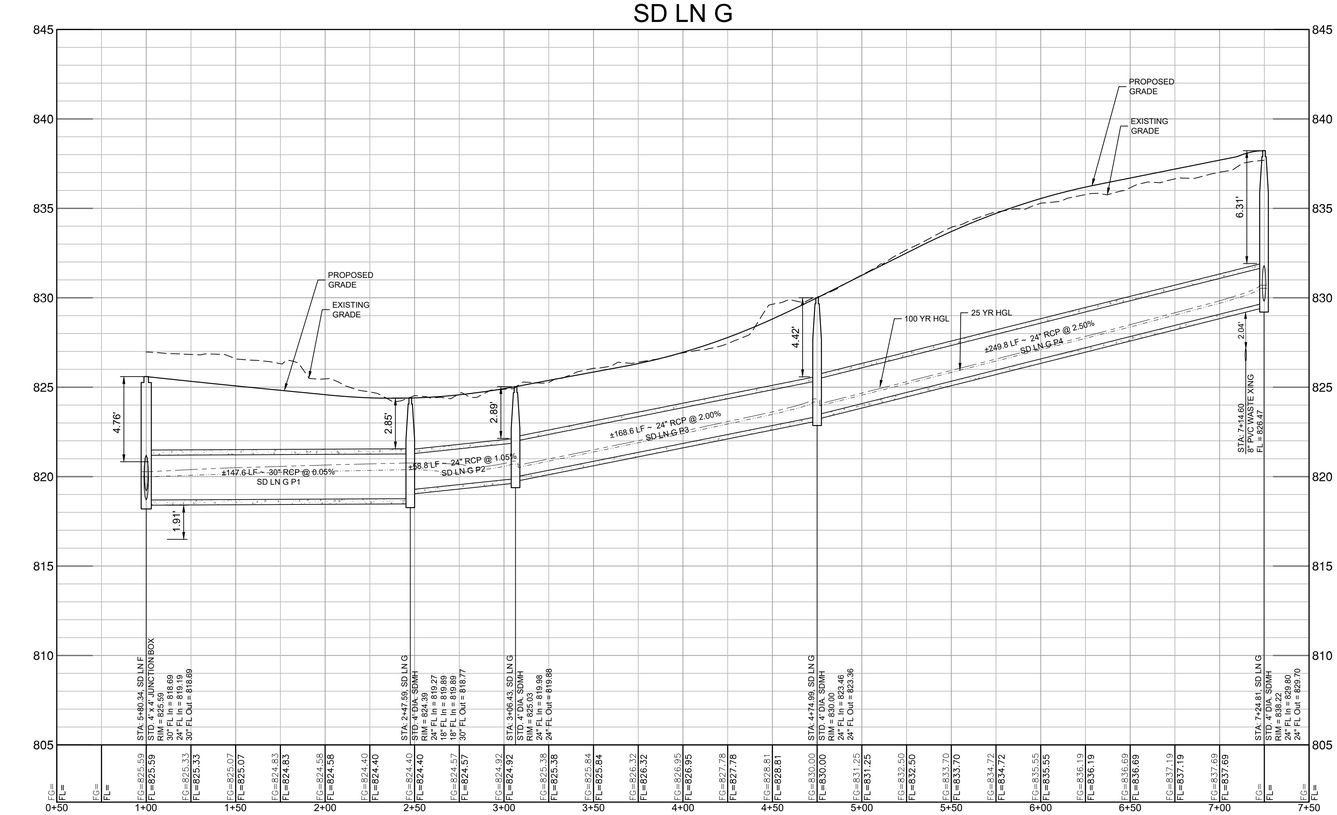
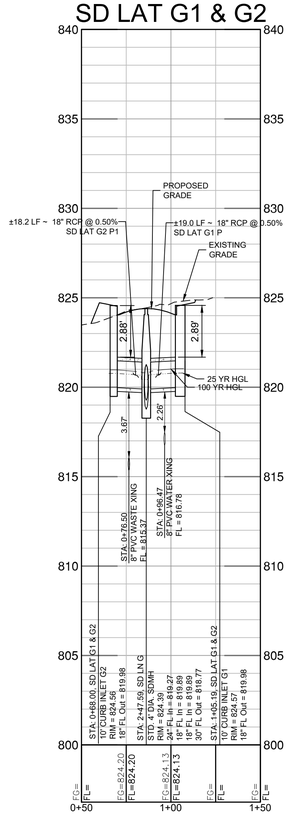
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 42 STORM SEWER LN F LATF1-F2 PLAN & PROFILE, October 31, 2024, 1:48 PM, mguerra







Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN G P1	30	12.1	2.47	17.56	3.58
SD LN G P2	24	6.05	6.21	8.6	6.83
SD LN G P3	24	6.11	7.85	8.68	8.66
SD LN G P4	24	6.2	8.54	8.8	9.42
SD LAT G1 P	18	4.29	4.36	6.56	4.75
SD LAT G2 P1	18	4.13	4.32	5.9	4.66

40 0 40
SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WW WASTEWATER LINE
- WL WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL	1"= 40' HORIZONTAL
PROPOSED GRADE CL	1"= 4' VERTICAL
HGL - 100yr	
HGL - 25yr	
ELEVATION EXISTING GRADE	EG=YY.YY, YY FG=XXX.XX ELEVATION PROPOSED GRADE

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STORM SEWER LN G, LAT G1-G4 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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43 OF 81

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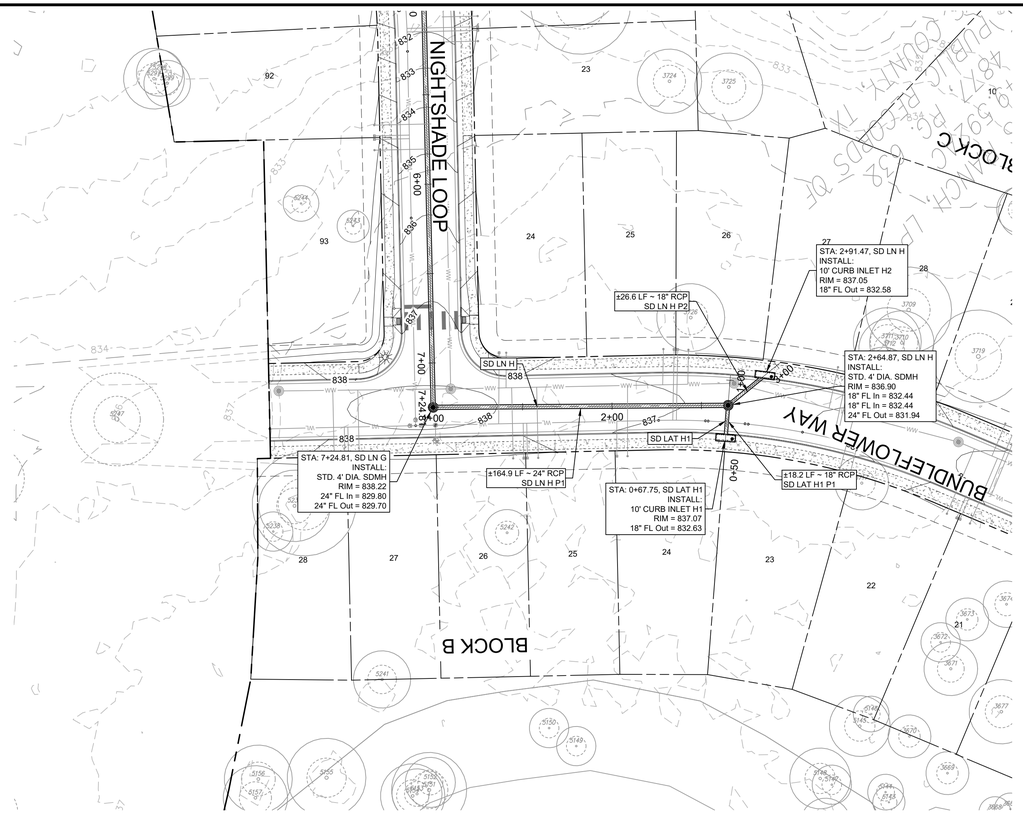
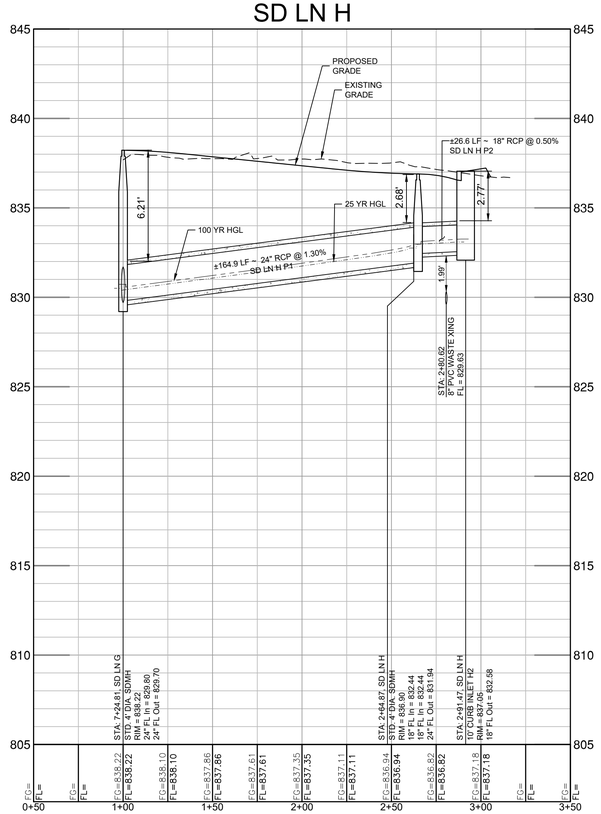
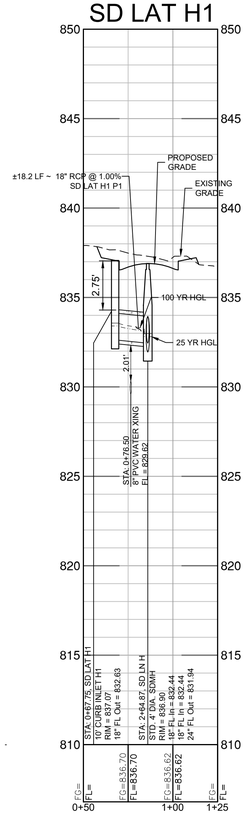
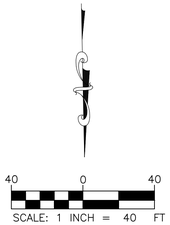
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 43 STORM SEWER LN G, LAT G1-G4 PLAN & PROFILE, October 31, 2024 - 1:49 PM, mguerra









LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WASTEWATER LINE
- WATER LINE
- STORM DRAIN LINE
- PROPOSED BERM
- PROPOSED SWALE
- PROPOSED ROCK BERM
- HEADWALL
- CURB INLET
- AREA INLET
- STORMSEWER MANHOLE
- TREE TO BE REMOVED
- TREE TO REMAIN

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL HGL - 100yr HGL - 25yr	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE (FG=YXX.XX)	ELEVATION PROPOSED GRADE (FG=XXX.XX)

Conduit Label	Diameter (in)	25-YR		100-YR	
		Flow (cfs)	Velocity (fps)	Flow (cfs)	Velocity (fps)
SD LN H P1	24	6.28	6.77	8.9	7.45
SD LN H P2	18	2.43	3.76	3.43	4.12
SD LAT H1 P1	18	4.38	5.67	6.22	6.19

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STORM SEWER LN H, LAT H1-H2 PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
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LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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44 OF 81

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V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_SDP.dwg, 44 STORM SEWER LN H, LAT H1-H2 PLAN & PROFILE, October 31, 2024, 1:49 PM, mguerra

La Cima PH8 **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
A S5	DA A1	IN SAG	10.00	-	122.71	11.62	11.62	0.00	-	1.00	15.00	100%
A1	DA A3	ON GRADE	10.00	4.10%	5.05	9.21	5.05	4.16	A S5	0.20	3.00	55%
A3	DA A4	IN SAG	10.00	-	17.24	17.24	17.24	0.00	-	1.20	18.00	100%
A4	DA A5	ON GRADE	10.00	1.30%	26.73	26.73	26.73	0.00	-	1.40	21.00	100%
A5	DA A6	IN SAG	10.00	-	2.53	2.53	2.53	0.00	-	0.70	10.50	100%
A6	DA A7	ON GRADE	10.00	5.10%	4.14	6.79	4.14	2.65	A4	0.20	3.00	61%
A7	DA A8	ON GRADE	10.00	4.80%	2.70	3.22	2.70	0.52	A5	0.20	3.00	84%
A8	DA A9	ON GRADE	10.00	4.90%	3.93	6.08	3.93	2.15	A6	0.20	3.00	65%
A9	DA A10	ON GRADE	10.00	5.10%	2.30	2.55	2.30	0.25	A7	0.10	1.50	90%
A10	DA A11	ON GRADE	10.00	1.00%	5.05	6.17	5.05	1.12	A8	0.30	4.50	82%
A11	DA A12	ON GRADE	10.00	1.10%	4.44	5.16	4.44	0.72	A9	0.20	3.00	86%
B1	DA B1	IN SAG	10.00	-	1.07	1.07	1.07	0.00	-	0.60	9.00	100%
B2	DA B2	IN SAG	10.00	-	12.38	12.38	12.38	0.00	-	1.10	16.50	100%
C1	DA C1	ON GRADE	10.00	3.70%	1.72	1.72	1.72	0.00	-	0.10	1.50	100%
C2	DA C2	ON GRADE	10.00	3.70%	8.21	23.87	8.21	15.66	A3	0.30	4.50	34%
C3	DA C3	ON GRADE	10.00	0.70%	11.85	25.97	11.85	14.12	C2	0.50	7.50	46%
C5	DA C4	ON GRADE	10.00	1.50%	9.01	20.09	9.01	11.08	C3	0.40	6.00	45%
C6	DA C5	ON GRADE	10.00	1.50%	1.90	1.90	1.90	0.00	-	0.20	3.00	100%
C7	DA C6	ON GRADE	10.00	2.40%	6.55	12.70	6.55	6.15	C2	0.30	4.50	52%
C8	DA C7	ON GRADE	10.00	2.50%	2.68	2.85	2.68	0.17	C5	0.20	3.00	94%
D1	DA D1	IN SAG	10.00	-	17.07	17.07	17.07	0.00	-	1.20	18.00	100%
D2	DA D2	ON GRADE	10.00	7.70%	5.80	15.50	5.80	9.70	D1	0.30	4.50	37%
D3	DA D3	ON GRADE	10.00	3.50%	6.96	16.49	6.96	9.53	D2	0.30	4.50	42%
D4	DA D4	ON GRADE	10.00	5.30%	1.62	1.63	1.62	0.01	A3	0.10	1.50	99%
D5	DA D5	ON GRADE	10.00	4.70%	3.26	4.34	3.26	1.08	D3	0.20	3.00	75%
E1	DA E1	ON GRADE	10.00	1.00%	4.21	4.68	4.21	0.47	A8	0.20	3.00	90%
F1	DA F1	ON GRADE	10.00	3.90%	2.22	2.35	2.22	0.13	C5	0.10	1.50	94%
F2	DA F2	ON GRADE	10.00	4.10%	3.97	5.88	3.97	1.91	C5	0.20	3.00	68%
F3	DA F3	ON GRADE	10.00	1.00%	2.27	2.27	2.27	0.00	-	0.20	3.00	100%
F4	DA F4	ON GRADE	10.00	1.10%	3.26	3.36	3.26	0.10	G1	0.20	3.00	97%
G1	DA G1	IN SAG	10.00	-	4.29	4.29	4.29	0.00	-	0.80	12.00	100%
G2	DA G2	IN SAG	10.00	-	4.13	4.13	4.13	0.00	-	0.80	12.00	100%
H1	DA H1	IN SAG	10.00	-	4.38	4.38	4.38	0.00	-	0.80	12.00	100%
H2	DA H2	IN SAG	10.00	-	2.43	2.43	2.43	0.00	-	0.70	10.50	100%

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STORM SEWER CALCULATIONS (25 YEAR)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

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45 OF 81

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V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DAM-INLET.dwg, 59 STORM SEWER CALCULATIONS (25 YEAR), October 31, 2024, 1:50 PM, mguerra

La Cima PH8 Inlet Calculations - 100 Year 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
A S5	DA A1	IN SAG	10.00	-	178.20	17.91	17.91	0.00	-	1.20	18.00	100%
A1	DA A3	ON GRADE	10.00	4.10%	6.10	13.39	6.10	7.29	A S5	0.30	4.50	46%
A3	DA A4	IN SAG	10.00	-	35.27	35.27	35.27	0.00	-	1.80	27.00	100%
A4	DA A5	ON GRADE	10.00	1.30%	40.85	40.85	40.85	0.00	-	2.30	34.50	100%
A5	DA A6	IN SAG	10.00	-	4.76	4.76	4.76	0.00	-	0.80	12.00	100%
A6	DA A7	ON GRADE	10.00	5.10%	5.60	12.26	5.60	6.66	A4	0.30	4.50	46%
A7	DA A8	ON GRADE	10.00	4.80%	3.76	5.58	3.76	1.82	A5	0.20	3.00	67%
A8	DA A9	ON GRADE	10.00	4.90%	5.20	10.41	5.20	5.21	A6	0.20	3.00	50%
A9	DA A10	ON GRADE	10.00	5.10%	3.31	4.54	3.31	1.23	A7	0.20	3.00	73%
A10	DA A11	ON GRADE	10.00	1.00%	6.23	8.74	6.23	2.51	A8	0.30	4.50	71%
A11	DA A12	ON GRADE	10.00	1.10%	5.52	7.29	5.52	1.77	A9	0.30	4.50	76%
B1	DA B1	IN SAG	10.00	-	1.55	1.55	1.55	0.00	-	0.60	9.00	100%
B2	DA B2	IN SAG	10.00	-	17.98	17.98	17.98	0.00	-	1.20	18.00	100%
C1	DA C1	ON GRADE	10.00	3.70%	2.30	2.45	2.30	0.15	A1	0.10	1.50	94%
C2	DA C2	ON GRADE	10.00	3.70%	10.86	43.56	10.86	32.70	A3	0.40	6.00	25%
C3	DA C3	ON GRADE	10.00	0.70%	14.90	41.24	14.90	26.34	C2	0.60	9.00	36%
C5	DA C4	ON GRADE	10.00	1.50%	11.26	31.76	11.26	20.50	C3	0.50	7.50	35%
C6	DA C5	ON GRADE	10.00	1.50%	2.98	3.10	2.98	0.12	C3	0.20	3.00	96%
C7	DA C6	ON GRADE	10.00	2.40%	7.84	18.17	7.84	10.33	C2	0.30	4.50	43%
C8	DA C7	ON GRADE	10.00	2.50%	3.43	4.08	3.43	0.65	C5	0.20	3.00	84%
D1	DA D1	IN SAG	10.00	-	28.18	28.18	28.18	0.00	-	1.50	22.50	100%
D2	DA D2	ON GRADE	10.00	7.70%	7.19	24.54	7.19	17.35	D1	0.30	4.50	29%
D3	DA D3	ON GRADE	10.00	3.50%	8.37	24.27	8.37	15.90	D2	0.30	4.50	34%
D4	DA D4	ON GRADE	10.00	5.30%	2.14	2.33	2.14	0.19	A3	0.10	1.50	92%
D5	DA D5	ON GRADE	10.00	4.70%	3.99	6.20	3.99	2.21	D3	0.20	3.00	64%
E1	DA E1	ON GRADE	10.00	1.00%	5.31	6.68	5.31	1.37	A8	0.30	4.50	79%
F1	DA F1	ON GRADE	10.00	3.90%	2.89	3.43	2.89	0.54	C5	0.20	3.00	84%
F2	DA F2	ON GRADE	10.00	4.10%	4.88	8.62	4.88	3.74	C5	0.20	3.00	57%
F3	DA F3	ON GRADE	10.00	1.00%	3.16	3.22	3.16	0.06	F1	0.20	3.00	98%
F4	DA F4	ON GRADE	10.00	1.10%	4.21	4.76	4.21	0.55	G1	0.20	3.00	88%
G1	DA G1	IN SAG	10.00	-	6.56	6.56	6.56	0.00	-	0.90	13.50	100%
G2	DA G2	IN SAG	10.00	-	5.90	5.90	5.90	0.00	-	0.80	12.00	100%
H1	DA H1	IN SAG	10.00	-	6.22	6.22	6.22	0.00	-	0.90	13.50	100%
H2	DA H2	IN SAG	10.00	-	3.43	3.43	3.43	0.00	-	0.70	10.50	100%

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DAM-INLET.dwg, 69 STORM SEWER CALCULATIONS (100 YEAR), October 31, 2024, 1:59 PM, mguerra

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REVISIONS

REVISION	DESCRIPTION	DATE
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STORM SEWER CALCULATIONS (100 YEAR)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

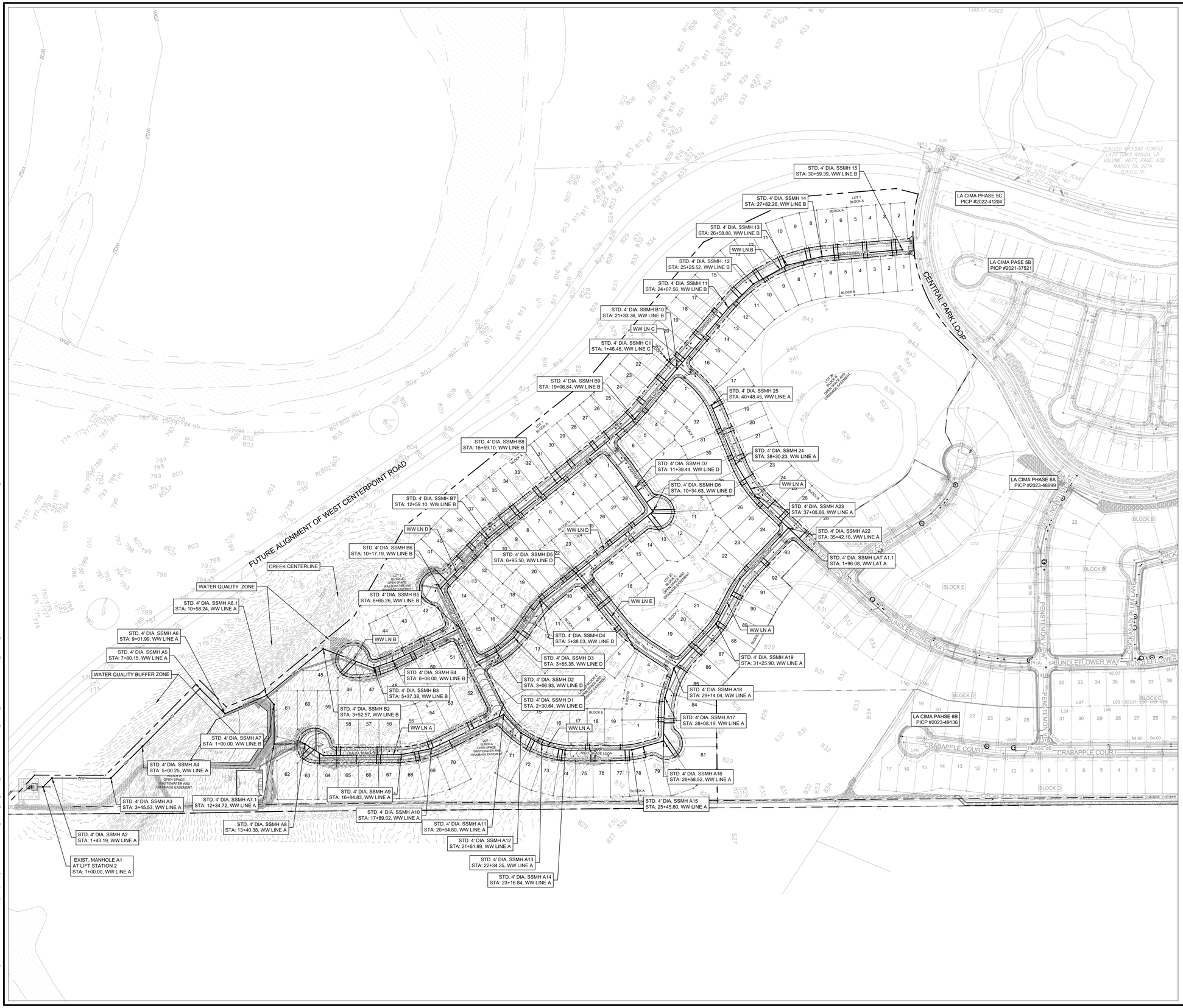
STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

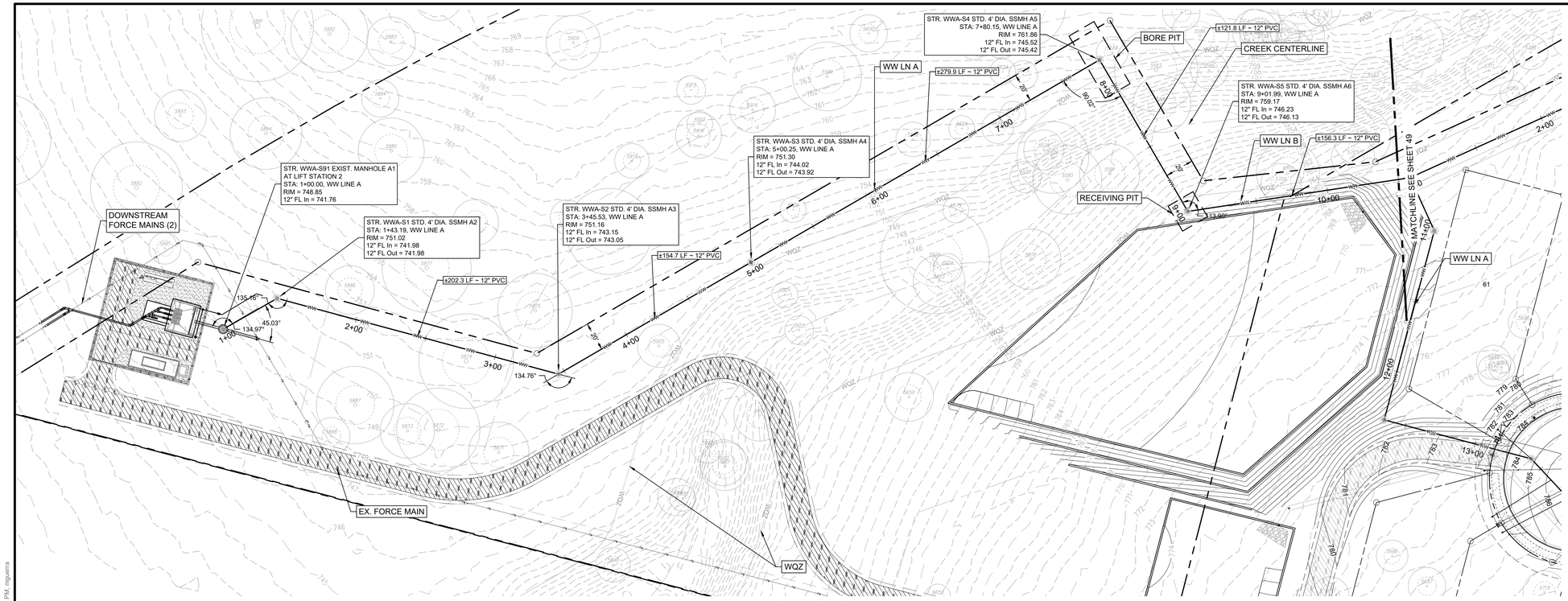
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
46 OF 81

FOR PERMIT


FUTURE ALIGNMENT OF WEST CENTERPOINT ROAD
CREEK CENTERLINE
WATER QUALITY ZONE
WATER QUALITY BUFFER ZONE
CENTRAL PARK LOOP
WEST CENTERPOINT ROAD
LA CIMA PHASE 5C
PICP #2022-41204
LA CIMA PASE 5B
PICP #2021-37521
LA CIMA PHASE 6A
PICP #2023-48999
LA CIMA PAHSE 6B
PICP #2023-49136
(CALLED 649.592 ACRES)
LAZY OAKS RANCH, LP
VOLUME: 4871, PAGE: 632
MARCH 19, 2014
D.R.H.C.TX.
1388.17 ACRES
STD. 4' DIA. SSMH 15
STA: 30+59.39, WW LINE B
STD. 4' DIA. SSMH 14
STA: 27+82.26, WW LINE B
STD. 4' DIA. SSMH 13
STA: 26+58.88, WW LINE B
STD. 4' DIA. SSMH. 12
STA: 25+25.52, WW LINE B
STD. 4' DIA. SSMH 11
STA: 24+07.56, WW LINE B
STD. 4' DIA. SSMH B10
STA: 21+33.36, WW LINE B
STD. 4' DIA. SSMH C1
STA: 1+46.46, WW LINE C
STD. 4' DIA. SSMH B9
STA: 19+06.84, WW LINE B
STD. 4' DIA. SSMH B8
STA: 15+59.10, WW LINE B
STD. 4' DIA. SSMH B7
STA: 12+59.10, WW LINE B
STD. 4' DIA. SSMH B6
STA: 10+17.19, WW LINE B
STD. 4' DIA. SSMH B5
STA: 8+65.26, WW LINE B
STD. 4' DIA. SSMH B4
STA: 6+08.00, WW LINE B
STD. 4' DIA. SSMH B3
STA: 5+37.38, WW LINE B
STD. 4' DIA. SSMH B2
STA: 3+52.57, WW LINE B
STD. 4' DIA. SSMH A6.1
STA: 10+58.24, WW LINE A
STD. 4' DIA. SSMH A6
STA: 9+01.99, WW LINE A
STD. 4' DIA. SSMH A5
STA: 7+80.15, WW LINE A
STD. 4' DIA. SSMH A7
STA: 1+00.00, WW LINE B
STD. 4' DIA. SSMH A4
STA: 5+00.25, WW LINE A
STD. 4' DIA. SSMH A3
STA: 3+45.53, WW LINE A
STD. 4' DIA. SSMH A2
STA: 1+43.19, WW LINE A
EXIST. MANHOLE A1
AT LIFT STATION 2
STA: 1+00.00, WW LINE A
STD. 4' DIA. SSMH A7.1
STA: 12+34.72, WW LINE A
STD. 4' DIA. SSMH A8
STA: 13+40.38, WW LINE A
STD. 4' DIA. SSMH A9
STA: 16+84.83, WW LINE A
STD. 4' DIA. SSMH A10
STA: 17+89.02, WW LINE A
STD. 4' DIA. SSMH A11
STA: 20+64.60, WW LINE A
STD. 4' DIA. SSMH A12
STA: 21+51.89, WW LINE A
STD. 4' DIA. SSMH A13
STA: 22+34.25, WW LINE A
STD. 4' DIA. SSMH A14
STA: 23+16.84, WW LINE A
STD. 4' DIA. SSMH A15
STA: 25+45.60, WW LINE A
STD. 4' DIA. SSMH A16
STA: 26+58.52, WW LINE A
STD. 4' DIA. SSMH A17
STA: 28+08.19, WW LINE A
STD. 4' DIA. SSMH A18
STA: 29+14.04, WW LINE A
STD. 4' DIA. SSMH A19
STA: 31+25.90, WW LINE A
STD. 4' DIA. SSMH A22
STA: 35+42.18, WW LINE A
STD. 4' DIA. SSMH A23
STA: 37+00.66, WW LINE A
STD. 4' DIA. SSMH LAT A1.1
STA: 1+96.08, WW LAT A
STD. 4' DIA. SSMH 25
STA: 40+48.45, WW LINE A
STD. 4' DIA. SSMH 24
STA: 38+30.23, WW LINE A
STD. 4' DIA. SSMH D7
STA: 11+39.44, WW LINE D
STD. 4' DIA. SSMH D6
STA: 10+34.63, WW LINE D
STD. 4' DIA. SSMH D5
STA: 6+95.50, WW LINE D
STD. 4' DIA. SSMH D4
STA: 5+38.03, WW LINE D
STD. 4' DIA. SSMH D3
STA: 3+85.35, WW LINE D
STD. 4' DIA. SSMH D2
STA: 3+06.93, WW LINE D
STD. 4' DIA. SSMH D1
STA: 2+30.64, WW LINE D
WW LN B
WW LN C
WW LN D
WW LN E
WW LN A
WW LN A
WW LN A
WW LN B
WW LN B
WW LN B
WW LN A
LOT 1 BLOCK A OPEN SPACE, WASTEWATER AND DRAINAGE EASEMENT
LOT 1 BLOCK C OPEN SPACE, WASTEWATER AND DRAINAGE EASEMENT
LOT 1 BLOCK A OPEN SPACE, WASTEWATER AND DRAINAGE EASEMENT
LOT 29 BLOCK A OPEN SPACE AND DRAINAGE EASEMENT
LOT 28 BLOCK E OPEN SPACE AND DRAINAGE EASEMENT
LOT 1 BLOCK A OPEN SPACE, WASTEWATER





40 0 40 80

SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- 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
ELEVATION EXISTING GRADE (EG=△XX.XX, FL=◇XX.XX)	ELEVATION PROPOSED FLOW LINE

NOTES:

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.
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 WASTWATER SERVICES.

STEEL CASING NOTES

1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
3. THE RESTRAINT CASING WILL BE SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE RESTRAINT CASING, AT A MAXIMUM OF FIVE-FOOT INTERVALS

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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REVISIONS	DESCRIPTION	DATE
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WASTEWATER LINE A PLAN & PROFILE (1 OF 5)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

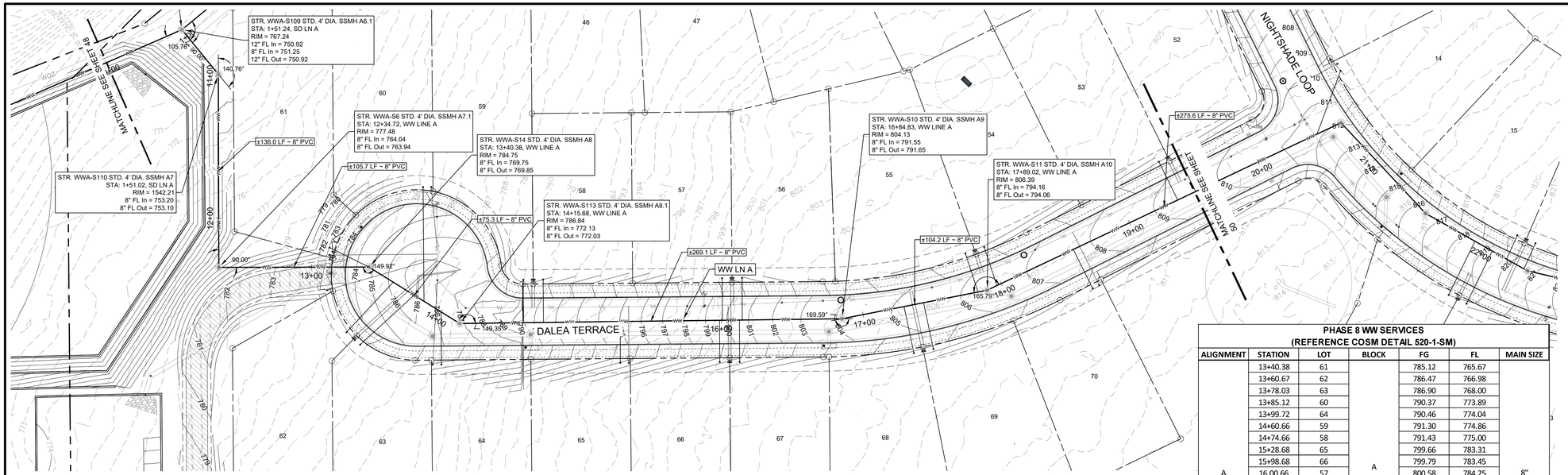
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 48 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 48 WASTEWATER LINE A PLAN & PROFILE (1 OF 5), October 31, 2024, 1:54 PM, mguerra





LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- 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

ELEVATION EXISTING GRADE (EG=XYX.XX, FL=XXX.XX) ELEVATION PROPOSED FLOW LINE

PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
A	13+40.38	61	A	785.12	765.67	8"
	13+60.67	62		786.47	766.98	
	13+78.03	63		786.90	768.00	
	13+85.12	60		790.37	773.89	
	13+99.72	64		790.46	774.04	
	14+60.66	59		791.30	774.86	
	14+74.66	58		791.43	775.00	
	15+28.68	65		799.66	783.31	
	15+98.68	66		799.79	783.45	
	16.00.66	57		800.58	784.25	
	16+12.68	67		800.73	784.38	
	16+14.66	56		805.18	791.87	
	17+29.41	68		805.47	792.26	
	17+43.41	69		806.26	793.39	
	17+82.47	55		806.53	793.78	
	17+96.58	54		807.73	795.95	
	18+56.12	70		809.36	798.78	
	19+37.45	53		809.64	799.27	
	19+51.45	52	E	811.74	802.68	

NOTES:

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.
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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.
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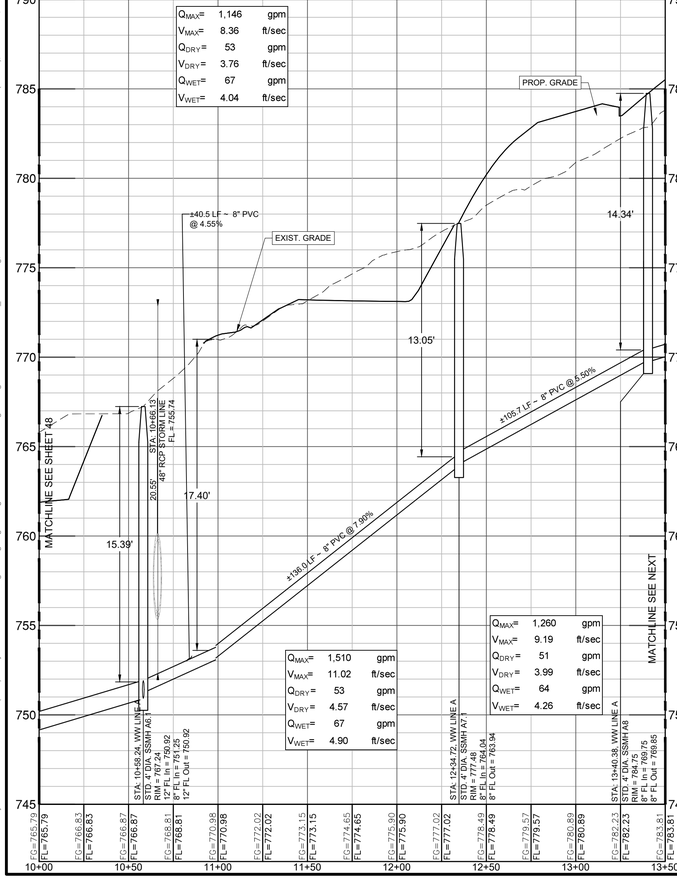
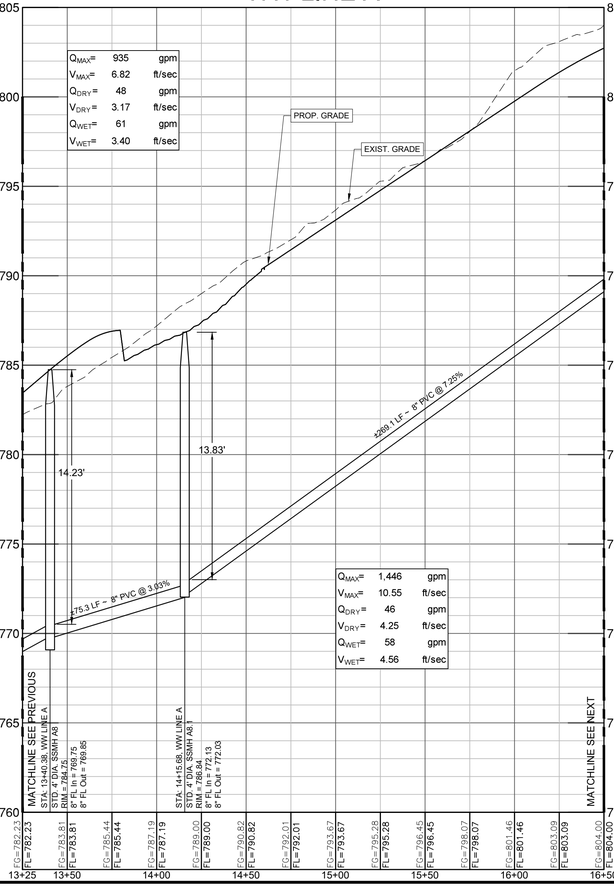
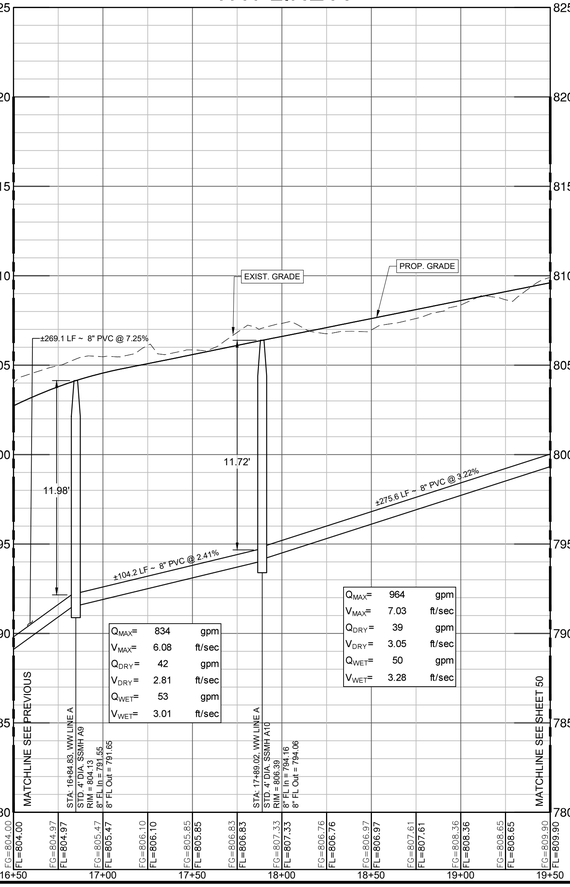
WW LINE A



WW LINE A



WW LINE A



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REVISION	DESCRIPTION	DATE
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WASTEWATER LINE A PLAN & PROFILE (2 OF 5)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

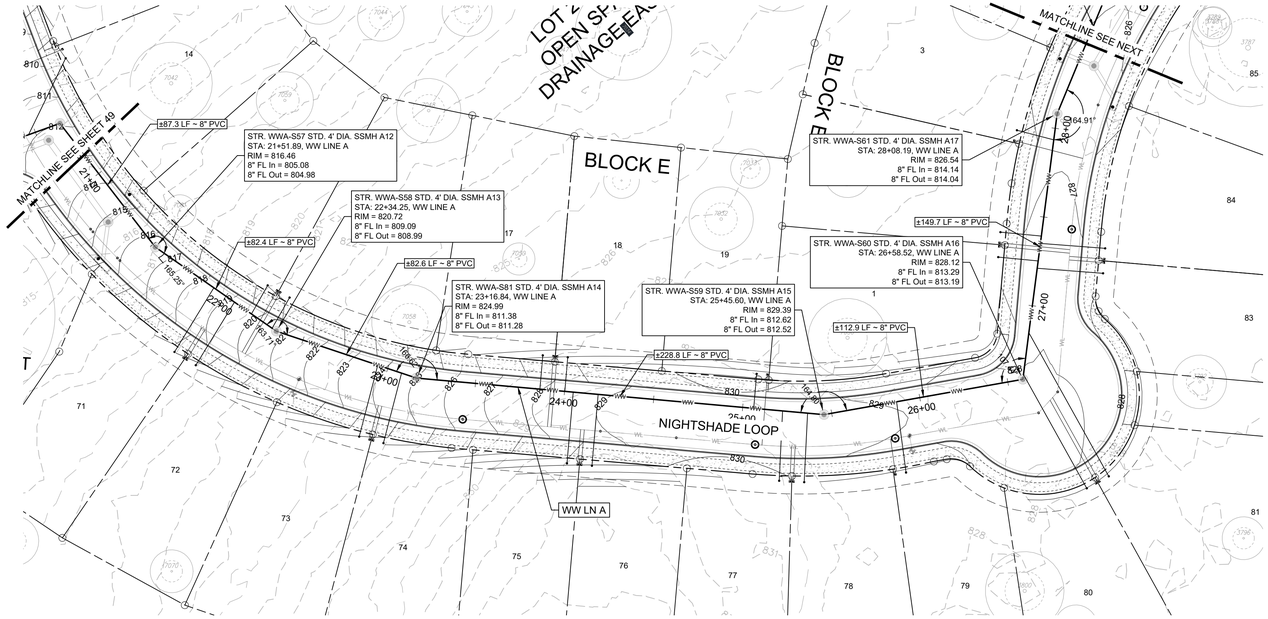
DESIGN	DRAWN	CHKD
BR	MG	JC

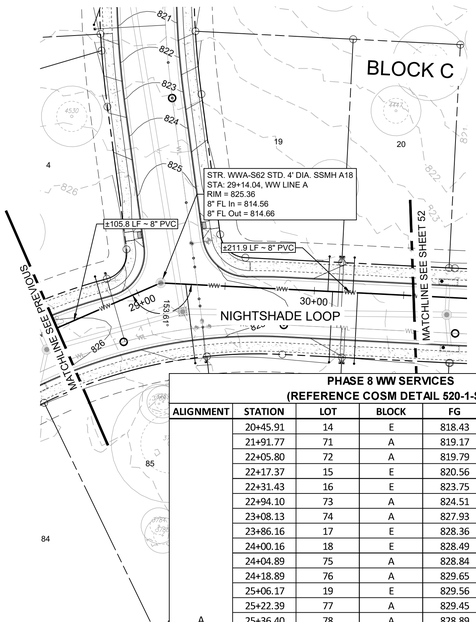
JOB No. 005956-01-114

SHEET 49 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 49 WASTEWATER LINE A PLAN & PROFILE (2 OF 5), October 31, 2024, 1:55 PM, mguerra





PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
A	20+45.91	14	E	818.43	807.00	8"
	21+91.77	71	A	819.17	807.65	
	22+05.80	72	A	819.79	808.20	
	22+17.37	15	E	820.56	808.86	
	22+31.43	16	E	823.75	811.60	
	22+94.10	73	A	824.51	812.15	
	23+08.13	74	A	827.93	812.95	
	23+86.16	17	E	828.36	813.02	
	24+00.16	18	E	828.49	813.05	
	24+04.89	75	A	828.84	813.12	
	24+18.89	76	A	829.65	813.55	
	25+06.17	19	E	829.56	813.64	
	25+22.39	77	A	829.45	813.71	
	25+36.40	78	A	828.89	814.06	
	25+86.85	79	A	828.05	814.53	
	26+61.20	80	A	827.71	814.65	
	26+84.81	81	A	827.47	814.83	
	27+21.11	83	A	827.43	814.85	
	27+25.25	1	E	827.34	814.90	
	27+35.13	84	A	827.30	814.92	
	27+39.26	2	E	826.33	815.49	
	27+93.52	3	E	826.33	815.49	
	28+79.39	4	E	826.19	815.56	
	29+28.00	85	A	824.63	816.46	
	30+07.56	19	C	824.60	816.47	
	30+10.21	86	A	824.49	816.53	
	30+24.21	20	C	824.46	816.65	

NOTES:

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.
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 WASTWATER SERVICES.

STEEL CASING NOTES

1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
3. THE RESTRAINT CASING WILL BE SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE RESTRAINT CASING, AT A MAXIMUM OF FIVE-FOOT INTERVALS

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.



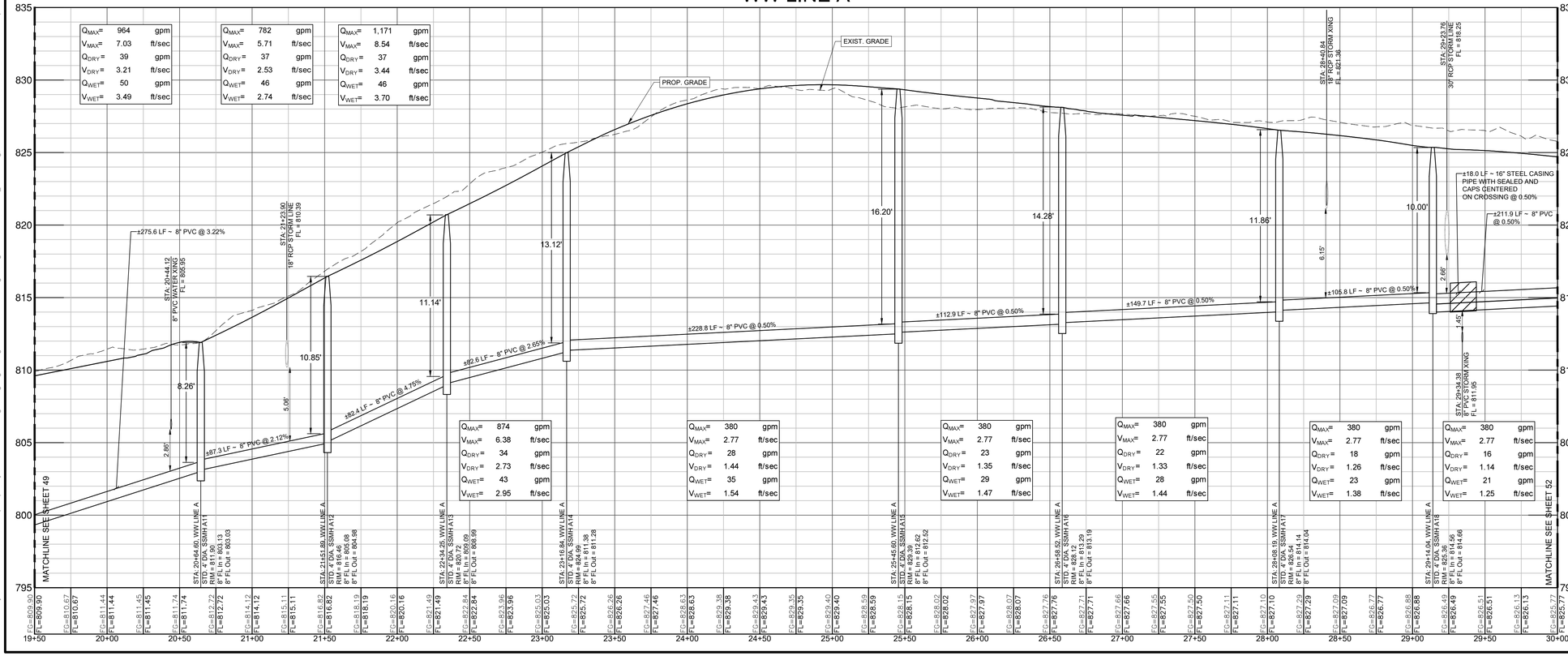
40 0 40 80
SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW EXISTING WASTEWATER LINE
- WL EXISTING WATER LINE
- WL PROPOSED WATER LINE
- WW PROPOSED WASTEWATER LINE
- SD PROPOSED STORM DRAIN LINE
- 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
ELEVATION EXISTING GRADE (EG=#XX.XX)	ELEVATION PROPOSED FLOW LINE (FL=#XX.XX)

WW LINE A



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REVISIONS	DESCRIPTION	DATE
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WASTEWATER LINE A PLAN & PROFILE (3 OF 5)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

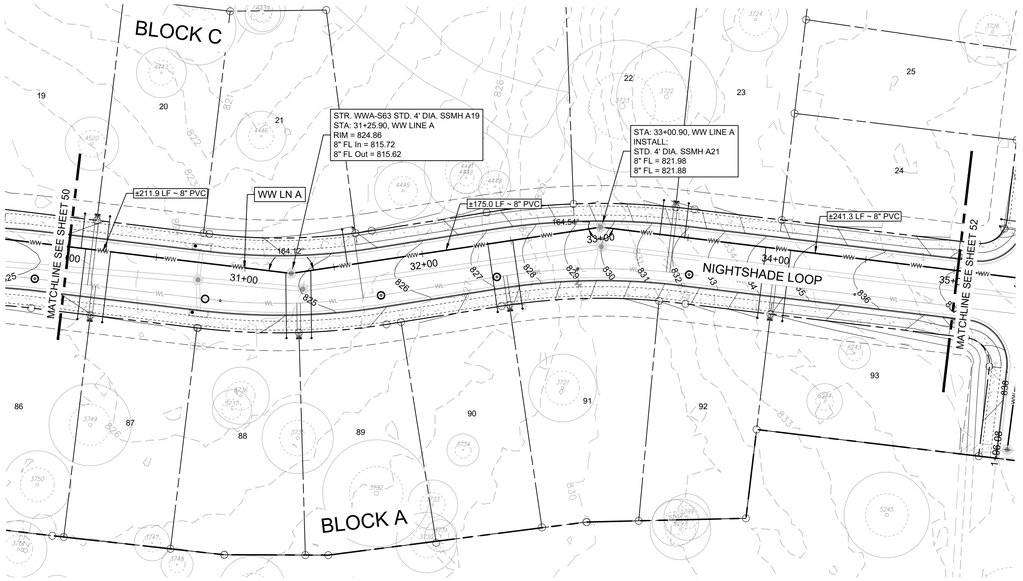
DESIGN	DRAWN	CHKD
BR	MG	JC

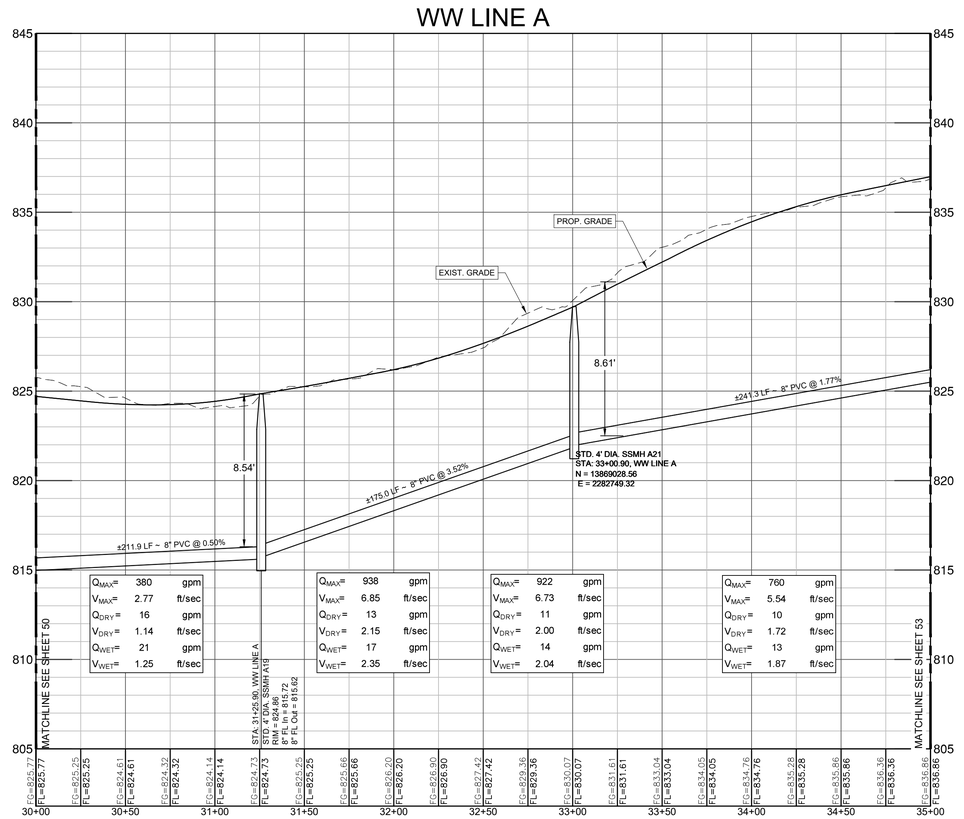
JOB No. 005956-01-114

SHEET 50 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 50 WASTEWATER LINE A PLAN & PROFILE (3 OF 5), October 31, 2024, 1:56 PM, mguerra







SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- 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

ELEVATION EXISTING GRADE — EG=YYY.YY

ELEVATION PROPOSED FLOW LINE — FL=XXX.XX

PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
A	31+22.82	88	A	824.79	817.04	8"
	31+36.97	89	A	825.03	817.31	
	31+57.66	21	C	825.38	817.72	
	32+37.02	90	A	827.19	819.26	
	32+51.08	91	A	827.69	819.75	
	33+33.47	22	C	831.45	822.93	
	33+47.47	23	C	832.14	823.35	
	33+93.19	92	A	834.24	824.67	
	34.07.18	93	A	834.76	825.08	
	35+72.48	24	C	837.79	829.25	
	35+75.61	26	B	837.76	829.27	
	35+89.60	25	B	837.62	829.34	
	36+40.39	24	B	836.93	829.69	
	36+60.06	25	C	836.83	829.76	
	36+74.07	26	C	836.73	829.84	
	37+54.77	27	C	836.70	830.01	
	37+68.77	28	C	836.97	830.26	
	37+69.41	23	B	837.09	830.33	
	38+39.18	22	B	837.94	830.84	
	38+49.80	29	C	838.10	830.94	
	38+53.18	21	B	837.15	830.98	
	38+63.80	30	C	838.31	831.09	
	39+39.18	20	B	839.33	831.87	
	39+49.93	31	C	839.42	831.98	
	39+53.18	19	B	839.45	832.02	
	39+63.80	32	C	839.53	832.13	
	40+34.80	18	B	839.70	832.86	
	40+47.72	17	B	839.68	832.99	

NOTES:

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.
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 WASTWATER SERVICES.

STEEL CASING NOTES

1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
3. THE RESTRAINT CASING WILL BE SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE RESTRAINT CASING, AT A MAXIMUM OF FIVE-FOOT INTERVALS

WATER AND WASTEWATER SEPARATION NOTES:

§290.44(e)(4)(B)(ii)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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San Marcos, Texas 78666
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REVISIONS

REVISION	DESCRIPTION	DATE
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WASTEWATER LINE A PLAN & PROFILE (4 OF 5)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

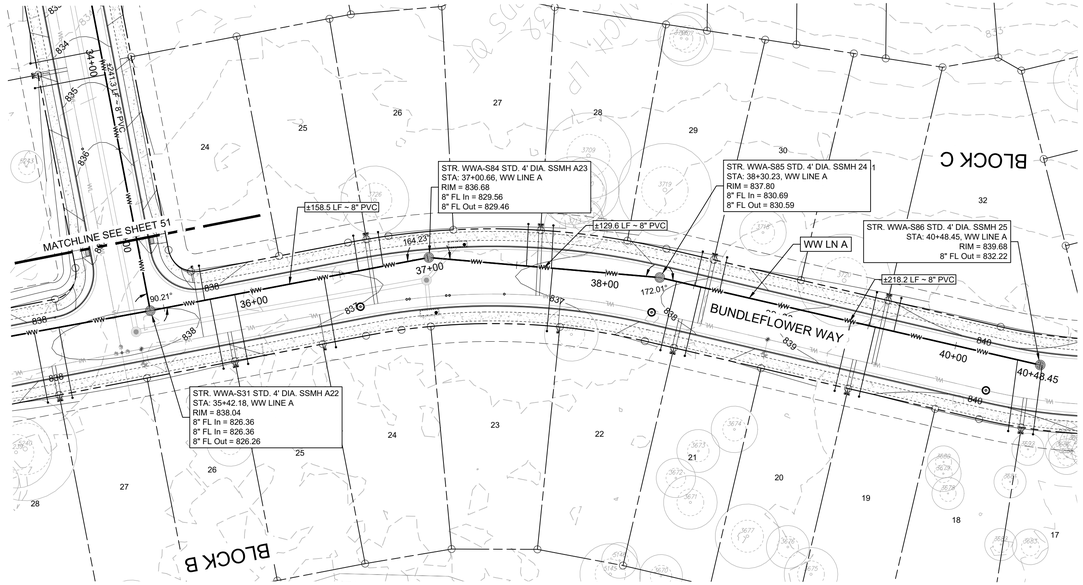
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

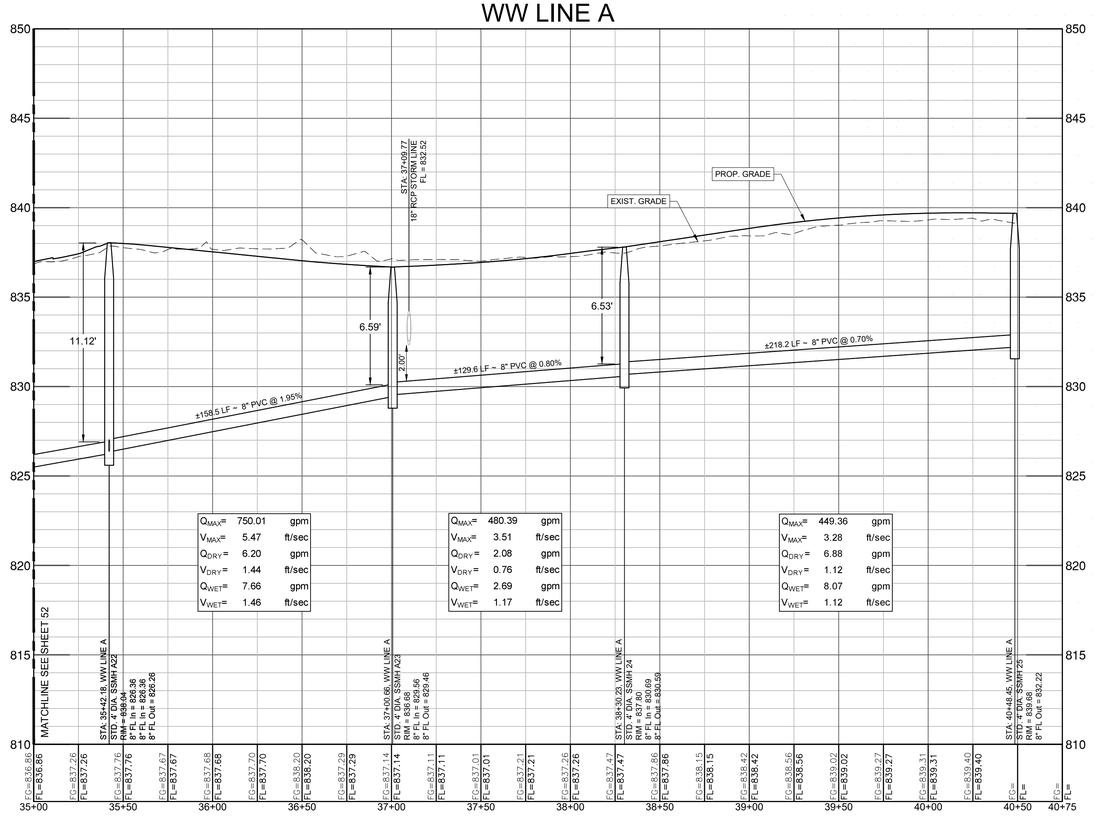
SHEET 51 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 51 WASTEWATER LINE A PLAN & PROFILE (4 OF 5), October 31, 2024, 1:56 PM, mguerra



WW LINE A



PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
A	31+22.82	88	A	824.79	817.04	8"
	31+36.97	89	A	825.03	817.31	
	31+57.66	21	C	825.38	817.72	
	32+37.02	90	A	827.19	819.26	
	32+51.08	91	A	827.69	819.75	
	33+33.47	22	C	831.45	822.93	
	33+47.47	23	C	832.14	823.35	
	33+93.19	92	A	834.24	824.67	
	34.07.18	93	A	834.76	825.08	
	35+72.48	24	C	837.79	829.25	
	35+75.61	26	B	837.76	829.27	
	35+89.60	25	B	837.62	829.34	
	36+40.39	24	B	836.93	829.69	
	36+60.06	25	C	836.83	829.76	
	36+74.07	26	C	836.73	829.84	
	37+54.77	27	C	836.70	830.01	
	37+68.77	28	C	836.97	830.26	
	37+69.41	23	B	837.09	830.33	
	38+39.18	22	B	837.94	830.84	
	38+49.80	29	C	838.10	830.94	
	38+53.18	21	B	837.15	830.98	
	38+63.80	30	C	838.31	831.09	
	39+39.18	20	B	839.33	831.87	
	39+49.93	31	C	839.42	831.98	
	39+53.18	19	B	839.45	832.02	
	39+63.80	32	C	839.53	832.13	
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	40+47.72	17	B	839.68	832.99	



40 0 40 80
SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
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- 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
ELEVATION EXISTING GRADE	EG=-XYX.XX / FL=-XXX.XX	ELEVATION PROPOSED FLOW LINE

NOTES:

1. SEE GENERAL CONSTRUCTION NOTES.
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4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS

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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.
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REVISION	DESCRIPTION	DATE
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WASTEWATER LINE A PLAN & PROFILE (5 OF 5)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

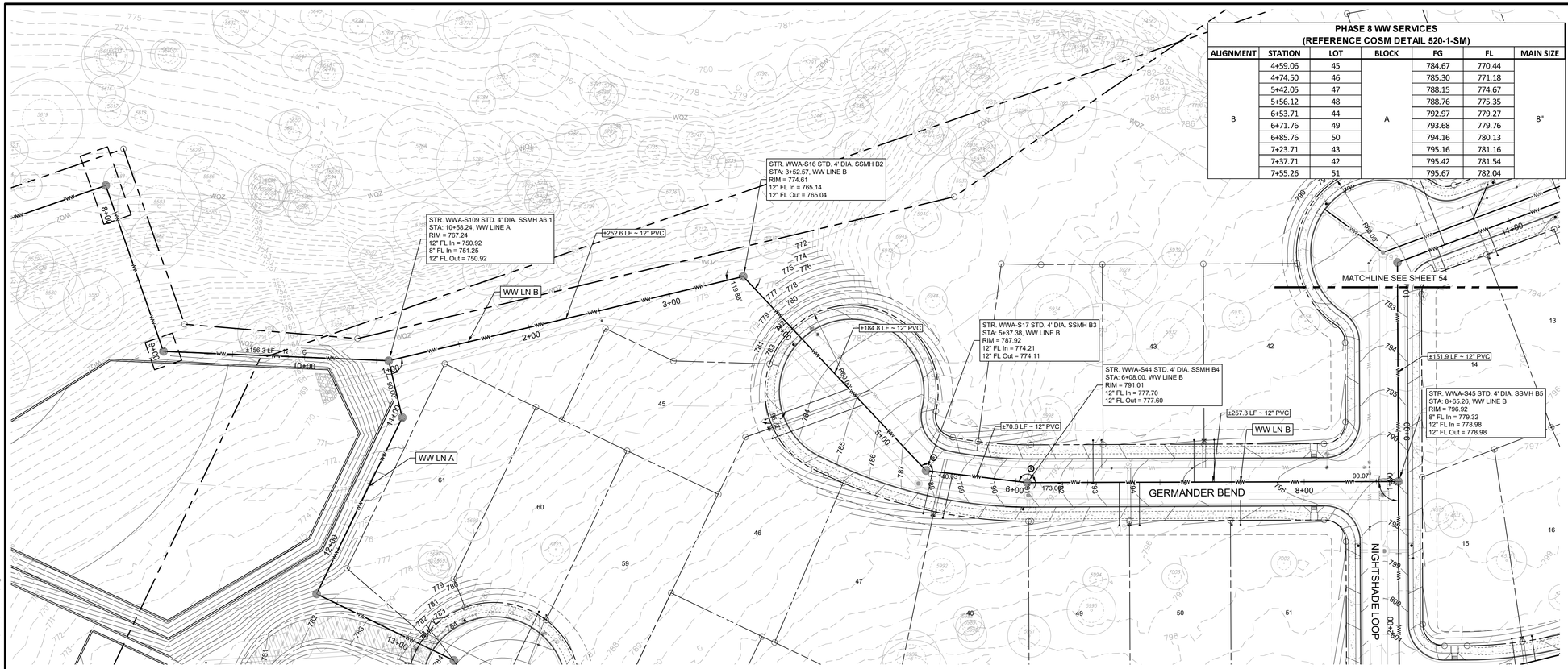
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 52 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 52 WASTEWATER LINE A PLAN & PROFILE (5 OF 5), October 31, 2024, 1:57 PM, mguerra





LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- 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
ELEVATION EXISTING GRADE (EG=XYX.XX, FL=WXX.XX)	ELEVATION PROPOSED FLOW LINE

NOTES:

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.
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 WASTWATER SERVICES.

STEEL CASING NOTES

1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
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WATER AND WASTEWATER SEPARATION NOTES:

§290.44(e)(4)(B)(ii)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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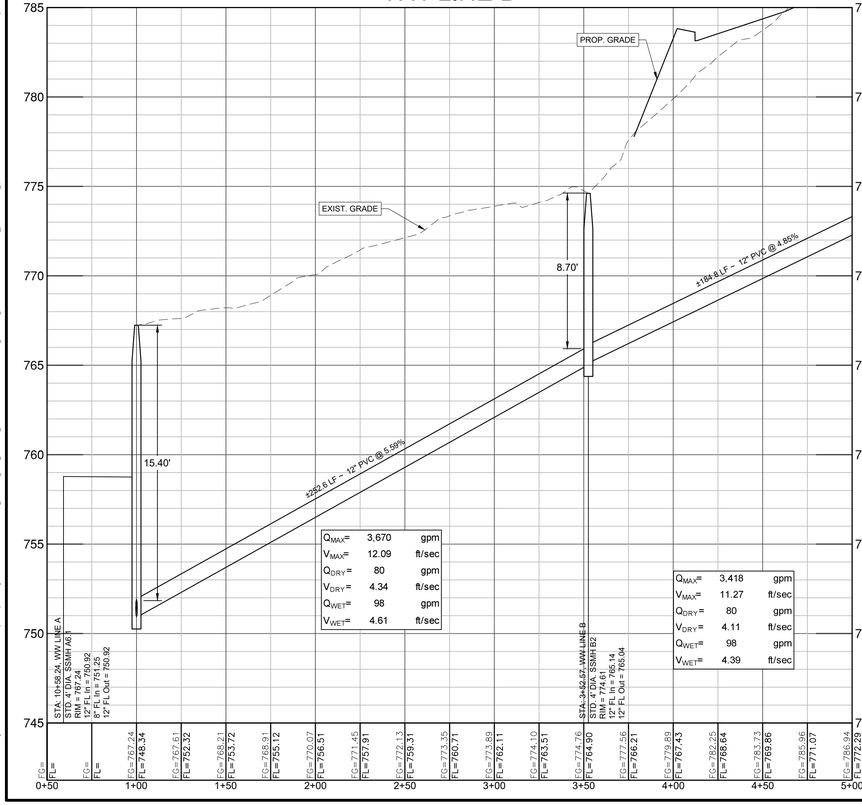
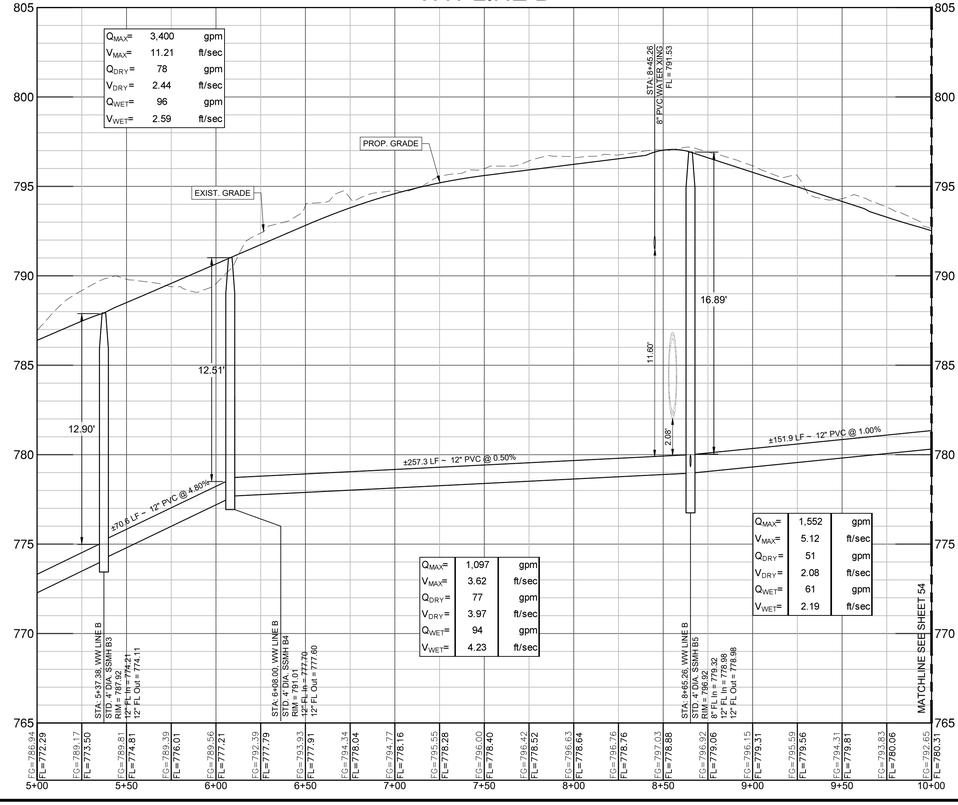
WW LINE B



WW LINE B



Bowman
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151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS	DESCRIPTION	DATE
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WASTEWATER LINE B PLAN & PROFILE (1 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 53 OF 81

FOR PERMIT

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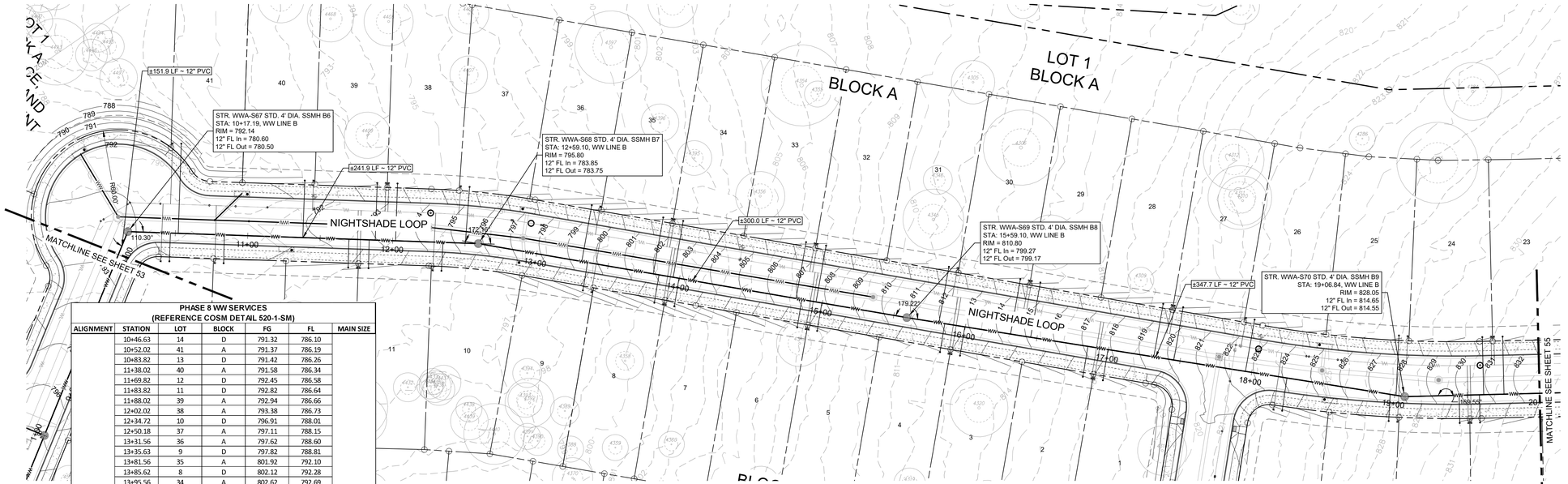
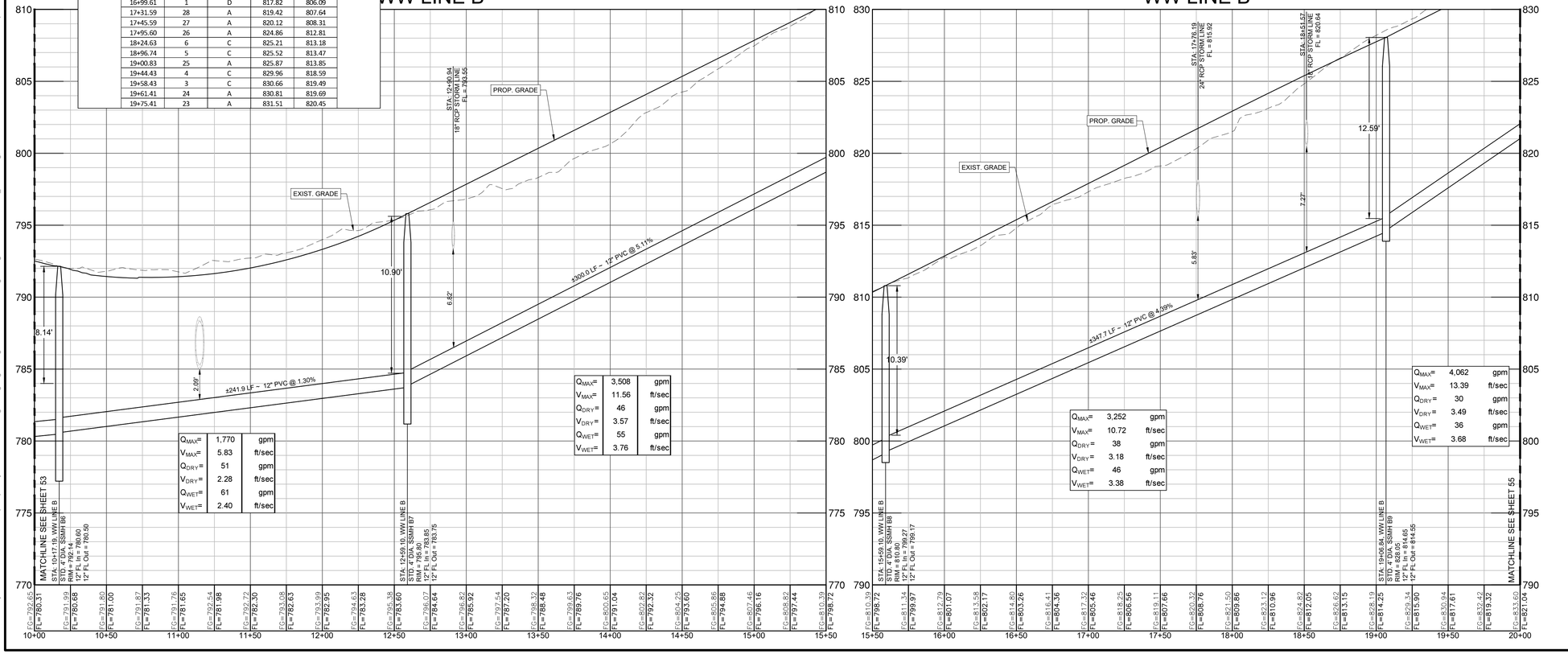


PHASE 8 WW SERVICES (REFERENCE COSM DETAIL 520-1-SM)						
ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
	10+46.63	14	D	791.32	786.10	
	10+52.02	41	A	791.37	786.19	
	10+83.82	13	D	791.42	786.26	
	11+38.02	40	A	791.58	786.34	
	11+69.82	12	D	792.45	786.58	
	11+83.82	11	D	792.82	786.64	
	11+88.02	39	A	792.94	786.66	
	12+02.02	38	A	793.38	786.73	
	12+34.72	10	D	796.91	788.01	
	12+50.18	37	A	797.11	788.15	
	13+31.56	36	A	797.62	788.60	
	13+35.63	9	D	797.82	788.81	
	13+81.56	35	A	801.92	792.10	
	13+85.62	8	D	802.12	792.28	
	13+95.56	34	A	802.62	792.69	
	13+99.63	7	D	802.82	792.85	
	14+81.56	33	A	806.92	796.19	
	14+85.62	6	D	807.12	796.36	
8	14+95.56	32	A	807.62	796.76	8"
	14+99.62	5	D	807.82	796.95	
	15+81.56	31	A	811.92	800.52	
	15+85.62	4	D	812.12	800.73	
	15+99.62	3	D	812.82	801.38	
	16+31.57	30	A	814.42	802.88	
	16+45.58	29	A	815.12	803.57	
	16+85.61	2	D	817.12	805.45	
	16+99.61	1	D	817.82	806.09	
	17+31.59	28	A	819.42	807.64	
	17+45.59	27	A	820.12	808.31	
	17+95.60	26	A	824.86	812.81	
	18+24.63	6	C	825.21	813.18	
	18+96.74	5	C	825.52	813.47	
	19+00.83	25	A	825.87	813.85	
	19+44.43	4	C	829.96	818.59	
	19+58.43	3	C	830.66	819.49	
	19+61.41	24	A	830.81	819.69	
	19+75.41	23	A	831.51	820.45	



SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW EXISTING WASTEWATER LINE
- WL EXISTING WATER LINE
- WL PROPOSED WATER LINE
- WW PROPOSED WASTEWATER LINE
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- PROPOSED DUAL WATER SERVICE
- PROPOSED SINGLE WASTEWATER SERVICE

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL	1"= 40' HORIZONTAL
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NOTES:

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4.5 BE CONSTRUCTED OF AT EAST 150 PSI PRESSURE CLASS

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San Marcos, Texas 78666
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REVISIONS		
REVISION	DESCRIPTION	DATE
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WASTEWATER LINE B PLAN & PROFILE (2 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 54 OF 81

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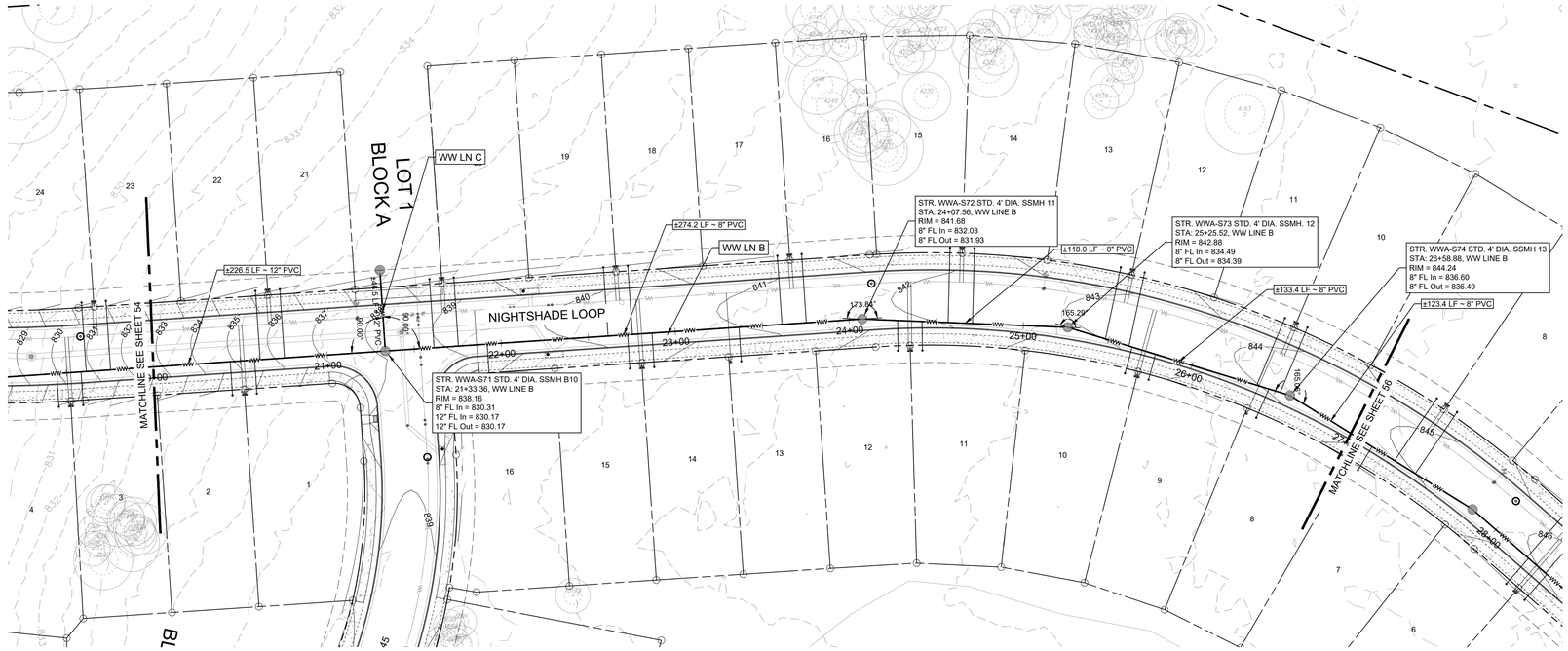

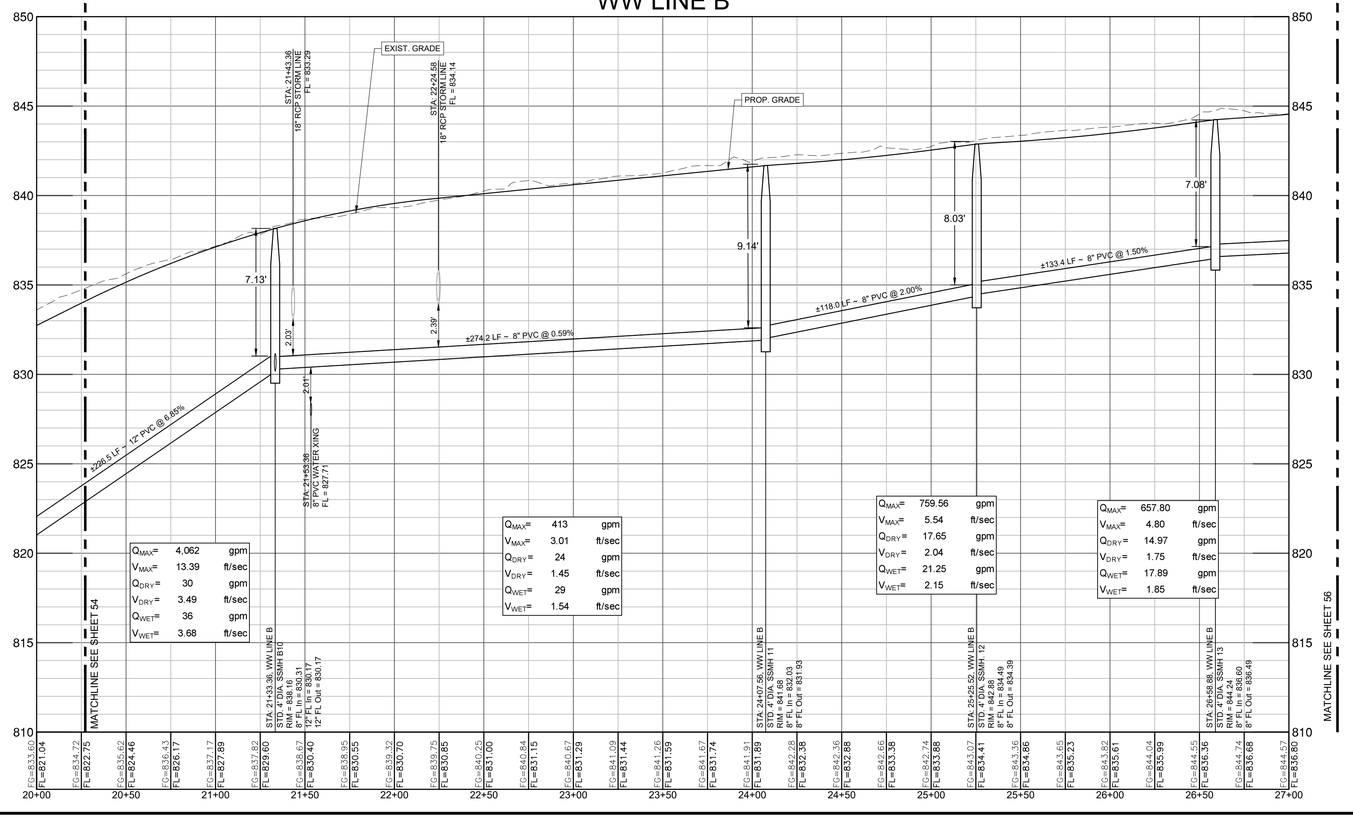

PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
B	20+44.24	2	C	834.90	824.67	8"
	20+58.24	1	C	835.51	825.47	
	20+61.41	22	A	835.65	825.66	
	20+75.41	21	A	836.22	826.49	
	21+75.41	20	A	839.14	830.62	
	21+91.89	16	B	836.43	830.85	
	22+61.41	19	A	840.21	831.73	
	22+72.68	15	B	840.32	831.87	
	22+75.41	18	A	840.35	831.91	
	22+86.68	14	B	840.46	832.05	
	23+36.70	13	B	840.96	832.69	
	23+61.41	17	A	841.21	833.00	
	23+75.41	16	A	841.35	833.18	
	24+27.83	12	B	841.81	833.92	
	24+41.85	11	B	841.92	834.06	
	24+56.85	15	A	842.05	834.26	
	24+70.85	14	A	842.19	834.41	
	25+48.14	13	A	843.02	835.34	
	25+62.19	12	A	843.12	835.47	
	25+64.15	10	B	843.13	835.50	
	25+78.15	9	B	843.26	835.63	
	26+38.89	11	A	843.96	836.18	
	26+46.30	8	B	844.06	836.25	
	26+52.96	10	A	844.16	836.30	



LEGEND

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- EASEMENT LINE
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REVISIONS		
REVISION	DESCRIPTION	DATE
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WASTEWATER LINE B PLAN & PROFILE (3 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

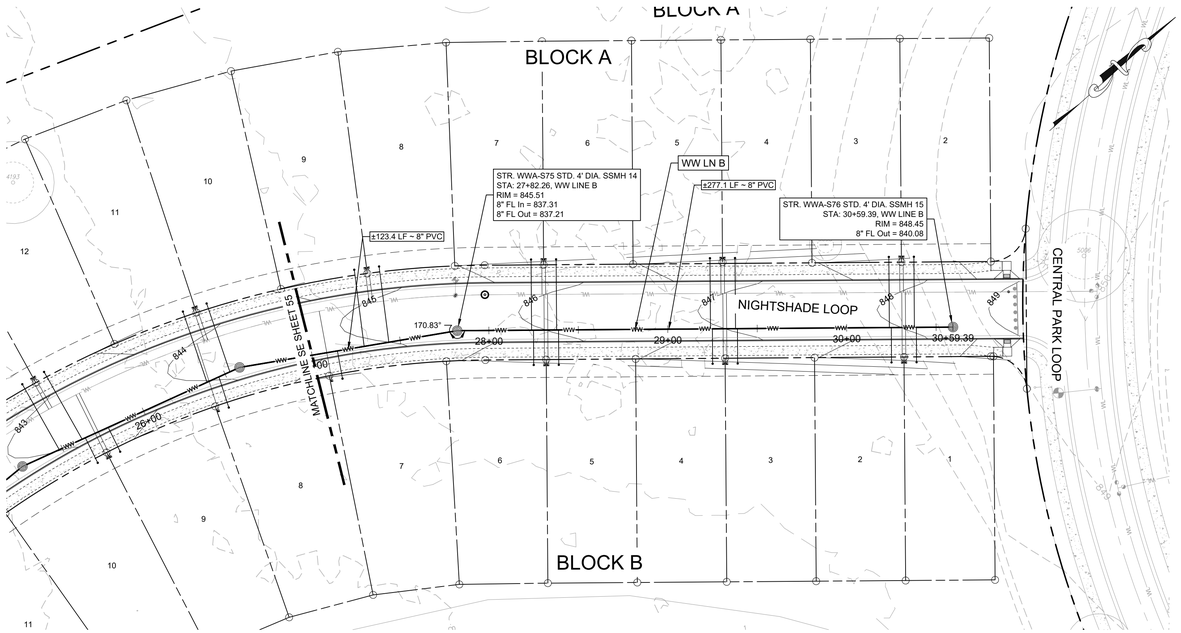
DESIGN	DRAWN	CHKD
BR	MG	JC

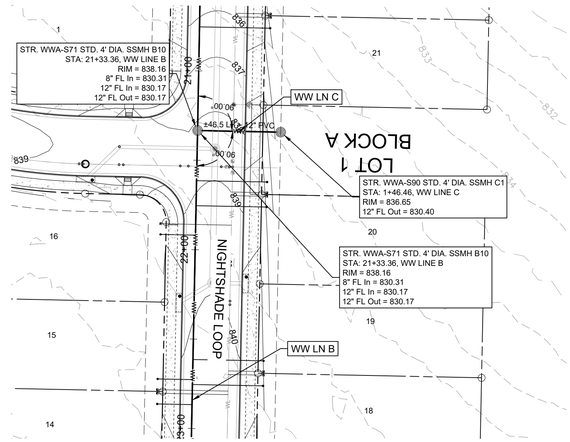
JOB No. 005956-01-114

SHEET
55 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 55 WASTEWATER LINE B PLAN & PROFILE (3 OF 3), October 31, 2024, 1:59 PM, mguerra





40 0 40 80

SCALE: 1 INCH = 40 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- EXISTING WASTEWATER LINE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE
- PROPOSED STORM DRAIN LINE
- 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
ELEVATION EXISTING GRADE	EC=-XYX.XX FL=-XYX.XX	ELEVATION PROPOSED FLOW LINE

NOTES:

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.
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-S-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 WASTWATER SERVICES.

STEEL CASING NOTES

1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
3. THE RESTRAINT CASING WILL BE SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE RESTRAINT CASING, AT A MAXIMUM OF FIVE-FOOT INTERVALS

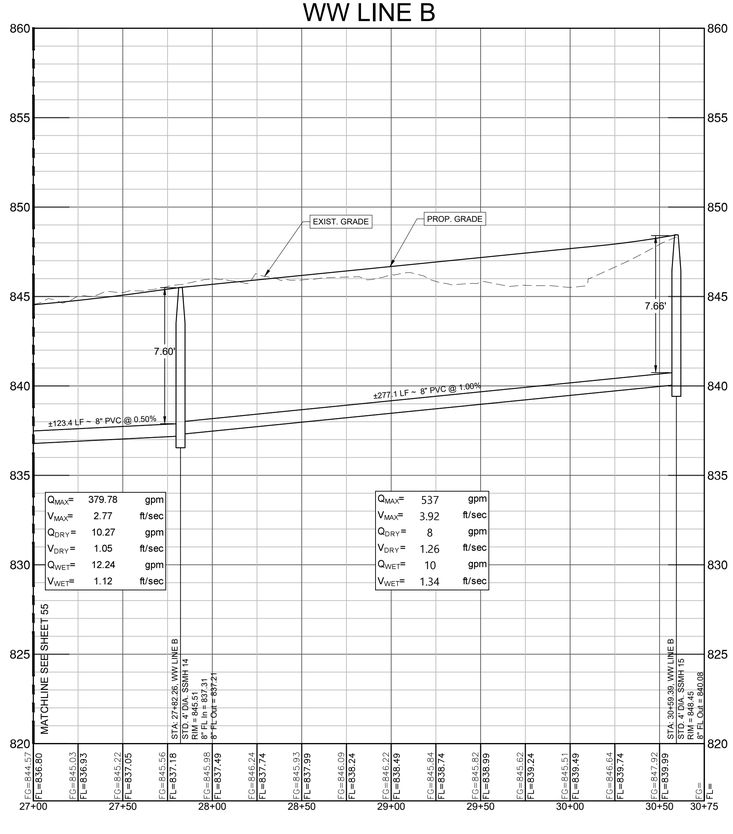
WATER AND WASTEWATER SEPARATION NOTES:

§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.

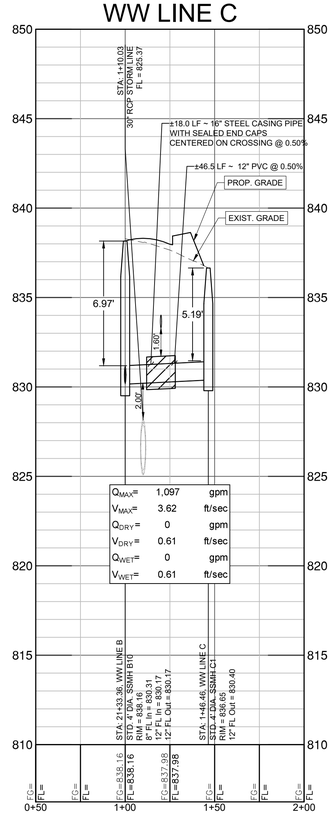
WW LINE B



PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
B	27+14.37	7	B	844.67	836.87	8"
	27+29.51	9	A	844.81	836.94	
	27+43.55	8	A	844.99	837.01	
	28+23.87	7	A	845.91	837.72	
	28+24.93	6	B	845.93	837.73	
	28+37.87	6	A	846.05	837.86	
	28+38.93	5	B	846.06	837.87	
	29+23.87	5	A	846.91	838.72	
	29+24.93	4	B	846.92	838.73	
	29+37.87	4	A	847.05	838.86	
	29+38.93	3	B	847.06	838.87	
	30+23.87	3	A	847.92	839.72	
	30+24.93	2	B	847.93	839.73	
	30+37.87	2	A	848.09	839.86	
	30+38.93	1	B	848.11	839.87	

WW LINE C



Bowman
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com
TBPE Firm Registration No.: F-14309
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REVISIONS		
REVISION	DESCRIPTION	DATE
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WASTEWATER LINE B AND C PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

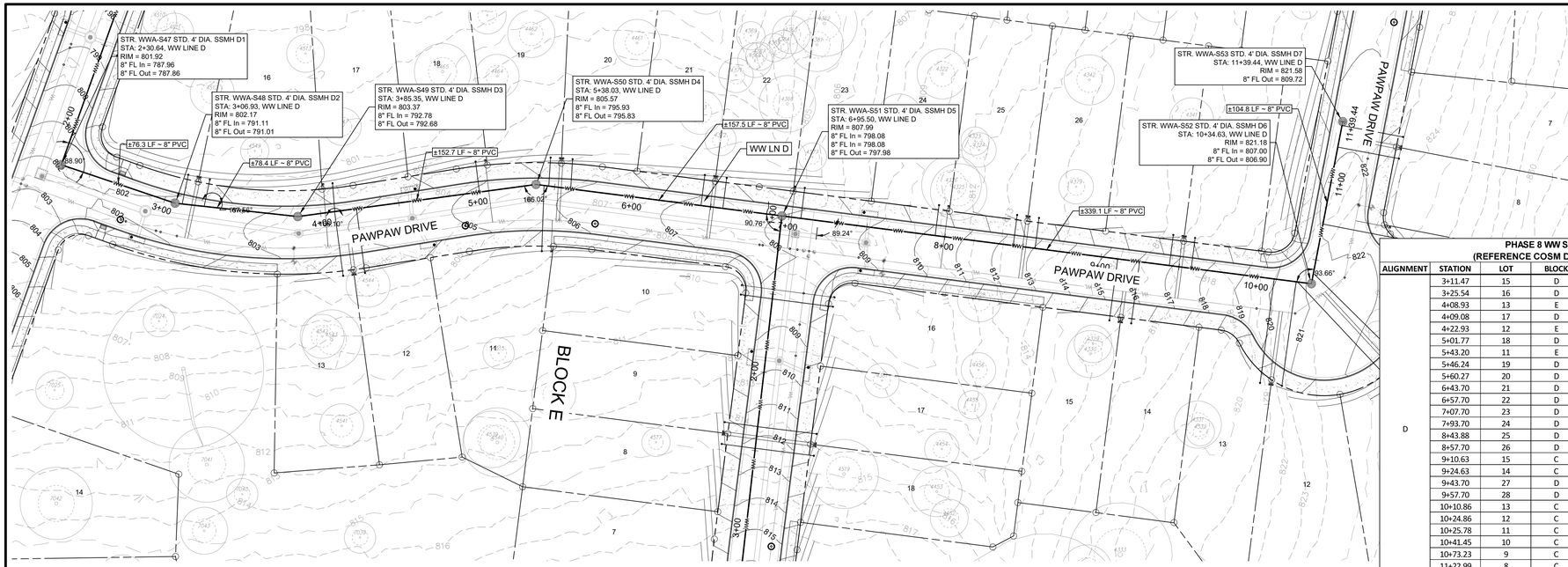
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
56 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 56 WASTEWATER LINE B AND C PLAN & PROFILE, October 31, 2024, 2:00 PM, mguerra



40 0 40 80

SCALE: 1 INCH = 40 FT

PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
D	3+11.47	15	D	802.21	791.52	8"
	3+25.54	16	D	802.37	791.84	
	4+08.93	13	E	803.69	793.75	
	4+09.08	17	D	804.35	794.62	
	4+22.93	12	E	804.45	794.74	
	5+01.77	18	D	804.57	794.90	
	5+43.20	11	E	804.67	795.04	
	5+46.24	19	D	805.72	796.66	
	5+60.27	20	D	805.96	796.96	
	6+43.70	21	D	807.21	798.65	
	6+57.70	22	D	807.42	798.93	
	7+07.70	23	D	808.79	800.82	
	7+93.70	24	D	809.13	801.13	
	8+43.88	25	D	812.41	802.97	
	8+57.70	26	D	813.04	803.27	
	9+10.63	15	C	815.42	804.40	
	9+24.63	14	C	816.05	804.70	
	9+43.70	27	D	816.90	805.11	
	9+57.70	28	D	817.54	805.41	
	10+10.86	13	C	819.92	806.55	
	10+24.86	12	C	820.68	806.86	
	10+25.78	11	C	820.71	806.87	
	10+41.45	10	C	821.24	807.35	
	10+73.23	9	C	822.03	808.20	
	11+22.99	8	C	821.82	809.55	
	11+36.99	7	C	821.61	809.93	

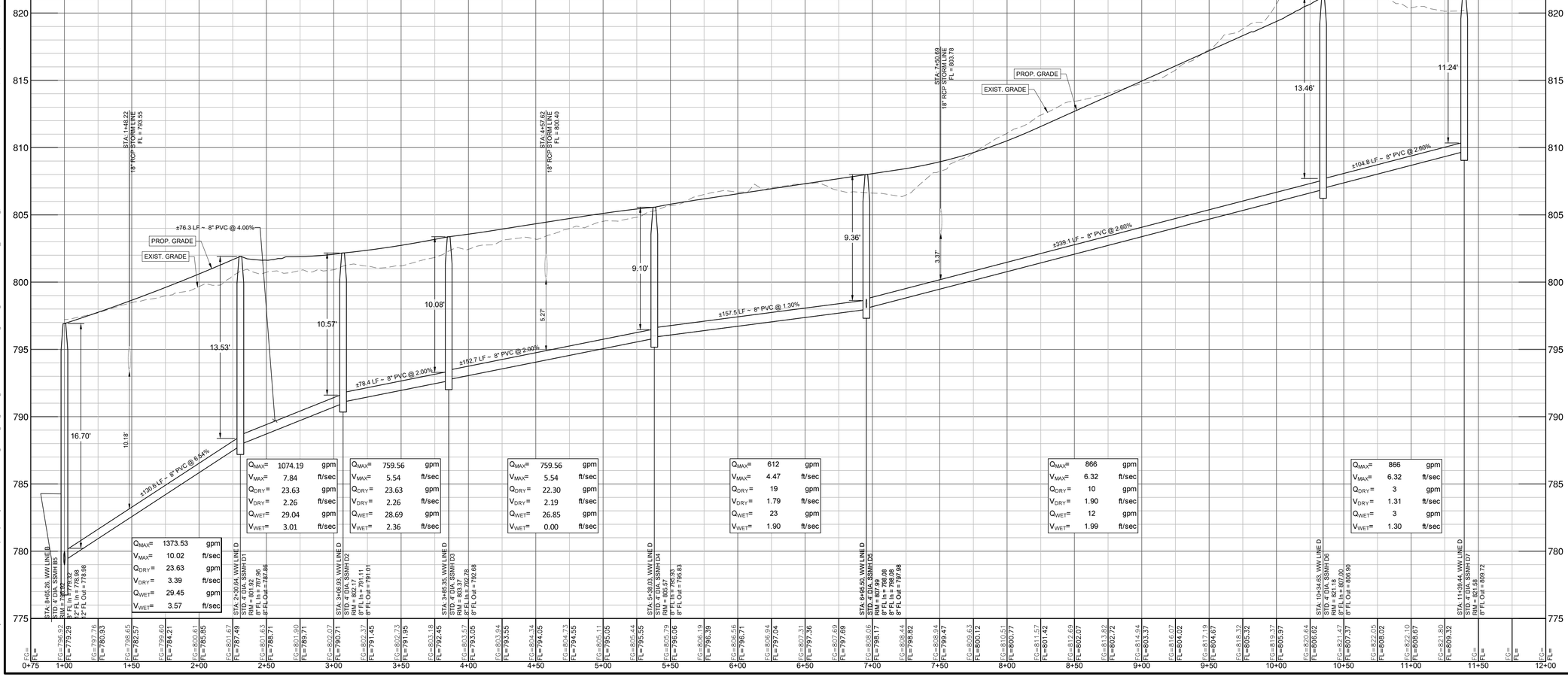
LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- 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

ELEVATION EXISTING GRADE — EG=XYX.XX
ELEVATION PROPOSED FLOW LINE — FL=XXX.XX

WW LINE D



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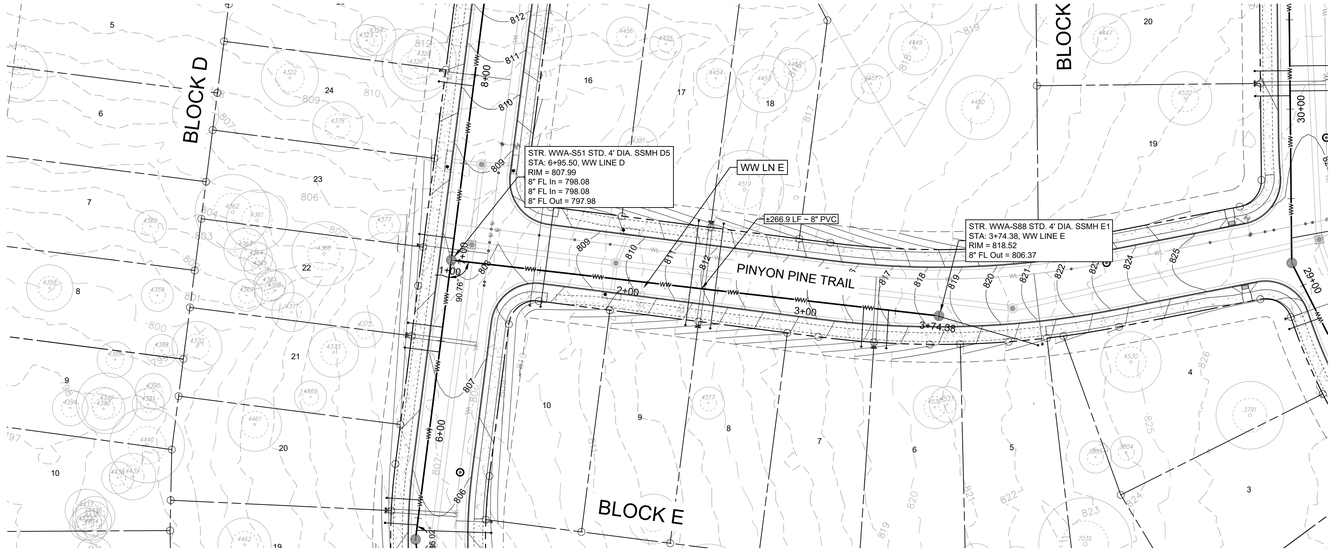



LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- WW — EXISTING WASTEWATER LINE
- WL — EXISTING WATER LINE
- WL — PROPOSED WATER LINE
- WW — PROPOSED WASTEWATER LINE
- SD — PROPOSED STORM DRAIN LINE
- WASTEWATER MANHOLE
- PROPOSED SINGLE WATER SERVICE
- PROPOSED DUAL WATER SERVICE
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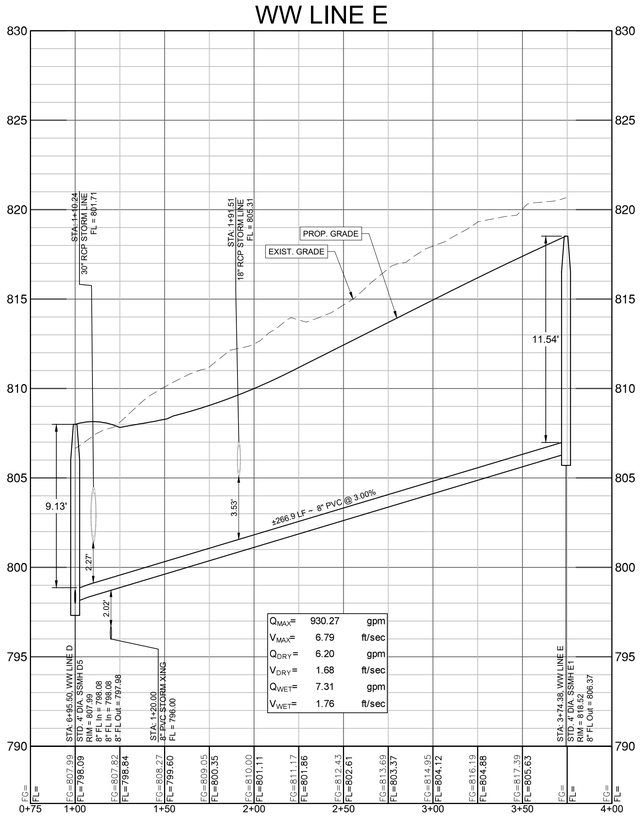
PROPOSED GRADE CL	1"= 4' VERTICAL
ELEVATION EXISTING GRADE — EG=+XYX.XX	ELEVATION PROPOSED FLOW LINE — FL=+XXX.XX



PHASE 8 WW SERVICES
(REFERENCE COSM DETAIL 520-1-SM)

ALIGNMENT	STATION	LOT	BLOCK	FG	FL	MAIN SIZE
E	1+52.98	10	E	809.37	802.92	8"
	1+53.09	16	C	809.38	802.94	
	2+34.63	17	C	809.92	803.45	
	2+34.72	9	E	811.65	804.79	
	2+48.51	18	C	812.35	805.32	
	2+48.63	8	E	812.36	805.32	
	3+35.09	7	E	816.53	808.42	
	3+46.11	6	E	817.20	808.94	
	3+74.29	5	E	818.52	809.99	

NOTES:

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.
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.
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12. CONTRACTOR TO STAMP CURB WITH "S" AT LOCATION OF WASTWATER SERVICES.

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1. THE RESTRAINT CASING WILL BE CONSTRUCTED OF AT LEAST 150PSI PRESSURE CLASS PIPE.
2. THE RESTRAINT CASING WILL BE SEALED AT BOTH ENDS WITH CEMENT GROUT OR A MANUFACTURED SEAL.
3. THE RESTRAINT CASING WILL BE SUPPORTED BY SPACERS BETWEEN THE COLLECTION SYSTEM PIPE AND THE RESTRAINT CASING, AT A MAXIMUM OF FIVE-FOOT INTERVALS

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.

Bowman
TBPE Firm Registration No.: F-14309
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San Marcos, Texas 78666
Phone: (512) 396-2600
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REVISIONS	DESCRIPTION	DATE
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WASTEWATER LINE E PLAN & PROFILE

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
58 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WWPP.dwg, 58 WASTEWATER LINE E PLAN & PROFILE, October 31, 2024, 2:01 PM, mgarcia

PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN A	1+57.67	1	B	8"
	1+58.74	2	A	
	1+59.67	2	B	
	1+60.74	3	A	
	2+57.67	3	B	
	2+58.74	4	A	
	2+59.67	4	B	
	2+60.74	5	A	
	3+57.67	5	B	
	3+58.74	6	A	
	3+59.67	6	B	
	3+60.74	7	A	
	4+55.49	8		
	4+57.49	9		
	4+85.92	7	B	
	5+50.33	10	A	
	5+52.33	11		
	5+56.68	8	B	
	6+28.15	9		
	6+30.15	10		
	6+45.39	12	A	
	6+47.39	13		
	7+40.52	14		
	7+42.52	15		
	7+70.40	11	B	
	7+72.40	12		
	8+37.91	16	A	
	8+39.91	17		
	8+76.56	13	B	
	9+26.62	14		
	9+28.62	15		
	9+37.91	18	A	
	9+39.91	19		
	10+21.37	16	B	
	10+37.91	20	A	
	11+37.91	21		
	11+39.91	22		
	11+55.03	1	C	
	11+57.03	2		
	12+37.91	23	A	
	12+39.91	24		
	12+54.83	3	C	
	12+56.83	4		
	12+98.73	25	A	
	13+02.75	5	C	
	13+85.13	6		
	14+13.63	26	A	
	14+63.63	27		
	14+65.63	28		
	15+09.79	1	D	
	15+11.79	2		
	15+63.63	29	A	
	15+65.63	30		
	16+09.79	3	D	
	16+11.79	4		
	16+15.63	31	A	
	17+09.79	5	D	
	17+11.79	6		
	17+13.63	32	A	
	17+15.63	33		
	18+09.79	7	D	
	18+11.79	8		
	18+13.63	34	A	
	18+15.63	35		
	18+61.79	9	D	
	18+65.63	36	A	
	19+60.95	37		
	19+76.83	10	D	
	20+09.91	38	A	
	20+11.91	39		
	20+28.31	11	D	
	20+30.31	12		
	20+61.91	40	A	

PHASE 8 WL SERVICES

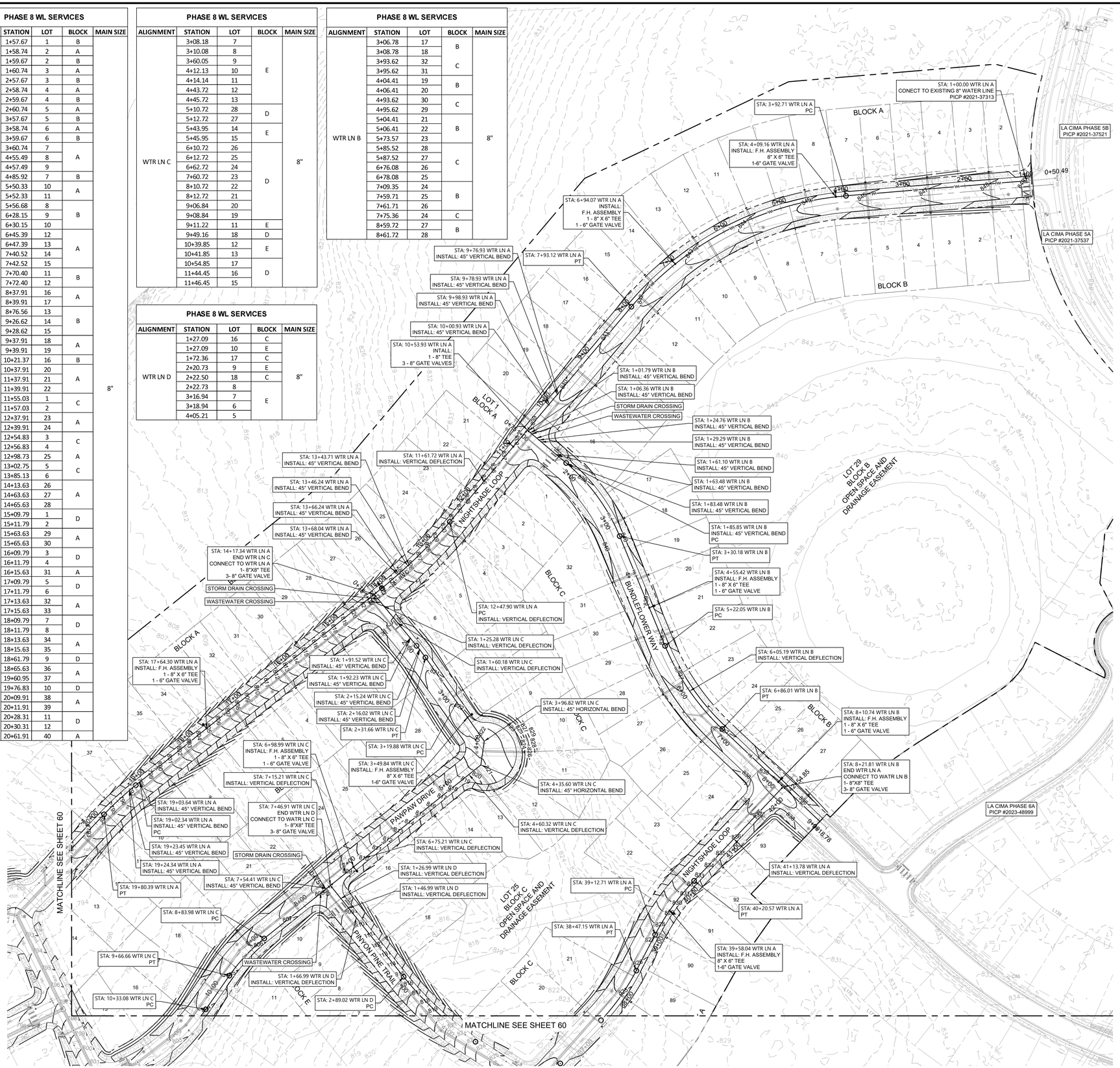
ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN C	3+08.18	7	E	8"
	3+10.08	8		
	3+60.05	9		
	4+12.13	10		
	4+14.14	11		
	4+43.72	12		
	4+45.72	13		
	5+10.72	28	D	
	5+12.72	27		
	5+43.95	14	E	
	5+45.95	15		
	6+10.72	26	D	
	6+12.72	25		
	6+62.72	24		
	7+60.72	23		
	8+10.72	22		
	8+12.72	21		
	9+06.84	20		
	9+08.84	19		
	9+11.22	11	E	
	9+49.16	18	D	
	10+39.85	12	E	
	10+41.85	13		
	10+54.85	17	D	
	11+44.45	16		
	11+46.45	15		

PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN B	3+06.78	17	B	8"
	3+08.78	18		
	3+93.62	32	C	
	3+95.62	31		
	4+04.41	19	B	
	4+06.41	20		
	4+93.62	30	C	
	4+95.62	29		
	5+04.41	21	B	
	5+06.41	22		
	5+73.57	23		
	5+85.52	28	C	
	5+87.52	27		
	6+76.08	26		
	6+78.08	25		
	7+09.35	24	B	
	7+59.71	25		
	7+61.71	26		
	7+75.36	24	C	
	8+59.72	27	B	
	8+61.72	28		

PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN D	1+27.09	16	C	8"
	1+27.09	10	E	
	1+72.36	17	C	
	2+20.73	9	E	
	2+22.50	18	C	
	2+22.73	8	E	
	3+16.94	7		
	3+18.94	6		
	4+05.21	5		



125 0 125 250

SCALE: 1 INCH = 125 FT

LEGEND

- PROPOSED R.O.W.
- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
- 830 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WW EXISTING WASTEWATER LINE
- WL EXISTING WATER LINE
- RW EXISTING RECLAIMED LINE
- WL PROPOSED WATER LINE
- WW PROPOSED WASTEWATER LINE
- PROPOSED STORM DRAIN LINE
- PROPOSED GATE VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SINGLE WATER SERVICE
- PROPOSED DUAL WATER SERVICE
- PROPOSED SINGLE WASTEWATER SERVICE

POTABLE WATER NOTES:

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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.

JOINT RESTRAINTS CALCULATED USING EBAA IRON RESTRAIN LENGTH CALCULATOR AND THE FOLLOWING ASSUMPTIONS:	
TYPE OF TRENCH	TYPE 5
FACTOR OF SAFETY	1.5 TO 1
TEST PRESSURE RATE	200 PSI
SOIL TYPE	CH (GRANULAR): INORGANIC CLAYS OF HIGH PLASTICITY, BACKFILLED WITH GRANULAR MATERIAL.
	MINIMUM DEPTH REQUIRED FOR WATER LINE = 4.13'

Bowman
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com
TBPE Firm Registration No.: F-14309

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REVISIONS	DESCRIPTION	DATE
REVISION	---	---

OVERALL WATERLINE PLAN 1 OF 2

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

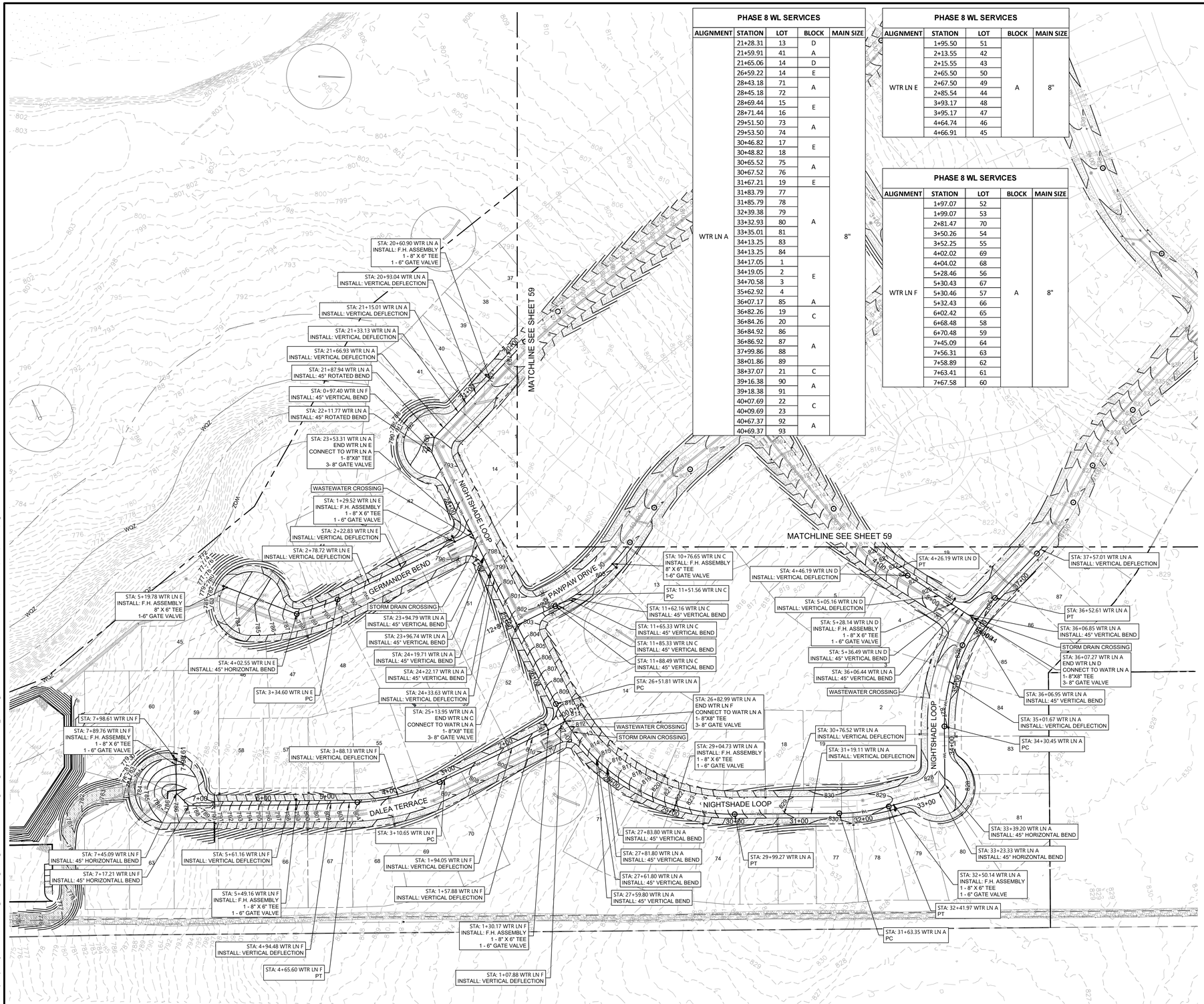
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 59 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_OWL.dwg, 59 OVERALL WATERLINE PLAN 1 OF 2, October 31, 2024, 2:03 PM, mguerra



PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN A	21+28.31	13	D	8"
	21+59.91	41	A	
	21+65.06	14	D	
	26+59.22	14	E	
	28+43.18	71	A	
	28+45.18	72		
	28+69.44	15	E	
	28+71.44	16		
	29+51.50	73	A	
	29+53.50	74		
	30+46.82	17	E	
	30+48.82	18		
	30+65.52	75	A	
	30+67.52	76		
	31+67.21	19	E	
	31+83.79	77	A	
	31+85.79	78		
	32+39.38	79		
	33+32.93	80		
	33+35.01	81		
	34+13.25	83		
	34+13.25	84		
	34+17.05	1	E	
	34+19.05	2		
	34+70.58	3		
	35+62.92	4		
	36+07.17	85	A	
	36+82.26	19	C	
	36+84.26	20		
	36+84.92	86	A	
	36+86.92	87		
	37+99.86	88		
	38+01.86	89		
	38+37.07	21	C	
	39+16.38	90	A	
	39+18.38	91		
	40+07.69	22	C	
	40+09.69	23		
	40+67.37	92	A	
	40+69.37	93		

PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN E	1+95.50	51	A	8"
	2+13.55	42		
	2+15.55	43		
	2+65.50	50		
	2+67.50	49		
	2+85.54	44		
	3+93.17	48		
	3+95.17	47		
	4+64.74	46		
	4+66.91	45		

PHASE 8 WL SERVICES

ALIGNMENT	STATION	LOT	BLOCK	MAIN SIZE
WTR LN F	1+97.07	52	A	8"
	1+99.07	53		
	2+81.47	70		
	3+50.26	54		
	3+52.25	55		
	4+02.02	69		
	4+04.02	68		
	5+28.46	56		
	5+30.43	67		
	5+30.46	57		
	5+32.43	66		
	6+02.42	65		
	6+68.48	58		
	6+70.48	59		
	7+45.09	64		
	7+56.31	63		
	7+58.89	62		
	7+63.41	61		
	7+67.58	60		

125 0 125 250

SCALE: 1 INCH = 125 FT

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- PROPOSED LOT LINE
- EASEMENT LINE
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TEST PRESSURE RATE	200 PSI
SOIL TYPE	CH (GRANULAR): INORGANIC CLAYS OF HIGH PLASTICITY, BACKFILLED WITH GRANULAR MATERIAL.
DEPTH	MINIMUM DEPTH REQUIRED FOR WATER LINE = 4.13'

Bowman
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www.bowman.com
TBPE Firm Registration No.: F-14309
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REVISIONS		
REVISION	DESCRIPTION	DATE
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OVERALL WATERLINE PLAN 2 OF 2

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

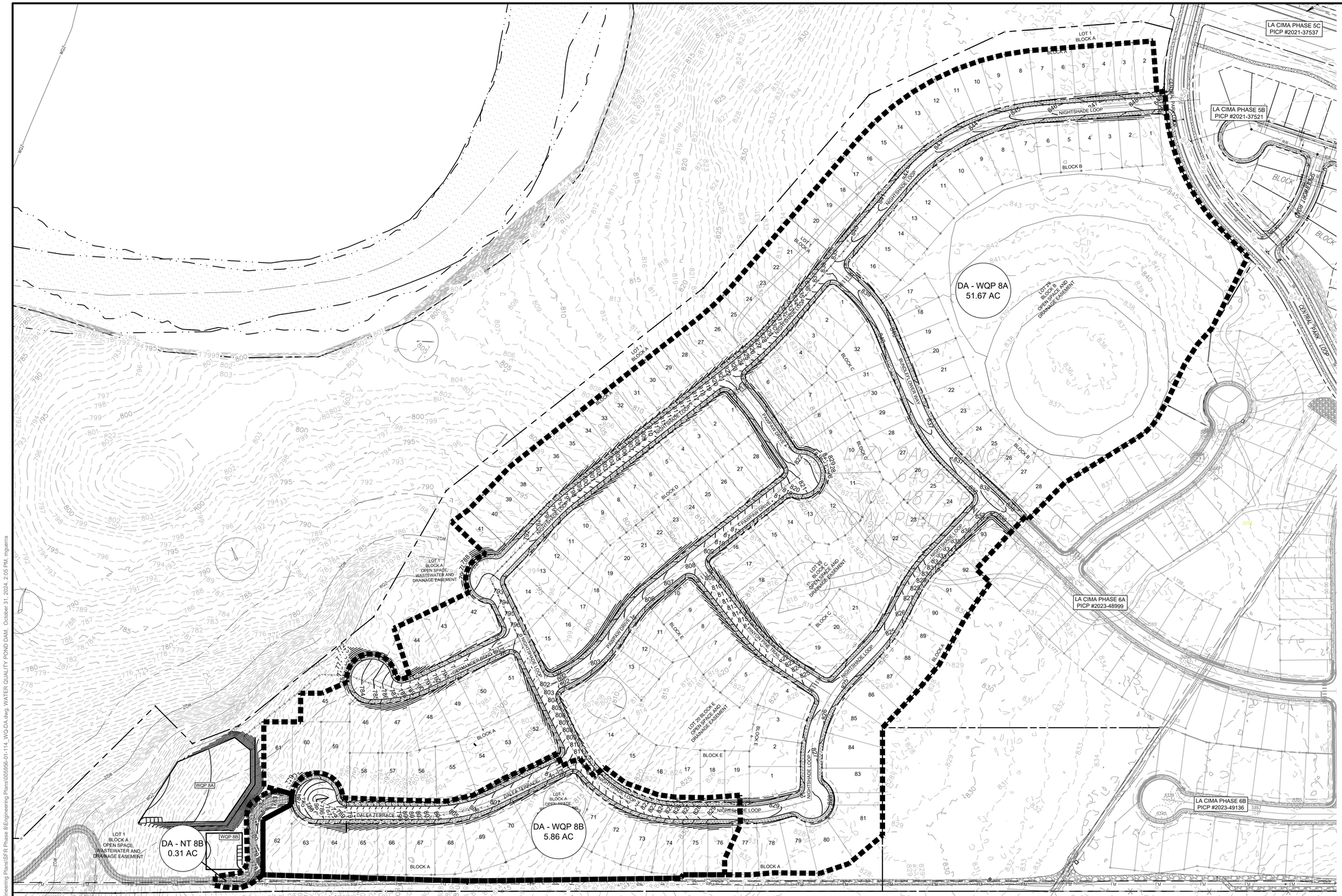
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
60 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_OWL.dwg, 60 OVERALL WATERLINE PLAN 2 OF 2, October 31, 2024, 2:03 PM, mguerra





120 0 120 240

SCALE: 1 INCH = 120 FT

LEGEND

- PROPERTY BOUNDARY
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- PROPOSED LOT LINE
- EASEMENT LINE
- PROPOSED CURB & GUTTER
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- EXISTING MINOR CONTOUR
- 830 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED DRAINAGE AREA
- TIME OF CONCENTRATION
- BERM
- SWALE
- XX / XX.XX DRAINAGE AREA IDENTIFIER
- FLOW ARROW
- HEADWALL
- CURB INLET
- AREA INLET
- JUNCTION BOX
- TIME OF CONCENTRATION
- WQ BASIN

La Cima Phase 8 Impervious Cover Calculations

Drainage Area Basin	Area (sf)	Area (ac)	Area (sq mi)	Number of Proposed Lots	Proposed Lot Impervious Cover (sf)	Proposed Driveway Impervious Cover(sf)	Proposed 5' Wide Sidewalk (LF)	Proposed Roadway - Asphalt (sf)	Open Area - Grass (sf)	Total Proposed Impervious Cover(sf)	Total Existing Impervious Cover (sf)	Total Impervious Cover (sf)	Total Impervious Cover (ac)	Total Impervious Cover (%)
WQP 8A	2,250,938	51.67	0.0807	182.5	547,500	27,740	62,326	229,832	1,134,236	1,116,702	0	1,116,702	25.64	49.61%
WQP 8B	255,262	5.86	0.0092	15.5	46,500	2,356	11,414	41,816	107,520	147,742	0	147,742	3.39	57.88%
NT 8B	13504	0.31	0.0005	0	0	0	0	5056	8448	5056	0	5,056	0.12	37.44%
TOTAL	**2,506,200**	**57.84**	**0.0904**	**198.0**	**594,000**	**30,096**	**73,740**	**271,648**	**1,241,756**	**1,264,444**	**0**	**1,264,444**	**29.14**	**50.45%**

BMP Drainage Area	Overall WQ Drainage Area (sqft)	Overall WQ Drainage Area (ac)	Total Impervious cover Area (sf)	Total Impervious cover Area (ac)	Total Impervious cover Area (%)	Rainfall (in)	TCEQ 80% Required Load Removal (lbs)	La Cima DA 85% Required Increased Load Removal (lbs)	Load To Be Removed (lbs)	BMP	BMP Efficiency	Maximum Removal Capacity (lbs)	F	Rainfall Depth (in)	Post Developed Runoff Coeff	WQV (cuft)	Required Capture Volume (cuft)	Provided Capture Volume (cuft)
WQP 8A	2,250,938	51.67	1,116,702	25.64	49.6%	33	23011	24449	24449	Extened Detention	0.91	27,059	0.90	1.70	0.36	113,318	135,982	125,389
WQP 8B	255,262	5.86	147,742	3.39	57.9%	33	3045	3235	3346	Extened Detention	0.91	3,564	0.94	2.40	0.41	20,702	24,842	22,946
NT 8B	13,504	0.31	5,056	0.12	37.4%	33	104	111	Non-Treated area accounted for in Pond 8B									
TOTAL TREATED	**2,519,703**	**57.84**	**1,269,500**	**29.14**	**50.4%**	-	**26,056**	**27,684**	**27,795**	-	-	**30,623**	-	-	-	-	**160,824**	**148,335**

La Cima Phase 8- Rational Method Calculations

BASIN	AREA			SHEET FLOW				CHANNEL FLOW							Increm	TC	Lag	2-year			5-year			10-year			25-year			50-year			100-year		
				L		S	Tc		L		S	R	V	Tc	TC	Total	min	C	I	Q	C	I	Q	C	I	Q	C	I	Q	C	I	Q	C	I	Q
	sf	ac	sq mi	ft	n	%	min	Type	ft	n	%		fps	min	min	min			in/hr	cfs		in/hr	cfs		in/hr	cfs		in/hr	cfs		in/hr	cfs		in/hr	cfs
WQP 8A	2250938	51.67	0.0807	25	0.016	2.85%	0.41	GUTTER	878	0.015	1.00%	0.17	3.01	4.87	8.3	8.7	5.2	0.47	5.31	128.72	0.51	6.69	174.87	0.54	7.86	218.33	0.58	9.49	284.87	0.62	10.74	341.40	0.66	12.13	412.93
								PIPE	18	0.013	0.50%	0.38	4.21	0.07																					
								PIPE	1207	0.013	2.50%	0.63	13.25	1.52																					
								PIPE	169	0.013	0.50%	0.75	6.69	0.42																					
								PIPE	1000	0.013	1.00%	1.00	11.46	1.45																					
WQP 8B	255262	5.86	0.0092	56	0.016	1.50%	1.01	GUTTER	309	0.015	1.00%	0.17	3.01	1.71	4.7	5.8	3.5	0.43	6.07	15.36	0.47	7.66	20.95	0.50	9.03	26.37	0.54	10.93	34.69	0.57	12.41	41.79	0.62	14.07	50.94
								PIPE	16	0.013	0.50%	0.38	4.21	0.07																					
								PIPE	1054	0.013	0.50%	0.63	5.92	2.97																					

Bowman
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REVISIONS		
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WATER QUALITY POND DAM

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
61 OF 81

FOR PERMIT

Know what's below. 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.

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WQ-DA.dwg, WATER QUALITY POND DAM, October 31, 2024, 2:05 PM, mgarcia

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: La Cima Phase 8
Date Prepared: 10/23/2024

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

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

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

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

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

County =	Hays	
Total project area included in plan * =	68.97	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	29.14	acres
Total post-development impervious cover fraction * =	0.42	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	26156	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 2

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

Drainage Basin/Outfall Area No. = WQP 8A

Total drainage basin/outfall area =	51.67	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	25.64	acres
Post-development impervious fraction within drainage basin/outfall area =	0.50	
$L_{M\ THIS\ BASIN}$ =	23014	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

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

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

A_C =	51.67	acres
A_I =	25.64	acres
A_P =	26.03	acres
L_R =	27063	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 24449 lbs.

F = 0.90

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

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.36	
On-site Water Quality Volume =	113332	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	22666	
Total Capture Volume (required water quality volume(s) x 1.20) =	135998	cubic feet

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: La Cima Phase 8
Date Prepared: 10/23/2024

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

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

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

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

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

County =	Hays	
Total project area included in plan * =	68.97	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	29.14	acres
Total post-development impervious cover fraction * =	0.42	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	26156	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = 2

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

Drainage Basin/Outfall Area No. = WQP 8B

Total drainage basin/outfall area =	5.86	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	3.39	acres
Post-development impervious fraction within drainage basin/outfall area =	0.58	
$L_{M\ THIS\ BASIN}$ =	3043	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 91 percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

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

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

A_C =	5.86	acres
A_I =	3.39	acres
A_P =	2.47	acres
L_R =	3562	lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 3346 lbs.

F = 0.94

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

Rainfall Depth =	2.40	inches
Post Development Runoff Coefficient =	0.41	
On-site Water Quality Volume =	20690	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	4138	
Total Capture Volume (required water quality volume(s) x 1.20) =	24828	cubic feet

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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS

REVISION	DESCRIPTION	DATE
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BMP CALCULATIONS

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

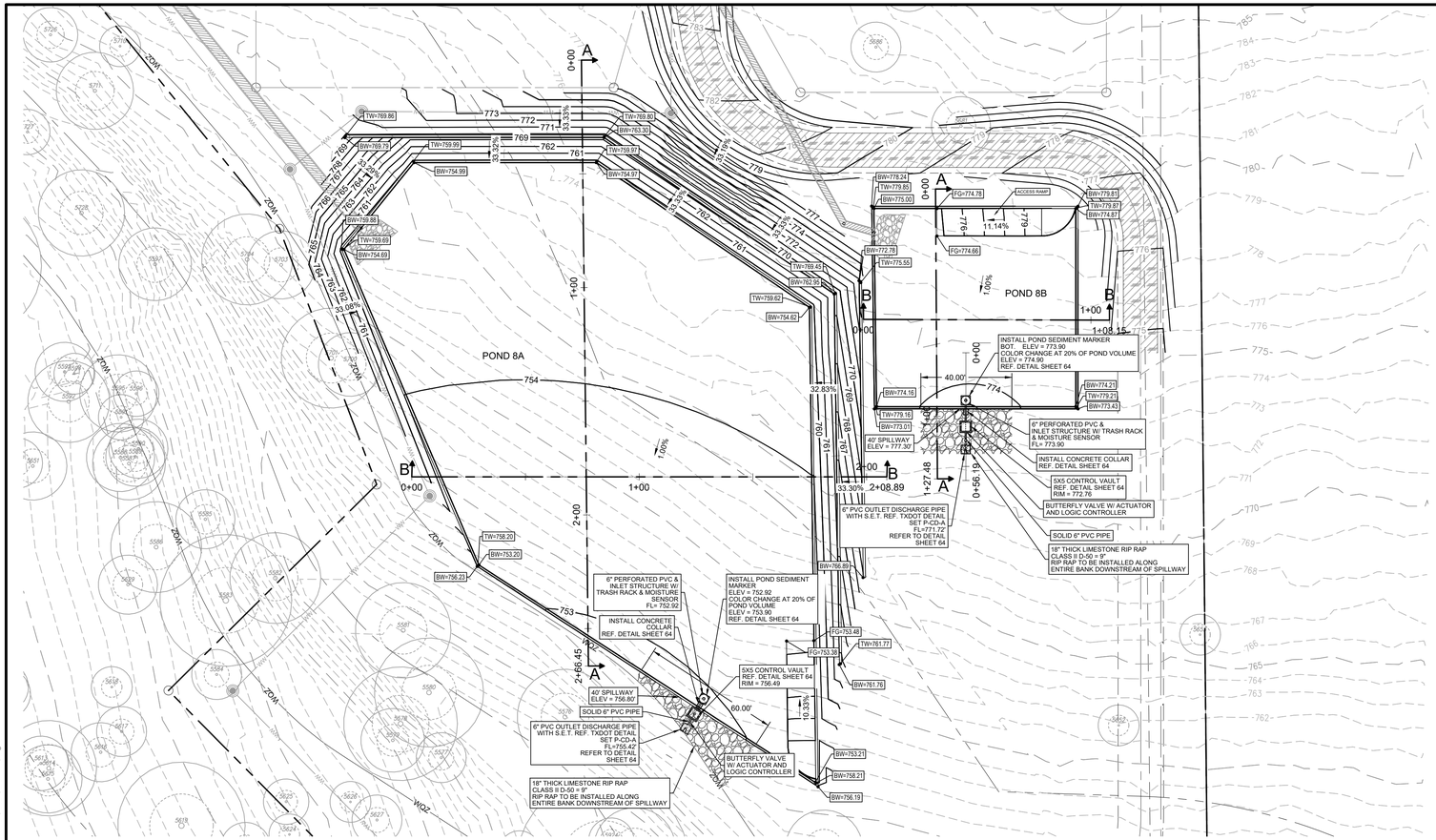
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 62 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WQ-BMP-Calc.dwg, 62 BMP CALCULATIONS, October 31, 2024, 2:05 PM, mguerra



WATER QUALITY POND 8A: STAGE STORAGE TABLE						
ELEVATION	AREA (sq.ft.)	DEPTH H (ft.)	AVG END INC. VOLUME (cu.ft.)	AVG END TOTAL VOLUME (cu.ft.)	Required Capture Volume (cuft)	
753	916					
753.5	9,431	0.5	2,214	2,214		
754	18,546	0.5	6,867	9,081		SEDIMENT STORAGE
754.5	28,329	0.5	11,633	20,714	22,664	
755.0	35,638	0.5	15,957	36,671		
755.5	35,646	0.5	17,821	54,492		
756.0	35,654	0.5	17,825	72,318		
756.5	35,662	0.5	17,829	90,147		
757.0	35,670	0.5	17,833	107,980		
757.5	35,677	0.5	17,837	125,816	135,982	CAPTURE VOLUME
757.8	35,682	0.3	11,406	137,222		
754.57	SEDIMENT STORAGE ELEVATION					
1.57	SEDIMENT STORAGE DEPTH					
757.45	WQ CAPTURE ELEVATION					
3.95	WATER QUALITY VOLUME DEPTH					
757.80	TOP OF BANK					
757.60	100 YEAR STORM ELEV					
0.20	100 YEAR FREE BOARD					

WATER QUALITY POND 8B: STAGE STORAGE TABLE						
ELEVATION	AREA (sq.ft.)	DEPTH H (ft.)	AVG END INC. VOLUME (cu.ft.)	AVG END TOTAL VOLUME (cu.ft.)	Required Capture Volume (cuft)	
774	307	-	-	-		
774.5	4,886	0.5	1,070	1,070	4,140	
775	7,019	0.5	2,960	4,029		SEDIMENT STORAGE
775.5	7,077	0.5	3,524	7,553		
776.0	7,135	0.5	3,553	11,106		
776.5	7,193	0.5	3,582	14,688		
777.0	7,250	0.5	3,611	18,299		
777.5	7,308	0.5	3,640	21,938	24,842	
778.0	7,366	0.5	3,669	25,607		
778.5	7,424	0.5	3,698	29,305		CAPTURE VOLUME
775.02	SEDIMENT STORAGE ELEVATION					
1.02	SEDIMENT STORAGE DEPTH					
777.90	WQ CAPTURE ELEVATION					
3.90	WATER QUALITY VOLUME DEPTH					
778.50	TOP OF BANK					
778.40	100 YEAR STORM ELEV					
0.10	100 YEAR FREE BOARD					

Summary Results for Reservoir "WQ POND 8A"

Project: PH 8 WQP Simulation Run: Developed 100 YR
Reservoir: WQ POND 8A

Start of Run:	18Oct2024, 00:00	Basin Model:	Developed
End of Run:	19Oct2024, 00:00	Meteorologic Model:	100 YR
Compute Time:	30Oct2024, 13:52:23	Control Specifications:	Control 1

Volume Units: (•) IN ( ) ACRE-FT

Computed Results

Peak Inflow:	161.0 (CFS)	Date/Time of Peak Inflow:	18Oct2024, 13:00
Peak Discharge:	145.9 (CFS)	Date/Time of Peak Discharge:	18Oct2024, 13:00
Inflow Volume:	12.07 (IN)	Peak Storage:	3.0 (ACRE-FT)
Discharge Volume:	11.49 (IN)	Peak Elevation:	757.6 (FT)

Summary Results for Reservoir "WQ POND 8B"

Project: PH 8 WQP Simulation Run: Developed 100 YR
Reservoir: WQ POND 8B

Start of Run:	18Oct2024, 00:00	Basin Model:	Developed
End of Run:	19Oct2024, 00:00	Meteorologic Model:	100 YR
Compute Time:	30Oct2024, 13:52:23	Control Specifications:	Control 1

Volume Units: (•) IN ( ) ACRE-FT

Computed Results

Peak Inflow:	180.4 (CFS)	Date/Time of Peak Inflow:	18Oct2024, 13:00
Peak Discharge:	163.7 (CFS)	Date/Time of Peak Discharge:	18Oct2024, 13:00
Inflow Volume:	12.24 (IN)	Peak Storage:	0.7 (ACRE-FT)
Discharge Volume:	12.10 (IN)	Peak Elevation:	778.4 (FT)

30 0 30 60
SCALE: 1 INCH = 30 FT

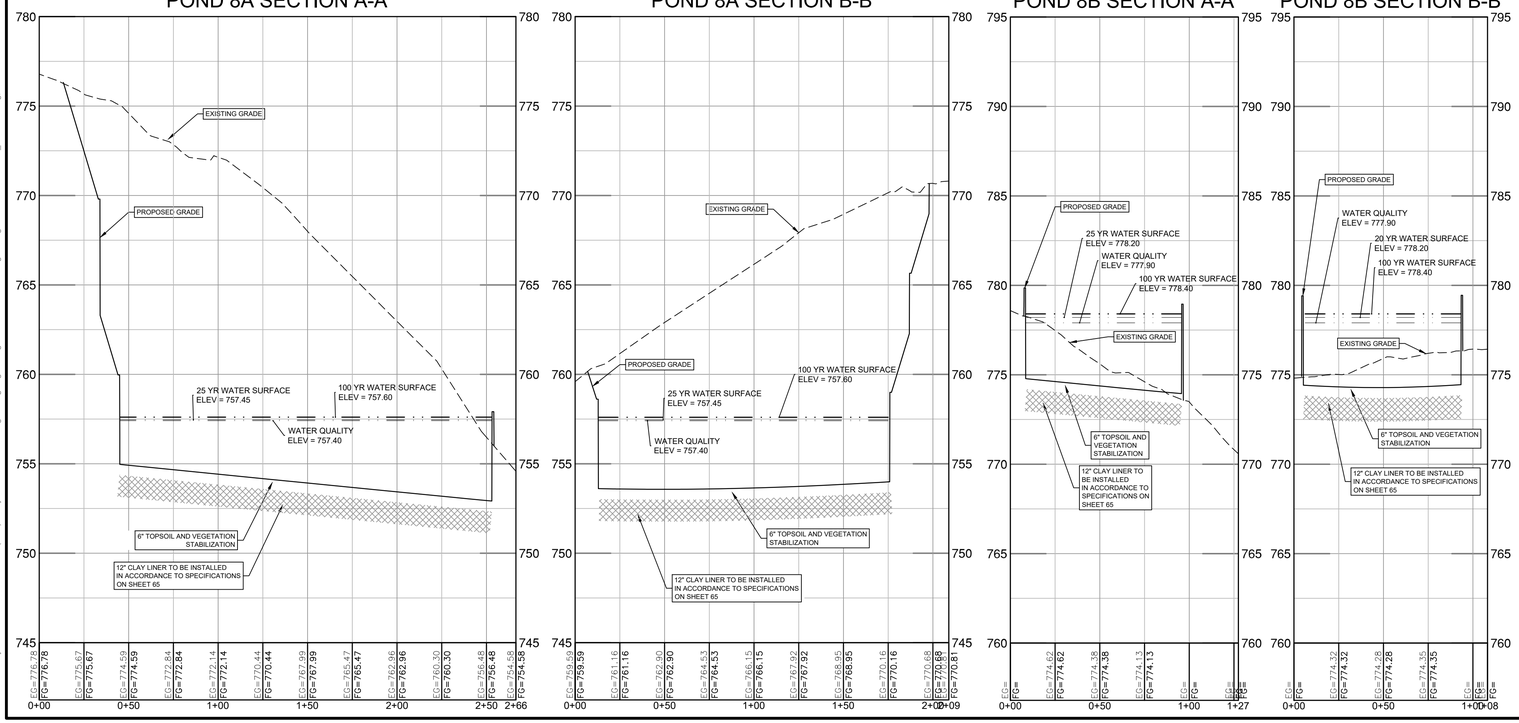
LEGEND

- 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
- BERM
- SWALE
- XX / XX.XX — DRAINAGE AREA IDENTIFIER
- FLOW ARROW
- HEADWALL
- CURB INLET
- AREA INLET
- JUNCTION BOX

PROFILE LEGEND:	PROFILE SCALE:
EXISTING GRADE CL PROPOSED GRADE CL 100yr WSE 100yr WQ VOLUME	1"= 40' HORIZONTAL 1"= 4' VERTICAL
ELEVATION EXISTING GRADE — EG=XXX.XX	ELEVATION PROPOSED FINISH GRADE — FG=XXX.XX

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.

NOTE:
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.



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REVISIONS			
REVISION	DESCRIPTION	DATE	
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WATER QUALITY POND 8A & 8B

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

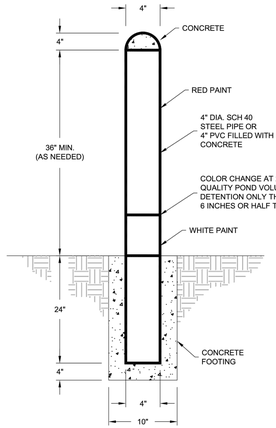
SHEET 63 OF 81

Know what's below. 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.

FOR PERMIT

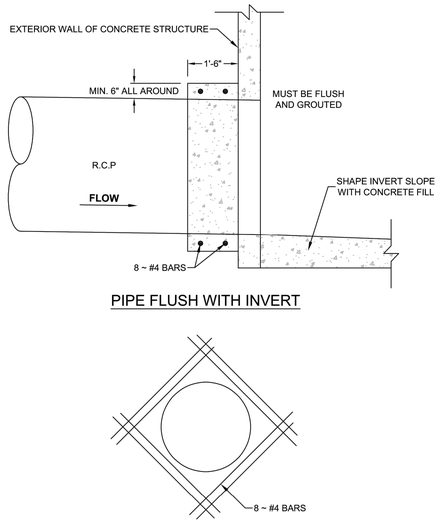
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\ISFR Phase 8\Engineering Plans\005956-01-114_WQ-POND.dwg, WATER QUALITY POND 8A & 8B, October 31, 2024, 2:07 PM, mgarcia



NOTES

1. PLAN MUST CALL OUT ELEVATION OF THE POND AT SEDIMENT MARK LOCATION.
2. PLAN MUST CALL OUT THE ELEVATION THAT SEDIMENT MUST BE REMOVE FORM THE POND AND NOTED COLOR CHANGE MUST MATCH THAT ELEVATION.
3. SEDIMENT MARK MUST BE WITHIN WITH 10 FEET OF THE LOWEST OUT FLOW CONTROL DEVICE.
4. PAINT NEEDS TO BE UV RESISTANT. SEDIMENT MARKERS IN THE WET POND NEED TO BE DESIGN FOR UNDER WATER USE. (possible)

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	POND SEDIMENT MAKER	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-PSM-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



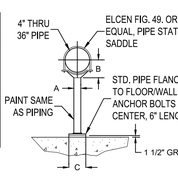
PIPE FLUSH WITH INVERT

NOTES:

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
2. 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.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. 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.

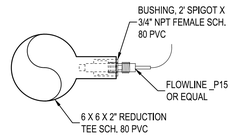
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	CONCRETE COLLAR FOR DRAINAGE PIPE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-CC-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

PIPE SIZE	DIMENSIONS (IN.) A	B	C
4"	3	4 3/16	9
5"	3	4 13/16	9
6"	3	5 7/16	9
8"	3	6 15/16	9
10"	3	8 7/16	9
12"	3	9 15/16	9
14"	4	8 1/8	11
16"	4	9 1/8	11
18"	4	10 3/8	11
20"	6	11 3/8	13 1/2
24"	6	13 3/4	13 1/2
30"	6	15 3/4	13 1/2
36"	8	24 1/2	16

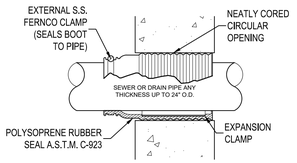


NOTE:
SAME DETAIL APPLIES FOR HORIZONTAL BRACING, SUPPORT PIPE SHALL BE DUCTILE IRON CLASS 250

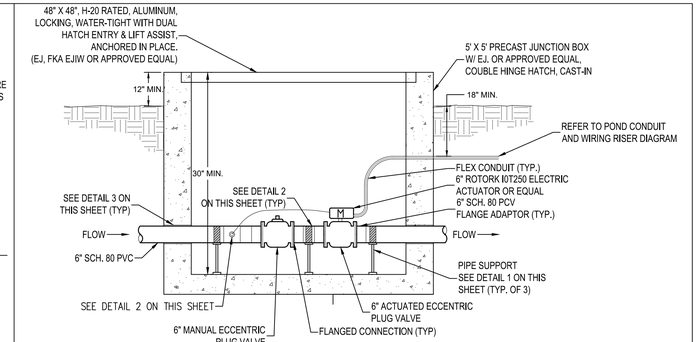
① PIPE SUPPORT DETAIL
NOT TO SCALE



② WET SWITCH DETAIL
NOT TO SCALE

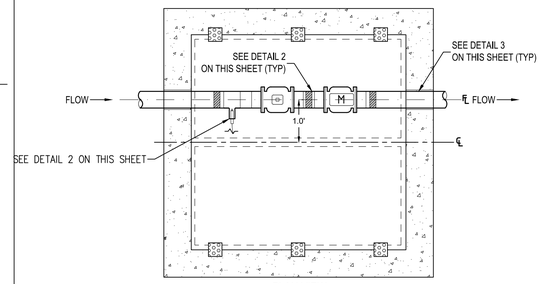


③ MANHOLE CONNECTION DETAIL
NOT TO SCALE



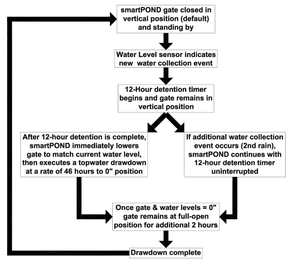
CROSS SECTION VIEW
NOT TO SCALE

NOTE:
REFER TO POND CONTROL LOGIC DIAGRAMS FOR CONTROL LOGIC.

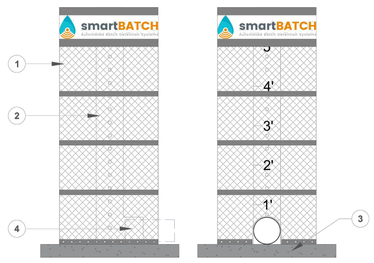


PLAN VIEW
NOT TO SCALE

PROGRAMMABLE LOGIC FLOW CHART

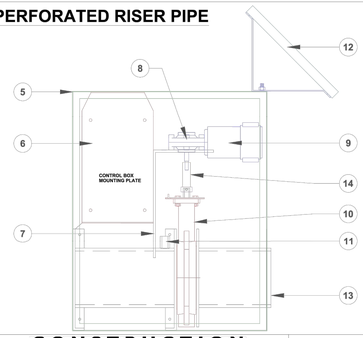


TRASH CAGE WITH PERFORATED RISER PIPE

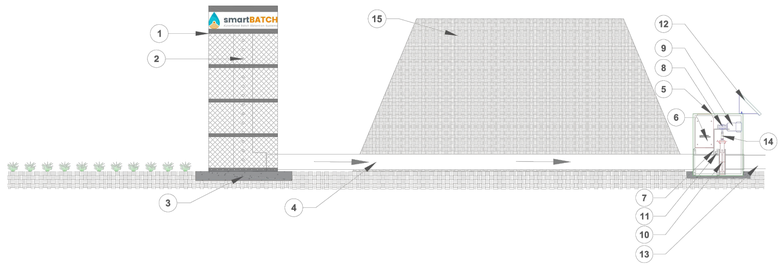


Parts List	
Item	smartPOND Valve Component
1	30" DIAMETER CAGE WITH 1 ½" GALVANIZED MESH SCREEN
2	8" SQUARE PERFORATED TUBING WITH 1" PERFORATION, WITH 4" VERTICAL SPACING ON CENTERS WITH WATER DEPTH MARKER
3	3 ½" X 3 ½" X 4" CONCRETE PAD (BY OTHERS)
4	6" PVC OUTFALL PIPE (BY OTHERS)
5	WEATHERPROOF ELECTRONIC BOX
6	CONTROL BOX
7	PEDESTAL
8	ACTUATOR
9	MOTOR
10	6" VALVE
11	LEVEL TRANSDUCER
12	SOLAR PANEL
13	OUTLET PIPE (BY OTHERS)
14	VALVE STEM
15	BERM (BY OTHERS)

PERFORATED RISER PIPE



smartPOND Valve with Berm

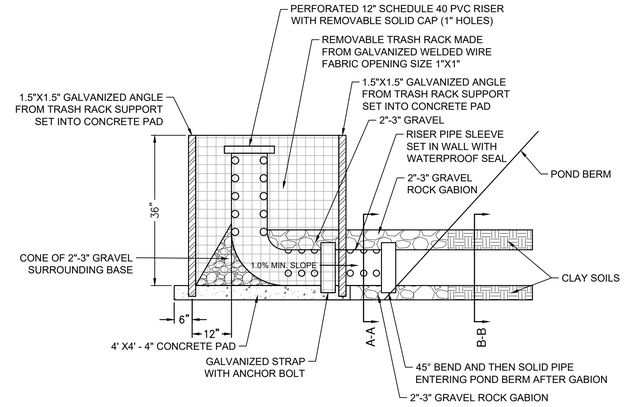


CONSTRUCTION ECO SERVICES

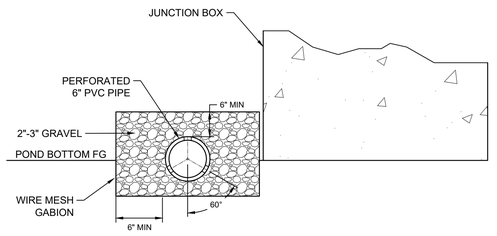
smartPOND
Automated Stormwater Control.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

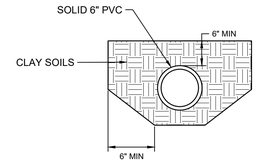
CONVERGENT WATER TECHNOLOGIES



TRASH RACK/RISER PIPE DETAIL
NTS



SECTION A-A
NTS



SECTION B-B
NTS

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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WATER QUALITY POND DETAILS (1 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

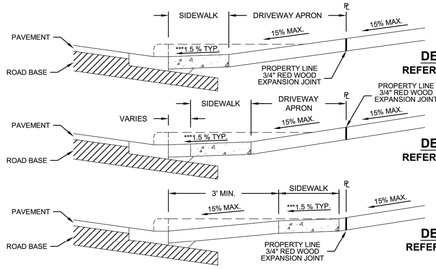
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

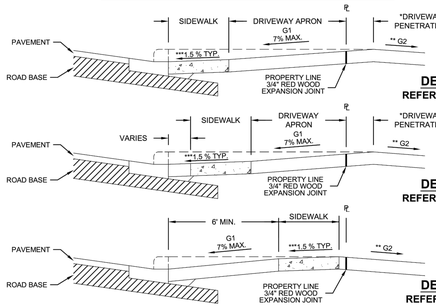
SHEET
64 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WQ-PND-DTL.dwg, 64 WATER QUALITY POND DETAILS (1 OF 2), October 31, 2024, 2:07 PM, mguerra



SECTION A-A POSITIVE SITE DRAINAGE



SECTION A-A NEGATIVE SITE DRAINAGE

*DRIVEWAY PENETRATION WILL EXTEND INTO THE PROPERTY UNTIL GRADING IS HIGHER THAN THAT OF THE CURB AT THE MAXIMUM G1 SLOPE. LIMITS OF PAVEMENT WILL EXTEND TO LIMITS OF DRIVEWAY PENETRATION.
** |G1 - G2| < 15%
*** 1.5% TYP., 1% MIN., 2% MAX.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DRIVEWAYS - COMMON DETAILS	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-A-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

DRIVEWAY	CONCRETE THICKNESS	REINFORCEMENT	DRIVEWAY BASE
TYPE I	6" CLASS A 3,000 PSI	#3 BARS PLACED ON CHAIRS AT MID DEPTH OF SLAB AT NO MORE THAN 18" O.C. BOTH DIRECTIONS	2" COMPACTED SAND
TYPE II	7" CLASS C 3,600 PSI	#4 BARS PLACED ON CHAIRS AT MID DEPTH OF SLAB AT NO MORE THAN 18" O.C. BOTH DIRECTIONS	2" COMPACTED SAND

NOTES:

A. NEW PAVEMENT WILL MATCH EXISTING PAVEMENT THICKNESS AND TYPE.
B. IN NO INSTANCE SHALL THE REBAR BE PLACED DIRECTLY ON THE SUBGRADE, SAND CUSHION LAYER OR CLOSER THAN 2" TO THE OUTSIDE EDGE OF THE CONCRETE.

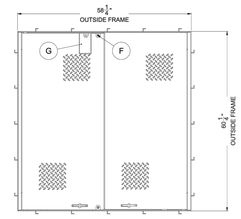
NOTES:

1. IF DIMENSION IS LESS THAN 5', REMOVE CURB AND GUTTER TO EXISTING JOINT AND POUR MONOLITHICALLY WITH DRIVEWAY. (SEE SHEET 1)
2. ALL DRIVEWAY WILL HAVE A CONTROL JOINT DOWN CENTER OF DRIVEWAY AND ON BOTH SIDES OF THE SIDEWALK PATH ACROSS THE DRIVEWAY. (SEE SHEET 3)
3. WHILE THE PROPERTY OWNER REMAINS RESPONSIBLE FOR GRADE BREAKS WITHIN PRIVATE PROPERTY, THE FIRE DEPARTMENT SHALL BE CONSULTED WHERE THE DRIVEWAY IS ESSENTIAL TO EMERGENCY VEHICLE ACCESS AND "G2 IS GREATER THAN 15%."
4. DRIVEWAY WIDTHS AND RADIUS DIMENSIONS, ONE/TWO WAY TRAVEL REQUIREMENTS, AND GEOMETRIC LAY-OUT ARE HIGHLY VARIABLE, SUBJECT TO SITE SPECIFIC CONDITIONS AND REQUIREMENTS. SEE TRANSPORTATION CRITERIA MANUAL SECTION 5 "DRIVEWAYS" IF CONFLICT WITH DETAIL.
5. IF THE BASE IS OVER-EXCAVATED WHERE THE CURB AND GUTTER WERE REMOVED, BACKFILL WITH CONCRETE MONOLITHICALLY WITH THE DRIVEWAY.
6. DRIVEWAY SHALL NOT BE CONSTRUCTED WITHIN THE CURB RETURN OF A STREET INTERSECTION.
7. WATER METER BOXES AND WASTEWATER CLEAN OUTS ARE PROHIBITED FROM BEING LOCATED IN DRIVEWAY AREAS.
8. PAY ITEM: ASPHALT TRANSITION, LAYDOWN CURB AND GUTTER WILL BE PAID FOR AS SEPARATE LINE ITEM UNLESS NOTED ON PLANS. CURB AND GUTTER INSTALLED ON THE RADIUS OR ALONG THE RAMPS WILL BE SUBSIDIARY TO DRIVEWAY LINE ITEM.
9. ALL NEW DRIVEWAYS SHALL BE CONSTRUCTED PER DETAIL 433S-AR-SM, DRIVEWAYS - RADIUS CONNECTION 433S-AR-SM EXCEPT IN NEW SUBDIVISIONS (TYPICALLY) WHERE HOUSES ARE BUILT AFTER THE CURB IS INSTALLED.
10. IF BOTH OF THE FOLLOWING CONDITIONS ARE MET, THEN DETAIL 433S-AF-SM - DRIVEWAYS - FLARED CONNECTION MAY BE USED:
    A) THE DRIVEWAY CLASSIFIED AS TYPE 1.
    B) THERE AN EXISTING CURB ALREADY INSTALLED AT THE PROPOSED DRIVEWAY LOCATION.

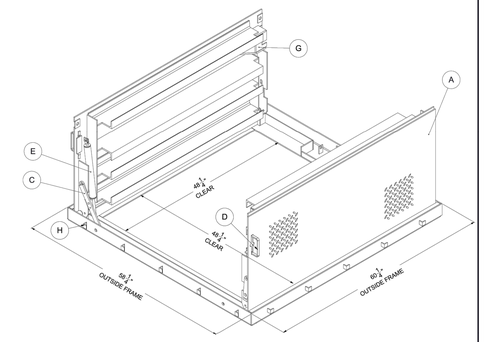
REFERENCES
DETAIL 430S-2-SM
DETAIL 430S-3-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DRIVEWAYS - COMMON DETAILS	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-A-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2

WEIGHTS	
	6061-T6 ALUMINUM
FRAME	64.00 LBS
COVER	103.00 LBS/EACH



PLAN VIEW



ISOMETRIC VIEW

Component Parts:

A. Aluminum shock assist covers available in diamond or slip resistance plate.
B. Frame assembly available in cast-in, bolt down, or skirted.
C. Kick stand.
D. Lift handle.
E. Mechanical shock.
F. Bolt down slot
G. Hinge
H. "TYP." Cast in Angle

Loading:

Suitable For H-20 Wheel Loading In Off-Street Location Where Not Subjected To High-Density traffic.

Features:

- Shock assist to reduce the lifting weight of cover.
- Locking kickstand prevents the covers from accidentally closing.
- Covers available with security bolts or locking mechanisms.
- Covers available with either lifting handles or pick holes.
- Other sizes available upon request.

INWESCO STANDARD DETAIL			
THE PARTS SHOWN IN THIS BORDER MAKE UP A SUB-ASSEMBLY TO BE USED IN EVERY SIMILAR TOP ASSEMBLY. THE BILL OF MATERIALS CONTAINED IN THIS BORDER SHALL NOT BE DUPLICATED IN THE ASSEMBLY BILL OF MATERIALS. THEREFORE THIS SUB-ASSEMBLY IS REFERRED TO AS AN INWESCO STANDARD DETAIL.			
INWESCO 748 N. Coney Avenue, Azusa, California 91702 626.334.9504	TITLE: 48"x48" Aluminum Shock Assist, Double leaf, 90 Degrees Watertight, H-20 Loading, Padlock		
	DRAWN BY: BB	DATE: 9/1/2017	SIZE: D/M2
			CAT. #: SMB-CWDH-20L-PDLK

C:\Users\RRegalado\Desktop\Drawings\Aluminum\48x48H20Watertight\Solidworks\

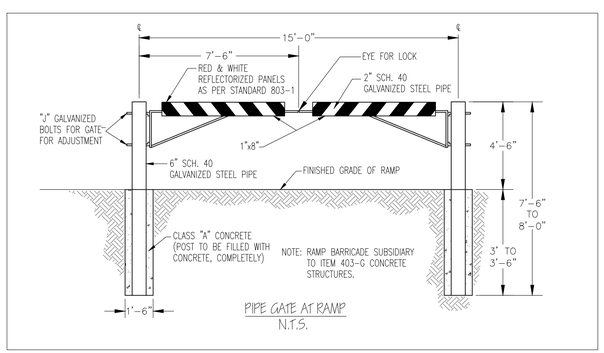
Clay Liner specification:

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	1×10^{-6}
Plasticity Index of Clay	ASTM D-423 & D-424	%	Not less than 15
Liquid Limit of Clay	ASTM D-2216	%	Not less than 30
Clay Particles Passing	ASTM D-422	%	Not less than 30
Clay Compaction	ASTM D-2216	%	95% of Standard Proctor Density

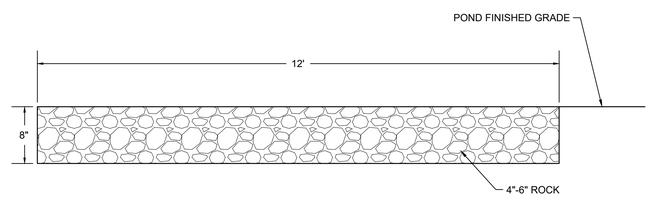
CLAY POND LINER - SPECIFICATION



PIPE GATE AT RAMP
N.T.S.

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

NTS

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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WATER QUALITY POND DETAILS (2 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

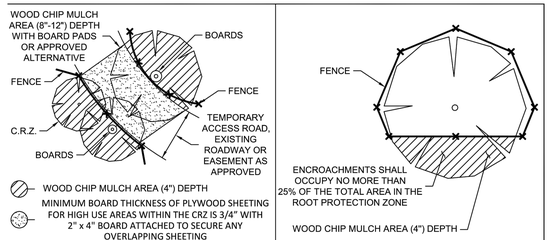
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 65 OF 81

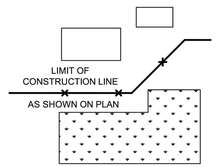
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_WQ-PND-DTL.dwg, 65 WATER QUALITY POND DETAILS (2 OF 2), October 31, 2024, 2:07 PM, mguerra

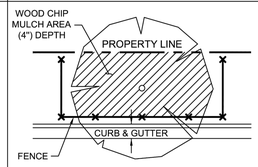


LINEAR CONSTRUCTION THROUGH TREES

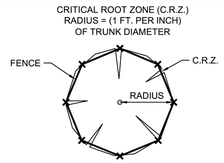
TREES BEING DISTURBED



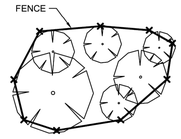
NATURAL AREAS



TREES IN PAVING AREA

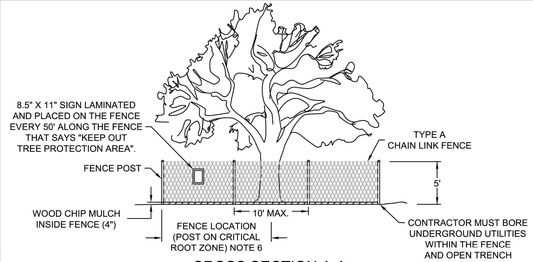


INDIVIDUAL TREE

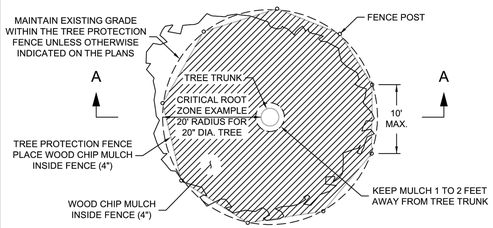


GROUP OF TREES

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TREE PROTECTION FENCE LOCATION	
RECORD COPY SIGNED BY	3/17/2017	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 610S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



CROSS SECTION A-A

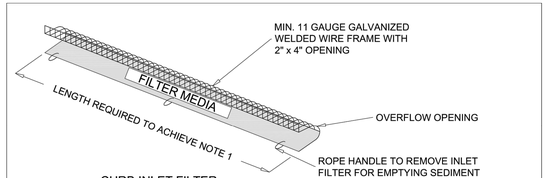


PLAN VIEW

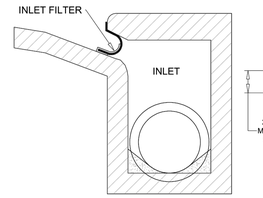
NOTES:

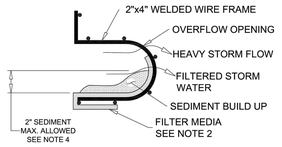
1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
2. IF THERE IS NO EXISTING IRRIGATION, SEE SPECIFICATIONS FOR WATERING REQUIREMENTS.
3. NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.
4. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
5. SEE TREE PRESERVATION PLAN FOR ANY MODIFICATIONS WITHIN THE TREE PROTECTION AREA.
6. ROOT PROTECTION ZONE EQUALS TO CRITICAL ROOT ZONE AND IS DETERMINED BY MEASURING THE TREE'S DIAMETER AT 54 INCHES FROM THE NATURAL GROUND LEVEL. FOR EVERY INCH IN DIAMETER THERE IS 1 FOOT RADIUS TREE PROTECTION.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TREE PROTECTION FENCE TYPE A - CHAIN LINK	
RECORD COPY SIGNED BY	3/17/2017	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 610S-2-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



CURB INLET FILTER



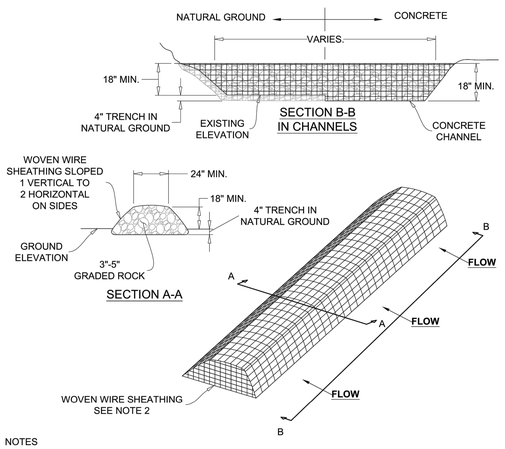


CURB INLET FILTER CROSS-SECTION

CURB INLET FILTER CROSS-SECTION SHOWING INLET PLACEMENT

NOTE:
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 HOURS OF A RAIN EVENT AND SILT ACCUMULATION MUST BE REMOVED WHEN THE DEPTH REACHES 2 INCHES.
5. INLET FILTER WILL BE REMOVED UPON STABILIZATION OF SEDIMENT SOURCES

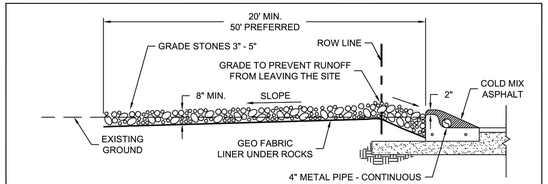
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	CURB INLET PROTECTION	
RECORDED COPY SIGNED BY	2-15-2015	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	628S-1-SM
LAURIE MOYER, P.E.	ADOPTED		N.T.S. STANDARD DETAIL



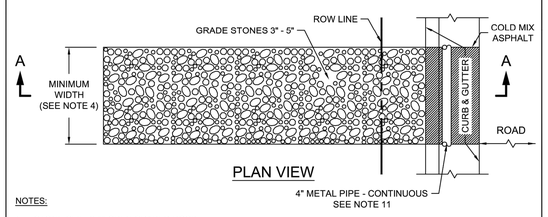
NOTES

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.
5. 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 1/1/2024	ROCK BERM DETAIL	
RECORDED COPY SIGNED BY	8/4/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	639S-1-SM
LAURIE MOYER, P.E.	ADOPTED		N.T.S. STANDARD DETAIL



PROFILE SECTION A-A

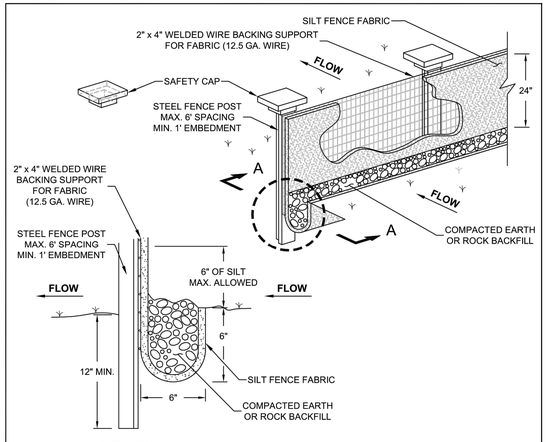


PLAN VIEW

NOTES:

1. STONE SIZE: 3-5" OPEN GRADED ROCK.
2. LENGTH: 50' PREFERRED OR AS EFFECTIVE BUT NOT LESS THAN 20'.
3. THICKNESS: NOT LESS THAN 8".
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. DIMENSIONS OF SITE WILL DICTATE THE DIMENSIONS OF THE STABILIZED CONSTRUCTION ENTRANCES IF THE PREFERRED DIMENSIONS ARE NOT POSSIBLE ON SITE.
6. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
7. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASUREMENT DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENT THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
8. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
9. WHEN ALL SITE WORK IS COMPLETED, REMOVE STABILIZED CONSTRUCTION ENTRANCE COMPLETELY. REGRADE TO ORIGINAL CONDITION, ELEVATION AND RESTORE TO MATCH EXISTING OR PROPOSED CONDITIONS.
10. TOP OF GRADE STONES SHALL MATCH TOP OF EXISTING PAVEMENT OR CURB. COLD MIX ASPHALT & 4" METAL PIPE OR ALTERNATIVE WILL NOT BE REQUIRED WHERE THERE IS NO CATCH OR SPILL CURB.
11. PRE-FABRICATED CURB RAMPS ARE AN ACCEPTABLE ALTERNATIVE TO COLD MIX ASPHALT AND 4" METAL PIPE.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	STABILIZED CONSTRUCTION ENTRANCE	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 641S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

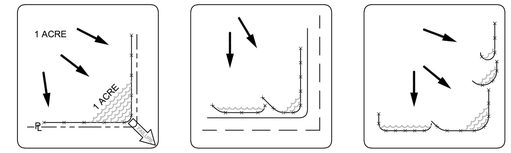


SECTION A-A

NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS SHALL MATCH THE TOP OF THE FENCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1'.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE WITHIN 24 HOURS OF INSPECTION.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS PERMANENTLY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WITHIN 24 HOURS WHEN IT REACHES A DEPTH OF 6" OR AS DIRECTED BY OWNER. THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. INSTALL J-HOOK SPACING PER ENGINEER'S DESIGN , BUT NOT TO EXCEED 200'.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	SILT FENCE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

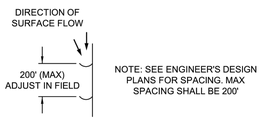


SILT FENCE TURNBACK DETAIL

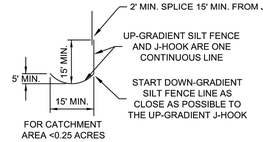
SILT FENCE PLACEMENT FOR PERIMETER CONTROL

PLAN VIEW

I. SPACING REQUIREMENTS:



II. SIZING REQUIREMENTS:



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	SILT FENCE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2

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San Marcos, Texas 78666
Phone: (512) 396-2600
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TBPE Firm Registration No.: F-14309
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REVISIONS

REVISION	DESCRIPTION	DATE
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EROSION AND SEDIMENT CONTROL DETAILS

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

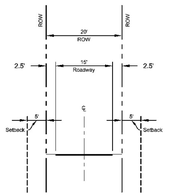
JOB No. 005956-01-114

SHEET
67 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_ESD.dwg, 67 EROSION AND SEDIMENT CONTROL DETAILS, October 31, 2024, 2:08 PM, mguerra

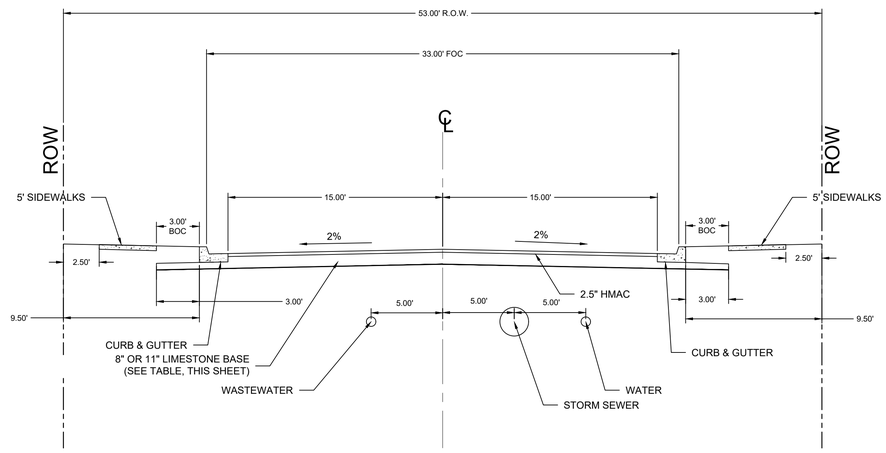
Figure 1-32: Residential Rear Alley (RA 20-15)



ONE-WAY REAR ALLEY IN RESIDENTIAL NEIGHBORHOOD (RA 20-15)

ONE-WAY REAR ALLEY IN RESIDENTIAL NEIGHBORHOOD (RA 20-15)
The City of San Marcos Engineering and Capital Improvements

32



RESIDENTIAL STREET
PAVEMENT & UTILITY ASSIGNMENT
N.T.S.

Street Classification	Subgrade Material	Hot Mix Asphaltic Concrete, in	Crushed Limestone Base, in
Residential Streets (Low Traffic)	Less Than 2' High PI Clay (PI > 25)	2.5	8
Residential Street	Less Than 2' High PI Clay (PI > 25)	2.5	11

STREET NAME	ROW WIDTH	ROAD CLASSIFICATION
YUCCA BEND	53'	RESIDENTIAL STREET LOW TRAFFIC
DOGWOOD BEND	53'	RESIDENTIAL STREET LOW TRAFFIC
PERSIMMON LANE	53'	RESIDENTIAL STREET LOW TRAFFIC
WILD INDIGO TRAIL	53'	RESIDENTIAL STREET LOW TRAFFIC
CORALBEAN CRESCENT	53'	RESIDENTIAL STREET LOW TRAFFIC
DALEA TERRACE	53'	RESIDENTIAL STREET LOW TRAFFIC
GAYFEATHER ROAD	53'	RESIDENTIAL STREET LOW TRAFFIC

NOTE:
ALL SUBGRADE PREPARATION AND PAVEMENT RECOMMENDATIONS SHALL COMPLY WITH REVISED GEOTECHNICAL REPORT DATED JANUARY 2024.

PVR and Effective PI Calculation

Project: La Cima Ph 6 & 8
Number: 23101100.047
Boring: **B-17**
Date: 7/18/2023

Engineer: MJR
version: 8.0 21-Mar-06 by trw
Surcharge 0
Wet Density 125 pcf

Notes:
In-Situ Condition, assuming dry moisture condition

280%

Layer	Top	Bottom	Weight Factor	Load Top	Load Bottom	Average Load, psi	Liquid Limit	PI	Minus #40	Stratum	Dry[1]	Moisture Content	Wet[2]	Moisture Condition	Free Swell	Top of Layer	Bottom of Layer	Δ PVR	Layer PVR	Σ PVR	Weighted PI[3]
1	0	1	3	0	1	0.5		38	100%	100%	9.0	32	2.0	dry	14.0	0.0	0.68	0.68	0.68	0.6	114.0
2	1	2	3	1	2	1.5		38	100%	100%	9.0	32	2.0	dry	14.0	0.7	0.96	0.28	0.28	0.4	114.0
3	2	3	3	2	3	2.5		38	100%	80%	9.0	32	2.0	dry	14.0	1.0	1.40	0.35	0.35	0.0	91.2
4	3	4	3	3	4	3.5			100%	0%	9.0	32	2.0	dry	0.0	3.0	0.00	0.00	0.00	0.0	0.0
5	4	5	3	4	5	4.5			100%	0%	9.0	20	2.0	dry	0.0	4.0	0.00	0.00	0.00	0.0	0.0
6	5	6	2	5	6	5.5			100%	0%	9.0	20	2.0	dry	0.0	5.0	0.00	0.00	0.00	0.0	0.0
7	6	7	2	6	7	6.5			100%	0%	9.0	20	2.0	dry	0.0	6.0	0.00	0.00	0.00	0.0	0.0
8	7	8	2	7	8	7.5			100%	0%	9.0	40	2.0	dry	0.0	7.0	0.00	0.00	0.00	0.0	0.0
9	8	9	2	8	9	8.5			100%	0%	9.0	40	2.0	dry	0.0	8.0	0.00	0.00	0.00	0.0	0.0
10	9	10	2	9	10	9.5			100%	0%	9.0	40	2.0	dry	0.0	9.0	0.00	0.00	0.00	0.0	0.0
11	10	11	1	10	11	10.5			100%	0%	9.0	40	2.0	dry	0.0	10.0	0.00	0.00	0.00	0.0	0.0
12	11	12	1	11	12	11.5			100%	0%	9.0	40	2.0	dry	0.0	11.0	0.00	0.00	0.00	0.0	0.0
13	12	13	1	12	13	12.5			100%	0%	9.0	40	2.0	dry	0.0	12.0	0.00	0.00	0.00	0.0	0.0
14	13	14	1	13	14	13.5			100%	0%	9.0	40	2.0	dry	0.0	13.0	0.00	0.00	0.00	0.0	0.0
15	14	15	1	14	15	14.5			100%	0%	9.0	40	2.0	dry	0.0	14.0	0.00	0.00	0.00	0.0	0.0

[1] Dry = 0.2LL + 9
[2] Wet = 0.4LL + 2
[3] Weighted PI = Weight Factor x Stratum x PI
[4] PI_{eff} = ∑ (Weighted PI) / ∑ (Weight Factor)

PVR = **1.3 in.**
PI_{eff}[4] = **11**

PVR and Effective PI Calculation

Project: La Cima Ph 6 & 8
Number: 23101100.047
Boring: **B-17**
Date: 7/18/2023

Engineer: MJR
version: 8.0 21-Mar-06 by trw
Surcharge 0
Wet Density 125 pcf

Notes:
Post Construction Condition, assuming 10.5 inch pavement section

193%

Layer	Top	Bottom	Weight Factor	Load Top	Load Bottom	Average Load, psi	Liquid Limit	PI	Minus #40	Stratum	Dry[1]	Moisture Content	Wet[2]	Moisture Condition	Free Swell	Top of Layer	Bottom of Layer	Δ PVR	Layer PVR	Σ PVR	Weighted PI[3]
1	0	1	3	0	1	0.5		38	100%	13%	9.0	20	2.0	dry	14.0	0.0	0.68	0.09	0.09	0.6	14.8
2	1	2	3	1	2	1.5		38	100%	100%	9.0	20	2.0	dry	14.0	0.7	0.96	0.28	0.28	0.4	114.0
3	2	3	3	2	3	2.5		38	100%	80%	9.0	20	2.0	dry	14.0	1.0	1.40	0.35	0.35	0.0	91.2
4	3	4	3	3	4	3.5			95%	0%	9.0	20	2.0	dry	0.0	3.0	0.00	0.00	0.00	0.0	0.0
5	4	5	3	4	5	4.5			100%	0%	9.0	20	2.0	dry	0.0	4.0	0.00	0.00	0.00	0.0	0.0
6	5	6	2	5	6	5.5			100%	0%	9.0	20	2.0	dry	0.0	5.0	0.00	0.00	0.00	0.0	0.0
7	6	7	2	6	7	6.5			100%	0%	9.0	40	2.0	dry	0.0	6.0	0.00	0.00	0.00	0.0	0.0
8	7	8	2	7	8	7.5			100%	0%	9.0	40	2.0	dry	0.0	7.0	0.00	0.00	0.00	0.0	0.0
9	8	9	2	8	9	8.5			100%	0%	9.0	40	2.0	dry	0.0	8.0	0.00	0.00	0.00	0.0	0.0
10	9	10	2	9	10	9.5			100%	0%	9.0	40	2.0	dry	0.0	9.0	0.00	0.00	0.00	0.0	0.0
11	10	11	1	10	11	10.5			100%	0%	9.0	40	2.0	dry	0.0	10.0	0.00	0.00	0.00	0.0	0.0
12	11	12	1	11	12	11.5			100%	0%	9.0	40	2.0	dry	0.0	11.0	0.00	0.00	0.00	0.0	0.0
13	12	13	1	12	13	12.5			100%	0%	9.0	40	2.0	dry	0.0	12.0	0.00	0.00	0.00	0.0	0.0
14	13	14	1	13	14	13.5			100%	0%	9.0	40	2.0	dry	0.0	13.0	0.00	0.00	0.00	0.0	0.0
15	14	15	1	14	15	14.5			100%	0%	9.0	40	2.0	dry	0.0	14.0	0.00	0.00	0.00	0.0	0.0

[1] Dry = 0.2LL + 9
[2] Wet = 0.4LL + 2
[3] Weighted PI = Weight Factor x Stratum x PI
[4] PI_{eff} = ∑ (Weighted PI) / ∑ (Weight Factor)

PVR = **0.7 in.**
PI_{eff}[4] = **7**

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Phone: (512) 396-2600
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REVISIONS

REVISION	DESCRIPTION	DATE
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ROADWAY CROSS SECTION

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

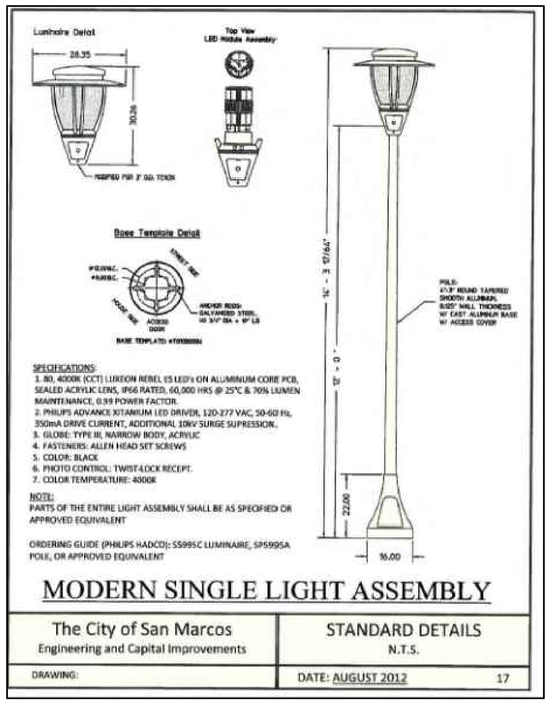
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
68 OF 81

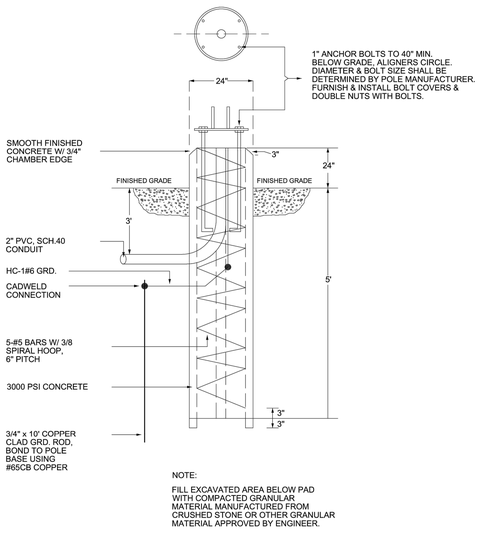
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_STD.dwg, 68 ROADWAY CROSS SECTION, October 31, 2024, 2:08 PM, mguerra



MODERN SINGLE LIGHT ASSEMBLY

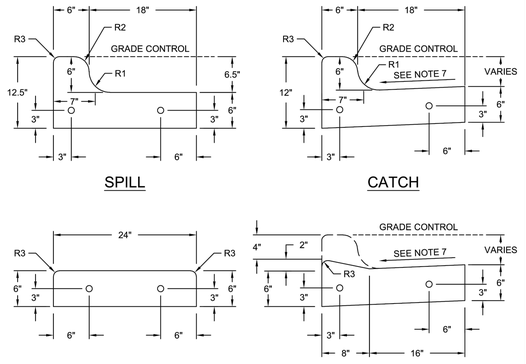
The City of San Marcos Engineering and Capital Improvements	STANDARD DETAILS N.T.S.
DRAWING:	DATE: AUGUST 2012 17



NOTE:
FILL EXCAVATED AREA BELOW PAD WITH COMPACTED GRANULAR MATERIAL MANUFACTURED FROM CRUSHED STONE OR OTHER GRANULAR MATERIAL APPROVED BY ENGINEER.

STREET LIGHT CONCRETE BASE

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	STANDARD DETAIL N.T.S.
DRAWING: T/DETAILS/STREET LIGHT BASE		DATE: NOVEMBER 9, 2011



LABEL	RADIUS
R1	3 1/2"
R2	2 1/2"
R3	1/4"

NOTES:
1. CONSTRUCTION CONTROL JOINTS AT 10' - 0" SPACING ALONG LENGTH OF CURB.
2. REINFORCING STEEL SHALL BE #3 BARS.
3. NO REBAR WILL BE ALLOWED IN CURB HEAD.
4. CONCRETE WILL BE 3000 PSI VIBRATED IN PLACE.
5. CONSTRUCT EXPANSION JOINTS AT A MAXIMUM OF 40'-0" ALONG THE LENGTH OF CURB. SEE DETAIL 430-3-SM.
6. FOR NEW CURB EXTEND ROAD BASE 3 FEET BEHIND BACK OF CURB PER DETAIL 1000S-10-SM. NOT REQUIRED FOR REMOVAL & REPLACEMENT OF CURB IF THE ALIGNMENT DOES NOT CHANGE.
7. MATCH CROSS-SLOPE OF ROAD. 2% TYPICAL ~ 1.5% MIN. OR 3% MAX.

REFERENCES
DETAIL 430-3-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	REINFORCED CURB AND GUTTER SECTIONS	
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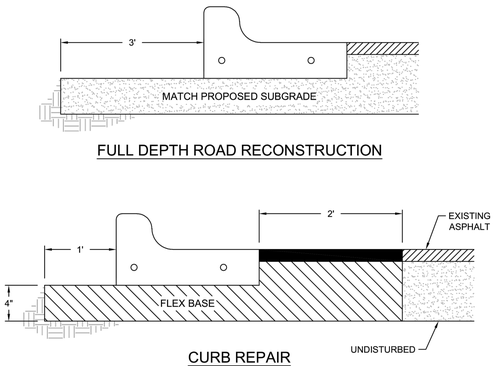
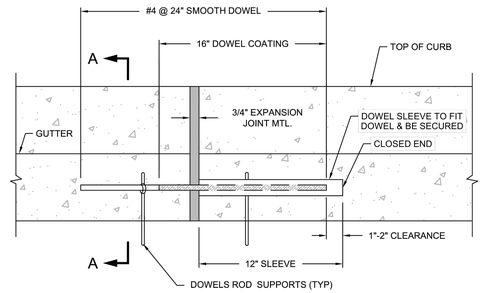
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

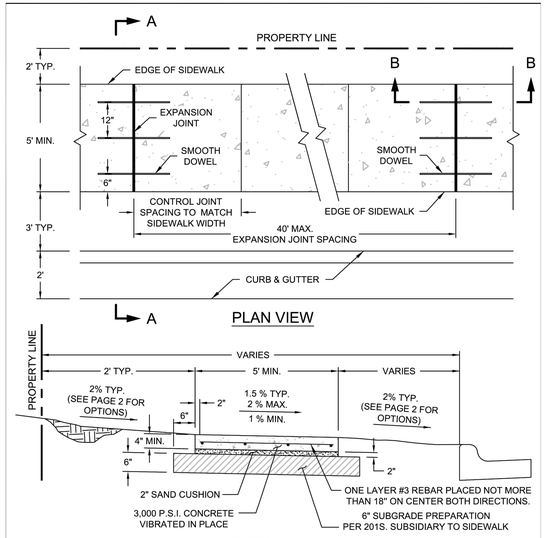


The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	REINFORCED CURB AND GUTTER SECTIONS	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 430S-2-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



NOTES:
1. CONSTRUCT EXPANSION JOINTS AT A MAXIMUM OF 40'-0" ALONG THE LENGTH OF CURB, SIDEWALK AND CONCRETE PAVEMENT.
2. DOWELS MINIMUM SIZE IS 1/2" AND WILL BE EQUAL TO THE REBAR SIZE IF REBAR IN THE RE-ENFORCED CONCRETE IF GREATER THAN 1/2".

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	CURB EXPANSION JOINT DOWEL DETAIL	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 430S-3-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

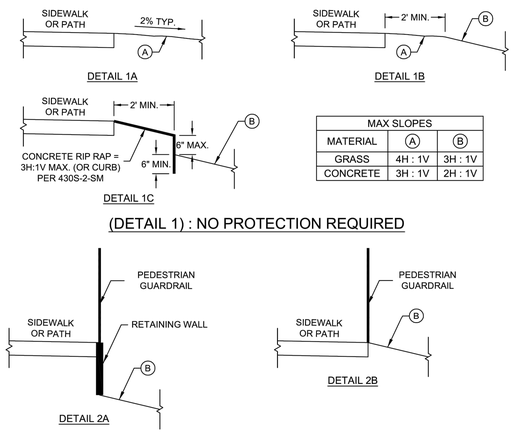


NOTES FOR REBAR PLACEMENT:

1. REINFORCEMENT SHALL BE ACCURATELY PLACED AT SLAB MID-DEPTH AND HELD FIRMLY IN PLACE BY MEANS OF BAR SUPPORTS OF ADEQUATE STRENGTH AND NUMBER THAT WILL PREVENT DISPLACEMENT AND KEEP THE STEEL AT ITS PROPER POSITION DURING THE PLACEMENT OF THE P.C. CONCRETE.
2. IN NO INSTANCE SHALL THE STEEL BE PLACED DIRECTLY ON THE SUBGRADE, SAND CUSHION LAYER OR CLOSER THAN 2" TO THE OUT SIDE EDGE OF THE CONCRETE.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 7/15/2024	SIDEWALK CONSTRUCTION	
RECORD COPY SIGNED BY	7/15/2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-1-SM
SHAUN CONDOR, P.E.	ADOPTED		1 OF 2

NOTES:
1. CONTROL JOINTS SHALL BE 1/4 INCH WIDE AND 3/4 INCH DEEP TOOLED OR SAW CUT INTO SIDEWALK.
2. CONSTRUCT 3/4" REDWOOD EXPANSION JOINTS AT MAXIMUM 40'- 0" SPACING ALONG LENGTH OF SIDEWALK. EXPANSION JOINTS SHALL INCLUDE SMOOTH DOWELS CENTERED TO THE JOINT AT 12" C-C. PER DETAIL 430S-3-SM.
3. IF SIDEWALK IS ADJOINED TO CURB, COLD JOINT IS REQUIRED, UNLESS APPROVED BY THE CITY INSPECTOR.
4. RAMPS AT INTERSECTION WILL FOLLOW CITY DETAIL 432S-3-SM.
5. MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH CITY SPECIFICATIONS.
6. REFER TO SPEC. 410S.25 FOR DEFECTIVE WORK. THE LIMITS OF THE REPLACEMENT SHALL EXTEND FROM JOINT TO JOINT, AS DETERMINED BY THE INSPECTOR.
7. WHEN A DRAINAGE CHANNEL IS LOCATED BEHIND THE SIDEWALK) THE SIDEWALK SHALL BE SLOPED TOWARDS THE CHANNEL.



MAX SLOPES		
MATERIAL	A	B
GRASS	4H : 1V	3H : 1V
CONCRETE	3H : 1V	2H : 1V

(DETAIL 1) : NO PROTECTION REQUIRED

REFERENCES
DETAIL 430S-3-SM
DETAIL 432S-3-SM

(DETAIL 2) : EDGE PROTECTION REQUIRED
WHEN OPTIONS SHOWN IN (DETAIL 1) CAN NOT BE MET

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 7/15/2024	SIDEWALK CONSTRUCTION	
RECORD COPY SIGNED BY	7/15/2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-1-SM
SHAUN CONDOR, P.E.	ADOPTED		2 OF 2

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San Marcos, Texas 78666
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TBPE Firm Registration No.: F-14309
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REVISIONS		
REVISION	DESCRIPTION	DATE
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STREET DETAILS (1 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

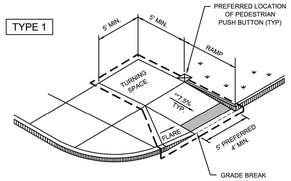
JOB No. 005956-01-114

SHEET
69 OF 81

FOR PERMIT

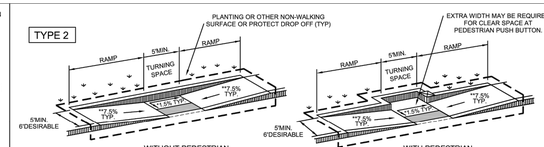
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_STD.dwg, 69 STREET DETAILS (1 OF 3), October 31, 2024, 2:09 PM, mgarrison

TYPE 1



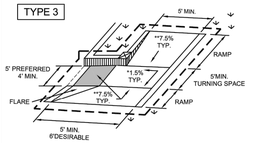
PERPENDICULAR CURB RAMP

TYPE 2



PARALLEL CURB RAMP

TYPE 3



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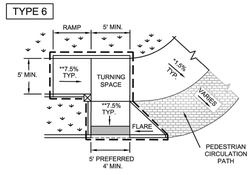
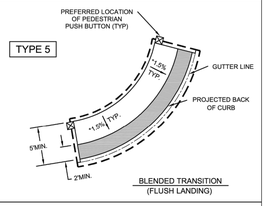


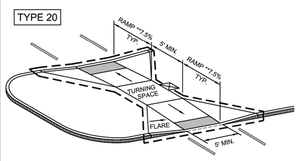
COMBINATION CURB RAMPS

TYPE 5



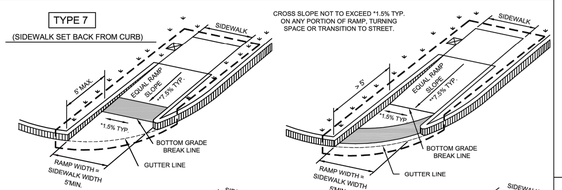
BLENDED TRANSITION (FLUSH LANDING)

TYPE 20

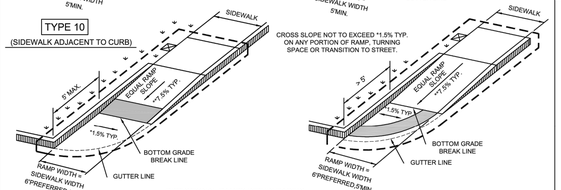


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

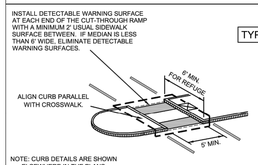


TYPE 10
(SIDEWALK ADJACENT TO CURB)



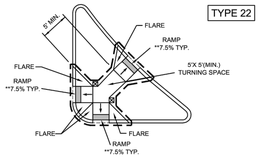
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 21

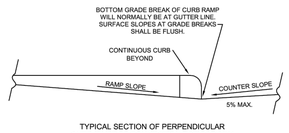


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.
MAX RAMP LENGTH IS 15' (SEE NOTE 2)
FLARE - SEE NOTE 7
TURNING SPACE - SEE NOTE 5

★ 1.5% TYPICAL, 1% MINIMUM, 2% MAXIMUM
★★ 7.5% TYPICAL, 8.3% MAXIMUM

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE
GRADE BREAK
RAMP LIMITS OF PAYMENT

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024
RECORD COPY SIGNED BY	1/1/2022
LAURIE MOYER, P.E.	ADOPTED
ADA RAMPS	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-3-SM
	1 OF 4

GENERAL NOTES:

CURB RAMPS

1. INSTALL A CURB RAMP OR BLENDED TRANSITION AT EACH PEDESTRIAN STREET CROSSING.
2. ALL SLOPES SHOWN ARE TYPICAL ALLOWABLE. CROSS SLOPES OF 1.5% AND LESSER RUNNING SHOULD BE USED. ADJUST CURB RAMP LENGTH OR GRADE OF APPROACH SIDEWALKS AS DIRECTED. THE RUNNING SLOPE OF THE CURB RAMP SHALL BE 8.3% MAX. BUT THE RAMP LENGTH SHALL NOT EXCEED 15' MIN. IF 8.3% CANNOT BE ACHIEVED.
3. MAXIMUM ALLOWABLE CROSS SLOPE ON SIDEWALK AND CURB RAMP SURFACES IS 2%.
4. THE MINIMUM SIDEWALK WIDTH IS 5'. WHERE THE SIDEWALK IS ADJACENT TO THE BACK OF CURB, A SIDEWALK WIDTH IS DESIRABLE. WHERE A 5' SIDEWALK CANNOT BE PROVIDED DUE TO SITE CONSTRAINTS, SIDEWALK WIDTH MAY BE REDUCED TO 4' FOR SHORT DISTANCES. 5'X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' ARE REQUIRED.
5. **TURNING SPACES** SHALL BE 5'X 5' MINIMUM. CROSS SLOPE SHALL BE MAXIMUM 2%.
6. CLEAR SPACE AT THE BOTTOM OF CURB RAMPS SHALL BE A MINIMUM OF 4'X 4' WHOLLY CONTAINED WITHIN THE CROSSWALK AND WHOLLY OUTSIDE THE PARALLEL VEHICULAR TRAVEL PATH.
7. PROVIDE **FLARED SIDES** WHERE THE PEDESTRIAN CIRCULATION PATH CROSSES THE CURB RAMP. FLARED SIDES SHALL BE SLOPED AT 10% MAXIMUM, MEASURED PARALLEL TO THE CURB. RETURNED CURBS MAY BE USED ONLY WHERE PEDESTRIANS WOULD NOT NORMALLY WALK ACROSS THE RAMP, EITHER BECAUSE THE ADJACENT SURFACE IS PLANTED, SUBSTANTIALLY OBSTRUCTED, OR OTHERWISE PROTECTED.
8. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, LIGHT REFLECTIVE VALUE AND TEXTURE MAY BE FOUND IN THE LATEST DRAFT OF THE PROPOSED GUIDELINES FOR PEDESTRIAN FACILITIES IN THE PUBLIC RIGHT OF WAY (PROWAG) AS PUBLISHED BY THE U.S. ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD (ACCESS-BOARD).
9. TO SERVE AS A PEDESTRIAN REFUGE AREA, THE MEDIAN SHOULD BE A MINIMUM OF 6' WIDE, MEASURED FROM BACK OF CURBS. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
10. SMALL CHANNELIZATION ISLANDS, WHICH DO NOT PROVIDE A MINIMUM 5'X 5' LANDING AT THE TOP OF CURB RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.
11. CROSSWALK DIMENSIONS, CROSSWALK MARKINGS AND STOP BAR LOCATIONS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. AT INTERSECTIONS WHERE CROSSWALK MARKINGS ARE NOT REQUIRED, CURB RAMPS SHALL ALIGN WITH THEORETICAL CROSSWALKS UNLESS OTHERWISE DIRECTED.
12. PROVIDE CURB RAMPS TO CONNECT THE PEDESTRIAN ACCESS ROUTE AT EACH PEDESTRIAN STREET CROSSING. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS.
13. CURB RAMPS AND LANDINGS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH ITEM 432S PORTLAND CEMENT CONCRETE SIDEWALK.
14. PLACE CONCRETE AT A MINIMUM DEPTH OF 5" FOR RAMPS, FLARES AND LANDINGS, UNLESS OTHERWISE DIRECTED.
15. FURNISH AND INSTALL NO. 3 REINFORCING STEEL BARS AT 18" O.C. BOTH WAYS, UNLESS OTHERWISE DIRECTED.
16. PROVIDE A SMOOTH TRANSITION WHERE THE CURB RAMPS CONNECT TO THE STREET.
17. CURBS SHOWN ON SHEET 1 WITHIN THE LIMITS OF PAYMENT ARE CONSIDERED PART OF THE CURB RAMP FOR PAYMENT, WHETHER IT IS CONCRETE CURB, GUTTER, OR COMBINED CURB AND GUTTER.
18. EXISTING FEATURES THAT COMPLY WITH APPLICABLE STANDARDS MAY REMAIN IN PLACE UNLESS OTHERWISE SHOWN ON THE PLANS.

DETECTABLE WARNING MATERIAL

19. CURB RAMPS MUST CONTAIN A DETECTABLE WARNING SURFACE THAT CONSISTS OF RAISED TRUNCATED DOMES COMPLYING WITH PROWAG. THE SURFACE MUST CONTRAST VISUALLY WITH ADJOINING SURFACES, INCLUDING SIDE FLARES. FURNISH AND INSTALL AN APPROVED CAST-IN-PLACE DARK BROWN OR DARK RED DETECTABLE WARNING SURFACE MATERIAL ADJACENT TO UNCOLORED CONCRETE, UNLESS SPECIFIED ELSEWHERE IN THE PLANS.
20. DETECTABLE WARNING MATERIALS MUST MEET COSM SPL PWV-1. INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
21. DETECTABLE WARNING SURFACES MUST BE FIRM, STABLE AND SLIP RESISTANT.
22. DETECTABLE WARNING SURFACES SHALL BE A MINIMUM OF 24 INCHES IN DEPTH IN THE DIRECTION OF PEDESTRIAN TRAVEL, AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR LANDING WHERE THE PEDESTRIAN ACCESS ROUTE ENTERS THE STREET.
23. DETECTABLE WARNING SURFACES SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS AT THE BACK OF CURB AND NEITHER END OF THAT EDGE IS GREATER THAN 5 FEET FROM THE BACK OF CURB. DETECTABLE WARNING SURFACES MAY BE CURVED ALONG THE CORNER RADIUS.

DETECTABLE WARNING MATERIAL

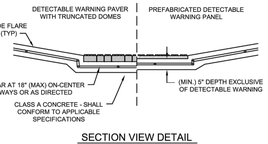
24. SHADED AREAS ON SHEET 1 OF 4 INDICATE THE APPROXIMATE LOCATION FOR THE DETECTABLE WARNING SURFACE FOR EACH CURB RAMP TYPE.

DETECTABLE WARNING PAVERS (IF USED)

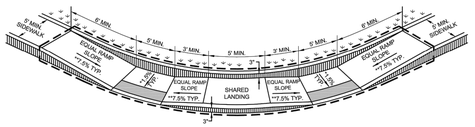
25. FURNISH DETECTABLE WARNING PAVER UNITS MEETING ALL REQUIREMENTS OF ASTM C-936, C-33. LAY IN A TWO BY TWO UNIT BASKET WEAVE PATTERN OR AS DIRECTED.
26. LAY FULL-SIZE UNITS FIRST FOLLOWED BY CLOSURE UNITS CONSISTING OF AT LEAST 25 PERCENT (25%) OF A FULL UNIT. CUT DETECTABLE WARNING PAVER UNITS USING A POWER SAW.

SIDEWALKS

27. PROVIDE CLEAR GROUND SPACE AT OPERABLE PARTS, INCLUDING PEDESTRIAN PUSH BUTTONS. OPERABLE PARTS SHALL BE PLACED WITHIN UNOBSTRUCTED REACH RANGE SPECIFIED IN PROWAG SECTION R406.
28. PLACE TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SO AS NOT TO OBSTRUCT THE PEDESTRIAN ACCESS ROUTE OR CLEAR GROUND SPACE.
29. STREET GRADES AND CROSS SLOPES SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
30. CHANGES IN LEVEL GREATER THAN 1/4 INCH ARE NOT PERMITTED.
31. THE LEAST POSSIBLE GRADE SHOULD BE USED TO MAXIMIZE ACCESSIBILITY. THE RUNNING SLOPE OF SIDEWALKS AND CROSSWALKS WITHIN THE PUBLIC RIGHT OF WAY MAY FOLLOW THE GRADE OF THE PARALLEL ROADWAY. WHERE A CONTINUOUS GRADE GREATER THAN FIVE PERCENT (5%) MUST BE PROVIDED, HANDRAILS MAY BE DESIRABLE TO IMPROVE ACCESSIBILITY. HANDRAILS MAY ALSO BE NEEDED TO PROTECT PEDESTRIANS FROM POTENTIALLY HAZARDOUS CONDITIONS. IF PROVIDED, HANDRAILS SHALL COMPLY WITH PROWAG R409.
32. HANDRAIL EXTENSIONS SHALL NOT PROTRUDE INTO THE USABLE LANDING AREA OR INTO INTERSECTING PEDESTRIAN ROUTES.
33. DRIVEWAYS AND TURNOUTS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH ITEM "INTERSECTIONS, DRIVEWAYS AND TURNOUTS". SIDEWALKS SHALL BE CONSTRUCTED AND PAID FOR IN ACCORDANCE WITH ITEM, "SIDEWALKS".
34. SIDEWALK DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.



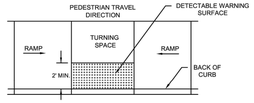
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



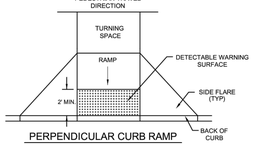
TYPE 23

DUAL PARALLEL CURB RAMPS AT CURB RADIUS
(USE ONLY WHERE WATER WILL NOT POND IN THE LANDING.)

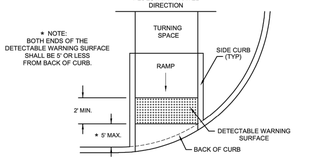
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

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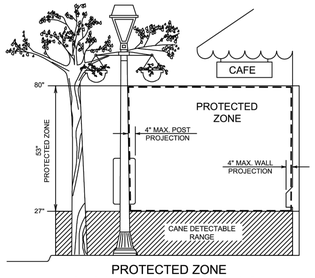
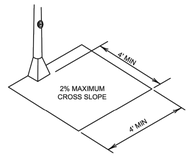
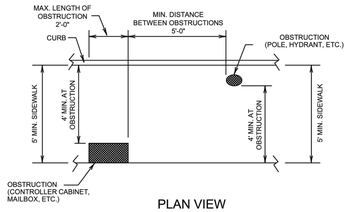
LAURIE MOYER, P.E.	ADOPTED
ADA RAMPS	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 432S-3-SM
	2 OF 4



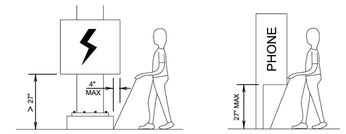
PROTECTED ZONE
In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27" and 80" above the surface.



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



PLAN VIEW
PLACEMENT OF STREET FIXTURES
(ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' x 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.)



DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

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ADA RAMPS	
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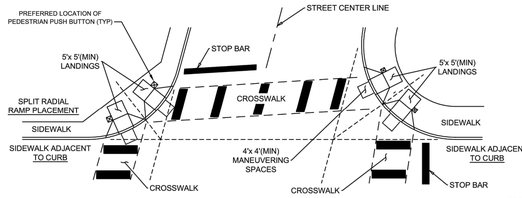
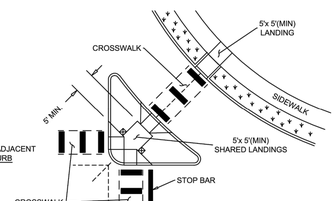
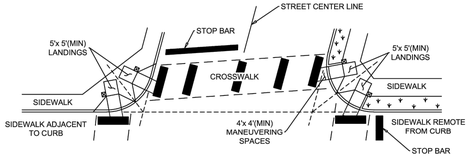
	3 OF 4



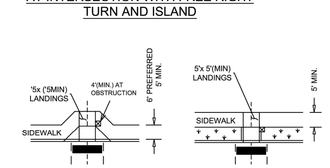
SKEWED INTERSECTION WITH "LARGE" RADIUS



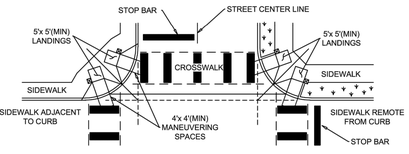
AT INTERSECTION WITH FREE RIGHT TURN AND ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

TYPICAL CROSSING LAYOUTS

MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

NOTES:

1. CROSSWALK STRIPING WILL BE PER CITY OF SAN MARCOS DETAIL 871S-1-SM PAVEMENT MARKING.
2. STREET GRADES AND CROSS SLOPES SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. RAMPS ARE SHOWN HERE WITHOUT DETECTABLE WARNINGS FOR SIMPLICITY. DETECTABLE WARNINGS ARE REQUIRED AT THE LOCATIONS SHOWN ON THE PED STANDARD (SHEET 1 AND 2 OF 4) AND IN ACCORDANCE WITH THE DETAILS SHOWN BELOW.
4. SMALL CHANNELIZATION ISLANDS, WHICH CAN NOT PROVIDE A MINIMUM OF 5' X 5' LANDING AT THE TOP OF RAMPS, SHALL BE CUT THROUGH LEVEL WITH THE SURFACE OF THE STREET.

LEGEND:

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE).

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024
RECORD COPY SIGNED BY	1/1/2022
LAURIE MOYER, P.E.	ADOPTED
ADA RAMPS	
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	4 OF 4

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS	DESCRIPTION	DATE
REVISION	---	---
	---	---

STREET DETAILS (2 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

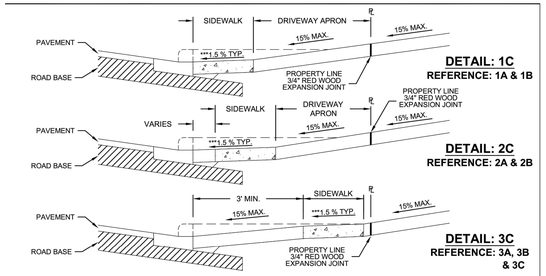
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

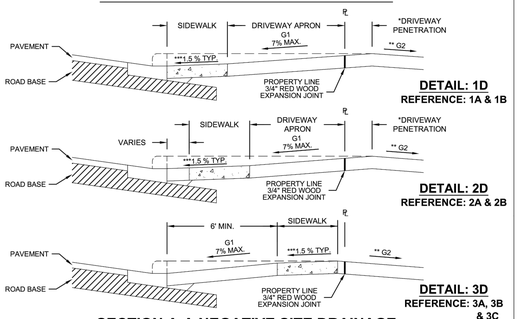
SHEET 70 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_STD.dwg, 70 STREET DETAILS (2 OF 3), October 31, 2024, 2:09 PM, mgarrison



SECTION A-A POSITIVE SITE DRAINAGE



SECTION A-A NEGATIVE SITE DRAINAGE

*DRIVEWAY PENETRATION WILL EXTEND INTO THE PROPERTY UNTIL GRADING IS HIGHER THAN THAT OF THE CURB AT THE MAXIMUM G1 SLOPE. LIMITS OF PAVEMENT WILL EXTEND TO LIMITS OF DRIVEWAY PENETRATION.
** !G1 - G2! ≤ 15%.
*** 1.5% TYP., 1% MIN., 2% MAX.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DRIVEWAYS - COMMON DETAILS	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-A-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

DRIVEWAY	CONCRETE THICKNESS	REINFORCEMENT	DRIVEWAY BASE
TYPE I	6" CLASS A 3,000 PSI	#3 BARS PLACED ON CHAIRS AT MID DEPTH OF SLAB AT NO MORE THAN 18" O.C. BOTH DIRECTIONS	2" COMPACTED SAND
TYPE II	7" CLASS C 3,600 PSI	#4 BARS PLACED ON CHAIRS AT MID DEPTH OF SLAB AT NO MORE THAN 18" O.C. BOTH DIRECTIONS	2" COMPACTED SAND

NOTES:

A. NEW PAVEMENT WILL MATCH EXISTING PAVEMENT THICKNESS AND TYPE.
B. IN NO INSTANCE SHALL THE REBAR BE PLACED DIRECTLY ON THE SUBGRADE, SAND CUSHION LAYER OR CLOSER THAN 2" TO THE OUTSIDE EDGE OF THE CONCRETE.

NOTES:

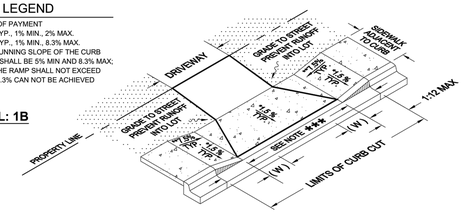
1. IF DIMENSION IS LESS THAN 5', REMOVE CURB AND GUTTER TO EXISTING JOINT AND POUR MONOLITHICALLY WITH DRIVEWAY. (SEE SHEET 1)
2. ALL DRIVEWAY WILL HAVE A CONTROL JOINT DOWN CENTER OF DRIVEWAY AND ON BOTH SIDES OF THE SIDEWALK PATH ACROSS THE DRIVEWAY. (SEE SHEET 3)
3. WHILE THE PROPERTY OWNER REMAINS RESPONSIBLE FOR GRADE BREAKS WITHIN PRIVATE PROPERTY, THE FIRE DEPARTMENT SHALL BE CONSULTED WHERE THE DRIVEWAY IS ESSENTIAL TO EMERGENCY VEHICLE ACCESS AND "G2 IS GREATER THAN 15%."
4. DRIVEWAY WIDTHS AND RADIUS DIMENSIONS, ONE/TWO WAY TRAVEL REQUIREMENTS, AND GEOMETRIC LAY-OUT ARE HIGHLY VARIABLE, SUBJECT TO SITE SPECIFIC CONDITIONS AND REQUIREMENTS. SEE TRANSPORTATION CRITERIA MANUAL SECTION 5 "DRIVEWAYS" IF CONFLICT WITH DETAIL.
5. IF THE BASE IS OVER-EXCAVATED WHERE THE CURB AND GUTTER WERE REMOVED, BACKFILL WITH CONCRETE MONOLITHICALLY WITH THE DRIVEWAY.
6. DRIVEWAY SHALL NOT BE CONSTRUCTED WITHIN THE CURB RETURN OF A STREET INTERSECTION.
7. WATER METER BOXES AND WASTEWATER CLEAN OUTS ARE PROHIBITED FROM BEING LOCATED IN DRIVEWAY AREAS.
8. PAY ITEM: ASPHALT TRANSITION, LAYDOWN CURB AND GUTTER WILL BE PAID FOR AS SEPARATE LINE ITEM UNLESS NOTED ON PLANS. CURB AND GUTTER INSTALLED ON THE RADIUS OR ALONG THE RAMPS WILL BE SUBSIDIARY TO DRIVEWAY LINE ITEM.
9. ALL NEW DRIVEWAYS SHALL BE CONSTRUCTED PER DETAIL 433S-AR-SM, DRIVEWAYS - RADIUS CONNECTION 433S-AR-SM EXCEPT IN NEW SUBDIVISIONS (TYPICALLY) WHERE HOUSES ARE BUILT AFTER THE CURB IS INSTALLED.
10. IF BOTH OF THE FOLLOWING CONDITIONS ARE MET, THEN DETAIL 433S-AF-SM - DRIVEWAYS - FLARED CONNECTION MAY BE USED:
    A) THE DRIVEWAY CLASSIFIED AS TYPE 1.
    B) THERE AN EXISTING CURB ALREADY INSTALLED AT THE PROPOSED DRIVEWAY LOCATION.

REFERENCES
DETAIL 430S-2-SM
DETAIL 430S-3-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DRIVEWAYS - COMMON DETAILS	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-A-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2

LEGEND

LIMIT OF PAYMENT
★ 1.5% TYP., 1% MIN., 2% MAX.
★★ 7.5% TYP., 1% MIN., 8.3% MAX.
★★★ THE RUNNING SLOPE OF THE CURB RAMP SHALL BE 5% MIN AND 8.3% MAX; BUT THE RAMP SHALL NOT EXCEED 15' IF 8.3% CAN NOT BE ACHIEVED



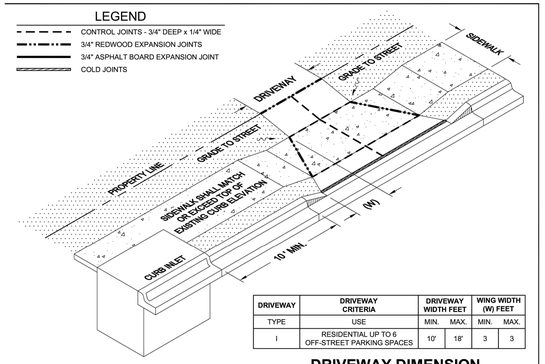
(NOT APPROVED FOR USE ON TYPE II DRIVEWAYS)

NOTES:
(FOR USE ON NEW RESIDENTIAL NEIGHBORHOODS ONLY) SEE NOTE 9 & 10 DETAILS 433S-A-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 7/15/2024	RESIDENTIAL DRIVEWAYS FLARED CONNECTION	
RECORD COPY SIGNED BY	7/15/2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-AF-SM
SHAUN CONDOR, P.E.	ADOPTED		1 OF 2

LEGEND

CONTROL JOINTS - 3/4" DEEP x 1/4" WIDE
3/4" REDWOOD EXPANSION JOINTS
3/4" ASPHALT BOARD EXPANSION JOINT
COLD JOINTS

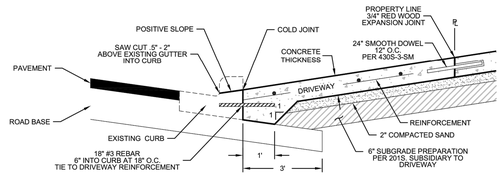


DRIVEWAY	DRIVEWAY CRITERIA	DRIVEWAY WIDTH FEET		WING WIDTH (W) FEET	
TYPE	USE	MIN.	MAX.	MIN.	MAX.
I	RESIDENTIAL UP TO 6 OFF-STREET PARKING SPACES	10'	18'	3	3

DRIVEWAY DIMENSION

NOTES:

A. FLARED CONNECTION SHALL ONLY BE USED IN RESIDENTIAL NEIGHBORHOODS. IT IS NOT APPROVED FOR TYPE II DRIVEWAYS.
B. WHERE DRIVEWAYS ARE CONTROLLED WITH YIELD OR STOP CONTROL DEVICES OR TRAFFIC SIGNALS, DETECTABLE WARNING SURFACES SHALL BE PROVIDED ON THE PEDESTRIAN CIRCULATION PATH WHERE THE PEDESTRIAN CIRCULATION PATH MEETS THE DRIVEWAY (PER PROWAG TECHNICAL REVISION R305.2.8)

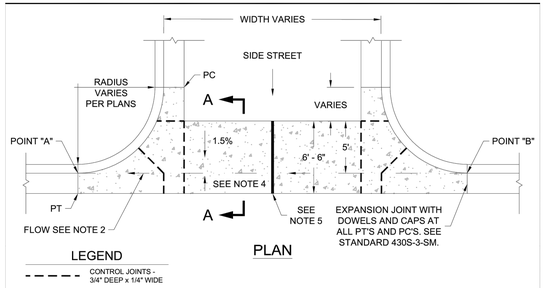


REFERENCES
DETAIL 430S-2-SM
DETAIL 430S-3-SM

FLARED CONNECTION

(NOT APPROVED FOR USE ON TYPE II DRIVEWAYS)

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 7/15/2024	RESIDENTIAL DRIVEWAYS FLARED CONNECTION	
RECORD COPY SIGNED BY	7/15/2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 433S-AF-SM
SHAUN CONDOR, P.E.	ADOPTED		2 OF 2

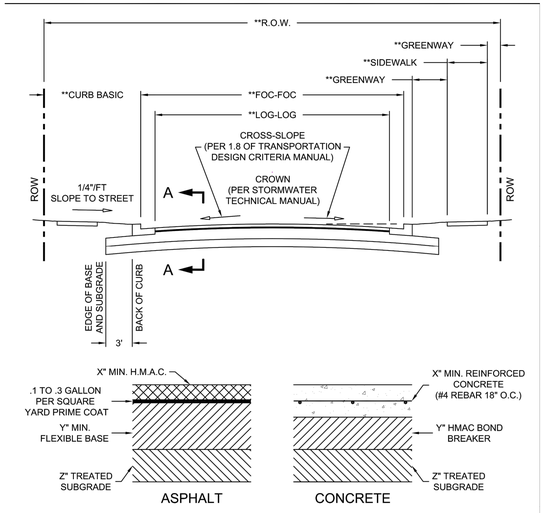


NOTES:

1. MONOLITHIC CURB AND GUTTER SHALL BE MEASURED BY PLAN QUANTITY PER SQUARE FEET AND PAID AS VALLEY GUTTER.
2. MINIMUM SLOPE FROM POINT "A" TO POINT "B" SHALL BE 0.50%.
3. ALL CONTROL JOINT WILL BE TOOL JOINT OR SAW CUT WITH WALK BEHIND SAW.
4. MATCH CROSS-SLOPE OF ROAD 2% TYPICAL ~ 1.5% MIN. OR 3% MAX.
5. INSTALL COLD JOINT IF NEEDED TO MAINTAIN TRAFFIC. SEE DETAIL 420S-3-SM.
6. IF A PEDESTRIAN PATH IS NOT REQUIRED, THE SLOPE MAY ME ADJUSTED TO MATCH THE ROAD OR 6% MAX,

REFERENCES
DETAIL 430S-3-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 7/15/2024	CONCRETE VALLEY GUTTER	
RECORD COPY SIGNED BY	7/15/2024	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 436S-2-SM
SHAUN CONDOR, P.E.	ADOPTED		1 OF 1



SECTION A-A

(TYPICAL STREET PAVEMENT)

NOTES:

★ 1. REFER TO THE COSM TRANSPORTATION DESIGN MANUAL REQUIREMENTS FOR ALL MINIMUM PAVEMENT LAYER THICKNESS. ACTUAL THICKNESSES TO BE DETERMINED BASED ON COMPUTERIZED PAVEMENT DESIGN.
2. ALL UNPAVED AREA WITHIN THE LIMITS OF CONSTRUCTION SHALL BE SODDED OR SEEDED AS INDICATED PER CITY SPECIFICATION 601S - 609S AS APPLICABLE.
3. SLOPES OF STREET SECTION WILL BE PER THE CURRENT TRANSPORTATION MANUAL. TYPICAL 2% TOWARDS THE CURB AND GUTTER FROM PROPERTY LINE AND PARABOLIC FROM CROWN UNLESS ALTERNATE CROSS SECTION PROPOSED.
★★ 4. ALL WIDTH AND SPACING WILL BE PER CURRENT CITY CODE / DESIGN MANUAL.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2022	TYPICAL STREET SECTION	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 1000S-10-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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STREET DETAILS (3 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

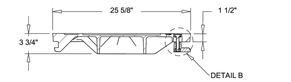
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
71 OF 81

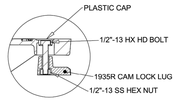
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_STD.dwg, 71 STREET DETAILS (3 OF 3), October 31, 2024, 2:09 PM, mgiertz

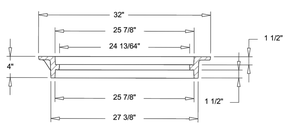


LID SECTION VIEW

SECTION A-A



DETAIL B



FRAME SECTION VIEW

SECTION A-A



DETAIL A

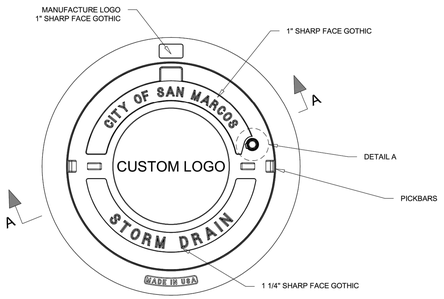
MATERIALS	
LID	DUCTILE IRON
FRAME	GRAY IRON

NOTE:

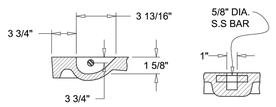
1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

SHT 2 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	STORM DRAIN CURB INLET RING AND COVER 25 5/8" UNBOLTED	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-2S-SM
LAURIE MOYER, P.E.	ADOPTED		N.T.S. STANDARD DETAIL



LID AND FRAME PLAN VIEW



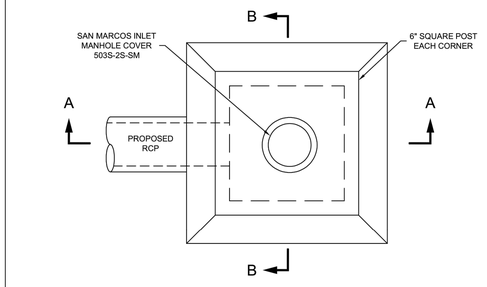
PICKBAR DETAIL



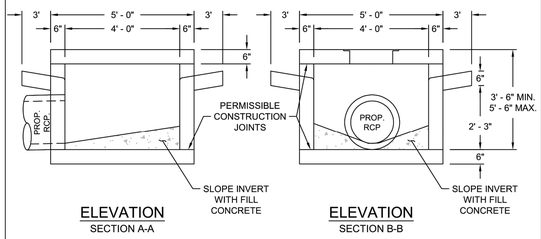
CUSTOM LOGO

SHT 1 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	STORM DRAIN CURB INLET RING AND COVER 25 5/8" UNBOLTED	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-2S-SM
LAURIE MOYER, P.E.	ADOPTED		N.T.S. STANDARD DETAIL



PLAN VIEW



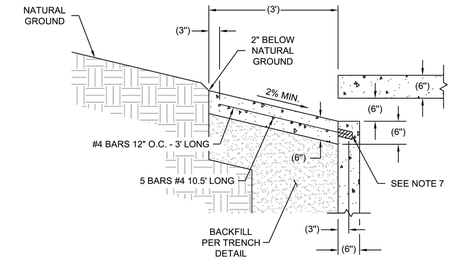
ELEVATION

SECTION A-A

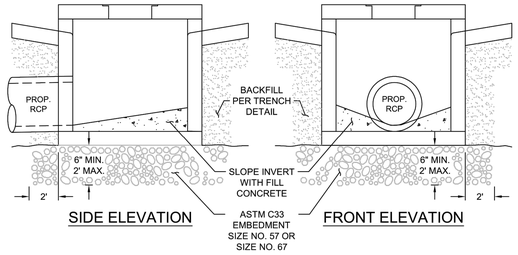
ELEVATION

SECTION B-B

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	PRECAST 4-SIDED AREA INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-9-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 3



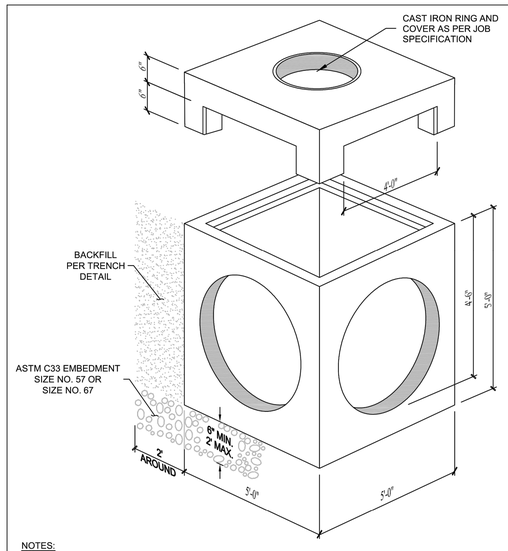
INLET OPENING



SIDE ELEVATION

FRONT ELEVATION

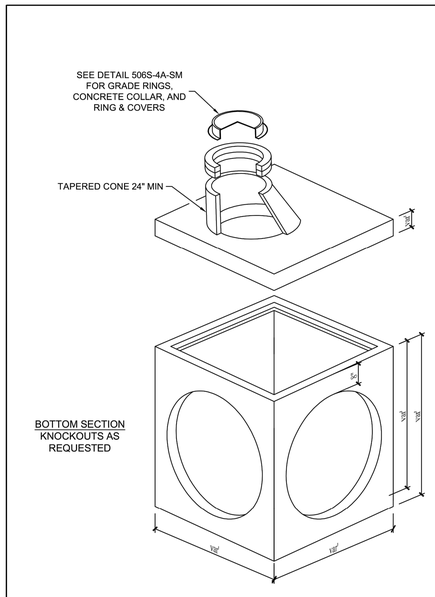
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	PRECAST 4-SIDED AREA INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-9-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 3



NOTES:

1. 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.
2. ALL CUT STEEL SHALL BE REPLACED WITH ADDITIONAL DIAGONAL BARS OF THE SAME DIAMETER.
3. 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.
6. CONSULT MANUFACTURER BEFORE HANDLING.
7. DRILL 3" DEEP HOLES (5/8" DIA.) AT 12" O.C.

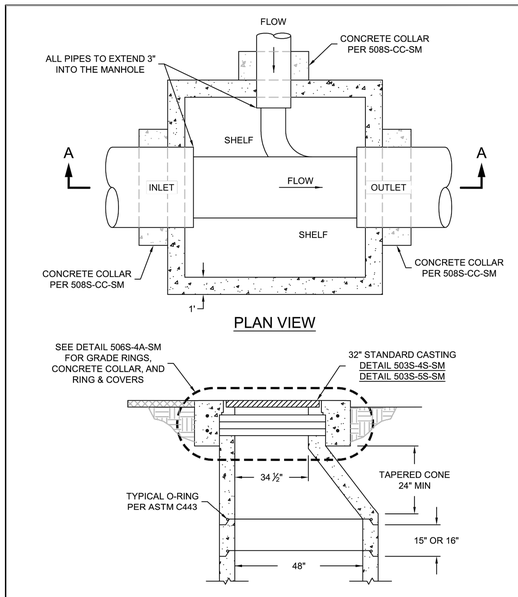
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	PRECAST 4-SIDED AREA INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-9-SM
LAURIE MOYER, P.E.	ADOPTED		3 OF 3



SPECIFICATIONS:
- CONCRETE HAS A 28 DAY STRENGTH OF 5,000 PSI
- STEEL REINFORCEMENT S ASTM A615 GRADE 60
-LOAD DESIGN IS H-20

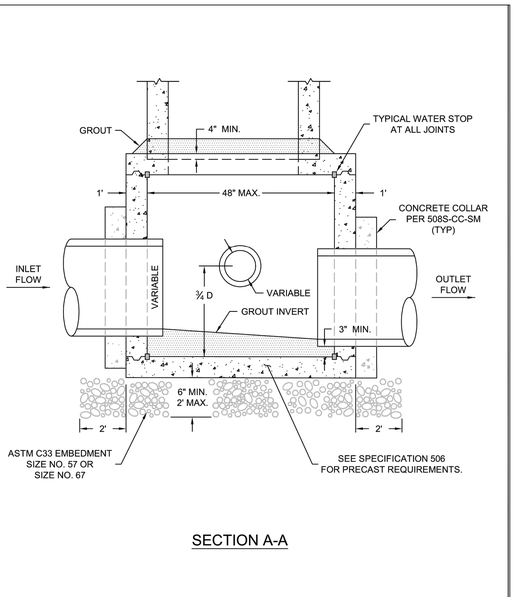
NOTES:
- CONSULT MANUFACTURER BEFORE HANDLING

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



PLAN VIEW

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2022	PRE-CAST STORM JUNCTION BOX	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 506S-5-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 3



SECTION A-A

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

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TBPE Firm Registration No.: F-14309

REVISIONS		
REVISION	DESCRIPTION	DATE
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STORM DRAIN DETAILS (1 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

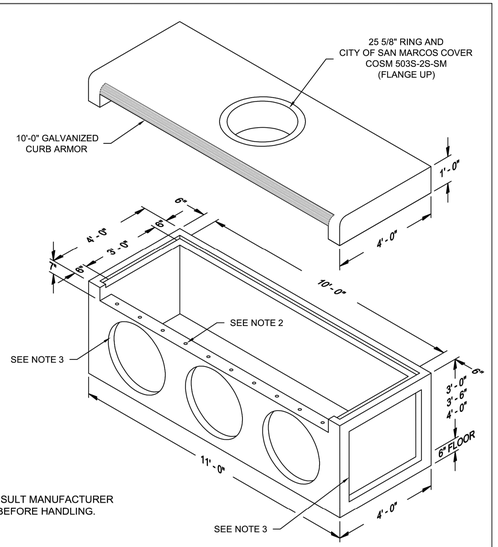
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET 74 OF 81

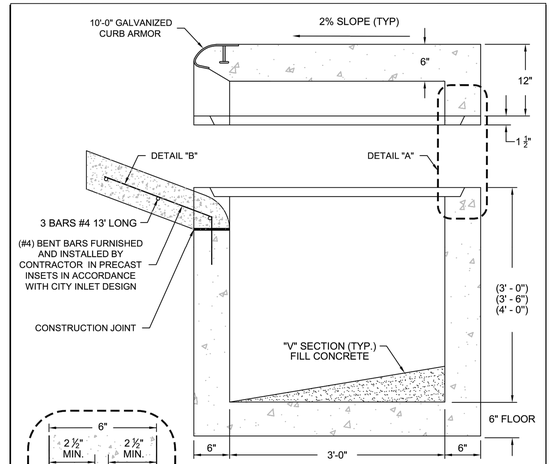
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 74 STORM DRAIN DETAILS (1 OF 3), October 31, 2024, 2:10 PM, mguerra

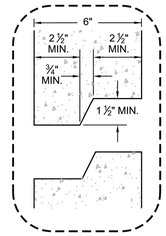


CONSULT MANUFACTURER
BEFORE HANDLING.

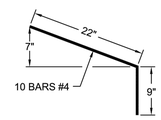
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL PRE-CAST CURB INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 4



ELEVATION - SECTION A-A

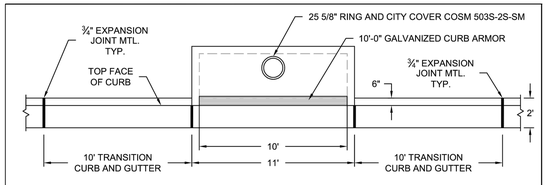


DETAIL "A"

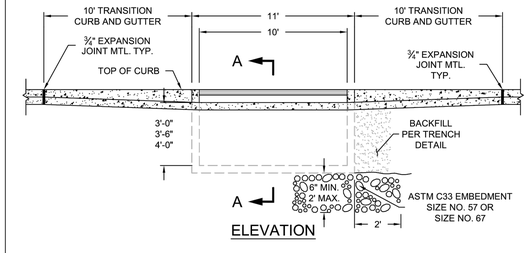


DETAIL "B"

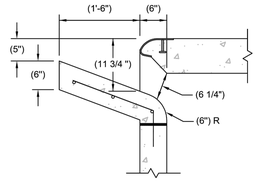
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL PRE-CAST CURB INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 4



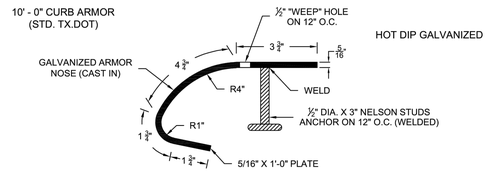
PLAN VIEW



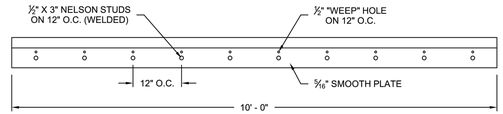
ELEVATION



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL PRE-CAST CURB INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3-SM
LAURIE MOYER, P.E.	ADOPTED		3 OF 4



GALVANIZED ARMOR NOSE



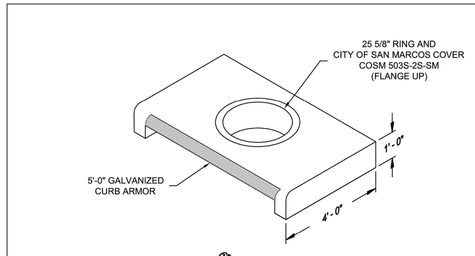
GALVANIZED ARMOR NOSE
PLAN VIEW

GENERAL NOTES:

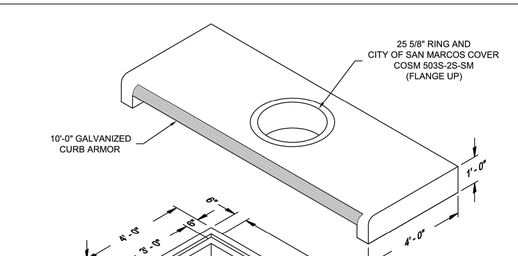
1. REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60. BAR BENDING AND PLACEMENT SHALL COMPLY WITH LATEST ACI STANDARDS. DESIGN BASED ON AASHTO HS 20 LOADING.
2. DRILL 6" DEEP HOLES (5/8" DIA.) AT 12" O.C. ON 3'-6" AND 4'-0" BASES. HOLES SHALL BE DRILLED IN THE FIELD PER THE DIRECTION OF THE CITY 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" INLETS.
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 Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL PRE-CAST CURB INLET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3-SM
LAURIE MOYER, P.E.	ADOPTED		4 OF 4



5' CURB INLET



CONSULT MANUFACTURER
BEFORE HANDLING.

10' CURB INLET

GENERAL NOTES:

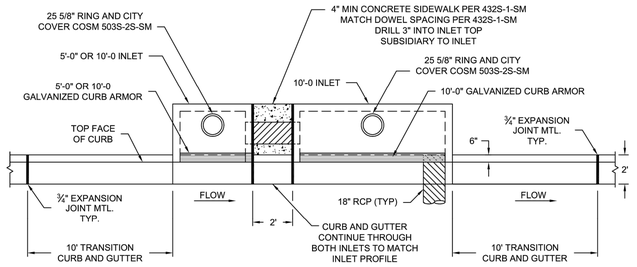
1. REINFORCING STEEL SHALL COMPLY WITH ASTM A615 GRADE 60. BAR BENDING AND PLACEMENT SHALL COMPLY WITH LATEST ACI STANDARDS. DESIGN BASED ON AASHTO HS 20 LOADING.
2. DRILL 6" DEEP HOLES (5/8" DIA.) AT 12" O.C. ON 3'-6" AND 4'-0" BASES. HOLES SHALL BE DRILLED IN THE FIELD PER THE DIRECTION OF THE CITY INSPECTOR ON 3'-0" BASES.

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.

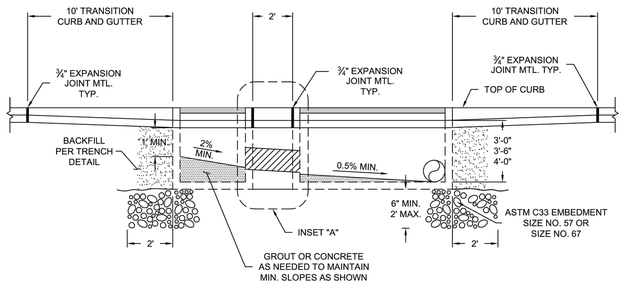
3B. 54" W x 30"H TWKO'S ON FRONT AND REAR OF 5'-0" INLETS. 36" W x 30"H TWKO'S ON BOTH END WALLS OF 5'-0" INLETS.

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.
10. IF A 5' INLET IS USED; IT SHALL BE PLACED UPSTREAM OF THE 10' INLET.

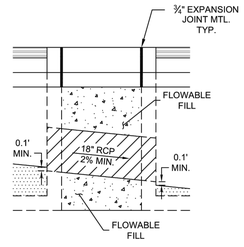
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DUEL PRE-CAST CURB INLETS	
RECORD COPY SIGNED BY	3/16/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3A-SM
SHAUN CONDOR, P.E.	ADOPTED		1 OF 2



PLAN VIEW



ELEVATION



INSET "A"

REFERENCES
DETAIL 430S-3-SM
DETAIL 503S-1-SM
DETAIL 508S-3-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	DUEL PRE-CAST CURB INLETS	
RECORD COPY SIGNED BY	3/16/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-3A-SM
SHAUN CONDOR, P.E.	ADOPTED		2 OF 2

Bowman
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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
DESCRIPTION	DATE	
---	---	
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STORM DRAIN DETAILS (2 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

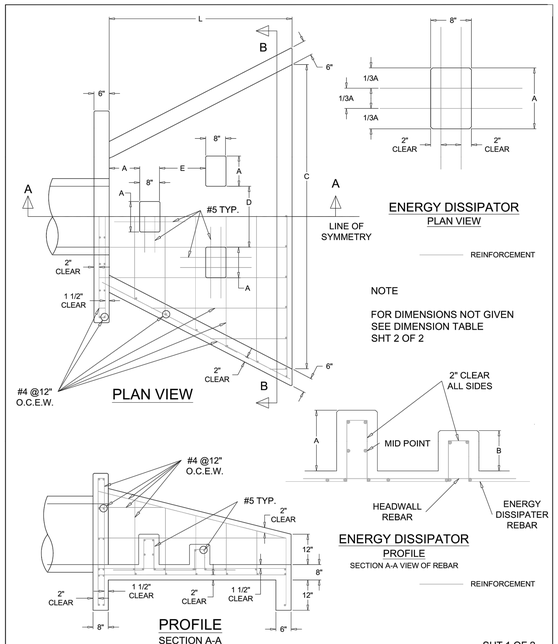
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
75 OF 81

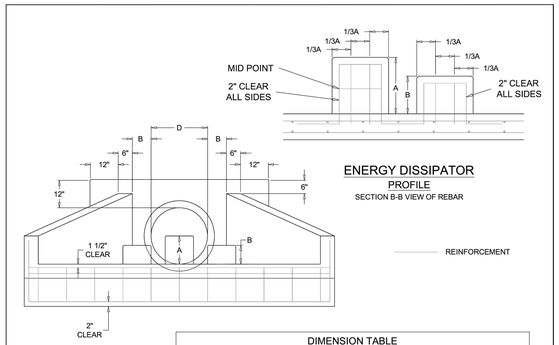
FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 75 STORM DRAIN DETAILS (2 OF 3), October 31, 2024, 2:10 PM, mguerra



SHT 1 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL HEADWALL AND ENERGY DISSIPATOR	
RECORDED COPY SIGNED BY	11/18/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	508S-13-SM
LAURIE MOYER, P.E.	ADOPTED	N.T.S.	STANDARD DETAIL



PROFILE
SECTION B-B

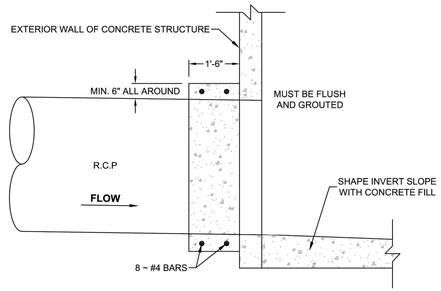
DIMENSION TABLE							
D	18"	21"	24"	27"	30"	33"	36"
A	9"	10"	12"	14"	15"	16	18"
B	6"	7"	8"	9	10"	11"	12"
C	90"	105"	120"	135"	150"	165"	180"
L	54"	63"	72"	81"	90"	99"	108"
E	12"	14"	16"	18"	20"	22"	24"

NOTE:

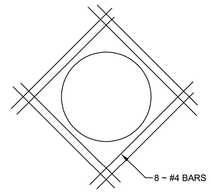
1. ALL CONCRETE SHALL BE TYPE "C" PER SPEC. 403S
2. CHAMFER ALL EXTERNAL VISIBLE CORNERS.
3. DISSIPATOR BLOCKS REQUIRED ON DISCHARGE HEADWALLS ONLY.
4. DISCHARGE VELOCITIES GREATER THAN 6 FEET/SECOND AFTER DISSIPATOR ALSO REQUIRE ROCK OUTLET PROTECTION.
5. DETAIL IS NOT FOR PIPES WITH EXIT VELOCITIES EXCEEDING 15 FEET PER SECOND.
6. ALL SPACING FOR CAST-IN-PLACE HEADWALLS AND DISSIPATORS.
7. ANY WALL THICKER THEN 6" WILL BE DOUBLE MATTED WITH REINFORCEMENT REBAR.

SHT 2 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	TYPICAL HEADWALL AND ENERGY DISSIPATOR	
RECORDED COPY SIGNED BY	11/18/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	508S-13-SM
LAURIE MOYER, P.E.	ADOPTED	N.T.S.	STANDARD DETAIL



PIPE FLUSH WITH INVERT



NOTES:

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
2. 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.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. 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 1/1/2024	CONCRETE COLLAR FOR DRAINAGE PIPE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 508S-CC-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS

REVISION	DESCRIPTION	DATE
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STORM DRAIN DETAILS (3 OF 3)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

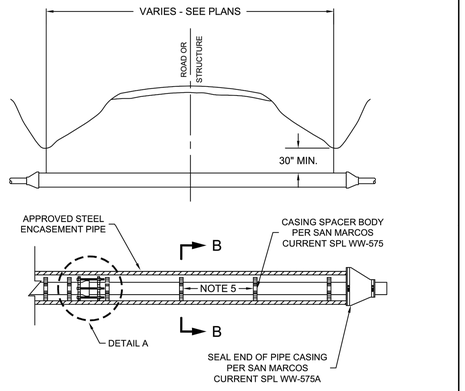
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
76 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 76 STORM DRAIN DETAILS (3 OF 3), October 31, 2024, 2:10 PM, mguerra

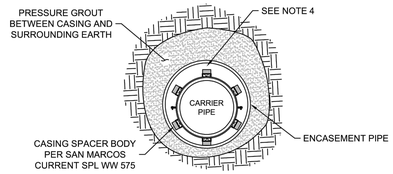


DETAIL A

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	ENCASEMENT DETAIL WITH CASING SPACERS	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 501S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

ENCASEMENT PIPE REQUIREMENTS - TYPICAL			
MAIN SIZE (INCHES)	NOM. DIA. STEEL (INCHES)	STEEL PIPE THICKNESS (INCHES)	PIPE WEIGHT (LBS./FT.)
6 / 8	18	0.375	70.59
12	24	0.375	94.62
16 / 18	30	0.375	118.65
20	36	0.438	166.19
24	42	0.438	194.02

RAILROAD CROSSING CASING REQUIREMENTS			
MAIN SIZE (INCHES)	NOM. DIA. STEEL CONDUIT (INCHES)	STEEL PIPE THICKNESS (INCHES)	PIPE WEIGHT (LBS./FT.)
6 / 8	18	0.375	70.59
12	24	0.438	110.22
16 / 18	30	0.500	157.53
20	36	0.562	212.70
24	42	0.625	276.18

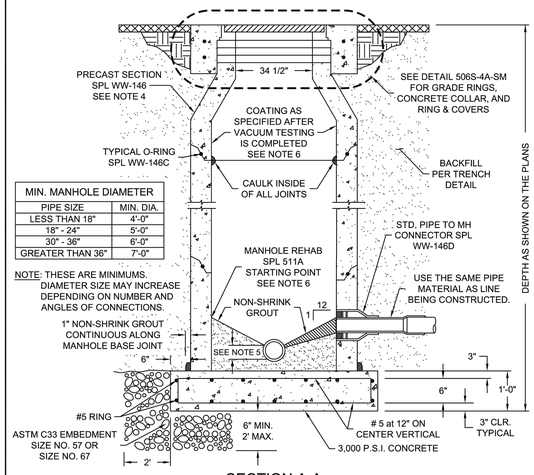


SECTION B - B

NOTES:

1. ALL FITTINGS INSIDE ENCASEMENT PIPE SHALL BE RESTRAINED PER SAN MARCOS CURRENT SPL WW-27A. (THIS DETAIL ILLUSTRATES PVC PIPE ONLY RESTRAINTS WILL BE PER SPL FOR THE PIPE USED AS CARRIER PIPE)
2. ALL FITTINGS INSIDE PIPE CASING WILL HAVE CASING SPACERS BODY PLACED 1 FOOT BEFORE AND AFTER FITTINGS.
3. BOTH ENDS SHALL BE SEALED PER SAN MARCOS CURRENT SPL WW-575A.
4. 1" MINIMUM BETWEEN SPACERS AND CASING PIPE ABOVE CENTER LINE OF PIPE.
5. SPACERS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PRODUCT SPECIFICATION BUT NO MORE THAN 8' APART.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	ENCASEMENT DETAIL WITH CASING SPACERS	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 501S-1-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



MIN. MANHOLE DIAMETER	
PIPE SIZE	MIN. DIA.
LESS THAN 18"	4'-0"
18" - 24"	5'-0"
30" - 36"	6'-0"
GREATER THAN 36"	7'-0"

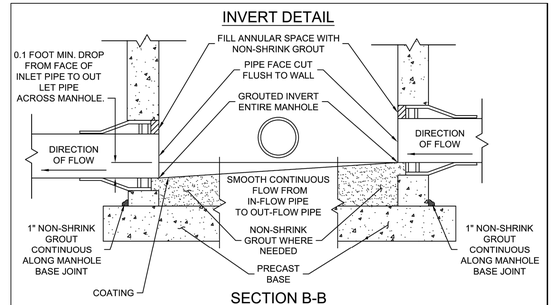
NOTE: THESE ARE MINIMUMS. DIAMETER SIZE MAY INCREASE DEPENDING ON NUMBER AND ANGLES OF CONNECTIONS.

SECTION A-A

NOTES:

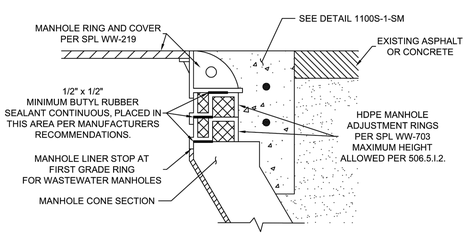
1. SEE PLANS FOR MANHOLE LOCATION, CONFIGURATION, PIPE SIZES AND TYPES.
2. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
3. MONOLITHIC MANHOLE TO BE CAST-IN-PLACE SHALL CONFORM TO ASTM SPECIFICATION C478 FOR MATERIALS AND DESIGN. MANUFACTURER TO PROVIDE DETAILS.
4. MANHOLES FOR MAINS 24" AND LARGER 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 GREATER THEN 24".
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 OF THIS STANDARD.	STANDARD NO. 506S-10-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

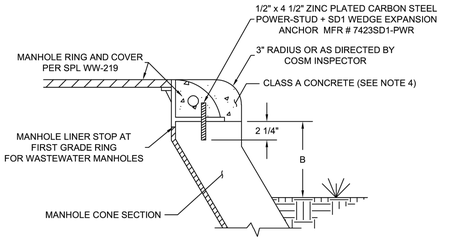


REFERENCES
DETAIL 503S-4W-SM
DETAIL 503S-5W-SM
DETAIL 506S-4A-SM

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 OF THIS STANDARD.	STANDARD NO. 506S-10-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



IN PAVEMENT



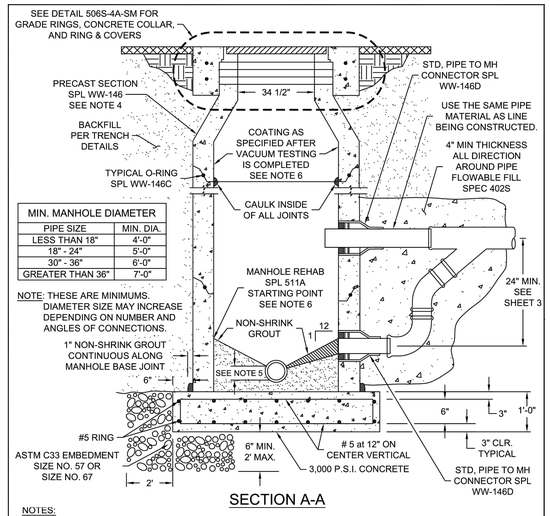
OUTSIDE PAVEMENT

NOTES:

1. IF MANHOLE IS WITHIN THE 100-YEAR FLOODPLAIN, USE BOLTED AND GASKET LIDS.
2. DIMENSION B = (6"-12" TO FINISH GRADE) FOR MANHOLE LOCATED IN THE 100-YR FLOOD PLAIN.
   = (2"-12" TO FINISH GRADE) FOR MANHOLE OUTSIDE THE 100-YR FLOOD PLAIN.
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

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



MIN. MANHOLE DIAMETER	
PIPE SIZE	MIN. DIA.
LESS THAN 18"	4'-0"
18" - 24"	5'-0"
30" - 36"	6'-0"
GREATER THAN 36"	7'-0"

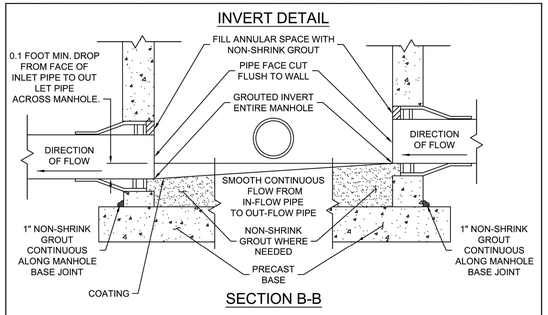
NOTE: THESE ARE MINIMUMS. DIAMETER SIZE MAY INCREASE DEPENDING ON NUMBER AND ANGLES OF CONNECTIONS.

SECTION A-A

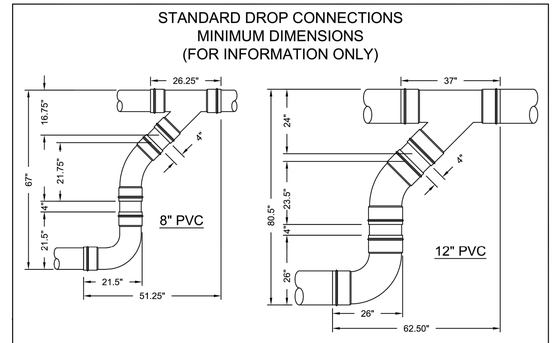
NOTES:

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 GREATER THEN 24"
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 WITH EXTERIOR DROP	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 506S-8-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 3



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WASTEWATER MANHOLE ON PRECAST BASE WITH EXTERIOR DROP	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 506S-8-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 3



REFERENCES
DETAIL 503S-4W-SM
DETAIL 503S-5W-SM
DETAIL 506S-4A-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WASTEWATER MANHOLE ON PRECAST BASE WITH EXTERIOR DROP	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 506S-8-SM
LAURIE MOYER, P.E.	ADOPTED		3 OF 3

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151 South Stagecoach Trail
San Marcos, Texas 78666
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www.bowman.com
TBPE Firm Registration No.: F-14309
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REVISIONS		
REVISION	DESCRIPTION	DATE
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WASTEWATER DETAILS (1 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

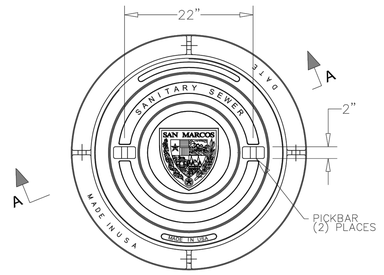
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

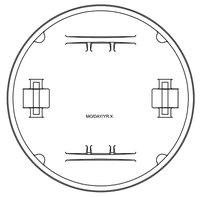
SHEET 77 OF 81

FOR PERMIT

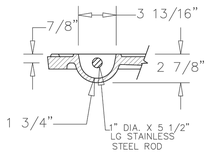
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 77 WASTEWATER DETAILS (1 OF 2), October 31, 2024, 2:10 PM, mguerra



FRAME AND LID PLAN VIEW



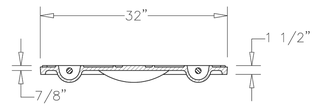
LID VIEW BOTTOM



PICKBAR DETAIL

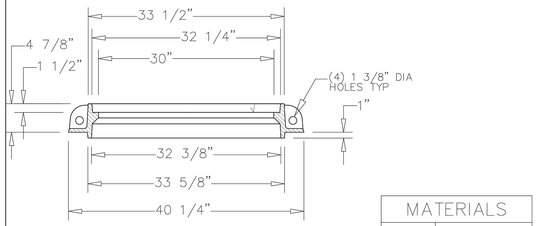
SHT 1 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SANITARY SEWER MANHOLE RING AND COVER 32" - UNBOLTED	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-4W-SM
LAURIE MOYER, P.E.	ADOPTED		



LID SECTION VIEW

SECTION A-A



FRAME SECTION VIEW

SECTION A-A

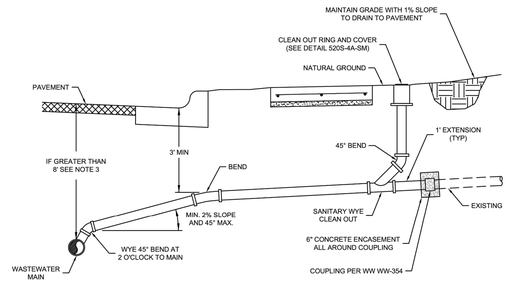
MATERIALS	
LID	DUCTILE IRON
FRAME	GRAY IRON

NOTE:

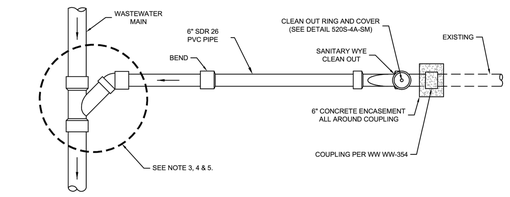
1. THIS DETAIL IS FOR USE IN PUBLIC INFRASTRUCTURE ONLY. PRIVATE INFRASTRUCTURE WILL NOT HAVE CITY OF SAN MARCOS LOGO.
2. COVER SHALL BE EAST JORDAN IRON WORKS OR APPROVED EQUIVALENT.

SHT 2 OF 2

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SANITARY SEWER MANHOLE RING AND COVER 32" - UNBOLTED	
RECORD COPY SIGNED BY	6/5/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-4W-SM
LAURIE MOYER, P.E.	ADOPTED		



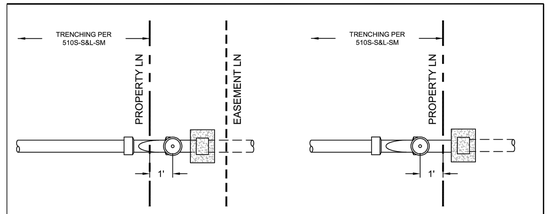
STANDARD CONNECTION



PLAN VIEW

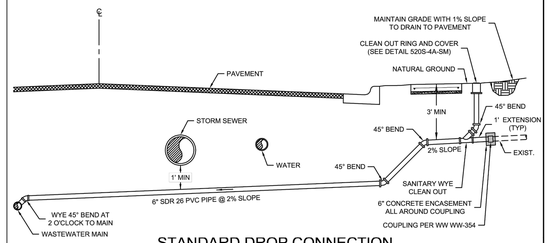
REFERENCES
DETAIL 510S-S&L-SM
DETAIL 520S-AW-01B-SM
DETAIL 520-4A-SM
DETAIL 520-6-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SINGLE WASTEWATER LATERAL CONNECTION	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 520S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2



SINGLE LATERAL CONNECTION
INSIDE EASEMENT

SINGLE LATERAL CONNECTION
INSIDE ROW / PROPERTY LINE WITH NO EASEMENT

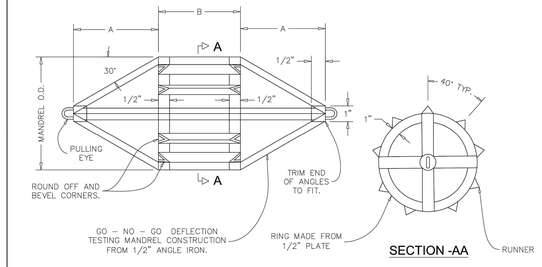


STANDARD DROP CONNECTION
(ALTERNATIVE TO ADDRESS UTILITY CONFLICTS)

NOTE:

1. THE PIPE WILL BE SLOPED NO MORE THAN 45° FROM HORIZONTAL AND HAVE A MINIMUM SLOPE OF 2% TO MAIN FROM BACK OF CURB.
2. CONNECTION JOINTS BEFORE AND AFTER BEND WILL NOT HAVE MORE THAN 5° DEFLECTION TO ACHIEVE THE REQUIRED SLOPE/ANGLE.
3. FOR MAINS THAT HAVE MORE THAN 8 FEET OF COVER MAINTAIN MINIMUM SLOPE TO WASTEWATER MAIN AND USE DETAIL 520-6-SM TO CONNECT TO WASTEWATER MAIN.
4. IF CONNECTING TO MANHOLE SERVICE LINE SLOPE CAN NOT EXCEED 12% AND IF REQUIRED A DROP MANHOLE CONNECTION WILL BE USED.
5. FOR EXISTING MAIN CONNECTIONS SEE DETAIL (520S-AW-01B-SM)
6. CONCRETE USED SHALL BE CLASS A OR PACKAGE CONCRETE PER WW-704.
7. IF THERE IS NO EXISTING LATERAL, INSTALL A PVC CAP ON THE END OF THE LATERAL.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SINGLE WASTEWATER LATERAL CONNECTION	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 520S-1-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



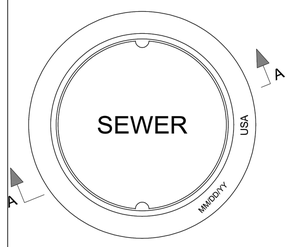
SECTION -AA

DIMENSION					
PIPE SIZE	A	B	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"

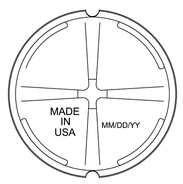
NOTES:

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).

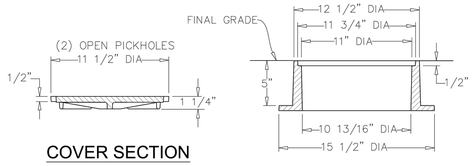
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PIPE MANDREL	
RECORDED COPY SIGNED BY	2-15-2015	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	510S-PM-SM
LAURIE MOYER, P.E.	ADOPTED		N.T.S. STANDARD DETAIL



PLAN VIEW



COVER BACK

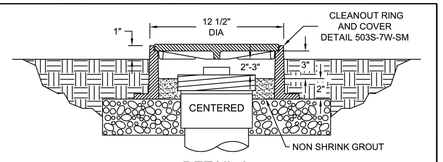


COVER SECTION
SECTION A-A

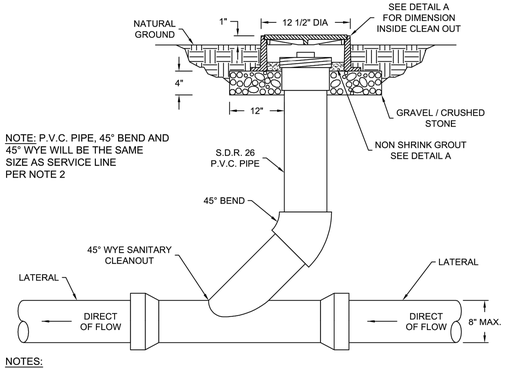
RING SECTION
SECTION A-A

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

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	CLEANOUT RING AND COVER	
RECORD COPY SIGNED BY	6/30/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	503S-7W-SM
LAURIE MOYER, P.E.	APPROVED		



DETAIL A



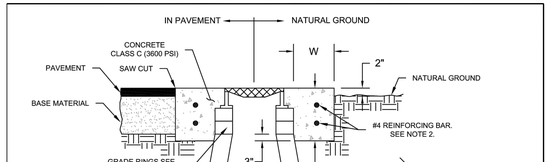
NOTE: P.V.C. PIPE, 45° BEND AND 45° WYE WILL BE THE SAME SIZE AS SERVICE LINE PER NOTE 2

NOTES:

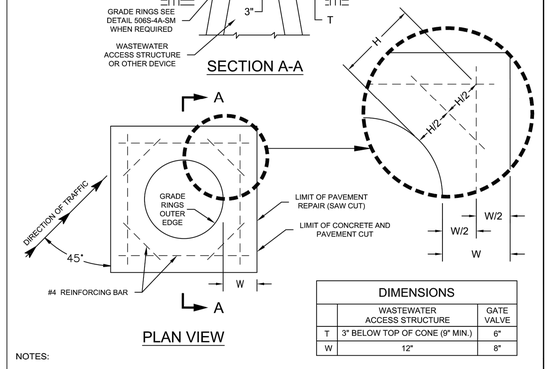
1. THIS DETAIL IS NOT FOR ANY LOCATION THAT WILL HAVE TRAFFIC LOADS.
2. THIS STANDARD IS ONLY FOR LATERALS 8" OR LESS AND ALL FITTING AND PIPE FOR CLEANOUT WILL BE THE SAME SIZE AS LATERAL.
3. TRENCH SHALL BE COMPACTED AND RESTORED AS PER STANDARD DETAIL 510S-S&L-SM.
4. CLEAN OUT WILL BE LOCATED IN R.O.W. OR WASTEWATER EASEMENT.

REFERENCES
DETAIL 503S-7W-SM
DETAIL 510S-S&L-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WASTEWATER CLEANOUT	
RECORD COPY SIGNED BY	6/2/2017	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 520S-4A-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



SECTION A-A



PLAN VIEW

DIMENSIONS		
	WASTEWATER ACCESS STRUCTURE	GATE VALVE
T	3" BELOW TOP OF CONE (9" MIN.)	6"
W	12"	8"

NOTES:

1. THE CONCRETE COLLAR SHALL BE REINFORCED WITH #4 BARS AS SHOWN. THE CONCRETE SHALL EXTEND TO EDGE OF SAW CUT PAVEMENT EDGE.
2. REBAR WILL BE PLACED IN TWO LAYERS. FIRST LAYER (1/3 T) FROM TOP OF COLLAR AND SECOND LAYER (⅔ T) FROM TOP OF COLLAR. IF (T) IS 12" OR LESS ONE LAYER OF REBAR WILL BE USED, PLACED MID POINT BETWEEN TOP AND BOTTOM OF COLLAR.
3. REQUIREMENTS FOR NEW MANHOLE CONSTRUCTION AND MINOR MANHOLE ADJUSTMENTS IN NEW RECONSTRUCTION AND REAPING PROJECTS ARE INCLUDED IN DETAIL NO. 506S-3-SM, 506S-8-SM, 506S-8A-SM AND 506S-10-SM.
4. REFER TO TRENCH DETAIL FOR ADDITIONAL BACKFILL REQUIREMENTS WITH APPROPRIATE CONDITIONS.
5. BOLLARDS REQUIRED IN RURAL AREAS AS OUTLINED IN COSM DETAIL 500S-B-SM

REFERENCES
DETAIL 500S-B-SM

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2022	CONCRETE RISER COLLAR	
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 1100S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

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TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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WASTEWATER DETAILS (2 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

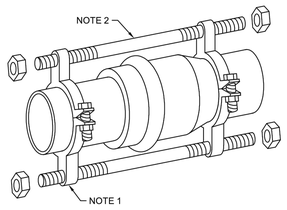
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
78 OF 81

FOR PERMIT

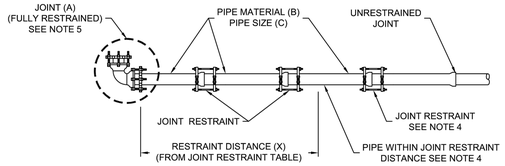
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 78 WASTEWATER DETAILS (2 OF 2), October 31, 2024, 2:10 PM, mguerra



TYPICAL RESTRAINT

EXAMPLE:

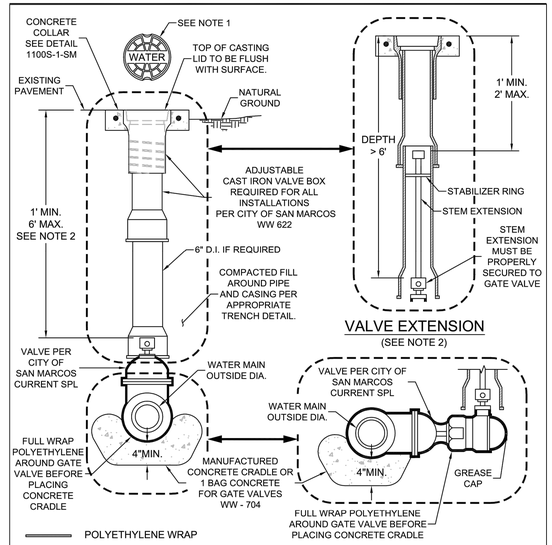
JOINT RESTRAINT TABLE			
JOINT (TYPE)	PIPE MATERIAL	PIPE SIZE	RESTRAINT DISTANCE
JOINT (A) SEE NOTE 5	MATERIAL (B)	SIZE (C)	RESTRAINT DISTANCE (X)



NOTES:

1. 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 BELL JOINTS	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-PR-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

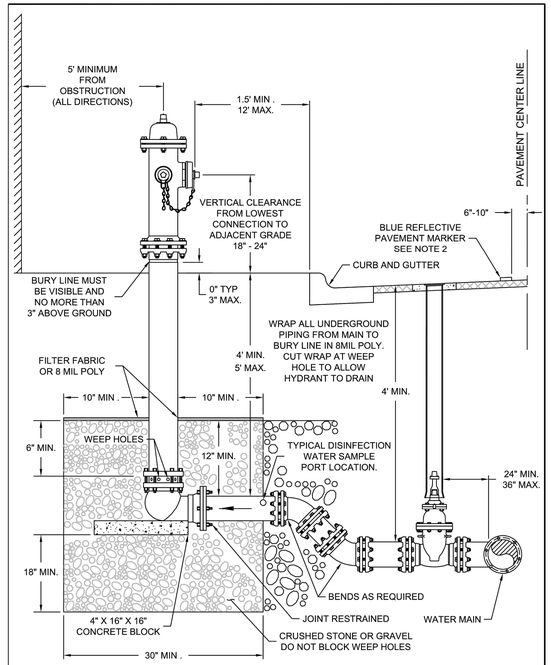


NOTE:

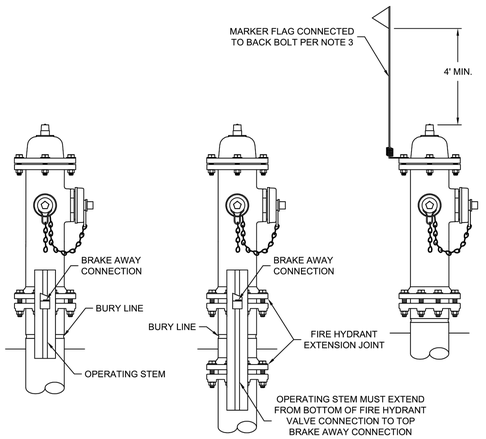
1. LID MUST SAY "WATER" FOR A WATERLINE, "SEWER" FOR NONPOTABLE LINES OR "RECLAIM" FOR RECLAIMED WATER. REFER TO SPL WW 622.
2. IF DEPTH EXCEEDS 6', A SINGLE VALVE EXTENSION IS REQUIRED. VALVE EXTENSION CAN NOT BE STACKED.

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 OF THIS STANDARD.	STANDARD NO. 511S-7-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



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

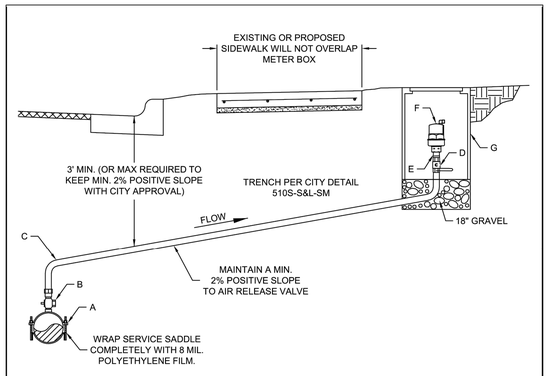


NOTES:

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.
3. 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.
5. 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.).
7. FIRE HYDRANT ASSEMBLY MUST BE PER CURRENT CITY OF SAN MARCOS STANDARD PRODUCT LIST.

REFERENCES
DETAIL 520S-WMT-SM

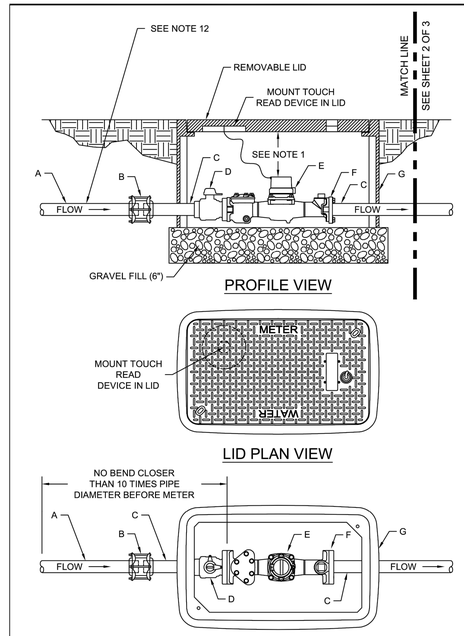
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	STANDARD FIRE HYDRANT	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 511-17-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



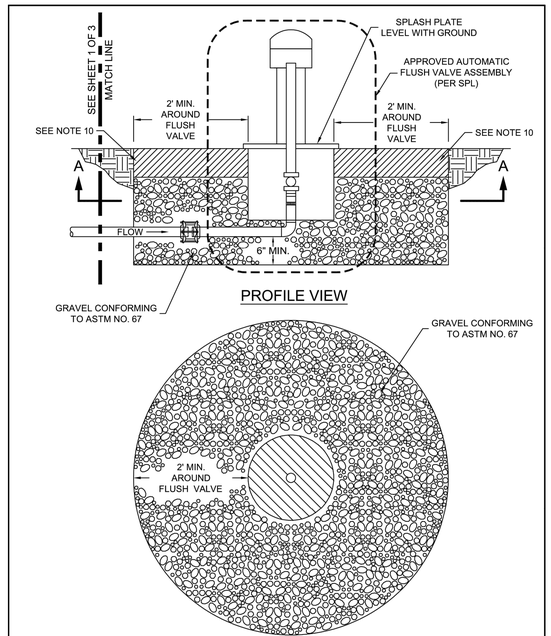
1 INCH TAP MATERIAL LIST		
LABEL	ITEM	SIZE
*A	APPROVED TAPPING SADDLE/SLEEVE.	PER SPL
B	CORPORATION STOP (COMPRESSION-TYPE FITTING)	1"
**C	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65 (MAINTAIN POSITIVE SLOPE TO AIR RELEASE VALVE)	1"
D	BRASS BALL VALVE WITH LEVER HANDLE	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 1/1/2020	1" AIR RELEASE VALVE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 511S-1A-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	AUTOMATIC FLUSH VALVE	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 3



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	AUTOMATIC FLUSH VALVE	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 3

MATERIALS		
LABEL	ITEM	SIZE
A	SUPPLY PIPE SCH. 80 FULLY RESTRAINED PER STANDARD PRODUCT LIST NO. WW-587	2"
B	RESTRAINT DRESSING COUPLINGS - MAXI-GRIP OR APPROVED EQUIVALENT PER STANDARD PRODUCT LIST NO. WW-587B	2"
C	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	REQUIRED

NOTES:

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.
3. 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 MAIN.
5. 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.
6. PIPES AND FITTINGS TO BE AS SHOWN PER DETAIL.
7. FOR APPROVED METER TYPE CALL THE WATER & WASTEWATER UTILITIES DEPT. AT (512)393-8010.
8. NO BY PASS REQUIRED.
9. 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 PORT.

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

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024	AUTOMATIC FLUSH VALVE	
RECORD COPY SIGNED BY	2/15/2019	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 511-20-SM
LAURIE MOYER, P.E.	ADOPTED		3 OF 3

Bowman
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com
TBPE Firm Registration No.: F-14309
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REVISIONS		
REVISION	DESCRIPTION	DATE
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WATER DETAILS (1 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED PROFESSIONAL ENGINEER
11/01/2024

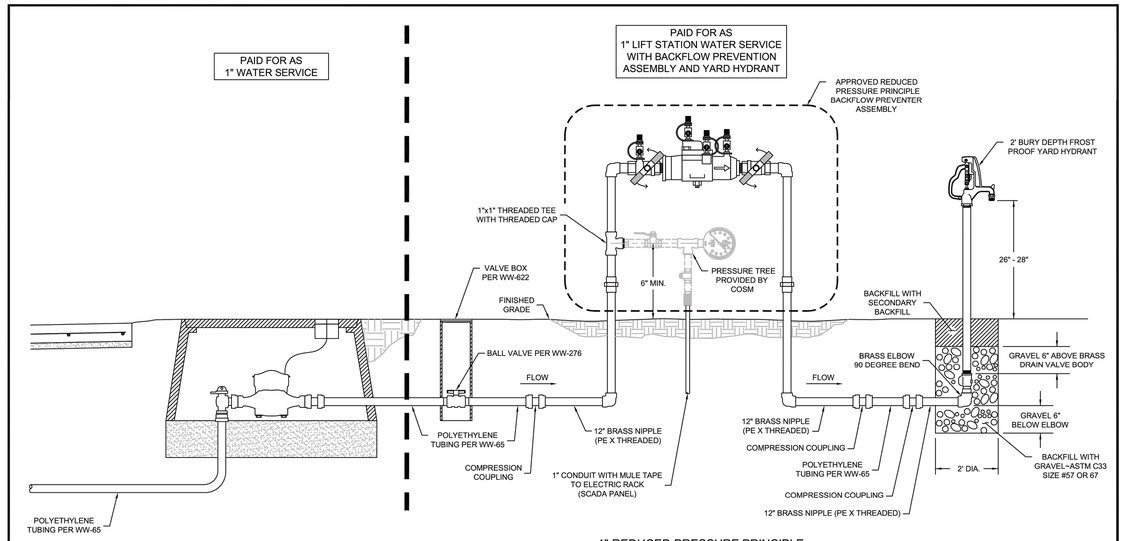
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
79 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 79 WATER DETAILS (1 OF 2), October 31, 2024, 2:10 PM, mguerra

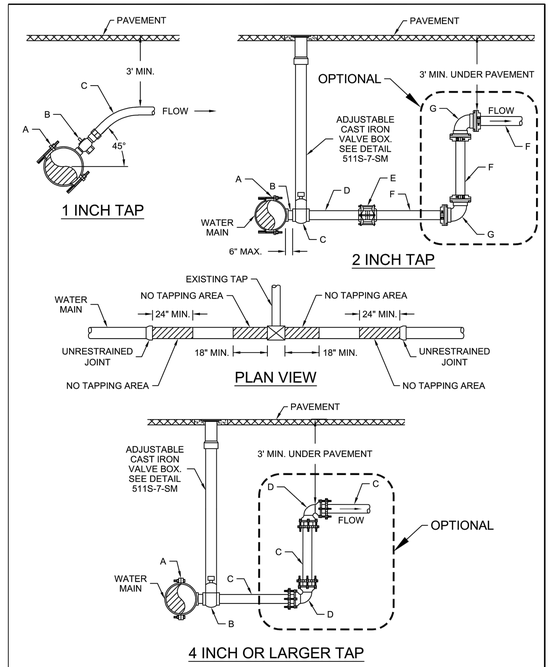


1" WATER SERVICE
(PER COSM DETAIL 520S-11-SM)

1" REDUCED PRESSURE PRINCIPLE
BACKFLOW PREVENTION ASSEMBLY
(PER COSM DETAIL 520S-19F-SM)

WOODFORD FREEZE-LESS IOWA
YARD HYDRANT MODEL Y1
(OR APPROVED EQUAL)

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2024
RECORD COPY SIGNED BY	1/1/2022
LAURIE MOYER, P.E.	ADOPTED
1" LIFT STATION WATER SERVICE WITH BACKFLOW PREVENTION ASSEMBLY AND YARD HYDRANT	
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 520S-LSS-SM 1 OF 1



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WATER MAIN TAP
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-WMT-SM 1 OF 2

1 INCH TAP MATERIAL LIST		
LABEL	ITEM	SIZE
*A	APPROVED TAPPING SADDLE PER SPL NO. WW-264/WW-256	REQUIRED
B	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
A	APPROVED TAPPING SADDLE PER SPL NO. WW-264	REQUIRED
B	GALVANIZED NIPPLE-THREADED	2"
C	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"

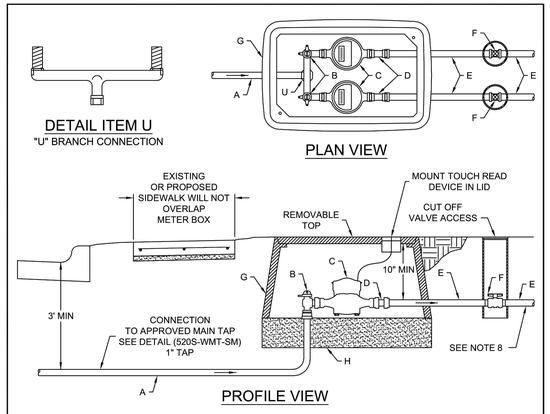
4 INCH AND LARGER TAP MATERIAL LIST					
LABEL	ITEM	SERVICE SIZE			
		4"	6"	8"	10"
A	APPROVED TAPPING SLEEVE PER SPL NO. WW-244	REQUIRED			
B	TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY M.J. X M.J.) WITH VALVE BOX DETAIL 511S-7-SM	4"	6"	8"	10"
C	SUPPLY PIPE C900 PER SPL NO. WW-308A OR DUCTILE IRON 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"

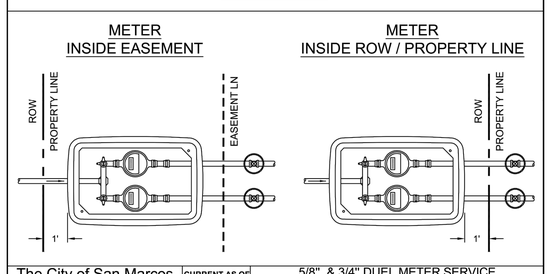
* WHEN CONDITIONS ALLOW 45° BENDS ARE PREFERRED OVER 90° BENDS

NOTES:
1. 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.
2. BACKFILL AND EMBEDMENT WILL BE PER CITY DETAIL 510-S&L-SM.
3. 3" SERVICE AND FIRE LINES WILL USE A 4" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.
4. ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST.
5. 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 Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WATER MAIN TAP
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-WMT-SM 2 OF 2





The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	5/8", & 3/4" DUEL METER SERVICE CONNECTIONS (IRRIGATION OR DOMESTIC)
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-9-SM 1 OF 2

1 INCH TAP MATERIAL LIST		
LABEL	ITEM	SIZE
*A	APPROVED TAPPING SADDLE PER SPL NO. WW-264/WW-256	REQUIRED
B	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
A	APPROVED TAPPING SADDLE PER SPL NO. WW-264	REQUIRED
B	GALVANIZED NIPPLE-THREADED	2"
C	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"

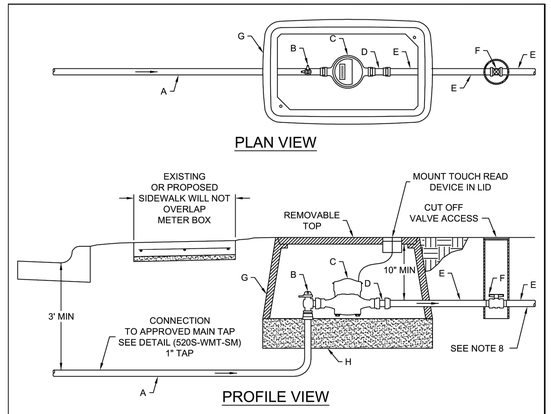
4 INCH AND LARGER TAP MATERIAL LIST					
LABEL	ITEM	SERVICE SIZE			
		4"	6"	8"	10"
A	APPROVED TAPPING SLEEVE PER SPL NO. WW-244	REQUIRED			
B	TAPPING VALVE (RESILIENT WEDGE GATE, IRON BODY M.J. X M.J.) WITH VALVE BOX DETAIL 511S-7-SM	4"	6"	8"	10"
C	SUPPLY PIPE C900 PER SPL NO. WW-308A OR DUCTILE IRON 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"

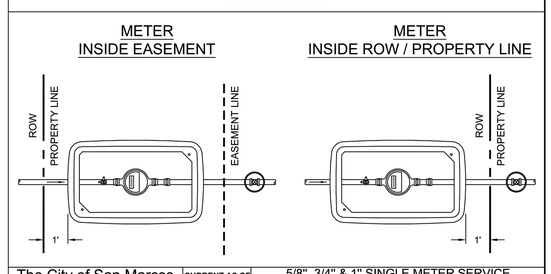
* WHEN CONDITIONS ALLOW 45° BENDS ARE PREFERRED OVER 90° BENDS

NOTES:
1. 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.
2. BACKFILL AND EMBEDMENT WILL BE PER CITY DETAIL 510-S&L-SM.
3. 3" SERVICE AND FIRE LINES WILL USE A 4" TAP AND HAVE A REDUCER AT THE METER PER THE DETAILS.
4. ALL PARTS WILL BE PER THE CURRENT CITY OF SAN MARCOS STANDARD PRODUCTS LIST.
5. 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 Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	WATER MAIN TAP
RECORD COPY SIGNED BY	1/1/2022	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-WMT-SM 2 OF 2





The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	5/8", 3/4" & 1" SINGLE METER SERVICE CONNECTION (IRRIGATION OR DOMESTIC)
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-11-SM 1 OF 2

MATERIALS				
LABEL	ITEMS	METER SIZE		
		5/8"	3/4"	1"
* A	TUBING PER STANDARD PRODUCT LIST - TYPE K COPPER WW-613 OR POLYETHYLENE WW-65	1"	1"	1"
B	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"
C	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	REQUIRED		
F	CUSTOMER CUT - OFF VALVE IN VALVE BOX AND LID	REQUIRED		
G	METER BOX AND LID PER STANDARD PRODUCT LIST NO. WW-145A HDPE METER BOXES	REQUIRED		
H	6" COMPACTED SAND	REQUIRED		

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

NOTES:
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.
3. WATER METER WILL BE HORIZONTALLY CENTERED WITH THE METER BOX.
4. TAP TO CITY WATER LINE WILL BE PER CITY DETAIL 510S-WMT-SM WITH A 1" TAP TO THE MAIN.
5. CUT-OFF VALVE AND CONNECTION TO YARD PIPING TO BE SUBMITTED FOR APPROVAL.
6. METERS TO BE SUPPLIED BY CONTRACTOR FOR COMMERCIAL ACCOUNTS.
7. 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 Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	5/8", 3/4" & 1" SINGLE METER SERVICE CONNECTION (IRRIGATION OR DOMESTIC)
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
LAURIE MOYER, P.E.	ADOPTED	STANDARD NO. 520S-11-SM 2 OF 2

Bowman
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com
TBPE Firm Registration No.: F-14309
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REVISIONS

REVISION	DESCRIPTION	DATE
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WATER DETAILS (2 OF 2)

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

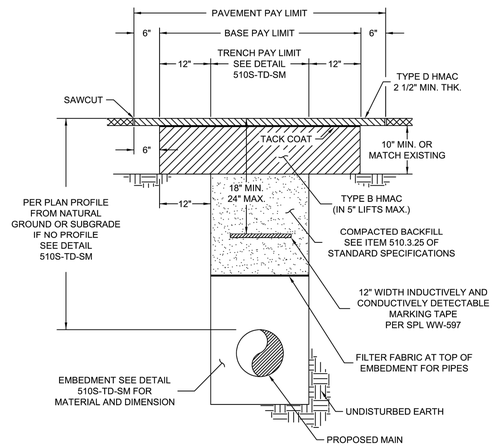
DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
80 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 80 WATER DETAILS (2 OF 2), October 31, 2024, 2:11 PM, mguerra

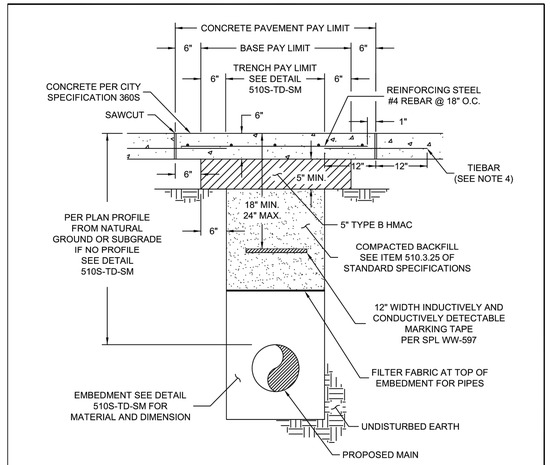


NOTES:

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.
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 PAVED SURFACE	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-3-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

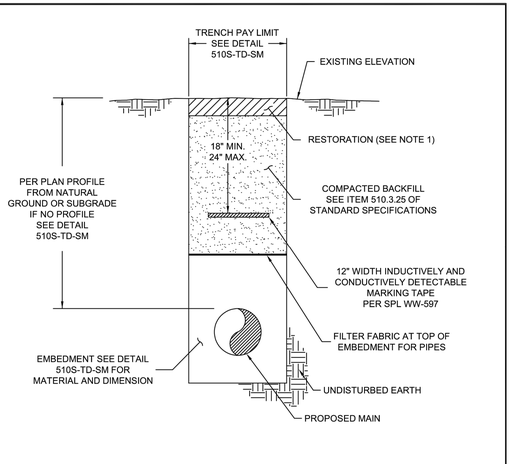


NOTES:

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 GREATER.
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 CONCRETE PAVEMENT	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-3C-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1

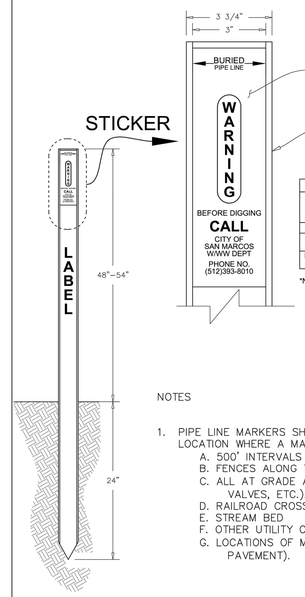


NOTES:

1. 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

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TRENCH DETAIL NATURAL GROUND	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 510S-5-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



3" DECAL SHALL BE WITH WHITE LETTERING BACKGROUND PER UTILITY MARKER TABLE

LONG DURABLE AND FLEXIBLE UTILITY MARKER FOR PIPE LINE AND SHALL BE MANUFACTURED BY CARSONITE INTERNATIONAL UTILITY MARKERS (CRM) OR APPROVED EQUAL

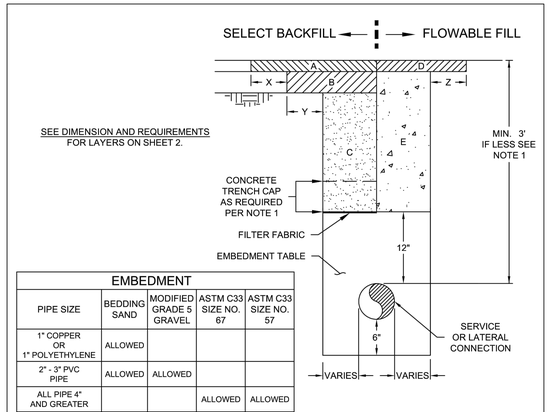
UTILITY MARK TABLE			
PIPE LINE TYPE	STICKER BACKGROUND COLOR	LABEL (WHITE TEXT)	*UTILITY MARKER COLOR
WATER	BLUE	WATER	BLUE
SANITARY SEWER	GREEN	SEWER	GREEN
RECLAIMED WATER	PURPLE	RECYCLE	PURPLE

*NOTE IF UTILITY MARKER COLOR CAN NOT BE OBTAINED WHITE UTILITY MARKER WILL BE USED INSTEAD AND LABELTEXT WILL BE THE COLOR LISTED UNDER UTILITY MARKER COLOR.

NOTES

1. PIPE LINE MARKERS SHALL BE LOCATED AT THE FOLLOWING LOCATION WHERE A MAIN IS INSTALLED IN RURAL AREAS.
   A. 500' INTERVALS ALONG PIPE
   B. FENCES ALONG THE PIPE CENTERLINE
   C. ALL AT GRADE APPURTENANCES (VALVES, AIR RELEASE VALVES, ETC.).
   D. RAILROAD CROSSING
   E. STREAM BED
   F. OTHER UTILITY CROSSING
   G. LOCATIONS OF MAJOR CHANGES IN DIRECTION (OUT OF PAVEMENT).

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	PIPE LINE MARKER	
RECORDED COPY SIGNED BY	7–10–2015	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	510S-M-SM



EMBEDMENT				
PIPE SIZE	BEDDING SAND	MODIFIED GRADE 5 GRAVEL	ASTM C33 SIZE NO. 67	ASTM C33 SIZE NO. 57
1" COPPER OR 1" POLYETHYLENE	ALLOWED			
2" - 3" PVC PIPE	ALLOWED	ALLOWED		
ALL PIPE 4" AND GREATER			ALLOWED	ALLOWED

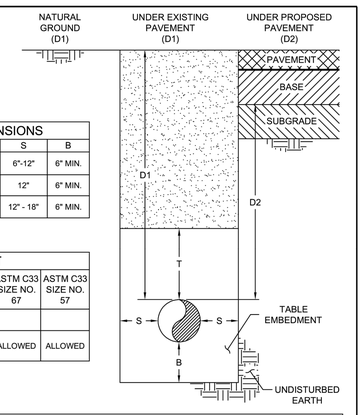
NOTES:

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 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 OF THIS STANDARD.	STANDARD NO. 51OS-S&L-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2

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)	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.
B	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.
C	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.		
FLOWABLE FILL			
	ASPHALT PAVEMENT Z = 6"	CONCRETE PAVEMENT Z = 6"	OUT OF PAVEMENT Z = 0
D (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.
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 OF THIS STANDARD.	STANDARD NO. 51OS-S&L-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



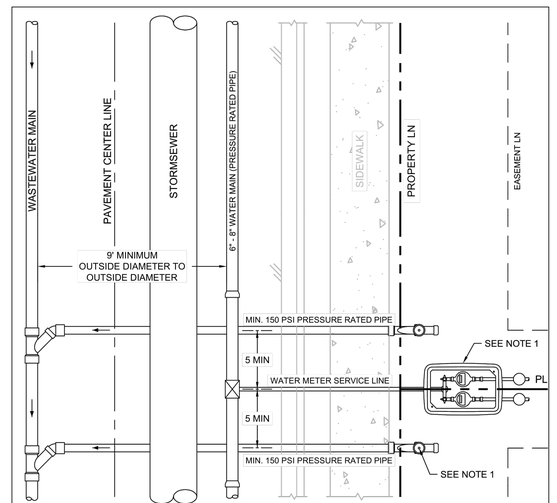
EMBEDMENT DIMENSIONS				
	SIZE	T	S	B
NON STORM PIPE	ALL	12"	6"-12"	6" MIN.
STORM PIPE	42" OR LESS	12"	12"	6" MIN.
	GREATER THAN 42"	12"	12" - 18"	6" MIN.

EMBEDMENT				
PIPE SIZE	BEDDING SAND	MODIFIED GRADE 5 GRAVEL	ASTM C33 SIZE NO. 67	ASTM C33 SIZE NO. 57
2" - 3" PVC PIPE	ALLOWED	ALLOWED		
ALL PIPE 4" AND GREATER			ALLOWED	ALLOWED

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
	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			

NOTES:
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.
3. REFERENCE APPROPRIATE 510 PIPE TRENCH DETAILS FOR PAYMENT LIMITS. THIS DETAIL iS FOR DIMENSIONAL PURPOSES ONLY.

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



MINIMUM SEPARATION REQUIREMENT OF SERVICES
N.T.S.

NOTES:

1. 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 & WASTEWATER SERVICE CONNECTION AT SAME LOT LINE	
RECORD COPY SIGNED BY	6/1/2018	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 520-AW-01A-SM
LAURIE MOYER, P.E.	ADOPTED		

Bowman
© 2021 Bowman Consulting Group, Ltd.
TBPE Firm Registration No.: F-14309
151 South Stagecoach Trail
San Marcos, Texas 78666
Phone: (512) 396-2600
www.bowman.com

REVISIONS		
REVISION	DESCRIPTION	DATE
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GENERAL UTILITY DETAILS

LA CIMA PHASE 8
PCIP #XXXX-XXXXX
SAN MARCOS, TX 78666

STATE OF TEXAS
BOBBY ROSS
149399
LICENSED
PROFESSIONAL ENGINEER
11/01/2024

DESIGN	DRAWN	CHKD
BR	MG	JC

JOB No. 005956-01-114

SHEET
81 OF 81

FOR PERMIT

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Engineering Plans\005956-01-114_DTL.dwg, 81 GENERAL UTILITY DETAILS, October 31, 2024, 2:11 PM, mguerra

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. The inspections will be documented in a report. The owner is responsible for keeping records in their office located at 303 Colorado St., Ste. 2300, Austin, TX, 78701. State inspection records will be made available upon request by the TCEQ.
- ***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. The inspections will be documented in a report. The owner is responsible for keeping records in their office located at 303 Colorado St., Ste. 2300, Austin, TX, 78701. State inspection records will be made available upon request by the TCEQ.
- **M*owing.*** 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.

8-30-2024

Date

LCSM Ph. 4, LLC
303 Colorado St. Suite 2300
Austin, TX. 78701
512-457-8000

Statement of Certification: I Bobby Ross, PE certify that the methods outlined within this attachment are adequate to adhere to the inspection, maintenance, and repair requirements outlined in TCEQ RG-348.



11/01/2024

Attachment H - Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs

N/A

Attachment I – Measures for Minimizing Surface Stream Contamination

All flows from the proposed streets and residential development will be treated by the 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.

Attachment J – Phase 8 Preliminary Plat

LA CIMA PHASE 8
PRELIMINARY PLAT

STATE OF TEXAS §
COUNTY OF HAYS §

I, BRYAN W. LEE, MANAGER OF LCSM PH.4, LLC., BEING THE OWNER OF THAT CERTAIN CALLED 248.225 ACRE TRACT OF LAND OUT OF THE JOHN WILLIAMS SURVEY, ABSTRACT NO. 490, HAYS COUNTY, TEXAS, DESCRIBED IN THE DEED TO LCSM PH. 4, LLC., OF RECORD IN DOCUMENT NO. 21059703, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS;

DO HEREBY SUBDIVIDE 68.99 ACRES OF LAND OUT OF THE SAID 248.225 ACRE TRACT, AS SHOWN ON THIS PLAT, AND DESIGNATED HEREIN AS

LA CIMA PHASE 8 PRELIMINARY PLAT

FUTURE SUBDIVISION TO THE CITY OF SAN MARCOS, TEXAS, AND WHOSE NAME IS SUBSCRIBED HERETO, HEREBY DEDICATE TO THE USE OF THE PUBLIC FOREVER PUBLIC RIGHT-OF-WAY AND DRAINS, EASEMENTS (EXCLUDING LANDSCAPE AREA WITHIN EASEMENTS), PARKS AND PUBLIC PLACES THEREON SHOWN FOR THE PURPOSE AND CONSIDERATION THEREIN EXPRESSED.

IN WITNESS WHEREOF, BRYAN W. LEE, HAVE CAUSED THESE PRESENTS TO BE

EXECUTED THIS THE _____ DAY OF _____, 2024 A.D.

_____
BRYAN W. LEE, MANAGER
303 COLORADO STREET, SUITE 2300
AUSTIN, TX 78701

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED, BRYAN LEE, MANAGER, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN STATED.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS _____ DAY OF_____, 2024,

BY: _____
NOTARY PUBLIC

_____
JAMES E. DYESS
HORIZON BANK, SSB
600 CONGRESS AVENUE, SUITE 400
AUSTIN, TX 78701

BEFORE ME, THE UNDERSIGNED AUTHORITY, ON THIS DAY PERSONALLY APPEARED, JAMES E. DYESS, LIENHOLDER, KNOWN TO ME TO BE THE PERSON WHOSE NAME IS SUBSCRIBED TO THE FOREGOING INSTRUMENT, AND ACKNOWLEDGED TO ME THAT HE EXECUTED THE SAME FOR THE PURPOSES AND CONSIDERATIONS THEREIN STATED.

GIVEN UNDER MY HAND AND SEAL OF OFFICE THIS _____ DAY OF_____, 2024,

BY: _____
NOTARY PUBLIC

UTILITY NOTE:

WATER/WASTE WATER: CITY OF SAN MARCOS
630 EAST HOPKINS STREET
SAN MARCOS, TEXAS 78666

ELECTRIC: PEDERNALES ELECTRIC COOPERATIVE
201 SOUTH AVENUE F
JOHNSON CITY, TEXAS 78636

FLOOD NOTE
:
THE SUBJECT TRACT IS SHOWN TO NOT BE IN ANY FLOOD ZONE, OTHER AREAS, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN, AS IDENTIFIED BY THE FLOOD INSURANCE RATE MAP PANEL NO. 48209C-0369-F, DATED SEPTEMBER 02, 2005.

THE ABOVE STATEMENT IS MEANT FOR FLOOD INSURANCE DETERMINATION ONLY AND THIS SURVEYOR ASSUMES NO LIABILITY FOR THE CORRECTNESS OF THE CITED MAP(S).

AQUIFER NOTE:

THIS PROJECT IS IN THE EDWARDS AQUIFER RECHARGE ZONE BUT IS NOT IN THE CONTRIBUTING ZONE.

NOTES:

1. THIS PROJECT IS IN THE EXTRA TERRITORIAL JURISDICTION OF THE CITY OF SAN MARCOS
2. BUFFER ZONES PER THE APPROVED WATER PROTECTION PLAN PHASE 1 ON NOVEMBER 20, 2014.
3. PUBLIC SIDEWALKS, BUILT TO CITY OF SAN MARCOS STANDARDS, ARE REQUIRED ALONG ALL PROPOSED STREETS. THESE SIDEWALKS SHALL BE IN PLACE PRIOR TO THE LOT BEING OCCUPIED. FAILURE TO CONSTRUCT THE REQUIRED SIDEWALKS MAY RESULT IN THE WITHOLDING OF CERTIFICATES OF OCCUPANCY, BUILDING PERMITS, OR UTILITY CONNECTIONS BY THE GOVERNING BODY OR UTILITY COMPANY. HOA SHALL MAINTAIN SIDEWALK/TRAILS IN PUBLIC AREAS. HOMEOWNER SHALL MAINTAIN SIDEWALK ASSOCIATED WITH LOT.
4. FIRE HYDRANT SPACING AND WATER FLOW WILL MEET CITY SPECIFICATIONS.
5. AS USED HEREIN, THE TERM "DEVELOPER" SHALL MEAN "LCSM PH4, LLC" OR ITS SUCCESSORS OR ASSIGNS.
6. ALL LOTS IN THIS SUBDIVISION ARE SUBJECT TO THE "DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS FOR LA CIMA, AS AMENDED FROM TIME TO TIME, ORIGINALLY RECORDED IN DOCUMENT NO. 17044512, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS.
7. THIS SUBDIVISION IS SUBJECT TO AND SHALL COMPLY WITH THE FOLLOWING AGREEMENTS BETWEEN THE OWNER AND HAYS COUNTY:

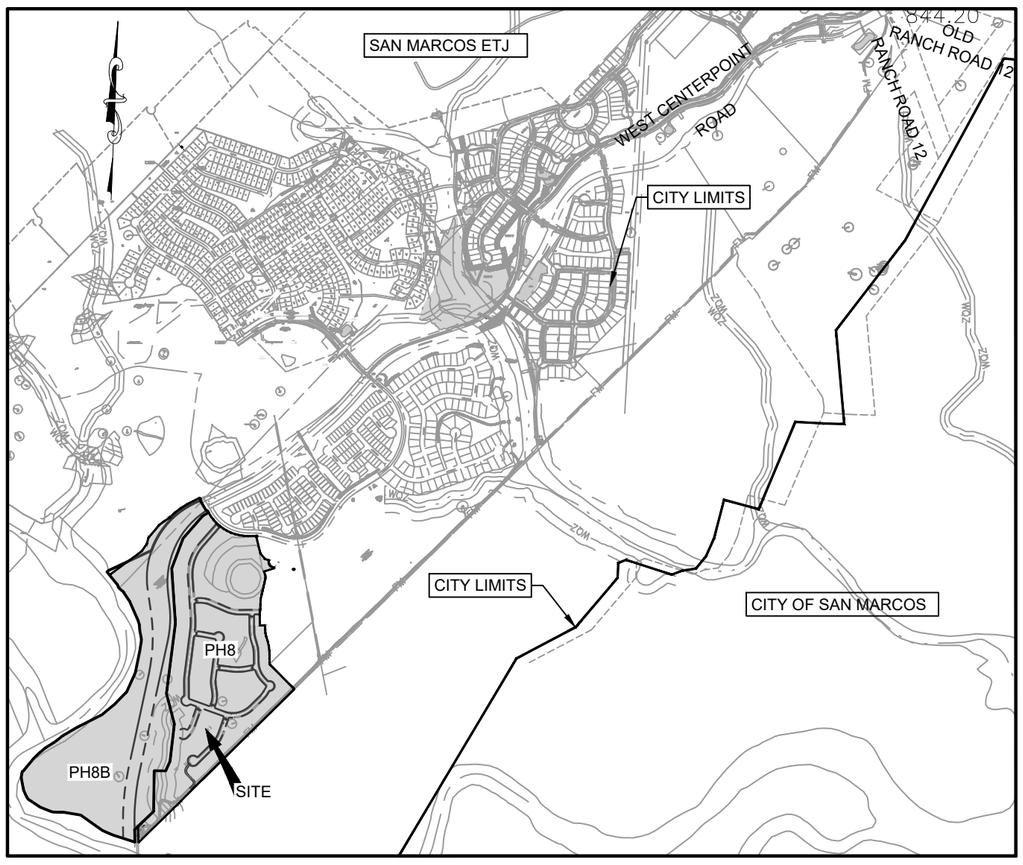
   AGREEMENT REGARDING LA CIMA HABITAT PRESERVATION, PURGATORY CREEK PARKLAND DEDICATION, AND CENTERPOINT RIGHT-OF-WAY DEDICATION" (EXECUTED JUNE 2, 2015).
   HAYS COUNTY LICENSE AGREEMENT (EXECUTED AUGUST 28, 2015).
8. THE SUBJECT TRACT SHOWN HEREON IS IN THE SAN MARCOS CISD.
9. THE LA CIMA H.O.A. OR ITS ASSIGNS SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE OPEN SPACE LOTS AND DRAINAGE EASEMENTS SHOWN HEREON, AS SET FORTH IN THE COVENANTS, CONDITIONS, AND RESTRICTIONS REFERENCED IN NOTE NO. 7, HEREON.
10. THIS DEVELOPMENT IS REGULATED PURSUANT TO THE DEVELOPMENT AGREEMENT AS APPROVED BY THE SAN MARCOS CITY COUNCIL VIA RESOLUTION NO. 2022-106R AND AS RECORDED IN THE REAL PROPERTY RECORDS OF HAYS COUNTY AS INSTRUMENT NUMBER 22046142.

11. **SINGLE FAMILY RESIDENTIAL MANOR LOTS**

LOT AREA, MINIMUM	6000 S.F.
LOT WIDTH, MINIMUM	50 FEET
LOT DEPTH, MINIMUM	100 FEET
LOT FRONTAGE MINIMUM	35 FEET
FRONT YARD SETBACK, MIN	10 FEET
SIDE YARD SETBACK, INTERIOR MIN	5 FEET
SIDE YARD SETBACK, CORNER MIN	10 FEET
REAR YARD SETBACK MIN	10 FEET
BUILDING HEIGHT MAXIMUM	2 STORIES
IMPERVIOUS COVER MAX	60 %

COTTAGE LOTS

LOT AREA, MINIMUM	4500 S.F.
LOT WIDTH, MINIMUM	40 FEET
LOT DEPTH, MINIMUM	100 FEET
LOT FRONTAGE MINIMUM	35 FEET
FRONT YARD SETBACK, MIN	10 FEET
SIDE YARD SETBACK, INTERIOR MIN	5 FEET
SIDE YARD SETBACK, CORNER MIN	10 FEET
REAR YARD SETBACK MIN	10 FEET
BUILDING HEIGHT MAXIMUM	2 STORIES
IMPERVIOUS COVER MAX	60 %



LOCATION MAP
NOT TO SCALE

PROJECT ADDRESS:

THIS PROJECT IS LOCATED SOUTH OF CENTRAL PARK LOOP AND SOUTHWEST OF LA CIMA PHASE 4, HAYS COUNTY, TEXAS.

AREA TABLES PHASE 8:

1. TOTAL ACREAGE: 5,761,801.35 SF=132.27 ACRES.
2. THE TOTAL AREA OF STREETS IN THIS SUBDIVISION IS 6.23 ACRES.
3. THE TOTAL LENGTH OF ALL STREETS IN THIS SUBDIVISION IS 7,562 LINEAR FEET.

TOTAL NUMBER OF LOTS: 204
SINGLE FAMILY: 198
OPEN SPACE: 6
PRIVATE STREET: 0

PHASE 8 STREET SUMMARY

STREET NAME	STREET LENGTH	PAVE WIDTH	R.O.W. WIDTH
NIGHTSHADE LOOP	4096 LF	33' F-F	53'
PAWPAW DRIVE	1129 LF	33' F-F	53'
BUNDLEFLOWER WAY	793	33' F-F	53'
PINYON PINE TRAIL	479 LF	33' F-F	53'
GERMANDER ROAD	393 LF	33' F-F	53'
DALEA TERRACE	672 LF	33' F-F	53'

PHASE 8 LOT SUMMARY

RIGHT-OF-WAY	9.65 ACRES
SINGLE FAMILY LOTS (198)	34.17 ACRES
OPEN SPACE LOTS (6)	25.31 ACRES
TOTAL	69.13 ACRES

PHASE 8B STREET SUMMARY

STREET NAME	STREET LENGTH	PAVE WIDTH	R.O.W. WIDTH
CENTER POINT ROAD			130'

PHASE 8B LOT SUMMARY

RIGHT-OF-WAY	15.24 ACRES
OPEN SPACE	46.95 ACRES
TOTAL	62.19 ACRES

PHASE 8 ALLOWED/ASSUMED IMPERVIOUS COVER TABLE

LOT WIDTH	TYPICAL DIMENSIONS	% IMPERVIOUS COVER	ALLOWED/ASSUMED IMPERVIOUS COVER
50'	50' X 125'	60%	3,750 S.F.
60'	60' X 125'	60%	4,500 S.F.
70'	70' X 125'	57%	5,000 S.F.

STATE OF TEXAS §
COUNTY OF HAYS §

I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THIS PLAT AND ALL PLANS AND SPECIFICATIONS WHICH ARE INCLUDED WITH THE PLAT ARE, TO THE BEST OF MY PROFESSIONAL CAPACITY, COMPLETE AND ACCURATE AND IN COMPLIANCE WITH ALL RELEVANT CITY ORDINANCES, CODES, PLANS, AND RELEVANT STATE STANDARDS

PRELIMINARY, THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE AND SHALL NOT BE USED OR VIEWED OR RELIED UPON AS A FINAL SURVEY DOCUMENT

BY: _____
BOBBY ROSS
REGISTERED PROFESSIONAL ENGINEER
BOWMAN CONSULTING GROUP, LTD.
151 STAGECOACH TRAIL
SUITE 130
SAN MARCOS, TEXAS 78666
512-396-2600

DATE: NOVEMBER 26 2024	DRAWN BY: LP
SCALE: N/A	CHECKED BY: MH
JOB No: 005956-01-114	DESIGNED BY: BR

REVISIONS

REVISION	DESCRIPTION	DATE
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TBPE Firm Registration No. F-14309

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www.bowmanconsulting.com

PRELIMINARY PLAT

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

SHEET 1 OF 10

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW, MARK-UP, AND/OR DRAFTING UNDER THE AUTHORITY OF BOBBY ROSS, P.E. #149399 ON NOVEMBER 26 2024. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

CoSM #PC-24-16

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, 18x24 PLAT PH 8, November 26, 2024, 1:46 PM, mguerra

MATCH LINE SHEET 4

NOTES:

1. BEARING BASIS IS TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NAD83, GRID.

2. DISTANCES SHOWN HEREON ARE BASED ON SURFACE MEASUREMENTS, TO CONVERT SURFACE DISTANCES TO GRID, MULTIPLY BY THE COMBINED SCALE FACTOR OF 0.999875.

3. THIS PROJECT WAS COMPLETED WITHOUT THE BENEFIT OF A CURRENT TITLE COMMITMENT; ONLY THE EASEMENTS FOUND IN DOC # 23041638 A 25' WATER & WASTEWATER EASEMENT WERE EVALUATED BY BOWMAN CONSULTING.

SCALE: 1 INCH = 80 FT

LEGEND

○	1/2" IRON ROD SET WITH CAP STAMPED "BCG"
●	1/2" IRON ROD FOUND WITH CAP STAMPED "BCG"
P.O.B.	POINT OF BEGINNING
O.P.R.H.C.TX.	OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
D.R.H.C.TX.	DEED RECORDS OF HAYS COUNTY, TEXAS

LOT 2
BLOCK F
OPEN SPACE.

130'
HAYS COUNTY R.O.W
15.24 A.C.
PER DEED NUMBER
24030099

LOT 1
BLOCK F
OPEN SPACE.

PHASE 8B
PHASE 8

300'
WATER QUALITY
BUFFER ZONE

50'
50'
100'
WATER QUALITY ZONE

LOT 1
BLOCK A
OPEN SPACE,
WASTEWATER, ACCESS AND
DRAINAGE EASEMENT
547332 SF

40'WATER &
WASTEWATER
EASEMENT
DOC # 23041638

25'

25' WATER &
WASTEWATER
EASEMENT
DOC # 23041638

PURGATORY CREEK

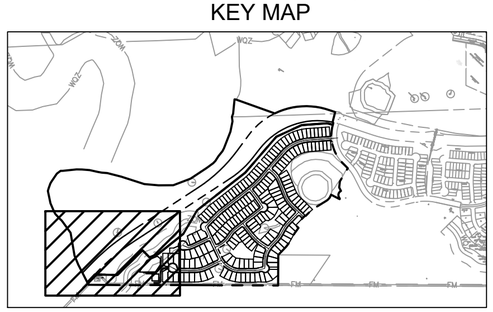
GERMANDER BEND

DALEA TERRACE

MATCH LINE SHEET 3

10' P.U.E.

KEY MAP



DATE: NOVEMBER 26 2024	DRAWN BY: LP
SCALE: 1" = 80'	CHECKED BY: NK
JOB No: 005956-01-114	DESIGNED BY: BR

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REVISION	DESCRIPTION	DATE
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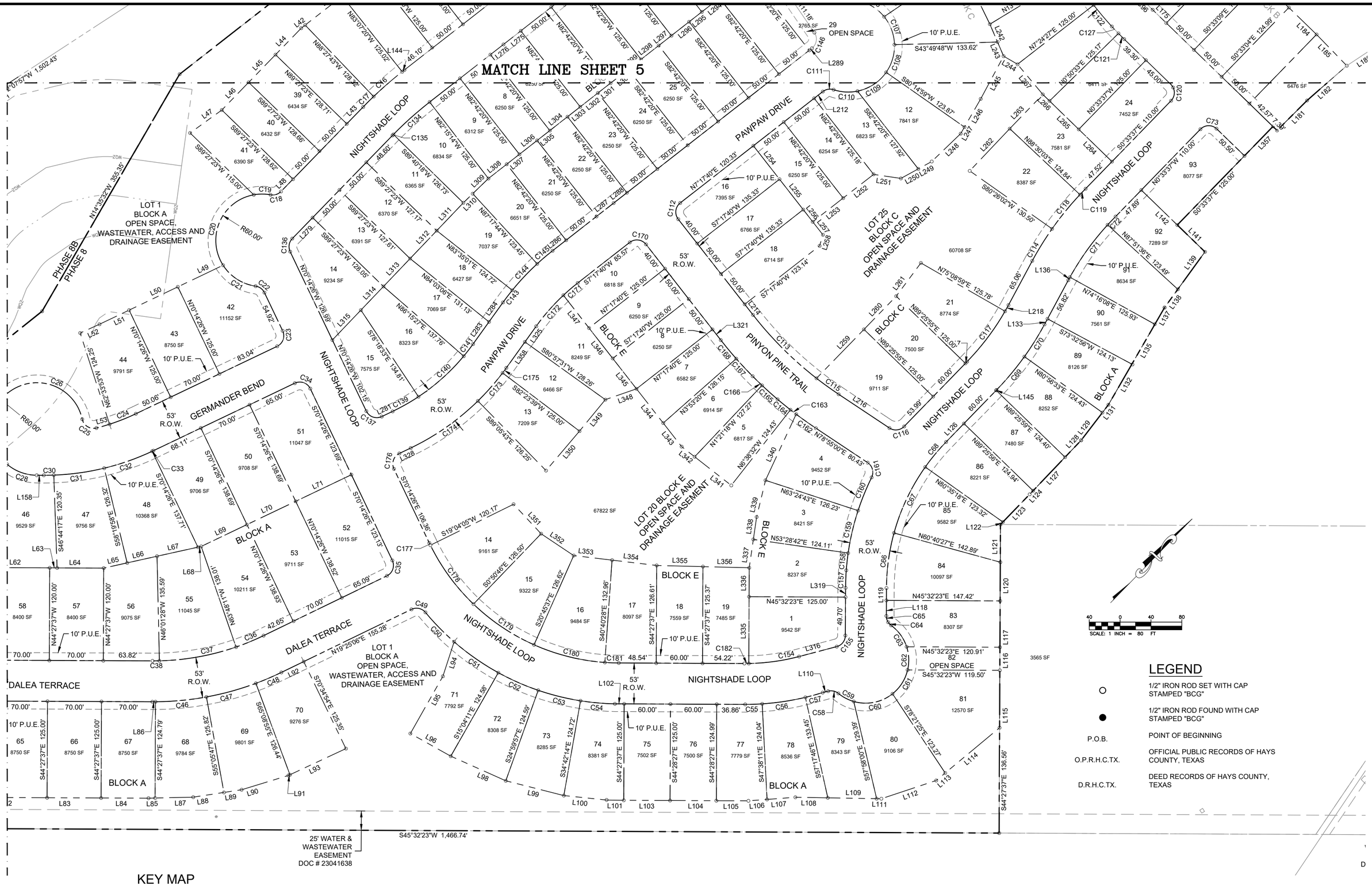
PRELIMINARY PLAT

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

SHEET 2 OF 10 CoSM # PC-24-16

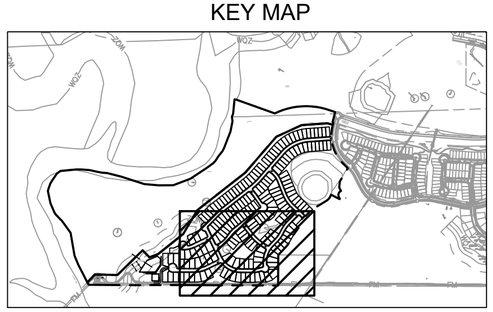
V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH8 SHEET 2, November 26, 2024, 1:47 PM, mguerra



LEGEND

○	1/2" IRON ROD SET WITH CAP STAMPED "BCG"
●	1/2" IRON ROD FOUND WITH CAP STAMPED "BCG"
P.O.B.	POINT OF BEGINNING
O.P.R.H.C.TX.	OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
D.R.H.C.TX.	DEED RECORDS OF HAYS COUNTY, TEXAS

KEY MAP



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PHASE 8
HAYS COUNTY, TEXAS

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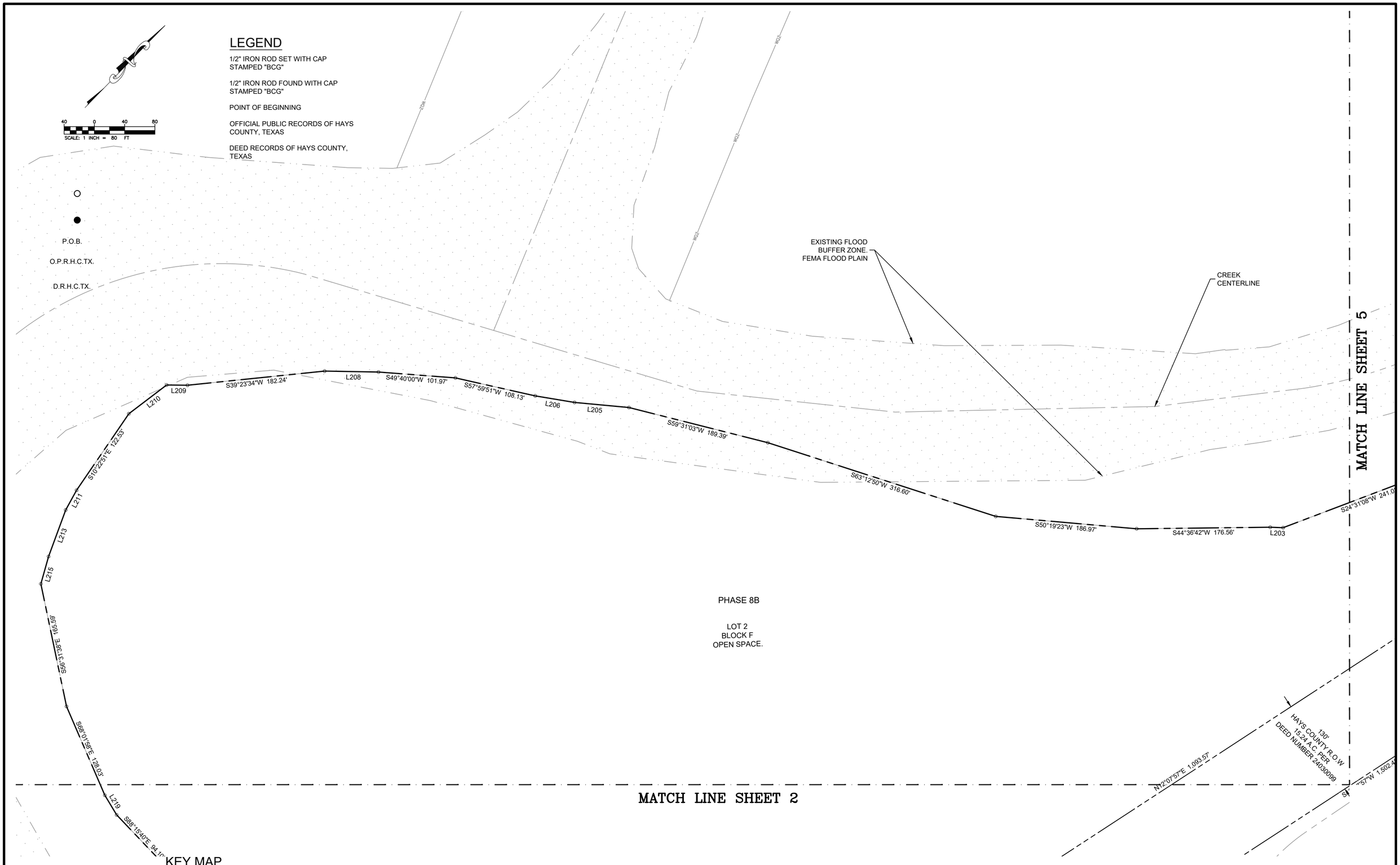
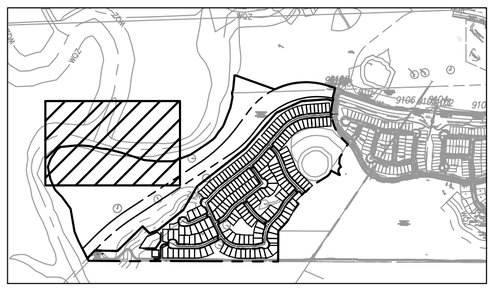


KEY MAP



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LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH8 SHEET 4, November 26, 2024, 1:47 PM, mguerra

MATCH LINE SHEET 7

LEGEND

1/2" IRON ROD SET WITH CAP STAMPED "BCG"

1/2" IRON ROD FOUND WITH CAP STAMPED "BCG"

POINT OF BEGINNING

OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS

DEED RECORDS OF HAYS COUNTY, TEXAS

SCALE: 1 INCH = 80 FT

P.O.B.

O.P.R.H.C.TX.

D.R.H.C.TX.

EXISTING FLOOD BUFFER ZONE. FEMA FLOOD PLAIN

CREEK CENTERLINE

230.17' HAYS COUNTY R.O.W 15.24 A.C. PER DEED NUMBER 24030099

130' HAYS COUNTY R.O.W 15.24 A.C. PER DEED NUMBER 24030099

LOT 2 BLOCK F OPEN SPACE.

LOT 1 BLOCK F OPEN SPACE.

PHASE 8B

PHASE 8

LOT 1 BLOCK A

LOT 29 BLOCK B OPEN SPACE AND DRAINAGE EASEMENT 420340 SF

NIGHTSHADE LOOP

PAWPAW DRIVE

BUNDLEFLOWER WAY

BLOCK A

BLOCK B

BLOCK C

BLOCK D

53' R.O.W.

10' P.U.E.

OPEN SPACE

MATCH LINE SHEET 4

MATCH LINE SHEET 6

MATCH LINE SHEET 3

KEY MAP

DATE: NOVEMBER 26 2024	DRAWN BY: LP
SCALE: 1" = 80'	CHECKED BY: NK
JOB No: 005956-01-114	DESIGNED BY: BR

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PRELIMINARY PLAT

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

SHEET 5 OF 10 CoSM # PC-24-16

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH8 SHEET 5, November 26, 2024, 1:47 PM, mguerra

MATCH LINE SHEET 7

BLOCK A

NIGHTSHADE LOOP

BLOCK B

CENTRAL PARK LOOP

WEST CENTERPOINT ROAD

BASKET GRASS ROAD

BLOCK "A"

BLOCK "B"

BLOCK "C"

BLOCK "D"

BLOCK "E"

BLOCK "F"

COGITARE LANE

BLACKFOOT DAISY PATH

LA CIMA PHASE 5A
FINAL PLAT
RECORDED DOC
#23024195

LA CIMA PHASE 5B
FINAL PLAT
RECORDED DOC
#23024196

LOT 29
BLOCK B
OPEN SPACE AND
DRAINAGE EASEMENT
420340 SF

S88°59'09"E 95.10'

P.O.B.

SPC 4204 TXSC GRID COORDINATES:
NORTHING: 13870140.2205'
EASTING: 2282810.4985'

CITY OF SAN MARCOS
GPS CONTROL MONUMENT #14
ALUMINUM DISK IN CONCRETE
BEARS: N 70°22'24" E, 14,159.673'

S13°30'05"E 198.91'

S38°21'25"E 81.56'

S73°06'12"W 126.01'

S13°40'04"W 150.00'

S0°33'04"E 124.99'

MATCH LINE SHEET 5

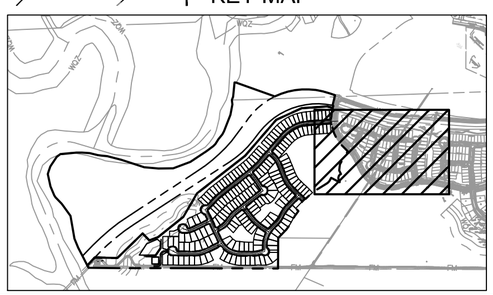
LA CIMA
PHASE 6

40 0 40 80
SCALE: 1 INCH = 80 FT

LEGEND

○	1/2" IRON ROD SET WITH CAP STAMPED "BCG"
●	1/2" IRON ROD FOUND WITH CAP STAMPED "BCG"
P.O.B.	POINT OF BEGINNING
O.P.R.H.C.TX.	OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
D.R.H.C.TX.	DEED RECORDS OF HAYS COUNTY, TEXAS

KEY MAP



DATE: DECEMBER 2 2024	DRAWN BY: LP
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JOB No: 005956-01-114	DESIGNED BY: BR

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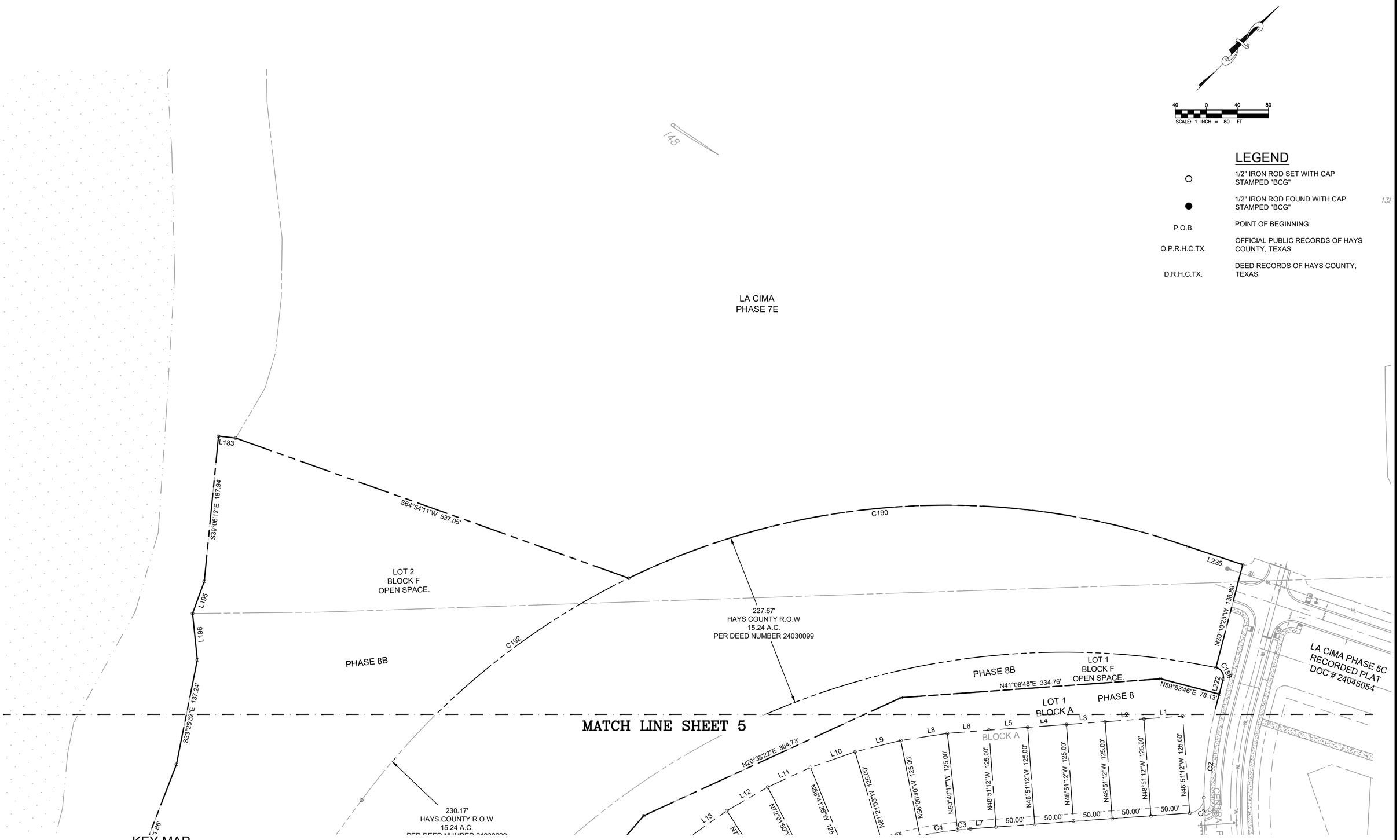
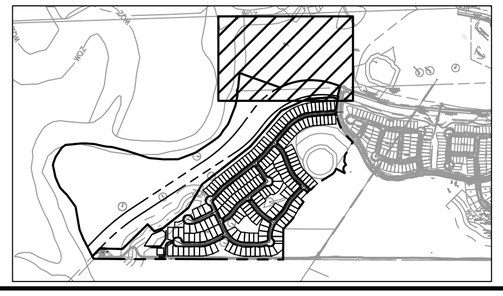
PRELIMINARY PLAT

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH8 SHEET 6, December 02, 2024, 11:21 AM, mguerra



KEY MAP



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PRELIMINARY PLAT

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH8 SHEET 7, November 26, 2024, 1:48 PM, mguerra

Line Table		
Line #	Length	Direction
L1	50.000	S41° 08' 48.38"W
L2	50.000	N41° 08' 48.38"E
L3	50.000	N41° 08' 48.38"E
L4	250.000	N41° 08' 48.38"E
L5	50.000	N41° 08' 48.38"E
L6	53.647	S40° 47' 47.30"W
L7	32.975	N41° 08' 48.38"E
L8	60.696	N36° 39' 31.47"E
L9	60.696	N31° 19' 08.29"E
L10	60.696	N25° 58' 45.10"E
L11	60.696	N20° 38' 21.91"E
L12	60.696	S15° 17' 58.72"W
L13	60.696	S09° 57' 35.53"W
L14	60.697	S04° 37' 12.10"W
L15	60.694	S00° 43' 11.09"E
L16	50.899	S03° 49' 34.22"E
L17	50.000	N03° 49' 34.22"W
L18	50.000	N03° 50' 14.92"W
L19	50.000	N03° 50' 14.92"W
L20	50.000	N03° 50' 14.92"W

Line Table		
Line #	Length	Direction
L21	50.000	S03° 50' 14.92"E
L22	50.000	N03° 50' 14.92"W
L23	50.000	N03° 40' 06.34"W
L24	34.709	S03° 14' 16.85"E
L25	14.627	S00° 32' 53.03"W
L26	8.976	N03° 50' 14.92"W
L27	33.162	N00° 32' 53.03"E
L28	16.220	N04° 45' 04.38"E
L29	31.570	N04° 45' 04.38"E
L30	17.794	N07° 17' 39.79"E
L31	50.000	N07° 17' 39.79"E
L32	50.000	N07° 17' 39.79"E
L33	50.000	N07° 17' 39.79"E
L34	50.000	N07° 17' 39.79"E
L35	50.000	N07° 17' 39.79"E
L36	50.000	N07° 17' 39.79"E
L37	50.000	N07° 17' 39.79"E
L38	50.000	N07° 17' 39.79"E
L39	50.000	N07° 17' 39.79"E
L40	50.836	N07° 17' 39.79"E

Line Table		
Line #	Length	Direction
L41	60.939	N07° 17' 39.79"E
L42	6.520	N07° 17' 39.79"E
L43	30.508	S00° 32' 36.61"E
L44	47.834	N00° 35' 56.96"W
L45	50.000	N00° 35' 56.96"W
L46	50.000	N00° 35' 56.96"W
L47	50.762	N09° 23' 36.58"E
L48	22.331	S00° 32' 36.61"E
L49	65.000	N19° 45' 34.08"E
L50	70.000	N19° 45' 34.08"E
L51	42.515	S19° 45' 34.08"W
L52	27.488	S20° 59' 27.59"W
L53	17.791	S29° 17' 56.56"W
L54	66.666	S21° 43' 14.72"W
L55	52.161	S45° 32' 19.68"W
L56	69.999	S44° 27' 30.14"E
L57	50.002	N45° 32' 22.15"E
L58	70.000	N45° 32' 22.56"E
L59	43.876	N44° 27' 37.45"W
L60	20.061	N00° 38' 37.90"E

Line Table		
Line #	Length	Direction
L61	75.904	N44° 27' 37.44"W
L62	70.000	N45° 32' 22.56"E
L63	9.546	N45° 32' 22.56"E
L64	60.454	N45° 32' 22.56"E
L65	31.126	S32° 45' 18.74"W
L66	39.657	S32° 45' 18.74"W
L67	54.290	S32° 45' 18.74"W
L68	4.386	S32° 45' 18.74"W
L69	65.726	S19° 45' 34.08"W
L70	70.000	N19° 45' 34.08"E
L71	80.000	N19° 45' 34.08"E
L72	19.998	N45° 32' 22.15"E
L73	7.508	N45° 32' 22.56"E
L74	21.211	N88° 25' 20.78"E
L75	71.853	S61° 13' 50.40"W
L76	81.343	N16° 21' 05.64"E
L77	24.865	N00° 33' 47.93"E
L78	70.000	S45° 32' 21.44"W
L79	70.000	S45° 32' 22.56"W
L80	11.309	N45° 32' 28.19"E

Line Table		
Line #	Length	Direction
L81	70.000	S45° 32' 22.56"W
L82	70.000	S45° 32' 22.56"W
L83	70.000	S45° 32' 22.56"W
L84	61.496	S45° 32' 22.56"W
L85	8.507	S43° 58' 48.92"W
L86	70.000	N45° 31' 18.20"E
L87	49.439	S43° 58' 48.92"W
L88	40.268	S36° 34' 16.14"W
L89	23.173	S36° 34' 16.14"W
L90	63.454	S28° 19' 39.18"W
L91	2.183	S20° 04' 31.34"W
L92	32.152	N19° 25' 06.24"E
L93	80.064	S20° 15' 56.56"W
L94	46.992	S26° 37' 51.78"E
L95	85.347	S15° 07' 51.69"E
L96	60.050	N74° 36' 13.27"E
L97	36.662	N71° 59' 03.47"W
L98	78.098	S69° 22' 31.62"W
L99	77.624	S59° 33' 55.72"W
L100	55.747	S51° 15' 49.85"W

Line Table		
Line #	Length	Direction
L101	22.226	S46° 11' 22.42"W
L102	12.021	N45° 32' 22.56"E
L103	60.030	S45° 32' 28.18"W
L104	60.000	N45° 31' 32.97"E
L105	41.582	N45° 31' 19.20"E
L106	19.515	N40° 57' 43.51"E
L107	36.773	S40° 57' 43.52"W
L108	37.247	S46° 15' 29.72"W
L109	58.464	N46° 15' 29.72"E
L110	7.270	S30° 31' 22.01"W
L111	6.117	S46° 15' 29.72"W
L112	74.881	S26° 53' 35.10"W
L113	10.543	S05° 30' 30.29"W
L114	91.714	N05° 30' 30.29"E
L115	74.397	N44° 27' 37.44"W
L116	23.226	S44° 27' 37.44"E
L117	60.000	S44° 27' 37.44"E
L118	20.134	N44° 27' 37.44"W
L119	16.057	N44° 27' 37.44"W
L120	50.159	S44° 27' 37.44"E

Line Table		
Line #	Length	Direction
L121	48.881	N44° 27' 37.44"W
L122	4.525	N00° 37' 45.58"W
L123	49.928	S00° 41' 04.72"E
L124	6.452	S01° 05' 01.55"E
L126	33.291	N00° 34' 04.64"W
L127	60.001	S01° 05' 01.55"E
L128	30.252	N01° 05' 01.55"W
L129	45.311	N07° 13' 01.22"W
L130	124.427	S80° 56' 32.61"W
L131	12.811	S07° 13' 01.22"E
L132	60.728	S14° 42' 10.26"E
L133	8.241	N16° 27' 03.97"W
L135	59.699	S14° 42' 10.26"E
L136	4.430	N16° 05' 31.49"W
L137	25.118	S14° 42' 09.87"E
L138	29.164	S08° 44' 49.49"E
L139	59.963	N08° 44' 49.11"W
L141	50.000	S89° 26' 26.64"W
L142	65.000	S89° 26' 23.14"W
L143	13.136	S07° 17' 39.79"W

Line Table		
Line #	Length	Direction
L144	3.827	S07° 05' 10.10"W
L145	0.565	S00° 34' 04.64"E
L146	70.000	N45° 32' 22.35"E
L147	50.000	N41° 08' 48.38"E
L148	50.000	N41° 08' 48.38"E
L149	50.000	N41° 08' 48.38"E
L150	50.000	N41° 08' 48.38"E
L151	50.000	N41° 08' 48.38"E
L152	49.489	N40° 45' 00.66"E
L153	48.566	N34° 36' 38.39"E
L154	48.566	N26° 37' 10.64"E
L155	48.564	N18° 37' 43.31"E
L156	48.565	N10° 37' 00.13"E
L157	48.566	N02° 40' 03.37"E
L158	9.068	S45° 32' 22.56"W
L159	49.625	N03° 27' 28.95"W
L160	50.000	N03° 50' 14.92"W
L161	50.000	N03° 50' 14.92"W
L162	50.000	N03° 50' 14.92"W
L163	53.386	N03° 50' 14.92"W

Line Table		
Line #	Length	Direction
L164	15.757	N09° 39' 14.99"E
L165	30.629	N86° 09' 45.08"E
L168	67.026	N74° 56' 44.61"W
L169	58.444	N67° 36' 09.12"W
L170	50.000	N66° 29' 58.23"W
L171	50.000	N66° 29' 58.23"W
L172	16.635	N66° 28' 22.49"W
L173	50.000	N66° 29' 58.12"W
L174	48.664	N68° 54' 26.30"W
L175	24.690	S89° 26' 23.14"W
L176	47.991	N79° 24' 33.26"W
L177	48.997	N89° 10' 06.30"W
L178	50.017	S89° 26' 23.25"W
L179	50.003	S89° 26' 51.10"W
L181	55.007	N00° 21' 14.28"E
L182	68.432	N04° 01' 25.88"E
L183	22.279	S51° 57' 22.26"W
L184	50.022	S89° 26' 52.66"W
L185	56.332	N88° 45' 25.23"W
L186	62.794	S11° 53' 19.14"W

Line Table		
Line #	Length	Direction
L188	23.424	S09° 19' 15.18"W
L189	22.866	S00° 23' 00.55"W
L190	13.905	S06° 42' 56.56"E
L191	44.887	S18° 05' 30.93"E
L192	51.044	S71° 03' 46.73"E
L193	25.239	S66° 28' 22.49"E
L194	30.629	S86° 09' 45.08"W
L195	44.005	S24° 40' 54.19"E
L196	60.026	S50° 33' 35.01"E
L197	43.999	S16° 52' 21.25"E
L198	83.528	S05° 38' 04.90"E
L199	74.085	S11° 50' 44.97"E
L200	56.090	S83° 27' 02.11"E
L201	40.462	S00° 47' 10.69"E
L202	29.190	S79° 02' 53.70"E
L203	17.077	S47° 29' 01.31"W
L204	42.470	S79° 02' 53.70"E
L205	72.322	S50° 35' 41.32"W
L206	52.698	S54° 46' 30.02"W
L208	71.197	S46° 17' 27.95"W

Line Table		
Line #	Length	Direction
L209	27.600	S45° 56' 19.03"W
L210	62.754	S08° 00' 12.27"W
L211	29.770	S15° 49' 41.58"E
L212	14.215	S07° 17' 39.79"W
L213	65.589	S24° 31' 09.41"E
L214	17.527	S82° 42' 20.21"E
L215	37.588	S28° 58' 04.76"E
L216	79.112	N78° 54' 59.97"E
L217	3.212	N00° 34' 04.64"W
L218	4.589	N16° 03' 03.27"W
L219	30.276	S75° 42' 00.89"E
L220	15.094	N87° 25' 23.79"E
L221	27.800	S83° 47' 13.64"E
L222	20.128	N30° 35' 45.88"W
L226	74.547	S63° 38' 18.53"W
L227	53.870	N03° 50' 14.92"W
L228	50.000	N03° 50' 14.92"W
L229	51.013	N03° 50' 14.92"W
L230	14.726	N50° 02' 40.39"W
L231	46.984	S05° 54' 16.28"W

Line Table		
Line #	Length	Direction
L232	56.519	S05° 54' 16.28"W
L233	63.853	S05° 54' 16.28"W
L234	29.221	N63° 20' 22.38"W
L235	36.179	N63° 20' 22.38"W
L236	14.368	N81° 30' 57.35"W
L237	35.679	N81° 30' 57.35"W
L238	16.096	N81° 30' 57.35"W
L239	33.951	N81° 30' 57.36"W
L240	23.243	S70° 54' 25.35"E
L241	62.974	S70° 47' 35.11"E
L242	25.195	S67° 54' 30.01"E
L243	19.954	S67° 54' 30.01"E
L244	20.884	S75° 23' 10.76"W
L245	62.841	S16° 31' 15.32"E
L246	42.187	S14° 47' 34.60"E
L247	9.862	S14° 47' 34.60"E
L248	52.049	S01° 22' 50.14"W
L249	19.932	S16° 32' 44.14"W
L250	25.661	S16° 32' 44.14"W
L251	35.741	S53° 38' 17.12"W

DATE: NOVEMBER 26 2024	DRAWN BY: LP
SCALE: NA	CHECKED BY: NK
JOB No: 005956-01-114	DESIGNED BY: BR

REVISIONS

REVISION	DESCRIPTION	DATE
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LINE TABLES

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH 8 LINE TABLES, November 26, 2024, 1:48 PM, mguerra

Line Table		
Line #	Length	Direction
L252	50.000	S07° 29' 58.68"W
L253	50.000	S07° 17' 39.79"W
L254	55.000	S82° 42' 20.21"E
L255	50.000	S82° 42' 20.21"E
L256	20.000	S82° 42' 20.21"E
L257	21.421	S82° 42' 20.21"E
L258	14.906	S27° 50' 31.94"E
L259	88.320	N00° 34' 04.64"W
L260	60.000	N00° 34' 04.64"W
L261	53.688	N08° 06' 16.95"W
L262	75.358	N01° 14' 11.54"W
L263	61.718	N00° 44' 36.38"W
L264	60.000	S89° 26' 23.14"W
L265	52.818	S89° 26' 23.14"W
L266	12.178	S89° 26' 23.14"W
L267	51.024	N84° 34' 15.08"W
L268	27.195	N66° 28' 22.49"W
L269	32.250	N79° 02' 53.70"W
L271	57.013	N83° 27' 02.11"W
L273	42.446	S07° 17' 39.79"W

Line Table		
Line #	Length	Direction
L274	42.446	S07° 17' 39.79"W
L275	50.000	S07° 17' 39.79"W
L276	50.000	S07° 17' 39.79"W
L279	37.819	N00° 32' 36.61"W
L281	15.615	S19° 45' 43.47"W
L283	35.309	S09° 02' 28.89"E
L284	31.114	S09° 02' 28.89"E
L286	22.259	S07° 17' 39.79"W
L287	50.000	S07° 17' 39.79"W
L288	50.000	S07° 17' 39.79"W
L289	4.389	N07° 17' 39.80"E
L291	19.130	N07° 17' 39.79"E
L292	29.144	N07° 17' 39.79"E
L293	12.321	S07° 17' 39.79"W
L294	27.378	S07° 17' 39.79"W
L295	14.087	S07° 17' 39.79"W
L296	27.679	S07° 17' 39.79"W
L297	12.622	S07° 17' 39.79"W
L298	29.144	N07° 17' 39.79"E
L299	20.856	N07° 17' 39.79"E

Line Table		
Line #	Length	Direction
L300	17.679	N07° 17' 39.79"E
L301	20.856	N07° 17' 39.79"E
L302	14.087	N07° 17' 39.79"E
L303	20.856	N07° 17' 39.79"E
L304	14.087	N07° 17' 39.79"E
L305	20.856	N07° 17' 39.79"E
L306	29.144	N07° 17' 39.79"E
L307	20.856	N07° 17' 39.79"E
L308	30.129	N07° 17' 39.79"E
L309	28.296	N01° 12' 47.35"E
L310	16.972	N01° 12' 47.35"E
L311	49.902	N01° 02' 46.77"W
L312	50.002	N01° 02' 46.77"W
L313	50.002	N01° 02' 46.77"W
L314	38.992	N01° 02' 46.77"W
L315	53.575	N01° 02' 46.77"W
L316	50.533	S30° 31' 22.01"W
L319	12.052	S44° 27' 37.44"E
L321	17.527	N82° 42' 20.21"W
L325	25.103	N09° 02' 28.89"W

Line Table		
Line #	Length	Direction
L328	16.297	S19° 45' 34.08"W
L335	86.557	N44° 27' 37.44"W
L336	37.514	N44° 27' 37.44"W
L337	37.140	N36° 23' 36.60"W
L338	29.418	S36° 23' 36.60"E
L339	48.899	S31° 07' 44.70"E
L340	94.443	N19° 50' 58.91"W
L341	60.242	N83° 18' 16.51"E
L342	21.374	N83° 18' 16.51"E
L343	38.810	S82° 42' 20.21"E
L344	56.296	S82° 42' 20.21"E
L345	27.976	S82° 42' 20.21"E
L346	50.000	S82° 42' 20.21"E
L347	43.865	S82° 42' 20.21"E
L348	42.797	S26° 07' 41.16"W
L349	52.740	N05° 20' 35.11"W
L350	67.108	S04° 24' 55.10"E
L351	52.303	S87° 43' 44.82"E
L352	50.816	N79° 03' 53.45"E
L353	50.090	N52° 06' 41.65"E

Line Table		
Line #	Length	Direction
L354	58.205	N52° 06' 41.65"E
L355	60.013	N46° 43' 19.28"E
L356	60.013	S46° 43' 19.28"W
L357	53.000	S00° 33' 39.77"E
L358	41.320	S09° 02' 28.89"E

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DATE: NOVEMBER 26 2024	DRAWN BY: LP
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JOB No: 005956-01-114	DESIGNED BY: BR

REVISIONS

REVISION	DESCRIPTION	DATE
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LINE TABLES

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

Curve Table			
Curve #	Length	Radius	Delta
C1	29.350	20.000	084.0823
C2	135.303	510.051	015.1991
C3	16.707	526.500	001.8181
C4	49.068	526.500	005.3398
C5	49.068	526.500	005.3398
C6	49.068	526.500	005.3398
C7	49.068	526.500	005.3398
C8	49.068	526.500	005.3398
C9	49.068	526.500	005.3398
C10	49.128	526.500	005.3463
C11	49.008	526.500	005.3333
C12	4.116	526.500	000.4479
C13	48.759	773.500	003.6117
C14	57.362	773.500	004.2490
C15	44.160	773.500	003.2711
C16	49.069	496.038	005.6678
C17	19.129	484.820	002.2606
C18	14.767	15.000	056.4040
C19	21.939	60.000	020.9500
C20	117.525	60.000	112.2280

Curve Table			
Curve #	Length	Radius	Delta
C21	51.655	60.000	049.3270
C22	14.767	15.000	056.4040
C23	23.562	15.000	090.0000
C24	36.640	273.500	007.6757
C25	24.081	15.000	091.9845
C26	182.709	60.000	174.4739
C27	45.247	60.000	043.2080
C28	41.810	60.000	039.9260
C30	12.979	326.500	002.2776
C31	66.072	326.500	011.5947
C32	65.963	326.500	011.5755
C33	1.894	326.500	000.3323
C34	23.562	15.000	090.0000
C35	23.473	15.000	089.6589
C36	38.628	326.500	006.7786
C37	101.311	326.500	017.7785
C38	8.912	326.500	001.5640
C39	21.956	15.000	083.8653
C40	75.660	59.987	072.2655
C41	59.218	60.000	056.5486

Curve Table			
Curve #	Length	Radius	Delta
C42	34.894	60.642	032.9687
C43	23.153	60.000	022.1097
C44	36.232	60.000	034.5993
C45	45.805	60.000	043.7406
C46	66.377	379.500	010.0214
C47	66.581	379.500	010.0522
C48	35.982	426.551	004.8332
C49	19.977	15.000	076.3079
C50	53.292	326.694	009.3464
C51	69.992	326.690	012.2754
C52	56.608	326.683	009.9283
C53	56.610	326.691	009.9283
C54	44.728	326.690	007.8445
C55	22.043	336.270	003.7557
C56	56.695	336.270	009.6600
C57	23.257	336.270	003.9627
C58	14.171	15.000	054.1300
C59	22.665	55.830	023.2596
C60	53.199	55.830	054.5962
C61	37.356	55.830	038.3372

Curve Table			
Curve #	Length	Radius	Delta
C62	30.408	55.830	031.2060
C63	34.912	55.830	035.8286
C64	5.565	15.000	021.2585
C65	8.606	15.000	032.8716
C66	72.244	273.500	015.1346
C67	95.060	273.500	019.9142
C68	42.215	273.500	008.8437
C69	56.528	381.500	008.4897
C70	49.229	381.500	007.3935
C71	83.865	353.500	013.5930
C72	14.872	353.500	002.4104
C73	23.057	14.999	088.0751
C74	314.111	510.021	035.2872
C75	28.285	20.000	081.0294
C76	1.374	20.000	003.9373
C77	21.789	473.500	002.6365
C78	66.039	473.500	007.9910
C79	66.039	473.500	007.9910
C80	66.039	473.500	007.9910
C81	66.039	473.500	007.9910

Curve Table			
Curve #	Length	Radius	Delta
C82	66.038	473.500	007.9910
C83	19.772	452.067	002.5059
C84	23.562	15.000	090.0000
C85	76.390	326.500	013.4052
C86	7.008	326.500	001.2298
C87	48.514	326.500	008.5135
C88	24.025	326.500	004.2161
C89	48.208	373.500	007.3951
C90	72.244	373.500	011.0824
C91	16.457	373.500	002.5246
C92	16.309	15.000	062.2956
C93	108.363	60.000	103.4793
C94	80.529	273.500	016.8701
C96	20.112	373.500	003.0852
C97	23.562	15.000	090.0000
C98	7.971	826.500	000.5525
C99	48.826	826.500	003.3848
C100	48.826	826.500	003.3848
C101	39.029	826.500	002.7057
C102	23.468	15.000	089.6408

Curve Table			
Curve #	Length	Radius	Delta
C103	25.087	326.500	004.4023
C104	7.888	15.000	030.1318
C105	6.878	15.000	026.2722
C106	54.118	60.000	051.6793
C107	39.378	60.000	037.6032
C108	38.139	60.000	036.4199
C109	45.506	60.000	043.4546
C110	31.410	60.000	029.9940
C111	14.767	15.000	056.4040
C112	23.562	15.000	090.0000
C113	116.536	473.500	014.1015
C114	48.847	406.500	006.8849
C115	35.340	473.500	004.2763
C116	20.809	15.000	079.4846
C117	81.887	328.500	014.2824
C118	57.234	406.500	008.0670
C119	12.157	406.500	001.7135
C120	23.562	15.000	090.0000
C121	10.456	426.500	001.4047
C122	36.345	426.500	004.8825

Curve Table			
Curve #	Length	Radius	Delta
C123	48.855	426.500	006.5631
C124	48.855	426.500	006.5631
C125	22.282	426.500	002.9934
C126	50.095	273.500	010.4944
C127	12.510	426.500	001.6806
C131	21.014	273.500	004.4023
C132	23.367	15.000	089.2550
C134	62.993	483.769	007.4606
C135	1.779	473.502	000.2152
C136	18.247	15.000	069.6970
C137	23.562	15.000	090.0000
C139	38.515	273.500	008.0685
C140	79.094	273.500	016.5694
C141	19.870	320.883	003.5479
C143	19.777	403.571	002.8077
C144	47.155	326.500	008.2750
C145	26.161	254.255	005.8953
C146	22.604	15.000	086.3426
C154	65.897	273.500	013.8048
C155	19.631	15.000	074.9832

Curve Table			
Curve #	Length	Radius	Delta
C157	45.238	326.500	007.9386
C158	45.238	326.500	007.9386
C159	56.608	326.500	009.9338
C160	46.528	326.500	008.1650
C161	21.640	15.000	082.6603
C162	31.533	526.500	003.4315
C163	9.279	526.500	001.0097
C164	48.584	526.500	005.2871
C165	48.584	526.500	005.2871
C166	48.187	526.500	005.2439
C167	48.187	526.500	005.2439
C168	31.294	526.500	003.4055
C170	23.562	15.000	090.0000
C171	24.467	273.500	005.1257
C172	53.511	273.500	011.2101
C173	48.498	326.500	008.5106
C174	106.762	326.500	018.7352
C175	8.180	326.500	001.4355
C176	23.562	15.000	090.0000
C177	3.301	273.500	000.6914

Curve Table			
Curve #	Length	Radius	Delta
C178	95.060	273.500	019.9142
C179	95.060	273.500	019.9142
C180	95.060	273.500	019.9142
C181	18.070	431.233	002.4008
C182	5.785	273.500	001.2120
C188	19.262	12.000	091.9678
C190	369.909	936.090	022.6412
C192	451.607	935.000	027.6740
C193	700.076	1965.000	020.4129
C194	604.788	2850.000	012.1585
C195	575.204	2715.519	012.1365
C196	412.491	1232.892	019.1695
C197	1073.578	965.000	063.7425

DATE: NOVEMBER 26 2024	DRAWN BY: LP
SCALE: NA	CHECKED BY: NK
JOB No: 005956-01-114	DESIGNED BY: BR

REVISIONS

REVISION	DESCRIPTION	DATE
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CURVE TABLES

LA CIMA
PHASE 8
HAYS COUNTY, TEXAS

V:\005956 - Lazy Oaks Ranch\005956-01-001 (ENG) - Lazy Oaks Subdivision\Engineering\Engineering Plans\SFR Phase 8\Preliminary Plat\SFR Phase 8 Preliminary Plat.dwg, PH 8 CURVE TABLES, November 26, 2024, 1:48 PM, mguerra

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

I Bryan Lee,
Print Name

Owner,
Title - Owner/President/Other

of LCSM PH 4, LLC,
Corporation/Partnership/Entity Name

have authorized Bowman Consulting Group, LTD
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

8-5-2024
Date

THE STATE OF MT §

County of Gallatin §

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

GIVEN under my hand and seal of office on this 5th day of August, 24.

LILLIAN HAGGARD
Notary Public
for the State of Montana
Residing at:
Bozeman, Montana
My Commission Expires:
February 7, 2028

NOTARY PUBLIC

Lillian Haggard
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 02/07/2028

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 Central Park Loop and to the east of La Cima Phase 6 in San Marcos, Hays County, Texas.

Name of Customer: Bryan Lee

Contact Person: Bobby Ross Phone: 737-221-8262

Customer Reference Number (if issued):CN CN605868074

Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

☒ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde

☐ Comal ☐ Kinney

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

☐ Austin Regional Office

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

☐ San Antonio Regional Office

☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	69.13 Acres	$ 6,500
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	8363 L.F.	$ 4,181.5
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____

Date: 10/30/2024

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*

Project	***Fee***
Extension of Time Request	$150

10 – TCEQ - 10400 Attachments

Core Data Form

TCEQ Core Data Form

TCEQ Use Only

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

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 605868074		RN

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy): 7/23/2021

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) — *If new Customer, enter previous Customer below:*

LCSM PH 4, LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
0803829440	32076637902	85-3886915	

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited

Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☒ Other:

12. Number of Employees
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☒ Other: DEVELOPER

15. Mailing Address:

303 Colorado St Suite 2300

City	State	ZIP	ZIP + 4
Austin	TX	78701	4653

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*
	Doug Goss <dougg@nd-austin.com>

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 457-8000		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☐ New Regulated Entity ☒ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

LA CIMA PHASE 8

23. Street Address of the Regulated Entity: ***(No PO Boxes)***	Central Park Loop and West Centerpoint Road							
	City	San Marcos - ETJ	**State**	TX	**ZIP**	78666	**ZIP + 4**	
24. County								

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	This project site is located south of Central Park Loop and west of La Cima Phase 6.

26. Nearest City	**State**	**Nearest ZIP Code**
San Marcos	TX	78666

27. Latitude (N) In Decimal:	29.8842	**28. Longitude (W) In Decimal:**	-98.0048

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	53	03	98	00	17

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
1521	1623	236115	237110

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Single Family Residential

34. Mailing Address:	**303 Colorado St Suite 2300**							
	City	**Austin**	**State**	**TX**	**ZIP**	**78701**	**ZIP + 4**	**4653**

35. E-Mail Address:	**Doug Goss <dougg@nd-austin.com>**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** ***(if applicable)***
(512) 402-1790		**( ) -**

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☒ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Bobby Ross, P.E.	**41. Title:**	Project Manager

42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(737) 221-8262		( ) -	bobbyross@bowman.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Bowman Consulting	**Job Title:**	Project Manager
Name *(In Print):*	Bobby Ross, P.E.	**Phone:**	**(737) 221- 8262**

Signature:		Date:	11-01-2024

