TCEQ WPAP & SCS APPLICATION

For

Woodfield Preserve
Phase 3

Prepared for:

LSMA Georgetown, LLC.
ATTN: Larry Colditz
6310 Capital Dr.
Ste 130
Lakewood Ranch, FL
Phone: (303)-720-4436

Prepared by:

LJA ENGINEERING, INC.
2700 La Frontera Blvd
Ste. 200
Round Rock, Texas 78681
TBPE# 1386
Phone: (512) 439-4700

March 2024

JUSTIN D. MIDURA
128809

3-4-2024

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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: Woodfield Preserve Phase 3						**2. Regulated Entity No.:**			
3. Customer Name: Larry Colditz, LSMA Georgetown LLC						**4. Customer No.: CN606070779**			
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):**		83.47 Acres
9. Application Fee:	$12,470		**10. Permanent BMP(s):**					Extended Batch Detention Ponds, VFS	
11. SCS (Linear Ft.):	11,939LF		**12. AST/UST (No. Tanks):**						
13. County:	Williamson		**14. Watershed:**					Berry Creek	

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)	___Edwards Aquifer Authority ___Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ___San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence _X 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.

Justin Midura, P.E.

Justin Midura

Print Name of Customer/Authorized Agent

3-4-2024

Signature of Customer/Authorized Agent Date

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

General Information Form

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: Justin Midura, P.E.

Date: 3-4-2024

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Woodfield Preserve Phase 3
2. County: Williamson
3. Stream Basin: Berry Creek
4. Groundwater Conservation District (If applicable): ____
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

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

7. Customer (Applicant):

   Contact Person: Larry Colditz
   Entity: LSMA Georgetown, LLC
   Mailing Address: 6310 Capital Dr, Ste 130
   City, State: Lakewood Ranch, FL Zip: 34202
   Telephone: 303-720-4436 FAX: _____
   Email Address: LColditz@starwoodland.com

8. Agent/Representative (If any):

   Contact Person: Justin Midura, P.E.
   Entity: LJA Engineering, Inc.
   Mailing Address: 2700 La Frontera Blvd, Ste 200
   City, State: Round Rock, TX Zip: 78681
   Telephone: 512-439-4700 FAX: _____
   Email Address: Jmidura@lja.com

9. Project Location:

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

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

    From Austin, TX, Travel North on I35. Take Exit 266 toward TX-195 N/Florence/Killeen. Turn Left onto TX-195 W. In two miles, turn left at Shell Rd. In about two miles site will be on the right, North of Shell Rd.

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

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

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

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

☒ Survey staking will be completed by this date: February 2023

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:

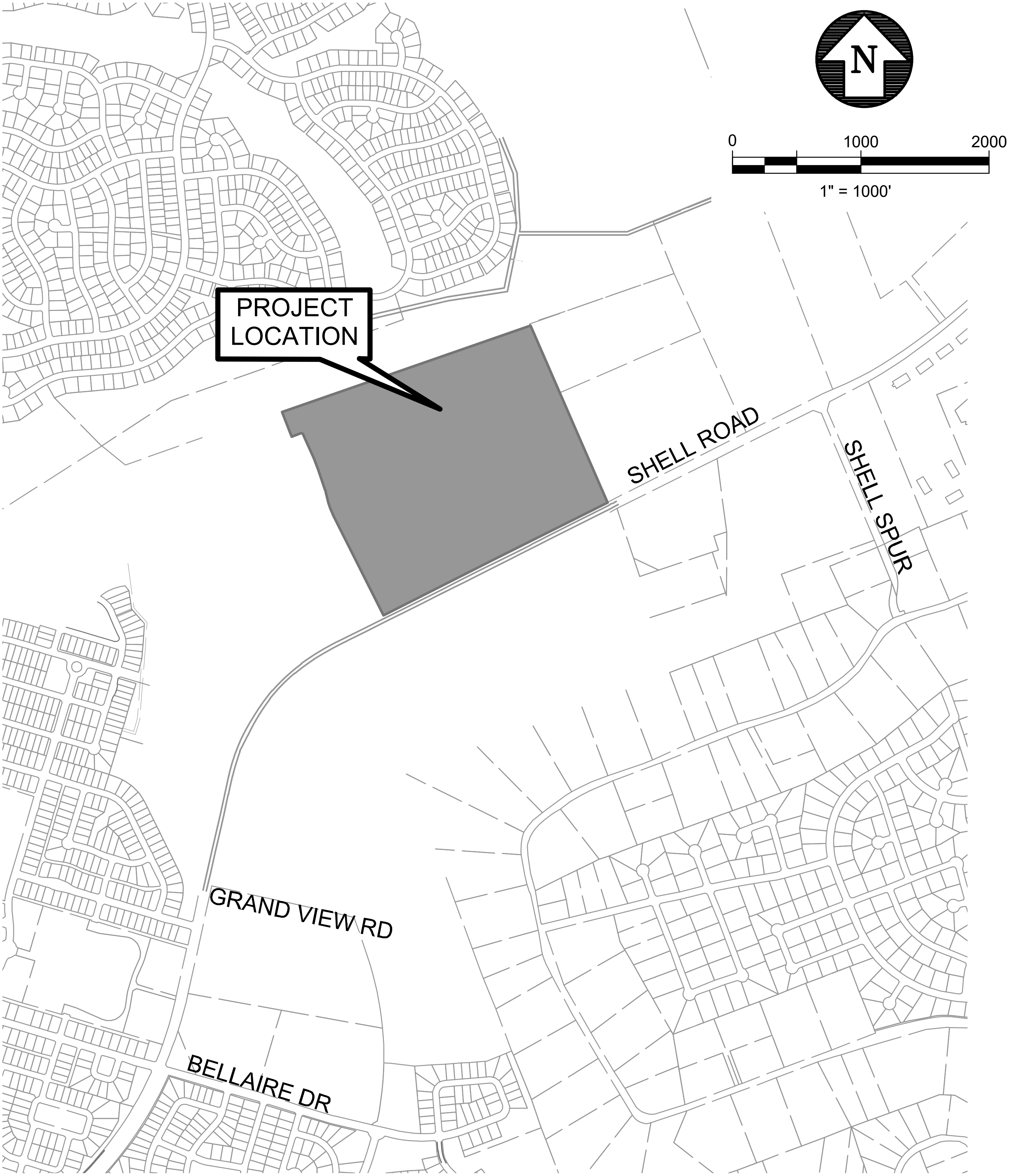
☒ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
☒ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
☐ For a UST Facility Plan or Modification or an AST Facility 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.



LJA Engineering, Inc.

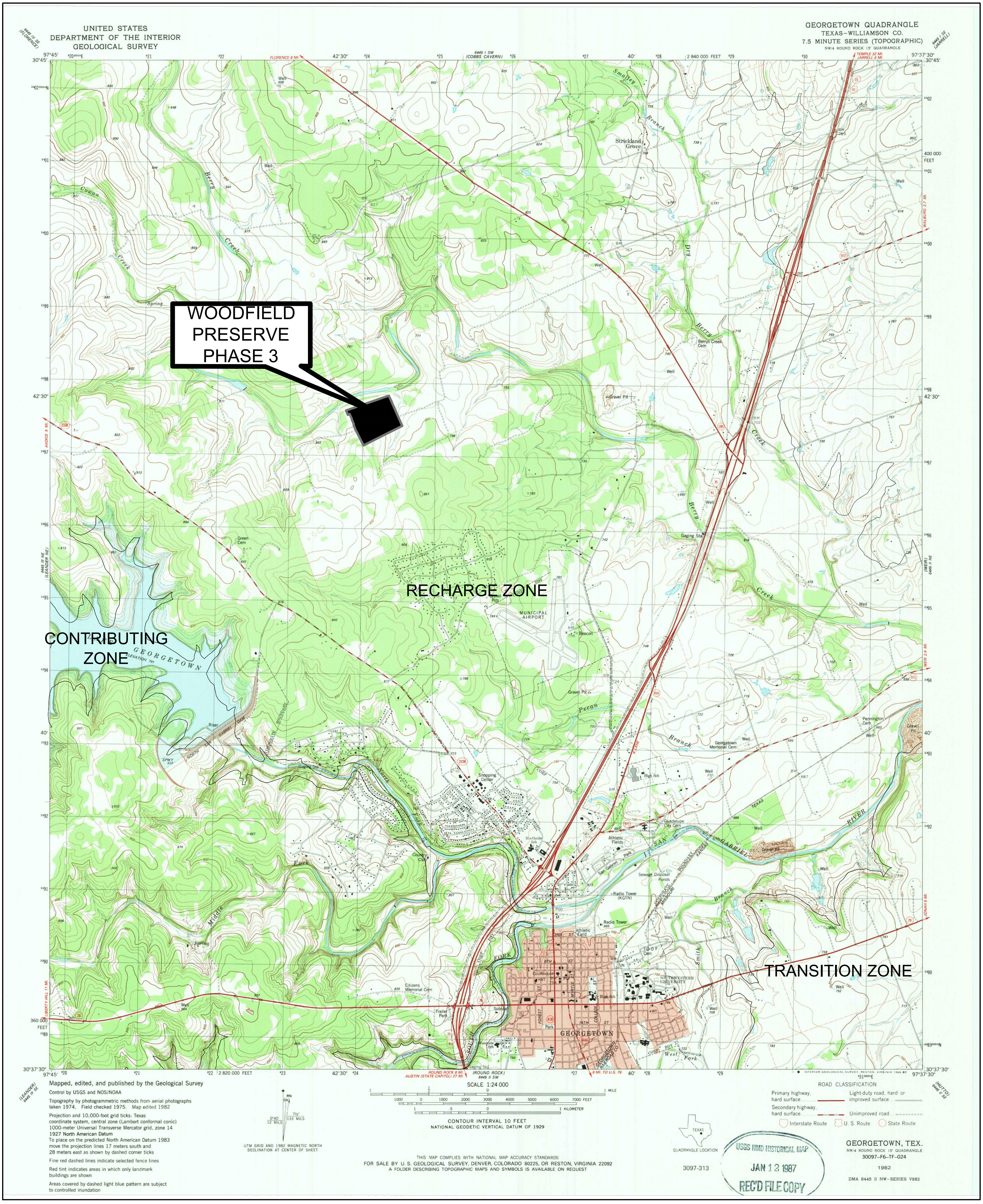
2700 La Frontera Blvd.
Suite 150
Round Rock, Texas 78681

Phone 512.439.4700
Fax 512.439.4716
FRN-F-1386

WOODFEILD PRESERVE PHASE 3
GEORGETOWN, TX
ATTACHMENT A - ROAD MAP

Date\Time : Fri, 20 Oct 2023 - 2:49pm
User Name : acamilleri
Path\Name : G:\A245-1002 Georgetown Village\PERMITTING\TCEQ\Phase 3\SCS & WPAP\02-general\02a_Road Map.dwg

Attachment B - USGS / Edwards Recharge Zone Map



General Information Form

ATTACHMENT C

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

PROJECT DESCRIPTION:

The Woodfield Preserve Phase 3 Subdivision is located North of Shell Road between SH 195 and FM 338 in Georgetown, TX, Williamson County. The entirety of The Woodfield Preserve development consists of approximately 293.6 acres and proposes a combination of single-family residential lots, a multi-family condominium site plan, commercial development, parkland, amenity-centers and all related infrastructure divided amongst seven (7) phases. The proposed development is located within the City of Georgetown city limits and subject to the Shell Road Planned Unit Development (PUD), approved ordinance number 2021-15-PUD. Under existing conditions, the tract is vacant and undeveloped. The site consists of assorted grasses and multiple protected trees, with terrain sloped at approximately 1% to 10%.

Woodfield Preserve Phase 3 proposes five drainage basins for developed conditions. Two drainage basins shall be treated by vegetative filter strips (VFS) and three drainage basins shall be treated by means of onsite ponding per Ponds 7, 8, and 9. The Phase 3 development is approximately 83.47 acres with 39.09 acres of impervious cover or 46.8%. The Phase 3 construction plans propose ROW, 229 single family lots, driveways, sidewalks, trail, parking lot, public park, water, wastewater, drainage improvements, water quality and detention. The lift station, south public park, and north public park proposed impervious cover are being treated via compensatory water quality treatment with Pond 7. The lift station and north public park areas are part of the Phase 3 construction plans. The south public park area is part of the Phase 1 construction plans as well as already accounted for in the approved Woodfield Preserve Phase 1 WPAP & SCS (EAPP ID Nos. 11003313 & 11003314). The lift station is part of the Woodfield Preserve offsite WWL improvements SCS currently in review at the TCEQ (EAPP ID No. 11003832). 46.8% impervious cover is proposed with this construction plan set. Detention will be required. Phase 3 proposes three extended batch detention ponds for water quality and detention improvements. The following table provides detail for each pond and each VFS..

		Total Area (ac)	**Impervious Cover Area (ac)**
Pond 7	**Existing Basin**	30.22	0
	Developed Basin	30.22	15.69
Pond 8	**Existing Basin**	34.53	0
	Developed Basin	34.53	16.05
Pond 9	**Existing Basin**	11.82	0
	Developed Basin	11.82	5.11
VFS C	**Existing Basin**	6.14	0
	Developed Basin	6.14	2.00
VFS D	**Existing Basin**	0.77	0
	Developed Basin	0.77	0.25
Total	**Existing Basin**	83.47	0
	Developed Basin	83.47	39.09

All extended batch detention ponds were analyzed by using HEC-HMS to model detention and outlet structures for the 24-hour duration, 2-, 10-, 25-, and 100-year frequency rainfall events with WQ volume using the TCEQ Technical Guidance Manual. Stormwater is conveyed to the proposed BMP via curb and gutter flow to curb and grate inlets located in the ROW and driveways. At these points the water drains into the pond via storm pipe and released to the designated watershed by means of a safety end treatment (SET) outlet structure.

This project is located over the Edwards Aquifer Recharge Zone and within the Berry Creek Watershed. Since this project is located over the Edwards Aquifer Recharge Zone and proposes more than one wastewater service line, a Sewage Collection System (SCS) application is required and is submitted following the WPAP application. Phase 3 proposes a combination of 11,939 linear feet of 8” and 12” wastewater line and will connect to the lift station built with the Woodfield Preserve development.

GEOLOGIC ASSESSMENT
APPROXIMATELY 308-ACRE GEORGETOWN VILLAGE TRACT
SHELL ROAD
GEORGETOWN, WILLIAMSON COUNTY, TEXAS
HJN 21081.001 GA

PREPARED FOR:

LENNAR HOMES AND CONSTRUCTION LTD
AUSTIN, TEXAS

PREPARED BY:

HORIZON ENVIRONMENTAL SERVICES, INC.
TBPG FIRM REGISTRATION NO. 50488

STATE OF TEXAS
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

JUNE 2021

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I. GEOLOGIC ASSESSMENT FORM (TCEQ-0585)

II. ATTACHMENTS:

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: James Killian
Telephone: 512 328-2430

Date: 1 June 2021
Fax: 512 328-1804

Representing: Horizon Environmental Services, Inc. and TBPG Firm Registration No. 50488
(Name of Company and TBPG or TBPE registration number)

Signature of Geologist:

James P. Killian

JAMES P. KILLIAN
GEOLOGY
No. 10281

Regulated Entity Name: 308-acre Georgetown Village Tract, Georgetown, Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 5 to 8 April 2021 and 12, 17 to 20 May 2021
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)
Doss silty clay, 1-5% slopes (DoC)	C	1 to 2
Eckrant extremely stony clay, 0-3% slopes (EeB)	D	0.5 to 1
Eckrant-Rock outcrop association, 1-10% slopes (ErE)	D	0.5 to 1
Georgetown silty clay loam, 1-3% slopes (GsB)	D	2 to 4

** Soil Group Definitions (Abbreviated)*

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

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

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

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

Applicant's Site Plan Scale: 1" = 400'
Site Geologic Map Scale: 1" = 400'
Site Soils Map Scale (if more than 1 soil type): 1" = 800'

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 1 (#) 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: 308-acre Georgetown Village tract, Georgetown, Williamson County, Texas

LOCATION			FEATURE CHARACTERISTICS												EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
F-1	30.70239	-97.70701	C/SH	30	Ked	20	20	1.5	--	0	--	--	C,F,O	50	80		x	x		Hillside
F-1.5	30.70223	-97.70707	SH/SC	20	Ked	11	7	3	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-2	30.70325	-97.7058	C/SH	30	Ked	10	10	1	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-3	30.70618	-97.69933	SH	20	Ked	10	10	1	--	0	--	--	C,F,O	15	35	x		x		Hillside
F-3.5	30.70612	-97.69896	SH	20	Ked	18	6.5	4	--	0	--	--	C,F,O	10	30	x		x		Hillside
F-4	30.7075	-97.70002	SC/SF	20	Ked	3	2	4.5	N280W	0	--	--	C,F,O	30	50		x	x		Hillside
F-5	30.70689	-97.70037	C/SH	30	Ked	20	15	3	--	0	--	--	C,F,O	55	85		x		x	Streambed
F-6	30.70764	-97.703	C/SH	30	Ked	35	30	5	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-6.5	30.7076	-97.70324	SC	20	Ked	1.5	0.6	1	--	0	--	--	C,F,O	10	30	x		x		Hillside
F-7	30.7069	-97.70314	SH	20	Ked	7	7	1	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-8	30.70199	-97.7014	SH	20	Ked	12	10	2.5	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-9	30.70213	-97.70326	C/SH	30	Ked	20	15	2.5	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-10	30.69908	-97.70325	C/SH	30	Ked	35	25	7.5	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-11	30.69673	-97.7043	SH	20	Kgt	20	20	1.5	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-12	30.70055	-97.7016	SH	20	Ked	8	8	1.5	--	0	--	--	C,F,O	30	50		x	x		Hillside
F-12A	30.70065	-97.70164	SC	20	Ked	1	0.5	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-13	30.69927	-97.70726	SH	20	Ked	20	6	2	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-14	30.69991	-97.70406	SF	20	Ked	3	0.5	1.5	N295W	0	--	--	C,F,O	15	35	x		x		Hillside
F-15	30.70863	-97.70583	SH	20	Ked	7	5	1.5	--	0	--	--	C,F,O	35	55		x	x		Hillside
F-16	30.70111	-97.70495	SC	20	Ked	3	2	1.5	--	0	--	--	C,F,O	15	35	x		x		Hillside
F-17	30.70078	-97.70264	C/SC	30	Ked	5	3	3	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-18	30.70118	-97.69934	SH/SC	20	Ked	5	5	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-19	30.7028	-97.69688	C/SH	30	Ked	30	25	3	--	0	--	--	C,F,O	45	75		x	x		Hillside
F-20	30.70318	-97.69697	SH/SC	20	Ked	20	20	3	--	0	--	--	C,F,O	30	50		x	x		Hillside
F-21	30.70379	-97.71244	SH	20	Ked	4	4	1	--	0	--	--	C,F,O	25	45		x	x		Hillside
F-22	30.70510	-97.71038	C/SH	30	Ked	60	50	2.5	--	0	--	--	C,F,O	40	70		x	x		Hillside
F-23	30.70491	-97.71087	SC	20	Ked	1.5	1	1.5	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-24	30.70429	-97.71169	SH	20	Ked	7	7	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-25	30.70399	-97.71223	SH/SF	20	Ked	8	8	1.5	N40E	10	--	--	C,F,O	20	50		x	x		Hillside
F-26	30.7047	-97.70947	SH/SC	20	Ked	7	5	7	--	0	--	--	C,F,O	40	60		x	x		Hillside
F-27	30.70450	-97.70913	C/SH	30	Ked	18	16	12	--	0	--	--	C,F,O	70	100		x		x	Streambed
F-28	30.70000	-97.70762	SH	20	Ked	6	6	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-29	30.70159	-97.7069	SC	20	Ked	2.5	0.5	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
F-30	30.70095	-97.70721	SC	20	Ked	1	1	1	--	0	--	--	C,F,O	5	25	x		x		Hillside
M-1	30.70598	-97.7004	MB	30	Ked	100	80	4	--	0	--	--	C,F,O	5	35	x		x		Hillside
M-2	30.70442	-97.7124	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-3	30.7046	-97.71195	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-4	30.70443	-97.7114	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-5	30.70477	-97.7105	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside
M-6	30.7045	-97.70972	MB	30	Ked	2	2	--	--	0	--	--	N	5	35	x		x		Hillside

* DATUM:____________________

2A TYP	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	Man-made 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: concrete and/or casing

12 TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

STATE OF TEXAS
James P. Killian
JAMES P. KILLIAN
GEOLOGY
No. 10281
LICENSED
PROFESSIONAL GEOSCIENTIST

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

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

Date: 27 May 2021

James P. Killian

Sheet 1 of 1

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

ATTACHMENT B
STRATIGRAPHIC COLUMN

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_05A_Strat

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)
Georgetown Formation (Kgt)	Edwards Aquifer	20
Edwards Formation (Ked)		120
Comanche Peak Limestone (Kc)		70
Walnut Formation (Kwa)	Confining Unit	175

Elevation (ft msl)	Depth (ft)
865	0
845	20
725	140
655	210
480	385

Note: Unit elevations and thicknesses given with respect to a ground surface elevation of 865 ft msl on the southern boundary of the subject site.

Horizon
Environmental Services, Inc.

JAMES P. KILLIAN
GEOLOGY
No. 10281

ATTACHMENT B

Stratigraphic Column
Lennar Georgetown Village
Georgetown, Williamson County, Texas

ATTACHMENT C
DESCRIPTION OF SITE GEOLOGY

Geologic information for the subject site obtained via literature review is provided in Attachment E, Supporting Information.

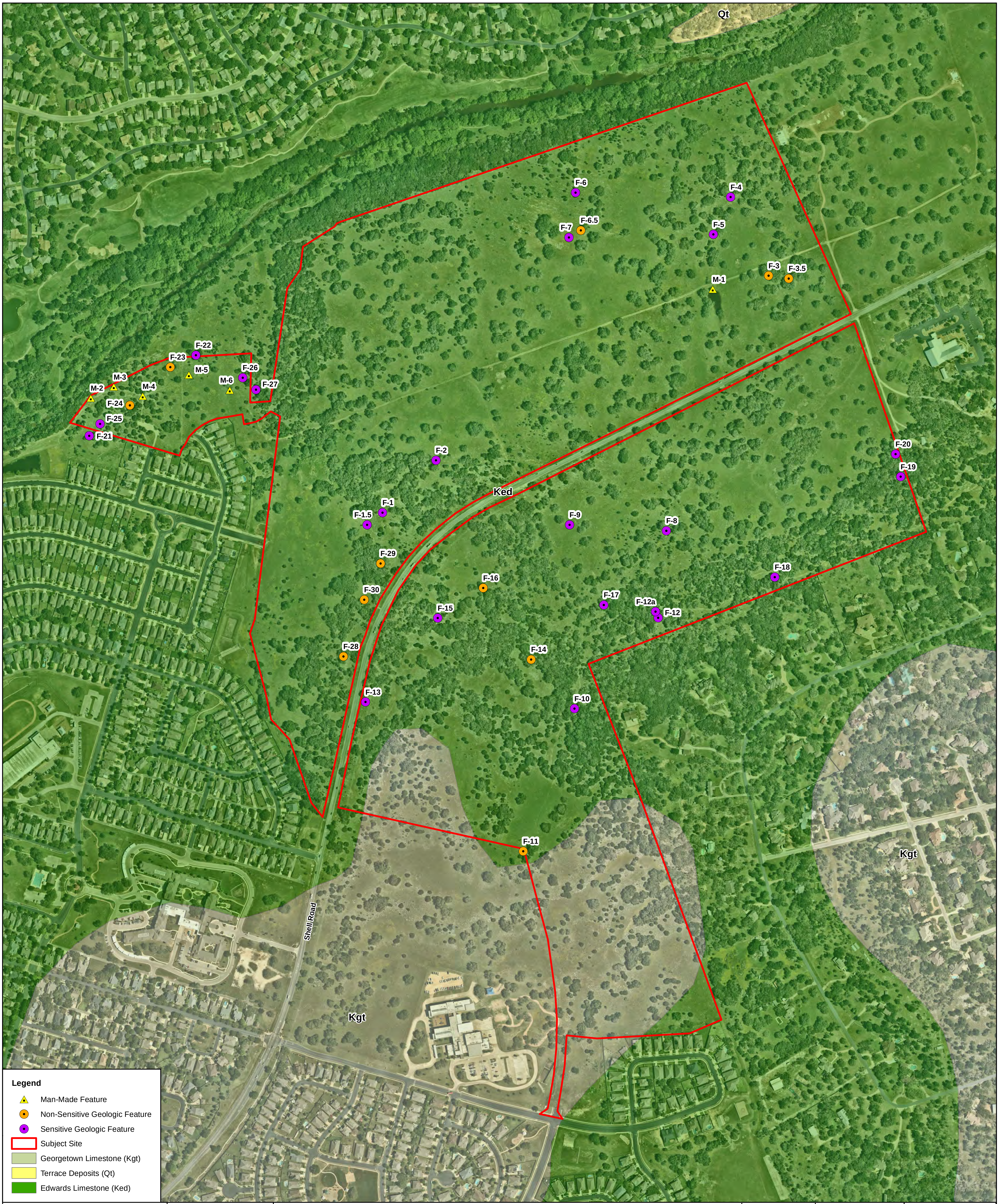
A geologic assessment of the approximately 308-acre Georgetown Village Tract was conducted pursuant to Texas rules for regulated activities on the Edwards Aquifer Recharge Zone (EARZ) (30 TAC 213). The subject site consists of undeveloped pastureland and rangeland located along both sides of Shell Road in Georgetown, Williamson County, Texas. Assessment findings were used to develop recommendations for site construction measures intended to be protective of water resources at the subject site and adjacent areas.

The entire subject site is located within the Edwards Aquifer Recharge Zone (EARZ) as defined by the Texas Commission on Environmental Quality (TCEQ). The EARZ occurs where surface water enters the subsurface through exposed limestone bedrock containing faults, fractures, sinkholes, and caves.

The subject site is predominantly underlain by the undifferentiated Edwards Limestone Formation (Ked) (UT-BEG, 1997) with an estimated maximum thickness of about 120 feet. Overlying the Edwards Formation is the Georgetown Formation, which crops out at higher elevations located in the southern portion of the subject site. The Georgetown Formation has an estimated maximum thickness of about 20 feet at the subject site.

A total of approximately 34 natural geologic features (F-1, F-1.5, F-2, F-3, F-3.5, F-4 to F-6, F-6.5, F-7 to F-12, F-12A, and F-13 to F-30) and 6 man-made features (M-1 to M-6) were identified at the subject site. Further information pertaining to the geologic and man-made features is presented in Attachments D, E, and F. Photographs of the geologic and man-made features are presented in Attachment G. Photographs of geologic features F-1 to F-20 are presented in the attached Cambrian Phase II Karst Survey report (Attachment H).

ATTACHMENT D
SITE GEOLOGIC MAP



Legend

- ▲ Man-Made Feature
- ● Non-Sensitive Geologic Feature
- ● Sensitive Geologic Feature
- ▭ Subject Site
- 🟩 Georgetown Limestone (Kgt)
- 🟨 Terrace Deposits (Qt)
- 🟩 Edwards Limestone (Ked)

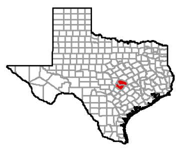
Horizon
Environmental Services, Inc.

Date:	04/15/2021
Drawn:	KRS
HJN NO:	21081.001 KS
Source:	Nearmap, 2021; USGS TWSC, 2014

Attachment D

Site Geologic Map
Lenner Georgetown Village
Georgetown, Williamson County, Texas

JAMES P. KILLIAN
GEOLOGY
No. 10291



N
0 200 400
Feet

21081--Lennar_Georgetown_Village\Graphics\21081-001GA_06A_SGM

ATTACHMENT E
SUPPORTING INFORMATION

1.0 INTRODUCTION AND METHODOLOGY

This report and any proposed abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 2005). This geologic assessment includes a review of the subject site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon Environmental Services, Inc. (Horizon) conducted the necessary field and literature studies according to TCEQ *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones* (TCEQ, 2004).

Horizon walked transects spaced 50 feet apart, mapped the locations of features using a sub-foot accurate Trimble Geo HX handheld GPS, and posted processed data utilizing GPS Pathfinder Office software, topographic maps, and aerial photographs. Horizon also searched the area around any potential recharge features encountered to look for additional features. When necessary, Horizon removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent while walking transects. However, labor-intensive excavation was not conducted during this assessment. Features that did not meet the TCEQ definition of a potential recharge feature (per TCEQ, 2004), such as surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report.

The results of this survey do not preclude the possibility of encountering subsurface voids or abandoned test or water wells during the clearing or construction phases of the proposed project. If a subsurface void is encountered during any phase of the project, work should be halted until the TCEQ (or appropriate agency) is contacted and a geologist can investigate the feature.

2.0 ENVIRONMENTAL SETTING

2.1 LOCATION AND GENERAL DESCRIPTION

The subject site consists of approximately 308 acres of mostly undeveloped pastureland and rangeland located along both sides of Shell Road in Georgetown, Williamson County, Texas (Attachment F, Figure 1) (Appendix F, Figure 1).

2.2 LAND USE

The subject site is currently undeveloped pastureland and rangeland used to raise beef cattle. Surrounding lands are generally used for agricultural and single-family residential and/or commercial retail purposes.

2.3 TOPOGRAPHY AND SURFACE WATER

The subject site is situated on gently to moderately sloping terrain that is located within the Berry Creek watershed (Attachment F, Figures 2 and 3). Surface elevations on the subject site vary from a minimum of approximately 765 feet above mean sea level (amsl) near the northeastern property corner adjacent to Berry Creek to a maximum of approximately 845 feet amsl near the southern property boundary along Bellaire Drive (USGS, 2019). Drainage on the site occurs primarily by overland sheet flow from south to north. Additionally, an unnamed tributary of Berry Creek bisects the eastern portion of the site, which drains from southwest to northeast into a small, man-made stock pond (M-1) and into Berry Creek. Berry Creek is located immediately north of the subject site and drains from west to east eventually into the San Gabriel River.

2.4 EDWARDS AQUIFER ZONE

The entire subject site is located within the Edwards Aquifer Recharge Zone (EARZ) (TCEQ, 2021) (Attachment F, Figure 2). The Recharge Zone is described as an area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a potential for recharge of surface waters into the Edwards Aquifer.

2.5 SURFACE SOILS

Four soil units are mapped within the subject site (NRCS, 2021) (Attachment F, Figure 4). Generally, the soil series are similar in their physical, chemical, and engineering properties, with the principal exception being rock fragment content and thickness. The soil units are described in further detail below.

Doss silty clay, 1 to 5% slopes (DoC): This is a gently sloping soil that occurs on uplands. Typically, this soil has a dark grayish-brown, silty clay surface layer about 9 inches thick. The subsoil, to 19 inches, is brown, silty clay loam. The underlying material is weakly cemented limy earth interbedded with fragments of limestone. This soil is calcareous and moderately alkaline. This soil is well-drained and has a low available water capacity. Permeability is moderately slow and runoff is medium. Erosion is a moderate hazard (Werchan and Coker, 1983).

Eckrant extremely stony clay, 0 to 3% slopes (EeB): Typically, this soil has an extremely stony, very dark gray, clay surface layer about 11 inches thick. The underlying material is indurated limestone. About 25% of the surface is covered with fragments of limestone; most are about 6 inches across, but range from 3 inches to 3 feet across and are as much as 10 inches thick. The soil is calcareous, moderately alkaline, and well-drained. Permeability is moderately slow and surface runoff is rapid. The fragments of limestone on the surface help to prevent erosion. The available water capacity is very low because of the shallowness of the soil and stones in the soil (Werchan and Coker, 1983).

Eckrant-Rock outcrop association, 1 to 10% slopes (ErE): This unit occurs along hills, ridges, and on sides of drainageways on uplands. This complex is made up of about 70% Eckrant soils, 15% Rock outcrop, and 15% other soils. Typically, the surface layer of Eckrant soils is calcareous, moderately alkaline, dark grayish-brown, extremely stony clay about 8 inches thick. The underlying material is fractured, indurated limestone. Fragments of limestone from 6 inches to 2 feet across cover about 35% of the surface. Rock outcrop consists of exposed limestone bedrock in narrow bands within areas of Eckrant soils. Loose cobbles and stones on the surface are common. Permeability is moderately slow and surface runoff is rapid. The available water capacity is very low (Werchan and Coker, 1983).

Georgetown stony clay loam, 1 to 3% slopes (GsB): This a gently sloping soil that occurs within central upland areas of the subject site. Typically, this soil has a slightly acidic, brown, stony clay loam surface layer about 7 inches thick, and few stones on or near the surface. The subsoil, which extends down to a depth of about 35 inches, is neutral, reddish-brown clay in the upper part and slightly acidic, reddish-brown, cobbly clay in the lower part. The underlying material is indurated, fractured limestone that has clay loam in crevices and fractures. This soil is well-drained. Permeability is slow and surface runoff is medium. The available water capacity is low. Reaction is neutral to slightly acidic and erosion is a slight hazard (Werchan and Coker, 1983).

2.6 WATER WELLS

A review of TCEQ and Texas Water Development Board (TWDB) records revealed 1 water well (No. 5819406) on the subject site and 17 wells within 0.5 miles of the subject site (TCEQ, 2021; TWDB, 2021). According to the TWDB records, the on-site well is completed within the Trinity Aquifer with no depth reported; however, this well was not found during the site survey and may no longer exist. Most of the off-site wells are reportedly completed within the Trinity Aquifer at total depths ranging from 800 to 970 feet below surface grade. Some of the off-site wells (Nos. 5819103, 390356, 439815, 439817, and 410122) are reportedly completed within the Edwards Aquifer at total depths ranging from 140 to 200 feet below surface grade. Horizon observed no wells on the subject site.

The results of this assessment do not preclude the existence of undocumented/abandoned wells on the site. If a water well or casing is encountered during construction, work should be halted near the feature until the TCEQ is contacted.

2.7 GEOLOGY

Literature Review

A review of existing literature shows most of the subject site is underlain by the undifferentiated Edwards Limestone Formation (Ked) (UT-BEG, 1997), with an estimated maximum thickness of about 120 feet. The Edwards Formation consists mostly of gray to light brownish-gray, thin to medium-bedded, dense dolomite, dolomitic limestone, and limestone.

Overlying the Edwards is the Georgetown Formation, which crops out in higher elevated areas located in the southern portion of the subject site. It generally consists of limestone and marl with an estimated maximum thickness of about 20 feet. The limestone is fine-grained, argillaceous, nodular, moderately indurated, and light gray; some limestone is hard, brittle, thickbedded, and white. Marine megafossils include *Kingena wacoensis* and *Gryphaea washitaensis* (UT-BEG, 1995).

The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

The subject site is located within the Balcones Fault Zone. Available geologic reports indicate the nearest mapped fault is located approximately 2 miles to the northeast (UT-BEG, 1995). In general, the rock strata beneath the site dip to the east-southeast at about 10 to 30 feet per mile (less than 1°). The site Stratigraphic Column is provided as Attachment B, and the Site Geologic Map is Attachment D.

Field Assessment

Please see Attachment C for a narrative description of geology observed on the subject site. The Site Geologic Map is provided as Attachment D. Horizon observed 34 naturally occurring geologic features (F-1, F-1.5, F-2, F-3, F-3.5, F-4 to F-6, F-6.5, F-7 to F-12, F-12A, and F-13 to F-30) and 6 man-made features (M-1 to M-6) on the subject site that meet the TCEQ definition of a potential recharge feature. No springs or spring runs were identified at the subject site.

It is of note that the entrance to Bat Well Cave is located off-site within an unnamed tributary of Berry Creek that runs along the northwestern side of the subject site. However, part of this cave's mapped footprint extends beneath the subject site toward the southeast and northwest for approximately 300 feet.

Geologic features identified on the subject site are described as follows:

Geologic Feature F-1: Originally described as a large upland sinkhole located in an open area immediately west of subject site boundary. The feature measures approximately 20 feet in diameter by (x) 1.5 feet deep, with several small drainage portal openings among large rocks and cobbles near the center, in an area measuring about 6 feet long x 3 feet wide x 3 feet deep. Moderate to high air flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential cave, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian Environmental (Cambrian) excavated this feature (17 feet long x 10.5 feet wide x 5.5 feet deep) using a backhoe and classified the feature as a cave that measures 250 feet long x 170 feet wide (see attached Phase II Karst Survey [KS] report by Cambrian). The cave entrance measures approximately 4 feet long x 0.5 to 1 foot high. The cave trends along a N55W rock joint fracture. When Horizon conducted the most recent geologic assessment, the cave had been filled in with material due to the improper placement of excavated spoil piles immediately upslope of the cave entrance. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-1.5: This feature was discovered by Cambrian during their Phase II KS. It was originally described as being a small solution cavity measuring approximately 1 foot in diameter x 8 inches deep. Sometime between June and August 2017, Cambrian conducted excavation of the feature using a backhoe (10.5 feet long x 7 feet wide x 3 feet deep). The feature was determined to have slight air flow conductivity at the opening. The feature has an intermediate infiltration rate and surface runoff catchment of less than 0.4 acres.

Geologic Feature F-2: Upland sinkhole measuring approximately 10 feet in diameter x 1 foot deep that funnels into an area near its center that had several small drainage portal openings among loose rocks. High to very high air flow conductivity was noted at all of the openings. After limited hand excavation, the drainage portal area was enlarged and measured about 2 feet in diameter x 3 feet deep among more loose rocks/cobbles. A bedrock headwall was observed about 4 feet below the surface with additional void space of unknown extent below. Based on the presence of air flow conductivity, well-defined drainage portal openings, and apparent void space, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June and August 2017, Cambrian excavated the feature with hand tools (2 feet long x 1.5 feet wide x 4 feet deep) and deemed the feature to be a cave with a 15-foot-diameter footprint extending to the east of the entrance. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-3: Upland sinkhole measuring approximately 10 feet in diameter x 1 foot deep, with small (<2 inches), semi-open drainage portals among loose to firm clayey soil infilling. Very slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 2 feet below the surface. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-3.5: This feature was discovered by Cambrian during their Phase II KS (originally labeled as F-3, now F-3.5 by Horizon). It was originally described as an upland sinkhole located approximately 100 feet southeast of F-3. Sometime between June and August 2017, Cambrian excavated the feature with a backhoe (17.5 feet long x 6.5 feet wide x 4 feet deep) and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-4: Solution cavity/solution enlarged fracture (azimuth: N280W) measuring approximately 3 feet long x 2 feet wide x 4.5 feet deep, with loose soil and rock infilling. Moderate air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 6 feet below the surface. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (3 feet long x 2.5 feet wide x 3 feet deep) until bedrock was encountered. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-5: Large upland sinkhole located within an unnamed tributary of Berry Creek. The feature measures approximately 20 feet long x 15 feet wide x 3 feet deep, with several small drainage portal openings among loose rocks and cobbles near the center. High air flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (3.5 feet long x 3.5 feet wide x 4 feet deep) and determined the feature was a solution cavity. Horizon staff investigated the feature further and noted a bedding plane at the bottom of the feature that extends at least 10 feet to the south where it appeared to drop down. Horizon did not agree with Cambrian's findings; in Horizon's opinion, this feature should have been considered a potential cave until subsequent mechanical excavation could prove otherwise. Horizon staff excavated the feature on 11 May 2021 using a backhoe with hoe ram attachment and finished on 14 May 2021. Excavation dimensions measured approximately 30 feet long x 16 feet wide x 1.5 feet deep. Most of the excavated area containing no portals and/or voids was filled back in with rock to reduce the hazard risk to livestock on the site. The deeper end of the excavation measures approximately 12.5 feet long x 8 feet wide x 8 feet deep. Near the floor of the excavation, the feature opens into an extensive, low (<3 feet high) horizontal bedding plane void that extends from northwest to southeast for approximately 56 feet. This feature was classified as a **cave** based on it being a natural underground open space formed by the dissolution of limestone that is large enough for an average-sized person to enter. Horizon staff began hand excavation and exploring the cave on 13 May 2021. After checking/hand-digging all possible leads, the primary drain for surface water runoff was determined to be located underneath a headwall at the northern end of the cave (~9 feet northeast of survey station no. 4). However, the drainage area lacked air flow conductivity and was too low to continue to pursue. During heavy rain recharge events, water flows into a secondary drain located along the northwestern end of the cave (near survey station no. 9). This drainage area also lacked air flow conductivity and was too low to pursue. The floor of the feature was composed of small to large breakdown pieces that are partially covered with clay and soils that have washed out. Of note, the floor and ceilings of the cave were covered with loose organic material such as twigs, leaves, and soils, indicating that the entire cave floods during heavy rainfall events. Horizon staff surveyed and mapped the cave, which has been officially named **Diluvio Cave** for identification purposes, on 20 May 2021. The footprint of the cave trends from northwest to southeast from the entrance of the cave. The cave is approximately 56 feet long (northwest to southeast) and 50 feet from north to south at the widest section of the cave (near survey stations nos. 1 and 4). Most of the cave is approximately 25 feet wide. Interior ceiling heights in the cave range from less than 0.5 feet to 3 feet. This cave is a significant recharge feature with a high infiltration rate and an apparent surface runoff catchment of greater than 1.6 acres due to its location within an extensive, unnamed drainage tributary of Berry Creek.

Geologic feature F-6: Large upland sinkhole located in an open area measuring about 35 feet long x 30 feet wide x 5 feet deep, with several boulders and large rocks apparently placed into the deeper recessed portions. Numerous drainage portals of various sizes are located throughout the rock debris. Slight to moderate air flow conductivity was noted at the openings. Based on the feature's overall size, the apparent placement of large rocks, the presence of air flow conductivity, and numerous drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential

cave, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature using a backhoe (20 feet long x 7 feet wide in the middle and 12.5 feet wide at the edge of the feature x 10 feet deep) and deemed the feature to be a **cave**. The cave is a single bedding plane room that extends 25 feet from southwest to northeast and 17.5 feet long from north to south. The bedding plane is approximately 1 to 1.5 feet high throughout the room. One small drain was noted in the easternmost corner past a humanly impassable passage. Numerous excavated spoil piles and large rocks are located around the cave entrance. This feature has a high infiltration rate and an apparent surface runoff catchment less than 1 acre.

Geologic Feature F-6.5: This feature was discovered by Cambrian during their Phase II KS. It was originally described as being a solution cavity measuring approximately 1.5 feet long x 0.6 feet wide x 0.5 to 1 foot deep with a rock joint fracture (azimuth: N10W). This feature is located approximately 50 feet northeast of F-7. Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (26 feet long x 16.5 feet wide x 4 feet deep). However, upon recent inspection by Horizon, no portals and/or voids were observed in the floor or the walls of the excavated feature. In addition, spoil piles from mechanical excavation were left upslope of the feature. This feature has a very low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-7: Small upland sinkhole measuring approximately 7 feet in diameter x 1 foot deep, with an open drainage portal about 0.5 feet in diameter x 1 foot deep near the center. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered a solution-enlarged fracture about 3 feet below the surface measuring 2.5 feet long x 1 foot wide x 5.5 feet deep (azimuth: N330°W). Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (12.5 feet long x 11 feet wide x 1.5 feet deep) in a T shape. The main drainage portal near the center of the excavation measures 1.5 feet in diameter and 4.5 feet deep. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-8: Upland sinkhole located in an open pasture area that appears to have been chained and/or bulldozed many (>50) years ago. The feature measures approximately 12 feet long x 10 feet wide x 2.5 feet deep, and funnels to a semi-open area about 3 feet long x 1.5 feet wide x 3.5 feet deep, with several drainage portal openings of various sizes among rocks and cobbles. This feature appears to have been partially filled with disturbed rock and soil material, possibly during past chaining/bulldozing. Slight to moderate air flow conductivity was noted at all of the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity, the apparent placement of fill material, and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian conducted mechanical excavation of the feature using a backhoe (13 feet long x 7 feet wide x 5.5 feet deep) and deemed the feature to be a cave. However, upon further investigation by Horizon, this feature lacks sufficient human-navigable passage to be considered a cave by Texas Speleological Survey (TSS) standards. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-9: Upland sinkhole located in an open area that measures approximately 20 feet long x 15 feet wide x 2.5 feet deep. This feature appears to have been partially filled with large rocks and/or soil debris, possibly during past chaining/bulldozing. Several drainage portal openings of various sizes occur among the fill material. Slight to moderate air flow conductivity was noted at all the openings. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 4 feet below the surface. Based on the presence of air flow conductivity, the apparent placement of fill material, and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (19 feet long x 15 feet wide x 6 feet deep) and deemed the feature to be a **cave**. The subsurface passage is a single room approximately 15 feet in diameter that extends to the south from the excavated entrance. This feature has a high infiltration rate and an apparent surface runoff catchment of less than 1 acre.

Geologic Feature F-10: Large upland sinkhole measuring approximately 35 feet long x 25 feet wide x 7.5 feet deep, with an exposed vertical rock headwall along the western side of the sink. Several hackberry trees are growing inside this sinkhole. An open drainage portal about 2.5 feet long x 1.5 feet wide x 2 feet deep was found along the southwestern corner of the sink floor next to the headwall. Moderate air flow conductivity was noted at the opening. After limited hand excavation, this opening was enlarged, and void space large enough to enter could be seen to the left, trending from northeast to southwest. After crawling down through the opening, a larger void passage was encountered that measured about 35 feet long x 10 to 12 feet wide x 3 to 8 feet high. Several internal open drains were observed along the floor at the lowest points of the void passage. In addition, cave crickets and a few tricolored bats (formerly known as eastern pipistrelle) were observed inside the void passage. This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian explored the cave during their Phase II KS and noted that the cave is 25 feet long and 10 feet wide extending from the sinkhole rim to the southwest. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre.

Geologic Feature F-11: Potential upland sinkhole measuring approximately 20 feet in diameter x 1.5 feet deep, with several thin, flat rocks and soil debris apparently placed into the feature. No drainage portals or air flow conductivity were identified in the feature. Somewhere between June to August of 2017, Cambrian excavated the feature using hand tools and deemed the feature to be non-sensitive. Cambrian noted this feature was likely due previous land clearing activities. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acres.

Geologic Feature F-12: Upland sinkhole located in wooded area measuring approximately 8 feet in diameter x 1.5 feet deep that had several medium-sized rocks placed near its center. Numerous small drainage portals were found among the rocks, and high air flow conductivity was noted at all the openings. After limited hand excavation, a solution cavity about 4.5 feet long x 2 feet wide x 4 feet deep, with small drainage portal openings along 2 sides, was exposed. Based on the presence of air flow conductivity and well-defined drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June to August of 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be sensitive but not a cave. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-12A: Small semi-open solution cavity located approximately 20 feet northwest of feature F-12, measuring approximately 1 feet long x 0.5 feet wide x 1 foot deep, with loose soil and rock infilling. Slight to moderate air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Somewhere between June to August of 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be sensitive but not a cave. This feature has a low to intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-13: Upland sinkhole measuring approximately 20 feet long x 6 feet wide x 2 feet deep, with 2 small (<2 inches) semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling. This feature appears to be partially filled with small rock and/or soil debris. Slight air flow conductivity was noted at the portal openings. After limited hand excavation, probing with a steel rod encountered loose soil, small rocks and/or cobbles about 3 feet below the surface. Somewhere between June to August of 2017, Cambrian mechanically excavated the feature using a backhoe (16.5 feet long x 4 to 11 feet wide x 7.5 feet deep) and deemed this feature to be a cave filled with soil. However, Horizon investigated the feature further and determined the feature is an upland sinkhole that lacks sufficient human- navigable passage to be considered a cave by TSS standards. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-14: Solution-enlarged fracture measuring approximately 3 feet long x 0.5 feet wide x 1.5 feet deep (azimuth: N295°W), with apparent semi-open drainage portals and slight air flow conductivity. After limited hand excavation, probing with a steel rod encountered loose clay and cobbles about 2.5 feet below the surface. Sometime between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-15: Small upland sinkhole measuring approximately 7 feet long x 5 feet wide x 1.5 feet deep that funnels into an open drainage portal about 1 foot long x 0.5 feet wide x 1 foot deep among loose rocks. High air flow conductivity was noted at the opening. After limited hand excavation, the drainage portal area was enlarged, and measured about 2 feet in diameter x 1.5 feet deep, narrowing for another 0.5 feet below before widening again with additional void space below of unknown extent. Based on the presence of air flow conductivity, well-defined drainage portal openings, and apparent void space, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (10 feet long x 4 to 8 feet wide x 3 feet deep) and deemed the feature to be sensitive but not a cave. The opening on the surface extends horizontally beneath a bedding plane for approximately 4 feet. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic Feature F-16: Solution cavity measuring approximately 3 feet long x 2 feet wide x 1.5 feet deep with loose soil infilling. The feature undercuts toward the north about 1 foot high and 2 feet long with an apparent animal burrow. Slight air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (12 feet long x 10 feet wide x 2 feet deep) and deemed the feature to be non-sensitive. No open portals and/or voids were found in the floor of the feature. This feature has a low infiltration rate and an apparent surface runoff catchment of less than 0.1 acre.

Geologic Feature F-17: Small drainage portal opening (0.5 feet in diameter) within the top of an underlying solution cavity measuring about 5 feet long x 3 feet wide x 3 feet high, with a dark grayish-brown soil and rock floor. Moderate to high air flow conductivity was noted at the opening. After limited hand excavation, the hole was widened (to 2.5 feet long x 1.5 feet wide), revealing additional void horizontal passages surrounding the cavity in all directions. After entering the cavity, a low (3 feet down to 1 foot high) bedding plane void passage continued toward the northwest, east, and southeast for about 6 to 8 feet from the surface opening. Another apparent bedding plane void area could be seen (though not entered without enlargement) to the south/southeast through an opening (2 feet wide x 1 foot high) along the southwestern side wall that drops into another passage (3 feet high x 4 feet wide, with an unknown length). This feature meets the requirements to be classified as a **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Somewhere between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be a cave. The cave consists of 2 low and wide rooms that extend a total of 25 feet to the south. This cave has a very high infiltration rate and a surface runoff catchment of less than 1 acre.

Geologic Feature F-18: Small upland sinkhole measuring approximately 5 feet in diameter x 1 foot deep that funnels into an open drainage portal about 0.5 feet in diameter x 1 foot deep among loose rocks and soil. Moderate to high air flow conductivity was noted at the opening. After limited hand excavation, probing with a steel rod encountered loose small rocks and/or cobbles about 2 feet below the surface. Based on the presence of air flow conductivity and a well-defined drainage portal opening, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature by hand (7 feet long x 2.5 to 4 feet wide x 3 feet deep) during their Phase II KS and deemed this feature to be a solution cavity but not a cave. This feature has a low to intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-19: Large upland sinkhole measuring about 30 feet long x 25 feet wide x 3 feet deep, with multiple drainage portal openings among rocks, cobbles, and loose soil. Moderate to high air flow conductivity was noted at the openings. Based on the feature's overall size, the presence of air flow conductivity, and numerous drainage portal openings, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian mechanically excavated the feature using a backhoe (14 feet long x 8.5 feet wide x 7 feet deep) and deemed the feature to be a cave. The cave was noted to be approximately 40 feet in diameter with a maximum depth of 20 feet below the surface. During Horizon's subsequent site investigation, the cave entrance had been filled in with material from improperly placed spoil piles immediately upslope of the excavation. This feature has a high infiltration rate and an apparent surface runoff catchment less than 1 acre.

Geologic feature F-20: Upland sinkhole measuring about 20 feet in diameter x 3 feet deep, with a small drainage portal opening among rocks, leaves, and loose soil. Moderate to high air flow conductivity was noted at the openings. Based on the feature's overall size, the presence of air flow conductivity, and an open drainage portal, the potential for additional subgrade passage is very probable. This feature meets the requirements to be classified as a potential **cave**, based on it being a natural underground open space formed by dissolution of limestone that is large enough for an average-sized person to enter. Sometime between June and August 2017, Cambrian excavated the feature by hand during their Phase II KS and deemed the feature to be a solution cavity but not a cave. Horizon staff further investigated the feature and determined that the feature is an upland sinkhole with a solution cavity drainage portal. This feature has an intermediate infiltration rate and an apparent surface runoff catchment less than 0.4 acres.

Geologic feature F-21: Small upland sinkhole measuring approximately 4 feet in diameter x 1 foot deep with a solution cavity drainage portal among rocks, leaves, and loose soil near the center of the sink. The drainage portal measures 1 foot in diameter x 3.5 feet deep and was noted to have slight air flow conductivity at the opening. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-22: Large upland sinkhole measuring approximately 60 feet long x 50 feet wide x 2.5 feet deep. Multiple drainage portals among rocks and loose soil were found near the center of the sink, with the largest portal being approximately 3 feet long x 1.5 feet wide x 2 feet deep. The feature was noted to have slight to moderate air flow conductivity near the opening. Horizon staff began excavation of the feature on 14 May 2021 using a backhoe with hoe ram attachment and finished on 18 May 2021. Excavation dimensions measure approximately 16 feet long x 13 feet wide x 9.5 feet deep. The main entrance excavation measures approximately 11 feet long x 6.5 feet wide x 9.5 feet deep. Approximately 5 feet below the surface is a low bedding plane that wraps around the feature from the southeast to the northeast. This feature was classified as a **cave** based on it being a natural underground open space formed by the dissolution of limestone that is large enough for an average-sized person to enter. Horizon staff began hand excavation and exploration of the cave on 18 May 2021. After checking/hand-digging all possible leads, the primary drain for surface water runoff was determined to be located at the southern end of the cave (approximately ~8.5 feet southeast from survey station no. 0) toward Bat Well Cave. The drainage portal lacked air flow conductivity and has been massively filled with clay, dirt, and loose soils. It is of note that the cave is approximately 50 feet from the footprint of Bat Well Cave and trending in line with the previously discovered cave. It is possible that the drainage portal to the southeast could lead to Bat Well Cave but has been massively filled with clay, dirt, and loose soils. A secondary drain was discovered in the northernmost portion of the cave; however, the drainage area lacked air flow conductivity and was too low to continue to pursue. The floor of the feature was covered with thick layers of loose soil/clay that have been washed into the sink for many years. Horizon staff surveyed and mapped the cave, which has been officially named **Bat Well Sink Cave** for identification purposes, on 19 May 2021. The total footprint of the cave trends northwest to southeast from the entrance of the cave. The cave is approximately 38 feet long (from northwest to southeast) and 23 feet from northeast to southwest at the widest section of the cave (near survey stations nos. 3, 4, 5 and 2A). Most of the cave is approximately 10 feet wide. Interior ceiling heights in the cave range from less than 0.5 feet to 3 feet. This feature has an intermediate infiltration rate and a surface runoff catchment of less than 1 acre. Of note, this cave is located approximately 50 feet from the footprint of Bat Well Cave and trending in line with the previously discovered cave. It is therefore possible that Bat Well Sink Cave may be connected and/or provide additional recharge input into Bat Well Cave.

Geologic feature F-23: Small solution cavity measuring approximately 1.5 feet long x 1 foot wide x 1.5 feet deep. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 9.5 feet long x 6.5 feet wide x 2.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-24: Small upland sinkhole measuring approximately 7 feet in diameter x 1 foot deep. One small, semi-open drainage portal was found near the center of the sink among rocks and loose soils. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 10.5 feet long x 10 feet wide x 1.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-25: Small upland sinkhole measuring approximately 8 feet long x 1.5 feet deep. Near the center of the sink is a solution-enlarged fracture (azimuth: N40E) that is approximately 4 feet long x 0.5 feet wide x 3 feet deep. During the initial site investigation, the feature was noted to have slight air flow conductivity. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-26: Small upland sinkhole measuring approximately 7 feet long x 5 feet wide x 1.5 feet deep. Near the center of the sink is a rock-choked solution cavity that is 1 foot in diameter x 7 feet deep. During the initial site investigation, the feature was noted to have moderate to high air flow conductivity. Based on the presence of air flow conductivity, the potential for additional subgrade passage is very probable. The characteristics of the feature meet the requirements to be classified as a potential **cave**. Of note, this feature is located directly over the footprint of Bat Well Cave and is most likely connected and/or provides additional recharge input to this cave. This feature has an intermediate infiltration rate and an apparent surface runoff catchment of less than 0.4 acres.

Geologic feature F-27: Historically known cave located off of the subject site. This cave is gated off and located within an unnamed tributary of Berry Creek. The cave was mapped and surveyed in May 1962 by Richard Finch, B. Wall, G. Davis, and D. Lemons of the Southwestern Speleological Society and officially named **Bat Well Cave.** Additionally, this cave was resurveyed and mapped in 1992 by Bill Russell and Jon Hunter (see attached cave map). The total surveyed passage of the cave is 1080 feet from northwest to southeast. The northwestern portion reportedly contained one of the larger bat colonies in Williamson County and was previously used for mining guano in 1909. The northwestern and southeastern portions of the cave footprint extend into the subject site boundaries. This cave is a significant recharge feature with a very high infiltration rate and an apparent surface runoff catchment of greater than 1.6 acres due to its location within an extensive unnamed tributary of Berry Creek

Geologic feature F-28: Small upland sinkhole measuring approximately 6 feet in diameter x 1 foot deep. Near the center of the sink, among rocks and loose soils, is a solution cavity that measures approximately 2 feet long x 0.8 feet wide x 1 foot deep. During the initial site investigation, slight air flow conductivity was noted at the opening. Horizon staff excavated the feature on 19 May 2021 using a backhoe with hoe ram attachment. The excavation measures approximately 8 feet long x 5 feet wide x 3 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-29: Small solution cavity measuring approximately 2.5 feet long x 0.5 feet wide x 1 foot deep. During the initial site investigation, the feature was noted to have very slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 8 feet long x 6 feet wide x 3.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Geologic feature F-30: Small solution cavity measuring approximately 1 foot in diameter x 1 foot deep. During the initial site investigation, the feature was noted to have slight air flow conductivity. Horizon staff excavated the feature on 18 May 2021 using a backhoe with hoe ram attachment. The excavation measured approximately 4 feet long x 3 feet wide x 1.5 feet deep where it hits a bedrock floor. After mechanical excavation, Horizon probed the floor of the feature with a steel rod; however, no portals and/or voids were discovered in the floor or the walls of the feature. This feature has a very low infiltration rate and a surface runoff catchment of less than 0.1 acre.

Man-made features identified on the subject site are described as follows:

Man-made feature M-1: Dry man-made stock pond measuring approximately 98 feet long x 68 feet wide x 5 feet deep. The pond has a clay-lined floor and no portals and/or voids were observed in the floor of the feature.

Man-made features M-2 to M-6: City of Georgetown sanitary sewer manholes measuring approximately 3 feet in diameter. No leaks were noticed surrounding these features. The sanitary sewer appears to be in good working condition.

3.0 CONCLUSIONS AND RECOMMENDATIONS

Twenty-three geologic features (F-1, F-1.5, F-2, F-4, F-5, F-6, F-7, F-8, F-9, F-10, F-12, F-12A, F-13, F-15, F-17, F-18, F-19, F-20, F-21, F-22, F-25, F-26, and F-27) have been evaluated as sensitive for groundwater recharge capability and would therefore require a TCEQ protective setback buffer. In general, a protective buffer encompassing a sensitive feature is recommended to meet the TCEQ guidance for a setback of at least 50 feet in all directions from the feature's areal extent (perimeter), plus its watershed catchment up to 200 feet from the perimeter of the feature. However, larger protective buffers for 10 of these features (F-1, F-2, F-5, F-6, F-9, F-10, F-17, F-19, F-22, and F-27) are recommended to meet the TCEQ guidance for setbacks of caves with mapped subsurface footprints. Caves with a known subsurface footprint (i.e., surveyed/mapped) include a protective buffer zone extending an additional 50 feet in all directions from the footprint, plus the cave's watershed catchment up to 200 feet from the footprint.

Eleven geologic features (F-3, F-3.5, F-6.5, F-11, F-14, F-16, F-23, F-24, F-28, F-29 and F-30) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers. No further action is recommended for these non-sensitive geologic features. In addition, the man-made features on the site (M-1, M-2, M-3, M-4, M-5, and M-6) have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers.

Most of the site generally appears well-suited to development prospectuses. It should be noted that soil and drainage erosion would increase with ground disturbance. Native grasses and the cobbly content of the soil aid to prevent erosion. Soil and sedimentation fencing should be placed in all appropriate areas prior to any site disturbing activities.

Because the subject site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. If any subsurface voids are encountered during site development, work should halt immediately so that a geologist may assess the potential for the void(s) to provide meaningful contribution to the Edwards Aquifer.

4.0 REFERENCES

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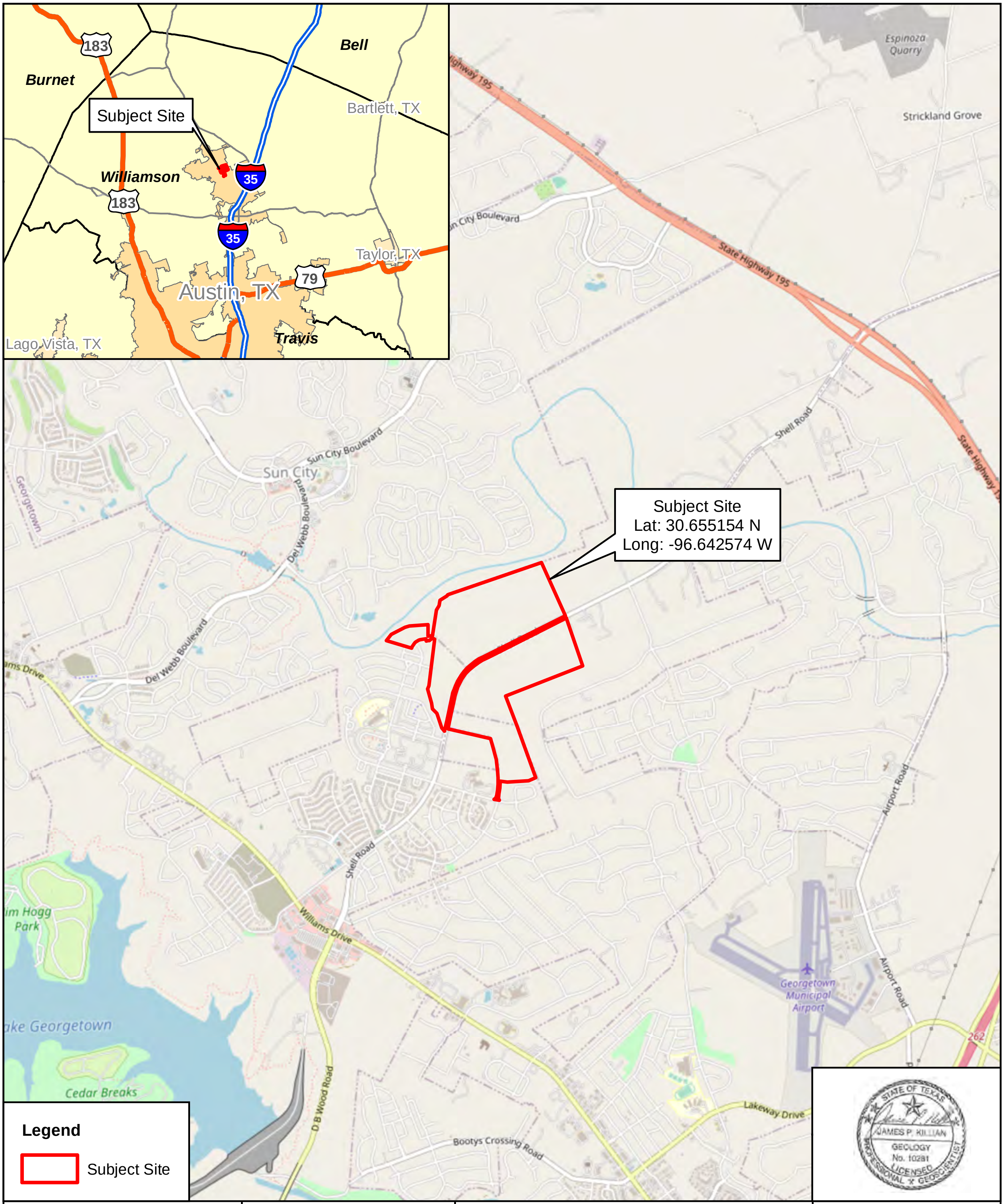
Werchan, L. E., and J. L. Coker. Soil survey of Williamson County, Texas. US Department of Agriculture, Natural Resources Conservation Service (formerly Soil Conservation Service), in cooperation with the Texas Agricultural Experiment Station. 1983.

ATTACHMENT F

ADDITIONAL SITE MAPS



Subject Site
Lat: 30.655154 N
Long: -96.642574 W

JAMES P. KILLIAN
GEOLOGY
No. 10281

Horizon
Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	OSM, 2021

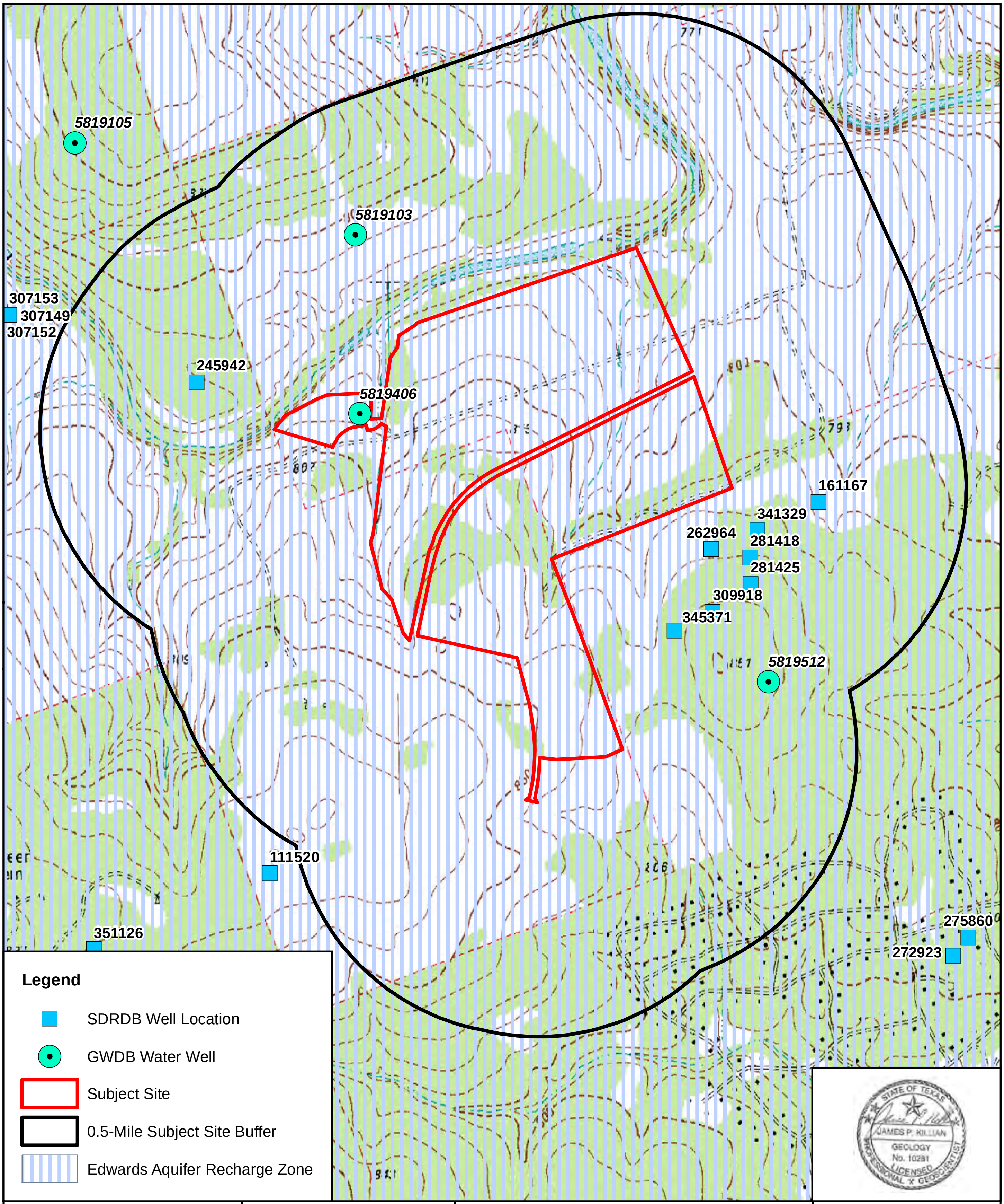
Attachment F, Figure 1

Vicinity Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

N

0 1,750 3,500
Feet

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_01A_Vicinity.mxd



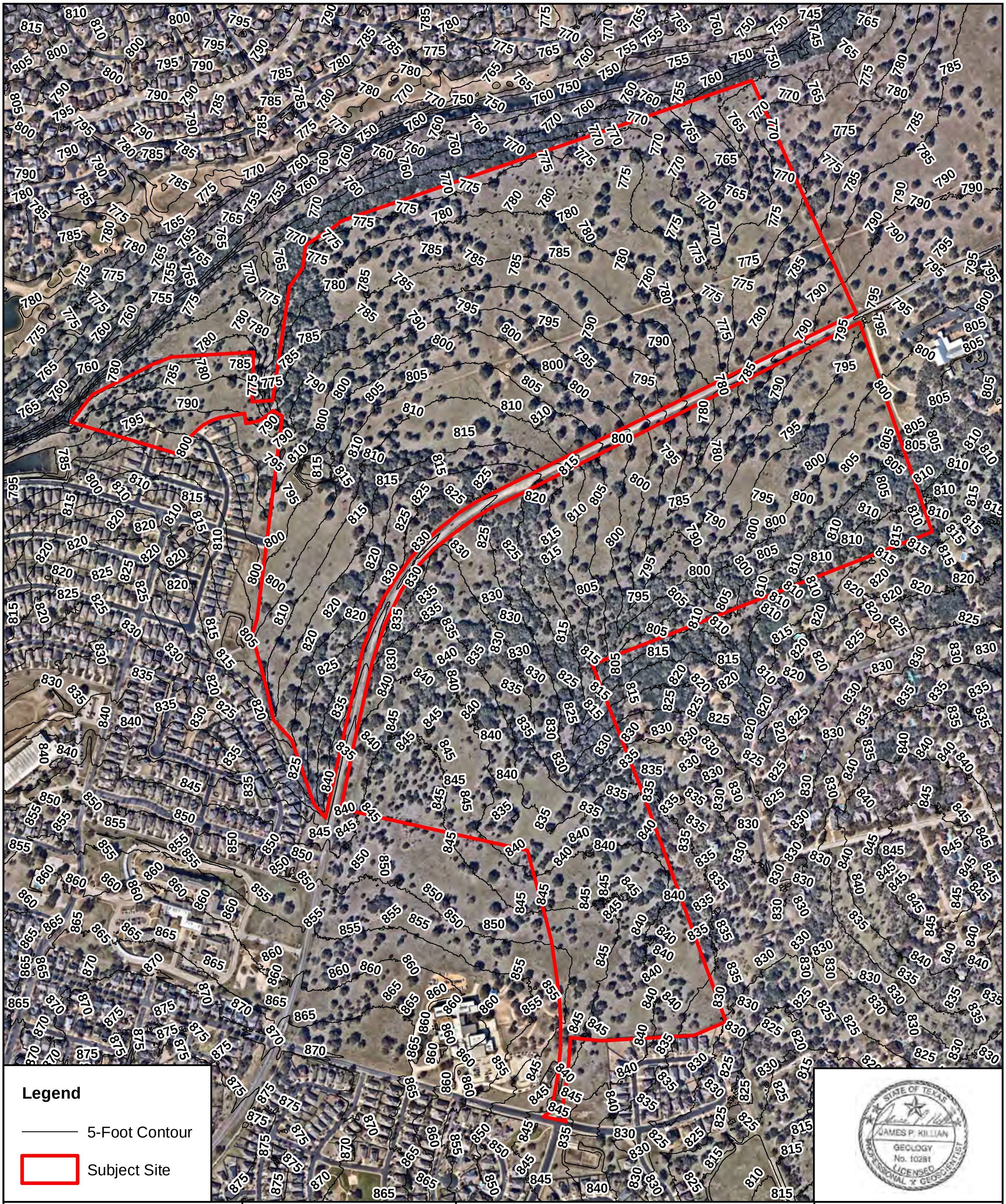
Horizon
Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	TCEQ, 2021; TWDB, 2021; USGS, 1995

Attachment F, Figure 2

Topography and Hydrogeology Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_02A_Topo_Hydro.mxd

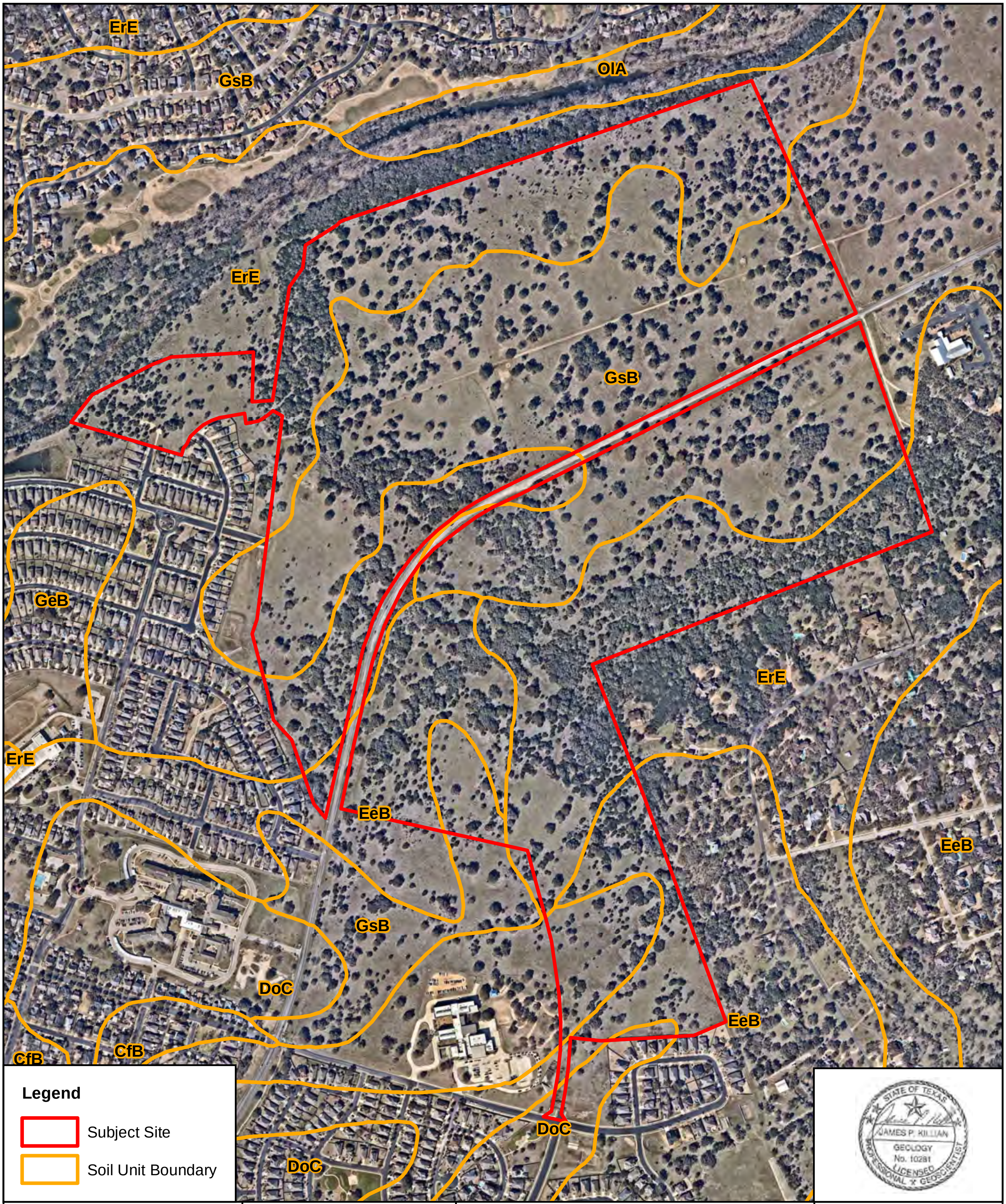


Horizon
Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	CAPCOG, 2015; Nearmap, 2021

Attachment F, Figure 3

Site Topography Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas



JAMES P. KILLIAN
GEOLOGY
No. 10281

Horizon Environmental Services, Inc.

Date:	04/23/2021
Drawn:	KRS
HJN NO:	21081.001 GA
Source:	Nearmap, 2021; NRCS, 2019

Attachment F, Figure 4

Site Soil Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

N

0 400 800
Feet

2021\21081--Lennar_Georgetown_Village\Graphics\21081-001GA_04A_Soil.mxd

Legend

▲	Man-Made Feature	🟥	Subject Site
●	Non-Sensitive Geologic Feature	▭	Cave Footprint
●	Sensitive Geologic Feature	▭	Sinkhole
●	Sensitive Cave Feature	▨	TCEQ Buffer Area
—	5-Foot Contour		

Horizon
Environmental Services, Inc.

Date:	04/15/2021
Drawn:	KRS
HJN NO:	21081.001 KS
Source:	CAPCOG, 2015; Nearmap, 2021

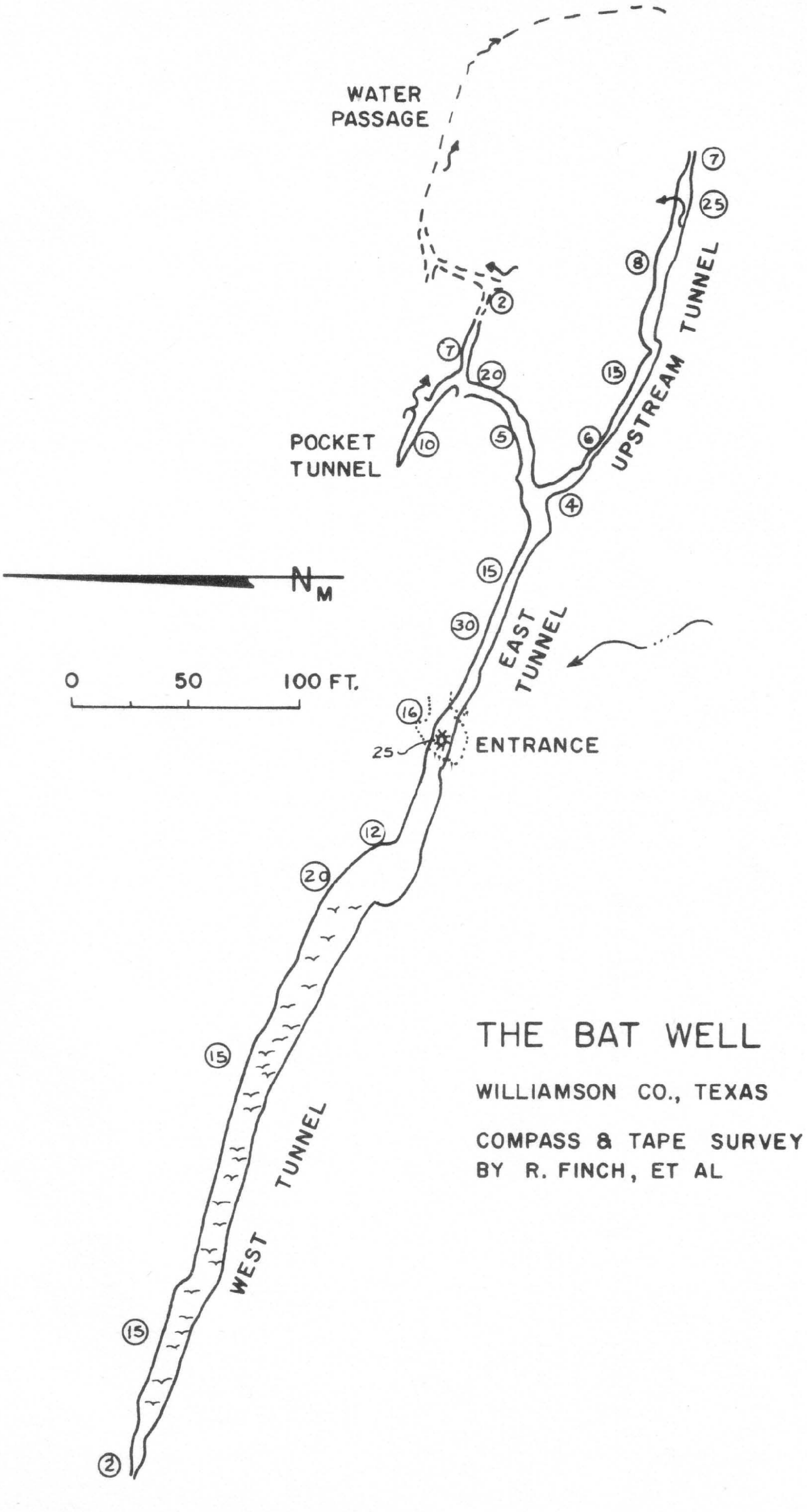
Attachment F, Figure 5

Geologic Feature Buffer Map
Lennar Georgetown Village
Georgetown, Williamson County, Texas

JAMES P. KILLIAN
GEOLOGY
No. 10391

0 200 400
Feet

21081--Lennar_Georgetown_Village\Graphics\21081-001GA_07A_Buffer_DRAFT

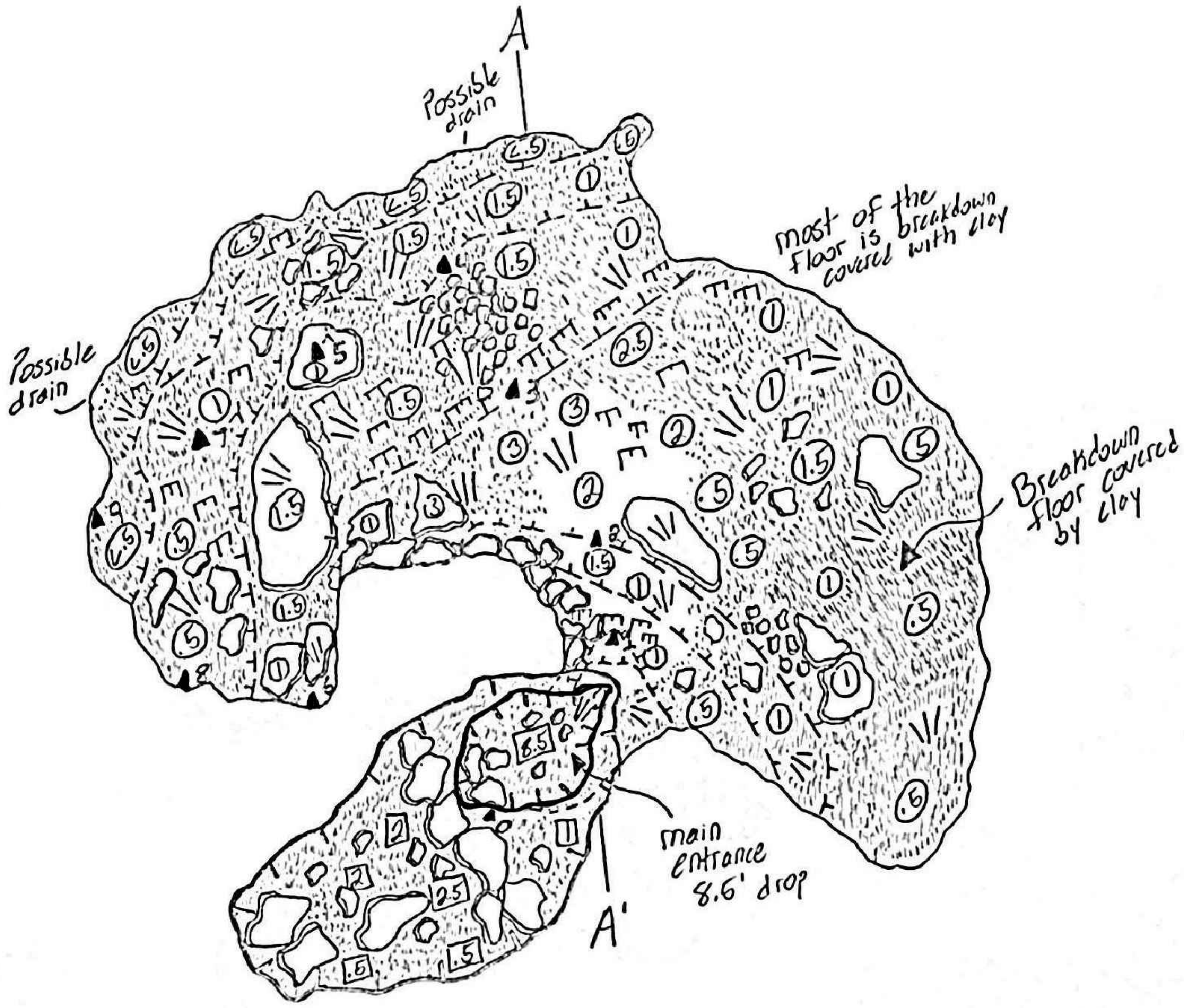


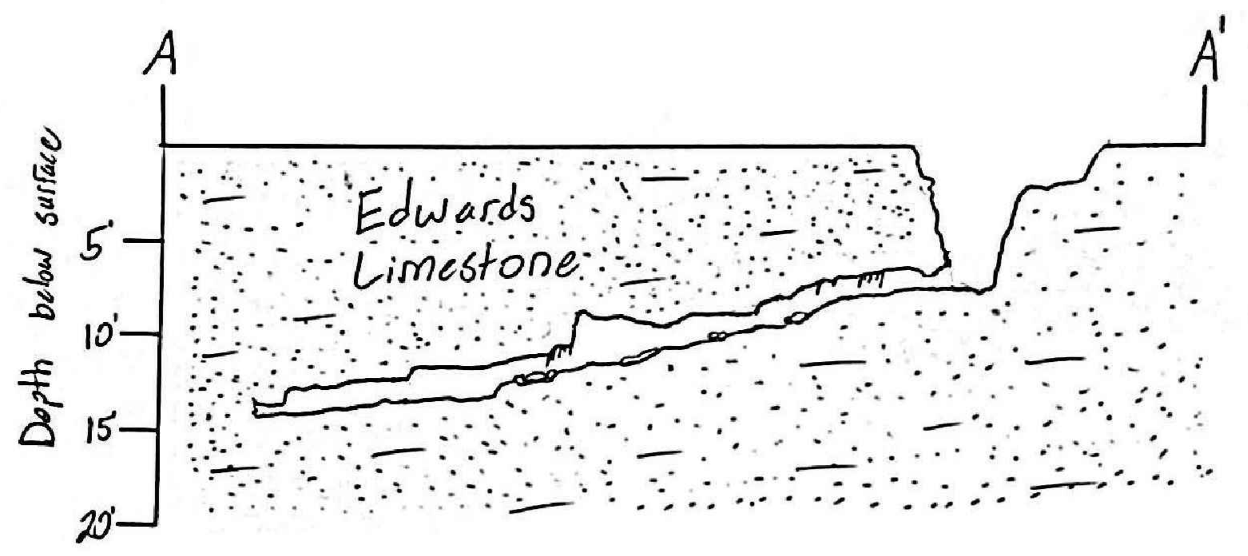
THE BAT WELL

WILLIAMSON CO., TEXAS

COMPASS & TAPE SURVEY
BY R. FINCH, ET AL

Coordinate System: NAD 1983 StatePlane Texas Central FIPS 4203 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 2,296,583.3333
False Northing: 9,842,500.0000
Central Meridian: -100.3333
Standard Parallel 1: 30.1167
Standard Parallel 2: 31.8833
Latitude Of Origin: 29.6667
Units: Foot US





Horizon
Environmental Services, Inc.

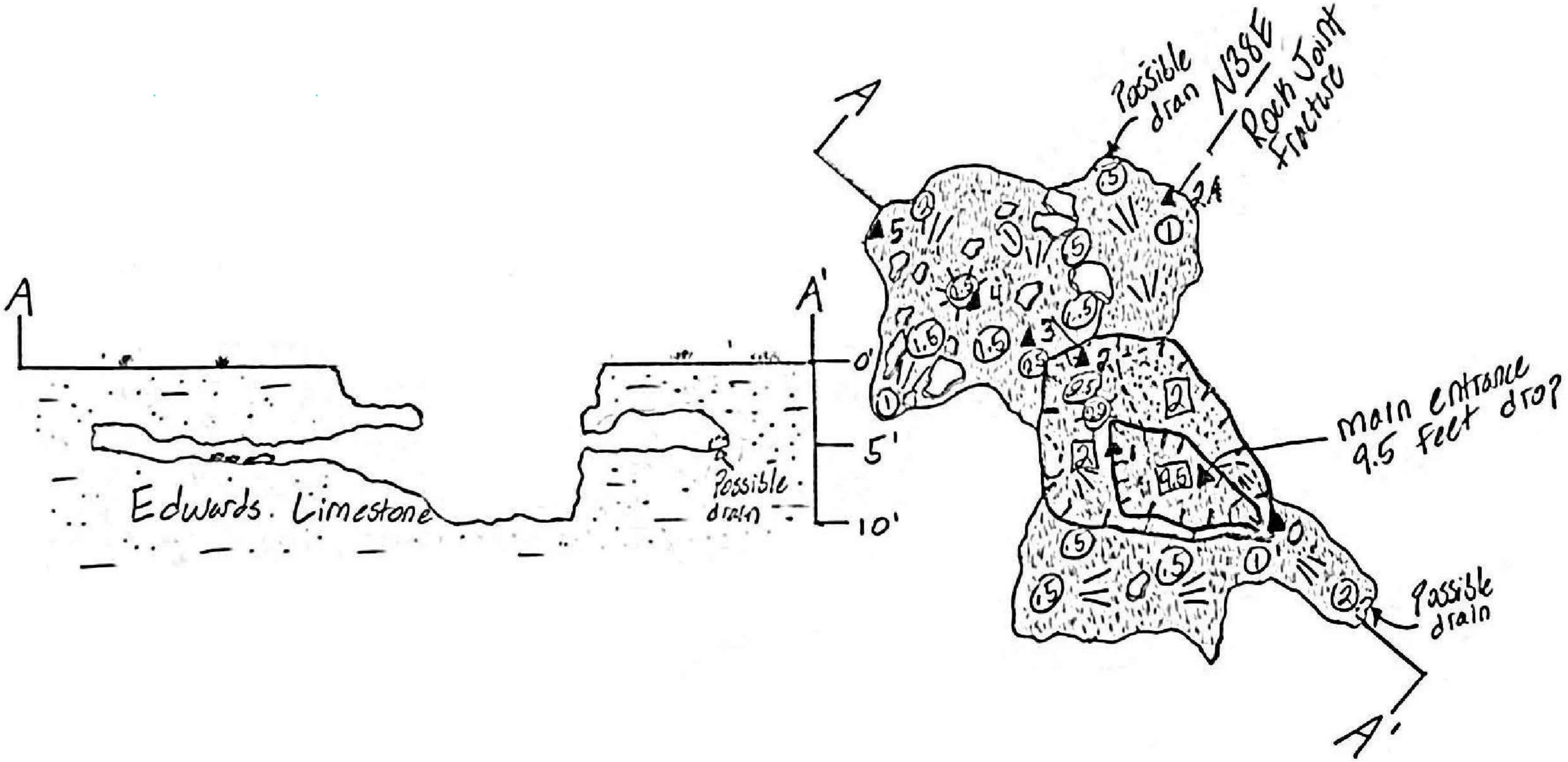
Date: 06/03/2021
Drawn: KRS
HJN NO: 21081.003KS
Drafted By:

Diluvio Cave (F-5)
Lennar Georgetown Village
Georgetown, Williamson County, Texas
Suuntos & Laser Survey, 20 May 2021
Personnel: J. Killian, C. Hall, J. Yarbrough & E. Bryant
Lenght: 60' Width: 50' Depth: 14'
Drafted By: J. Yarbrough

② Ceiling Height (ft)
△ Survey Station
1" = 10'
N

JAMES P. KILLIAN
No. 10281

21081--Lennar_Georgetown_Village\Graphics\CADD



Date:	06/03/2021
Drawn:	KRS
HJN NO:	21081.003KS
Drafted By::	

Horizon
Environmental Services, Inc.

Bat Well Sink Cave (F-22)
Lennar Georgetown Village
Georgetown, Williamson County, Texas
Suuntos & Laser Survey, 19 May 2021
Personnel: J. Killian, C. Hall, J. Yarbrough & E. Bryant
Lenght: 38' Width: 23' Depth: 9.5'
Drafted By: C. Hall

② Ceiling Height (ft)
△ Survey Station

1" = 10'

N

JAMES P. KILLIAN
GEOLOGY
No. 10281

ATTACHMENT G

SITE PHOTOGRAPHS

PHOTO 1
View of geologic feature F-3 (upland sinkhole) drainage portal, facing northeast

PHOTO 2
View of geologic feature F-5 (sinkhole/Diluvio Cave) prior to excavation in unnamed tributary of Berry Creek, facing northeast

PHOTO 3
View of F-5 after mechanical excavation, facing northwest

PHOTO 4
View of F-5 main cave entrance drop, facing down

PHOTO 5
View of F-5 horizontal bedding plane room from survey station no. 2 to station no. 3, facing north

PHOTO 6
View of F-5 bedding plane room from station no. 2, facing east

PHOTO 7
View of F-5 from station no. 5 into the lowest portion of the room near station no. 7, facing northwest

PHOTO 8
View of geologic feature F-21 (upland sinkhole), facing down

PHOTO 9
View of geologic feature F-22 (sinkhole/Bat Well Sink Cave) before mechanical excavation, facing north

PHOTO 10
View of feature F-22 after mechanical excavation, facing north

PHOTO 11
View of F-22 cave entrance drop, facing down

PHOTO 12
Interior view of F-22 low (<2 feet high) horizontal bedding plane room going toward the back drain, facing northwest

PHOTO 13
View of geologic feature F-23 (solution cavity), facing west

PHOTO 14
View of F-23 after mechanical excavation, facing northeast

PHOTO 15
View of F-23 bedrock floor, facing down

PHOTO 16
View of geologic feature F-24 (small upland sinkhole), facing northeast

PHOTO 17
View of F-24 after mechanical excavation, facing northwest

PHOTO 18
View of geologic feature F-25 (upland sinkhole/solution enlarged fracture trending N40E), facing northeast

PHOTO 19
View of geologic feature F-26 (sinkhole/solution cavity), facing north

PHOTO 20
View of geologic feature F-27 (BatWell Cave) gated entrance, facing northwest

PHOTO 21
View of F-27 (BatWell Cave) entrance with initial drop, facing northwest

PHOTO 22
View of geologic feature F-28 (sinkhole/solution cavity), facing northwest

PHOTO 23
View of F-28 after mechanical excavation, facing northwest

PHOTO 24
View of geologic feature F-29 (solution cavity), facing south

PHOTO 25
View of F-29 after mechanical excavation, facing northeast

PHOTO 26
View of geologic feature F-30 (solution cavity), facing down

PHOTO 27
View of F-30 after mechanical excavation, facing south

PHOTO 28
View of man-made feature M-1 (man-made stock pond), facing southwest

ATTACHMENT H

CAMBRIAN PHASE II KARST INVESTIGATIONS REPORT

RESULTS OF PHASE 2 KARST INVESTIGATIONS AT THE GEORGETOWN VILLAGE, GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Prepared for

Trio Development
7811 Ranch Road 2338
Georgetown, Texas 78633

Prepared by

CAMBRIAN ENVIRONMENTAL
4422 Pack Saddle Pass, Suite 204
Austin, Texas 78745
www.cambrianenvironmental.com
Geoscience Firm Registration No. 50484
U.S. Fish and Wildlife Permit # TE37416B-0

15 August 2017

As a licensed professional geoscientist I attest that the contents of this report are complete and accurate to the best of my knowledge.

Kemble White Ph.D., P.G.
Cambrian Environmental
kwhite@cambrianenvironmental.com

STATE OF TEXAS
KEMBLE WHITE
GEOLOGY
No. 3863
LICENSED
PROFESSIONAL GEOSCIENTIST

RESULTS OF PHASE 2 KARST INVESTIGATIONS AT THE GEORGETOWN VILLAGE, GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Between the 18th of June and the 10th of August 2017 Cambrian Environmental personnel conducted a phase 2 investigation of previously documented potential karst features located on land proposed for future expansion of the Georgetown Village residential development in Georgetown, Texas. Phase 2 investigations involved excavation and exploration of known and suspected karst features identified in a site investigation conducted by Horizon Environmental Services earlier in 2017. Twenty-three features were investigated including 21 features identified by Horizon and two features identified by Cambrian adjacent to features identified by Horizon (identified herein as features F-1.5 and F-6.5). Four features were determined to be non-karst and non-sensitive with respect to aquifer recharge and karst ecology (F-3, F-11, F-14, and F-16). Nine features were determined to be caves of various size (F-1, F-2, F-6, F-8, F-9, F-10, F-13, F-17, and F-19). These features are sensitive with respect to aquifer recharge and are recommended for further study for endangered karst invertebrates (Phase 3 investigation). The most notable features by far are the caves F-1 and F-19. The remaining features (F-1.5 F-4, F-5, F6.5, F-7, F-12 a, F-12-b, F-15, F-18, and F-20) were determined to be karst features too small for human entry. They are sensitive with respect to aquifer recharge but show limited potential for endangered karst invertebrate habitat. Some of these are solution cavities that are suitable for further investigation by bait trapping.

Table 1. Summary of excavation results.

Feature	Type	Progress	Next Step
F1	**Cave (150’ x 250’)**	Excavation complete	Biological Survey
F1.5	Solution Cavity	Excavation complete	Bait Trap
F2	**Cave (15' in diameter)**	Excavation complete	Biological survey
F3	Non-sensitive	Excavation complete	None
F4	Solution Cavity	Excavation complete	Bait Trap
F5	Solution Cavity	Excavation complete	Bait Trap
F6	**Cave (25' in diameter)**	Excavation complete	Biological survey
F6.5	Solution Cavity	Excavation complete	Bait Trap
F7	Solution Cavity	Excavation complete	Bait Trap
F8	**Cave (10’ in diameter)**	Excavation complete	Biological Survey
F9	**Cave (12’ in diameter)**	Excavation complete	Biological survey
F10	**Cave (10’ x 20’ diam.)**	Excavation complete	Biological survey
F11	Non-sensitive	Excavation complete	None
F12a	Solution Cavity	Excavation complete	Bait Trap
F12b	Solution Cavity	Excavation complete	Bait Trap
F13	**Small Cave**	Excavation complete	Bait Trap
F14	Non-sensitive	Excavation complete	None
F15	Solution Cavity	Excavation complete	Bait Trap
F16	Non-sensitive	Excavation complete	None
F17	**Cave (25' in diameter)**	Excavation complete	Biological survey
F18	Solution Cavity	Excavation complete	None, minor recharge feature
F19	**Cave (40' in diameter)**	Excavation complete	Biological Survey
F20	Solution Cavity	Excavation Complete	Bait Trap

Feature-by-feature Excavation Results

F-1 Cave — Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 20 feet in diameter by 1.5 feet deep with a central drainage portal area measuring approximately 6 feet long by 3 feet wide by 3 feet deep (Photo 1). Moderate to high air flow was observed at all drainage openings. Preliminary hand excavation revealed loose rocks and cobbles approximately 4 feet below the surface with additional void space of unknown extent.

Cambrian personnel conducted backhoe and hand excavation in the feature (Photo 2). During the excavation process, signs of airflow and channelized recharge of water were detected. Fill material predominantly consisted of large limestone boulders, cobbles, and dark brown clayey soil. Excavation ceased when the feature became accessible for human entry. Excavation of this feature confirmed that it is karst in origin. The feature is a fracture-controlled cave with the entrance passage formed primarily along a trend of N55°W. The cave entrance occurs beneath the north rim of the excavation pit approximately 4.5 feet below the surface. The cave consist of three basic elements; a series of stair-stepping passages trending downward to the east from the entrance (Photos 3 through 5) followed by a low, wide bedding plane passage which extends to the north and east (Photo 6), and an additional series of passages extending to the northeast at slightly higher elevation leading to a gallery of speleothems with pools of water (Photos 7 and 8). The speleothems and water indicate that some sort of recharge feature exists at the surface approximately 220 feet northeast of the entrance. A drainage channel is carved into the soil floor of the cave (Photo 6) extending from the vicinity of the entrance eastward to a cluster of drainage portals in the floor of the eastern end of the cave. The cave reaches its maximum humanly-passible depth in this area at approximately 18 feet below the surface. The presence of the drainage channel confirms the significance of the cave as an aquifer recharge feature. The overall footprint of the cave measures approximately 250 feet from west to east and approximately 170 feet from north to south (Figure 1). The feature contains significant habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 1. Feature F-1 prior to excavation.

Photo 2. Feature F-1 during backhoe and hand excavation (facing north rim of cave entrance).

Photo 3. Talus pile at entrance of F-1 with daylight in the background from excavation pit.

Photo 4. Fracture-controlled entrance passage heading east from the entrance of F-1.

Photo 5. Westward view toward entrance passage from lower room of F-1.

Photo 6. Drainage channel in soil floor in lower room of F-1.

Photo 7. Speleothems in northern end of F-1 indicating a recharge pathway from the surface.

Photo 8. Speleothem gallery and pool of water at northeastern extent of F-1.

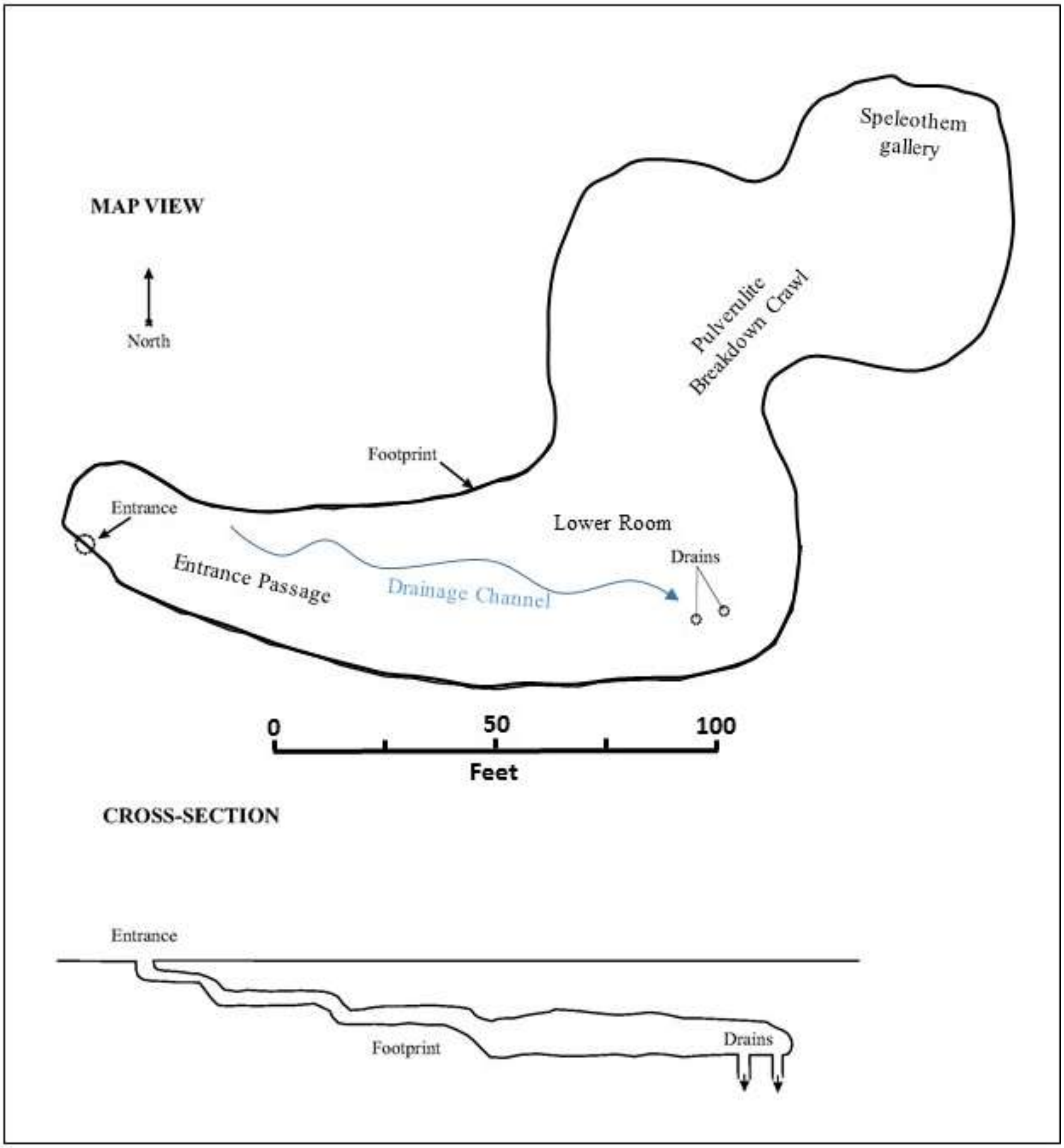


Figure 1. Map view and cross-section of Feature F-1.

F-1.5 Solution Cavity Presence/Absence Investigation Recommended

An additional feature occurring approximately 95 feet southwest of F-1 was identified by Cambrian Environmental on 21 July 2017 when the backhoe ran over it. Surface expression of the feature prior to excavation measured approximately 1 foot in diameter by 8 inches deep (Photo 9). Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. During the excavation process, signs of airflow were detected. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 1 foot long by 3.5 feet wide by 2.5 feet deep horizontally and is likely an extension of Feature F-1 (Photo 10). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 9. Feature F-1.5 prior to Cambrian excavation.

Photo 10. Feature F-1.5 following backhoe and hand excavation.

F-2 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 10 feet in diameter by 1 foot deep with several small drainage portal openings. Preliminary hand excavation produced a central drainage portal area measuring approximately 2 feet in diameter by 3 feet deep with a bedrock headwall about 4 feet below the surface with additional void space and high air flow conductivity (Photo 11). The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of limestone cobbles and boulders and dark clayey soil. During the excavation process, signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photos 12 through 14). Excavation of this feature confirmed that it is karst in origin. The feature is a cave that contains significant habitat potential for endangered karst invertebrates. The entrance of the feature measures approximately 2 feet long by 1.5 feet wide by 4 feet deep and the footprint is approximately 15 feet in diameter extending to the east of the entrance (Figure 2). Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 11. Feature F-2 prior to Cambrian excavation.

Photos 12, 13, and 14. Feature F-2 during and after to Cambrian excavation.

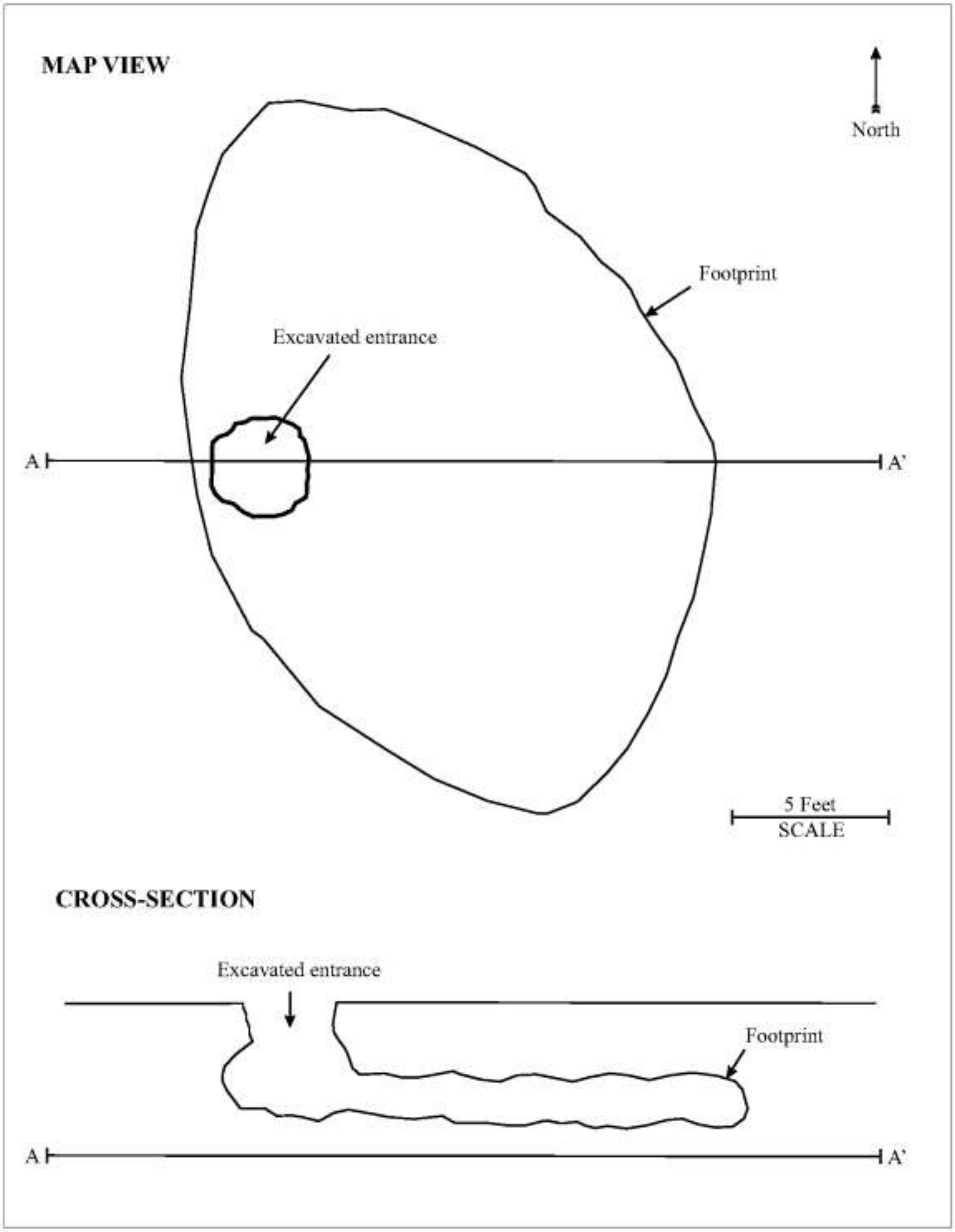


Figure 2. Map view and cross-section of Feature F-2.

F-3 Non-karst Closed Depression No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 10 feet in diameter by 1 foot deep with several small (<2 in) semi-open drainage portals containing fill material of loose to firm clayey soil and small rocks and cobbles (Photo 15).

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated area measures approximately 7 feet long by 4 feet wide by 4.5 feet deep, and fill material consisted of dark to brown clayey soil with interspersed limestone cobbles. Excavation ceased when a bedrock surface was exposed (Photo 16 and 17). Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse. **No Habitat Potential.**

Photo 15. Feature F-3 prior to Cambrian excavation.

Photo 16. Feature F-3 during Cambrian backhoe excavation.

Photo 17. Feature F-3 after Cambrian backhoe and hand excavation.

F-4 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a solution cavity measuring approximately 3 feet long by 2 feet wide by 4.5 feet deep with loose soil and rock infilling (Photo 18). Moderate air flow conductivity was observed.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated solution cavity measures approximately 2 feet long by 1 foot wide by 3 feet deep, and the fill material consisted of brown clayey soil and organics with interspersed limestone cobbles. The feature seems to continue into the subsurface but further excavation was not practical with the backhoe (Photos 19 through 21). Excavation of this feature confirmed that it is karst in origin. The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-5, F-8, F-10, and F-17 are likely associated with the same fault. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 18. Feature F-4 prior to Cambrian excavation.

Photo 19. Feature F-4 during Cambrian backhoe excavation.

Photo 20. Feature F-4 prior to Cambrian excavation.

Photo 21. Feature F-4 after Cambrian backhoe and hand excavation.

F-5 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole in an unnamed tributary of Berry Creek measuring approximately 20 feet long by 15 feet wide by 3 feet deep with several small drainage portal openings among rocks and cobbles in the center and high air flow conductivity (Photo 22). Preliminary excavation and probing revealed a depth of approximately 4 feet. The feature was classified as a potential cave. The feature is a significant recharge feature being located in the bed of a drainage channel.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated drainage area is triangular and measures approximately 3.5 feet long by 3.5 feet wide by 4 feet deep, and the fill material consisted of dark to brown clayey soil with limestone cobbles (Photo 23). Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity that extends horizontally along a bedding plane to the northwest and to the southeast but is not humanly passable in either direction (Photo 24 and 25, Figure 3). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-8, F-10, and F-17 are likely associated with the same fault. Cambrian personnel will conduct bait trapping surveys in the feature.

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Photo 22. Feature F-5 prior to Cambrian excavation.

Photo 23. Feature F-5 after Cambrian backhoe excavation.

Photo 24. Feature F-5 during Cambrian hand excavation.

Photo 25. Feature F-5 after Cambrian backhoe and hand excavation.

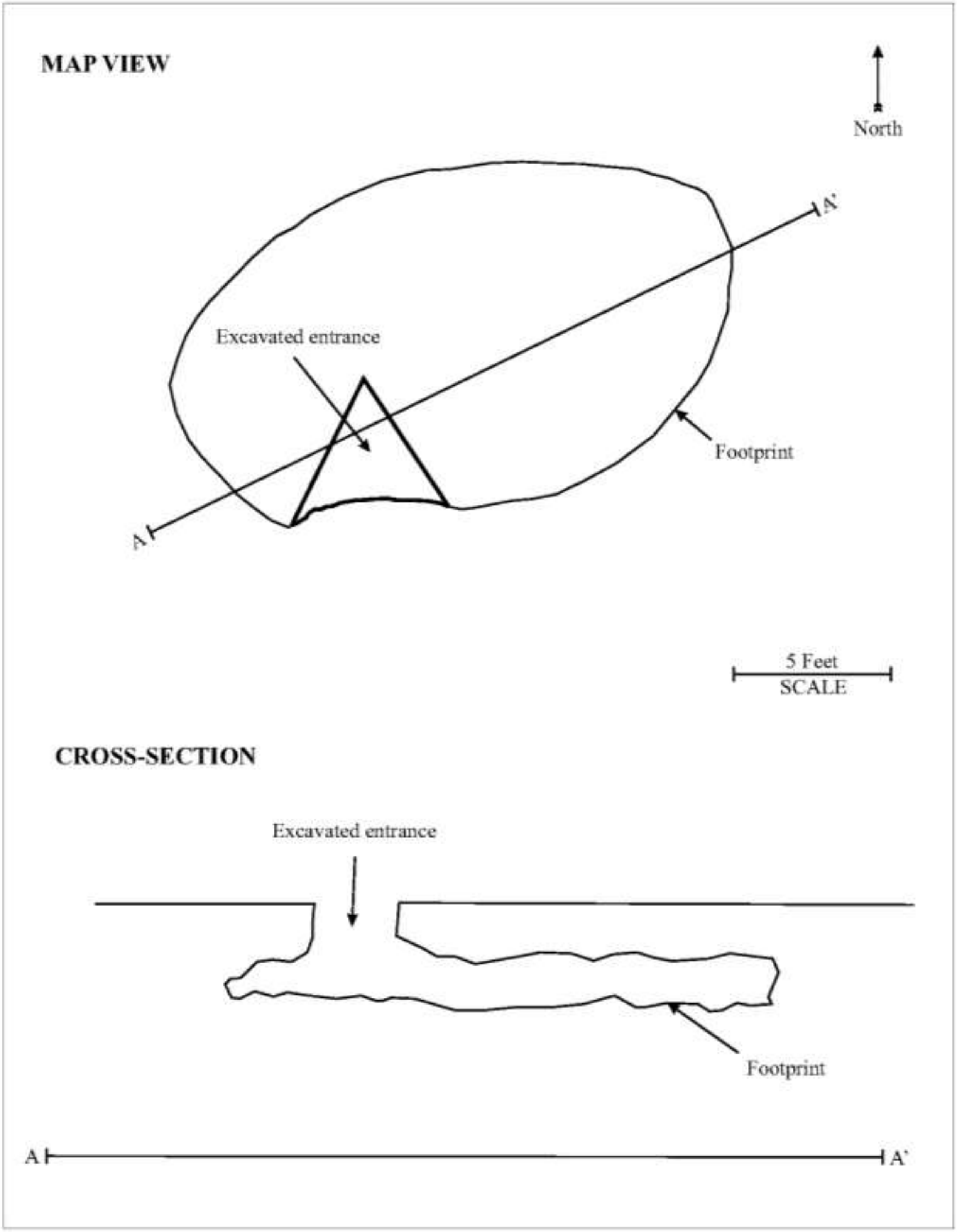


Figure 3. Map view and cross-section of Feature F-5.

F-6 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole located in an open area measuring approximately 35 feet long by 30 feet wide by 5 feet deep with numerous drainage portals of various sizes located throughout the rock debris (Photo 26). Slight to moderate air flow was noted at the openings. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. The excavated backhoe area is approximately 14.5 feet long by 12.5 feet wide by 12 feet deep. Fill material consisted of large limestone boulders and cobbles and dark clayey soil. During the excavation process, signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photo 27 through 29, Figure 4). Excavation of this feature confirmed that it is karst in origin. The feature is a cave consisting of a single room formed along the same bedding plane approximately 10 feet below the surface. The room measures approximately 25 feet across from east-west by 17.5 feet across north-south, by 12-18 inches in height. The room drains to the east through a humanly-impassible constriction in the wall and contains significant habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 26. Feature F-6 prior to Cambrian excavation.

Photo 27. Feature F-6 during to Cambrian backhoe excavation.

Photo 28. Feature F-6 during Cambrian hand excavation.

Photo 29. Feature F-6 after Cambrian backhoe and hand excavation.

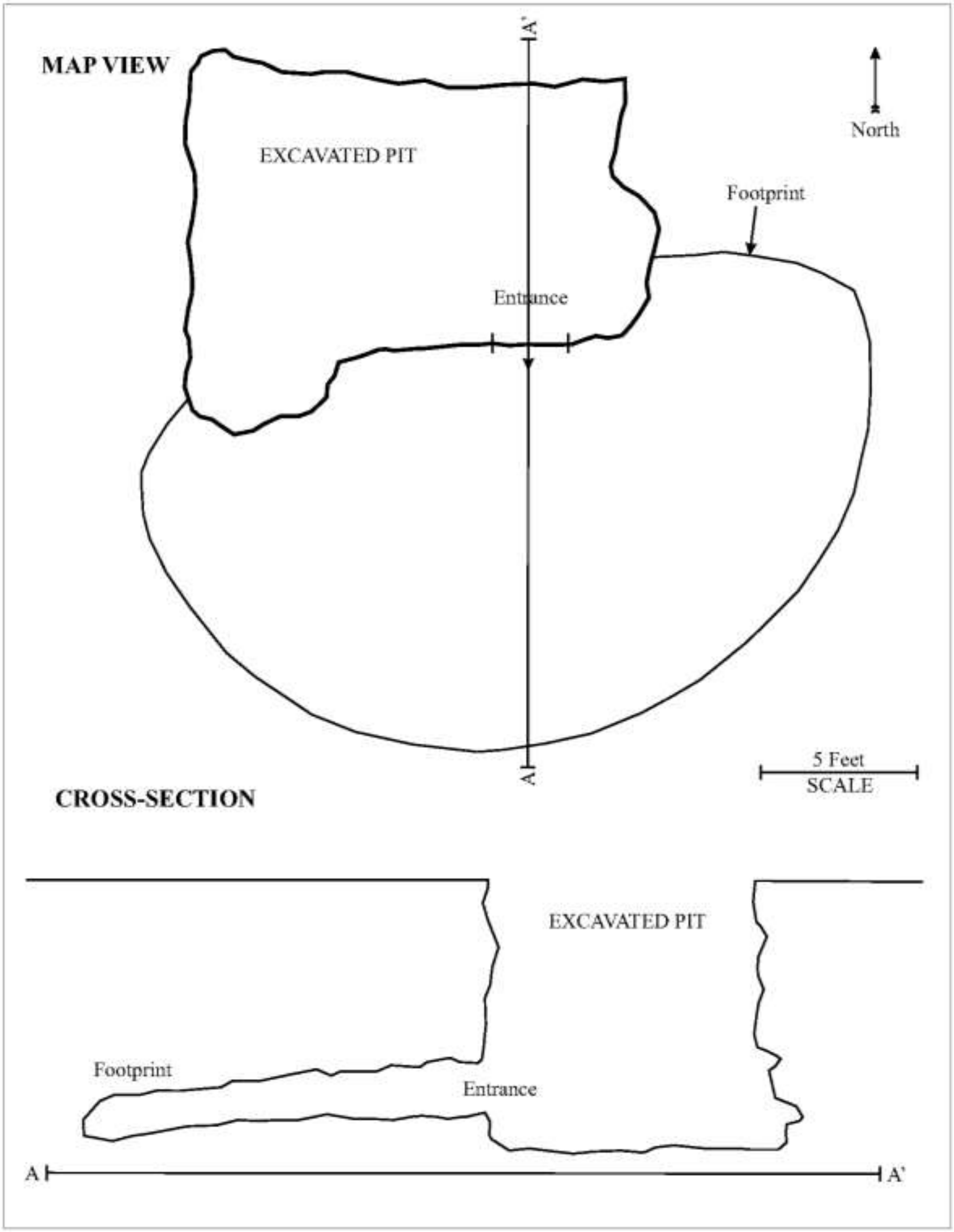


Figure 4. Map view and cross-section of Feature F-6.

F-6.5 Solution Cavity — Presence/Absence Investigation Recommended

An additional feature was identified Cambrian Environmental on 24 May 2017 (Photo 30). Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 1.5 feet long horizontally by 8 inches tall by 0.5+ feet deep and fill material consisted of dark to light brown clayey soil with limestone cobbles (Photos 31 and 32). The solution cavity is formed along a prominent bedrock fracture (trending N10°W) of tectonic origin which seems to be structurally related to feature F-6. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 30. Feature F-6.5 prior to Cambrian excavation.

Photo 31. Feature F-6.5 during Cambrian backhoe excavation.

Photo 32. Feature F-6.5 after Cambrian backhoe and hand excavation.

F-7 Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 7 feet in diameter by 1 foot deep with an open drainage portal about 0.5 feet in diameter by 1 foot deep near the center (Photo 33). Slight air flow was noted at the opening. Preliminary hand excavation revealed a solution-enlarged fracture approximately 3 feet below the surface measuring 2.5 feet long by 1 foot wide by 5.5 feet deep (azimuth: N30°W).

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is karst in origin. An open solution cavity was encountered about 6 inches below the surface, measuring approximately 2 feet long by 1.5 feet wide by at least 5.5 feet deep (Photo 34 and 35). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 33. Feature F-7 prior to Cambrian excavation.


Photo 34. Feature F-7 during Cambrian backhoe excavation.


Photo 35. Feature F-7 after Cambrian backhoe and hand excavation.

F-8 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 12 feet long by 10 feet wide by 2.5 feet deep that funnels into a semi-open area about 3 feet long by 1.5 feet wide by 3.5 feet deep that contains several drainage portal openings of various sizes (Photo 36). The feature was presumed to be associated with previous land disturbance including chaining and bulldozing. Preliminary hand excavation and probing reveled loose small rocks and cobbles approximately 4 feet below the surface with slight to moderate air flow. The feature was classified as a potential cave.

Excavation by hand followed by backhoe revealed a collapse sinkhole measuring approximately 12 feet long by 5 feet wide by 4 feet deep (Photo 37). Small extents of cave passage extend from the collapse to the northeast for approximately 10 feet (Photos 38 and 39). The sinkhole is elongated along a fracture trending roughly N40°E, which parallels a lineation in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-17, and F-10 are likely associated with the same fault. Biological surveys from the entrance will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 36. Feature F-8 prior to Cambrian excavation.

Photo 37. Excavation of Feature F-8.

Photo 38. Bedding plane void which drains the sinkhole to the southeast.

Photo 39. Bedding plane void which drains the sinkhole to the southeast.

F-9 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet long by 15 feet wide by 2.5 feet deep (Photo 40). The feature appeared to have been partially filled with large rocks and/or soil debris from previous land disturbance activities including chaining and bulldozing. Several drainage portal openings of various sizes were noted among the fill material with slight to moderate air flow. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of large limestone boulders and cobbles, organics, dark brown clayey soil to light brown soil (Photo 41). Signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photo 42). Excavation of this feature confirmed that it is karst in origin. The feature is a small cave measuring approximately 15 feet in diameter extending to the south from the entrance (Figure 5). It contains habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 40. Feature F-9 prior to Cambrian excavation.

Photo 41. Feature F-9 during Cambrian backhoe excavation.

Photo 42. Feature F-9 after Cambrian backhoe and hand excavation.

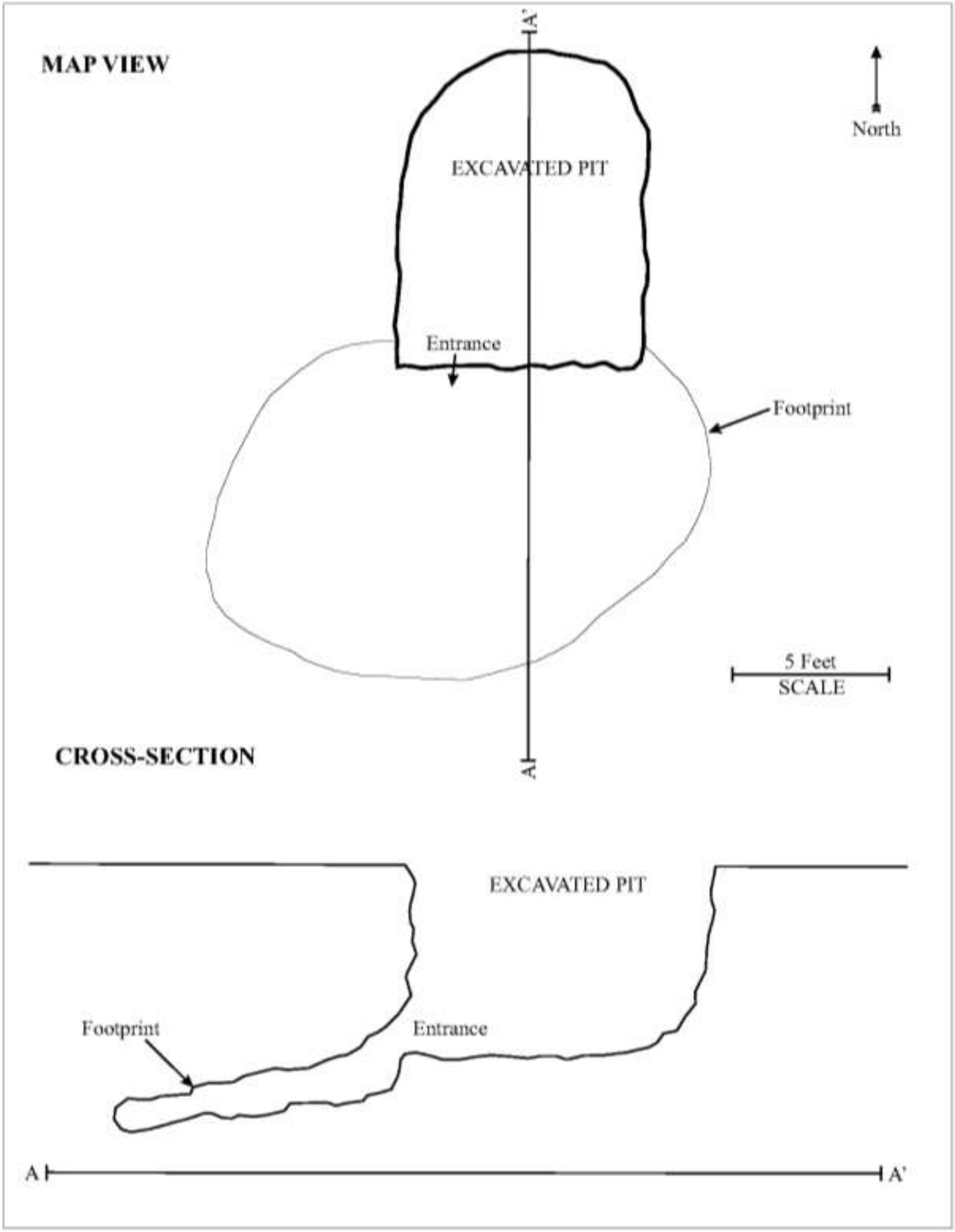


Figure 5. Map view and cross-section of Feature F-9.

F-10 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 35 feet long by 25 feet wide by 7.5 feet deep with an exposed vertical rock headwall along the west side of the sink (Photo 43). Several hackberry trees were observed growing inside the feature. An open drainage portal approximately 2.5 feet long by 1.5 feet wide by 2 feet deep exists along the southwest corner of the sink floor adjacent to the headwall and moderate airflow was noted at the opening. Within the opening, a larger void passage measuring 35 feet long by 10 to 12 feet wide by 3 to 8 feet high. Additional drainage points and cave biota (cave crickets and tricolored bats) were observed within the void passage. The feature was determined to be a cave.

Cambrian personnel conducted minor hand excavation in the feature. Signs of airflow and channelized recharge of water were detected. The feature is a cave measuring approximately 25 feet long and 10 feet wide extending from the sinkhole rim to the southwest (Photo 44, Figure 6). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-8, and F-17 are likely associated with the same fault. The feature contains habitat potential for endangered karst invertebrates. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 43. View of Feature F-10 from surface.

Photo 44. View of entrance into Feature F-10.

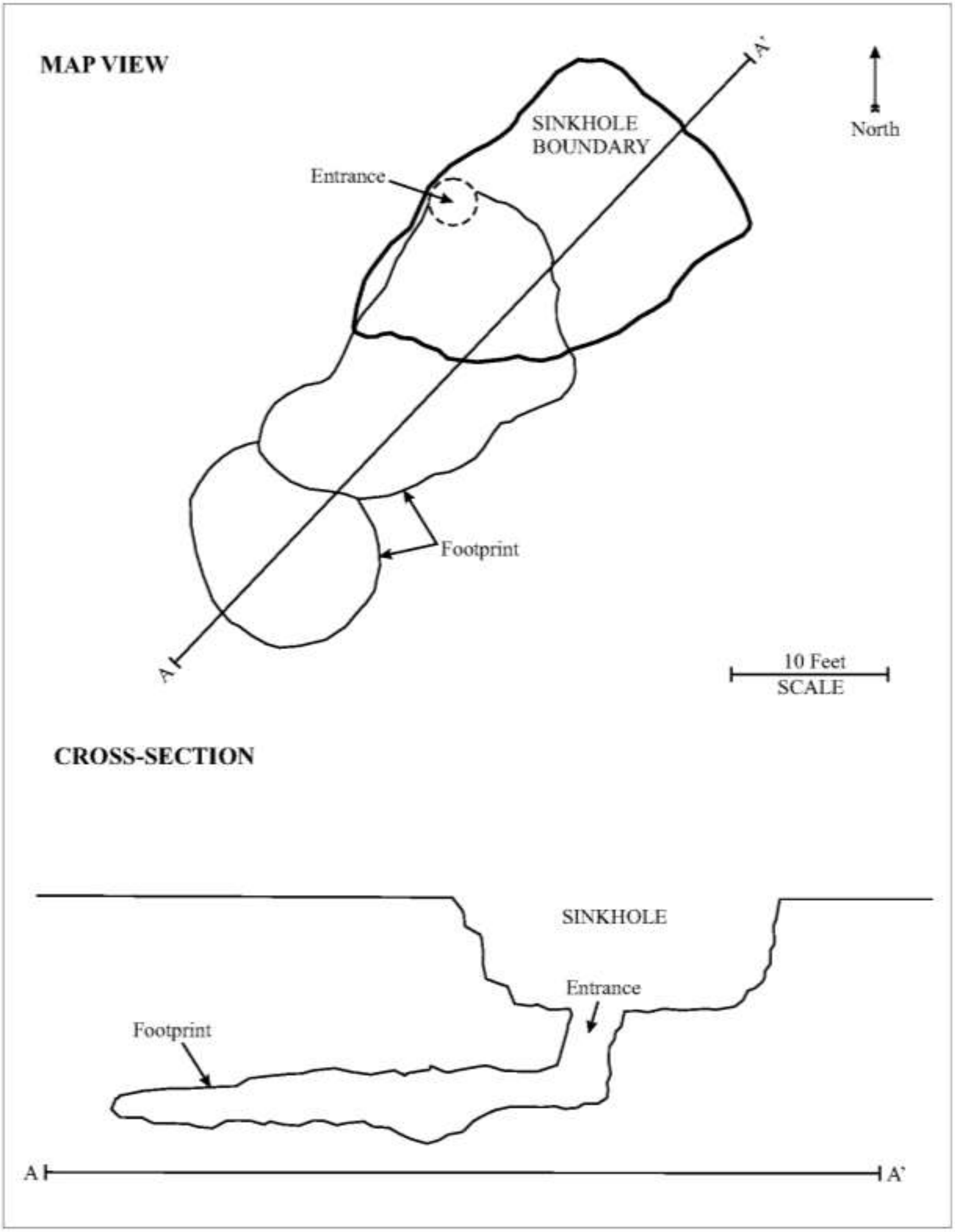


Figure 6. Map view and cross-section of Feature F-10.

F-11 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a potential upland sinkhole measuring approximately 20 feet in diameter by 1.5 feet deep with several thin, flat rocks and soil debris placed into the feature (Photo 45). No airflow or drainage portals were observed.

Cambrian personnel conducted hand excavated in the feature by removing limestone rocks and cobbles. Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photo 46). The feature was determined to be a push pile related to previous land clearing activities. **No Habitat Potential.**

Photo 45. Feature F-11 prior to excavation.

Photo 46. Feature F-11 following Cambrian excavation.

F-12a Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 8 feet in diameter by 1.5 feet deep with numerous small drainage portals and high air flow conductivity at the openings. Preliminary hand excavation revealed a solution cavity measuring approximately 4.5 feet long by 2 feet wide by 4 feet deep, with small drainage portal openings along two sides (Photo 47). The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 3.5 feet long by 2.5 feet wide by 3.5 feet deep. Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 47. View of Feature F-12a.

F-12b Solution Cavity Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a small, semi-open solution cavity measuring approximately 1 foot long by 0.5 feet wide by 1 foot deep with loose soil and rock infilling (Photo 48). Slight to moderate air flow was noted at the opening.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil with interspersed limestone cobbles. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity measuring approximately 8 inches long by 6 inches wide by 1+ foot deep (Photo 49). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 48. Feature F-12b prior to Cambrian excavation.

Photo 49. Feature F-12b during Cambrian hand excavation.

F-13 Small Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet long by 6 feet wide by 2 feet deep. Two small, semi-open drainage portals about 12 feet apart among loose to firm clayey soil infilling were noted in the feature (Photos 50 and 51). Slight air flow was observed at the portal openings.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation to the extent practical within the feature. Fill material consisted of large limestone boulders and cobbles, organics, and dark brown clayey soil (Photo 52). Signs of airflow and channelized recharge of water were detected. Approximately 6 cubic yards of material was removed by backhoe. Subsequent hand excavation ceased after Cambrian personnel removed approximately 2 cubic yards of firm clayey soil from the interior (Photo 53 and 54). The feature is karst in origin and is currently classified as a small cave that seems entirely filled with soil. Cambrian personnel will conduct bait trapping in the feature.

Photo 50. Feature F-13 prior to Cambrian excavation.

Photo 51. Feature F-13 prior to Cambrian excavation.

Photo 52. Feature F-13 during Cambrian hand excavation.

Photo 53. Feature F-13 after Cambrian backhoe excavation.

Photo 54. Interior of Feature F-13 after Cambrian backhoe and hand excavation.

F-14 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a solution-enlarged fracture measuring approximately 3 feet long by 0.5 feet wide by 1.5 feet deep (azimuth: N65°W) with apparent semi-open drainage portals and slight air flow conductivity (Photo 55).

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of organics and brown clayey soil. Excavation of this feature confirmed that it is non-karst in origin. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photo 56). The feature is likely the result of surficial weathering processes and the presence of limestone float slabs. **No Habitat Potential.**

Photo 55. Feature F-14 prior to Cambrian excavation.

Photo 56. Feature F-14 after Cambrian hand excavation.

F-15 Solution Cavity Presence / Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 7 feet long by 5 feet wide by 1.5 feet deep that funnels into an open drainage portal about 1 foot long by 0.5 feet wide by 1 foot deep among loose rocks (Photo 57). Preliminary hand excavation enlarged the drainage portal to approximately 2 feet in diameter by 1.5 feet deep with high air flow. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature (Photo 58). Fill material consisted of organics and dark brown clayey soil to light brown soil. Excavation of this feature confirmed that it is karst in origin. The feature is a solution cavity that extends horizontally beneath a bedding plane for at least 4 feet (Photo 59, Figure 7). Cambrian personnel will conduct bait trapping surveys in the feature.

Photo 57. Feature F-15 prior to Cambrian excavation.

Photo 58. Feature F-15 during Cambrian backhoe excavation.

Photo 59. Feature F-15 after Cambrian backhoe excavation.

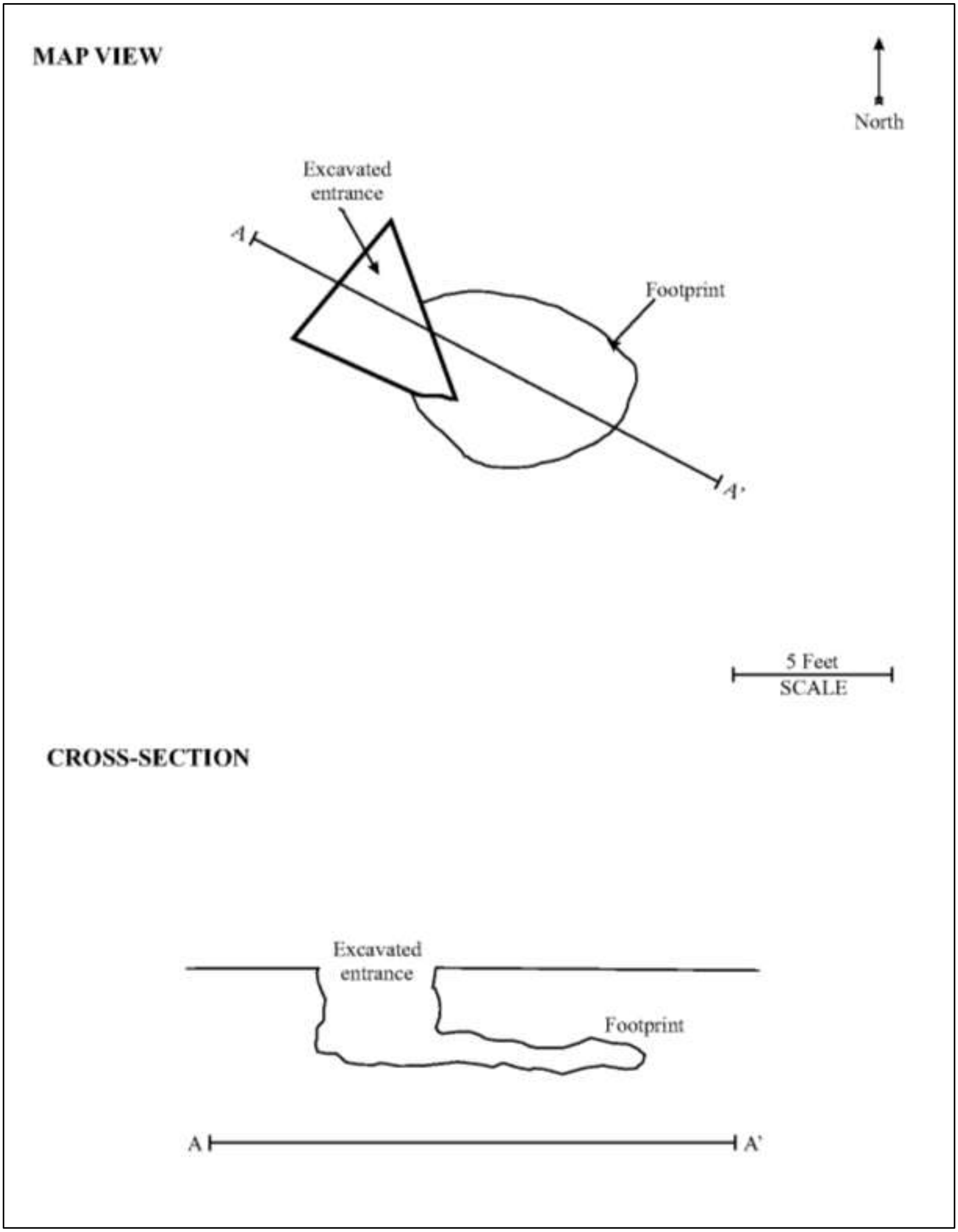


Figure 7. Map view and cross-section of Feature F-15.

F-16 Non-karst Feature No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a solution cavity measuring approximately 3 feet long by 2 feet wide by 1.5 feet deep with loose soil infilling (Photo 60). The feature undercuts toward the north about 1 foot high and two feet long with apparent burrowing mammal activity. Slight air flow was noted at the opening.

Cambrian personnel conducted hand excavated and subsequent backhoe excavation in the feature. Excavation of this feature confirmed that it is non-karst in origin and appears to be the result of plant root growth and burrowing animals. During the excavation process, no signs of airflow or channelized recharge of water were detected, nor does the feature appear to have formed by soil or bedrock collapse (Photos 61 and 62). Excavation ceased when weathered bedrock was encountered. **No Habitat Potential.**

Photo 60. Feature F-16 prior to Cambrian excavation.

Photo 61. Feature F-16 after Cambrian hand excavation.

Photo 62. Feature F-16 after Cambrian backhoe excavation.

F-17 Cave **Presence/Absence Investigation Recommended**

The feature was originally described by Horizon Environmental Services, Inc. as a small drainage portal opening measuring approximately 0.5 feet in diameter within the top of an underlying solution cavity measuring approximately 5 feet long by 3 feet wide by 3 feet high with dark graying brown soil and rock floor (Photo 63). Moderate to high air flow was noted at the opening. Preliminary hand excavation widened the solution cavity to approximately 2.5 feet long by 1.5 feet wide, revealing a bedding plane void passage extending toward the northwest, east, and southeast. An additional passage was discovered along the southwest side wall. The feature was determined to be a cave.

Cambrian personnel conducted hand excavation in the feature. Fill material consisted of limestone cobbles. Signs of airflow and channelized recharge of water were detected. Excavation ceased when the feature became accessible for human entry (Photos 64 and 65). Excavation of this feature confirmed that it is a cave that contains habitat potential. Entrance to the feature measures approximately 2 feet long by 2.5 feet wide through which the floor can be seen approximately by 4.75 feet below. The cave consists of two low, wide rooms stretching in succession to the south for a total distance of approximately 25 feet (Figure 8). The feature parallels a lineation (trending roughly N40°E) in the vegetation crossing the property as seen in aerial photos. Cambrian concludes that this feature is likely formed on or within the damage zone of an un-mapped fault. Features F-4, F-5, F-8, and F-10 are likely associated with the same fault. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 63. Feature F-17 prior to Cambrian excavation.

Photo 64. Feature F-17 after Cambrian hand excavation.

Photo 65. Interior view of Feature F-17 after Cambrian hand excavation.

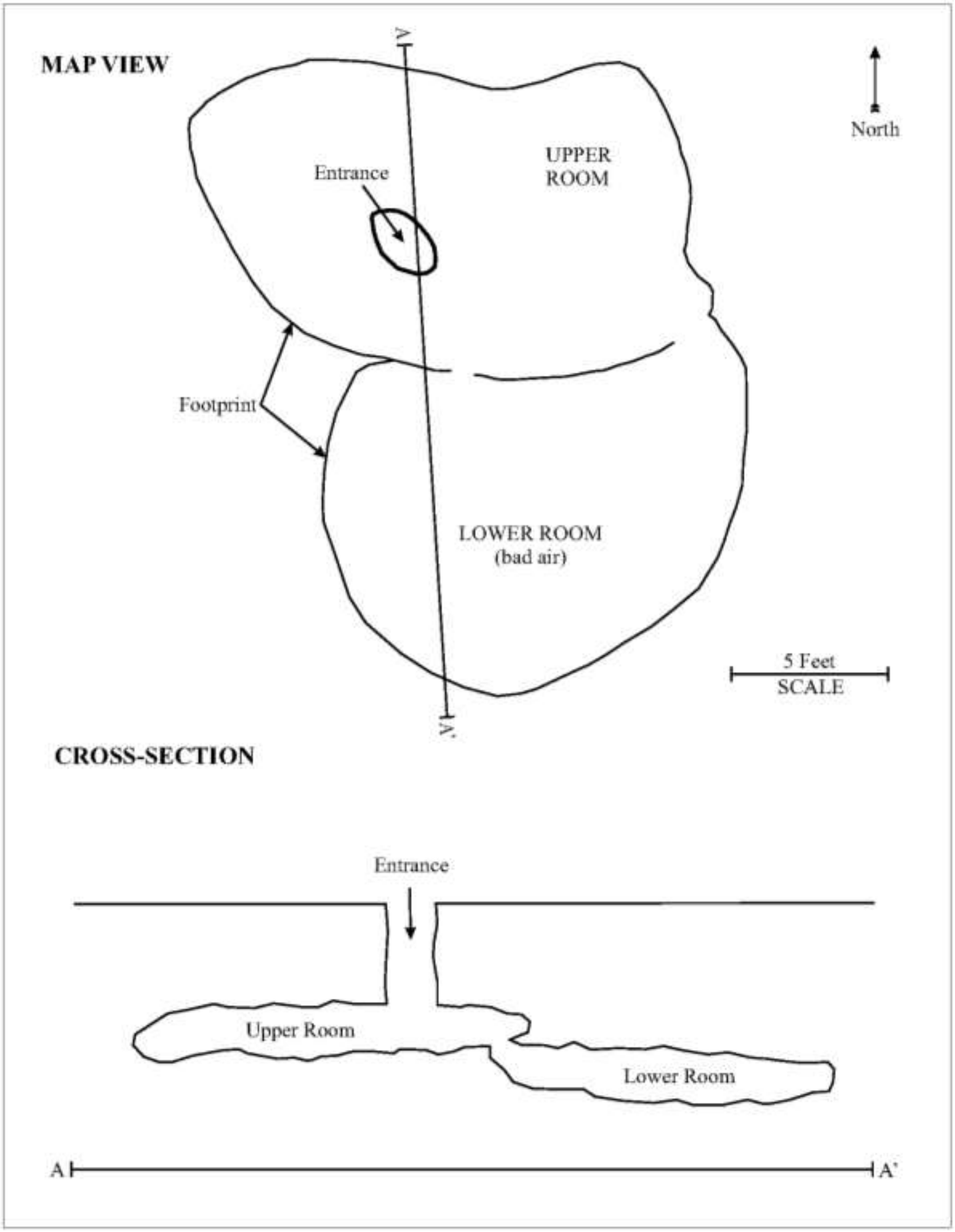


Figure 8. Map view and cross-section of Feature F-17.

F-18 Solution Cavity No Further Action Required

The feature was originally described by Horizon Environmental Services, Inc. as a small upland sinkhole measuring approximately 5 feet in diameter by 1 foot deep that funnels into an open drainage portal about 0.5 feet in diameter by 1 foot deep among loose rocks and soil (Photo 66). Moderate to high air flow was observed at the opening. Preliminary hand excavation and probing revealed that the feature continues approximately 2 feet beneath the surface where loose small rocks and/or cobbles were detected. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature. Fill material consisted of organics, root matter, and brown clayey soil. Excavation of this feature confirmed that it is karst in origin (Photo 67). The feature is a solution cavity and is a minor recharge feature but became too narrow to investigate further. **No Habitat Potential.**

Photo 66. Feature F-18 prior to Cambrian excavation.

Photo 67. Feature F-18 after Cambrian hand excavation.

F19 Cave Presence/Absence Investigation Recommended

The feature was originally described by Horizon Environmental Services, Inc. as a large upland sinkhole measuring approximately 30 feet long by 25 feet wide by 3 feet deep with multiple drainage portal openings among rocks, cobbles, and loose soil. Moderate to high air flow was noted at the openings. The feature was classified as a potential cave.

Cambrian personnel conducted backhoe excavation and subsequent hand excavation in the feature (Photo 68). Fill material consisted of limestone boulders and cobbles and dark brown soil. Signs of airflow and channelized recharge were detected. Excavation ceased when the feature became accessible for human entry (Photo 69). Excavation of this feature confirmed that it is karst in origin. The feature is a cave measuring at least 40 feet in diameter and contains habitat potential. The cave has the most vertical expression of known caves on the site descending immediately from the entrance at a roughly 45 degree angle. It reaches a total depth of approximately 20 feet below the surface. Biological surveys will be conducted to determine presence or absence of endangered karst invertebrates.

Photo 68. Feature F-19 prior to backhoe excavation.

Photo 69. View of Feature F-19 entrance after Cambrian backhoe and hand excavation.

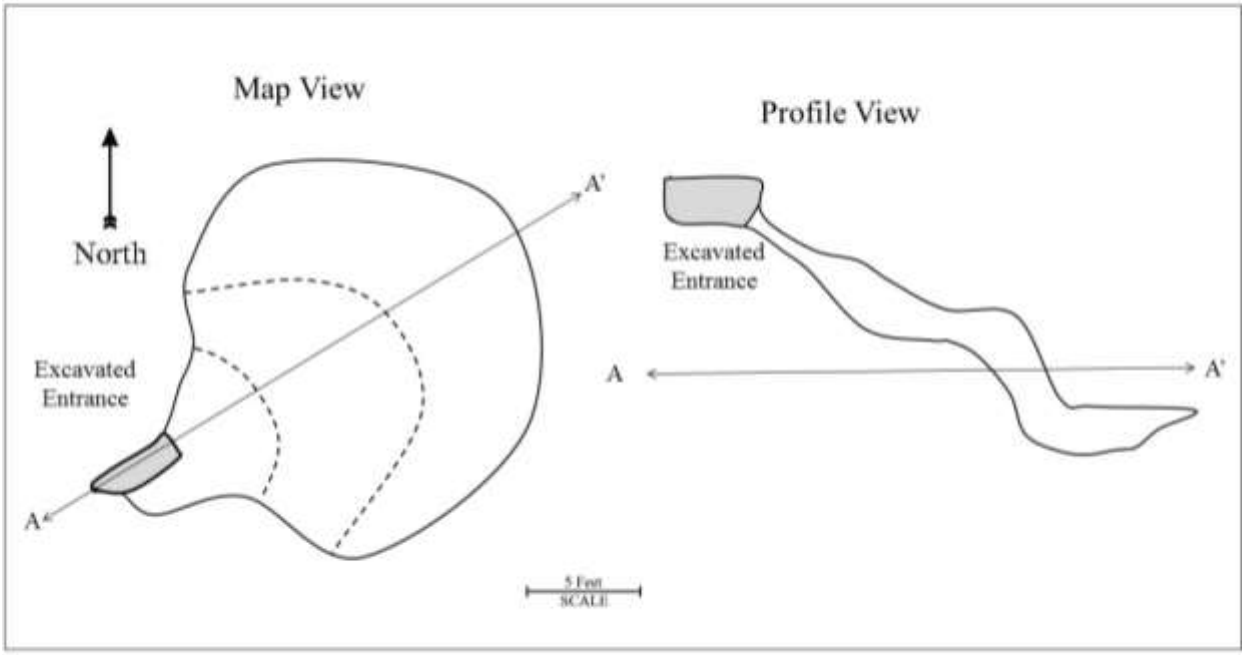


Figure 9. Map view and cross-section of Feature F-19.

F20 Solution Cavity Presence/Absence Investigations Recommended

The feature was originally described by Horizon Environmental Services, Inc. as an upland sinkhole measuring approximately 20 feet in diameter by 3 feet deep with a small drainage portal opening with moderate to high air flow. The feature was classified as a potential cave.

Cambrian personnel conducted hand excavation in the feature. Fill material predominantly consisted of dark brown clayey soil and root mats from adjacent live oak, cedar elm, and juniper trees. Excavation of this feature confirmed that it is karst in origin, although no humanly-accessible passage was detected (Photo 70). The feature is a solution cavity that is likely an extension of Feature F-19 and measures approximately 2.5 feet in diameter by 3 feet deep. Cambrian personnel will conduct bait trapping in the feature.

Photo 70. Feature F-20 following Cambrian hand excavation.

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: Justin Midura, P.E.

Date: 3-4-2024

Signature of Customer/Agent:

Regulated Entity Name: Woodfield Preserve Phase 3

Regulated Entity Information

1. The type of project is:

   ☒ Residential: Number of Lots:229
   ☐ Residential: Number of Living Unit Equivalents:_____
   ☐ Commercial
   ☐ Industrial
   ☐ Other:_____

2. Total site acreage (size of property):83.47
3. Estimated projected population:802
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	1,045,887	÷ 43,560 =	24.01
Parking	5,404	÷ 43,560 =	0.12
Other paved surfaces	651,367	÷ 43,560 =	14.96
Total Impervious Cover	1,702,658	÷ 43,560 =	39.09

Total Impervious Cover 39.09 **÷ Total Acreage** 83.47 **X 100 =** 46.8**% 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 = _____ Ft² ÷ 43,560 Ft²/Acre = _____ acres.

10. Length of pavement area: _____ feet.

Width of pavement area: _____ feet.
L x W = _____ Ft² ÷ 43,560 Ft²/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	57,250Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day

TOTAL gallons/day 57,250

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 Berry Creek (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" = _____'.

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 PANEL MAP 48491C0280E EFFECTIVE SEPTEMBER 26, 2008.

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.

Water Pollution Abatement Plan Application

ATTACHMENT A

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Factors Affecting Water Quality:

DURING CONSTRUCTION

Non-Stormwater Discharges: The following non-stormwater discharges may occur from the site during the construction period:

- Water from utility line flushing during initial line testing must use uncontaminated water that is not hyperchlorinated
- Pavement wash waters (where no spills or leaks of toxic or hazardous materials have occurred)
- Groundwater (from dewatering of excavation) must be uncontaminated
- Water used to wash vehicles or control dust must be accomplished using potable water without detergents

All non-stormwater discharge will be directed to the Erosion and Sedimentation Controls (Best Management Practices) to remove any suspended solids contained therein.
Stormwater during construction will remove loose material and transport it downstream

POST CONSTRUCTION

Non-Stormwater Discharges after construction has been completed which can affect water quality include:

- Fertilizers and pesticides
- Household chemicals
- Pet waste
- Used oil
- Car washing
- Mulching
- Sediment

Post-construction stormwater discharges typically will transport sediment in the form of dirt and dust accumulated on streets and other impervious flatwork, rooftops and sediment from erosion of grassy areas. That material will be transported through the storm sewer system to the WQ facilities, where most of the pollutants will be removed.

Water Pollution Abatement Plan Application

ATTACHMENT B

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Volume and Character of Stormwater:

The volume and character of stormwater at the project site for both existing and post-development conditions are as follows:

Under existing conditions, the tract is vacant and undeveloped. The site consists of assorted grasses and multiple protected trees, with terrain sloped at approximately 1% to 10%. Developed conditions propose five drainage basins. Two drainage basins to be treated by vegetative filter strips and three drainage basins to be treated by means of onsite ponding per Ponds 7, 8, and 9.

The Phase 3 development is approximately 83.47 acres with 39.09 acres of impervious cover or 46.8%. The Phase 3 construction plans propose ROW, 229 single family lots, driveways, sidewalks, trail, parking lot, public park, water, wastewater, drainage improvements, water quality and detention. The lift station, south public park, and north public park proposed impervious cover are being treated via compensatory water quality treatment with Pond 7. The lift station and north public park areas are part of the Phase 3 construction plans. The south public park area is part of the Phase 1 construction plans as well as already accounted for in the approved Woodfield Preserve Phase 1 WPAP & SCS (EAPP ID Nos. 11003313 & 11003314). Impervious cover is proposed with this construction plan set. Detention will be required. Phase 3 proposes three extended batch detention ponds for water quality and detention improvements. The following table provides detail for each pond and each VFS.

		Total Area (ac)	**Impervious Cover Area (ac)**
Pond 7	**Existing Basin**	30.22	0
	Developed Basin	30.22	15.69
Pond 8	**Existing Basin**	34.53	0
	Developed Basin	34.53	16.05
Pond 9	**Existing Basin**	11.82	0
	Developed Basin	11.82	5.11
VFS C	**Existing Basin**	6.14	0
	Developed Basin	6.14	2.00
VFS D	**Existing Basin**	0.77	0
	Developed Basin	0.77	0.25
Total	**Existing Basin**	83.47	0
	Developed Basin	83.47	39.09

WOODFIELD PRESERVE
PHASE 3
STREET, DRAINAGE, WATER
AND WASTEWATER IMPROVEMENTS
SHELL ROAD MUNICIPAL UTILITY DISTRICT

WOODFIELD PRESERVE
PHASE 3
SUBDIVISION PLANS

SUBMITTED FOR APPROVAL BY:
LJA ENGINEERING, INC.

JUSTIN D. MIDURA
128809

2-29-2024

LJA ENGINEERING, INC.
JUSTIN D. MIDURA , P.E.
DATE

DEVELOPMENT SERVICES DEPARTMENT
DATE

2023-33-CON
SITE PLAN/DEVELOPMENT PERMIT NUMBER

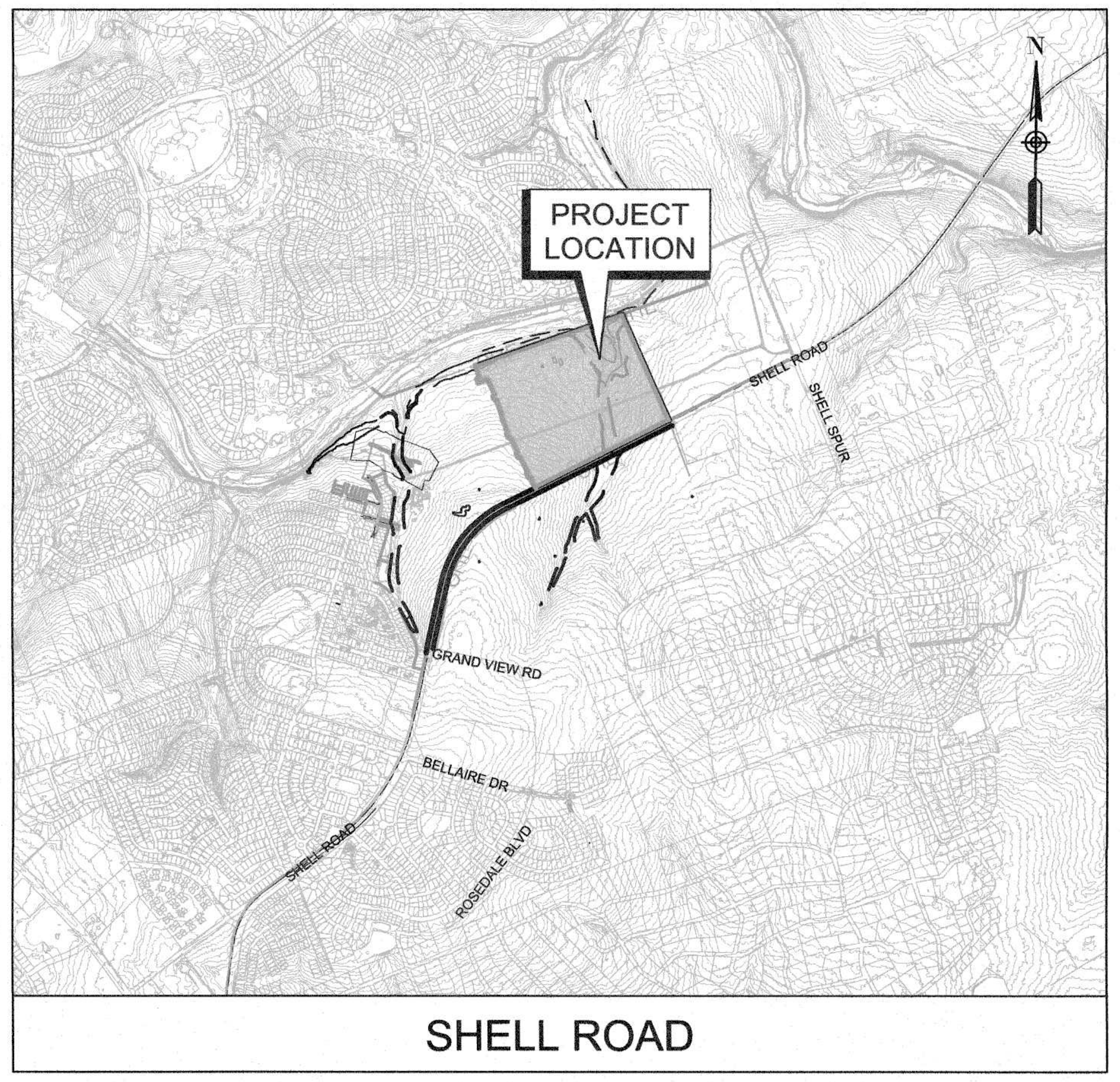
2023-24-PP
SUBDIVISION FILE NUMBER (Preliminary Plat)

WATERSHED & TCEQ RECHARGE ZONE STATUS
THIS SITE IS LOCATED WITHIN THE BERRY CREEK WATERSHED, THIS SITE IS LOCATED ENTIRELY WITHIN THE EDWARDS AQUIFER RECHARGE ZONE.

FLOODPLAIN INFORMATION
THE TRACTS SHOWN ARE ENCUMBERED BY ZONE AE ACCORDING TO FIRM PANEL MAP 48491C0280E EFFECTIVE SEPTEMBER 26, 2008.

THIS FLOOD STATEMENT DOES NOT IMPLY THAT THE PROPERTY AND/OR THE STRUCTURES THEREON WILL BE FREE FROM FLOODING OR FLOOD DAMAGE. THIS FLOOD STATEMENT SHALL NOT CREATE LIABILITY ON THE PART OF THE SURVEYOR OR ENGINEER.

ZONING
SHELL ROAD PUD ORDINANCE NO. 2019-32



LOCATION MAP
SCALE: 1" = 2000'

NOTES

1. THESE PLANS WERE PREPARED, SEALED, SIGNED AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE, BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE PLANS FOR CONSTRUCTION OF THE PROPOSED PROJECT ARE HEREBY APPROVED SUBJECT TO THE STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS MANUAL AND ALL OTHER APPLICABLE CITY, STATE AND FEDERAL REQUIREMENT AND CODES.
2. THIS PROJECT IS SUBJECT TO ALL CITY STANDARD SPECIFICATIONS AND DETAILS IN EFFECT AT THE TIME OF SUBMITTAL OF THE PROJECT TO THE CITY.
3. ALL ELECTRIC DISTRIBUTION LINES AND INDIVIDUAL SERVICE LINES SHALL BE INSTALLED UNDERGROUND. IF OVERHEAD LINES EXISTED PRIOR TO UNDERGROUND INSTALLATION, SUCH POLES, GUY WIRES, AND RELATED STRUCTURES SHALL BE REMOVED FOLLOWING CONSTRUCTION OF THE UNDERGROUND INFRASTRUCTURE (ONLY APPLICABLE FOR RESIDENTIAL PROPERTY).
4. ALL ELECTRIC AND COMMUNICATION INFRASTRUCTURE SHALL COMPLY WITH UDC SECTION 13.06.
5. THE PROPERTY SUBJECT TO THIS APPLICATION IS SUBJECT TO THE WATER QUALITY REGULATIONS OF THE CITY OF GEORGETOWN.
6. A GEOLOGIC ASSESSMENT, IN ACCORDANCE WITH THE CITY OF GEORGETOWN WATER QUALITY REGULATIONS, WAS COMPLETED ON JUNE, 2021. ANY SPRINGS AND STREAMS AS IDENTIFIED IN THE GEOLOGIC ASSESSMENT ARE SHOWN HEREIN.

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EMAIL: LJA@LJA.COM

SURVEYOR:
C/O: JOBY EARLY, R.P.L.S.
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Sheet Number		Sheet Description
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20	GN2	GENERAL NOTES
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24	DM4	INTERNAL DRAINAGE CALCULATIONS
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40	ST3	BUTTERFLY BUSH WAY PLAN & PROFILE STA. 1+00 TO 8+00
41	ST4	BUTTERFLY BUSH WAY PLAN & PROFILE STA. 8+00 TO END
42	ST5	PAINTED FLOWER PLACE PLAN & PROFILE STA. 1+00 TO 9+00
43	ST6	PAINTED FLOWER PLACE PLAN & PROFILE STA. 9+00 TO 17+00
44	ST7	PAINTED FLOWER PLACE PLAN & PROFILE STA. 14+00 TO END
45	ST8	HEARTHSTONE DRIVE PLAN & PROFILE STA 9+00 TO 18+00
46	ST9	HEARTHSTONE DRIVE & HAWK FLIGHT ROAD PLAN & PROFILE
47	ST10	PEACEFUL PORCH WAY PLAN & PROFILE 9+00 TO 18+00
48	ST11	WOODDALE DRIVE PLAN & PROFILE STA 18+00 TO 25+00
49	ST12	HAMMOCK ROAD PLAN & PROFILE STA 25+00 TO END
50	ST13	PORCH SWING DRIVE PLAN & PROFILE
51	ST14	WOODEN FENCE ST PLAN AND PROFILE
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69	SS4	STORMSEWER LINE P1 PLAN & PROFILE STA. 8+00 TO END
70	SS5	STORMSEWER LINE P4, P6, & P9 PLAN & PROFILE STA. 1+00 TO END
71	SS6	STORMSEWER LINE Q1 PLAN & PROFILE STA. 1+00 TO 10+00
72	SS7	STORMSEWER LINE Q1 & Q25 PLAN & PROFILE
73	SS8	STORMSEWER LINE Q8, Q17, & Q20 PLAN & PROFILE
74	SS9	STORMSEWER LINE R1 PLAN & PROFILE STA. 1+00 TO END
75	SS10	STORMSEWER LINE S1 PLAN & PROFILE STA. 1+00 TO END
76	SS11	STORMSEWER LINE S1 & R2 PLAN & PROFILE
77	SS12	STORMSEWER LINE S7 PLAN & PROFILE STA. 1+00 TO END
78	SS13	STORMSEWER LINE S13, T1 & T2 PLAN & PROFILE STA. 1+00 TO END
79	SS14	STORMSEWER LATERALS - K, M, N & P
80	SS15	STORMSEWER LATERALS - P & Q
81	SS16	STORMSEWER LATERALS - Q, R, & S
82	SS17	STORMSEWER LATERALS - S
83	SS18	STORMSEWER LATERALS - S
84	SS19	PRIVATE STORM SEWER CULVERT 9 & 10
85 - 87	WL1 - WL3	WATER LINE PLAN VIEW
88	WW1	WASTEWATER LINE Q PLAN & PROFILE STA. 1+00 TO 10+50
89	WW2	WASTEWATER LINE Q PLAN & PROFILE STA. 10+50 TO 20+00
90	WW3	WASTEWATER LINE Q PLAN & PROFILE STA. 20+00 TO END
91	WW4	WASTEWATER LINE U PLAN & PROFILE STA. 1+00 TO 10+00
92	WW5	WASTEWATER LINE U PLAN & PROFILE STA. 10+00 TO 19+00
93	WW6	WASTEWATER LINE U & AA PLAN & PROFILE
94	WW7	WASTEWATER LINE UU PLAN & PROFILE STA. 1+00 TO 10+00
95	WW8	WASTEWATER LINE UU PLAN & PROFILE STA. 10+00 TO END
96	WW9	WASTEWATER LINE CC PLAN & PROFILE STA. 1+00 TO END
97	WW10	WASTEWATER LINE DD PLAN & PROFILE STA. 1+00 TO 10+00
98	WW11	WASTEWATER LINE DD PLAN & PROFILE STA. 10+00 TO END
99	WW12	WASTEWATER LINE EE & FF PLAN & PROFILE
100	WW13	WASTEWATER LINE HH PLAN & PROFILE STA. 1+00 TO END
101	WW14	WASTEWATER LINE HH & JJ PLAN & PROFILE
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103	SP1	SIGNAGE AND STRIPING
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106	SP4	SIGNAGE AND STRIPING
107 -110	DT1 - DT4	GENERAL DETAILS
111-120	TXDOT 1-10	TxDOT DETAILS

REVISIONS / CORRECTIONS

Number	Revision Description	Revise (R) Add (A) Void (V) Sheet No.'s	NET Change Imp. Cover (SF)	Total Site Imp. Cover (%)	COA Approval Date

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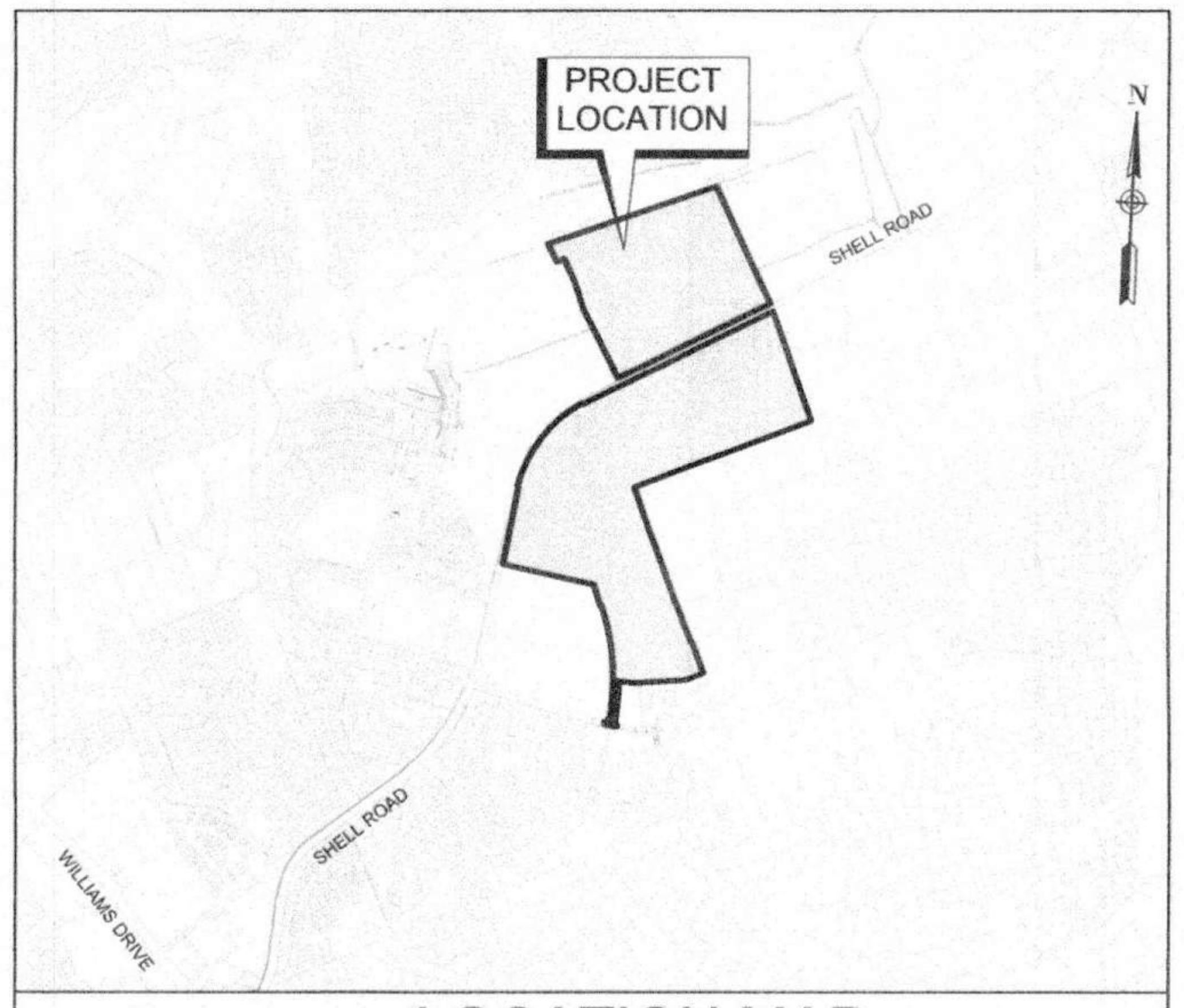
Approved by the City of Georgetown
Planning & Zoning Commission on:
November 11, 2023
Per Section 3.08.070.E of the Unified Development Code, this Preliminary Plat will expire on **Nov. 11, 2025** if a Final Plat is not recorded.

WOODFIELD PRESERVE
PRELIMINARY PLAT



LOCATION MAP

SCALE: 1"=2000'
SUBMITTAL DATE: 08/21/2023

AREA:	206.5 ACRES
LOTS:	572 RESIDENTIAL
1 LOT MULTI-FAMILY	18.6 ACRES
1 LOT COMMERCIAL	*12.6 ACRES
2 LOT PUBLIC PARKS	11.0 ACRES
1 LOT PRIVATE AMENITY CENTERS	2.3 ACRES
1 LOT LIFT STATIONS	0.27 ACRES
10 LOT PUE	5.84 ACRES
9 LOT DE/PUE	40.34 ACRES
1 LOT DE/PUE/PAE	0.5 ACRES
2 LOT PUE/PAE	0.66 ACRES
TOTAL LOTS	600
BLOCKS	23

*13.1 ACRES, NET OF ROW DEDICATION

PUD PARKLAND REQUIREMENTS

REQUIRED = 26 ACRES
PROVIDED = 54 ACRES (EXCLUDES FLOODPLAIN & SLOPES ABOVE 20%)
→ PUBLIC PARK = 11 ACRES
(LOT 2, BLOCK E)
(LOT 132, BLOCK Q)
→ PARKLAND OPEN SPACE LOTS = 47 ACRES

LEGEND:

DE	DRAINAGE EASEMENT
PUE	PUBLIC UTILITY EASEMENT
PAE	ACCESS EASEMENT

Street Name	Classification	ROW Width (ft)	Pavement Dimension (FOC-FOC, ft)	Curb Type	Pedestrian Clear Zone (ft)	Sidewalk Width (ft)	Design Speed (mph)	Min. CL Radius (ft)
Woodfield Drive	Divided Collector	60 - 80	31 - 47	Stand Up	14 - 16	5	30	470'
Wooden Fence Drive	Local	50	31	Stand Up	9	5	30	180'
Wooddale Drive	Local	50	31	Stand Up	9	5	30	180'
Arbordale Street	Local	50	31	Stand Up	9	5	30	180'
Falling Leaf Lane	Local	50	31	Stand Up	9	5	30	180'
Antler Edge Court	Local	50	31	Stand Up	9	5	30	180'
Acorn Oak Drive	Local	50	31	Stand Up	9	5	30	180'
Painted Flower Place	Residential Collector	60	35	Stand Up	12	5	30	300'
Sunrise Oak Cove	Local	50	31	Stand Up	9	5	30	180'
Evening Sky Court	Local	50	31	Stand Up	9	5	30	180'
Porch Swing Drive	Local	50	31	Stand Up	9	5	30	180'
Tree House Road	Local	50	31	Stand Up	9	5	30	180'
Hawk Flight Road	Local	50	31	Stand Up	9	5	30	180'
Misted Grass Trail	Local	50	31	Stand Up	9	5	30	180'
Peaceful Porch Way	Local	50	31	Stand Up	9	5	30	180'
Hammock Road	Local	50	31	Stand Up	9	5	30	180'
Rosedale Blvd	Residential Collector	60	35	Stand Up	12	5	30	300'
Fair Acres Drive	Local	50	31	Stand Up	9	5	30	180'
ButterFly Bush Lane	Residential Collector	50 - 80	31 - 55.5	Stand Up	9 - 11.75	5	30	470'
Flowering Cactus Court	Local	50	31	Stand Up	9	5	30	180'
Hearthstone Drive	Local	50	31	Stand Up	9	5	30	180'
Grand View Road	Residential Collector	60	35	Stand Up	12	5	30	470'
Hummingbird Flight Drive	Local	50	31	Stand Up	9	5	30	180'
Nesting Bird Drive	Local	50	31	Stand Up	9	5	30	180'
Firefly Drive	Local	50	31	Stand Up	9	5	30	180'
Dragonfly Street	Local	50	31	Stand Up	9	5	30	180'
Stone Fence Street	Local	50	31	Stand Up	9	5	30	180'
Shell Road	Major Arterial	135	90	Stand Up	22	6	45	470'

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Sheet Number	Sheet Title	Sheet Description
1	CV1	COVER SHEET
2	PL0	PRELIMINARY PLAT & PHASING PLAN
3	PL1	PRELIMINARY PLAT
4	PL2	PRELIMINARY PLAT
5	PL3	PRELIMINARY PLAT
6	PL4	PRELIMINARY PLAT
7	PL5	PRELIMINARY PLAT
8	PL6	PRELIMINARY PLAT
9	PL7	PRELIMINARY PLAT
10	PL8	PRELIMINARY PLAT
11	PL9	PRELIMINARY PLAT
12	PL10	PRELIMINARY PLAT LINE TABLE
13	PL11	PRELIMINARY PLAT CURVE TABLE
14	PL12	LOT AREA LIST
15	PL13	LOT AREA LIST
16	PL14	SURVEY, METES & BOUNDS
17	PL15	NOTES

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THIS IS A SURFACE DRAWING.

BEARING BASIS: THE TEXAS COORDINATE SYSTEM OF 1983 (NAD83), CENTRAL ZONE, BASED ON GPS OBSERVATIONS ON EARLY LAND SURVEYING CONTROL POINTS "ELS #1-3".

COMBINED SCALE FACTOR = 0.999880014
(FOR SURFACE TO GRID CONVERSION)

INVERSE SCALE FACTOR = 1.000120
(FOR GRID TO SURFACE CONVERSION)

SCALED ABOUT 0,0
THETA ANGLE: 1°21'15"

ELS #2

1/2" REBAR WITH RED "EARLY CONTROL" CAP SET

SURFACE COORDINATES:
N 10230032.36
E 3123412.08

TEXAS STATE PLANE COORDINATES:
N 10228804.90
E 3123037.32

ELS #3

MAG NAIL WITH WASHER SET IN STORM SEWER INLET ON THE SOUTHWEST SIDE OF BELLAIRE DRIVE, APPROXIMATELY 115' NORTHWEST OF ROSEDALE BLVD.

SURFACE COORDINATES:
N 10226500.13
E 3123229.88

TEXAS STATE PLANE COORDINATES:
N 10225273.10
E 3122855.14

ELEVATION = 843.96
VERTICAL DATUM: NAVD 88 (GEOID 12B)

2023-24-PP

Date\Time : Fri, 22 Sep 2023 – 8:37am User Name : jpiecuch
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3
FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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JOB NUMBER:
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FP1

SHEET NO.
02
OF 118 SHEETS

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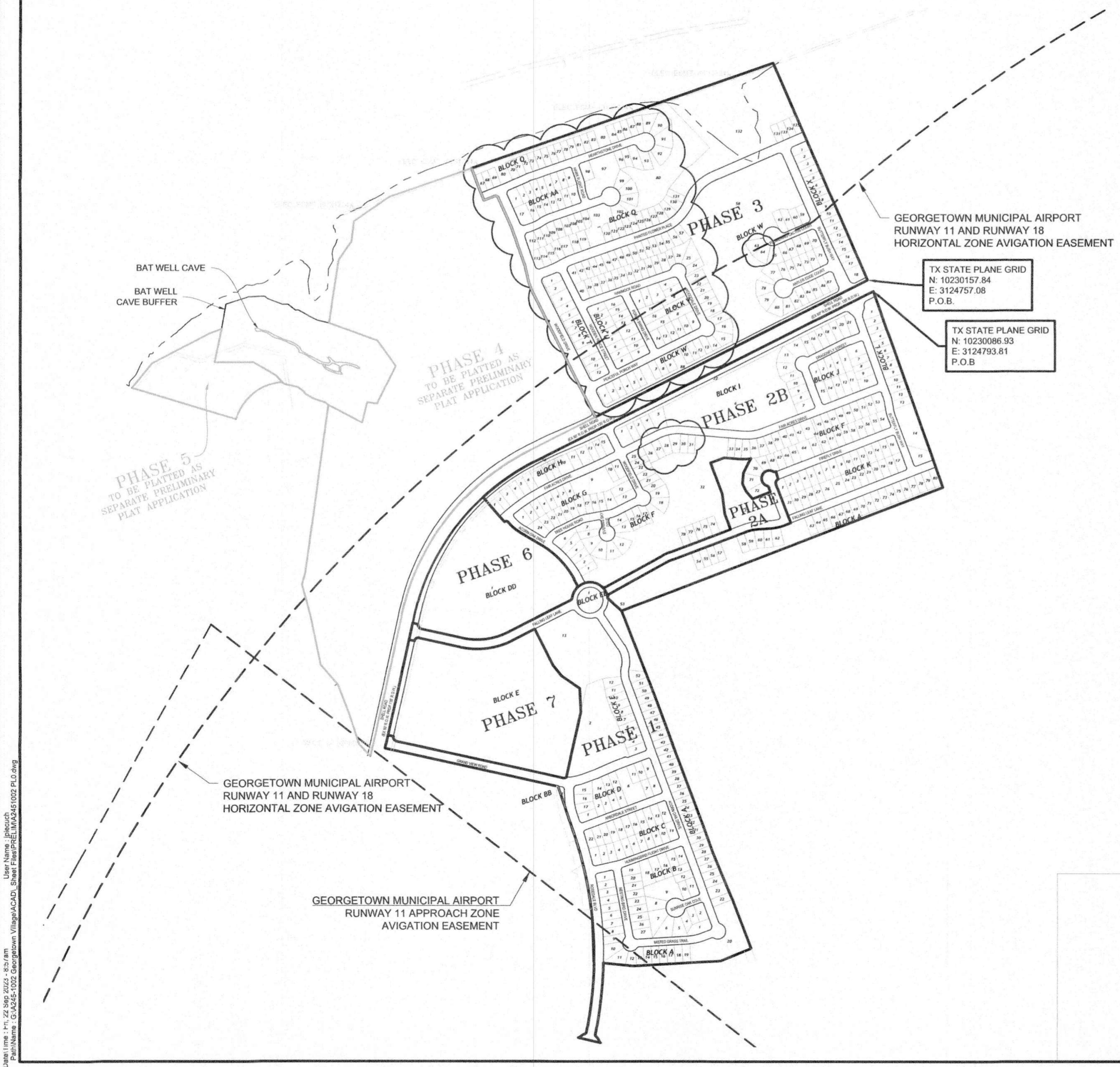

N

0 400 800

1" = 400'

LEGEND:

100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······700······	SURVEY CONTOURS
▨ 1234	HERITAGE TREE TO BE SAVED
▨ 1234	HERITAGE TREE TO BE REMOVED
	LOT LINE CHANGE PROPOSED WITH THIS PRELIMINARY PLAT AMENDMENT (ALSO DENOTES PHASE 2 BEING SPLIT INTO "PHASE 2A" AND "PHASE 2B") NO ROW OR STREET LAYOUT CHANGES PROPOSED

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT & PHASING PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL0.dwg

JUSTIN D. MIDURA
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9-22-2023

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JOB NUMBER:
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PL0

SHEET NO. 02
OF 17 SHEETS

2023-24-PP

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TXDOT 1- 9

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WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP2.dwg

JUSTIN D. MIDURA
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11-30-2023

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JOB NUMBER:
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FP2

SHEET NO.
03
OF 118 SHEETS

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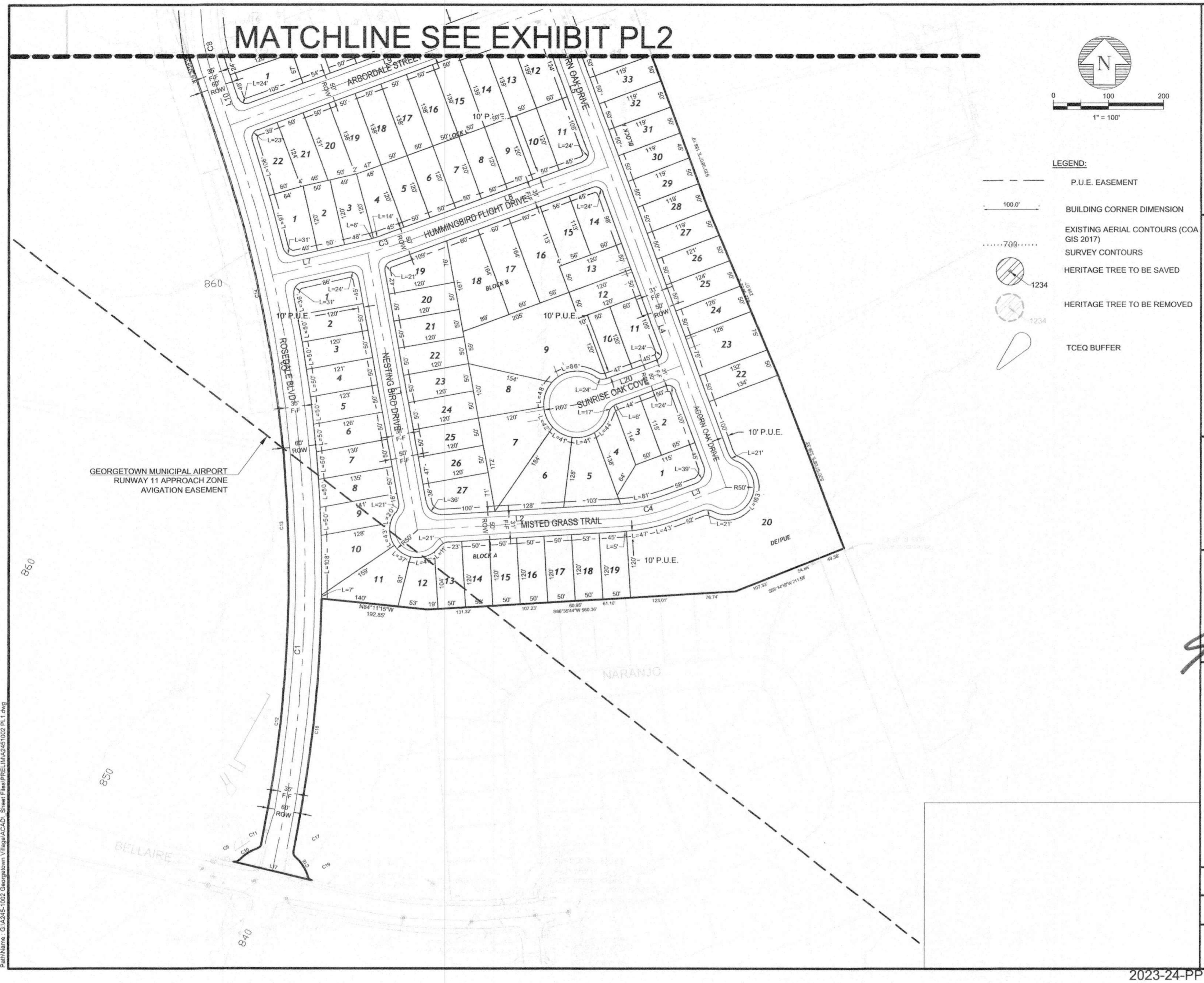

LEGEND:

	P.U.E. EASEMENT
100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······700······	SURVEY CONTOURS
1234	HERITAGE TREE TO BE SAVED
1234	HERITAGE TREE TO BE REMOVED
	TCEQ BUFFER

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WOODFIELD PRESERVE PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL1.dwg

JUSTIN D. MIDURA
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9-22-2023

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JOB NUMBER: A245-1002

PL1

SHEET NO. 03
OF 17 SHEETS

2023-24-PP

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WOODFIELD PRESERVE PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP3.dwg

JUSTIN D. MIDURA
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11-30-2023

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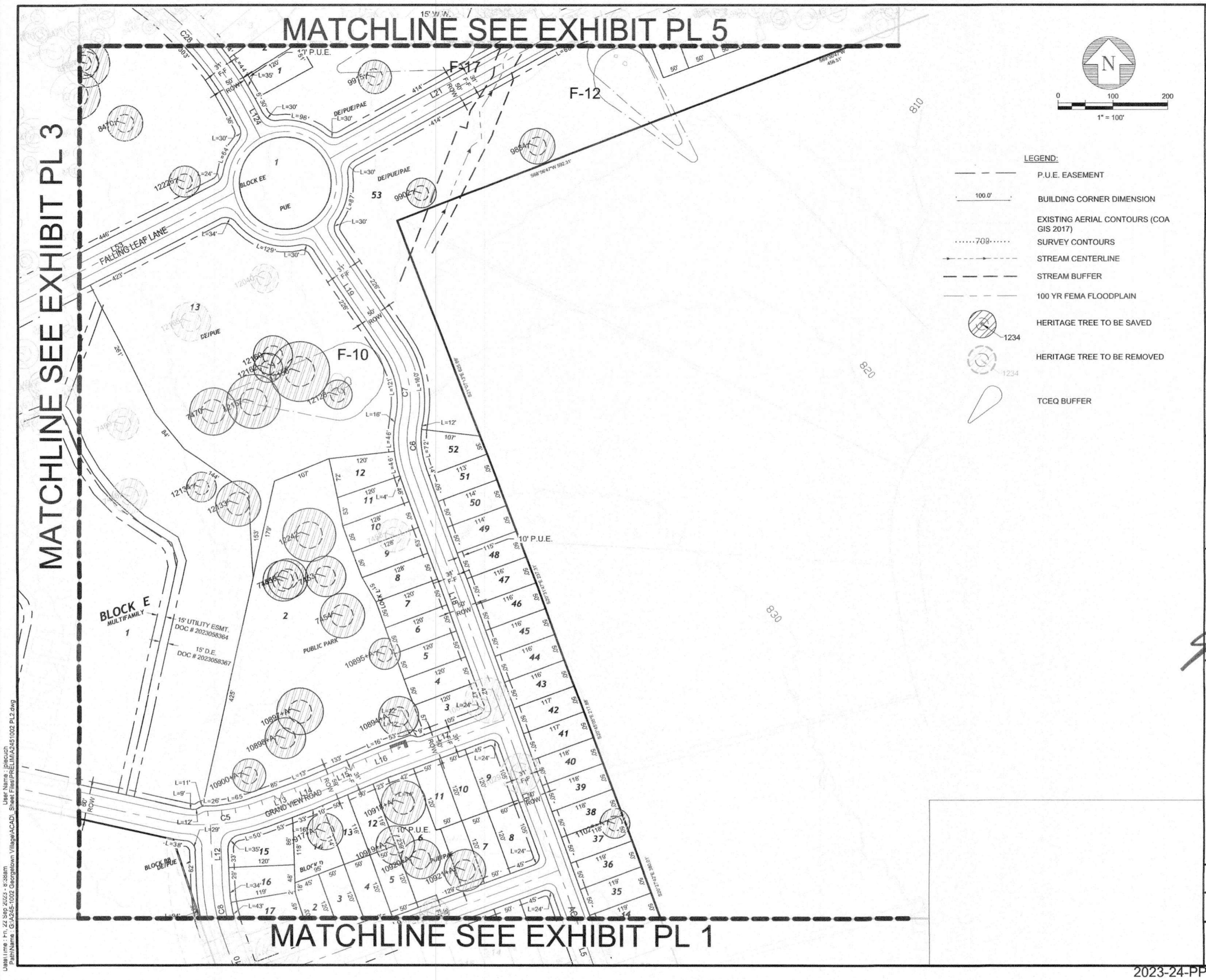
JOB NUMBER: A245-1002

FP3

SHEET NO. 04
OF 118 SHEETS

2022-24-CON



LEGEND:

— — —	P.U.E. EASEMENT
100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······700······	SURVEY CONTOURS
→- - -→- - -	STREAM CENTERLINE
— — — —	STREAM BUFFER
— — —	100 YR FEMA FLOODPLAIN
● 1234	HERITAGE TREE TO BE SAVED
○ 1234	HERITAGE TREE TO BE REMOVED
	TCEQ BUFFER

WOODFIELD PRESERVE PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL2.dwg

JUSTIN D. MIDURA
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9-22-2023

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JOB NUMBER:
A245-1002

PL2

SHEET NO. 04
OF 17 SHEETS

2023-24-PP

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WOODFIELD PRESERVE PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP4.dwg

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JOB NUMBER:
A245-1002

FP4

SHEET NO.
05
OF 118 SHEETS

2022-24-CON

Date\Time : Tue, 28 Nov 2023 - 8:54am
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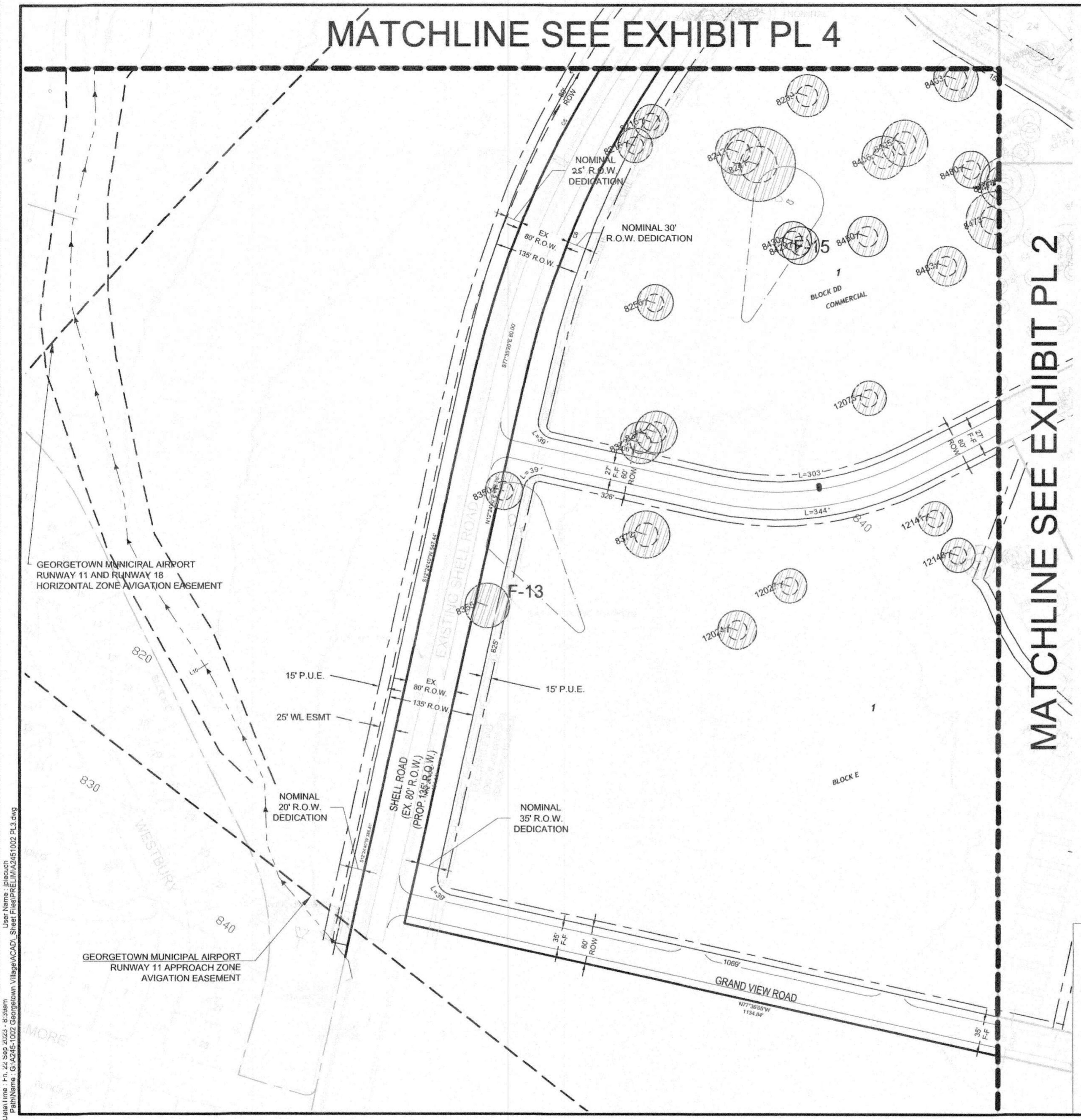

N

0 100 200

1" = 100'

LEGEND:

— — —	P.U.E. EASEMENT
100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······700······	SURVEY CONTOURS
→- - - -→- - - -	STREAM CENTERLINE
— — — —	STREAM BUFFER
— — —	100 YR FEMA FLOODPLAIN
◎ 1234	HERITAGE TREE TO BE SAVED
◌ 1234	HERITAGE TREE TO BE REMOVED
	TCEQ BUFFER

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL3.dwg

JUSTIN D. MIDURA
128809
9-22-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
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Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
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PL3

SHEET NO. 05
OF 17 SHEETS

2023-24-PP

WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP5.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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

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FP5

SHEET NO. 06
OF 118 SHEETS

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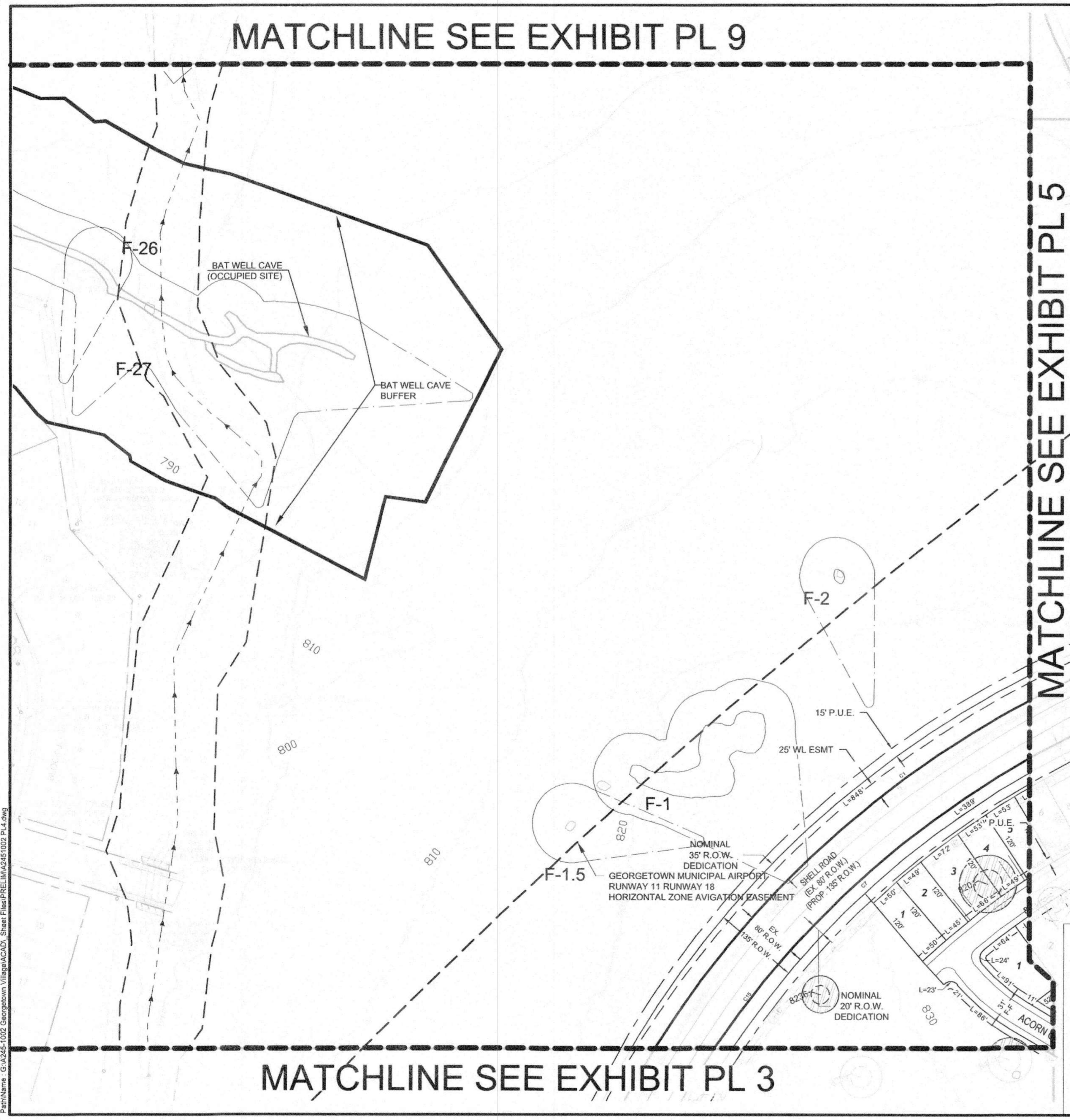

N
0 100 200
1" = 100'

LEGEND:

— — —	P.U.E. EASEMENT
100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······708······	SURVEY CONTOURS
→- - -→- - -	STREAM CENTERLINE
— — — —	STREAM BUFFER
— — — —	100 YR FEMA FLOODPLAIN
◎ 1234	HERITAGE TREE TO BE SAVED
◌ 1234	HERITAGE TREE TO BE REMOVED
	TCEQ BUFFER

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL4.dwg

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PL4

SHEET NO. 06
OF 17 SHEETS

2023-24-PP

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Date\Time : Tue, 28 Nov 2023 - 8:54am
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP6.dwg

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128809
11-30-2023

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JOB NUMBER:
A245-1002

FP6

SHEET NO.
07
OF 118 SHEETS

N

0 100 200

1" = 100'

LEGEND:

- P.U.E. EASEMENT
- 100.0' BUILDING CORNER DIMENSION
- EXISTING AERIAL CONTOURS (COA GIS 2017)
- ······700······ SURVEY CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- 100 YR FEMA FLOODPLAIN
- 1234 HERITAGE TREE TO BE SAVED
- 1234 HERITAGE TREE TO BE REMOVED
- TCEQ BUFFER

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL5.dwg

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128809
9-22-2023

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JOB NUMBER:
A245-1002

PL5

SHEET NO. 07
OF 17 SHEETS

2023-24-PP

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PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
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FP7

SHEET NO. 08
OF 118 SHEETS

2022-24-CON

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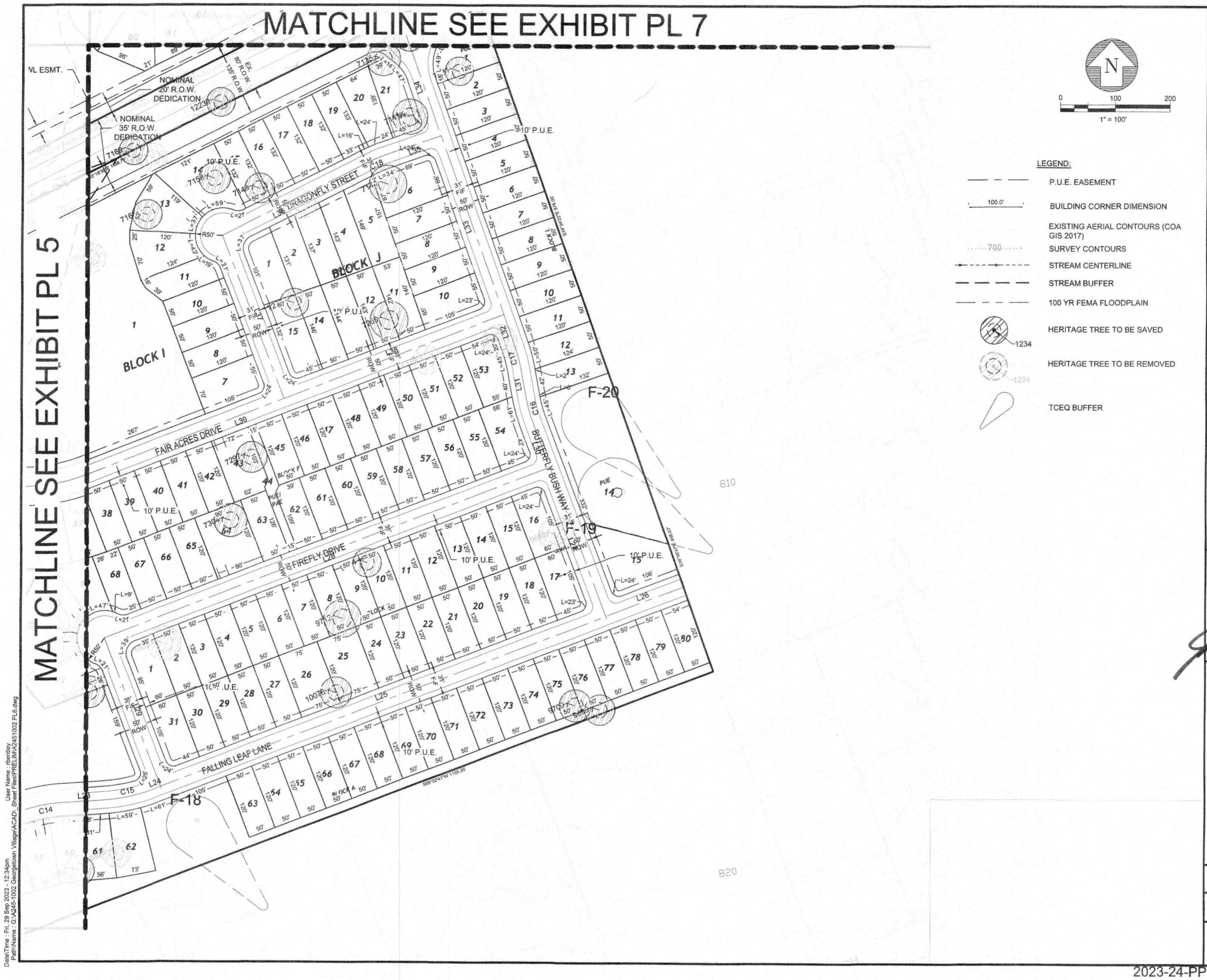

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

NO.	DESCRIPTION	BY	DATE
	REVISIONS		
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/29/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL6.dwg

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PL6

SHEET NO. 08
OF 17 SHEETS

2023-24-PP

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WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 11/28/2023
DESIGNED BY: XXX
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CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP8.dwg

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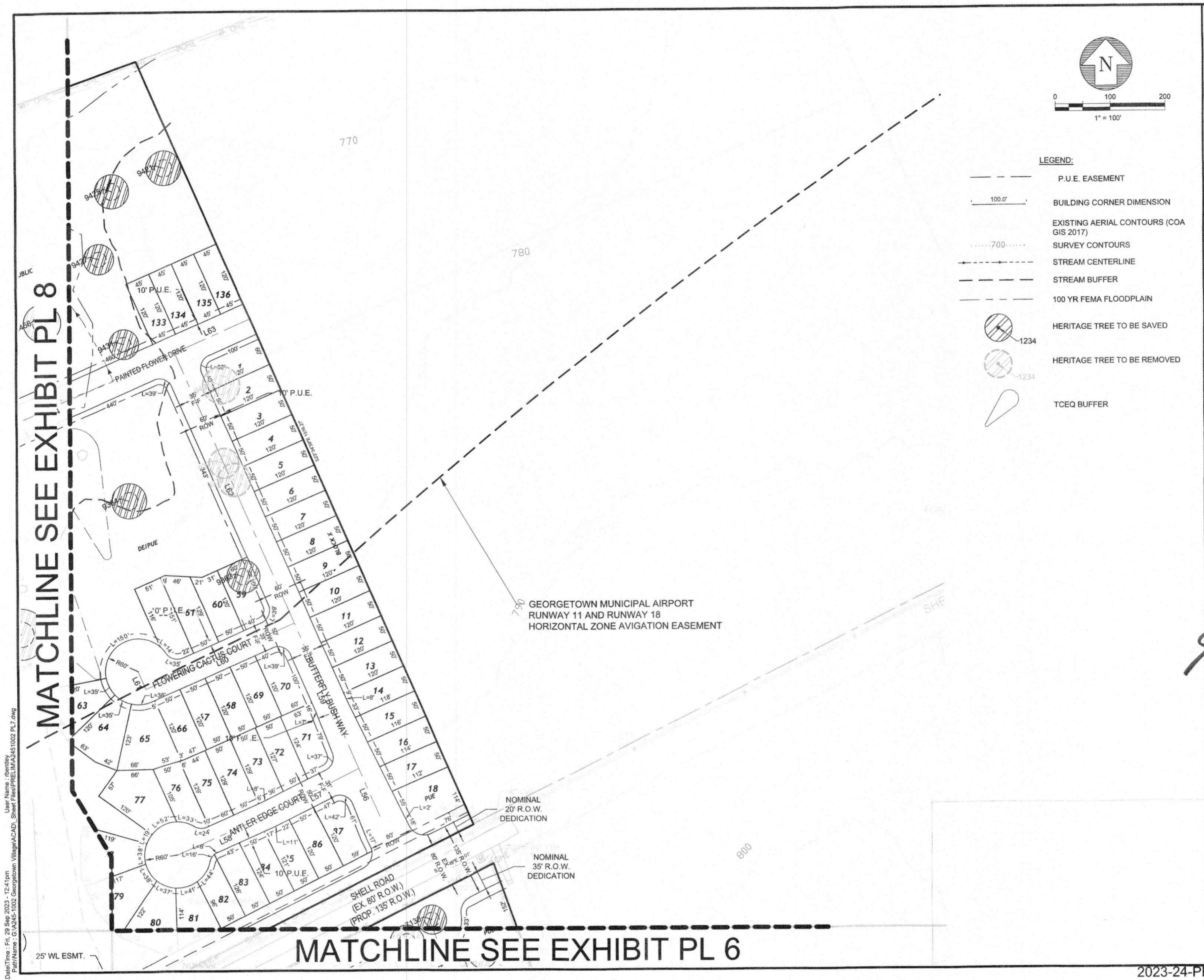
SHEET NO. 09
OF 118 SHEETS



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WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/29/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL7.dwg

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SHEET NO. 09
OF 17 SHEETS

2023-24-PP

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PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
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SHEET NO.
10
OF 118 SHEETS

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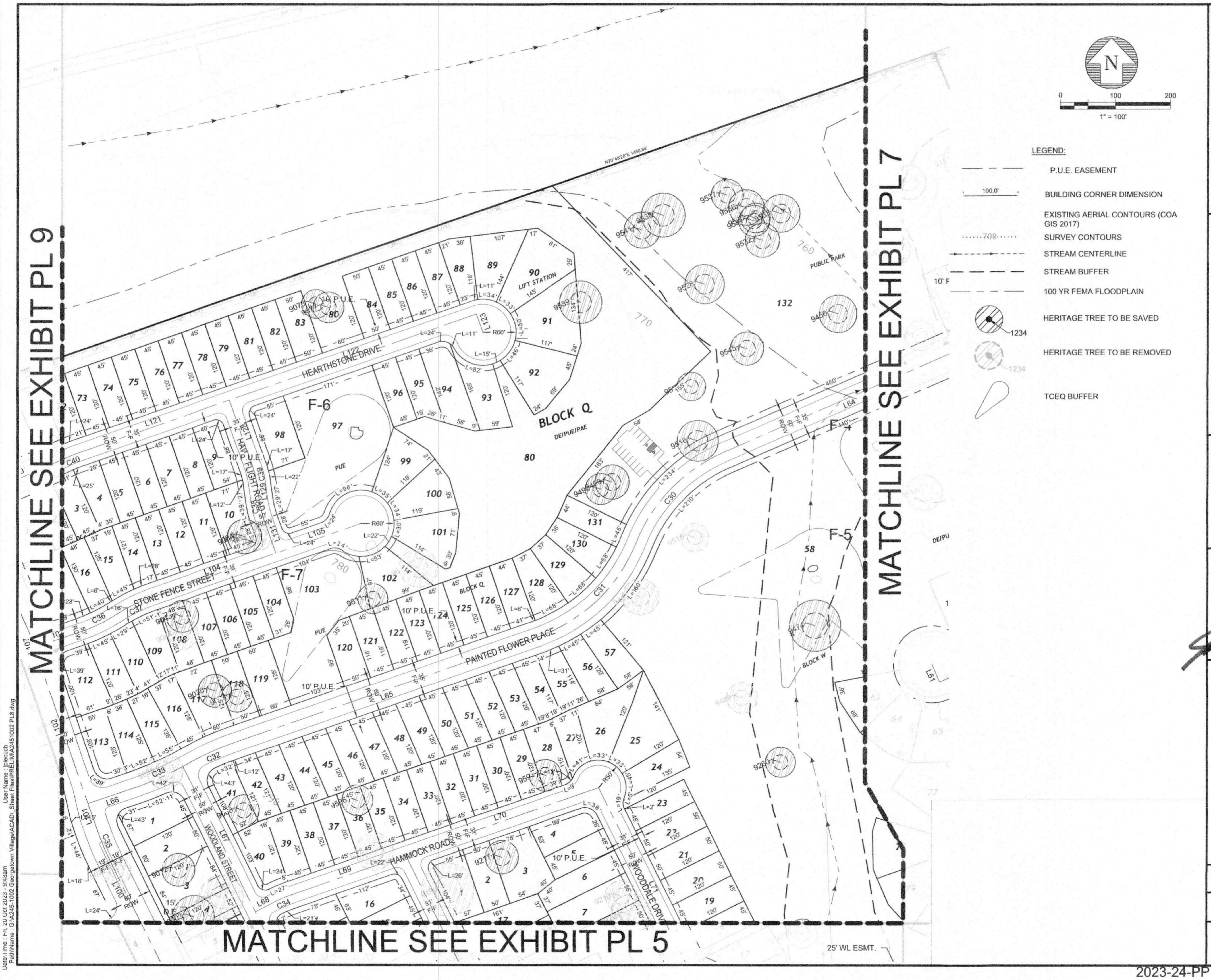

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WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

NO.	DESCRIPTION	BY	DATE
REVISIONS			
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 10/20/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL8.dwg

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10-20-2023

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PL8

SHEET NO. 10
OF 17 SHEETS

2023-24-PP

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WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

NO.	DESCRIPTION	BY	DATE
REVISIONS			

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP10.dwg

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FP10

SHEET NO. 11
OF 118 SHEETS

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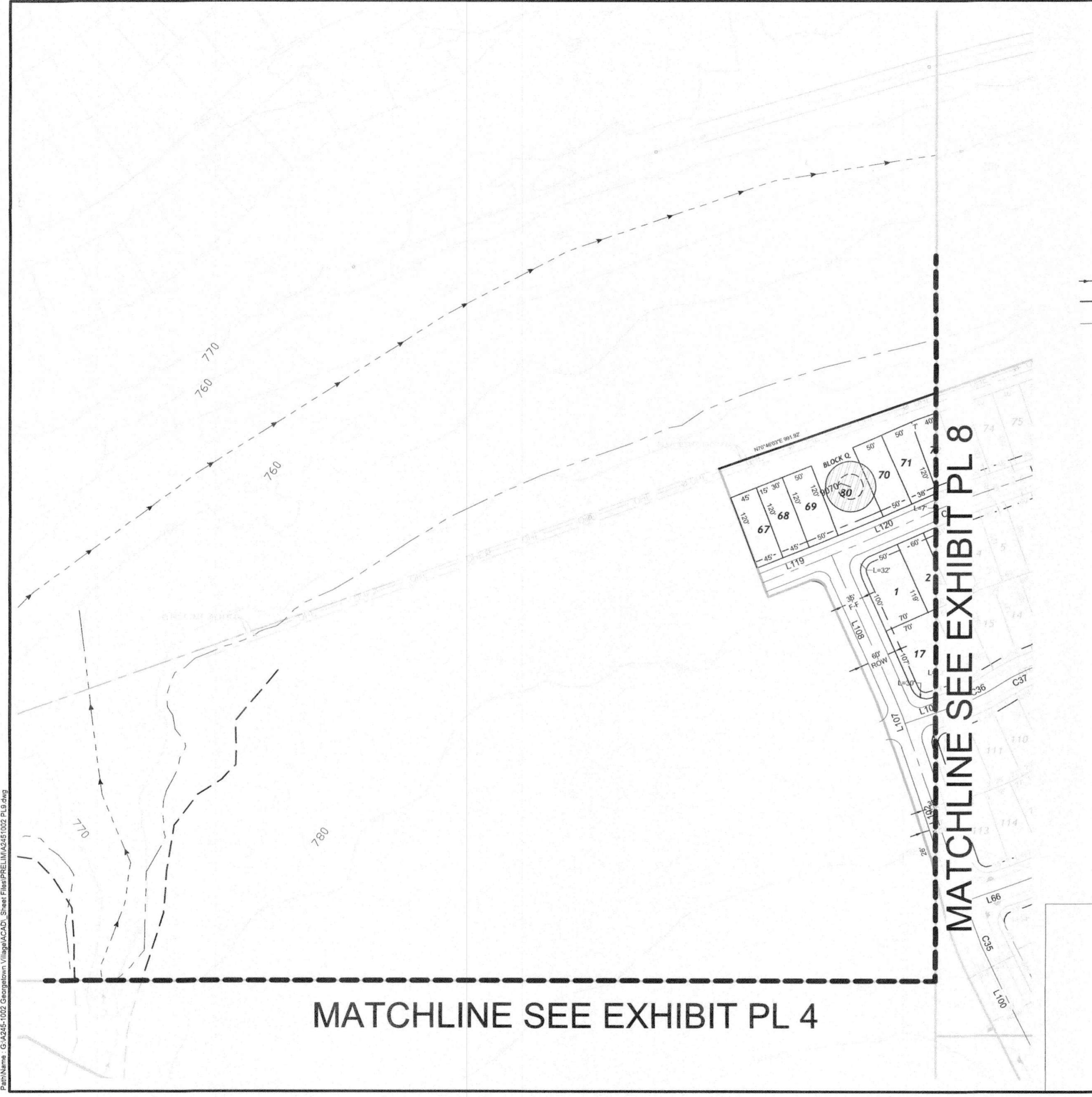

LEGEND:

— — —	P.U.E. EASEMENT
100.0'	BUILDING CORNER DIMENSION
	EXISTING AERIAL CONTOURS (COA GIS 2017)
······700······	SURVEY CONTOURS
—•— — —•— —	STREAM CENTERLINE
— — — —	STREAM BUFFER
— — —	100 YR FEMA FLOODPLAIN
⊘ 1234	HERITAGE TREE TO BE SAVED
◌ 1234	HERITAGE TREE TO BE REMOVED
◇	TCEQ BUFFER

WOODFIELD PRESERVE
PRELIMINARY PLAT

PRELIMINARY PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
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DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL9.dwg

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PL9

SHEET NO. 11
OF 17 SHEETS

2023-24-PP

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WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
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CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP11.dwg

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FP11

SHEET NO.
12
OF 118 SHEETS

Date\Time : Tue, 28 Nov 2023 - 8:55am User Name : jpiecuch
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Date\Time : Fri, 22 Sep 2023 - 8:42am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PRELIM\A2451002 PL11.dwg

Line Table		
Line #	Length	Direction
L1	509.464	S10° 11' 17.43"E
L2	373.526	N86° 33' 30.60"E
L3	107.915	N69° 42' 17.44"E
L4	617.711	N20° 08' 07.43"W
L5	309.186	N20° 17' 42.56"W
L6	290.000	N20° 17' 42.56"W
L7	134.025	N77° 19' 40.31"E
L8	376.637	N69° 51' 52.57"E
L9	617.898	N69° 42' 17.44"E
L10	128.226	S18° 52' 03.68"E
L11	1084.243	S77° 36' 05.18"E
L12	107.938	S02° 24' 03.97"E
L13	85.261	N69° 42' 17.44"E
L14	14.755	N68° 17' 44.45"E
L15	133.329	N66° 53' 11.45"E
L16	14.755	N68° 17' 44.45"E
L17	227.470	N69° 42' 17.44"E
L18	477.622	N20° 17' 42.56"W
L19	262.630	N33° 50' 36.34"W
L20	200.769	N69° 42' 17.44"E
L21	450.173	N61° 02' 59.58"E
L22	507.491	N69° 25' 40.09"E

Line Table		
Line #	Length	Direction
L23	77.147	N86° 11' 12.57"E
L24	14.109	N68° 56' 29.19"E
L25	869.959	N68° 56' 29.19"E
L26	151.331	N68° 56' 29.19"E
L27	289.728	N21° 03' 30.81"W
L28	869.960	S68° 56' 29.19"W
L29	290.000	S21° 03' 30.81"E
L30	81.993	N20° 57' 19.47"W
L31	43.739	N10° 15' 08.28"W
L32	60.889	N19° 35' 09.06"W
L33	345.559	N19° 34' 16.95"W
L34	193.063	N19° 38' 49.57"W
L35	108.406	S70° 25' 37.52"W
L36	293.315	S63° 18' 30.22"W
L37	318.122	S20° 57' 19.47"E
L38	429.343	N68° 56' 29.19"E
L39	391.556	S68° 56' 29.19"W
L40	389.092	N85° 11' 10.10"W
L41	264.721	S63° 18' 30.22"W
L42	320.306	S26° 41' 29.78"E
L43	188.393	S63° 18' 30.22"W
L44	142.362	S79° 49' 11.49"W

Line Table		
Line #	Length	Direction
L45	119.778	S10° 10' 48.51"E
L46	145.647	S63° 18' 30.22"W
L47	16.106	S30° 47' 22.60"W
L48	123.277	S63° 18' 30.22"W
L49	187.840	S66° 51' 23.25"W
L50	144.514	S63° 44' 42.12"W
L51	158.064	S59° 12' 37.40"E
L52	294.722	S77° 35' 20.03"E
L53	469.317	N63° 00' 04.63"E
L54	30.111	N26° 41' 29.78"W
L55	134.889	N26° 41' 29.78"W
L56	95.565	N23° 34' 39.02"W
L57	182.807	S63° 18' 30.22"W
L58	183.080	S66° 26' 22.18"W
L59	288.797	N23° 34' 39.02"W
L60	295.756	S66° 25' 20.98"W
L61	35.000	N23° 34' 39.02"W
L62	538.470	N23° 34' 39.02"W
L63	150.000	N66° 25' 20.98"E
L64	489.576	S66° 25' 20.98"W
L65	587.774	S70° 46' 02.70"W
L66	87.925	S71° 03' 23.91"W

Line Table		
Line #	Length	Direction
L67	294.657	S26° 39' 13.83"E
L68	42.184	N63° 05' 07.71"E
L69	225.638	N70° 46' 02.70"E
L70	371.545	N70° 46' 02.70"E
L71	410.635	S26° 39' 13.83"E
L72	368.433	S63° 18' 30.22"W
L73	458.868	N26° 39' 13.83"W
L74	290.302	S63° 20' 46.17"W
L75	489.326	N26° 39' 13.83"W
L76	195.323	S63° 18' 30.22"W
L81	165.000	S26° 39' 13.83"E
L82	294.652	N26° 39' 13.83"W
L86	285.000	N26° 39' 13.83"W
L100	113.812	N26° 39' 13.83"W
L101	43.810	N18° 56' 36.09"W
L102	300.000	N18° 56' 36.09"W
L103	87.925	N71° 03' 23.91"E
L104	237.028	N70° 46' 02.70"E
L105	164.172	N70° 46' 02.70"E
L107	13.017	N18° 56' 36.09"W
L108	252.244	N24° 16' 37.56"W
L119	118.357	N68° 16' 11.91"E

Line Table		
Line #	Length	Direction
L120	191.127	N66° 38' 54.30"E
L121	287.914	N70° 46' 02.70"E
L122	475.661	N70° 46' 02.70"E
L123	35.000	S19° 13' 57.30"E
L124	75.039	S28° 29' 48.65"E

WOODFIELD PRESERVE
PRELIMINARY PLAT

LINE TABLE

REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL11.dwg

JUSTIN D. MIDURA
128809
9-22-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
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Round Rock, TX 78681
Phone 512.439.4700
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JOB NUMBER: A245-1002

PL10

SHEET NO. 12
OF 17 SHEETS

2023-24-PP

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PHASE 3

FINAL PLAT

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP12.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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JOB NUMBER: A245-1002

FP12

SHEET NO. 13
OF 118 SHEETS

Curve Table							
Name	Radius	Arc Length	Chord Length	Tangent Length	External Distance	Chord Direction	Delta
C1	2485.81	762.70	759.71	384.37	762.70	N03° 40' 24.20"E	017.5795
C2	2470.00	588.57	587.18	295.69	588.57	N11° 58' 19.23"W	013.6529
C3	1000.00	130.26	130.17	65.22	130.26	N73° 35' 46.44"E	007.4633
C4	300.00	88.25	87.93	44.44	88.25	N78° 07' 54.02"E	016.8537
C5	300.00	171.18	168.87	87.99	171.18	N86° 03' 06.13"E	032.6937
C6	180.00	97.77	96.57	50.12	97.77	S04° 44' 07.29"E	031.1196
C7	180.00	140.33	136.80	73.95	140.33	N11° 30' 34.18"W	044.6679
C8	300.00	86.22	85.92	43.41	86.22	S10° 38' 03.85"E	016.4666
C13	300.00	43.87	43.83	21.97	43.87	S65° 14' 19.84"W	008.3779
C14	300.00	87.75	87.44	44.19	87.75	S77° 48' 26.33"W	016.7590
C15	300.00	90.30	89.96	45.49	90.30	N77° 33' 50.88"E	017.2454
C16	300.00	56.04	55.96	28.10	56.04	S15° 36' 13.87"E	010.7031
C17	300.00	48.80	48.75	24.46	48.80	N14° 54' 45.38"W	009.3206
C18	300.00	37.27	37.25	18.66	37.27	S66° 52' 03.87"W	007.1187
C19	300.00	135.47	134.32	68.91	135.47	N81° 52' 39.54"E	025.8724
C20	300.00	164.96	162.89	84.62	164.96	S79° 03' 40.06"W	031.5055
C21	1042.50	64.39	64.38	32.21	64.39	N65° 04' 40.46"E	003.5390
C22	577.50	35.67	35.67	17.84	35.67	S65° 04' 40.62"W	003.5391
C23	1217.50	302.17	301.39	151.86	302.17	S56° 11' 54.29"W	014.2200
C24	180.00	51.87	51.69	26.12	51.87	N71° 33' 50.85"E	016.5115
C25	180.00	51.87	51.69	26.12	51.87	S71° 33' 50.85"W	016.5115
C26	180.00	102.16	100.80	52.50	102.16	S47° 02' 56.41"W	032.5188
C27	300.00	139.46	138.21	71.01	139.46	S45° 53' 34.18"E	026.6351
C28	590.10	313.33	309.66	160.45	313.33	N43° 59' 51.29"W	030.4230
C29	470.00	323.28	316.95	168.33	323.28	N82° 42' 22.30"E	039.4098

Curve Table							
Name	Radius	Arc Length	Chord Length	Tangent Length	External Distance	Chord Direction	Delta
C30	300.00	233.55	227.70	123.05	233.55	S44° 07' 12.30"W	044.6048
C31	300.00	256.30	248.58	136.56	256.30	N46° 17' 33.15"E	048.9497
C32	470.00	85.24	85.13	42.74	85.24	S65° 34' 17.63"W	010.3917
C33	600.00	111.85	111.69	56.09	111.85	N65° 42' 58.23"E	010.6809
C34	180.00	24.13	24.12	12.08	24.13	S66° 55' 35.20"W	007.6819
C35	480.00	64.60	64.55	32.35	64.60	S22° 47' 54.96"E	007.7105
C36	300.00	74.25	74.06	37.32	74.25	N63° 57' 57.28"E	014.1815
C37	300.00	72.74	72.56	36.55	72.74	S63° 49' 16.68"W	013.8922
C38	180.00	34.16	34.11	17.13	34.16	S13° 47' 44.48"E	010.8738
C39	180.00	34.16	34.11	17.13	34.16	N13° 47' 44.48"W	010.8738
C40	300.00	300.00	26.80	13.41	26.81	S68° 12' 25.91"W	005.1204

WOODFIELD PRESERVE
PRELIMINARY PLAT

CURVE TABLES

REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL12.dwg

JUSTIN D. MIDURA
128809

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

PL11

SHEET NO. 13
OF 17 SHEETS

2023-24-PP

Date/Time : Fri, 22 Sep 2023 - 8:43am User Name : jslecuch
Path/Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PRELIM\A2451002 PL12.dwg

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

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

WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP13.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

FP13

SHEET NO. 14
OF 118 SHEETS

2022-24-CON

Date/Time : Tue, 28 Nov 2023 - 8:55am User Name : jslecuch
Path/Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 FP13.dwg

Date\Time : Tue, 28 Nov 2023 - 8:55am User Name : jpiecuch
PathName : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 FP14.dwg

Date\Time : Fri, 20 Oct 2023 - 9:41am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PRELIM\A2451002 PL15.dwg

PHASE 1

BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
A	1	6911.91	0.159
A	2	6016.40	0.138
A	3	6038.64	0.139
A	4	6110.92	0.140
A	5	6233.31	0.143
A	6	6405.96	0.147
A	7	6628.15	0.152
A	8	6900.45	0.158
A	9	6943.56	0.159
A	10	9714.96	0.223
A	11	9537.01	0.219
A	12	5500.69	0.126
A	13	5836.72	0.134
A	14	5989.20	0.137
A	15	5990.82	0.138
A	16	5992.44	0.138
A	17	5994.06	0.138
A	18	5995.69	0.138
A	19	5997.39	0.138
A	20	70152.36	1.610
A	21	6699.35	0.154
A	22	6635.01	0.152
A	23	9738.66	0.224
A	24	6349.54	0.146
A	25	6235.22	0.143
A	26	6120.90	0.141
A	27	6006.57	0.138
A	28	5947.96	0.137
A	29	5949.99	0.137
A	30	5855.69	0.134
A	31	5963.33	0.137
A	32	5962.32	0.137
A	33	5954.19	0.137
A	34	5946.93	0.137
A	35	5939.66	0.136
A	36	5932.40	0.136
A	37	5925.13	0.136
A	38	5917.87	0.136
A	39	5907.31	0.136
A	40	5890.42	0.135
A	41	5870.51	0.135
A	42	5850.59	0.134
A	43	5831.47	0.134
A	44	5817.19	0.134
A	45	5806.95	0.133
A	46	5796.71	0.133
A	47	5786.48	0.133
A	48	5773.99	0.133
A	49	5742.35	0.132
A	50	5706.35	0.131
A	51	5670.34	0.130
A	52	6699.15	0.154
B	1	10023.25	0.230
B	2	7426.71	0.170
B	3	5748.46	0.132
B	4	5775.28	0.133
B	5	9202.28	0.211
B	6	11471.20	0.263
B	7	13352.72	0.307
B	8	9442.28	0.217
B	9	26140.34	0.600
B	10	6000.00	0.138
B	11	7151.71	0.164
B	12	6000.00	0.138
B	13	6000.00	0.138
B	14	6747.24	0.155
B	15	6337.57	0.145
B	16	9613.51	0.221
B	17	9829.51	0.226
B	18	12231.55	0.281
B	19	7797.24	0.179
B	20	6000.00	0.138
B	21	6000.00	0.138
B	22	6000.00	0.138
B	23	6000.00	0.138
B	24	6000.00	0.138
B	25	6000.00	0.138
B	26	6000.00	0.138
B	27	7679.04	0.176
C	1	7219.12	0.166
C	2	6000.00	0.138
C	3	6166.12	0.142
C	4	6384.48	0.147
C	5	6000.00	0.138
C	6	6000.00	0.138
C	7	6000.00	0.138
C	8	6000.00	0.138
C	9	6000.00	0.138
C	10	6000.00	0.138
C	11	7194.60	0.165
C	12	8288.33	0.190
C	13	6943.69	0.159
C	14	6936.72	0.159
C	15	6929.75	0.159
C	16	6922.78	0.159
C	17	6915.81	0.159
C	18	6908.85	0.159
C	19	6898.54	0.158
C	20	6711.40	0.154
C	21	6377.26	0.146
C	22	6863.17	0.158
D	1	7014.84	0.161
D	2	6201.89	0.142
D	3	6000.00	0.138
D	4	6000.00	0.138
D	5	6000.00	0.138
D	6	24862.31	0.571
D	7	6000.00	0.138
D	8	7151.71	0.164
D	9	7151.71	0.164
D	10	6000.00	0.138
D	11	6000.00	0.138
D	12	5865.98	0.135
D	13	5742.91	0.132
D	14	8712.72	0.200
D	15	8077.07	0.185
D	16	6686.18	0.153
D	17	6856.15	0.157
E	2	137662.27	3.160
E	3	6791.71	0.156
E	4	6000.00	0.138
E	5	6000.00	0.138
E	6	6000.00	0.138
E	7	6000.00	0.138
E	8	6203.85	0.142
E	9	6407.70	0.147
E	10	6407.70	0.147
E	11	6303.75	0.145
E	12	6984.33	0.160
E	13	180376.22	4.141
BB	1	2538.21	0.058
EE	1	21903.97	0.503

PHASE 2

BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
A	53	220945.21	5.072
A	54	6000.00	0.138
A	55	6000.00	0.138
A	56	6000.00	0.138
A	57	6000.00	0.138
A	58	6119.41	0.140
A	59	6900.50	0.158
A	60	6620.35	0.152
A	61	6264.90	0.144
A	62	7742.26	0.178
A	63	6000.00	0.138
A	64	6000.00	0.138
A	65	6000.00	0.138
A	66	6000.00	0.138
A	67	6000.00	0.138
A	68	6000.00	0.138
A	69	6000.00	0.138
A	70	6000.00	0.138
A	71	6000.00	0.138
A	72	6000.00	0.138
A	73	6000.00	0.138
A	74	6000.00	0.138
A	75	6000.00	0.138
A	76	6000.00	0.138
A	77	6000.00	0.138
A	78	6000.00	0.138
A	79	6000.00	0.138
A	80	6210.89	0.143
F	1	5684.99	0.131
F	2	5730.10	0.132
F	3	5812.36	0.133
F	4	6283.80	0.144
F	5	7188.55	0.165
F	6	9497.94	0.218
F	7	8527.40	0.196
F	8	6103.47	0.140
F	9	8505.80	0.195
F	10	8583.16	0.197
F	11	8471.19	0.194
F	12	8471.19	0.194
F	13	6927.09	0.159
F	14	6734.34	0.155
F	15	6126.17	0.141
F	16	6126.14	0.141
F	17	5758.30	0.132
F	18	8471.19	0.194
F	19	7488.23	0.172
F	20	5842.72	0.134
F	21	5713.74	0.131
F	22	5400.00	0.124
F	23	5400.00	0.124
F	24	5400.00	0.124
F	25	6551.71	0.150
F	26	7200.00	0.165
F	27	6000.00	0.138
F	28	7148.22	0.164
F	29	7516.09	0.173
F	30	6017.85	0.138
F	31	5365.12	0.123
F	32	315971.85	7.254
F	33	5740.40	0.132
F	34	5801.61	0.133
F	35	6766.48	0.155
F	36	6530.06	0.150
F	37	6674.37	0.153
F	38	6004.67	0.138
F	39	6000.00	0.138
F	40	6000.00	0.138
F	41	6000.00	0.138
F	42	6000.00	0.138
F	43	8559.37	0.196
F	44	3784.56	0.087
F	45	6000.00	0.138
F	46	6000.00	0.138
F	47	6000.00	0.138
F	48	6000.00	0.138
F	49	6000.00	0.138
F	50	6000.00	0.138
F	51	6000.00	0.138
F	52	6000.00	0.138
F	53	7695.38	0.177
F	54	7289.32	0.167
F	55	6000.00	0.138
F	56	6000.00	0.138
F	57	6000.00	0.138
F	58	6000.00	0.138
F	59	6000.00	0.138
F	60	6000.00	0.138
F	61	6000.00	0.138
F	62	5941.36	0.136
F	63	6000.00	0.138
F	64	10746.62	0.247
F	65	6000.00	0.138
F	66	6000.00	0.138
F	67	6000.00	0.138
F	68	5905.12	0.136
F	69	6012.62	0.138
F	70	9220.71	0.212
F	71	9604.46	0.220
F	72	8463.18	0.194
F	73	102285.95	2.348
F	74	6000.00	0.138
F	75	6000.00	0.138
F	76	6000.00	0.138
F	77	6000.00	0.138
F	78	6000.00	0.138
G	1	7917.07	0.182
G	2	5946.98	0.137
G	3	5946.98	0.137
G	4	5352.20	0.123
G	5	5311.34	0.122
G	6	5174.62	0.119
G	7	5175.00	0.119
G	8	5443.07	0.125
G	9	37406.09	0.859
G	10	5326.13	0.122
G	11	6551.71	0.150
G	12	8306.58	0.191
G	13	8172.45	0.188
G	14	7247.81	0.166
G	15	5400.00	0.124
G	16	5399.07	0.124
G	17	5469.08	0.126
G	18	6663.80	0.153
G	19	5546.25	0.127
G	20	5173.65	0.119
G	21	5172.02	0.119
G	22	5472.41	0.126
G	23	6070.02	0.139
G	24	8633.99	0.198
H	1	6002.00	0.138
H	2	5643.97	0.130
H	3	8316.66	0.191
H	4	6138.45	0.141
H	5	6138.09	0.141
H	6	6137.34	0.141
H	7	10169.87	0.233
H	8	5400.00	0.124
H	9	5400.23	0.124
H	10	10646.89	0.244
H	11	7213.76	0.166
H	12	8988.55	0.206
H	13	5403.03	0.124
H	14	5400.01	0.124
H	15	7146.06	0.164
H	16	17515.74	0.402
I	1	10326.91	0.237
I	2	6000.00	0.138
I	3	6000.00	0.138
I	4	7200.16	0.165
I	5	11117.47	0.255
I	6	258875.61	5.943
I	7	8351.93	0.192
I	8	6000.01	0.138
I	9	6001.13	0.138
I	10	6007.89	0.138
I	11	6448.87	0.148
I	12	8210.75	0.188
I	13	8795.45	0.202
I	14	11453.08	0.263
I	15	6611.70	0.152
I	16	6611.70	0.152
I	17	6611.70	0.152
I	18	6611.70	0.152
I	19	6613.80	0.152
I	20	7556.22	0.173
I	21	8073.69	0.185
I	22	33604.90	0.771
J	1	7516.31	0.173
J	2	6694.35	0.154
J	3	7005.81	0.161
J	4	7317.27	0.168
J	5	8437.61	0.194
J	6	9843.73	0.226
J	7	6001.55	0.138
J	8	6001.55	0.138
J	9	6001.55	0.138
J	10	7756.58	0.178
J	11	7278.82	0.167
J	12	7118.36	0.163
J	13	7183.19	0.165
J	14	7248.03	0.166
J	15	8734.73	0.201
K	1	7065.87	0.162
K	2	6000.00	0.138
K	3	6000.00	0.138
K	4	6000.00	0.138
K	5	6039.31	0.139
K	6	6000.01	0.138
K	7	6000.01	0.138
K	8	6000.01	0.138
K	9	6000.01	0.138
K	10	6000.01	0.138
K	11	6000.01	0.138
K	12	6000.01	0.138
K	13	6000.01	0.138
K	14	6000.00	0.138
K	15	6000.01	0.138
K	16	7151.52	0.164
K	17	7151.93	0.164
K	18	6013.48	0.138
K	19	6000.00	0.138
K	20	6000.00	0.138
K	21	6000.00	0.138
K	22	6000.00	0.138
K	23	6000.00	0.138
K	24	6000.00	0.138
K	25	8986.73	0.206
K	26	9013.27	0.207
K	27	6000.00	0.138
K	28	6000.00	0.138
K	29	6000.00	0.138
K	30	6000.00	0.138
K	31	7151.71	0.164
L	1	11825.95	0.271
L	2	5991.54	0.138
L	3	5992.59	0.138
L	4	5993.68	0.138
L	5	5994.78	0.138
L	6	5995.88	0.138
L	7	5996.98	0.138
L	8	5998.08	0.138
L	9	5999.18	0.138
L	10	6000.28	0.138
L	11	6001.51	0.138
L	12	6074.24	0.139
L	13	6416.27	0.147
L	14	38128.45	0.875
L	15	13084.0232	0.300

PHASE 3

BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
Q	67	5402.86	0.124
Q	68	5361.92	0.123
Q	69	5999.80	0.138
Q	70	6009.13	0.138
Q	71	5808.43	0.133
Q	72	5518.62	0.127
Q	73	5398.05	0.124
Q	74	5400.00	0.124
Q	75	5400.00	0.124
Q	76	5400.00	0.124
Q	77	5400.00	0.124
Q	78	5400.00	0.124
Q	79	5400.00	0.124
Q	80	195165.45	4.480
Q	81	5400.00	0.124
Q	82	5400.00	0.124
Q	83	6000.00	0.138
Q	84	6000.00	0.138
Q	85	5400.00	0.124
Q	86	5400.00	0.124
Q	87	5400.00	0.124
Q	88	5500.60	0.126
Q	89	8438.05	0.194
Q	90	11597.83	0.266
Q	91	12484.31	0.287
Q	92	10766.42	0.247
Q	93	7747.51	0.178
Q	94	9042.00	0.208
Q	95	5733.77	0.132
Q	96	5400.00	0.124
Q	97	42391.81	0.973
Q	98	8355.81	0.192
Q	99	7722.78	0.177
Q	100	7898.91	0.181
Q	101	8643.58	0.198
Q	102	8182.09	0.188
Q	103	30793.52	0.707
Q	104	5247.34	0.120
Q	105	5400.00	0.124
Q	106	5400.00	0.124
Q	107	5400.00	0.124
Q	108	5753.31	0.132
Q	109	5517.63	0.127
Q	110	5414.34	0.124
Q	111	5639.68	0.129
Q	112	7998.54	0.184
Q	113	6741.32	0.155
Q	114	6118.03	0.140
Q	115	6038.30	0.139
Q	116	6292.15	0.144
Q	117	8324.58	0.191
Q	118	6250.00	0.143
Q	119	7500.00	0.172
Q	120	5590.19	0.128
Q	121	5312.74	0.122
Q	122	5347.65	0.123
Q	123	5382.55	0.124
Q	124	5400.19	0.124
Q	125	5400.57	0.124
Q	126	5400.94	0.124
Q	127	5477.31	0.126
Q	128	6345.96	0.146
Q	129	6345.96	0.146
Q	130	6345.96	0.146
Q	131	5346.12	0.123
Q	132	340276.32	7.812
Q	133	5400.00	0.124
Q	134	5400.00	0.124
Q	135	5400.00	0.124
Q	136	5400.00	0.124
T	1	7599.04	0.174
T	2	7200.00	0.165
T	3	10045.76	0.231
T	4	21737.11	0.499
T	5	5400.00	0.124
T	6	6000.00	0.138
T	7	6000.00	0.138
T	8	6000.00	0.138
T	9	6000.00	0.138
T	10	6000.00	0.138
T	11	6000.00	0.138
T	12	7146.64	0.164
U	1	6382.20	0.147
U	2	6000.00	0.138
U	3	8365.19	0.192
U	4	6207.59	0.143
U	5	6000.00	0.138
U	6	6000.00	0.138
U	7	6000.00	0.138
U	8	7154.01	0.164
U	9	7154.95	0.164
U	10	5400.00	0.124
U	11	5400.00	0.124
U	12	8809.50	0.202
U	13	6000.00	0.138
U	14	5521.02	0.127
U	15	5400.00	0.124
U	16	6604.98	0.152
V	1	7697.35	0.177
V	2	6000.00	0.138
V	3	9998.66	0.230
V	4	6541.95	0.150
V	5	5400.00	0.124
V	6	7012.26	0.161
V	7	8948.97	0.205
V	8	7956.10	0.183
V	9	7069.24	0.162
V	10	6000.00	0.138
V	11	5806.05	0.133
V	12	6000.00	0.138
V	13	6000.00	0.138
V	14	7154.41	0.164
V	15	7964.74	0.183
V	16	7963.09	0.183
V	17	8590.08	0.197
W	1	6954.83	0.160
W	2	6000.00	0.138
W	3	6000.00	0.138
W	4	6000.00	0.138
W	5	6000.00	0.138
W	6	5400.00	0.124
W	7	6000.00	0.138
W	8	6000.00	0.138
W	9	7200.00	0.165
W	10	6000.00	0.138
W	11	5400.00	0.124
W	12	5400.00	0.124
W	13	5255.17	0.121
W	14	4973.68	0.114
W	15	8265.19	0.190
W	16	8395.34	0.193
W	17	6531.77	0.150
W	18	5400.00	0.124
W	19	6181.54	0.142
W	20	6000.00	0.138
W	21	6000.00	0.138
W	22	6000.00	0.138
W	23	5390.30	0.124
W	24	6008.54	0.138
W	25	10961.49	0.252
W	26	9284.01	0.213
W	27	4698.86	0.108
W	28	6558.76	0.151
W	29	5400.00	0.124
W	30	5400.00	0.124
W	31	5400.00	0.124
W	32	5400.00	0.124
W	33	5400.00	0.124
W	34	5400.00	0.124
W	35	5400.00	0.124
W	36	5400.00	0.124
W	37	5400.00	0.124
W	38	5397.21	0.124
W	39	5385.49	0.124
W	40	7073.70	0.162
W	41	6628.56	0.152
W	42	5439.72	0.125
W	43	5407.30	0.124
W	44	5400.66	0.124
W	45	5400.00	0.124
W	46	5400.00	0.124
W	47	5400.00	0.124
W	48	5401.05	0.124
W	49	5398.95	0.124
W	50	5400.00	0.124
W	51	5400.00	0.124
W	52	5400.00	0.124
W	53	5400.00	0.124
W	54	5365.69	0.123
W	55	5682.83	0.130
W	56	5974.55	0.137
W	57	6184.90	0.142
W	58	472872.62	10.856

NOTE :

1) LOT NUMBER 21 ON BLOCK A IS OMITTED.

WOODFIELD PRESERVE
PRELIMINARY PLAT

LOT AREA LIST

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 10/20/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL15.dwg

JUSTIN D. MIDURA
128809
10-20-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

PL12

SHEET NO. 14
OF 17 SHEETS

2023-24-PP

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

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

WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP14.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

FP14

SHEET NO. 15
OF 118 SHEETS

2022-24-CON

PHASE 3			
BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
W	59	7114.16	0.163
W	60	6089.16	0.140
W	61	7095.68	0.163
W	62	7425.86	0.170
W	63	8230.14	0.189
W	64	8395.45	0.193
W	65	9636.20	0.221
W	66	5999.47	0.138
W	67	6000.00	0.138
W	68	6000.00	0.138
W	69	6000.00	0.138
W	70	7114.16	0.163
W	71	7433.87	0.171
W	72	6259.44	0.144
W	73	6392.12	0.147
W	74	6435.85	0.148
W	75	6437.30	0.148
W	76	5984.02	0.137
W	77	9764.28	0.224
W	78	8805.97	0.202
W	79	8834.93	0.203
W	80	8849.16	0.203
W	81	6383.99	0.147
W	82	5421.17	0.124
W	83	6263.51	0.144
W	84	6129.63	0.141
W	85	6014.33	0.138
W	86	6000.00	0.138
W	87	7517.57	0.173
W	88	34495.32	0.792
X	1	7114.16	0.163
X	2	6000.00	0.138
X	3	6000.00	0.138
X	4	6000.00	0.138
X	5	6000.00	0.138
X	6	6000.00	0.138
X	7	6000.00	0.138
X	8	6000.00	0.138
X	9	6000.00	0.138
X	10	6000.00	0.138
X	11	6000.00	0.138
X	12	6000.00	0.138
X	13	6000.00	0.138
X	14	5969.99	0.137
X	15	5864.50	0.135
X	16	5749.69	0.132
X	17	5651.27	0.130
X	18	10467.1111	0.240
AA	1	8761.70	0.201
AA	2	5378.94	0.123
AA	3	5395.57	0.124
AA	4	5337.13	0.123
AA	5	5400.00	0.124
AA	6	5400.00	0.124
AA	7	5400.00	0.124
AA	8	5400.00	0.124
AA	9	6546.30	0.150
AA	10	7480.62	0.172
AA	11	5400.00	0.124
AA	12	5400.00	0.124
AA	13	5400.00	0.124
AA	14	5411.24	0.124
AA	15	6151.93	0.141
AA	16	5949.19	0.137
AA	17	10784.83	0.248
PHASE 6			
BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
DD	1	548268.89	12.587
PHASE 7			
BLOCK	LOT NUMBER	AREA (SQFT.)	AREA (ACRES)
E	1	803843.46	18.454

KEY	TREE NO.	TOTAL INCHES	TRUNK SIZE IN INCHES									HALF CRITICAL ROOT ZONE (FEET)	SPECIES
HT	7131	26	26									13.0	LO
HT	7133	26.5	18	17								13.25	PO
HT	7135	31	31									15.5	PO
HT	7141	32	24	16								16	PO
HT	7143	34	25	18								17	LO
R-HT	7145	27	27									13.5	PO
HT	7148	27	14	13	13							13.5	PO
HT	7158	28.5	20	17								14.25	PO
HT	7165	27	27									13.5	LO
HT	7169	26	26									13	LO
R-HT	7170	26	26									13	LO
R-HT	7175	27	27									13.5	LO
R-HT	7210	26	26									13	LO
R-HT	7225	28	28									14	LO
HT	7227	26	18	16								13	LO
HT	7269	34.5	23	23								17.25	PO
HT	7297	28	22	12								14	PO
HT	7304	30	22	16								15	LO
R-HT	7315	26	18	16								13	PO
HT	7325	31.5	24	15	HORNET NEST							15.75	LO
R-HT	7327	28	28									14	LO
R-HT	7328	38	38									19	LO
HT	7339	26	26									13	LO
HT	7344	34	23	22								17	LO
HT	7349	32	18	14	14							16	LO
HT	7350	26	26									13	LO
HT	7351	26	26									13	LO
HT	7354	31.5	24	15								15.75	LO
HT	7355	52	25	23	17	14						26	LO
HT	7358	30	30									15	LO
HT	7360	34	23	22								17	LO
HT	7370	26	26									13	LO
HT	7374	34	25	18								17	LO
HT	7380	29	29									14.5	LO
HT	7385	26	26									13	LO
HT	7392	33	23	20								16.5	LO
HT	7394	26	26									13	LO
HT	7395	26	26									13	LO
HT	7396	33	33									16.5	LO
HT	7400	28	28									14	LO
HT	7403	27	27									13.5	LO
HT	7407	26	26									13	LO
HT	7409	29	29									14.5	LO
HT	7412	33	33									16.5	LO
HT	7417	29	29									14.5	LO
HT	7418	29.5	20	19								14.75	LO
HT	7419	32	32									16	LO
R-HT	7422	30	30									15	LO
HT	7424	37.5	25	25	BROKEN							18.75	LO
HT	7427	28	28									14	LO
HT	7431	49	25	24	24							24.5	LO
HT	7432	27	27									13.5	LO
HT	7433	27	27									13.5	LO
HT	7434	37	37									18.5	LO
HT	7437	41.5	29	25								20.75	LO
HT	7441	33	33									16.5	LO
R-HT	7449	28	28	BEEHIVE								14	LO
HT	7450	36	36									18	LO
HT	7451	37	37									18.5	LO
HT	7453	37	37									18.5	LO
HT	7454	40	40									20	LO
R-HT	7458	30	17	15	11							15	LO
R-HT	7468	32	32									16	LO
R-HT	7469	29	15	14	14							14.5	LO
HT	7470	43	30	10	10	6						21.5	LO
HT	8179	27.5	20	15								13.75	LO
HT	8192	34.5	14	12	12	9	8					17.25	LO
HT	8201	45	25	22	9	9						22.5	LO
HT	8215	27	14	13	13							13.5	LO
HT	8216	27	27									13.5	LO
HT	8236	29	29									14.5	LO
HT	8239	33	13	11	0	10	10	9				16.5	LO
HT	8241	58	23	22	20	14	14					29	LO
HT	8243	36.5	16	15	14	12						18.25	LO
HT	8256	28	28									14	LO
HT	8276	26	26									13	LO
HT	8334	26.5	12	10	10	9						13.25	LO
HT	8350	29.5	13	12	11	10						14.75	LO
HT	8355	35	15	15	15	10						17.5	LO
HT	8372	37	28	18								18.5	LO
HT	8373	33	33									16.5	LO
HT	8374	33	33									16.5	LO
HT	8378	27	13	11	9	8						13.5	LO
HT	8403	35	27	16								17.5	LO
HT	8405	36.5	22	18	11							18.25	LO
HT	8406	34	20	15	13							17	LO
D, R-HT	8414	27	27	DEAD								13.5	LO
HT	8429	29.5	18	12	11							14.75	LO
HT	8430	29.5	18	12	11							14.75	LO
HT	8450	31.5	20	12	11							15.75	LO
HT	8470	32	32									16	LO
HT	8473	45	21	19	15	14						22.5	LO
HT	8475	28	15	14	12							14	LO
HT	8476	43	19	15	13	10	10					21.5	LO
HT	8480	29	15	15	13							14.5	LO
HT	8483	31	22	18								15.5	LO
HT	9003	38	20	19	17							19	LO
R-HT	9004	40	29	22								20	LO
HT	9008	28	19	18								14	LO
HT	9012	29.5	21	17								14.75	LO
R-HT	9022	26	26									13	LO
R-HT	9026	33	25	16								16.5	LO
HT	9029	27.5	20	15								13.75	LO
HT	9030	30	21	18								15	LO
HT	9043	29	29									14.5	LO
R-HT	9044	27	27									13.5	LO
HT	9070	40.5	28	25								20.25	LO
HT	9077	28	28									14	LO
HT	9078	26	26									13	LO
R-HT	9081	26	26									13	LO
HT	9084	31	22	18								15.5	LO
R-HT	9104	27	27									13.5	LO
HT	9106	39	39									19.5	LO
HT	9109	26	18	16								13	LO
HT	9117	26	26									13	LO
R-HT	9123	26	26									13	LO
HT	9135	37	26	22								18.5	LO
HT	9136	26	26									13	PO
HT	9157	34	34									17	LO
HT	9162	35.5	25	21								17.75	LO
HT	9165	28	19	18								14	LO
HT	9166	33.5	27	13								16.75	LO
HT	9171	26	26									13	LO
HT	9172	36	26	20								18	LO
HT	9174	30	20	20								15	PO
R-HT	9190	48	36	24								24	LO
R-HT	9191	28	28									14	LO
HT	9194	28	28									14	LO
R-HT	9195	26.5	19	15								13.25	LO
HT	9199	33	33									16.5	LO
R-HT	9209	37	25	12	7	5						18.5	LO
R-HT	9210	29	29									14.5	LO
HT	9217	30	30									15	LO
R-HT	9218	34	25	18								17	LO

KEY	TREE NO.	TOTAL INCHES	TRUNK SIZE IN INCHES									HALF CRITICAL ROOT ZONE (FEET)	SPECIES
R-HT	9228	26	26									13	LO
HT	9230	26	26									13	LO
HT	9233	26.5	18	17								13.25	PO
HT	9260	27	27									13.5	LO
HT	9363	30	30									15	LO
R-HT	9376	30	30									15	LO
HT	9384	32	22	20								16	LO
R-HT	9391	27	27									13.5	LO
R-HT	9408	34	19	18	12							17	LO
HT	9421	31.5	21	21								15.75	LO
HT	9425	31	23	16								15.5	LO
HT	9427	27.5	21	13								13.75	PO
HT	9431	27	27									13.5	LO
HT	9456	34	34									17	LO
HT	9474	46.5	19	19	18	18						23.25	LO
R-HT	9489	28	28									14	LO
R-HT	9495	33	33									16.5	LO
HT	9498	28	28									14	LO
HT	9499	31	31									15.5	LO
R-HT	9510	26	26									13	LO
HT	9516	37	26	22								18.5	LO
HT	9520	26	26									13	LO
HT	9528	35.5	16	15	13	11						17.75	LO
HT	9532	31	19	13	11							15.5	LO
HT	9533	34	34									17	LO
HT	9534	28	28									14	LO
HT	9535	27	27									13.5	LO
HT	9536	32	32									16	LO
HT	9537	29	29									14.5	LO
HT	9538	39.5	29	21								19.75	LO
HT	9541	32.5	26	13								16.25	LO
HT	9545	30	24	12								15	LO
HT	9589	38.5	21	18	17							19.25	LO
HT	9594	29	29									14.5	LO
HT	9596	28	28									14	LO
HT	9611	27	19	16								13.5	LO
R-HT	9613	35	24	22								17.5	LO
R-HT	9622	31	31									15.5	PO
R-HT	9688	32.5	18	17	12							16.25	LO
HT	9699	27.5	12	12	11	8						13.75	LO
HT	9700	29	29									14.5	LO
HT	9712	34	34									17	LO
HT	9724	26	26									13	LO
R-HT	9825	26	26									13	LO
HT	9829	27	27									13.5	LO
HT	9884	32.5	19	18	9							16.25	LO
HT	9902	27	27									13.5	LO
HT	9915	30	30									15	LO
R-HT	9944	29	20	18								14.5	LO
HT	9946	34	25	18								17	LO
R-HT	9947	34	25	18								17	LO
HT	10027	27	27									13.5	LO
HT	10076	28	28									14	LO
R-HT	10098	31	31									15.5	LO
HT	12024	30.5	21	19								15.25	LO
HT	12027	27	27									13.5	LO
R-HT	12040	26	26									13	LO
HT	12076	27	27									13.5	LO
HT	12128	26	26									13	LO
HT	12130	26	26									13	CE
HT	12133	41	30	22								20.5	LO
HT	12134	27	27									13.5	LO
R-HT	12140	27	27									13.5	LO
HT	12141	27	27									13.5	LO
HT	12148	27	18	18								13.5	LO
HT	12157	49	33	19	13							24.5	LO
HT	12158	54	54									27	LO
HT	12160	35.5	29	13								17.75	LO
HT	12162	26	26									13	LO
R-HT	12165	36	36									18	LO
HT	12192	27	27									13.5	LO
HT	12226	28	18	11	9							14	LO
HT	12238	28	28									14	LO
HT	12239	26	26									13	LO
HT	12242	48	40	16								24	LO
R-HT	10893+A	41	41									20.5	LO
HT	10894+A	36	36									18	LO
HT	10895+A	28	28									14	LO
HT	10897+A	42	42									21	LO
HT	10898+A	37	20	17	17							18.5	LO
HT	10900+A	30	30									15	LO
R-HT	10913+A	40	40									20	LO
HT	10917+A	33	33									16.5	LO
HT	10918+A	40	40									20	LO
HT	10919+A	35	35									17.5	LO
HT	10920+A	35.5	25	21								17.75	LO
HT	10921+A	37.5	26	23								18.75	LO
R-HT	10927+A	27	27									13.5	LO
HT	10932+A	35.5	28	15								17.75	LO
HT	10947+A	29	29									14.5	LO
HT	10952+A	32	32									16	LO
HT	10954+A	44.5	34	21								22.25	LO
HT	10955+A	41	29	24								20.5	LO
HT	10965+A	39	39									19.5	LO
HT	11026+A	27	20	14								13.5	LO
R-HT	11029+A	36	25	22								18	LO
HT	11032+A	44	44									22	LO
R-HT	11037+A	36	25	22								18	LO
HT	20013+A	28	28									14	LO
R-HT	2548+A	28	28									14	LO

WOODFIELD PRESERVE PRELIMINARY PLAT

LOT AREA LIST

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/29/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL16.dwg

JUSTIN D. MIDURA
128809
9-29-2023

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2700 La Frontera Blvd
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Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER: A245-1002

PL13

SHEET NO. 15 OF 17 SHEETS

2023-24-PP

Date/Time : Fri, 29 Sep 2023 - 11:44am
User Name : jpiecuch
PathName : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PRELIM\A2451002 PL16.dwg

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

WOODFIELD PRESERVE PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP15.dwg

JUSTIN D. MIDURA
128809
11-28-2023

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FRN - F-1386

JOB NUMBER: A245-1002

FP15

SHEET NO. 16 OF 118 SHEETS

2022-24-CON

Date/Time : Tue, 28 Nov 2023 - 8:55am
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Early Land Surveying, LLC
P.O. Box 92588, Austin, TX 78709
512-202-8631
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TBPELS Firm No. 10194487

144.856 ACRES
WILLIAMSON COUNTY, TEXAS

A DESCRIPTION OF 144.856 ACRES IN THE WILLIAM ROBERTS SURVEY NO. 4, ABSTRACT NO. 524 IN WILLIAMSON COUNTY, TEXAS, BEING ALL OF A 42.552 ACRE TRACT CONVEYED TO GREEN BUILDERS, INC. IN A WARRANTY DEED DATED MAY 1, 2017 AND RECORDED IN DOCUMENT NO. 2017040134, ALL OF A 30.000 ACRE TRACT CONVEYED TO GREEN BUILDERS, INC. IN A WARRANTY DEED DATED MAY 24, 2016 AND RECORDED IN DOCUMENT NO. 2016045203, ALL OF A 30.00 ACRE TRACT CONVEYED TO GREEN BUILDERS, INC. IN A WARRANTY DEED DATED MAY 1, 2015 AND RECORDED IN DOCUMENT NO. 2015036587, ALL OF A 19.997 ACRE TRACT CONVEYED TO WILSON FAMILY COMMUNITIES, INC. IN A WARRANTY DEED DATED MAY 1, 2012 AND RECORDED IN DOCUMENT NO. 2012032637, A PORTION OF A 10.01 ACRE TRACT CONVEYED TO WILSON FAMILY COMMUNITIES, INC. IN A WARRANTY DEED DATED JULY 13, 2011 AND RECORDED IN DOCUMENT NO. 2011045887, A PORTION OF A 30.007 ACRE TRACT CONVEYED TO WILSON FAMILY COMMUNITIES, INC. IN A WARRANTY DEED DATED MAY 2, 2011 AND RECORDED IN DOCUMENT NO. 2011028626, A PORTION OF A 32.383 ACRE TRACT CONVEYED TO WILSON FAMILY COMMUNITIES, INC. IN A WARRANTY DEED DATED JUNE 2, 2009 AND RECORDED IN DOCUMENT NO. 2009039509, A PORTION OF A 129.527 ACRE TRACT CONVEYED TO WILSON FAMILY COMMUNITIES, INC. IN A WARRANTY DEED DATED JUNE 6, 2008 AND RECORDED IN DOCUMENT NO. 2008045286, ALL OF THE OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY, TEXAS; SAID 144.856 ACRES BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING at a 1/2" rebar found in the southeast right-of-way line of Shell Road (80' right-of-way width) as described in Volume 1751, Page 872 of the Deed Records of Williamson County, Texas, being the northernmost corner of the said 42.552 acre tract, being also the westernmost corner of a 6.00 acre tract described in Document No. 2002047344 of the Official Public Records of Williamson County, Texas, from which a 1/2" rebar with "RPLS 1847" cap found in the southeast right-of-way line of Shell Road, being the northernmost corner of the said 6.00 acre tract, bears North 63°18'30" East, a distance of 60.42 feet and additional 1/2" rebar with "Halff" cap found in the northwest right-of-way line of Shell Road, being the easternmost corner of a 124.708 acre tract described in Document No. 2017040134 of the Official Public Records of Williamson County, Texas, bears North 27°20'49" West, a distance of 80.01 feet;

THENCE South 19°34'22" East with the northeast line of the said 42.552 acre tract and the southwest line of the said 6.00 acre tract, a distance of 876.05 feet to a 1/2" rebar with "RPLS 1847" cap found for the southernmost corner of the said 6.00 acre tract;

THENCE South 19°38'47" East with the northeast line of the said 42.552 acre tract, a distance of 456.67 feet to a 1/4" iron pipe found for the easternmost corner of the said 42.552 acre tract, being the westernmost corner of Lot 34A, Resubdivision of Lot 34, Logan Ranch, Section 1, a subdivision of record in Cabinet G, Slide 207 of the Plat Records of Williamson County, Texas, being also the northernmost corner of Lot 35, Logan Ranch, Section 1, a subdivision of record in Cabinet E, Slide 7 of the Plat Records of Williamson County, Texas;

THENCE South 69°02'41" West with the southeast line of the said 42.552 acre tract, the northwest line of said Lot 35, the northwest line of Lot 36, Amending Final Plat of Lot 36, Logan Ranch, Section 1 Subdivision, a subdivision of record in Document No. 2014057118 of the Official Public Records of Williamson County, Texas and the northwest line of Lot 37, of said Logan Ranch, Section 1, a distance of 1155.35 feet to a 1/2" iron pipe found for the westernmost corner of said Lot 37, being the northernmost corner of Lot 38, of said Logan Ranch, Section 1;

THENCE South 69°00'47" West with the southeast line of the said 42.552 acre tract and the northwest line of said Lot 38, a distance of 303.58 feet to a calculated point for the southernmost corner of the said 42.552 acre tract, being the easternmost corner of the said 30.000 acre tract described in Document No. 2016045203, from which a 1/2" rebar with "CBD Setstone" cap found, bears South 20°59'27" East, a distance of 0.67 feet;

THENCE South 69°00'47" West with the southeast line of the said 30.000 acre tract described in Document No. 2016045203 and the northwest line of said Lot 38, a distance of 152.93 feet to a calculated point for the westernmost corner of said Lot 38, being the northernmost corner of Lot 39, of said Logan Ranch, Section 1;

THENCE South 68°56'47" West with the southeast line of the said 30.000 acre tract described in Document No. 2016045203 and the northwest line of said Lot 39, a distance of 592.31 feet to a 1/2" rebar found for the southernmost corner of the said 30.000 acre tract described in Document No. 2016045203, being in the northeast line of the said 30.000 acre tract described in Document No. 2015036587, being the westernmost corner of said Lot 39, being also the northernmost corner of Lot 40, of said Logan Ranch, Section 1;

THENCE South 21°07'13" East with the east line of the said 30.000 acre tract described in Document No. 2015036587 and the west line of said Lot 40, a distance of 625.69 feet to a 1/2" rebar found for the southwest corner of said Lot 40, being the northwest corner of Lot 41, of said Logan Ranch, Section 1;

THENCE South 20°31'47" East with the east line of the said 30.000 acre tract described in Document No. 2015036587 and the west line of said Lot 41, a distance of 237.31 feet to a 1/2" rebar with "Capital" cap found for the southeast corner of the said 30.000 acre tract described in Document No. 2015036587, being the northeast corner of the said 19.997 acre tract;

THENCE South 20°45'05" East with the east line of the said 19.997 acre tract and the west line of said Lot 41, a distance of 217.88 feet to a 1/2" rebar found for the southwest corner of said Lot 41, being the northwest corner of Lot 42, of said Logan Ranch, Section 1;

THENCE South 20°27'42" East with the east line of the said 19.997 acre tract, the east line of the said 10.01 acre tract and the west line of said Lot 42, a distance of 380.01 feet to a 1/2" iron pipe found for the southwest corner of said Lot 42, being the northwest corner of Lot 43 A, Resubdivision of Lot 43, Logan Ranch, Section 1, a subdivision of record in Cabinet N, Slide 92 of the Plat Records of Williamson County, Texas;

THENCE South 20°08'07" East with the east line of the said 10.01 acre tract and the west line of said Lot 43 A, a distance of 188.19 feet to a 1/2" rebar found for the southeast corner of the said 10.01 acre tract, being the northeast corner of the said 30.007 acre tract;

THENCE South 22°54'52" East with the east line of the said 30.007 acre tract and the west line of said Lot 43 A, a distance of 45.76 feet to a 1/2" rebar found for the southwest corner of said Lot 43 A, being the northwest corner of Lot 43 B, of said Resubdivision of Lot 43, Logan Ranch, Section 1;

THENCE South 22°54'52" East with the east line of the said 30.007 acre tract and the west line of said Lot 43 B, a distance of 239.07 feet to a 1/2" iron pipe found for the southwest corner of said Lot 43 B, being the northwest corner of Lot 44, of said Logan Ranch, Section 1;

THENCE with the east line of the said 30.007 acre tract and the west line of said Lot 44, the following two (2) courses and distances:

1. South 22°54'52" East, a distance of 40.06 feet to a 1/2" rebar found;
2. South 20°57'08" East, a distance of 339.33 feet to a 1/2" rebar with "Capital" cap found for the southeast corner of the said 30.007 acre tract, being the northeast corner of the said 32.383 acre tract, being also the northeast corner of Lot 59, Block D, Georgetown Village, Section Nine, Phases Nine & Ten, a subdivision of record in Document No. 2016019432 of the Official Public Records of Williamson County, Texas;

THENCE with the south line of the said 32.383 acre tract and the north line of Lots 59 and 64-72, Block D, of said Georgetown Village, Section Nine, Phases Nine & Ten, the following two (2) courses and distances:

1. South 68°14'16" West, a distance of 211.58 feet to a calculated point, from which a 1/2" rebar found, bears North 11°41'14" West, a distance of 3.19 feet;
2. South 86°35'44" West, a distance of 560.36 feet to a 1/2" rebar with "Capital" cap found for the northwest corner of said Lot 72, being the northeast corner of a 2.792 acre tract described in Document No. 2020082411 of the Official Public Records of Williamson County, Texas, from which an "X" in concrete found in the north right-of-way line of Bellaire Drive (60' right-of-way width) as shown on Georgetown Village, Section Nine, Phase Eight, a subdivision of record in Document No. 2014078318 of the Official Public Records of Williamson County, being the southwest corner of Lot 78, Block D, of said Georgetown Village, Section Nine, Phases Nine & Ten, being also the southeast corner of the said 2.792 acre tract, bears South 04°44'28" East, a distance of 528.12 feet;

THENCE North 84°11'15" West with the south line of the said 32.383 acre tract and the north line of the said 2.792 acre tract, a distance of 192.85 feet to a 1/2" rebar with "Capital" cap found for the northwest corner of the said 2.792 acre tract;

THENCE crossing the said 129.527 and with the west line of the said 2.792 acre tract, the following four (4) courses and distances:

1. With a curve to the right, having a radius of 2500.00 feet, a delta angle of 10°34'12", an arc length of 461.20 feet, and a chord which bears South 06°17'36" West, a distance of 460.55 feet to an "X" in concrete found;
2. With a curve to the left, having a radius of 10.00 feet, a delta angle of 61°48'13", an arc length of 10.79 feet, and a chord which bears South 17°51'25" East, a distance of 10.27 feet to a 1/2" rebar with "Halff" cap found;
3. With a curve to the right, having a radius of 73.00 feet, a delta angle of 32°54'27", an arc length of 41.93 feet, and a chord which bears South 33°05'34" East, a distance of 41.35 feet to a 1/2" rebar with "Halff" cap found;
4. With a curve to the left, having a radius of 10.00 feet, a delta angle of 60°52'21", an arc length of 10.62 feet, and a chord which bears South 45°54'03" East, a distance of 10.13 feet to an "X" in concrete found in the north right-of-way line of Bellaire Drive, from which an "X" in concrete found in the north right-of-way line of Bellaire Drive, being in the south line of the said 2.792 acre tract, bears South 76°46'56" East, a distance of 47.89 feet;

THENCE North 76°46'56" West with the north right-of-way line of Bellaire Drive and crossing the said 129.527 acre tract, a distance of 145.53 feet to an "X" in concrete found for the southeast corner of a 14.600 acre tract described in Document No. 2009066516 of the Official Public Records of Williamson County, Texas, from which an "X" in concrete found in the north right-of-way line of Bellaire Drive and the south line of the said 14.600 acre tract, bears North 76°46'56" West, a distance of 265.28 feet;

THENCE crossing the said 129.527 acre tract and with the east line of the said 14.600 acre tract, the following four (4) courses and distances:

1. With a curve to the left, having a radius of 10.00 feet, a delta angle of 62°06'03", an arc length of 10.84 feet, and a chord which bears North 72°20'09" East, a distance of 10.32 feet to a 1/2" rebar found;
2. With a curve to the right, having a radius of 73.00 feet, a delta angle of 31°27'18", an arc length of 40.08 feet, and a chord which bears North 57°46'29" East, a distance of 39.58 feet to a 1/2" rebar with "Capital" cap found;
3. With a curve to the left, having a radius of 10.00 feet, a delta angle of 61°23'21", an arc length of 10.71 feet, and a chord which bears North 42°27'04" East, a distance of 10.21 feet to a 1/2" rebar with "Halff" cap found;
4. With a curve to the left, having a radius of 2440.00 feet, a delta angle of 10°31'59", an arc length of 448.56 feet, and a chord which bears North 06°16'31" East, a distance of 447.93 feet to a calculated angle point in the south line of the said 32.383 acre tract, from which a 1/2" rebar with "Capital" cap found for an angle point in the south line of the said 32.383 acre tract, bears South 89°00'54" East, a distance of 59.90 feet;

THENCE crossing the said 32.383 acre tract and with the east line of the said 14.600 acre tract, with a curve to the left, having a radius of 2440.00 feet, a delta angle of 06°09'15", an arc length of 262.09 feet, and a chord which bears North 02°04'06" West, a distance of 261.96 feet to a 1/2" rebar with "Capital" cap found for the northeast corner of the said 14.600 acre tract, being the southeast corner of a 25.918 acre tract described in Document No. 2011045942 of the Official Public Records of Williamson County, Texas;

THENCE crossing the said 32.383 acre tract, the said 30.007 acre tract, the said 10.01 acre tract and with the east line of the said 25.918 acre tract, the following two (2) courses and distances:

1. With a curve to the left, having a radius of 2440.00 feet, a delta angle of 13°39'10", an arc length of 581.42 feet, and a chord which bears North 11°58'19" West, a distance of 580.05 feet to a 1/2" rebar found;
2. North 18°52'04" West, a distance of 314.26 feet to a 1/2" rebar found for the northeast corner of the said 25.918 acre tract;

THENCE North 77°36'05" West crossing the said 10.01 acre tract and with the north line of the said 25.918 acre tract, passing a 1/2" rebar with "Halff" cap found at a distance of 1133.62 feet and continuing for a total distance of 1134.84 feet to a calculated point in the east right-of-way line of Shell Road, being in the west line of the said 10.01 acre tract, being also the northwest corner of the said 25.918 acre tract, from which a 1/2" rebar with "Capital" cap found in the east right-of-way line of Shell Road, being the southwest corner of the said 25.918 acre tract, bears South 12°24'40" West, a distance of 857.88 feet;

THENCE North 12°24'40" East with the east right-of-way line of Shell Road, the west line of the said 10.01 acre tract and the west line of the said 19.997 acre tract, a distance of 464.14 feet to a 1/2" rebar with "Capital" cap found for the northwest corner of the said 19.997 acre tract, being the southwest corner of the said 30.000 acre tract described in Document No. 2015036587;

THENCE with the east right-of-way line of Shell Road and the west line of the said 30.000 acre tract described in Document No. 2015036587, the following two (2) courses and distances:

1. North 12°24'40" East, a distance of 398.16 feet to a calculated point, from which a 1/2" rebar with "Capital" cap found in the west right-of-way line of Shell Road, bears North 77°35'20" West, a distance of 80.00 feet and an additional 1/2" rebar found, bears South 88°56'47" East, a distance of 2.18 feet;
2. With a curve to the right, having a radius of 1460.00 feet, a delta angle of 20°01'52", an arc length of 510.43 feet, and a chord which bears North 22°26'13" East, a distance of 507.83 feet to a calculated point for the northwest corner of the said 30.000 acre tract described in Document No. 2015036587, being the westernmost corner of the said 30.000 acre tract described in Document No. 2016045203, from which a 1/2" rebar with "CBD Setstone" cap found, bears North 77°35'27" West, a distance of 0.31 feet;

THENCE with the southeast right-of-way line of Shell Road and the northwest line of the said 30.000 acre tract described in Document No. 2016045203, the following two (2) courses and distances:

1. With a curve to the right, having a radius of 1460.00 feet, a delta angle of 30°54'09", an arc length of 787.45 feet, and a chord which bears North 47°54'14" East, a distance of 777.94 feet to a cotton spindle found, from which a 1/2" rebar with "Halff" cap found in the northwest right-of-way line of Shell Road, being in the southeast line of the said 124.708 acre tract, bears North 26°38'42" West, a distance of 80.00 feet;
2. North 63°18'30" East, a distance of 930.85 feet to a 1/2" rebar with "CBD Setstone" cap found for the northernmost corner of the said 30.000 acre tract described in Document No. 2016045203, being the westernmost corner of the said 42.552 acre tract;

THENCE North 63°18'30" East with the southeast right-of-way line of Shell Road and the northwest line of the said 42.552 acre tract, a distance of 1498.73 feet to the POINT OF BEGINNING, containing 144.856 acres of land, more or less.

Surveyed on the ground on January 13, 2021.

Bearing Basis: The Texas Coordinate System of 1983 (NAD83), Central Zone, utilizing the SmartNet North America Network.

Attachments: Survey Drawing No. 1073-001-BASE

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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. (Per "The Board of Professional Engineering and Land Surveying" Texas Administrative Code, Title 22 - Part 29, General Rules of Procedures and Practices, Standards of Responsibility and Rules of Conduct, Rule 663.18)

Joe Ben Early, Jr. Date
Registered Professional Land Surveyor
State of Texas No. 6016

74.91 ACRES OF PHASE 3, WOODFIELD PRESERVE PRELIMINARY PLAT
WILLIAMSON COUNTY, TEXAS.

WOODFIELD PRESERVE
PRELIMINARY PLAT

SURVEY, METES & BOUNDS

REVISIONS

NO.	DESCRIPTION	BY	DATE
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 9/22/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL13.dwg

JUSTIN D. MIDURA
128809
9-22-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

PL14

SHEET NO. 16
OF 17 SHEETS

2023-24-PP

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

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

WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP16.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

FP16

SHEET NO.
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OF 118 SHEETS

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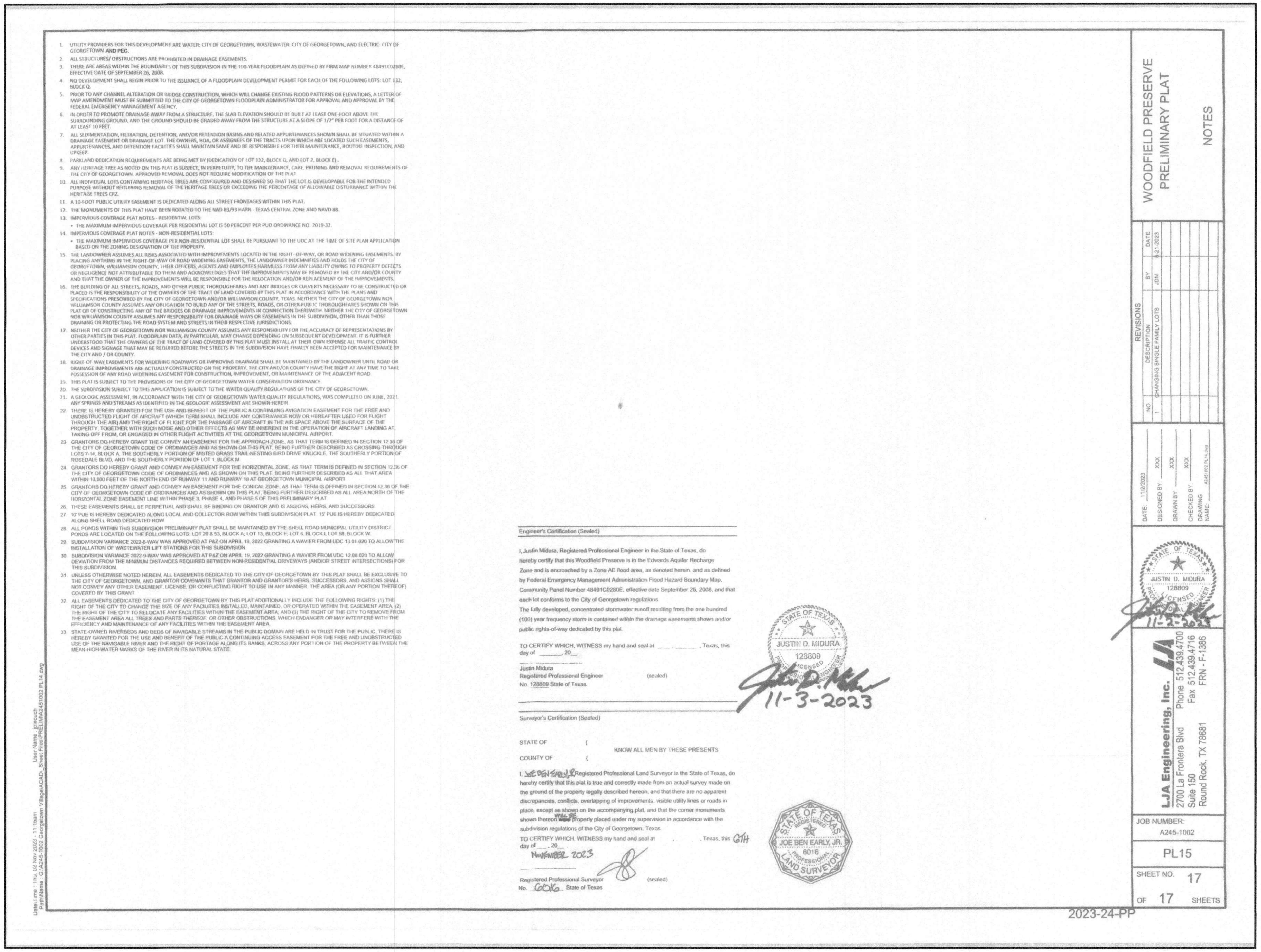

1. UTILITY PROVIDERS FOR THIS DEVELOPMENT ARE WATER: CITY OF GEORGETOWN, WASTEWATER: CITY OF GEORGETOWN, AND ELECTRIC: CITY OF GEORGETOWN **AND PEC.**
2. ALL STRUCTURES/ OBSTRUCTIONS ARE PROHIBITED IN DRAINAGE EASEMENTS.
3. THERE ARE AREAS WITHIN THE BOUNDARIES OF THIS SUBDIVISION IN THE 100-YEAR FLOODPLAIN AS DEFINED BY FIRM MAP NUMBER 48491C0280E, EFFECTIVE DATE OF SEPTEMBER 26, 2008.
4. NO DEVELOPMENT SHALL BEGIN PRIOR TO THE ISSUANCE OF A FLOODPLAIN DEVELOPMENT PERMIT FOR EACH OF THE FOLLOWING LOTS: LOT 132, BLOCK Q.
5. PRIOR TO ANY CHANNEL ALTERATION OR BRIDGE CONSTRUCTION, WHICH WILL CHANGE EXISTING FLOOD PATTERNS OR ELEVATIONS, A LETTER OF MAP AMENDMENT MUST BE SUBMITTED TO THE CITY OF GEORGETOWN FLOODPLAIN ADMINISTRATOR FOR APPROVAL AND APPROVAL BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.
6. IN ORDER TO PROMOTE DRAINAGE AWAY FROM A STRUCTURE, THE SLAB ELEVATION SHOULD BE BUILT AT LEAST ONE-FOOT ABOVE THE SURROUNDING GROUND, AND THE GROUND SHOULD BE GRADED AWAY FROM THE STRUCTURE AT A SLOPE OF 1/2" PER FOOT FOR A DISTANCE OF AT LEAST 10 FEET.
7. ALL SEDIMENTATION, FILTRATION, DETENTION, AND/OR RETENTION BASINS AND RELATED APPURTENANCES SHOWN SHALL BE SITUATED WITHIN A DRAINAGE EASEMENT OR DRAINAGE LOT. THE OWNERS, HOA, OR ASSIGNEES OF THE TRACTS UPON WHICH ARE LOCATED SUCH EASEMENTS, APPURTENANCES, AND DETENTION FACILITIES SHALL MAINTAIN SAME AND BE RESPONSIBLE FOR THEIR MAINTENANCE, ROUTINE INSPECTION, AND UPKEEP.
8. PARKLAND DEDICATION REQUIREMENTS ARE BEING MET BY (DEDICATION OF LOT 132, BLOCK Q, AND LOT 2, BLOCK E) .
9. ANY HERITAGE TREE AS NOTED ON THIS PLAT IS SUBJECT, IN PERPETUITY, TO THE MAINTENANCE, CARE, PRUNING AND REMOVAL REQUIREMENTS OF THE CITY OF GEORGETOWN. APPROVED REMOVAL DOES NOT REQUIRE MODIFICATION OF THE PLAT
10. ALL INDIVIDUAL LOTS CONTAINING HERITAGE TREES ARE CONFIGURED AND DESIGNED SO THAT THE LOT IS DEVELOPABLE FOR THE INTENDED PURPOSE WITHOUT REQUIRING REMOVAL OF THE HERITAGE TREES OR EXCEEDING THE PERCENTAGE OF ALLOWABLE DISTURBANCE WITHIN THE HERITAGE TREES CRZ.
11. A 10-FOOT PUBLIC UTILITY EASEMENT IS DEDICATED ALONG ALL STREET FRONTAGES WITHIN THIS PLAT.
12. THE MONUMENTS OF THIS PLAT HAVE BEEN ROTATED TO THE NAD 83/93 HARN - TEXAS CENTRAL ZONE AND NAVD 88.
13. IMPERVIOUS *COVERAGE* PLAT NOTES - RESIDENTIAL LOTS:
    - THE MAXIMUM IMPERVIOUS COVERAGE PER RESIDENTIAL LOT IS 50 PERCENT PER PUD ORDINANCE NO. 2019-32.
14. IMPERVIOUS COVERAGE PLAT NOTES - NON-RESIDENTIAL LOTS:
    - THE MAXIMUM IMPERVIOUS COVERAGE PER NON-RESIDENTIAL LOT SHALL BE PURSUANT TO THE UDC AT THE TIME OF SITE PLAN APPLICATION BASED ON THE ZONING DESIGNATION OF THE PROPERTY.
15. THE LANDOWNER ASSUMES ALL RISKS ASSOCIATED WITH IMPROVEMENTS LOCATED IN THE RIGHT- OF-WAY, OR ROAD WIDENING EASEMENTS. BY PLACING ANYTHING IN THE RIGHT-OF-WAY OR ROAD WIDENING EASEMENTS, THE LANDOWNER INDEMNIFIES AND HOLDS THE CITY OF GEORGETOWN, WILLIAMSON COUNTY, THEIR OFFICERS, AGENTS AND EMPLOYEES HARMLESS FROM ANY LIABILITY OWING TO PROPERTY DEFECTS OR NEGLIGENCE NOT ATTRIBUTABLE TO THEM AND ACKNOWLEDGES THAT THE IMPROVEMENTS MAY BE REMOVED BY THE CITY AND/OR COUNTY AND THAT THE OWNER OF THE IMPROVEMENTS WILL BE RESPONSIBLE FOR THE RELOCATION AND/OR REPLACEMENT OF THE IMPROVEMENTS.
16. THE BUILDING OF ALL STREETS, ROADS, AND OTHER PUBLIC THOROUGHFARES AND ANY BRIDGES OR CULVERTS NECESSARY TO BE CONSTRUCTED OR PLACED IS THE RESPONSIBILITY OF THE OWNERS OF THE TRACT OF LAND COVERED BY THIS PLAT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS PRESCRIBED BY THE CITY OF GEORGETOWN AND/OR WILLIAMSON COUNTY, TEXAS. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY OBLIGATION TO BUILD ANY OF THE STREETS, ROADS, OR OTHER PUBLIC THOROUGHFARES SHOWN ON THIS PLAT OR OF CONSTRUCTING ANY OF THE BRIDGES OR DRAINAGE IMPROVEMENTS IN CONNECTION THEREWITH. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY RESPONSIBILITY FOR DRAINAGE WAYS OR EASEMENTS IN THE SUBDIVISION, OTHER THAN THOSE DRAINING OR PROTECTING THE ROAD SYSTEM AND STREETS IN THEIR RESPECTIVE JURISDICTIONS.
17. NEITHER THE CITY OF GEORGETOWN NOR WILLIAMSON COUNTY ASSUMES ANY RESPONSIBILITY FOR THE ACCURACY OF REPRESENTATIONS BY OTHER PARTIES IN THIS PLAT. FLOODPLAIN DATA, IN PARTICULAR, MAY CHANGE DEPENDING ON SUBSEQUENT DEVELOPMENT. IT IS FURTHER UNDERSTOOD THAT THE OWNERS OF THE TRACT OF LAND COVERED BY THIS PLAT MUST INSTALL AT THEIR OWN EXPENSE ALL TRAFFIC CONTROL DEVICES AND SIGNAGE THAT MAY BE REQUIRED BEFORE THE STREETS IN THE SUBDIVISION HAVE FINALLY BEEN ACCEPTED FOR MAINTENANCE BY THE CITY AND / OR COUNTY.
18. RIGHT-OF-WAY EASEMENTS FOR WIDENING ROADWAYS OR IMPROVING DRAINAGE SHALL BE MAINTAINED BY THE LANDOWNER UNTIL ROAD OR DRAINAGE IMPROVEMENTS ARE ACTUALLY CONSTRUCTED ON THE PROPERTY. THE CITY AND/OR COUNTY HAVE THE RIGHT AT ANY TIME TO TAKE POSSESSION OF ANY ROAD WIDENING EASEMENT FOR CONSTRUCTION, IMPROVEMENT, OR MAINTENANCE OF THE ADJACENT ROAD.
19. THIS PLAT IS SUBJECT TO THE PROVISIONS OF THE CITY OF GEORGETOWN WATER CONSERVATION ORDINANCE.
20. THE SUBDIVISION SUBJECT TO THIS APPLICATION IS SUBJECT TO THE WATER QUALITY REGULATIONS OF THE CITY OF GEORGETOWN.
21. A GEOLOGIC ASSESSMENT, IN ACCORDANCE WITH THE CITY OF GEORGETOWN WATER QUALITY REGULATIONS, WAS COMPLETED ON JUNE, 2021. ANY SPRINGS AND STREAMS AS IDENTIFIED IN THE GEOLOGIC ASSESSMENT ARE SHOWN HEREIN.
22. THERE IS HEREBY GRANTED FOR THE USE AND BENEFIT OF THE PUBLIC A CONTINUING AVIGATION EASEMENT FOR THE FREE AND UNOBSTRUCTED FLIGHT OF AIRCRAFT (WHICH TERM SHALL INCLUDE ANY CONTRIVANCE NOW OR HEREAFTER USED FOR FLIGHT THROUGH THE AIR) AND THE RIGHT OF FLIGHT FOR THE PASSAGE OF AIRCRAFT IN THE AIR SPACE ABOVE THE SURFACE OF THE PROPERTY, TOGETHER WITH SUCH NOISE AND OTHER EFFECTS AS MAY BE INHERENT IN THE OPERATION OF AIRCRAFT LANDING AT, TAKING OFF FROM, OR ENGAGED IN OTHER FLIGHT ACTIVITIES AT THE GEORGETOWN MUNICIPAL AIRPORT.
23. GRANTORS DO HEREBY GRANT THE CONVEY AN EASEMENT FOR THE APPROACH ZONE, AS THAT TERM IS DEFINED IN SECTION 12.36 OF THE CITY OF GEORGETOWN CODE OF ORDINANCES AND AS SHOWN ON THIS PLAT, BEING FURTHER DESCRIBED AS CROSSING THROUGH LOTS 7-14, BLOCK A, THE SOUTHERLY PORTION OF MISTED GRASS TRAIL-NESTING BIRD DRIVE KNUCKLE, THE SOUTHERLY PORTION OF ROSEDALE BLVD, AND THE SOUTHERLY PORTION OF LOT 1, BLOCK M.
24. GRANTORS DO HEREBY GRANT AND CONVEY AN EASEMENT FOR THE HORIZONTAL ZONE, AS THAT TERM IS DEFINED IN SECTION 12.36 OF THE CITY OF GEORGETOWN CODE OF ORDINANCES AND AS SHOWN ON THIS PLAT, BEING FURTHER DESCRIBED AS ALL THAT AREA WITHIN 10,000 FEET OF THE NORTH END OF RUNWAY 11 AND RUNWAY 18 AT GEORGETOWN MUNICIPAL AIRPORT.
25. GRANTORS DO HEREBY GRANT AND CONVEY AN EASEMENT FOR THE CONICAL ZONE, AS THAT TERM IS DEFINED IN SECTION 12.36 OF THE CITY OF GEORGETOWN CODE OF ORDINANCES AND AS SHOWN ON THIS PLAT, BEING FURTHER DESCRIBED AS ALL AREA NORTH OF THE HORIZONTAL ZONE EASEMENT LINE WITHIN PHASE 3, PHASE 4, AND PHASE 5 OF THIS PRELIMINARY PLAT.
26. THESE EASEMENTS SHALL BE PERPETUAL AND SHALL BE BINDING ON GRANTOR AND IS ASSIGNS, HEIRS, AND SUCCESSORS.
27. 10' PUE IS HEREBY DEDICATED ALONG LOCAL AND COLLECTOR ROW WITHIN THIS SUBDIVISION PLAT. 15' PUE IS HEREBY DEDICATED ALONG SHELL ROAD DEDICATED ROW.
28. ALL PONDS WITHIN THIS SUBDIVISION PRELIMINARY PLAT SHALL BE MAINTAINED BY THE SHELL ROAD MUNICIPAL UTILITY DISTRICT. PONDS ARE LOCATED ON THE FOLLOWING LOTS: LOT 20 & 53, BLOCK A; LOT 13, BLOCK E; LOT 6, BLOCK I, LOT 58, BLOCK W.
29. SUBDIVISION VARIANCE 2022-8-WAV WAS APPROVED AT P&Z ON APRIL 19, 2022 GRANTING A WAVIER FROM UDC 13.01.020 TO ALLOW THE INSTALLATION OF WASTEWATER LIFT STATIONS FOR THIS SUBDIVISION.
30. SUBDIVISION VARIANCE 2022-9-WAV WAS APPROVED AT P&Z ON APRIL 19, 2022 GRANTING A WAVIER FROM UDC 12.08.020 TO ALLOW DEVIATION FROM THE MINIMUM DISTANCES REQUIRED BETWEEN NON-RESIDENTIAL DRIVEWAYS (AND/OR STREET INTERSECTIONS) FOR THIS SUBDIVISION.
31. UNLESS OTHERWISE NOTED HEREIN, ALL EASEMENTS DEDICATED TO THE CITY OF GEORGETOWN BY THIS PLAT SHALL BE EXCLUSIVE TO THE CITY OF GEORGETOWN, AND GRANTOR COVENANTS THAT GRANTOR AND GRANTOR'S HEIRS, SUCCESSORS, AND ASSIGNS SHALL NOT CONVEY ANY OTHER EASEMENT, LICENSE, OR CONFLICTING RIGHT TO USE IN ANY MANNER, THE AREA (OR ANY PORTION THEREOF) COVERED BY THIS GRANT.
32. ALL EASEMENTS DEDICATED TO THE CITY OF GEORGETOWN BY THIS PLAT ADDITIONALLY INCLUDE THE FOLLOWING RIGHTS: (1) THE RIGHT OF THE CITY TO CHANGE THE SIZE OF ANY FACILITIES INSTALLED, MAINTAINED, OR OPERATED WITHIN THE EASEMENT AREA, (2) THE RIGHT OF THE CITY TO RELOCATE ANY FACILITIES WITHIN THE EASEMENT AREA; AND (3) THE RIGHT OF THE CITY TO REMOVE FROM THE EASEMENT AREA ALL TREES AND PARTS THEREOF, OR OTHER OBSTRUCTIONS, WHICH ENDANGER OR MAY INTERFERE WITH THE EFFICIENCY AND MAINTENANCE OF ANY FACILITIES WITHIN THE EASEMENT AREA.
33. STATE-OWNED RIVERBEDS AND BEDS OF NAVIGABLE STREAMS IN THE PUBLIC DOMAIN ARE HELD IN TRUST FOR THE PUBLIC. THERE IS HEREBY GRANTED FOR THE USE AND BENEFIT OF THE PUBLIC A CONTINUING ACCESS EASEMENT FOR THE FREE AND UNOBSTRUCTED USE OF THE NAVIGABLE RIVER AND THE RIGHT OF PORTAGE ALONG ITS BANKS, ACROSS ANY PORTION OF THE PROPERTY BETWEEN THE MEAN HIGH-WATER MARKS OF THE RIVER IN ITS NATURAL STATE.

Engineer's Certification (Sealed)

I, Justin Midura, Registered Professional Engineer in the State of Texas, do hereby certify that this Woodfield Preserve is in the Edwards Aquifer Recharge Zone and is encroached by a Zone AE flood area, as denoted herein, and as defined by Federal Emergency Management Administration Flood Hazard Boundary Map, Community Panel Number 48491C0280E, effective date September 26, 2008, and that each lot conforms to the City of Georgetown regulations.

The fully developed, concentrated stormwater runoff resulting from the one hundred (100) year frequency storm is contained within the drainage easements shown and/or public rights-of-way dedicated by this plat.

TO CERTIFY WHICH, WITNESS my hand and seal at ____ , ______ , Texas, this day of ______ , 20__

Justin Midura
Registered Professional Engineer (sealed)
No. 128809 State of Texas

JUSTIN D. MIDURA
128809

11-3-2023

Surveyor's Certification (Sealed)

STATE OF {
KNOW ALL MEN BY THESE PRESENTS
COUNTY OF {

I, JOE BEN EARLY, JR Registered Professional Land Surveyor in the State of Texas, do hereby certify that this plat is true and correctly made from an actual survey made on the ground of the property legally described hereon, and that there are no apparent discrepancies, conflicts, overlapping of improvements, visible utility lines or roads in place, except as shown on the accompanying plat, and that the corner monuments shown thereon ~~were~~ WILL BE properly placed under my supervision in accordance with the subdivision regulations of the City of Georgetown, Texas.

TO CERTIFY WHICH, WITNESS my hand and seal at , , Texas, this 6TH day of ___ , 20__ .
NOVEMBER 2023

Registered Professional Surveyor (sealed)
No. 6016 State of Texas

JOE BEN EARLY, JR.
6016

WOODFIELD PRESERVE
PRELIMINARY PLAT
NOTES

NO	DESCRIPTION	BY	DATE
	REVISIONS		
1	CHANGING SINGLE FAMILY LOTS	JDM	8-21-2023

DATE: 11/2/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A2451002 PL14.dwg

JUSTIN D. MIDURA
128809
11-2-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

PL15

SHEET NO. 17
OF 17 SHEETS

Date\Time : Thu, 02 Nov 2023 - 11:15am User Name : jpiecuch
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2023-24-PP

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

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

WOODFIELD PRESERVE
PHASE 3

FINAL PLAT

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 FP17.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

FP17

SHEET NO.
18
OF 118 SHEETS

Date\Time : Tue, 28 Nov 2023 - 8:55am User Name : jpiecuch
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GENERAL NOTES

1. THESE CONSTRUCTION PLANS WERE PREPARED, SEALED, SIGNED AND DATED BY A TEXAS LICENSED PROFESSIONAL ENGINEER. THEREFORE BASED ON THE ENGINEER'S CONCURRENCE OF COMPLIANCE, THE CONSTRUCTION PLANS FOR CONSTRUCTION OF THE PROPOSED PROJECT ARE HEREBY APPROVED SUBJECT TO THE STANDARD CONSTRUCTION SPECIFICATIONS AND DETAILS MANUAL AND ALL OTHER APPLICABLE CITY, STATE AND FEDERAL REQUIREMENTS AND CODES.
2. THIS PROJECT IS SUBJECT TO ALL CITY STANDARD SPECIFICATIONS AND DETAILS IN EFFECT AT THE TIME OF SUBMITTAL OF THE PROJECT TO THE CITY.
3. THIS SITE CONSTRUCTION PLAN SHALL MEET ALL REQUIREMENTS OF THE APPROVED SITE PLAN.
4. WASTEWATER MAINS AND SERVICES LINES BE SDR 26 PVC.
5. WASTEWATER MAINS SHALL BE INSTALLED WITHOUT HORIZONTAL OR VERTICAL BENDS.
6. MAXIMUM DISTANCE BETWEEN WASTEWATER MANHOLES IS 500 FEET.
7. WASTEWATER MAINS SHALL BE LOW PRESSURE AIR TESTED AND MANDREL TESTED BY THE CONTRACTOR ACCORDING TO CITY OF GEORGETOWN AND TCEQ REQUIREMENTS.
8. WASTEWATER MANHOLES SHALL BE VACUUM TESTED AND COATED BY THE CONTRACTOR ACCORDING TO CITY OF GEORGETOWN AND TCEQ REQUIREMENTS.
9. WASTEWATER MAINS SHALL BE CAMERA TESTED BY THE CONTRACTOR AND SUBMITTED TO THE CITY ON DVD FORMAT PRIOR TO PAVING THE STREET.
10. PRIVATE WATER SYSTEM FIRE LINES SHALL BE TESTED BY THE CONTRACTOR TO 200 PSI FOR 2 HOURS
11. PRIVATE WATER SYSTEM FIRE LINES SHALL BE DUCTILE IRON PIPING FROM THE WATER MAIN TO THE BUILDING SPRINKLER SYSTEM, AND 200 PSI C900 PVC FOR ALL OTHERS.
12. PUBLIC WATER SYSTEM MAINS SHALL BE 150 PSI C900 PVC AND TESTED BY THE CONTRACTOR AT 150 PSI FOR 4 HOURS.
13. ALL BENDS AND CHANGES IN DIRECTION ON WATER MAINS SHALL BE RESTRAINED AND THRUST BLOCKED.
14. LONG FIRE HYDRANT LEADS SHALL BE RESTRAINED.
15. ALL WATER LINES ARE TO BE BACTERIA TESTED BY THE CONTRACTOR ACCORDING TO THE CITY STANDARDS AND SPECIFICATIONS.
16. WATER AND SEWER MAIN CROSSINGS SHALL MEET ALL REQUIREMENTS OF THE TCEQ AND THE CITY.
17. FLEXIBLE BASE MATERIAL FOR PUBLIC STREETS SHALL BE TXDOT TYPE A GRADE 1.
18. HOT MIX ASPHALTIC CONCRETE PAVEMENT SHALL BE TYPE D UNLESS OTHERWISE SPECIFIED AND SHALL BE A MINIMUM OF 2 INCHES THICK ON PUBLIC STREETS AND ROADWAYS.
19. ALL SIDEWALK RAMPS ARE TO BE INSTALLED WITH THE PUBLIC INFRASTRUCTURE.
20. A MAINTENANCE BOND IS REQUIRED TO BE SUBMITTED TO THE CITY PRIOR TO ACCEPTANCE OF THE PUBLIC IMPROVEMENTS. THIS BOND SHALL BE ESTABLISHED FOR 2 YEAR IN THE AMOUNT OF 10% OF THE COST OF THE PUBLIC IMPROVEMENTS AND SHALL FOLLOW THE CITY FORMAT.
21. RECORD DRAWINGS OF THE PUBLIC IMPROVEMENTS SHALL BE SUBMITTED TO THE CITY BY THE DESIGN ENGINEER PRIOR TO ACCEPTANCE OF THE PROJECT. THESE DRAWINGS SHALL BE ON MYLAR OR ON TIFF OR PDF DISK (300 DPI). IF A DISK IS SUBMITTED A BOND SET SHALL BE INCLUDED WITH THE DISK.

GENERAL CONSTRUCTION NOTES

APPLICABLE TO ALL LINE AND SITE WORK

1. ANY FITTINGS, VALVES, OR OTHER APPURTENANCES NECESSARY FOR TESTING OR STERILIZATION OF UTILITY LINES SHALL BE PROVIDED BY CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

2. ALL BACKFILLED AREAS UNDER PROPOSED ROADS SHALL BE COMPACTED IN ACCORDANCE WITH THE CITY OF GEORGETOWN STANDARD SPECIFICATIONS REQUIREMENTS.

3. ALIGNMENT SHOWN ON PLANS SHALL BE ACHIEVED BY DEFLECTION, EXCEPT WHERE SPECIFIC FITTINGS ARE CALLED FOR ON PLANS. THERE WILL BE NO PAY ITEM FOR FITTINGS USED FOR DEFLECTION PURPOSES.

4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND PROTECT ALL EXISTING UTILITIES SUCH AS GAS LINES, WATER LINES, VALVE BOXES, FIRE HYDRANTS, STRUCTURES AND OTHER APPURTENANCES THAT LIE WITHIN THE RIGHT-OF-WAY AND EASEMENTS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR, AT HIS EXPENSE, ALL UTILITIES, DRIVEWAYS, PAVEMENT, CURB AND GUTTER, SIDEWALKS, FENCES AND OTHER ITEMS DAMAGED DURING CONSTRUCTION REGARDLESS OF WHETHER THESE ITEMS ARE SHOWN ON THE PLANS. THE LOCATION OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES IS APPROXIMATE.

5. WHENEVER EXISTING UTILITIES, INDICATED OR NOT ON PLANS, PRESENT OBSTRUCTIONS TO GRADE AND ALIGNMENT OF PIPE, IMMEDIATELY NOTIFY ENGINEER, WHO WITHOUT DELAY, WILL DETERMINE WHENEVER EXISTING IMPROVEMENTS ARE TO BE RELOCATED, OR GRADE AND ALIGNMENT OF PROPOSED UTILITY CHANGED. WHERE NECESSARY TO MOVE SERVICES, POLES, GUY WIRES, PIPELINES, OR OTHER OBSTRUCTIONS, THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNERS OF UTILITIES AND RELOCATE THESE AT EH CONTRACTOR'S SOLE EXPENSE.

6. ALL WATER LINES SHALL CONFORM TO AWWA C-900, CLASS 200 (DR 14). ALL GRAVITY SANITARY SEWER LINES LOCATED WITHIN THE R.O.W.'S AND EASEMENTS SHALL CONFORM TO ASTM D-3034, PVC, SDR 26 WITH ASTM D-3212 JOINTS UNLESS OTHERWISE NOTED. ALL OTHER GRAVITY SANITARY SEWER LINES SHALL CONFORM TO ASTM D-3034, PVC, SDR 35 WITH ASTM D-3212 JOINTS UNLESS OTHERWISE NOTED. GRAVITY SANITARY SEWER LINE CROSSING POTABLE WATER LINES TO BE 1-20' PIPE SECTION PVC SDR 26 CENTERED AT THE CROSSING. SANITARY FORCEMAINS SHALL BE SCH 80 PVC. ALL STORM SEWER LOCATED IN EASEMENTS SHALL BE CLASS III RCP. OTHER STORM SEWER MAY BE HDPE OR AS APPROVED BY THE ENGINEER.

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF GEORGETOWN STANDARD SPECIFICATIONS.

2. DESIGN PROCEDURES ARE IN COMPLETE COMPLIANCE WITH THE CITY OF GEORGETOWN DRAINAGE CRITERIA MANUAL.

FIRE DEPARTMENT NOTES

1. THE CITY OF GEORGETOWN FIRE DEPARTMENT REQUIRES FINAL ASPHALT OR CONCRETE PAVEMENT ON REQUIRED ACCESS ROADS PRIOR TO THE START OF THE COMBUSTIBLE CONSTRUCTION. ANY OTHER METHOD OF PROVIDING "ALL-WEATHER DRIVING CAPABILITIES" SHALL BE REQUIRED TO BE DOCUMENTED AND APPROVED AS AN ALTERNATE METHOD OF CONSTRUCTION IN ACCORDANCE WITH THE APPLICABLE RULES FOR TEMPORARY ROADS OUTLINED IN THE CITY OF AUSTIN FIRE PROTECTION CRITERA MANUAL.

2. FIRE HYDRANTS SHALL BE INSTALLED WITH THE CENTER OF FOUR (4) INCH OPENING (STEAMER) LOCATED AT LEAST 18 INCHES ABOVE FINISHED GRADE. THE STEAMER OPENING OF FIRE HYDRANTS SHALL FACE THE APPROVED FIRE ACCESS DRIVEWAY OR PUBLIC STREET AND SET BACK FROM THE CURB LINE(S) AN APPROVED DISTANCE, TYPICALLY THREE (3) TO SIX (6) FEET. THE AREA BETWEEN THE STEAMER OPENING AND THE STREET OR DRIVEWAY GIVING EMERGENCY VEHICLE ACCESS SHALL BE FREE OF OBSTRUCTIONS.

3. TIMING OF INSTALLATIONS: WHEN FIRE PROTECTION FACILITIES ARE INSTALLED BY THE CONTRACTOR, SUCH FACILITIES SHALL INCLUDE SURFACE ACCESS ROADS. EMERGENCY ACCESS ROADS OR DRIVES SHALL BE INSTALLED AND MADE SERVICEABLE PRIOR TO AND DURING THE TIME OF CONSTRUCTION. WHEN THE FIRE DEPARTMENT APPROVES AN ALTERNATE METHOD OF PROTECTION, THIS REQUIREMENT MAY BE MODIFIED AS DOCUMENTED IN THE APPROVAL OF THE ALTERNATE METHOD.

4. ALL EMERGENCY ACCESS ROADWAYS AND FIRE LANES, INCLUDING PREVIOUS/DECORATIVE PAVING, SHALL BE ENGINEERED AND INSTALLED AS REQUIRED TO SUPPORT THE AXLE LOADS OF EMERGENCY VEHICLES. A LOAD CAPACITY SUFFICIENT TO MEET THE REQUIREMENTS FOR HS-20 LOADING (16 KIPS/WHEEL) AND A TOTAL VEHICLE LIVE LOAD OF 80,000 POUNDS IS CONSIDERED COMPIANT WITH THIS REQIREMENT.

5. FIRE LANES DESIGNATED ON SITE PLANS SHALL BE REGISTERED WITH THE CITY OF GEORGETOWN FIRE DEPARTMENT AND INSPECTED FOR FINAL APPROVAL.

6. THE MINIMUM VERTICAL CLEARANCE REQUIRED FOR EMERGENCY VEHICLE ACCESS ROADS OR DRIVES IS 14 FEET FOR THE FULL WIDTH OF THE ROADWAY OR DRIVEWAY.

7. STENCIL THE WORDS "FIRE ZONE/TOW-AWAY ZONE" IN WHITE LETTERS AT LEAST 3" HIGH AT 35 FOOT INTERVALS ALONG THE CURB. SIGNS SHALL BE POSTED AT BOTH ENDS OF THE FIRE ZONE AT INTERVALS OF 50 FEET OR LESS.

CITY OF GEORGETOWN - GENERAL CONSTRUCTION NOTES

1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF GEORGETOWN MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

2. CONTRACTOR SHALL CALL TEXAS 811 (811 OR 1-800-344-8377) FOR UTILITY LOCATIONS PRIOR TO ANY WORK IN CITY EASEMENTS OR STREET R.O.W.

3. CONTRACTOR SHALL NOTIFY THE CITY OF GEORGETOWN - SITE & SUBDIVISION DIVISION TO SUBMIT REQUIRED DOCUMENTATION, PAY CONSTRUCTION INSPECTION FEES, AND TO SCHEDULE THE REQUIRED SITE AND SUBDIVISION PRE-CONSTRUCTION MEETING. THIS MEETING MUST BE HELD PRIOR TO ANY CONSTRUCTION ACTIVITIES WITHIN THE R.O.W. OR PUBLIC EASEMENTS.

4. FOR SLOPES AND TRENCHES GREATER THAN FIVE FEET IN DEPTH, A NOTE MUST BE ADDED STATING: "ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION." (OSHA STANDARDS MAY BE PURCHASED FROM THE GOVERNMENT PRINTING OFFICE; INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA, 611 EAST 6TH STREET, AUSTIN, TEXAS.)

5. ALL SITE WORK MUST COMPLY WITH ENVIRONMENTAL REGULATIONS.

6. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENTS AND PRIOR TO THE FOLLOWING, THE ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DRAINAGE, FILTRATION AND DETENTION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS:

    - RELEASE THE CERTIFICATE OF OCCUPANCY BY THE DEVELOPMENT SERVICES DEPARTMENT (INSIDE THE CITY LIMITS); OR
    - INSTALLATION OF AN ELECTRIC OR WATER METER (IN THE FIVE-MILE ETJ).

7. THE CONTRACTOR SHALL GIVE THE CITY A MINIMUM OF 48 HOURS NOTICE BEFORE BEGINNING EACH PHASE OF CONSTRUCTION, CALL CONSTRUCTION INSPECTION DIVISION, 512-974-6360 OR 512-974-7034.

8. BARRICADES, BUILT TO CITY OF GEORGETOWN STANDARD SPECIFICATIONS, SHALL BE CONSTRUCTED ON ALL DEAD-END STREETS AND AS NECESSARY DURING CONSTRUCTION TO MAINTAIN JOB SAFETY.

9. IF BLASTING IS PLANNED BY THE CONTRACTOR, A BLASTING PERMIT MUST BE SECURED PRIOR TO COMMENCEMENT OF ANY BLASTING.

10. ANY EXISTING PAVEMENT, CURBS, AND/OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE BEFORE ACCEPTANCE OF THE SUBDIVISION.

11. THE LOCATION OF ANY WATER AND/OR WASTEWATER LINES SHOWN ON THE PLANS MUST BE VERIFIED BY THE WATER AND WASTEWATER DEPARTMENT.

DEVELOPER INFORMATION

OWNER: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD

ADDRESS: 13620 NORTH FM 620 BUILDING 2, SUITE 15 AUSTIN, TX 78717 PHONE#: ###

OWNER'S REPRESENTATIVE RESPONSIBLE FOR PLAN ALTERATIONS: JUSTIN MIDURA
PHONE #: 512.439.4700

PERSON OR FIRM RESPONSIBLE FOR EROSION/SEDIMENTATION CONTROL MAINTENANCE:

____
PHONE#: __________

PERSON OR FIRM RESPONSIBLE FOR TREE/NATURAL AREA PROTECTION MAINTENANCE:

____
PHONE #: __________

SPECIAL NOTES

NOTES FOR PLANS WHERE APPLICABLE

1. THE SUBGRADE MATERIAL IN WOODFIELD PRESERVE WAS TESTED BY MLA GEOTECHNICAL IN A REPORT DATED JULY, 2021 AND THE STREET SECTION DESIGNED ACCORDING TO CURRENT CITY OF GEORGETOWN DESIGN CRITERIA. THE STREET SECTIONS ARE TO BE CONSTRUCTED AS FOLLOWS:

STREET NAME	R.O.W. WIDTH	PAVEMENT WIDTH	CLB	HMAC	GEOGRID	LIME STABILIZED BASE
*LOCAL STREET	PER PUD	PER PUD	8"	2"	N/A	N/A
*PRIVATE DRIVES/FIRE LANES	PER PUD	PER PUD	8"	2"	N/A	N/A
*RESIDENTIAL COLLECTOR	PER PUD	PER PUD	10"	2"	N/A	N/A
*NEIGHBORHOOD COLLECTOR	PER PUD	PER PUD	13"	2"	N/A	N/A

*REFER TO GEOTECH REPORT FOR SUBGRADE MATERIALS SPECIFICATIONS IF PI IS GREATER THAN 20

HMAC – HOT MIX ASPHALTIC CONCRETE
CLB – CRUSHED LIMESTONE BASE
MOISTURE BARRIER – 10 MIL POLY LINER

NOTES:
IN AREAS WHERE LIMESTONE WILL FORM THE SUBGRADE, THE CRUSHED LIMESTONE MAY BE DECREASE BY ONE (1) INCH FOR LOCAL STREETS ONLY.

ALTERNATE BID ITEM MAY BE PROVIDED FOR IN THE BID DOCUMENTS FOR LIME STABILIZED BASE, ADDITIONAL CRUSHED LIMESTONE BASE, OR ALTERNATE DESIGNS WHEN REQUIRED FOR EXPANSIVE CLAYS. WHEN EXPANSIVE CLAYS ARE ENCOUNTERED IN THE FIELD THE GEOTECHNICAL ENGINEER WILL DIRECT THE OWNER/CONTRACTOR TO PROVIDE ADDITIONAL BASE, LIME STABILIZATION, OR ALTERNATIVE SECTION.

2. MANHOLE FRAMES, COVERS, AND WATER VALVE COVERS WILL BE RAISED TO FINISHED PAVEMENT GRADE AT THE OWNER'S EXPENSE BY A QUALIFIED CONTRACT WITH CITY INSPECTION. ALL UTILITY ADJUSTMENTS SHALL BE COMPLETED PRIOR TO FINAL PAVING CONSTRUCTION.

3. ALL COLLECTOR AND ARTERIAL STREETS SHALL HAVE AUTOMATIC SCREED CONTROL ON ASPHALTIC CONCRETE PAVEMENT CONSTRUCTION, PLACED AS PER THE CITY OF GEORGETOWN STANDARD SPECIFICATIONS.

4. AT INTERSECTIONS WHICH HAVE VALLEY DRAINAGE, THE CROWNS OF THE INTERSECTING STREETS WILL CULMINATE IN A DISTANCE OF 40' FROM THE INTERSECTING CURB LINE UNLESS OTHERWISE NOTED. INLETS ON THE INTERSECTING STREET SHALL NOT BE CONSTRUCTED WITHIN 50 FEET OF THE VALLEY GUTTER.

5. AT INTERSECTIONS OF TWO 44' STREETS OR LARGER, THE CROWNS OF THE INTERSECTING STREETS WILL CULMINATE IN A DISTANCE OF 40 FEET FROM INTERSECTING CURB LINE UNLESS OTHERWISE NOTED.

6. PRIOR TO FINAL ACCEPTANCE OF A STREET OUTSIDE THE CITY LIMITS, STREET NAME SIGNS CONFORM TO COUNTY STANDARDS SHALL BE INSTALLED BY DEVELOPER.

7. SIDEWALK REQUIREMENTS: PER SITE PLAN DESIGN.

8. A CURB LAY DOWN IS REQUIRED AT ALL POINTS WHERE THE PROPOSED SIDEWALK INTERSECTS THE CURB.

9. WHEN USING LIME STABILIZATION OF SUBGRADE, IT SHALL BE PLACED IN SLURRY FORM.

10. INSIDE THE GEORGETOWN CITY LIMITS, SIDEWALKS SHALL BE COMPLETED PRIOR TO ACCEPTANCE OF ANY TYPE I OR TYPE II DRIVEWAY APPROACHES AND/OR ISSUANCE OF A CERTIFICATE OF OCCUPANCY. WHEN OUTSIDE THE GEORGETOWN CITY LIMITS, LETTER OF CREDIT MAY BE POSTED OR OTHER SUITABLE FINANCIAL ARRANGEMENTS MAY BE MADE TO INSURE CONSTRUCTION OF THE SIDEWALKS. IN EITHER CASE, SIDEWALKS ADJACENT TO "COMMON AREAS", PARKWAYS, OR OTHER LOCATIONS ON WHICH NO BUILDING CONSTRUCTION WILL TAKE PLACE, MUST BE CONSTRUCTED PRIOR TO FINAL ACCEPTANCE OF THE SUBDIVISION.

11. A LICENSE AGREEMENT FOR LANDSCAPING MAINTENANCE AND IRRIGATION IN STREET R.O.W. SHALL BE EXECUTED BY THE DEVELOPER IN PARTY WITH THE CITY OF GEORGETOWN PRIOR TO FINAL ACCEPTANCE OF THE SITE PLAN IMPROVEMENTS.

12. THE ACQUISITION OF RIGHT-OF-WAY AND/OR EASEMENTS AND THE SCHEDULING OF CONSTRUCTION IS THE RESPONSIBILITY OF THE OWNER.

13. CONTOUR DATA SOURCE:
    JOBY EARLY R.P.L.S.
    EARLY LAND SURVEYING, LLC
    P.O BOX 92588
    AUSTIN, TX 78709
    PHONE: 512-202-8631

14. UNDERGROUND FACILITIES WERE NOT LOCATED BY SURVEY COMPANY.

15. TREE CROWN DIAMETER WAS CALCULATED USING THE CITY OF GEORGETOWN'S FORMULA; ONE INCH OF TRUNK DIAMETER EQUALS ONE FOOT OF CROWN RADIUS.

16. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION.

17. ALL SITE WORK MUST ALSO COMPLY WITH ENVIRONMENTAL REQUIREMENTS.

18. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENTS AND PRIOR TO THE FOLLOWING, THE ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DRAINAGE, AND DETENTION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.

ON-SITE FILL SPECIFICATIONS

1. SELECTION OF ON-SITE FILL MATERIAL SHALL BE GUIDED BY THE FOLLOWING CRITERIA:

    A. THE MATERIAL SHALL NOT CONTAIN ANY ROCKS HAVING A MAXIMUM DIMENSION GREATER THAN (6) INCHES.

    B. THE MATERIAL SHALL HAVE AT LEAST FIFTY PERCENT (50%) PASSING THE NO. 4 SIEVE.

    C. THE MATERIAL SHALL BE FREE OF ROOTS, TRASH, CONCRETE RUBBLE, AND OTHER ORGANIC MATERIAL.

2. COMPACTION SHALL BE NINTY-FIVE PERCENT (95%) OF MAXIMUM LABORATORY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D-698. THE MATERIAL SHALL BE WITHIN THREE (3) PERCENTAGE POINTS OF OPTIMUM MOISTURE CONTENT DURING COMPACTION.

3. PLACEMENT SHALL BE IN LIFTS NOT EXCEEDING SIX (6) INCHES AFTER COMPACTION. EACH COMPACTED LIFT SHOULD BE INSPECTED AND/OR TESTED FOR DENSITY COMPLIANCE BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING THE NEXT LIFT. THE FILL AREA SHOULD EXTEND AT LEAST 24 INCHES (36 INCHES ON FILLS OVER SIX (6) FEET IN HEIGHT) BEYOND THE BACK OF CURB OR FOUNDATION LINE BEFORE SLOPING DOWNWARD ON NOT MORE THAN THREE (3) TO ONE (1) SLOPE TO NATURAL SOIL. BACKSLOPES SHALL BE WELL-COMPACTED. MAXIMUM FILL HEIGHTS SHOULD NOT EXCEED FOUR (4) FEET WITHOUT ENGINEERING CONSULTATION.

4. TESTING AND CERTIFICATION OF THE ON-SITE FILL MATERIAL SHALL BE PERFORMED BY THE GEOTECHNICAL ENGINEER. A 50-LB. SAMPLE OF THE PROPOSED MATERIAL SHALL BE SUBMITTED TO THE GEOTECHNICAL ENGINEER FOR APPROVAL AND DETERMINATION OF A MOISTURE-DENSITY RELATIONSHIP IN ADVANCE OF THE FILL AND COMPACTION OPERATIONS IN ORDER TO PERMIT INSPECTION AND TESTING AS THE FILL IS PLACED. FILL PLACEMENT WILL BE INSPECTED AND TESTED FOR UNIFORMITY, ACCEPTABLE MATERIAL, AND FIELD DENSITY PER 5,000 SQUARE FEET PER LIFT (A MINIMUM OF THREE (3) PER LIFT PER PAD).

5. DEVIATIONS FROM THE ABOVE SPECIFICATIONS MAY BE PERMITTED UPON APPROVAL FROM THE GEOTECHNICAL ENGINEER.

6. COMPLIANCE WITH THESE SPECIFICATIONS AS STATED ABOVE OR AS MODIFIED BY THE GEOTECHNICAL ENGINEER FOR SPECIFIC CONDITIONS SHALL BE THE BASIS FOR CERTIFICATION OF COMPLIANCE WITH FHA DATA SHEET 79G AND VA REQUIREMENTS.

SPOILS SITE

1. THE TEMPORARY AND PERMANENT SPOILS DISPOSAL SITES ARE LOCATED ON THE E/S CONTROL AND SOIL MANAGEMENT PLAN.

2. OFF-SITE DISPOSAL: THE CONTRACTOR SHALL NOT DISPOSE OF SURPLUS EXCAVATED MATERIAL FROM THE SITE WITHOUT NOTIFYING THE INSPECTOR 48 HOURS PRIOR TO THE REMOVAL. THIS NOTIFICATION SHALL INCLUDE THE DISPOSAL LOCATION AND A COPY OF THE PERMIT ISSUED TO RECEIVE THE MATERIAL.

SITE RELATED CONCRETE AND STEEL WORK

1. CONCRETE COMPRESSIVE STRENGTH WILL BE A MINIMUM OF 3,000 PSI AFTER 28 DAYS.

2. ALL STEEL SHALL BE GRADE 60.

3. ALL CONCRETE SLOPE PROTECTION SHALL BE REINFORCED WITH WELDED WIRE FABRIC, 6X6 W1.4XW1.4 WITH MINIMUM CLEARANCE TO EDGE OF CONCRETE.

4. PLACEMENT OF STEEL AND ALL SPLICES SHALL BE PER LATEST ACI CODE.

5. PLACEMENT OF CONCRETE SHALL BE PER LATEST ACI CODE.

6. ALL CONCRETE SLOPE PROTECTION TO HAVE 12" DEEP X 6" WIDE TOE WALL AROUND ENTIRE STRUCTURE.

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WOODFIELD PRESERVE
PHASE 3
GENERAL NOTES

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 11/30/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 GN1.dwg

JUSTIN D. MIDURA
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JOB NUMBER: A245-1002

GN1

SHEET NO. 19
OF 118 SHEETS

2023-XX-CON

Texas Commission on Environmental Quality
Water Pollution Abatement Plan
General Construction Notes

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

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

2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan (WPAP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.

3. If any sensitive feature(s) (caves, solution cavity, sink hole, etc.) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. Construction activities may not be resumed until the TCEQ has reviewed and approved the appropriate protective measures in order to protect any sensitive feature and the Edwards Aquifer from potentially adverse impacts to water quality.

4. No temporary or permanent hazardous substance storage tank shall be installed within 150 feet of a water supply source, distribution system, well, or sensitive feature.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the approved plans and manufacturers specifications. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. Any sediment that escapes the construction site must be collected and properly disposed of before the next rain event to ensure it is not washed into surface streams, sensitive features, etc.

7. Sediment must be removed from the sediment traps or sedimentation basins not later than when it occupies 50% of the basin's design capacity.

8. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.

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

10. If portions of the site will have a temporary or permanent cease in construction activity lasting longer than 14 days, soil stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

11. The following records shall be maintained and made available to the TCEQ upon request:
    - the dates when major grading activities occur;
    - the dates when construction activities temporarily or permanently cease on a portion of the site; and
    - the dates when stabilization measures are initiated.

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

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

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

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

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

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

Texas Commission on Environmental Quality
Organized Sewage Collection System
General Construction Notes

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

1. This Organized Sewage Collection System (SCS) must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality's (TCEQ) Edwards Aquifer Rules and any local government standard specifications.

2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the SCS plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.

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

4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.

5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. These controls must remain in place until the disturbed areas have been permanently stabilized.

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

7. Sewer lines located within or crossing the 5-year floodplain of a drainage way will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of 6 inches.

8. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.

9. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

    The diameter of the manholes must be a minimum of four feet and the manhole for entry must have a minimum clear opening diameter of 30 inches. These dimensions and other details showing compliance with the commission's rules concerning manholes and sewer line/manhole inverts described in 30 TAC §217.55 are included on Plan Sheet __ of __.

    It is suggested that entrance into manholes in excess of four feet deep be accomplished by means of a portable ladder. The inclusion of steps in a manhole is prohibited.

10. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §217.53(d) (Pipe Design) and 30 TAC §290.44(e) (Water Distribution).

11. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: ______________________________.

    If pipe flexure is proposed, the following method of preventing deflection of the joint must be used: ______________________________.

    Specific care must be taken to ensure that the joint is placed in the center of the trench and properly bedded in accordance with 30 TAC §217.54.

12. New sewage collection system lines must be constructed with stub outs for the connection of anticipated extensions. The location of such stub outs must be marked on the ground such that their location can be easily determined at the time of connection of the extensions. Such stub outs must be manufactured wyes or tees that are compatible in size and material with both the sewer line and the extension. At the time of original construction, new stub-outs must be constructed sufficiently to extend beyond the end of the street pavement. All stub-outs must be sealed with a manufactured cap to prevent leakage. Extensions that were not anticipated at the time of original construction or that are to be connected to an existing sewer line not furnished with stub outs must be connected using a manufactured saddle and in accordance with accepted plumbing techniques.

    If no stub-out is present an alternate method of joining laterals is shown in the detail on Plan Sheet __ of __. (For potential future laterals).

    The private service lateral stub-outs must be installed as shown on the plan and profile sheets on Plan Sheet __ of __ and marked after backfilling as shown in the detail on Plan Sheet __ of __.

13. Trenching, bedding and backfill must conform with 30 TAC §217.54. The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.

14. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).

15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:

(a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:

(1) *Low Pressure Air Test.*

(A) A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C-924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B)(ii) of this paragraph.

(B) For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.

(i) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.

(ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

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

Where:

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 X D X L, but not less than 1.0
D = average inside pipe diameter in inches

L = length of line of same size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

(C) Since a K value of less than 1.0 may not be used, the minimum testing time for each pipe diameter is shown in the following Table C.3:

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

(D) An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.

(E) If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.

(F) Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.

(G) A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

(2) *Infiltration/Exfiltration Test.*

(A) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.

(B) An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.

(C) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.

(D) For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.

(E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

(b) If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:

(1) For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.

(A) *Mandrel Sizing.*

(i) A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.

(ii) If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.

(iii) All dimensions must meet the appropriate standard.

(B) *Mandrel Design.*

(i) A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.

(ii) A mandrel must have nine or more odd number of runners or legs.

(iii) A barrel section length must equal at least 75% of the inside diameter of a pipe.

(iv) Each size mandrel must use a separate proving ring.

(C) *Method Options.*

(i) An adjustable or flexible mandrel is prohibited.

(ii) A test may not use television inspection as a substitute for a deflection test.

(iii) If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.

(2) For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.

(3) A deflection test method must be accurate to within plus or minus 0.2% deflection.

(4) An owner shall not conduct a deflection test until at least 30 days after the final backfill.

(5) Gravity collection system pipe deflection must not exceed five percent (5%).

(6) If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

16. All manholes must be tested to meet or exceed the requirements of 30 TAC §217.58.

(a) All manholes must pass a leakage test.

(b) An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.

(1) Hydrostatic Testing.

(A) The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.

(B) To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.

(C) A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

(2) Vacuum Testing.

(A) To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.

(B) No grout must be placed in horizontal joints before testing.

(C) Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.

(D) An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.

(E) A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.

(F) There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.

(G) A test does not begin until after the vacuum pump is off.

(H) A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

17. All private service laterals must be inspected and certified in accordance with 30 TAC §213.5(c)(3)(I). After installation of and, prior to covering and connecting a private service lateral to an existing organized sewage collection system, a Texas Licensed Professional Engineer, Texas Registered Sanitarian, or appropriate city inspector must visually inspect the private service lateral and the connection to the sewage collection system, and certify that it is constructed in conformity with the applicable provisions of this section. The owner of the collection system must maintain such certifications for five years and forward copies to the appropriate regional office upon request. Connections may only be made to an approved sewage collection system.

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

WOODFIELD PRESERVE
PHASE 3

GENERAL NOTES

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 11/30/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_Ph3 GN2.dwg

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A245-1002

GN1

SHEET NO.
20
OF 118 SHEETS

2023-XX-CON

Date/Time : Thu, 30 Nov 2023 - 11:41pm
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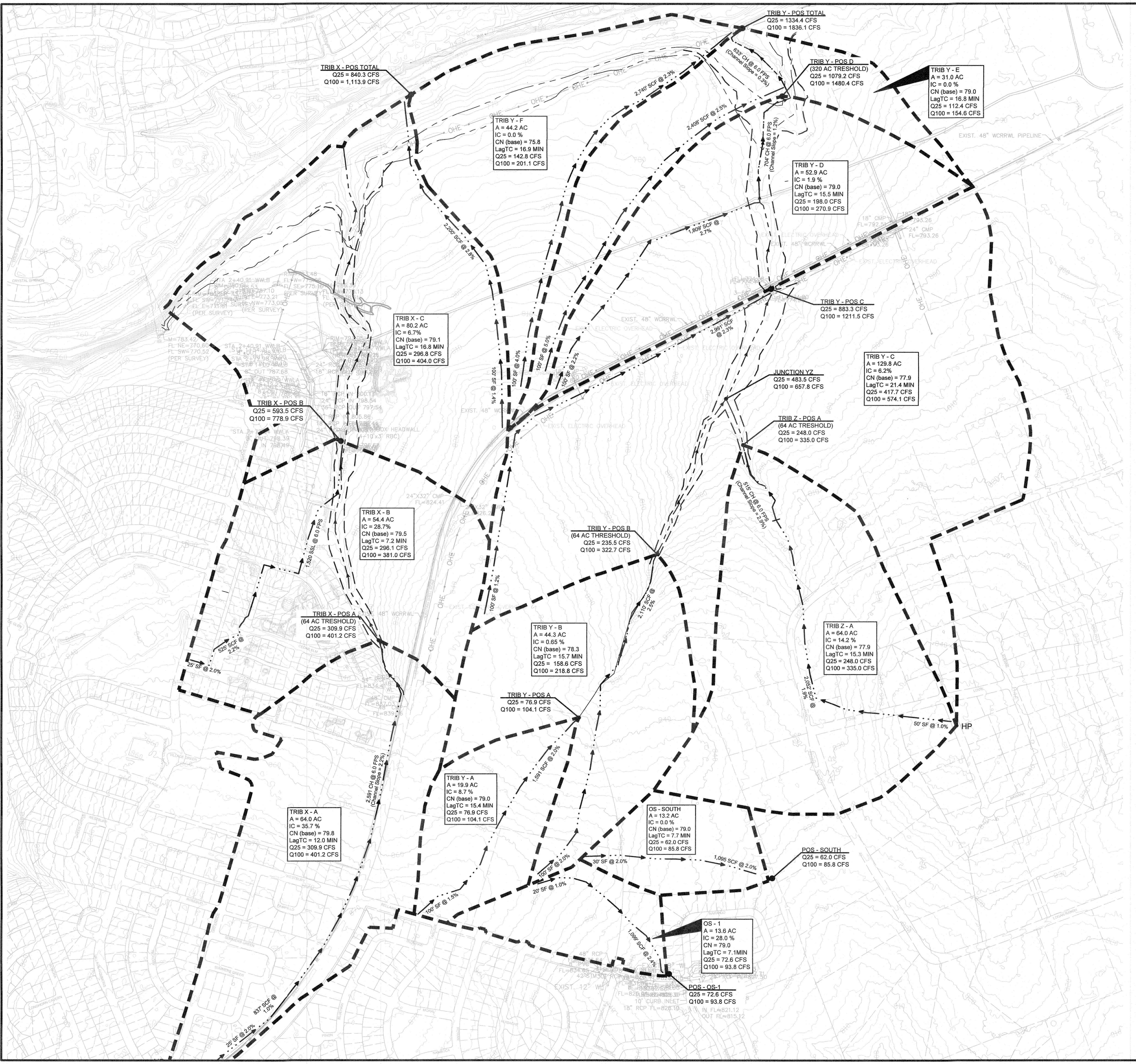
WOODFIELD PRESERVE
PHASE 3
EXISTING DRAINAGE AREA MAP



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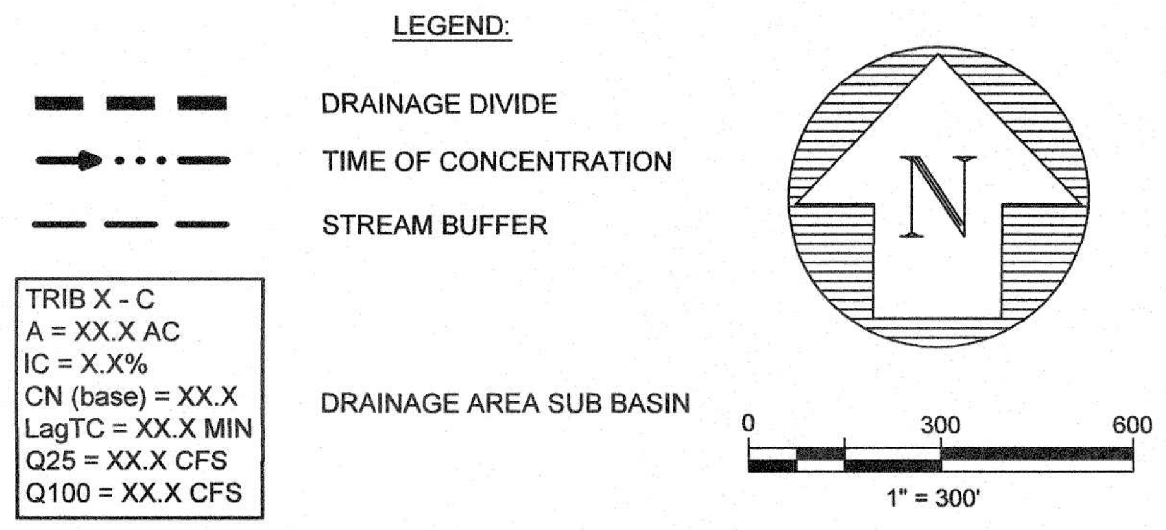

Drainage Area: TRIB X - A

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	13.9	13
Soil D - Pasture (Existing IC)	80	50.2	42
Total		64.1	
Weighted	79.8		35.7

Drainage Area: TRIB X - B

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	28.1	1.4
Soil D - Pasture (Existing IC)	80	26.3	58
Total		54.4	
Weighted	79.5		28.7

Drainage Area: TRIB X - C

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	72.6	1.4
Soil D - Pasture (Existing IC)	80	7.5	58
Total		80.2	
Weighted	79.1		6.7

Drainage Area: TRIB Z - A

Description	CN	Area (ac)	IC (%)
Soil D - Woods	77	35.1	16.8
Soil D - Woods/Grass Combo	79	28.8	10.9
Total		63.9	
Weighted	77.9		14.15

Drainage Area: OS - 1

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	13.6	28
Total		13.6	

Drainage Area: OS - SOUTH

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	13.2	0
Total		13.2	

Subbasin	CN (base)	IC (%)	IC	CN (composite)
TRIB X - A	79.8	35.7	0.36	86
TRIB X - B	79.5	28.7	0.29	85
TRIB X - C	79.1	6.7	0.07	80
TRIB Y - A	79.0	8.7	0.09	81
TRIB Y - B	78.3	0.65	0.01	78
TRIB Y - C	77.9	6.24	0.06	79
TRIB Y - D	79.0	1.9	0.02	79
TRIB Y - E	79.0	0	0.00	79
TRIB Y - F	75.8	0	0.00	76
TRIB Z - A	77.9	14.2	0.14	81
OS - 1	79.0	28	0.28	84
OS - SOUTH	79.0	0	0.00	79

Drainage Area: TRIB Y - A

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	19.9	8.7
Total		19.9	

Drainage Area: TRIB Y - B

Description	CN	Area (ac)	IC (%)
Soil D - Woods	77	15.4	0.0
Soil D - Woods/Grass Combo	79	28.9	1.0
Total		44.3	
Weighted	78.3		0.65

Drainage Area: TRIB Y - C

Description	CN	Area (ac)	IC (%)
Soil D - Woods	77	71.1	7.4
Soil D - Woods/Grass Combo	79	58.7	4.9
Total		129.8	
Weighted	77.9		6.24

Drainage Area: TRIB Y - D

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	52.9	1.9
Total		52.9	

Drainage Area: TRIB Y - E

Description	CN	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	31.2	0.0
Total		31.2	

Drainage Area: Trib Y - F

Description	CN	Area (ac)	IC (%)
Soil B - Woods	55	4.7	0
Soil D - Woods	77	13.5	0
Soil D - Woods/Grass Combo	79	25.9	0
Total		44.2	
Weighted	75.8		0.0

Existing Peak Capacity Flow Rates

POS	2 yr	10 yr	25 yr	100 yr
TRIB X - POS TOTAL	352.3	650.4	840.3	1113.9
TRIB Y - POS TOTAL	466.4	1000.7	1334.4	1836.1
POS - SOUTH	23.0	48.2	62.0	85.8
POS - OS - 1	32.4	56.4	72.6	93.8

TIME OF CONCENTRATION CALCULATIONS

Light underbrush = 0.40 P2 - 2-year, 24-hour rainfall = 4.2 in

ENTER MANNINGS n-VALUE Dense Grasses = 0.24 Pvmt = 0.011

DRAINAGE AREA	SHEET FLOW DIST (FT)	SHEET FLOW SLOPE (FT/FT)	SHEET FLOW Tc (MIN)	SHALLOW CONC FLOW DIST (FT)	SHALLOW CONC FLOW SLOPE (FT/FT)	SHALLOW CONC FLOW Tc (MIN)	CHANNEL FLOW DIST (FT)	CHANNEL FLOW VELOCITY (FPS)	CHANNEL FLOW Tc (MIN)	TOTAL Tc (MIN)	LAG TIME (MIN)
TRIB X - A	25.00	0.02	4.1	837	0.01	8.6	2,591	6.00	7.2	20.0	12.0
TRIB X - B	25.00	0.02	4.1	525	0.02	3.7	1,520	6.00	4.2	12.0	7.2
TRIB X - C	100.00	0.01	14.4	2,200	0.03	13.6	0	6.00	0.0	27.9	16.8
TRIB Y - A	100.00	0.02	14.0	1,590	0.02	11.6	0	6.00	0.0	25.6	15.4
TRIB Y - B	100.00	0.02	12.5	2,110	0.03	13.8	0	6.00	0.0	26.2	15.7
TRIB Y - C	100.00	0.01	15.3	2,990	0.02	20.4	0	6.00	0.0	35.6	21.4
TRIB Y - D	100.00	0.02	12.0	1,809	0.03	11.4	704	4.82	2.4	25.8	15.5
TRIB Y - E	100.00	0.05	8.6	2,408	0.03	15.7	633	2.96	3.6	27.9	16.8
TRIB Y - F	100.00	0.04	9.4	2,740	0.02	18.7	0	6.00	0.0	28.1	16.9
TRIB Z - A	50.00	0.01	9.4	2,052	0.02	15.0	515	8.62	1.0	25.4	15.3
OS - 1	20.00	0.01	4.5	1,100	0.02	7.3	0	6.00	0.0	11.9	7.1
OS - SOUTH	30.00	0.02	4.8	1,095	0.02	8.0	0	6.00	0.0	12.8	7.7

EQUATION 3-11 SCS METHOD SHEET FLOW

$$T_t = \frac{\left[0.42 * (nL)^{0.8}\right]}{(P_2)^{0.5} * (S)^{0.4}}$$

T_t - Travel time (min)

n - Manning's roughness coefficient

L - Length of flow path (ft)

P_2 - 2-year, 24-hour rainfall = 4.2 in

S - Ground slope along flow path (ft/ft)

Manning n Values	
Light Underbrush	0.40
Dense Grasses	0.24
Pavement	0.011

EQUATION 3-12 SCS SHALLOW CONCENTRATED

Unpaved $V = 16.1345(S)^{0.5}$

Paved $V = 20.3282(S)^{0.5}$

V - Average velocity (ft/s)

S - Ground slope along flow path (ft/ft)

EQUATION 3-13 OPEN CHANNEL FLOW

$$T_t = \frac{L}{60V}$$

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM1.dwg

JUSTIN D. MIDURA
128809
2-26-2024

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Phone 512.439.4700
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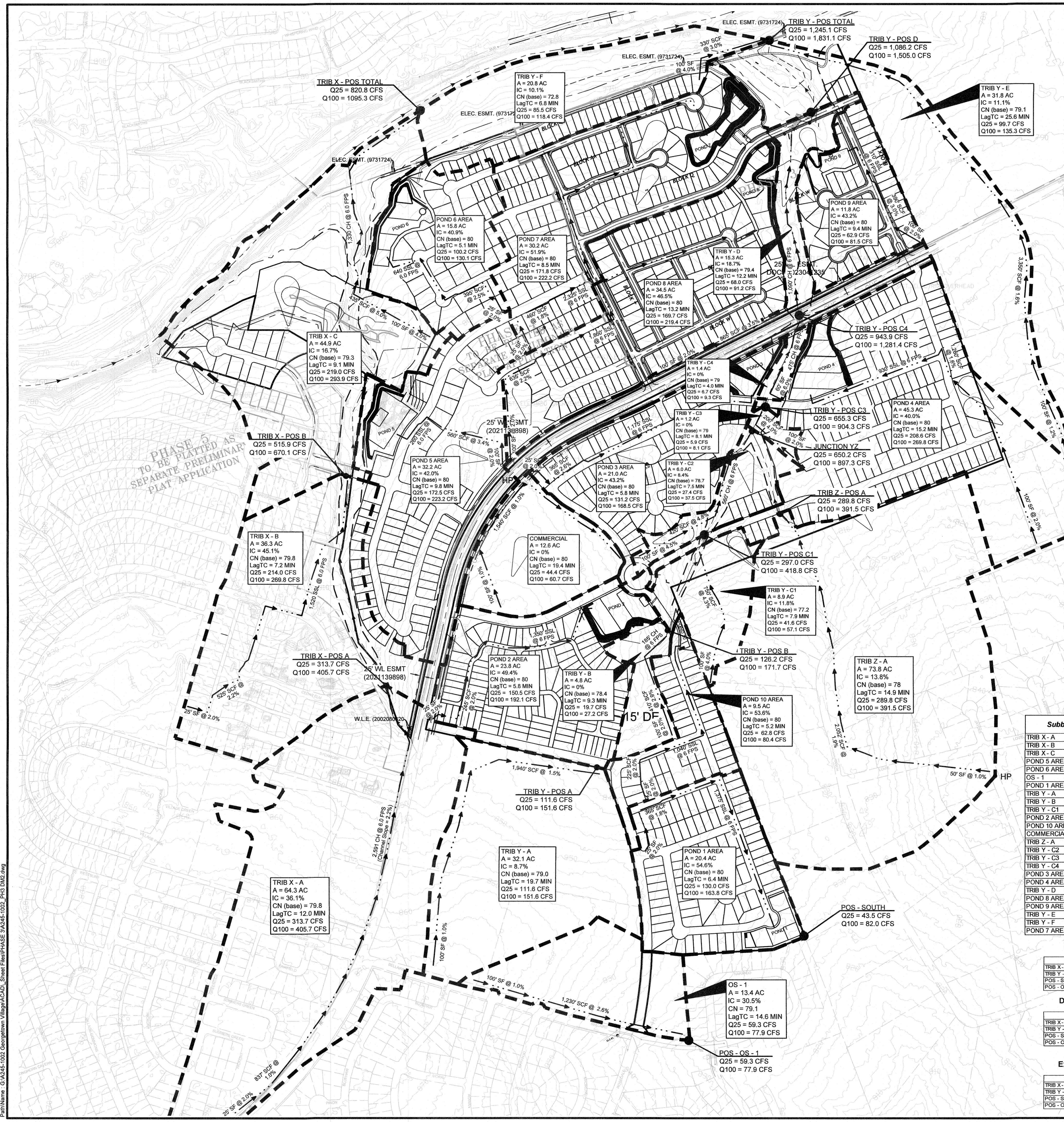
FRN - F-1386

JOB NUMBER:
A245-1002

DM 1

SHEET NO.
21
OF 132 SHEETS

Date\Time : Tue, 27 Feb 2024 - 10:36am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 DM1.dwg



LEGEND:

▬ ▬ ▬ DRAINAGE DIVIDE

➔ • • • — TIME OF CONCENTRATION

— — — STREAM BUFFER

TRIB X - C
A = XX.X AC
IC = X.X%
CN (base) = XX.X
LagTC = XX.X MIN
Q25 = XX.X CFS
Q100 = XX.X CFS

DRAINAGE AREA SUB BASIN

N

0 300 600
1" = 300'

NOTES:

1. EACH POND SHALL BE LOCATED WITHIN A DRAINAGE EASEMENT LOT TO BE DEDICATED PER FINAL PLAT.
2. PONDS 1-10 ARE BOTH WATER QUALITY AND DETENTION PONDS.
3. REFER TO SHEETS WQ1-WQ9 FOR POND DETAILS.
4. ALL PONDS WITHIN THIS SUBDIVISION ARE EXTENDED BATCH DETENTION PONDS.

Drainage Area: POND 3 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 3 Area	80	21.0	43.2
Total		21.0	

Drainage Area: POND 4 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 4 Area	80	35.5	49.8
Offsite Logan Ranch Area	80	9.8	4.30
Total		45.3	
Weighted Base	80		40.0

Drainage Area: TRIB Y - D

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	8.8	0.0
Soil D - Existing Shell Road ROW	80	5.7	39.0
Soil D - 60' ROW	80	0.9	77.0
Total		15.3	
Weighted Base	79.4		18.7

Drainage Area: POND 8 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 8 Area	80	34.5	46.5
Total		34.5	

Drainage Area: POND 9 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 9 Area	80	11.8	43.2
Total		11.8	

Drainage Area: TRIB Y - E

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	28.0	0.0
Soil D - Existing Impervious Cover	80	3.3	100.0
Soil D - Lots	80	0.5	50.0
Total		31.8	
Weighted Base	79.1		11.1

Drainage Area: Trib Y - F

Description	CN (Base)	Area (ac)	IC (%)
Soil B - Woods	55	4.7	0
Soil D - Woods	77	9.9	0
Soil D - Woods/Grass Combo	79	2.0	0
Soil D - Lots	80	4.2	50
Total		20.8	
Weighted Base	72.8		10.1

Drainage Area: POND 7 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 7 Area	80	30.2	51.9
Total		30.2	

Drainage Area: TRIB Y - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	32.1	8.7
Total		32.1	

Drainage Area: TRIB Y - B

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	1.4	0.0
Soil D - Woods/Grass Combo	79	3.4	0.0
Total		4.8	
Weighted Base	78.4		0.00

Drainage Area: TRIB Y - C1

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	8.4	7.4
Soil D - 60' ROW	80	0.2	77.0
Soil D - 50' ROW	80	0.3	84.0
Total		8.9	
Weighted Base	77.2		11.8

Drainage Area: POND 2 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 2 Area	80	23.8	49.4
Total		23.8	

Drainage Area: POND 10 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 10 Area	80	9.5	53.6
Total		9.5	

Drainage Area: COMMERCIAL

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Commercial	80	12.6	0.0
Total		12.6	

Drainage Area: TRIB Y - C2

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	1.4	0.0
Soil D - Woods/Grass Combo	79	3.6	0.0
Soil D - 60' ROW	80	0.2	77.0
Soil D - Lots	80	0.7	50.0
Total		6.0	
Weighted Base	78.7		8.4

Drainage Area: TRIB Y - C3

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	1.2	0.0
Total		1.2	

Drainage Area: TRIB Y - C4

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	1.4	0.0
Total		1.4	

Drainage Area: TRIB X - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	13.9	13
Soil D - Pasture (Existing IC)	80	50.0	42
Soil D - 60' ROW	80	0.4	77
Total		64.3	
Weighted Base	79.8		36.1

Drainage Area: TRIB X - B

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	8.0	1.4
Soil D - Pasture (Existing IC)	80	26.4	58
Soil D - Lots	80	1.9	50
Total		36.3	
Weighted Base	79.8		45.1

Drainage Area: TRIB X - C

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	32.7	1.4
Soil D - Pasture (Existing IC)	80	7.5	58
Soil D - 60' ROW	80	0.2	77
Soil D - 50' ROW	80	0.8	84
Soil D - Lots	80	3.7	50
Total		44.9	
Weighted Base	79.3		16.7

Drainage Area: POND 5 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 5 Area	80	29.7	42.2
Soil D - Existing Shell Road ROW	80	2.5	39
Total		32.2	
Weighted Base	80.0		42.0

Drainage Area: POND 6 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 6 Area	80	15.8	40.9
Total		15.8	
Weighted Base	80.0		40.9

Drainage Area: TRIB Z - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	36.6	16.8
Soil D - Woods/Grass Combo	79	37.2	10.9
Total		73.8	
Weighted Base	78.0		13.8

Drainage Area: OS - 1

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	12.7	28
Soil D - 60' ROW	80	0.7	77
Total		13.4	
Weighted Base	79.1		30.5

Drainage Area: POND 1 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 1 Area	80	20.4	54.6
Total		20.4	

Subbasin	CN (base)	IC (%)	IC	CN (composite)
TRIB X - A	79.8	36.1	0.36	86
TRIB X - B	79.8	45.1	0.45	88
TRIB X - C	79.3	16.7	0.17	82
POND 5 AREA	80.0	42.0	0.42	88
POND 6 AREA	80.0	40.9	0.41	87
OS - 1	79.1	30.5	0.31	85
POND 1 AREA	80.0	54.6	0.55	90
TRIB Y - A	79.0	8.7	0.09	81
TRIB Y - B	78.4	0.0	0.00	78
TRIB Y - C1	77.2	11.8	0.12	80
POND 2 AREA	80.0	49.4	0.49	89
POND 10 AREA	80.0	53.6	0.54	90
COMMERCIAL	80.0	0.0	0.00	80
TRIB Z - A	78.0	13.8	0.14	81
TRIB Y - C2	78.7	8.4	0.08	80
TRIB Y - C3	79.0	0.0	0.00	79
TRIB Y - C4	79.0	0.0	0.00	79
POND 3 AREA	80.0	43.2	0.43	88
POND 4 AREA	80.0	49.8	0.50	89
TRIB Y - D	79.4	18.7	0.19	83
POND 8 AREA	80.0	46.5	0.46	88
POND 9 AREA	80.0	43.2	0.43	88
TRIB Y - E	79.1	11.1	0.11	81
TRIB Y - F	72.8	10.1	0.10	75
POND 7 AREA	80.0	51.9	0.52	89

Existing Peak Capacity Flow Rates

POS	2 yr	10 yr	25 yr	100 yr
TRIB X - POS TOTAL	352.3	650.4	840.3	1113.9
TRIB Y - POS TOTAL	466.4	1000.7	1334.4	1836.1
POS - SOUTH	23.0	48.2	62.0	85.8
POS - OS - 1	32.4	56.4	72.6	93.8

Developed Peak Capacity Flow Rates

POS	2 yr	10 yr	25 yr	100 yr
TRIB X - POS TOTAL	345.1	648.0	820.8	1095.3
TRIB Y - POS TOTAL	458.2	928.3	1245.1	1831.1
POS - SOUTH	20.4	31.5	43.5	82.0
POS - OS - 1	26.1	46.5	59.3	77.9

Existing & Proposed Flow Rate Deltas

POS	2 yr	10 yr	25 yr	100 yr
TRIB X - POS TOTAL	7.2	2.4	19.5	18.6
TRIB Y - POS TOTAL	8.2	72.4	89.3	5.0
POS - SOUTH	2.6	16.7	18.5	3.8
POS - OS - 1	6.3	9.9	13.3	15.9

TIME OF CONCENTRATION CALCULATIONS

ENTER MANNINGS n-VALUE
Light underbrush = 0.40
Dense Grasses = 0.24
Pvmt = 0.011
P2 - 2-year, 24-hour rainfall = 4.2 in

DRAINAGE AREA (SUBBASIN)	SHEET FLOW DIST (FT)	SHEET FLOW SLOPE (FT/FT)	SHEET FLOW Tc (MIN)	SHALLOW CONC FLOW DIST (FT)	SHALLOW CONC FLOW SLOPE (FT/FT)	SHALLOW CONC FLOW Tc (MIN)	VELOCITY FLOW DIST (FT)	VELOCITY FLOW VELOCITY (FPS)	VELOCITY FLOW Tc (MIN)	TOTAL Tc (MIN)	LAG TIME (MIN)
TRIB X - A	25	0.02	4.1	837	0.01	8.6	2,591	6.00	7.2	20.0	12.0
TRIB X - B	25	0.02	4.1	525	0.02	3.7	1,520	6.00	4.2	12.0	7.2
TRIB X - C	100	0.04	9.4	435	0.05	2.0	1,330	6.00	3.7	15.1	9.1
POND 5 AREA	100	0.02	12.5	560	0.03	3.1	260	6.00	0.7	16.3	9.8
POND 6 AREA	25	0.02	4.1	395	0.03	2.6	640	6.00	1.8	8.5	5.1
OS - 1	100	0.01	16.4	1,230	0.03	7.9	0	0.00	0.0	24.3	14.6
POND 1 AREA	25	0.02	4.1	365	0.02	2.8	1,375	6.00	3.8	10.7	6.4
TRIB Y - A	100	0.01	16.4	1,940	0.02	16.4	0	0.00	0.0	32.8	19.7
TRIB Y - B	100	0.02	12.5	410	0.03	2.5	185	6.00	0.5	15.5	9.3
TRIB Y - C1	100	0.04	9.4	750	0.04	3.7	0	0.00	0.0	13.2	7.9
POND 2 AREA	25	0.02	4.1	245	0.02	1.8	1,350	6.00	3.8	9.6	5.8
POND 10 AREA	25	0.02	4.1	225	0.02	1.6	1,040	6.00	2.9	8.6	5.2
COMMERCIAL	100	0.01	16.4	1,540	0.01	15.9	0	0.00	0.0	32.3	19.4
TRIB Z - A	50	0.01	9.4	2,052	0.02	15.4	0	0.00	0.0	24.8	14.9
TRIB Y - C2	100	0.05	9.0	420	0.05	2.0	560	6.00	1.6	12.5	7.5
TRIB Y - C3	100	0.02	12.5	200	0.04	1.0	0	0.00	0.0	13.5	8.1
TRIB Y - C4	60	0.06	5.3	0	NA	0.0	475	6.00	1.3	6.7	4.0
POND 3 AREA	25	0.02	4.1	365	0.03	2.3	1,175	6.00	3.3	9.7	5.8
POND 4 AREA	100	0.02	12.5	1,260	0.02	10.3	930	6.00	2.6	25.3	15.2
TRIB Y - D	100	0.02	12.5	865	0.04	4.8	1,090	6.00	3.0	20.3	12.2
POND 8 AREA	100	0.02	12.5	635	0.02	4.4	1,860	6.00	5.2	22.0	13.2
POND 9 AREA	100	0.02	12.5	390	0.03	2.3	310	6.00	0.9	15.6	9.4
TRIB Y - E	100	0.01	15.3	3,350	0.02	27.4	0	0.00	0.0	42.6	25.6
TRIB Y - F	100	0.04	9.4	330	0.03	2.0	0	0.00	0.0	11.4	6.8
POND 7 AREA	25	0.02	4.1	460	0.02	3.5	2,325	6.00	6.5	14.1	8.5

EQUATION 3-11 SCS METHOD SHEET FLOW

$$T_t = \frac{\left[0.42 * (nL)^{0.8}\right]}{(P_2)^{0.5} * (S)^{0.4}}$$

T_t - *Travel time (min)*
n - *Manning's roughness coefficient*
L - *Length of flow path (ft)*
P_2 - *2-year, 24-hour rainfall = 4.2 in*
S - *Ground slope along flow path (ft/ft)*

Manning n Values	
Light Underbrush	0.40
Dense Grasses	0.24
Pavement	0.011

EQUATION 3-12 SCS SHALLOW CONCENTRATED

Unpaved $V = 16.1345(S)^{0.5}$
Paved $V = 20.3282(S)^{0.5}$

V - *Average velocity (ft/s)*
S - *Ground slope along flow path (ft/ft)*

EQUATION 3-13 OPEN CHANNEL FLOW

$$T_t = \frac{L}{60V}$$

WOODFIELD PRESERVE
PHASE 3
DEVELOPED DRAINAGE AREA MAP

NO.	DESCRIPTION	BY	DATE

REVISIONS

DATE: 3/1/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM2.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809

2-26-2024

LJA Engineering, Inc.
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Phone 512.439.4700
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FRN - F-1386

JOB NUMBER:
A245-1002

DM2

SHEET NO.
22
OF 132 SHEETS

Date/Time : Fri, 01 Mar 2024 - 10:06am
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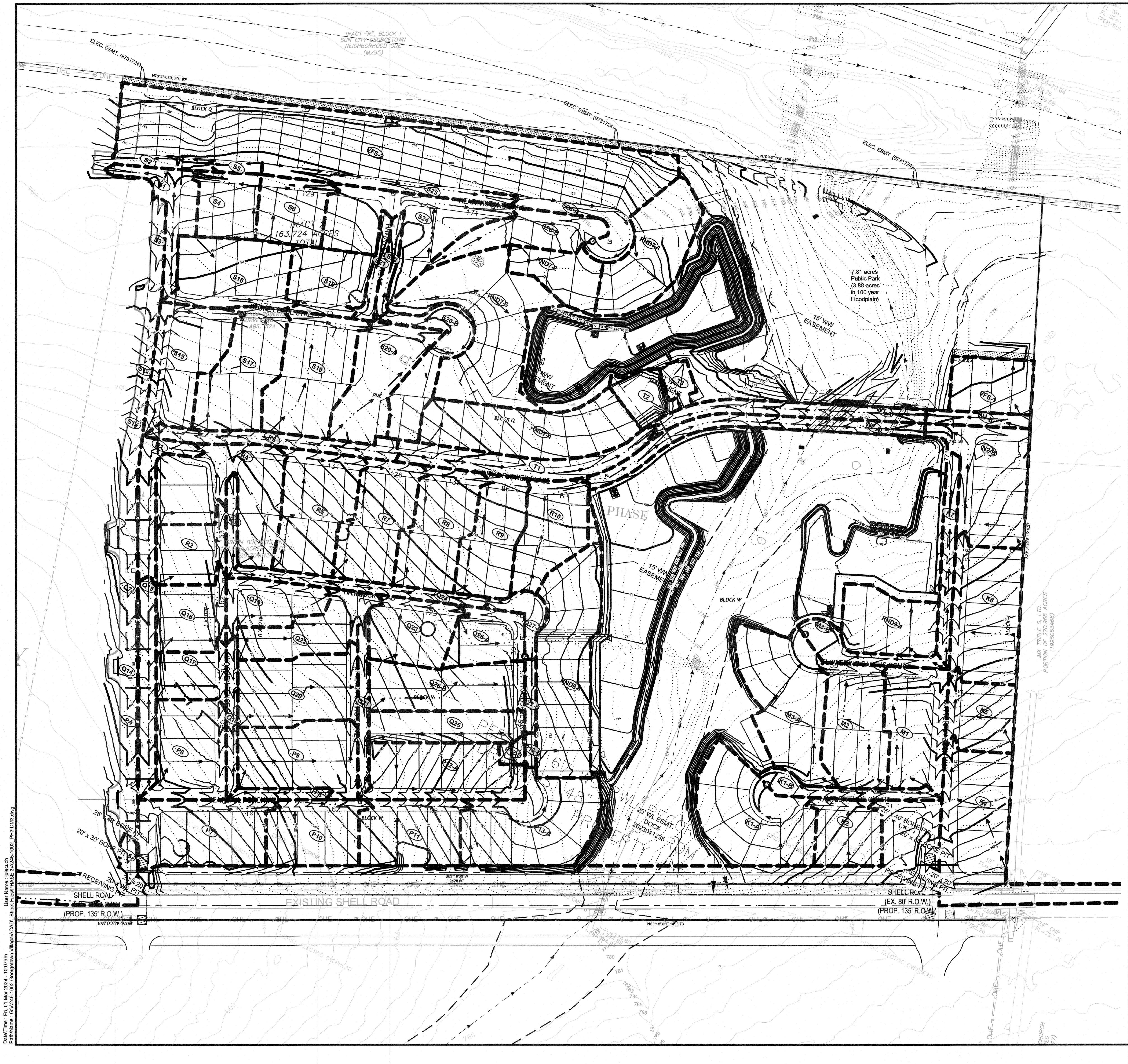

LEGEND:

A#	DRAINAGE AREA
HP	HIGH POINT
LP	LOW POINT
➡	FLOW DIRECTION ARROW
───	DRAINAGE DIVIDE
→‐ · ‐	TIME OF CONCENTRATION

N

0 100 200

1" = 100'

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

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

WOODFIELD PRESERVE
PHASE 3
INTERNAL DRAINAGE AREA MAP

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 3/1/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM3.dwg

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JOB NUMBER:
A245-1002

DM3

SHEET NO.
23
OF 132 SHEETS

Date\Time : Fri, 01 Mar 2024 - 10:07am
User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 DM3.dwg

TIME OF CONCENTRATION CALCULATIONS

ENTER MANNINGS n-VALUE
Light underbrush = 0.40
Dense Grasses = 0.25
P2 - 2-year, 24-hour rainfall = 4.2 in
Pvmt = 0.011

AREA NO.	SHEET FLOW DIST (FT)	SHEET FLOW SLOPE (FT/FT)	SHEET FLOW Tc (MIN)	SHALLOW CONC FLOW DIST (FT)	SHALLOW CONC FLOW SLOPE (FT/FT)	SHALLOW CONC FLOW Tc (MIN)	STREET FLOW DIST (FT)	STREET FLOW SLOPE (FT/FT)	STREET FLOW Tc (MIN)	TOTAL Tc (MIN)
K1-A	25	0.020	4.7	88	0.020	0.6	135	0.01	1.5	6.8
K1-B	10	0.006	3.8	0	0.020	0.0	393	0.01	4.3	8.1
K2	25	0.020	4.7	129	0.020	0.9	82	0.03	0.4	6.0
K3	25	0.020	4.7	101	0.020	0.7	51	0.03	0.2	5.7
K4	25	0.030	4.0	193	0.030	1.2	136	0.04	0.6	5.7
K5	25	0.020	4.7	154	0.020	1.1	115	0.02	0.7	6.5
K6	25	0.010	6.2	207	0.010	2.1	216	0.02	1.3	9.6
K7	10	0.020	2.3	0	0.010	0.0	464	0.02	2.7	5.0
M1	25	0.020	4.7	252	0.020	1.8	10	0.02	0.1	6.6
M2	25	0.020	4.7	307	0.020	2.2	56	0.02	0.4	7.3
M3-A	25	0.020	4.7	364	0.020	2.7	86	0.01	1.0	8.3
M3-B	10	0.005	3.9	0	0.020	0.0	349	0.01	4.0	8.0
N1-A	10	0.017	2.4	0	0.020	0.0	644	0.02	4.0	6.5
N1-B	10	0.005	3.9	0	0.020	0.0	222	0.01	2.6	6.5
N2-A	10	0.010	3.0	0	0.020	0.0	798	0.01	6.5	9.5
N2-B	25	0.020	4.7	139	0.020	1.0	273	0.01	3.2	8.9
P5	10	0.022	2.2	0	0.020	0.0	1102	0.02	6.1	8.2
P6	25	0.020	4.7	141	0.020	1.0	130	0.02	0.7	6.4
P7	25	0.010	6.2	107	0.010	1.1	195	0.05	0.8	8.0
P8	10	0.020	2.3	0	0.010	0.0	217	0.02	1.3	5.0
P9	25	0.030	4.0	262	0.030	1.6	85	0.01	0.7	6.2
P10	25	0.020	4.7	142	0.020	1.0	162	0.02	0.9	6.7
P11	25	0.010	6.2	152	0.010	1.6	156	0.04	0.7	8.4
P12-A	25	0.020	4.7	80	0.020	0.6	320	0.01	3.7	9.0
P12-B	25	0.020	4.7	27	0.020	0.2	10	0.01	0.1	5.0
P13-A	25	0.020	4.7	107	0.020	0.8	275	0.01	3.2	8.7
P13-B	10	0.005	3.9	0	0.020	0.0	66	0.01	0.8	5.0
Q15	25	0.030	4.0	0	0.030	0.0	468	0.02	3.0	7.0
Q16	25	0.035	3.8	107	0.035	0.6	162	0.01	1.2	5.5
Q17	25	0.035	3.8	130	0.035	0.7	97	0.01	1.1	5.6
Q18	10	0.005	3.9	0	0.035	0.0	338	0.01	3.9	7.8
Q19	25	0.020	4.7	190	0.020	1.4	10	0.02	0.1	6.1
Q20	25	0.030	4.0	276	0.030	1.6	91	0.01	0.7	6.3
Q21	10	0.011	2.8	0	0.030	0.0	375	0.01	2.9	5.7
Q22	25	0.020	4.7	287	0.020	2.1	108	0.02	0.6	7.4
Q23	25	0.020	4.7	130	0.020	0.9	129	0.01	0.9	6.5
Q24	10	0.014	2.6	0	0.020	0.0	551	0.01	3.8	6.3
Q25	25	0.030	4.0	293	0.030	1.7	49	0.01	0.6	6.3
Q26-A	25	0.020	4.7	145	0.020	1.1	39	0.01	0.5	6.2
Q26-B	25	0.030	4.0	324	0.030	1.9	36	0.01	0.4	6.3
Q27-A	10	0.005	3.9	0	0.010	0.0	257	0.01	3.0	6.9
Q27-B	10	0.005	3.9	0	0.010	0.0	148	0.01	1.7	5.6
R1	10	0.020	2.3	0	0.010	0.0	376	0.02	2.2	5.0
R2	25	0.036	3.7	104	0.036	0.6	153	0.01	1.1	5.4
R3	10	0.013	2.7	0	0.036	0.0	219	0.01	1.6	5.0
R4	25	0.036	3.7	113	0.036	0.6	258	0.02	1.5	5.8
R5	25	0.024	4.4	249	0.024	1.7	131	0.02	0.8	6.8
R6	10	0.020	2.3	0	0.027	0.0	544	0.02	3.2	5.4
R7	25	0.027	4.2	249	0.027	1.6	126	0.02	0.7	6.5
R8	25	0.026	4.2	253	0.026	1.6	130	0.01	1.5	7.4
R9	25	0.024	4.4	256	0.024	1.7	86	0.01	1.0	7.1
R10	25	0.020	4.7	199	0.020	1.5	83	0.01	1.0	7.1
S1	10	0.005	3.9	0	0.020	0.0	381	0.01	4.4	8.3
S2	10	0.005	3.9	0	0.020	0.0	185	0.01	2.1	6.1
S4	25	0.030	4.0	92	0.030	0.5	136	0.01	1.6	6.1
S5	10	0.005	3.9	0	0.020	0.0	100	0.01	1.2	5.1
S6	25	0.030	4.0	102	0.030	0.6	129	0.01	1.5	6.1
S15	10	0.007	3.4	0	0.020	0.0	408	0.01	4.0	7.4
S16	25	0.010	6.2	118	0.010	1.2	174	0.01	1.7	9.1
S17	25	0.020	4.7	289	0.020	2.1	96	0.01	0.9	7.7
S18	25	0.010	6.2	149	0.010	1.5	79	0.01	0.8	8.5
S19	25	0.020	4.7	247	0.020	1.8	117	0.01	1.1	7.6
S20-A	25	0.020	4.7	264	0.020	1.9	10	0.01	0.1	6.7
S20-B	10	0.007	3.4	0	0.020	0.0	357	0.01	3.5	6.9
S21	10	0.007	3.5	0	0.010	0.0	236	0.01	2.4	5.9
S22	10	0.007	3.5	0	0.010	0.0	203	0.01	2.0	5.5
S23	10	0.005	3.9	0	0.020	0.0	300	0.01	3.5	7.4
S24	25	0.010	6.2	135	0.010	1.4	171	0.01	2.0	9.6
S25	10	0.005	3.9	0	0.010	0.0	550	0.01	6.4	10.3
S26-A	10	0.005	3.9	0	0.020	0.0	370	0.01	4.3	8.2
S26-B	25	0.015	5.3	196	0.015	1.7	172	0.01	2.0	8.9
T1	10	0.006	3.6	0	0.010	0.0	584	0.01	6.2	9.8
T3	10	0.020	2.3	0	0.010	0.0	100	0.02	0.6	5.0
VFS-1	25	0.020	4.7	236	0.020	1.7	0	0.01	0.0	6.4
PND7-1	25	0.010	6.2	143	0.010	1.5	0	0.01	0.0	7.7
PND7-2	25	0.030	4.0	191	0.030	1.1	0	0.01	0.0	5.1
PND7-3	25	0.020	4.7	331	0.020	2.4	0	0.01	0.0	7.1
PND7-4	25	0.020	4.7	300	0.020	2.2	0	0.01	0.0	6.9
PND8-1	25	0.035	3.8	312	0.035	1.7	0	0.01	0.0	5.5
PND9-1	25	0.020	4.7	155	0.020	1.1	0	0.01	0.0	5.8
T2	10	0.020	2.3	130	0.020	0.9	0	0.01	0.0	5.0
VFS-2	25	0.020	4.7	125	0.040	0.6	0	0.01	0.0	5.3
P4	25	0.020	4.7	226	0.020	1.7	218	0.02	1.4	7.8
Q7	10	0.020	2.3	0	0.020	0.0	127	0.02	0.8	5.0
Q14	25	0.020	4.7	245	0.020	1.8	105	0.02	0.7	7.2
S3	25	0.020	4.7	134	0.020	1.0	291	0.02	1.9	7.6
S13	25	0.020	4.7	127	0.020	0.9	298	0.02	1.9	7.5
S14	25	0.020	4.7	128	0.020	0.9	126	0.04	0.5	6.1

Residental Collector
where, $b = S_x = -0.0568$
Neighborhood Collector
where, $b = S_x = -0.073$
Local Street
where, $b = S_x = -0.0641$

Eqn. (7-2) Manning's Equation for Straight Crown Gutter Flow

$$y_0 = \frac{Q * 0.013 * S_x}{0.557^{0.333} * {S_o}^{1/2}}$$

EQUATION 3-11 SCS METHOD SHEET FLOW

$$T_t = \frac{\left[0.42 * (nL)^{0.8}\right]}{(P_2)^{0.5} * (S)^{0.4}}$$

T_t - Travel time (min)
n - Manning's roughness coefficient
L - Length of flow path (ft)
P_2 - 2-year, 24-hour rainfall = 4.2 in
S - Ground slope along flow path (ft/ft)

Manning n Values	
Light Underbrush	0.40
Dense Grasses	0.24
Pavement	0.011

EQUATION 3-12 SCS SHALLOW CONCENTRATED

Unpaved $V = 16.1345(S)^{0.5}$
Paved $V = 20.3282(S)^{0.5}$

V - Average velocity (ft/s)
S - Ground slope along flow path (ft/ft)

EQUATION 3-13 OPEN CHANNEL FLOW

$$T_t = \frac{L}{60V}$$

PROPOSED DRAINAGE CALCULATIONS - RATIONAL METHOD

IDF COEFFICIENTS	25-YEAR	100-YEAR
a	111.07	129.03
b	17.23	17.83
c	0.7815	0.7625

DEVELOPED RUNOFF COEFFICIENTS	25-YEAR	100-YEAR
LOTS	0.64	0.67
ROW (50')	0.85	0.89
OPEN SPACE	0.31	0.36

DEVELOPED RUNOFF COEFFICIENTS	25-YEAR	100-YEAR
ROW (60')	0.80	0.81

AREA NO.	TOTAL AREA (AC)	LOT AREA (AC)	ROW AREA (AC)	OPEN SPACE (AC)	Tc (MIN)	C25 COMP	C100 COMP	I25 (IN/HR)	I100 (IN/HR)	Q25 (CFS)	Q100 (CFS)	INLET TYPE
K1-A	1.12	0.95	0.17	0.00	6.8	0.67	0.70	9.25	11.21	7.0	8.8	SUMP
K1-B	0.27	0.00	0.27	0.00	8.1	0.85	0.89	8.90	10.80	2.0	2.6	SUMP
K2	0.49	0.41	0.08	0.00	6.0	0.67	0.70	9.50	11.49	3.1	3.9	GRADE
K3	0.44	0.24	0.20	0.00	5.7	0.73	0.76	9.61	11.62	3.1	3.9	GRADE
K4	1.71	0.46	1.01	0.24	5.7	0.72	0.75	9.60	11.60	11.8	14.9	GRADE
K5	0.52	0.41	0.10	0.00	6.5	0.68	0.71	9.36	11.32	3.3	4.1	GRADE
K6	1.04	0.83	0.21	0.00	9.6	0.68	0.71	8.50	10.33	6.0	7.6	GRADE
K7	0.31	0.00	0.31	0.00	5.0	0.85	0.89	9.84	11.88	2.6	3.3	GRADE
M1	0.81	0.55	0.26	0.00	6.6	0.71	0.74	9.32	11.28	5.3	6.7	GRADE
M2	0.85	0.77	0.08	0.00	7.3	0.66	0.69	9.11	11.04	5.1	6.4	GRADE
M3-A	1.15	1.04	0.10	0.00	8.3	0.66	0.68	8.82	10.70	6.7	8.4	SUMP
M3-B	0.28	0.00	0.28	0.00	8.0	0.85	0.89	8.92	10.82	2.1	2.7	SUMP
N1-A	0.44	0.00	0.44	0.00	6.5	0.85	0.89	9.36	11.33	3.5	4.4	SUMP
N1-B	0.16	0.00	0.16	0.00	6.5	0.85	0.89	9.35	11.32	1.3	1.6	SUMP
N2-A	0.53	0.00	0.53	0.00	9.5	0.85	0.89	8.52	10.35	3.8	4.9	SUMP
N2-B	0.98	0.65	0.34	0.00	8.9	0.71	0.74	8.68	10.54	6.1	7.7	SUMP
P5	1.42	0.00	1.42	0.00	8.2	0.85	0.89	8.86	10.75	10.6	13.5	GRADE
P6	0.80	0.44	0.22	0.14	6.4	0.64	0.67	9.38	11.35	4.8	6.1	GRADE
P7	0.96	0.67	0.29	0.00	8.0	0.70	0.73	8.90	10.80	6.0	7.6	GRADE
P8	0.12	0.00	0.12	0.00	5.0	0.85	0.89	9.84	11.88	1.0	1.3	GRADE
P9	0.90	0.78	0.12	0.00	6.2	0.67	0.69	9.44	11.42	5.7	7.1	GRADE
P10	0.68	0.57	0.12	0.00	6.7	0.68	0.70	9.30	11.26	4.3	5.4	GRADE
P11	0.74	0.62	0.13	0.00	8.4	0.68	0.70	8.79	10.67	4.4	5.6	GRADE
P12-A	0.93	0.70	0.24	0.00	9.0	0.69	0.72	8.65	10.51	5.6	7.1	SUMP
P12-B	0.07	0.03	0.03	0.00	5.0	0.74	0.77	9.84	11.88	0.5	0.6	SUMP
P13-A	1.15	0.95	0.19	0.00	8.7	0.68	0.70	8.73	10.61	6.8	8.5	SUMP
P13-B	0.04	0.00	0.04	0.00	5.0	0.85	0.89	9.84	11.88	0.4	0.5	SUMP
Q15	0.43	0.00	0.43	0.00	7.0	0.85	0.89	9.19	11.14	3.4	4.2	GRADE
Q16	0.54	0.41	0.09	0.03	5.5	0.65	0.68	9.67	11.68	3.4	4.3	GRADE
Q17	0.39	0.20	0.08	0.11	5.6	0.59	0.62	9.64	11.65	2.2	2.8	GRADE
Q18	0.20	0.00	0.20	0.00	7.8	0.85	0.89	8.96	10.86	1.5	1.9	GRADE
Q19	0.48	0.29	0.20	0.00	6.1	0.72	0.75	9.46	11.45	3.3	4.2	GRADE
Q20	0.91	0.81	0.10	0.00	6.3	0.66	0.69	9.40	11.37	5.7	7.2	GRADE
Q21	0.22	0.00	0.22	0.00	5.7	0.85	0.89	9.59	11.59	1.8	2.2	GRADE
Q22	0.61	0.47	0.14	0.00	7.4	0.69	0.72	9.08	11.00	3.8	4.8	GRADE
Q23	0.60	0.50	0.11	0.00	6.5	0.68	0.70	9.34	11.31	3.8	4.8	GRADE
Q24	0.33	0.00	0.33	0.00	6.3	0.85	0.89	9.40	11.38	2.6	3.3	GRADE
Q25	0.54	0.51	0.03	0.00	6.3	0.65	0.68	9.41	11.39	3.3	4.2	GRADE
Q26-A	0.44	0.31	0.13	0.00	6.2	0.70	0.73	9.44	11.42	2.9	3.7	SUMP
Q26-B	0.82	0.76	0.06	0.00	6.3	0.66	0.68	9.40	11.38	5.0	6.3	SUMP
Q27-A	0.18	0.00	0.18	0.00	6.9	0.85	0.89	9.23	11.18	1.4	1.8	SUMP
Q27-B	0.09	0.00	0.09	0.00	5.6	0.85	0.89	9.62	11.63	0.8	1.0	SUMP
R1	0.35	0.00	0.35	0.00	5.0	0.85	0.89	9.84	11.88	2.9	3.7	GRADE
R2	0.48	0.22	0.08	0.17	5.4	0.55	0.59	9.71	11.73	2.6	3.3	GRADE
R3	0.12	0.00	0.12	0.00	5.0	0.85	0.89	9.84	11.88	1.0	1.3	GRADE
R4	1.17	0.92	0.22	0.03	5.8	0.67	0.70	9.56	11.56	7.5	9.5	GRADE
R5	0.94	0.81	0.13	0.00	6.8	0.67	0.69	9.26	11.22	5.8	7.3	GRADE
R6	0.40	0.02	0.38	0.00	5.4	0.84	0.87	9.69	11.71	3.3	4.1	GRADE
R7	0.82	0.73	0.09	0.00	6.5	0.66	0.69	9.36	11.33	5.1	6.4	GRADE
R8	0.84	0.74	0.09	0.00	7.4	0.66	0.69	9.10	11.02	5.1	6.4	GRADE
R9	0.70	0.64	0.06	0.00	7.1	0.66	0.69	9.18	11.12	4.2	5.3	GRADE
R10	0.69	0.60	0.09	0.00	7.1	0.67	0.69	9.17	11.11	4.2	5.3	GRADE
S1	0.43	0.11	0.32	0.00	8.3	0.80	0.83	8.82	10.71	3.0	3.8	GRADE
S2	0.13	0.00	0.13	0.00	6.1	0.85	0.89	9.48	11.47	1.0	1.3	GRADE
S4	0.45	0.36	0.08	0.00	6.1	0.68	0.71	9.47	11.46	2.9	3.6	GRADE
S5	0.06	0.00	0.06	0.00	5.1	0.85	0.89	9.81	11.85	0.5	0.7	GRADE
S6	0.50	0.41	0.10	0.00	6.1	0.68	0.71	9.48	11.46	3.2	4.1	GRADE
S15	0.83	0.56	0.28	0.00	7.4	0.71	0.74	9.07	11.00	5.4	6.8	GRADE
S16	0.87	0.71	0.16	0.00	9.1	0.68	0.71	8.62	10.47	5.1	6.4	GRADE
S17	0.86	0.80	0.07	0.00	7.7	0.66	0.68	8.98	10.90	5.1	6.4	GRADE
S18	0.56	0.48	0.08	0.00	8.5	0.67	0.70	8.78	10.66	3.3	4.2	GRADE
S19	0.99	0.87	0.10	0.02	7.6	0.65	0.68	9.01	10.93	5.9	7.4	GRADE
S20-A	0.79	0.10	0.10	0.58	6.7	0.42	0.47	9.28	11.24	3.1	4.2	SUMP
S20-B	0.59	0.21	0.28	0.10	6.9	0.68	0.72	9.22	11.17	3.7	4.7	SUMP
S21	0.15	0.00	0.15	0.00	5.9	0.85	0.89	9.55	11.55	1.2	1.5	GRADE
S22	0.13	0.00	0.13	0.00	5.5	0.85	0.89	9.66	11.68	1.1	1.4	GRADE
S23	0.17	0.00	0.17	0.00	7.4	0.85	0.89	9.08	11.01	1.3	1.6	GRADE
S24	1.06	0.53	0.26	0.27	9.6	0.61	0.64	8.50	10.34	5.5	7.0	GRADE
S25	0.32	0.00	0.32	0.00	10.3	0.85	0.89	8.32	10.13	2.3	2.9	GRADE
S26-A	0.30	0.00	0.30	0.00	8.2	0.85	0.89	8.85	10.75	2.2	2.8	SUMP
S26-B	0.55	0.20	0.15	0.19	8.9	0.58	0.62	8.67	10.53	2.8	3.6	SUMP
T1	0.58	0.18	0.41	0.00	9.8	0.78	0.82	8.44	10.26	3.9	4.9	GRADE
T3	0.12	0.12	0.00	0.00	5.0	0.64	0.67	9.84	11.88	0.8	1.0	GRADE
VFS-1	0.50	0.50	0.00	0.00	6.4	0.64	0.67	9.38	11.35	3.0	3.7	NA
PND7-1	0.88	0.80	0.00	0.08	7.7	0.61	0.64	9.01	10.92	4.8	6.1	NA
PND7-2	0.44	0.44	0.00	0.00	5.1	0.64	0.67	9.80	11.83	2.8	3.5	NA
PND7-3	1.52	0.82	0.00	0.70	7.1	0.49	0.52	9.17	11.11	6.8	8.8	NA
PND7-4	1.14	1.14	0.00	0.00	6.9	0.64	0.67	9.23	11.18	6.7	8.5	NA
PND8-1	1.41	1.33	0.00	0.09	5.5	0.62	0.65	9.68	11.70	8.5	10.7	NA
PND9-1	0.64	0.64	0.00	0.00	5.8	0.64	0.67	9.56	11.56	3.9	4.9	NA
T2	0.28	0.00	0.00	0.28	5.0	0.31	0.36	9.84	11.88	0.8	1.2	SUMP
VFS-2	3.85	2.87	0.00	0.98	5.3	0.56	0.59	9.72	11.75	20.8	26.6	NA

	I.C	Frequency	C_1 - Developed	C_2 - Undeveloped	Eqn. $C_{COM} = IC*C_1 + (1-IC)*C_2$
LOTS	50%	25-YR	0.97	0.31	0.64
	50%	100-YR	0.97	0.36	0.67
ROW (50')	84%	25-YR	0.95	0.31	0.85
	84%	100-YR	0.95	0.36	0.86
ROW (60')	77%	25-YR	0.95	0.31	0.80
	77%	100-YR	0.95	0.36	0.81
OPEN SPACE	0%	25-YR	0.95	0.31	0.31
	0%	100-YR	0.95	0.36	0.36

Residental Collector
where, $b = S_x = -0.0568$
$G_2 = 0.00871$
$G_1 = 0.0568$
$A = -1.3358 \times 10^{-3}$
Neighborhood Collector
where, $b = S_x = -0.073$
$G_2 = 0.01033$
$G_1 = 0.073$
$A = -2.321 \times 10^{-3}$
Local Street
where, $b = S_x = -0.0641$
$G_2 = 0.009073$ $G_1 = 0.0641$ $A = -1.775 \times 10^{-3}$

Eqn. (7-2) Manning's Equation for Straight Crown Gutter Flow

$$y_0 = \frac{Q * 0.013 * S_x}{0.557^{0.333} * {S_o}^{1/2}}$$

STREET GUTTER DEPTH CALCULATIONS FOR 25YR STORM

AREA #	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QX-OVER (CFS)	Q NET (CFS)	FLOW TO	STREET WIDTH (FT)	SPREAD (FT)	ALLOWABLE SPREAD (FT)	INLET TYPE
K1-A	7.0		7.0	11.6	0.56	0.41	0.0	7.0	NA	31	8.4	15.5	SUMP
K1-B	2.0		2.0	11.6	0.56	0.26	0.0	2.0	NA	31	4.7	15.5	SUMP
K2	3.1		3.1	26.1	2.81	0.23	0.0	3.1	NA	31	4.0	15.5	GRADE
K3	3.1		3.1	26.1	2.81	0.23	0.0	3.1	NA	31	4.0	15.5	GRADE
K4	11.8		11.8	29.8	3.68	0.35	0.0	11.8	NA	31	6.8	15.5	GRADE
K5	3.3	2.6	5.9	22.0	2.00	0.31	0.0	5.9	NA	31	5.6	15.5	GRADE
K6	6.0		6.0	22.0	2.00	0.31	0.0	6.0	NA	31	5.7	15.5	GRADE
K7	2.6		2.6	22.0	2.00	0.22	0.0	2.6	NA	31	3.9	15.5	GRADE
M1	5.3		5.3	19.0	1.50	0.31	0.0	5.3	NA	31	5.8	15.5	GRADE
M2	5.1		5.1	19.0	1.50	0.31	0.0	5.1	NA	31	5.6	15.5	GRADE
M3-A	6.7		6.7	11.0	0.50	0.41	0.0	6.7	NA	31	8.4	15.5	SUMP
M3-B	2.1		2.1	11.0	0.50	0.27	0.0	2.1	NA	31	4.9	15.5	SUMP
N1-A	3.5		3.5	20.3	1.70	0.26	0.0	3.5	NA	31	4.6	15.5	SUMP
N1-B	1.3		1.3	11.0	0.50	0.22	0.0	1.3	NA	31	3.9	15.5	SUMP
N2-A	3.8		3.8	15.6	1.00	0.30	0.0	3.8	NA	31	5.4	15.5	SUMP
N2-B	6.1		6.1	11.0	0.50	0.40	0.0	6.1	NA	31	8.0	15.5	SUMP
P5	10.6		10.6	23.2	2.23	0.37	0.0	10.6	NA	31	7.3	15.5	GRADE
P6	4.8		4.8	24.2	2.43	0.27	0.0	4.8	NA	31	4.9	15.5	GRADE
P7	6.0		6.0	33.1	4.52	0.26	0.0	6.0	NA	31	4.7	15.5	GRADE
P8	1.0		1.0	22.0	2.00	0.16	0.0	1.0	NA	31	2.7	15.5	GRADE
P9	5.7		5.7	16.5	1.12	0.34	0.0	5.7	NA	31	6.3	15.5	GRADE
P10	4.3		4.3	22.0	2.00	0.27	0.0	4.3	NA	31	4.9	15.5	GRADE
P11	4.4		4.4	29.2	3.53	0.25	0.0	4.4	NA	31	4.4	15.5	GRADE
P12-A	5.6		5.6	11.0	0.50	0.39	0.0	5.6	NA	31	7.7	15.5	SUMP
P12-B	0.5		0.5	11.0	0.50	0.16	0.0	0.5	NA	31	2.6	15.5	SUMP
P13-A	6.8		6.8	11.0	0.50	0.42	0.0	6.8	NA	31	8.5	15.5	SUMP
P13-B	0.4		0.4	11.0	0.50	0.14	0.0	0.4	NA	31	2.3	15.5	SUMP
Q15	3.4		3.4	19.7	1.61	0.26	0.0	3.4	NA	31	4.6	15.5	GRADE
Q16	3.4		3.4	17.7	1.30	0.27	0.0	3.4	NA	31	4.9	15.5	GRADE
Q17	2.2		2.2	11.0	0.50	0.27	0.0	2.2	NA	31	4.9	15.5	GRADE
Q18	1.5		1.5	11.0	0.50	0.24	0.0	1.5	NA	31	4.2	15.5	GRADE
Q19	3.3		3.3	19.2	1.53	0.26	0.0	3.3	NA	31	4.6	15.5	GRADE
Q20	5.7		5.7	16.5	1.12	0.34	0.0	5.7	NA	31	6.4	15.5	GRADE
Q21	1.8		1.8	16.5	1.12	0.22	0.0	1.8	NA	31	3.8	15.5	GRADE
Q22	3.8		3.8	22.0	2.00	0.26	0.0	3.8	NA	31	4.6	15.5	GRADE
Q23	3.8		3.8	18.7	1.44	0.28	0.0	3.8	NA	31	5.0	15.5	GRADE
Q24	2.6		2.6	18.7	1.44	0.24	0.0	2.6	NA	31	4.2	15.5	GRADE
Q25	3.3		3.3	11.0	0.50	0.32	0.0	3.3	NA	31	6.0	15.5	GRADE
Q26-A	2.9		2.9	11.0	0.50	0.30	0.0	2.9	NA	31	5.6	15.5	SUMP
Q26-B	5.0		5.0	11.0	0.50	0.37	0.0	5.0	NA	31	7.3	15.5	SUMP
Q27-A	1.4		1.4	11.0	0.50	0.23	0.0	1.4	NA	31	4.1	15.5	SUMP
Q27-B	0.8		0.8	11.0	0.50	0.18	0.0	0.8	NA	31	3.1	15.5	SUMP
R1	2.9		2.9	22.0	2.00	0.23	0.0	2.9	NA	31	4.1	15.5	GRADE
R2	2.6		2.6	17.7	1.30	0.24	0.0	2.6	NA	31	4.3	15.5	GRADE
R3	1.0		1.0	17.7	1.30	0.17	0.0	1.0	NA	31	2.9	15.5	GRADE
R4	7.5		7.5	21.9	1.98	0.33	0.0	7.5	NA	31	6.3	15.5	GRADE
R5	5.8		5.8	21.9	1.98	0.30	0.0	5.8	NA	31	5.6	15.5	GRADE
R6	3.3		3.3	21.9	1.98	0.24	0.0	3.3	NA	31	4.3	15.5	GRADE
R7	5.1		5.1	21.9	1.98	0.29	0.0	5.1	NA	31	5.3	15.5	GRADE
R8	5.1		5.1	11.0	0.50	0.37	0.0	5.1	NA	31	7.3	15.5	GRADE
R9	4.2		4.2	11.0	0.50	0.35	0.0	4.2	NA	31	6.7	15.5	GRADE
R10	4.2		4.2	11.0	0.50	0.35	0.0	4.2	NA	31	6.7	15.5	GRADE
S1	3.0		3.0	11.0	0.50	0.31	0.0	3.0	NA	31	5.7	15.5	GRADE
S2	1.0		1.0	11.0	0.50	0.20	0.0	1.0	NA	31	3.5	15.5	GRADE
S4	2.9		2.9	11.0	0.50	0.30	0.0	2.9	NA	31	5.6	15.5	GRADE
S5	0.5		0.5	11.0	0.50	0.16	0.0	0.5	NA	31	2.7	15.5	GRADE
S6	3.2		3.2	11.0	0.50	0.32	0.0	3.2	NA	31	5.9	15.5	GRADE
S15	5.4		5.4	13.0	0.70	0.36	0.0	5.4	NA	31	6.9	15.5	GRADE
S16	5.1		5.1	13.0	0.70	0.35	0.0	5.1	NA	31	6.8	15.5	GRADE
S17	5.1		5.1	13.0	0.70	0.35	0.0	5.1	NA	31	6.7	15.5	GRADE
S18	3.3		3.3	13.0	0.70	0.30	0.0	3.3	NA	31	5.5	15.5	GRADE
S19	5.9		5.9	13.0	0.70	0.37	0.0	5.9	NA	31	7.2	15.5	GRADE
S20-A	3.1		3.1	13.0	0.70	0.29	0.0	3.1	NA	31	5.3	15.5	SUMP
S20-B	3.7		3.7	13.0	0.70	0.31	0.0	3.7	NA	31	5.8	15.5	SUMP
S21	1.2		1.2	12.7	0.67	0.21	0.0	1.2	NA	31	3.6	15.5	GRADE
S22	1.1		1.1	12.7	0.67	0.20	0.0	1.1	NA	31	3.4	15.5	GRADE
S23	1.3		1.3	11.0	0.50	0.22	0.0	1.3	NA	31	3.9	15.5	GRADE
S24	5.5		5.5	11.0	0.50	0.38	0.0	5.5	NA	31	7.6	15.5	GRADE
S25	2.3		2.3	11.0	0.50	0.28	0.0	2.3	NA	31	5.0	15.5	GRADE
S26-A	2.2		2.2	11.0	0.50	0.28	0.0	2.2	NA	31	5.0	15.5	SUMP
S26-B	2.8		2.8	11.0	0.50	0.30	0.0	2.8	NA	31	5.5	15.5	SUMP
T1	3.9		3.9	12.0	0.60	0.33	0.0	3.9	NA	31	6.1	15.5	GRADE
T3	0.8		0.8	22.0	2.00	0.14	0.0	0.8	NA	31	2.4	15.5	GRADE
VFS-1	3.0		3.0	15.6	1.00	0.27	0.0	3.0	NA	31	4.8	15.5	NA
PND7-1	4.8		4.8	15.6	1.00	0.32	0.0	4.8	NA	31	6.0	15.5	NA
PND7-2	2.8		2.8	15.6	1.00	0.26	0.0	2.8	NA	31	4.7	15.5	NA
PND7-3	6.8		6.8	15.6	1.00	0.37	0.0	6.8	NA	31	7.1	15.5	NA
PND7-4	6.7		6.7	15.6	1.00	0.37	0.0	6.7	NA	31	7.1	15.5	NA
PND8-1	8.5		8.5	15.6	1.00	0.40	0.0	8.5	NA	31	8.0	15.5	NA
PND9-1	3.9		3.9	15.6	1.00	0.30	0.0	3.9	NA	31	5.5	15.5	NA

INLET CALCULATIONS FOR 25YR STORM (ALL INLETS ARE TYPE 1 ON GRADE)

INLET #	AREA #	ST WIDTH (FT)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QA/LA (CFS/FT)	LA (FT)	L (FT)	L/LA	A/Y	Q/QA	QIN (CFS)	QBYPASS (CFS)	FLOW TO
K2	K2	31	3.1	26.1	2.81	0.23	0.7	4.61	10	2.17	1.85	1.0000	3.1	0.0	NA
K3	K3	31	3.1	26.1	2.81	0.23	0.7	4.61	10	2.17	1.85	1.0000	3.1	0.0	NA
K4	K4	31	11.8	29.8	3.68	0.35	0.8	14.56	10	0.69	1.18	0.7797	9.2	2.6	K5
M2	M2	31	5.1	19.0	1.50	0.31	0.8	6.73	10	1.49	1.37	1.0000	5.1	0.0	NA
P6	P6	31	4.8	24.2	2.43	0.27	0.7	6.60	10	1.51	1.53	1.0000	4.8	0.0	NA
P11	P11	31	4.4	29.2	3.53	0.25	0.7	6.31	10	1.59	1.69	1.0000	4.4	0.0	NA
Q15	Q15	31	3.4	19.7	1.61	0.26	0.7	4.72	10	2.12	1.62	1.0000	3.4	0.0	NA
Q16	Q16	31	3.4	17.7	1.30	0.27	0.7	4.71	10	2.12	1.55	1.0000	3.4	0.0	NA
Q19	Q19	31	3.3	19.2	1.53	0.26	0.7	4.67	10	2.14	1.61	1.0000	3.3	0.0	NA
Q20	Q20	31	5.7	16.5	1.12	0.34	0.8	7.20	10	1.39	1.24	1.0000	5.7	0.0	NA
Q21	Q21	31	1.8	16.5	1.12	0.22	0.7	2.66	10	3.77	1.92	1.0000	1.8	0.0	NA
Q22	Q22	31	3.8	22.0	2.00	0.26	0.7	5.38	10	1.86	1.60	1.0000	3.8	0.0	NA
Q23	Q23	31	3.8	18.7	1.44	0.28	0.7	5.23	10	1.91	1.51	1.0000	3.8	0.0	NA
Q24	Q24	31	2.6	18.7	1.44	0.24	0.7	3.77	10	2.65	1.74	1.0000	2.6	0.0	NA
R1	R1	31	2.9	22.0	2.00	0.23	0.7	4.23	10	2.37	1.78	1.0000	2.9	0.0	NA
R2	R2	31	2.6	17.7	1.30	0.24	0.7	3.69	10	2.71	1.72	1.0000	2.6	0.0	NA
R3	R3	31	1.0	17.7	1.30	0.17	0.6	1.61	10	6.20	2.44	1.0000	1.0	0.0	NA
R4	R4	31	7.5	21.9	1.98	0.33	0.8	9.51	10	1.05	1.24	1.0000	7.5	0.0	NA
R5	R5	31	5.8	21.9	1.98	0.30	0.8	7.68	10	1.30	1.37	1.0000	5.8	0.0	NA
R10	R10	31	4.2	11.0	0.50	0.35	0.8	5.23	10	1.91	1.20	1.0000	4.2	0.0	NA
S1	S1	31	3.0	11.0	0.50	0.31	0.8	3.95	10	2.53	1.36	1.0000	3.0	0.0	NA
S2	S2	31	1.0	11.0	0.50	0.20	0.7	1.54	10	6.50	2.04	1.0000	1.0	0.0	NA
S4	S4	31	2.9	11.0	0.50	0.30	0.8	3.79	10	2.64	1.38	1.0000	2.9	0.0	NA
S5	S5	31	0.5	11.0	0.50	0.16	0.6	0.85	10	11.76	2.61	1.0000	0.5	0.0	NA
S6	S6	31	3.2	11.0	0.50	0.32	0.8	4.21	10	2.37	1.32	1.0000	3.2	0.0	NA
S15	S15	31	5.4	13.0	0.70	0.36	0.8	6.59	10	1.52	1.16	1.0000	5.4	0.0	NA
S16	S16	31	5.1	13.0	0.70	0.35	0.8	6.32	10	1.58	1.18	1.0000	5.1	0.0	NA
S17	S17	31	5.1	13.0	0.70	0.35	0.8	6.30	10	1.59	1.19	1.0000	5.1	0.0	NA
S18	S18	31	3.3	13.0	0.70	0.30	0.8	4.38	10	2.28	1.39	1.0000	3.3	0.0	NA
S19	S19	31	5.9	13.0	0.70	0.37	0.8	7.08	10	1.41	1.12	1.0000	5.9	0.0	NA
S21	S21	31	1.2	12.7	0.67	0.21	0.7	1.84	10	5.43	2.01	1.0000	1.2	0.0	NA
S22	S22	31	1.1	12.7	0.67	0.20	0.7	1.67	10	6.00	2.10	1.0000	1.1	0.0	NA
S23	S23	31	1.3	11.0	0.50	0.22	0.7	1.92	10	5.21	1.86	1.0000	1.3	0.0	NA
S24	S24	31	5.5	11.0	0.50	0.38	0.8	6.48	10	1.54	1.08	1.0000	5.5	0.0	NA
S25	S25	31	2.3	11.0	0.50	0.28	0.7	3.11	10	3.21	1.51	1.0000	2.3	0.0	NA
T1	T1	31	3.9	12.0	0.60	0.33	0.8	4.95	10	2.02	1.28	1.0000	3.9	0.0	NA
T3	T3	31	0.8	22.0	2.00	0.14	0.6	1.31	10	7.66	2.91	1.0000	0.8	0.0	NA

INLET CALCULATIONS FOR 25YR STORM (ALL INLETS ARE TYPE 1 IN SUMP WITH 10% REDUCTION)

INLET #	AREA #	QTOTAL (CFS)	L (FT)	L x 0.90 (FT)	Q/L (CFS/FT)	Yo + 5" (FT)	INLET Yo (FT)	BELOW 0.5 FT
K1		9.0	10	9	1.00	0.48	0.06	Yes
M3		8.8	10	9	0.98	0.47	0.05	Yes
N1		4.7	10	9	0.53	0.31	-0.11	Yes
N2		9.9	10	9	1.10	0.51	0.09	Yes
P12		6.1	10	9	0.68	0.37	-0.05	Yes
P13		7.1	10	9	0.79	0.41	-0.01	Yes
Q26		7.9	10	9	0.88	0.44	0.02	Yes
Q27		2.2	10	9	0.25	0.19	-0.23	Yes
S20		6.8	10	9	0.76	0.40	-0.02	Yes
S26		5.0	10	9	0.56	0.33	-0.09	Yes

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

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

WOODFIELD PRESERVE
PHASE 3

INTERNAL DRAINAGE CALCULATIONS

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM4.dwg

JUSTIN D. MIDURA
128809
2-27-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

DM4

SHEET NO.
24
OF 132 SHEETS

2023-33-CON

Date\Time : Tue, 27 Feb 2024 - 10:38am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 DM4.dwg

STREET GUTTER DEPTH CALCULATIONS FOR 100YR STORM

AREA #	FLOW (CFS)	QBYPASS (CFS)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QX-OVER (CFS)	Q NET (CFS)	FLOW TO	STREET WIDTH (FT)	SPREAD (FT)	ALLOWABLE SPREAD (FT)	INLET TYPE
K1-A	8.8		8.8	11.6	0.56	0.45	0.0	8.8	NA	31	9.5	15.5	SUMP
K1-B	2.6		2.6	11.6	0.56	0.28	0.0	2.6	NA	31	5.2	15.5	SUMP
K2	3.9		3.9	26.1	2.81	0.25	0.0	3.9	NA	31	4.4	15.5	GRADE
K3	3.9		3.9	26.1	2.81	0.25	0.0	3.9	NA	31	4.4	15.5	GRADE
K4	14.9		14.9	29.8	3.68	0.39	0.0	14.9	NA	31	7.6	15.5	GRADE
K5	4.1	4.8	9.0	22.0	2.00	0.36	0.0	9.0	NA	31	6.9	15.5	GRADE
K6	7.6		7.6	22.0	2.00	0.34	0.0	7.6	NA	31	6.4	15.5	GRADE
K7	3.3		3.3	22.0	2.00	0.25	0.0	3.3	NA	31	4.4	15.5	GRADE
M1	6.7		6.7	19.0	1.50	0.34	0.0	6.7	NA	31	6.4	15.5	GRADE
M2	6.4		6.4	19.0	1.50	0.33	0.0	6.4	NA	31	6.3	15.5	GRADE
M3-A	8.4		8.4	11.0	0.50	0.45	0.0	8.4	NA	31	9.6	15.5	SUMP
M3-B	2.7		2.7	11.0	0.50	0.30	0.0	2.7	NA	31	5.4	15.5	SUMP
N1-A	4.4		4.4	20.3	1.70	0.28	0.0	4.4	NA	31	5.1	15.5	SUMP
N1-B	1.6		1.6	11.0	0.50	0.24	0.0	1.6	NA	31	4.3	15.5	SUMP
N2-A	4.9		4.9	15.6	1.00	0.32	0.0	4.9	NA	31	6.1	15.5	SUMP
N2-B	7.7		7.7	11.0	0.50	0.44	0.0	7.7	NA	31	9.1	15.5	SUMP
P5	13.5		13.5	23.2	2.23	0.41	0.0	13.5	NA	31	8.2	15.5	GRADE
P6	6.1		6.1	24.2	2.43	0.30	0.0	6.1	NA	31	5.5	15.5	GRADE
P7	7.6		7.6	33.1	4.52	0.29	0.0	7.6	NA	31	5.3	15.5	GRADE
P8	1.3		1.3	22.0	2.00	0.17	0.0	1.3	NA	31	2.9	15.5	GRADE
P9	7.1		7.1	16.5	1.12	0.37	0.0	7.1	NA	31	7.1	15.5	GRADE
P10	5.4		5.4	22.0	2.00	0.30	0.0	5.4	NA	31	5.4	15.5	GRADE
P11	5.6		5.6	29.2	3.53	0.27	0.0	5.6	NA	31	4.8	15.5	GRADE
P12-A	7.1		7.1	11.0	0.50	0.42	0.0	7.1	NA	31	8.7	15.5	SUMP
P12-B	0.6		0.6	11.0	0.50	0.17	0.0	0.6	NA	31	2.9	15.5	SUMP
P13-A	8.5		8.5	11.0	0.50	0.45	0.0	8.5	NA	31	9.7	15.5	SUMP
P13-B	0.5		0.5	11.0	0.50	0.15	0.0	0.5	NA	31	2.5	15.5	SUMP
Q15	4.2		4.2	19.7	1.61	0.28	0.0	4.2	NA	31	5.1	15.5	GRADE
Q16	4.3		4.3	17.7	1.30	0.29	0.0	4.3	NA	31	5.4	15.5	GRADE
Q17	2.8		2.8	11.0	0.50	0.30	0.0	2.8	NA	31	5.5	15.5	GRADE
Q18	1.9		1.9	11.0	0.50	0.26	0.0	1.9	NA	31	4.6	15.5	GRADE
Q19	4.2		4.2	19.2	1.53	0.28	0.0	4.2	NA	31	5.1	15.5	GRADE
Q20	7.2		7.2	16.5	1.12	0.37	0.0	7.2	NA	31	7.1	15.5	GRADE
Q21	2.2		2.2	16.5	1.12	0.24	0.0	2.2	NA	31	4.2	15.5	GRADE
Q22	4.8		4.8	22.0	2.00	0.28	0.0	4.8	NA	31	5.2	15.5	GRADE
Q23	4.8		4.8	18.7	1.44	0.30	0.0	4.8	NA	31	5.5	15.5	GRADE
Q24	3.3		3.3	18.7	1.44	0.26	0.0	3.3	NA	31	4.7	15.5	GRADE
Q25	4.2		4.2	11.0	0.50	0.35	0.0	4.2	NA	31	6.7	15.5	GRADE
Q26-A	3.7		3.7	11.0	0.50	0.33	0.0	3.7	NA	31	6.2	15.5	SUMP
Q26-B	6.3		6.3	11.0	0.50	0.41	0.0	6.3	NA	31	8.2	15.5	SUMP
Q27-A	1.8		1.8	11.0	0.50	0.26	0.0	1.8	NA	31	4.6	15.5	SUMP
Q27-B	1.0		1.0	11.0	0.50	0.20	0.0	1.0	NA	31	3.5	15.5	SUMP
R1	3.7		3.7	22.0	2.00	0.26	0.0	3.7	NA	31	4.6	15.5	GRADE
R2	3.3		3.3	17.7	1.30	0.27	0.0	3.3	NA	31	4.8	15.5	GRADE
R3	1.3		1.3	17.7	1.30	0.19	0.0	1.3	NA	31	3.2	15.5	GRADE
R4	9.5		9.5	21.9	1.98	0.37	0.0	9.5	NA	31	7.1	15.5	GRADE
R5	7.3	0.8	8.1	21.9	1.98	0.34	0.0	8.1	NA	31	6.6	15.5	GRADE
R6	4.1		4.1	21.9	1.98	0.27	0.0	4.1	NA	31	4.8	15.5	GRADE
R7	6.4	0.1	6.5	21.9	1.98	0.32	0.0	6.5	NA	31	5.9	15.5	GRADE
R8	6.4		6.4	11.0	0.50	0.41	0.0	6.4	NA	31	8.2	15.5	GRADE
R9	5.3		5.3	11.0	0.50	0.38	0.0	5.3	NA	31	7.5	15.5	GRADE
R10	5.3		5.3	11.0	0.50	0.38	0.0	5.3	NA	31	7.5	15.5	GRADE
S1	3.8		3.8	11.0	0.50	0.34	0.0	3.8	NA	31	6.4	15.5	GRADE
S2	1.3		1.3	11.0	0.50	0.22	0.0	1.3	NA	31	3.9	15.5	GRADE
S4	3.6		3.6	11.0	0.50	0.33	0.0	3.6	NA	31	6.2	15.5	GRADE
S5	0.7		0.7	11.0	0.50	0.17	0.0	0.7	NA	31	3.0	15.5	GRADE
S6	4.1		4.1	11.0	0.50	0.34	0.0	4.1	NA	31	6.6	15.5	GRADE
S15	6.8		6.8	13.0	0.70	0.39	0.0	6.8	NA	31	7.8	15.5	GRADE
S16	6.4		6.4	13.0	0.70	0.38	0.0	6.4	NA	31	7.6	15.5	GRADE
S17	6.4		6.4	13.0	0.70	0.38	0.0	6.4	NA	31	7.6	15.5	GRADE
S18	4.2		4.2	13.0	0.70	0.33	0.0	4.2	NA	31	6.1	15.5	GRADE
S19	7.4		7.4	13.0	0.70	0.40	0.0	7.4	NA	31	8.1	15.5	GRADE
S20-A	4.2		4.2	13.0	0.70	0.33	0.0	4.2	NA	31	6.1	15.5	SUMP
S20-B	4.7		4.7	13.0	0.70	0.34	0.0	4.7	NA	31	6.5	15.5	SUMP
S21	1.5		1.5	12.7	0.67	0.23	0.0	1.5	NA	31	4.0	15.5	GRADE
S22	1.4		1.4	12.7	0.67	0.22	0.0	1.4	NA	31	3.8	15.5	GRADE
S23	1.6		1.6	11.0	0.50	0.25	0.0	1.6	NA	31	4.3	15.5	GRADE
S24	7.0		7.0	11.0	0.50	0.42	0.0	7.0	NA	31	8.7	15.5	GRADE
S25	2.9		2.9	11.0	0.50	0.30	0.0	2.9	NA	31	5.6	15.5	GRADE
S26-A	2.8		2.8	11.0	0.50	0.30	0.0	2.8	NA	31	5.6	15.5	SUMP
S26-B	3.6		3.6	11.0	0.50	0.33	0.0	3.6	NA	31	6.2	15.5	SUMP
T1	4.9		4.9	12.0	0.60	0.36	0.0	4.9	NA	31	6.9	15.5	GRADE
T3	1.0		1.0	22.0	2.00	0.16	0.0	1.0	NA	31	2.6	15.5	GRADE
VFS-1	3.7		3.7	15.6	1.00	0.29	0.0	3.7	NA	31	5.4	15.5	NA
PND7-1	6.1		6.1	15.6	1.00	0.35	0.0	6.1	NA	31	6.8	15.5	NA
PND7-2	3.5		3.5	15.6	1.00	0.28	0.0	3.5	NA	31	5.2	15.5	NA
PND7-3	8.8		8.8	15.6	1.00	0.40	0.0	8.8	NA	31	8.2	15.5	NA
PND7-4	8.5		8.5	15.6	1.00	0.40	0.0	8.5	NA	31	8.0	15.5	NA
PND8-1	10.7		10.7	15.6	1.00	0.43	0.0	10.7	NA	31	9.0	15.5	NA
PND9-1	4.9		4.9	15.6	1.00	0.32	0.0	4.9	NA	31	6.1	15.5	NA

INLET CALCULATIONS FOR 100YR STORM (ALL INLETS ARE TYPE 1 ON GRADE)

INLET #	AREA #	ST WIDTH (FT)	QTOTAL (CFS)	STREET CAP (CFS)	S (%)	Y (FT)	QA/LA (CFS/FT)	LA (FT)	L (FT)	L/LA	A/Y	Q/QA	QIN (CFS)	QBYPASS (CFS)	FLOW TO
K2	K2	31	3.9	26.1	2.81	0.25	0.7	5.63	10	1.78	1.69	1.0000	3.9	0.0	NA
K3	K3	31	3.9	26.1	2.81	0.25	0.7	5.64	10	1.77	1.69	1.0000	3.9	0.0	NA
K4	K4	31	14.9	29.8	3.68	0.39	0.8	17.72	10	0.56	1.08	0.6786	10.1	4.8	K5
M2	M2	31	6.4	19.0	1.50	0.33	0.8	8.17	10	1.22	1.25	1.0000	6.4	0.0	NA
P6	P6	31	6.1	24.2	2.43	0.30	0.8	8.11	10	1.23	1.40	1.0000	6.1	0.0	NA
P11	P11	31	5.6	29.2	3.53	0.27	0.7	7.71	10	1.30	1.55	1.0000	5.6	0.0	NA
Q15	Q15	31	4.2	19.7	1.61	0.28	0.7	5.78	10	1.73	1.48	1.0000	4.2	0.0	NA
Q16	Q16	31	4.3	17.7	1.30	0.29	0.7	5.75	10	1.74	1.42	1.0000	4.3	0.0	NA
Q19	Q19	31	4.2	19.2	1.53	0.28	0.7	5.69	10	1.76	1.48	1.0000	4.2	0.0	NA
Q20	Q20	31	7.2	16.5	1.12	0.37	0.8	8.71	10	1.15	1.14	1.0000	7.2	0.0	NA
Q21	Q21	31	2.2	16.5	1.12	0.24	0.7	3.26	10	3.07	1.76	1.0000	2.2	0.0	NA
Q22	Q22	31	4.8	22.0	2.00	0.28	0.7	6.57	10	1.52	1.47	1.0000	4.8	0.0	NA
Q23	Q23	31	4.8	18.7	1.44	0.30	0.8	6.36	10	1.57	1.39	1.0000	4.8	0.0	NA
Q24	Q24	31	3.3	18.7	1.44	0.26	0.7	4.62	10	2.16	1.60	1.0000	3.3	0.0	NA
R1	R1	31	3.7	22.0	2.00	0.26	0.7	5.17	10	1.93	1.63	1.0000	3.7	0.0	NA
R2	R2	31	3.3	17.7	1.30	0.27	0.7	4.59	10	2.18	1.57	1.0000	3.3	0.0	NA
R3	R3	31	1.3	17.7	1.30	0.19	0.6	1.99	10	5.03	2.24	1.0000	1.3	0.0	NA
R4	R4	31	9.5	21.9	1.98	0.37	0.8	11.52	10	0.87	1.14	0.9177	8.7	0.8	R5
R5	R5	31	8.1	21.9	1.98	0.34	0.8	10.13	10	0.99	1.21	0.9921	8.0	0.1	R7
R10	R10	31	5.3	11.0	0.50	0.38	0.8	6.33	10	1.58	1.10	1.0000	5.3	0.0	NA
S1	S1	31	3.8	11.0	0.50	0.34	0.8	4.82	10	2.08	1.24	1.0000	3.8	0.0	NA
S2	S2	31	1.3	11.0	0.50	0.22	0.7	1.89	10	5.29	1.87	1.0000	1.3	0.0	NA
S4	S4	31	3.6	11.0	0.50	0.33	0.8	4.60	10	2.17	1.27	1.0000	3.6	0.0	NA
S5	S5	31	0.7	11.0	0.50	0.17	0.6	1.05	10	9.53	2.39	1.0000	0.7	0.0	NA
S6	S6	31	4.1	11.0	0.50	0.34	0.8	5.10	10	1.96	1.21	1.0000	4.1	0.0	NA
S15	S15	31	6.8	13.0	0.70	0.39	0.8	7.98	10	1.25	1.06	1.0000	6.8	0.0	NA
S16	S16	31	6.4	13.0	0.70	0.38	0.8	7.66	10	1.31	1.08	1.0000	6.4	0.0	NA
S17	S17	31	6.4	13.0	0.70	0.38	0.8	7.63	10	1.31	1.09	1.0000	6.4	0.0	NA
S18	S18	31	4.2	13.0	0.70	0.33	0.8	5.33	10	1.88	1.28	1.0000	4.2	0.0	NA
S19	S19	31	7.4	13.0	0.70	0.40	0.9	8.56	10	1.17	1.03	1.0000	7.4	0.0	NA
S21	S21	31	1.5	12.7	0.67	0.23	0.7	2.26	10	4.42	1.84	1.0000	1.5	0.0	NA
S22	S22	31	1.4	12.7	0.67	0.22	0.7	2.05	10	4.88	1.92	1.0000	1.4	0.0	NA
S23	S23	31	1.6	11.0	0.50	0.25	0.7	2.36	10	4.24	1.70	1.0000	1.6	0.0	NA
S24	S24	31	7.0	11.0	0.50	0.42	0.9	7.93	10	1.26	0.99	1.0000	7.0	0.0	NA
S25	S25	31	2.9	11.0	0.50	0.30	0.8	3.82	10	2.62	1.38	1.0000	2.9	0.0	NA
T1	T1	31	4.9	12.0	0.60	0.36	0.8	6.04	10	1.66	1.17	1.0000	4.9	0.0	NA
T3	T3	31	1.0	22.0	2.00	0.16	0.6	1.61	10	6.23	2.68	1.0000	1.0	0.0	NA

INLET CALCULATIONS FOR 100YR STORM (ALL INLETS ARE TYPE 1 IN SUMP WITH 10% REDUCTION)

INLET #	AREA #	QTOTAL (CFS)	L (FT)	L x 0.90 (FT)	Q/L (CFS/FT)	Yo + 5" (FT)	INLET Yo (FT)	BELOW 0.5 FT
K1		11.4	10	9	1.26	0.56	0.14	Yes
M3		11.1	10	9	1.24	0.55	0.13	Yes
N1		6.0	10	9	0.67	0.37	-0.05	Yes
N2		12.5	10	9	1.39	0.60	0.18	Yes
P12		7.7	10	9	0.86	0.43	0.01	Yes
P13		9.0	10	9	1.00	0.48	0.06	Yes
Q26		10.0	10	9	1.11	0.52	0.10	Yes
Q27		2.8	10	9	0.31	0.22	-0.20	Yes
S20		8.9	10	9	0.98	0.48	0.06	Yes
S26		6.4	10	9	0.71	0.38	-0.04	Yes

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

811

Know what's **below.**

Call before you dig.

WOODFIELD PRESERVE
PHASE 3

INTERNAL DRAINAGE CALCULATIONS

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM5.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

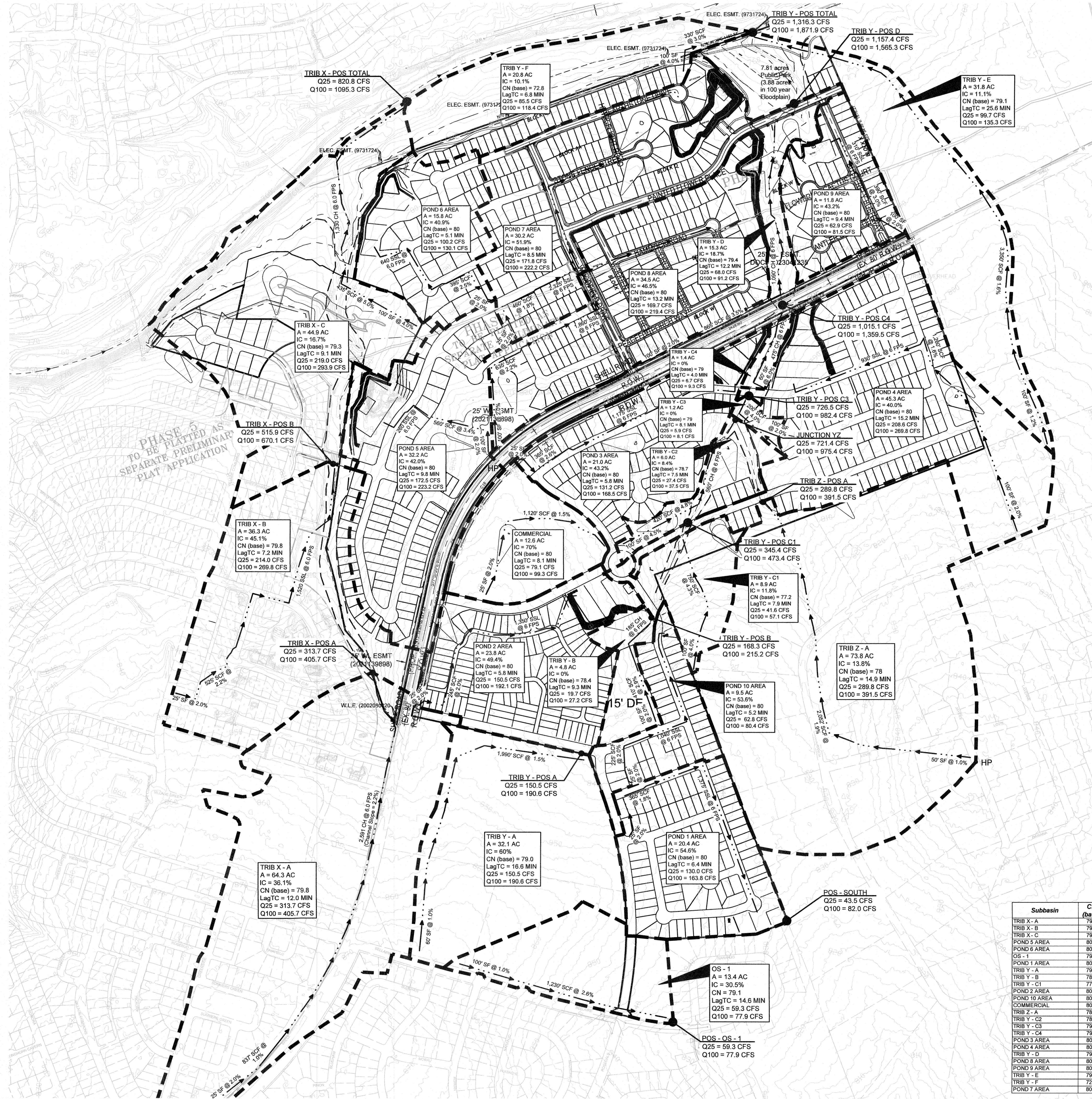
JOB NUMBER:
A245-1002

DM5

SHEET NO.
25
OF 132 SHEETS

2023-33-CON

Date\Time : Tue, 27 Feb 2024 - 10:41am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 DM5.dwg



LEGEND:

#	DRAINAGE AREA NUMBER
#	INLET NUMBER
HP	HIGH POINT
LP	LOW POINT
➔	FLOW DIRECTION ARROW
	DRAINAGE DIVIDE

0 300 600
1" = 300'

N

Drainage Area: TRIB X - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	13.9	13
Soil D - Pasture (Existing IC)	80	50.0	42
Soil D - 60' ROW	80	0.4	77
Total		64.3	
Weighted Base	79.8		36.1

Drainage Area: TRIB X - B

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	8.0	1.4
Soil D - Pasture (Existing IC)	80	26.4	58
Soil D - Lots	80	1.9	50
Total		36.3	
Weighted Base	79.8		45.1

Drainage Area: TRIB X - C

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	32.7	1.4
Soil D - Pasture (Existing IC)	80	7.5	58
Soil D - 60' ROW	80	0.2	77
Soil D - 50' ROW	80	0.8	84
Soil D - Lots	80	3.7	50
Total		44.9	
Weighted Base	79.3		16.7

Drainage Area: POND 5 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 5 Area	80	29.7	42.2
Soil D - Existing Shell Road ROW	80	2.5	39
Total		32.2	
Weighted Base	80.0		42.0

Drainage Area: POND 6 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 6 Area	80	15.8	40.9
Total		15.8	
Weighted Base	80.0		40.9

Drainage Area: TRIB Z - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	36.6	16.8
Soil D - Woods/Grass Combo	79	37.2	10.9
Total		73.8	
Weighted Base	78.0		13.8

Drainage Area: POND 4 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 4 Area	80	35.5	49.8
Offsite Logan Ranch Area	80	9.8	4.30
Total		45.3	
Weighted Base	80		40.0

Drainage Area: TRIB Y - D

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	8.8	0.0
Soil D - Existing Shell Road ROW	80	5.7	39.0
Soil D - 60' ROW	80	0.9	77.0
Total		15.3	
Weighted Base	79.4		18.7

Drainage Area: POND 8 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 8 Area	80	34.5	46.5
Total		34.5	

Drainage Area: POND 9 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 9 Area	80	11.8	43.2
Total		11.8	

Drainage Area: TRIB Y - E

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	28.0	0.0
Soil D - Existing Impervious Cover	80	3.3	100.0
Soil D - Lots	80	0.5	50.0
Total		31.8	
Weighted Base	79.1		11.1

Drainage Area: Trib Y - F

Description	CN (Base)	Area (ac)	IC (%)
Soil B - Woods	55	4.7	0
Soil D - Woods	77	9.9	0
Soil D - Woods/Grass Combo	79	2.0	0
Soil D - Lots	80	4.2	50
Total		20.8	
Weighted Base	72.8		10.1

Drainage Area: POND 7 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 7 Area	80	30.2	51.9
Total		30.2	

Drainage Area: OS - 1

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	12.7	28
Soil D - 60' ROW	80	0.7	77
Total		13.4	
Weighted Base	79.1		30.5

Drainage Area: POND 1 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 1 Area	80	20.4	54.6
Total		20.4	

Drainage Area: TRIB Y - A

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	32.1	60.0
Total		32.1	

Drainage Area: TRIB Y - B

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	1.4	0.0
Soil D - Woods/Grass Combo	79	3.4	0.0
Total		4.8	
Weighted Base	78.4		0.00

Drainage Area: TRIB Y - C1

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	8.4	7.4
Soil D - 60' ROW	80	0.2	77.0
Soil D - 50' ROW	80	0.3	84.0
Total		8.9	
Weighted Base	77.2		11.8

Drainage Area: POND 2 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 2 Area	80	23.8	49.4
Total		23.8	

Drainage Area: POND 10 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 10 Area	80	9.5	53.6
Total		9.5	

Drainage Area: COMMERCIAL

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Commercial	80	12.6	70.0
Total		12.6	

Drainage Area: TRIB Y - C2

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods	77	1.4	0.0
Soil D - Woods/Grass Combo	79	3.6	0.0
Soil D - 60' ROW	80	0.2	77.0
Soil D - Lots	80	0.7	50.0
Total		6.0	
Weighted Base	78.7		8.4

Drainage Area: TRIB Y - C3

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	1.2	0.0
Total		1.2	

Drainage Area: TRIB Y - C4

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Woods/Grass Combo	79	1.4	0.0
Total		1.4	

Drainage Area: POND 3 AREA

Description	CN (Base)	Area (ac)	IC (%)
Soil D - Pond 3 Area	80	21.0	43.2
Total		21.0	

TIME OF CONCENTRATION CALCULATIONS

ENTER MANNINGS n-VALUE
Light underbrush = 0.40
Dense Grasses = 0.24
Pvmt = 0.011
P2 - 2-year, 24-hour rainfall = 4.2 in

DRAINAGE AREA (SUBBASIN)	SHEET FLOW DIST (FT)	SHEET FLOW SLOPE (FT/FT)	SHEET FLOW Tc (MIN)	SHALLOW CONC FLOW DIST (FT)	SHALLOW CONC FLOW SLOPE (FT/FT)	SHALLOW CONC FLOW Tc (MIN)	VELOCITY FLOW DIST (FT)	VELOCITY FLOW VELOCITY (FPS)	VELOCITY FLOW Tc (MIN)	TOTAL Tc (MIN)	LAG TIME (MIN)
TRIB X - A	25	0.02	4.1	837	0.01	8.6	2,591	6.00	7.2	20.0	12.0
TRIB X - B	25	0.02	4.1	525	0.02	3.7	1,520	6.00	4.2	12.0	7.2
TRIB X - C	100	0.04	9.4	435	0.05	2.0	1,330	6.00	3.7	15.1	9.1
POND 5 AREA	100	0.02	12.5	560	0.03	3.1	260	6.00	0.7	16.3	9.8
POND 6 AREA	25	0.02	4.1	395	0.03	2.6	640	6.00	1.8	8.5	5.1
OS - 1	100	0.01	16.4	1,230	0.03	7.9	0	0.00	0.0	24.3	14.6
POND 1 AREA	25	0.02	4.1	365	0.02	2.8	1,375	6.00	3.8	10.7	6.4
TRIB Y - A	60	0.01	10.9	1,990	0.02	16.8	0	0.00	0.0	27.7	16.6
TRIB Y - B	100	0.02	12.5	410	0.03	2.5	185	6.00	0.5	15.5	9.3
TRIB Y - C1	100	0.04	9.4	750	0.04	3.7	0	0.00	0.0	13.2	7.9
POND 2 AREA	25	0.02	4.1	245	0.02	1.8	1,350	6.00	3.8	9.6	5.8
POND 10 AREA	25	0.02	4.1	225	0.02	1.6	1,040	6.00	2.9	8.6	5.2
COMMERCIAL	25	0.02	4.1	1,120	0.02	9.4	0	0.00	0.0	13.6	8.1
TRIB Z - A	50	0.01	9.4	2,052	0.02	15.4	0	0.00	0.0	24.8	14.9
TRIB Y - C2	100	0.05	9.0	420	0.05	2.0	560	6.00	1.6	12.5	7.5
TRIB Y - C3	100	0.02	12.5	200	0.04	1.0	0	0.00	0.0	13.5	8.1
TRIB Y - C4	60	0.06	5.3	0	NA	0.0	475	6.00	1.3	6.7	4.0
POND 3 AREA	25	0.02	4.1	365	0.03	2.3	1,175	6.00	3.3	9.7	5.8
POND 4 AREA	100	0.02	12.5	1,260	0.02	10.3	930	6.00	2.6	25.3	15.2
TRIB Y - D	100	0.02	12.5	865	0.04	4.8	1,090	6.00	3.0	20.3	12.2
POND 8 AREA	100	0.02	12.5	635	0.02	4.4	1,860	6.00	5.2	22.0	13.2
POND 9 AREA	100	0.02	12.5	390	0.03	2.3	310	6.00	0.9	15.6	9.4
TRIB Y - E	100	0.01	15.3	3,350	0.02	27.4	0	0.00	0.0	42.6	25.6
TRIB Y - F	100	0.04	9.4	330	0.03	2.0	0	0.00	0.0	11.4	6.8
POND 7 AREA	25	0.02	4.1	460	0.02	3.5	2,325	6.00	6.5	14.1	8.5

Subbasin	CN (base)	IC (%)	IC	CN (composite)
TRIB X - A	79.8	36.1	0.36	86
TRIB X - B	79.8	45.1	0.45	88
TRIB X - C	79.3	16.7	0.17	82
POND 5 AREA	80.0	42.0	0.42	88
POND 6 AREA	80.0	40.9	0.41	87
OS - 1	79.1	30.5	0.31	85
POND 1 AREA	80.0	54.6	0.55	90
TRIB Y - A	79.0	60.0	0.60	90
TRIB Y - B	78.4	0.0	0.00	78
TRIB Y - C1	77.2	11.8	0.12	80
POND 2 AREA	80.0	49.4	0.49	89
POND 10 AREA	80.0	53.6	0.54	90
COMMERCIAL	80.0	70.0	0.70	93
TRIB Z - A	78.0	13.8	0.14	81
TRIB Y - C2	78.7	8.4	0.08	80
TRIB Y - C3	79.0	0.0	0.00	79
TRIB Y - C4	79.0	0.0	0.00	79
POND 3 AREA	80.0	43.2	0.43	88
POND 4 AREA	80.0	49.8	0.50	89
TRIB Y - D	79.4	18.7	0.19	83
POND 8 AREA	80.0	46.5	0.46	88
POND 9 AREA	80.0	43.2	0.43	88
TRIB Y - E	79.1	11.1	0.11	81
TRIB Y - F	72.8	10.1	0.10	75
POND 7 AREA	80.0	51.9	0.52	89

EQUATION 3-11 SCS METHOD SHEET FLOW

$$T_t = \frac{\left[0.42 * (nL)^{0.8}\right]}{(P_2)^{0.5} * (S)^{0.4}}$$

T_t - *Travel time (min)*
n - *Manning's roughness coefficient*
L - *Length of flow path (ft)*
P_2 - *2-year, 24-hour rainfall = 4.2 in*
S - *Ground slope along flow path (ft/ft)*

Manning n Values	
Light Underbrush	0.40
Dense Grasses	0.24
Pavement	0.011

EQUATION 3-12 SCS SHALLOW CONCENTRATED

Unpaved $V = 16.1345(S)^{0.5}$
Paved $V = 20.3282(S)^{0.5}$

V - *Average velocity (ft/s)*
S - *Ground slope along flow path (ft/ft)*

EQUATION 3-13 OPEN CHANNEL FLOW

$$T_t = \frac{L}{60V}$$

WOODFIELD PRESERVE
PHASE 3
CONVEYANCE DRAINAGE AREA MAP

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 3/1/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 DM6.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
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Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

DM6

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2023-33-CON

Date/Time : Fri, 01 Mar 2024 - 10:11am User Name : jplecuch
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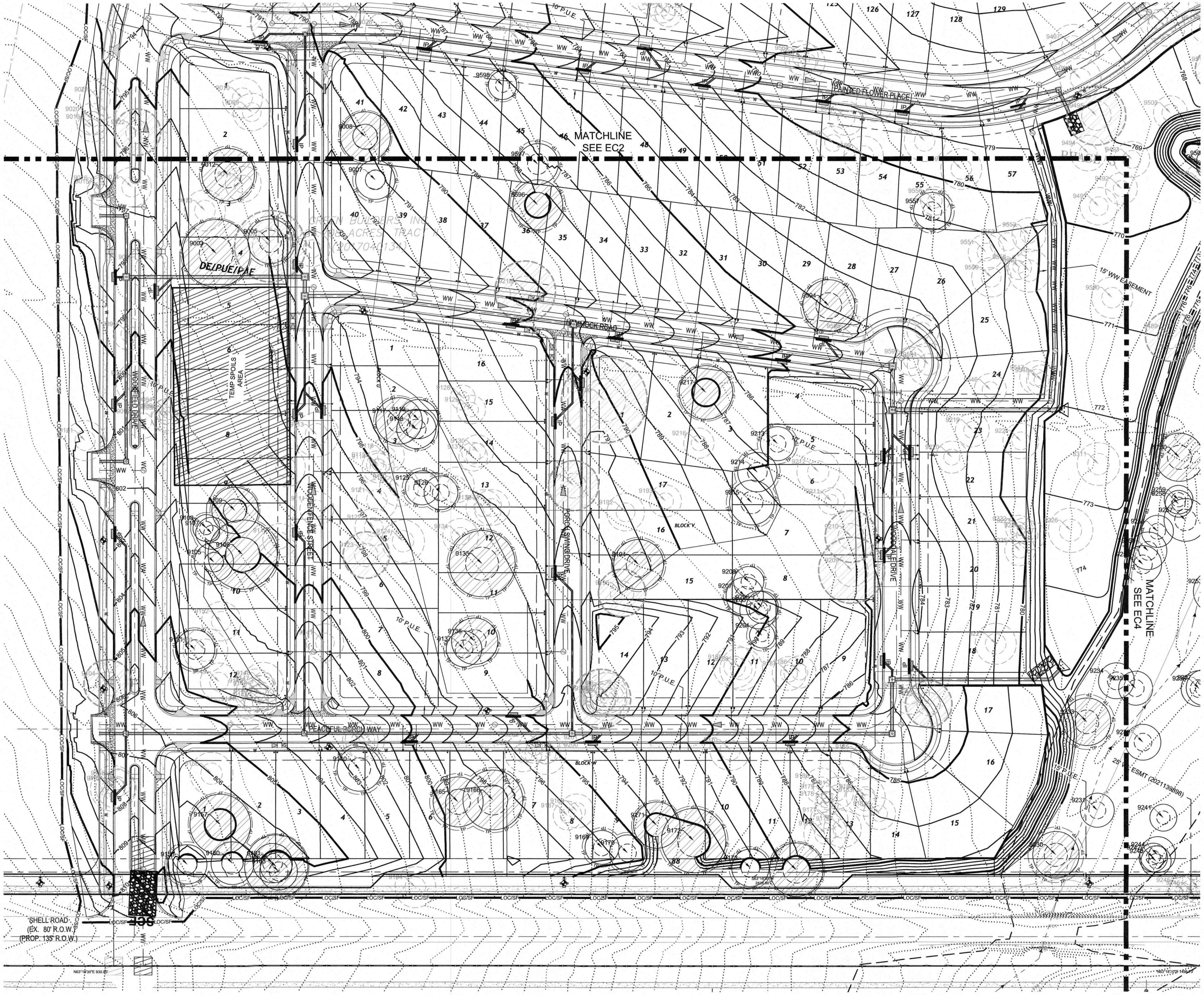

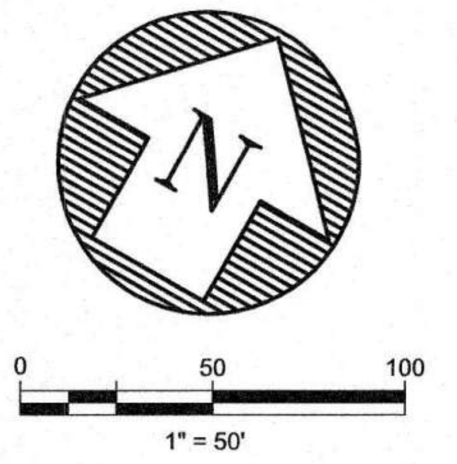

LEGEND:

RB	ROCK BERM
IP	INLET PROTECTION
SF	SILT FENCE
LOC	LIMITS OF CONSTRUCTION
LOC/SF	LIMITS OF CONSTRUCTION/SILT FENCE
LOC/OF	LIMITS OF CONSTRUCTION/ORANGE FENCE
TP TP	TREE PROTECTION FENCE
700	PROPOSED CONTOURS
700	EXISTING CONTOURS
SCE	STABILIZED CONSTRUCTION EXIT
▨	STAGING & SPOILS SITE
	LOT LINE
1234	TREE TO BE SAVED W/ 1/2 CRZ
1234	TREE TO BE REMOVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE SAVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE REMOVED W/ 1/2 CRZ
CONCRETE WASHOUT	CONCRETE WASHOUT
▨ → → →	POND SKIMMER

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

EROSION/SEDIMENTATION CONTROL &
TREE PROTECTION PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

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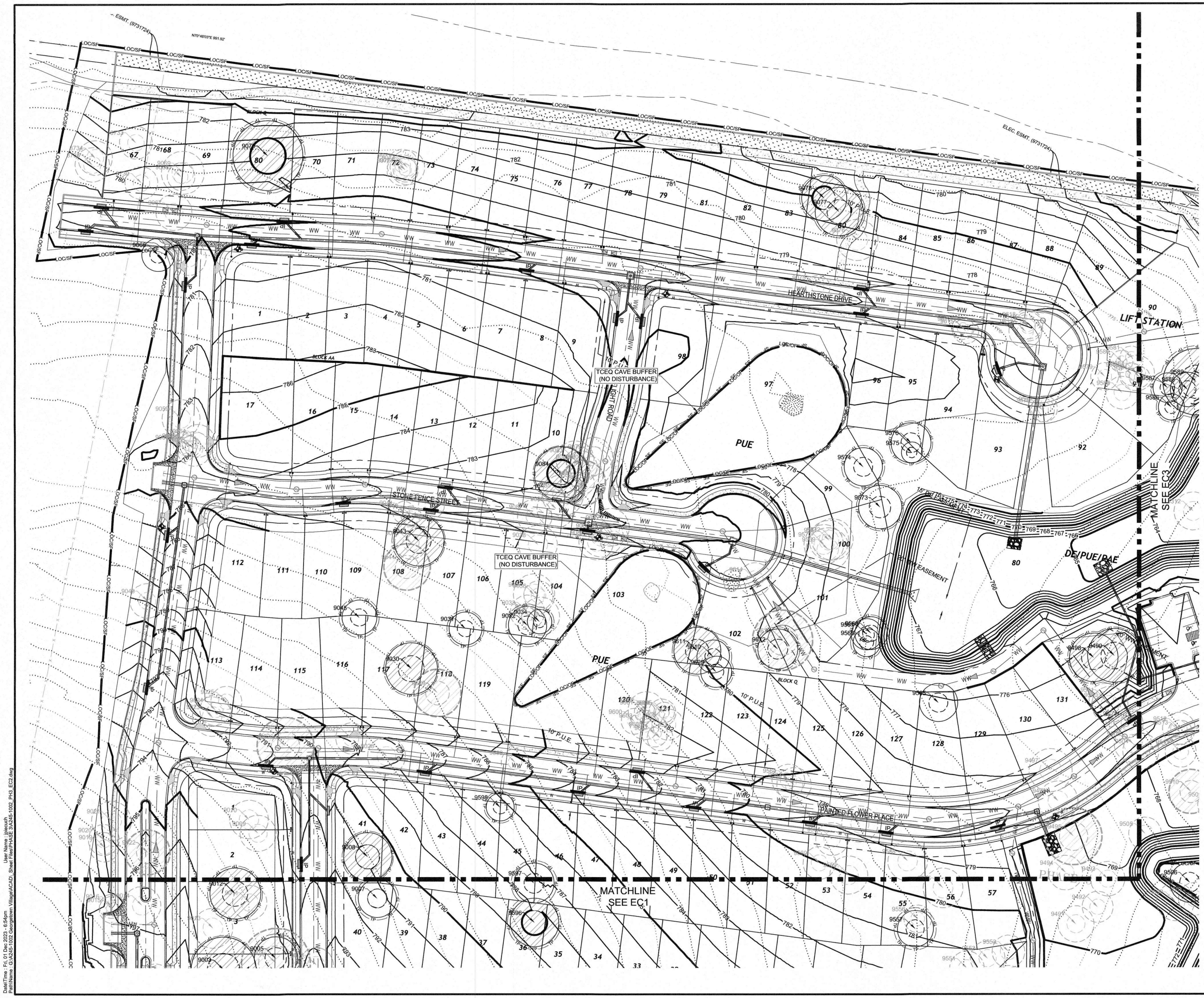

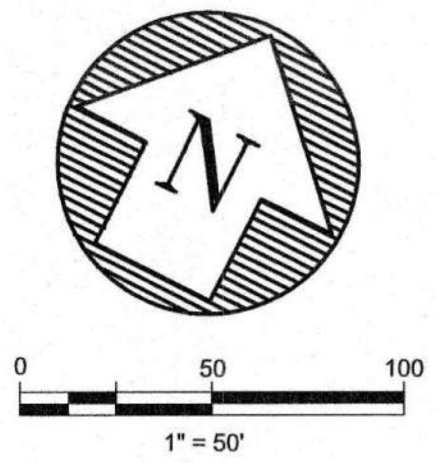

LEGEND:

RB	ROCK BERM
IP	INLET PROTECTION
—SF—	SILT FENCE
—LOC—	LIMITS OF CONSTRUCTION
—LOC/SF—	LIMITS OF CONSTRUCTION/SILT FENCE
—LOC/OF—	LIMITS OF CONSTRUCTION/ORANGE FENCE
—TP—TP—	TREE PROTECTION FENCE
—700—	PROPOSED CONTOURS
- -700- -	EXISTING CONTOURS
SCE	STABILIZED CONSTRUCTION EXIT
▨	STAGING & SPOILS SITE
—	LOT LINE
1234	TREE TO BE SAVED W/ 1/2 CRZ
1234	TREE TO BE REMOVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE SAVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE REMOVED W/ 1/2 CRZ
CONCRETE WASHOUT	CONCRETE WASHOUT
▨→→→→	POND SKIMMER

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WOODFIELD PRESERVE
PHASE 3

EROSION/SEDIMENTATION CONTROL & TREE PROTECTION PLAN

REVISIONS

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DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC2.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
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Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

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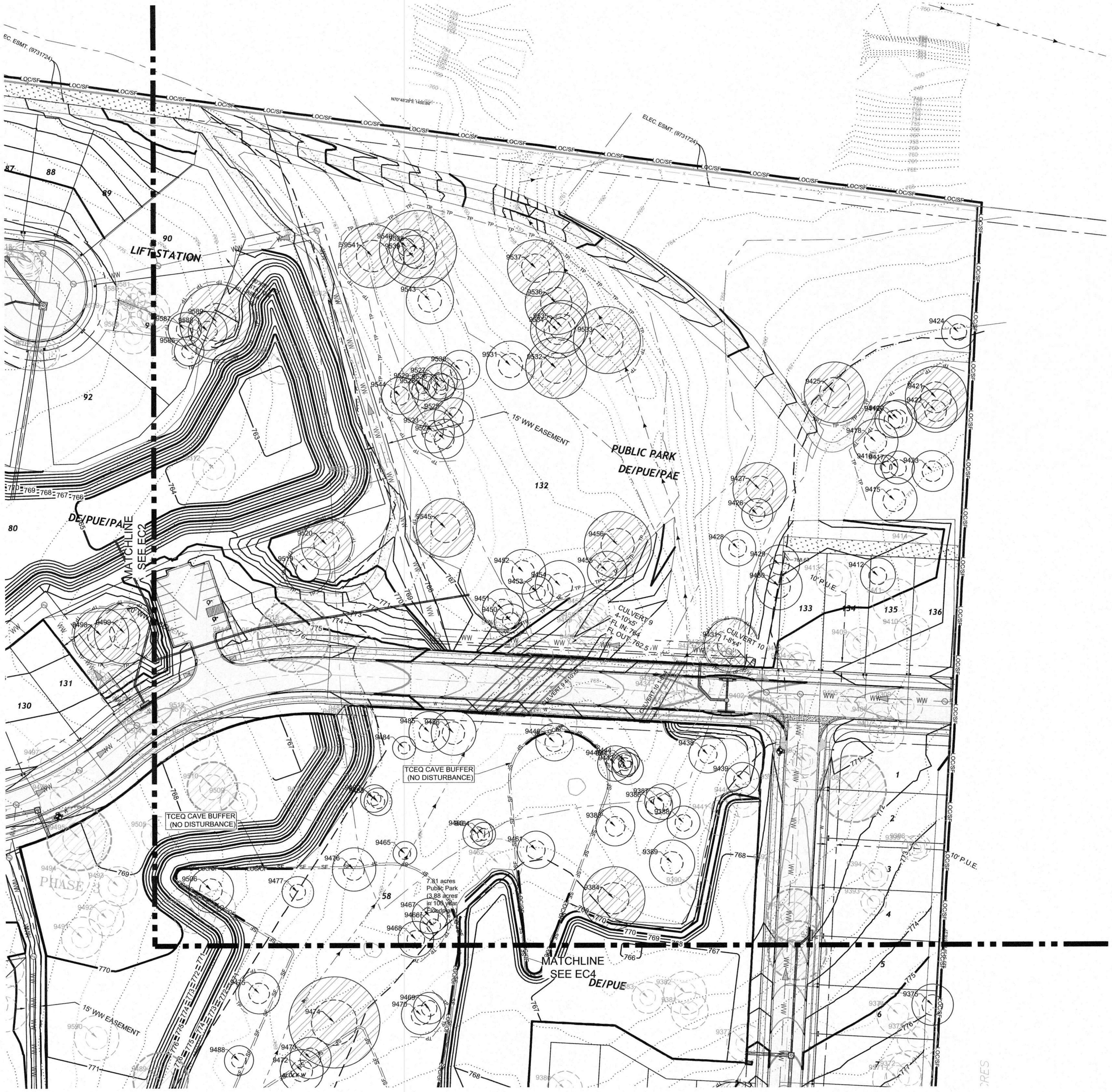

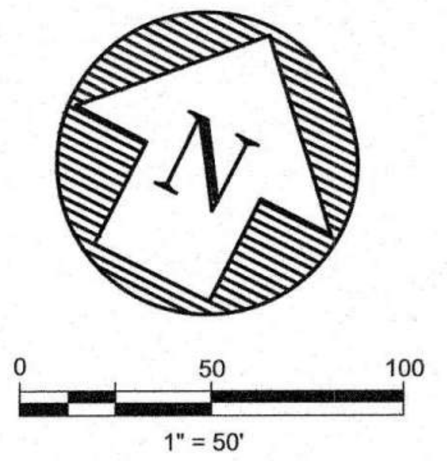

LEGEND:

RB ▨	ROCK BERM
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—SF—	SILT FENCE
—LOC—	LIMITS OF CONSTRUCTION
—LOC/SF—	LIMITS OF CONSTRUCTION/SILT FENCE
—LOC/OF—	LIMITS OF CONSTRUCTION/ORANGE FENCE
—TP—TP—	TREE PROTECTION FENCE
—700—	PROPOSED CONTOURS
- -700- -	EXISTING CONTOURS
SCE	STABILIZED CONSTRUCTION EXIT
▨	STAGING & SPOILS SITE
—	LOT LINE
◎ 1234	TREE TO BE SAVED W/ 1/2 CRZ
◎ 1234	TREE TO BE REMOVED W/ 1/2 CRZ
◎ 1234	HERITAGE TREE TO BE SAVED W/ 1/2 CRZ
◎ 1234	HERITAGE TREE TO BE REMOVED W/ 1/2 CRZ
▣	CONCRETE WASHOUT
▨→→→	POND SKIMMER

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WOODFIELD PRESERVE
PHASE 3

EROSION/SEDIMENTATION CONTROL & TREE PROTECTION PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC3.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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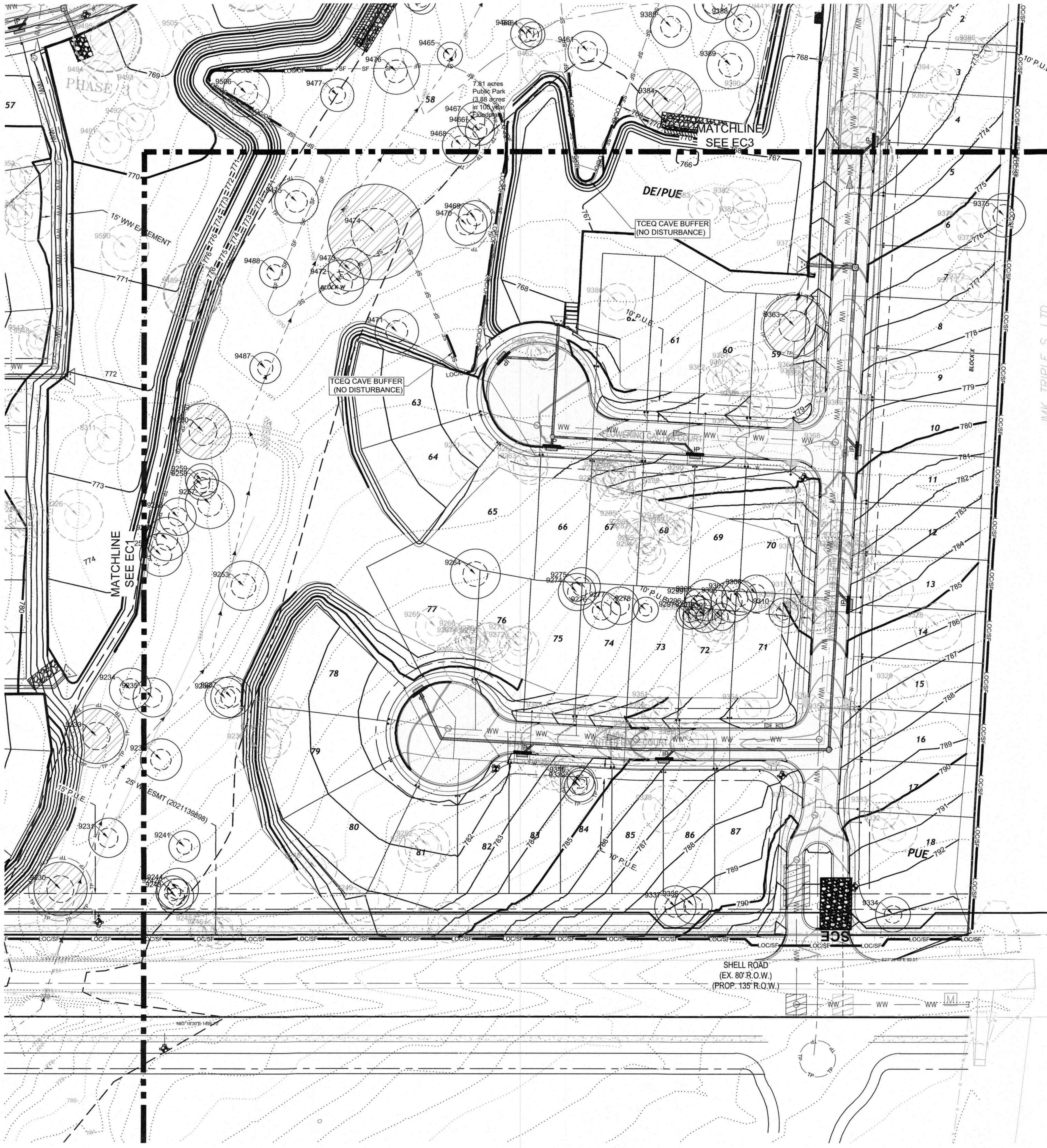

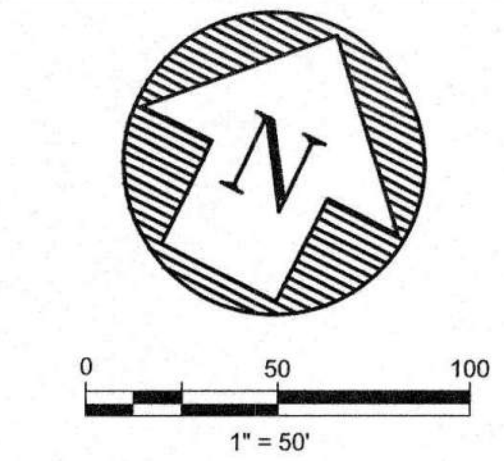

LEGEND:

RB	ROCK BERM
IP	INLET PROTECTION
SF	SILT FENCE
LOC	LIMITS OF CONSTRUCTION
LOC/SF	LIMITS OF CONSTRUCTION/SILT FENCE
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700	PROPOSED CONTOURS
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SCE	STABILIZED CONSTRUCTION EXIT
▨	STAGING & SPOILS SITE
	LOT LINE
1234	TREE TO BE SAVED W/ 1/2 CRZ
1234	TREE TO BE REMOVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE SAVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE REMOVED W/ 1/2 CRZ
	CONCRETE WASHOUT
▨ → → →	POND SKIMMER

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5. LIMITS OF CONSTRUCTION & SILT FENCE SHOWN OFF BOUNDARY LINES FOR CLARITY ONLY. SILT FENCE SHALL BE PLACED WITHIN TRACT BOUNDARIES.
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7. CONTRACTOR SHALL MAINTAIN THE DEWATERING SYSTEM TO ENSURE PERFORMANCE. IF THE DEWATERING SYSTEM IS NOT PERFORMING, THE CONTRACTOR MUST IMMEDIATELY MAKE THE NECESSARY MODIFICATIONS, FOLLOWING THE ENVIRONMENTAL INSPECTOR'S DIRECTION TO ENSURE ADEQUATE SYSTEM PERFORMANCE. CONTRACTOR SHALL PROVIDE THE DEWATERING PLAN AT THE PRE-CONSTRUCTION MEETING.
8. ALL SILT FENCE ALONG EXISTING PAVED R.O.W.S SHALL BE SET AT A MINIMUM OF 3' AWAY FROM BACK OF CURB OR EDGE OF PAVING TO AVOID STANDING WATER ON SUBGRADE SURFACES.
9. SILT FENCE ALONG BACK OF CURB MAY BE TEMPORARILY REMOVED FOR GRADING TO CURB EDGES BUT SHALL BE REINSTALLED DAILY.
10. MID-CONSTRUCTION CONTROLS SHALL BE SET AFTER MAJOR SITE GRADING OPERATIONS ARE COMPLETED TO WITHIN ± 0.1 FEET OF SITE SUBGRADE.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY SEDIMENT TRANSPORTED FROM THE SITE TO THE WATER QUALITY/DETENTION PONDS.

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

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

WOODFIELD PRESERVE
PHASE 3

EROSION/SEDIMENTATION CONTROL &
TREE PROTECTION PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC4.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

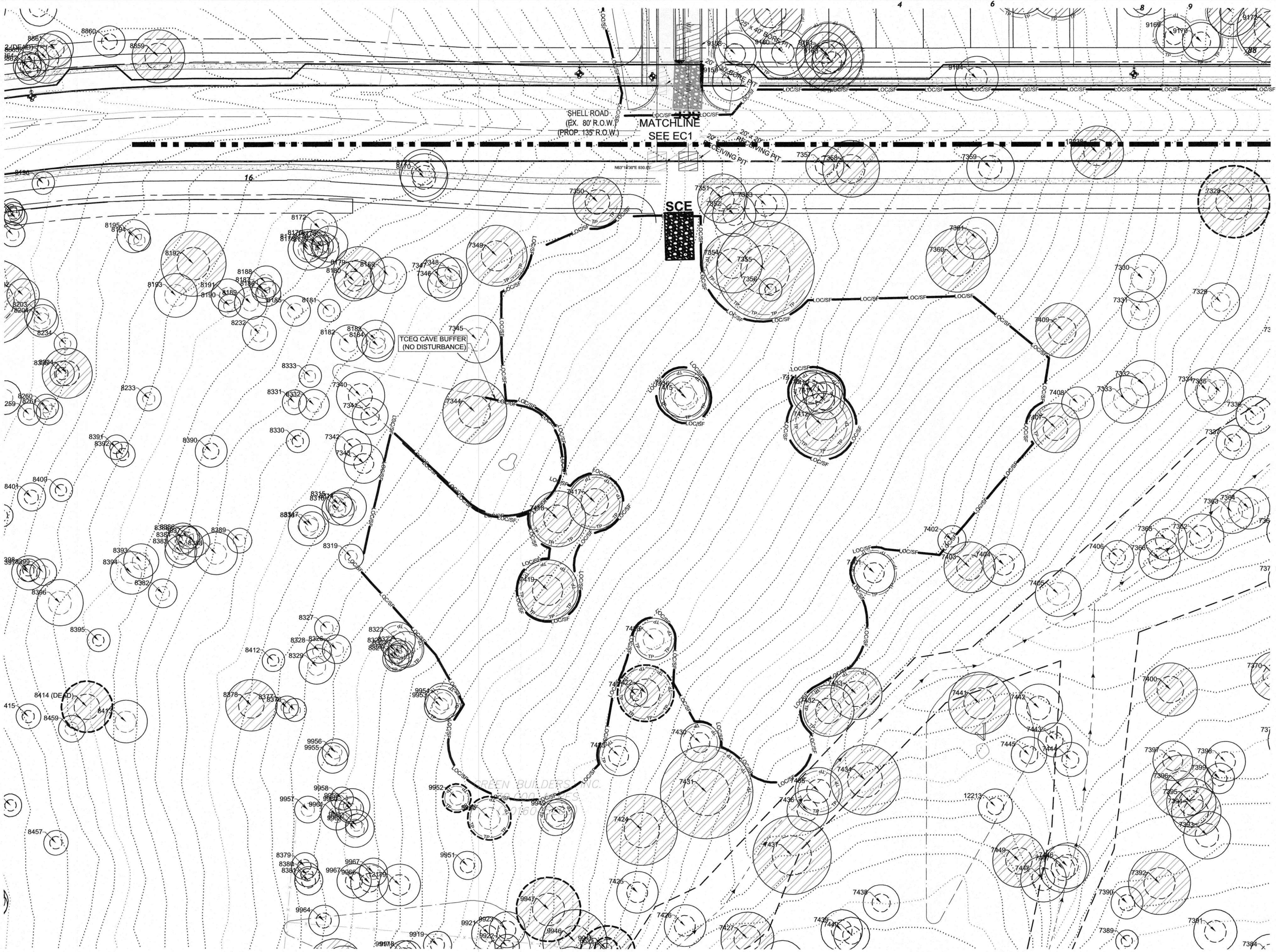
JOB NUMBER:
A245-1002

EC4

SHEET NO.
30
OF 118 SHEETS

2023-XX-CON

Date\Time : Fri, 01 Dec 2023 - 6:55pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_EC4.dwg



0 50 100
1" = 50'

LEGEND:

RB	ROCK BERM
IP	INLET PROTECTION
SF	SILT FENCE
LOC	LIMITS OF CONSTRUCTION
LOC/SF	LIMITS OF CONSTRUCTION/SILT FENCE
LOC/OF	LIMITS OF CONSTRUCTION/ORANGE FENCE
TP	TREE PROTECTION FENCE
700	PROPOSED CONTOURS
700	EXISTING CONTOURS
SCE	STABILIZED CONSTRUCTION EXIT
▨	STAGING & SPOILS SITE
	LOT LINE
1234	TREE TO BE SAVED W/ 1/2 CRZ
1234	TREE TO BE REMOVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE SAVED W/ 1/2 CRZ
1234	HERITAGE TREE TO BE REMOVED W/ 1/2 CRZ
CONCRETE WASHOUT	CONCRETE WASHOUT
▨	POND SKIMMER

NOTES:

1. IF DISTURBED AREA IS NOT WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION MATTING. (ECM 1.4.4.B.3, SECTION 5, I.).
2. ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN COMPLIANCE WITH THE CITY OF AUSTIN RULES AND REGULATIONS. (LDC 1.4.4.D.4)
3. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING AS PER ECM 1.4.5(A), OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
4. THE CONTRACTOR WILL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY. (ECM 1.4.4.D.4)
5. LIMITS OF CONSTRUCTION & SILT FENCE SHOWN OFF BOUNDARY LINES FOR CLARITY ONLY. SILT FENCE SHALL BE PLACED WITHIN TRACT BOUNDARIES.
6. NO MORE THAN 2000 LINEAR FEET OF DISTURBANCE FOR UTILITY INSTALLATION SHALL OCCUR AT ANY TIME WITH CLEAN UP AND RESTORATION WORK OCCURING BEFORE PROCEEDING TO THE NEXT SECTION. THE CONTRACTOR IS REQUIRED TO RESTORE ALL DISTURBED AREAS AS THE WORK PROGRESSES.
7. CONTRACTOR SHALL MAINTAIN THE DEWATERING SYSTEM TO ENSURE PERFORMANCE. IF THE DEWATERING SYSTEM IS NOT PERFORMING, THE CONTRACTOR MUST IMMEDIATELY MAKE THE NECESSARY MODIFICATIONS, FOLLOWING THE ENVIRONMENTAL INSPECTOR'S DIRECTION TO ENSURE ADEQUATE SYSTEM PERFORMANCE. CONTRACTOR SHALL PROVIDE THE DEWATERING PLAN AT THE PRE-CONSTRUCTION MEETING.
8. ALL SILT FENCE ALONG EXISTING PAVED R.O.W.S SHALL BE SET AT A MINIMUM OF 3' AWAY FROM BACK OF CURB OR EDGE OF PAVING TO AVOID STANDING WATER ON SUBGRADE SURFACES.
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

WOODFIELD PRESERVE
PHASE 3

EROSION/SEDIMENTATION CONTROL & TREE PROTECTION PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC5.dwg

JUSTIN D. MIDURA
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Round Rock, TX 78681
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JOB NUMBER:
A245-1002

EC5

SHEET NO.
31
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 6:55pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_EC5.dwg

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SW3P) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
2. ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARD'S AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TNRCC FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
3. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
4. ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FESCUE (KENTUCKY 31) AT A RATE OF 100lb/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, HULLED, MINIMUM 82% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE "A" RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
5. ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
6. THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS . RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% *COVERAGE*, PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
8. A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
9. THE CONTRACTOR TO HYDROMULCH OR SOD (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
10. EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
12. WHERE A FENCE IS CLOSER THAN FOUR (4) FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF EIGHT (8) FEET (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE FENCING.
13. TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
14. ANY ROOT EXPOSED BY CONSTRUCTION ACTIVITY TO BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOPSOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
15. CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.). ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES").
16. THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTINUED EFFECTIVE OPERATION OF EACH DEVICE.
17. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'-4') BEHIND THE AREA IN QUESTION.
18. NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
19. IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES

Drawing	EC01A
Scale	NTS
Date	1/2003
Drawn by	MRS
Approved by	TRB

Georgetown Utility Systems
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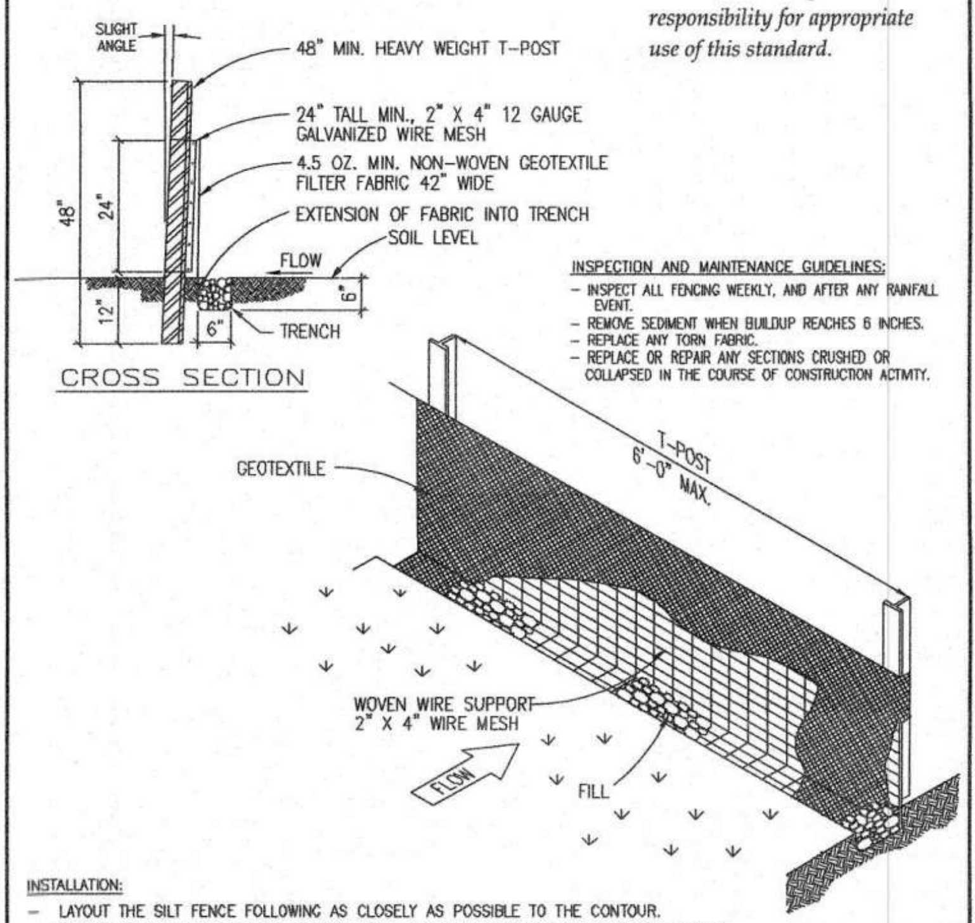
The Architect/Engineer assumes responsibility for appropriate use of this standard.



INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.

INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T-POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T-POST WITH 11 1/2 GAUGE GALVANIZED T-POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SILT FENCE DETAIL

Drawing	EC02
Scale	NTS
Date	1/2003
Drawn by	MRS
Approved by	TRB

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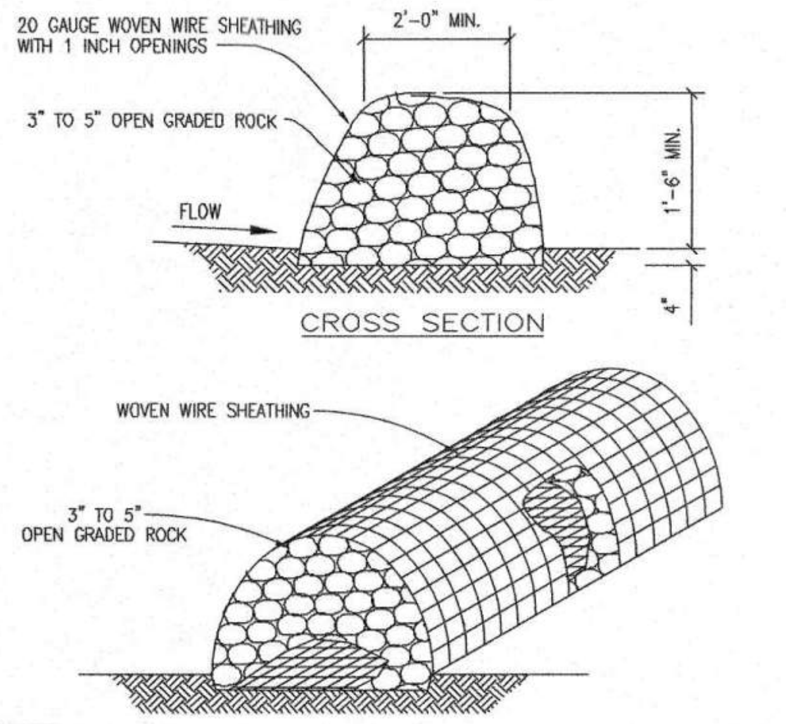

INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER
- REPAIR ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
ROCK BERM DETAIL

Drawing	EC03
Scale	NTS
Date	1/2003
Drawn by	MRS
Approved by	TRB

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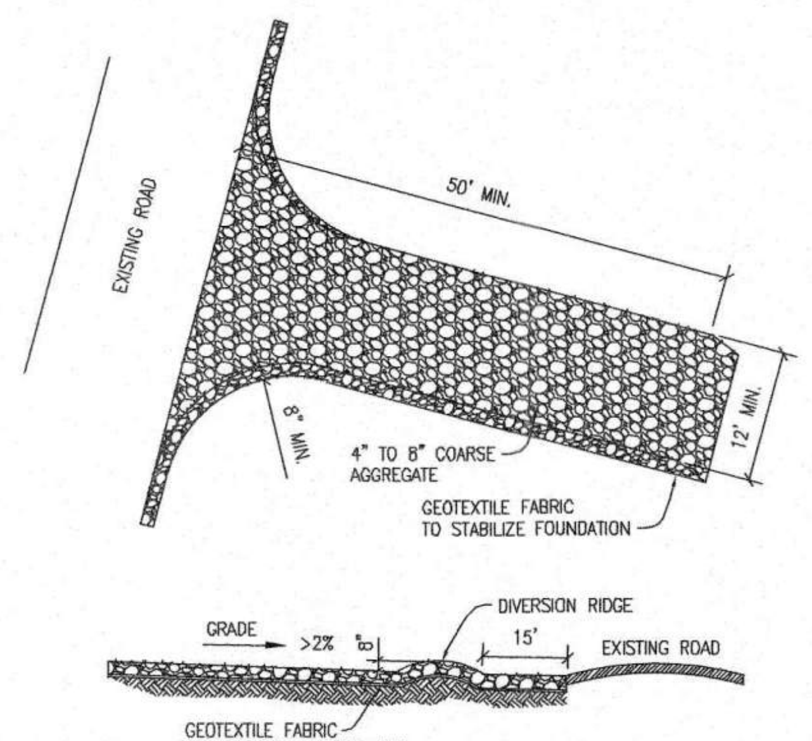

INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
- WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
- WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STABILIZED CONSTRUCTION ENTRANCE

Drawing	EC06
Scale	NTS
Date	1/2003
Drawn by	MRS
Approved by	TRB

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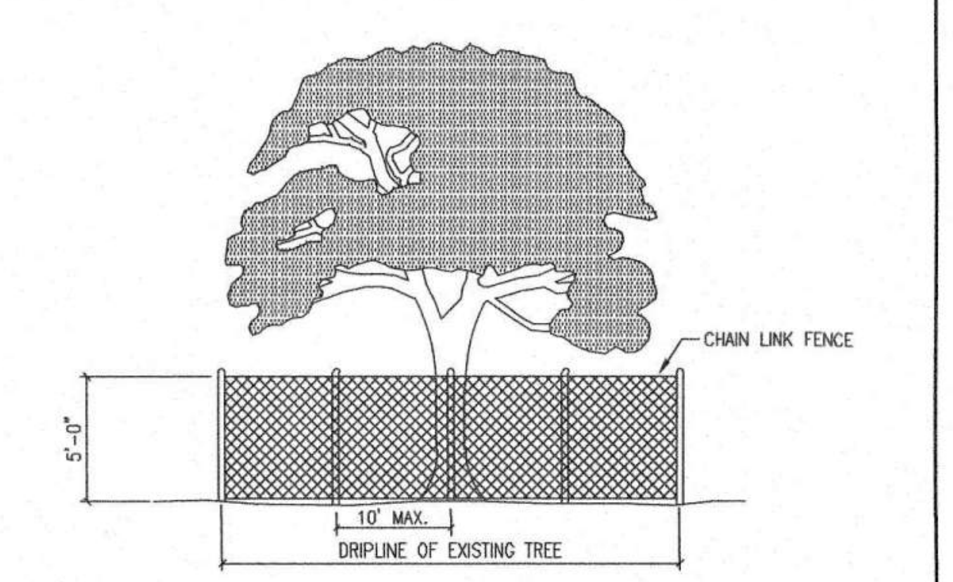

NOTES:

1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   - A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   - B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   - C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   - D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   - A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   - B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TREE PROTECTION – CHAIN LINK FENCE

Drawing	EC09
Scale	NTS
Date	1/2003
Drawn by	MRS
Approved by	TRB

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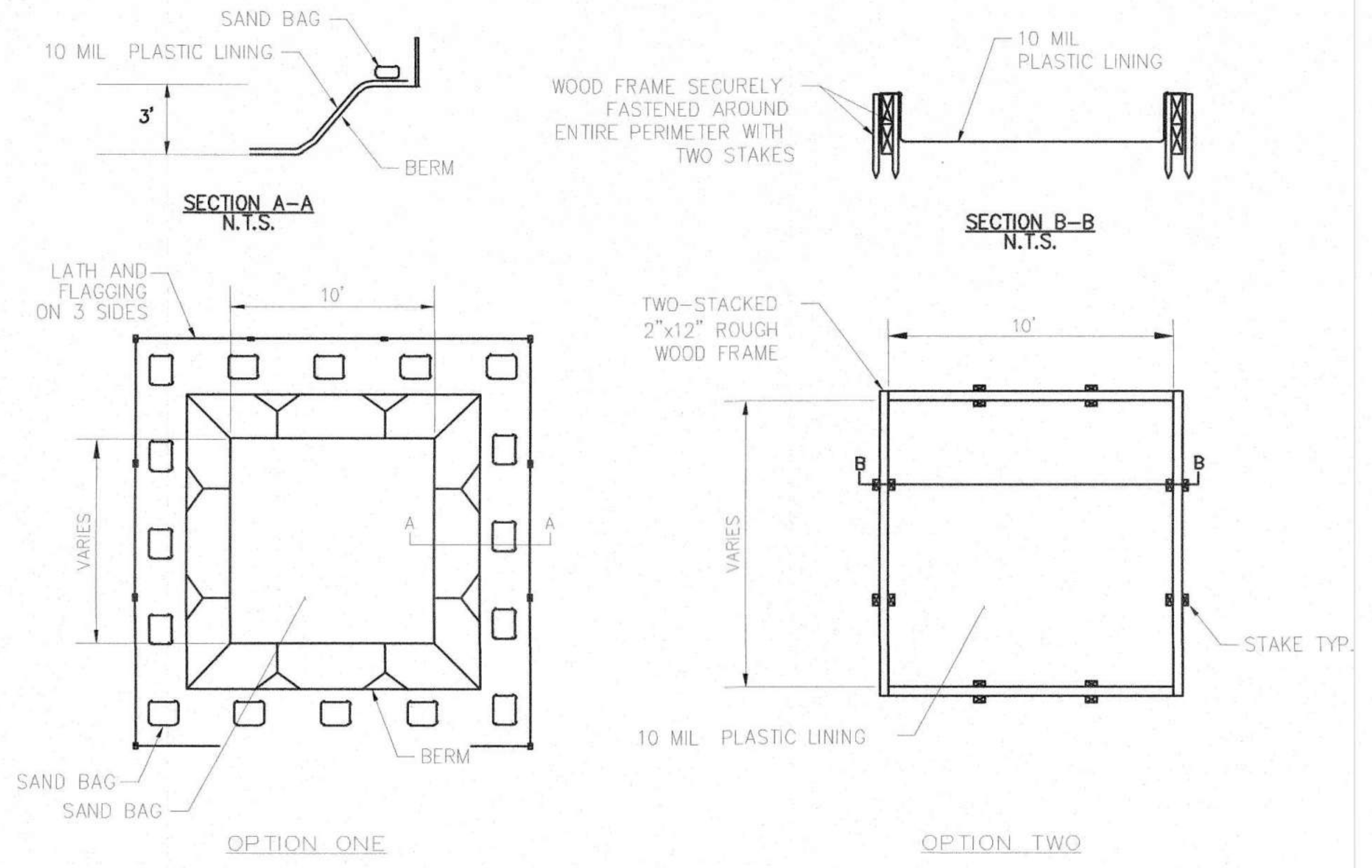
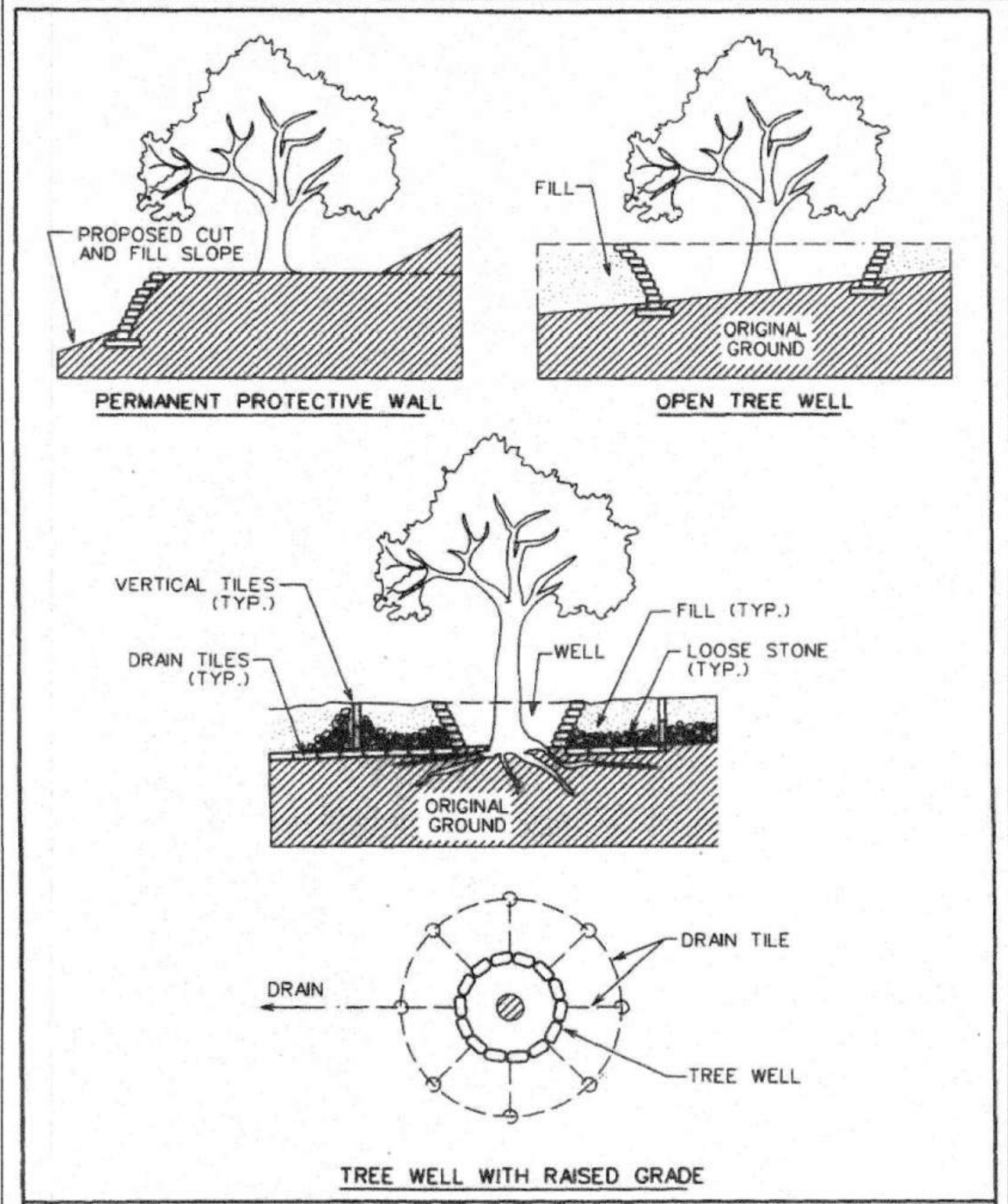


CONCRETE WASHOUT

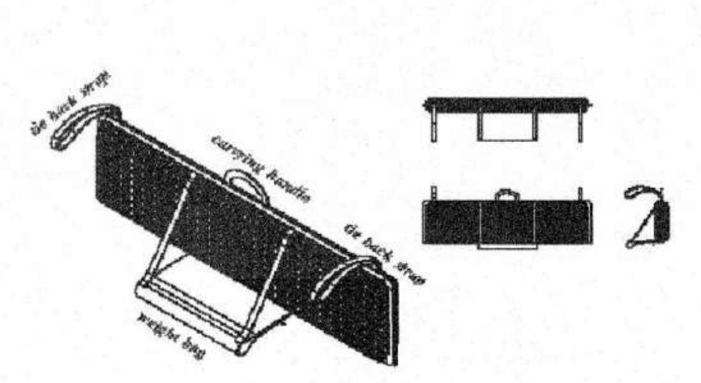
N.T.S.



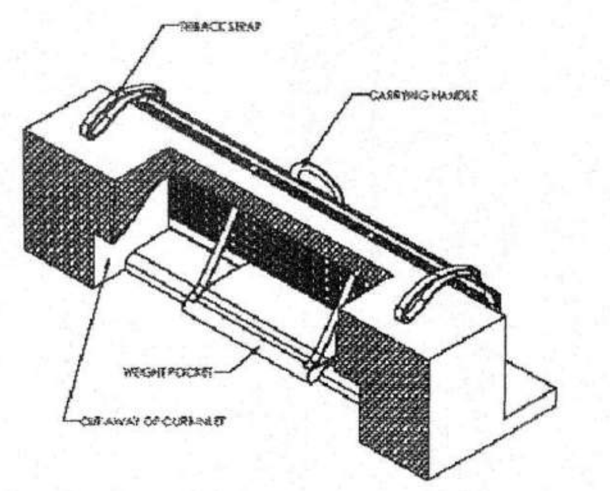
TREE WELL WITH RAISED GRADE

CITY OF AUSTIN DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW	SLOPE PROTECTION AND TREE WELLS	
3/13/06 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 610S-6 2 OF 2

Gutter Gator
or Approved Equal



Non Woven Filter Fabric Sleeve per City of Austin specifications for curb inlet protection

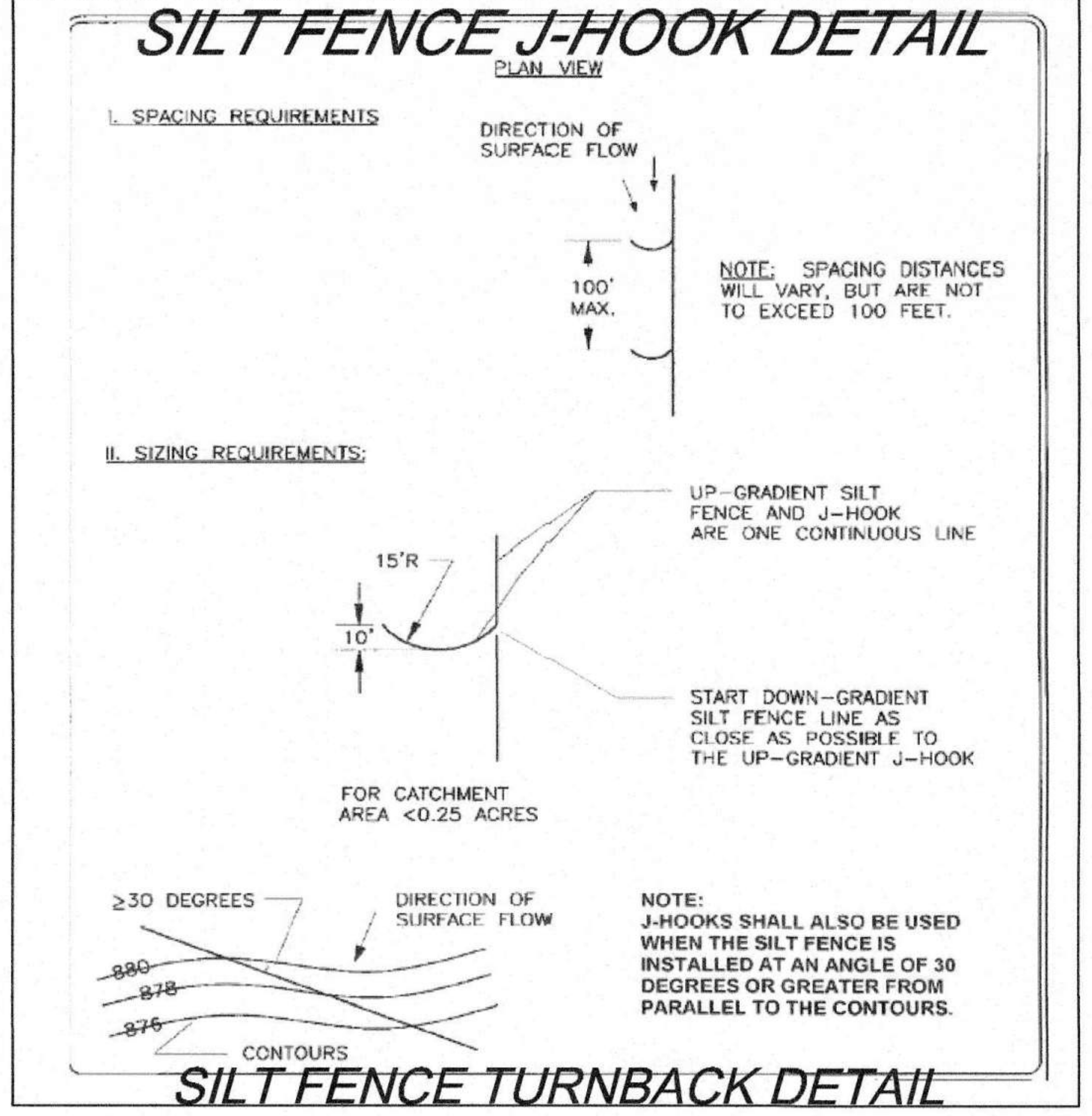


Gutter Gator Inlet Protection Barrier

StormWater Structures

1930 Aldine Western Road
Houston, TX 77038

SILT FENCE J-HOOK DETAIL



NOTE: J-HOOKS SHALL ALSO BE USED WHEN THE SILT FENCE IS INSTALLED AT AN ANGLE OF 30 DEGREES OR GREATER FROM PARALLEL TO THE CONTOURS.

SILT FENCE TURNBACK DETAIL

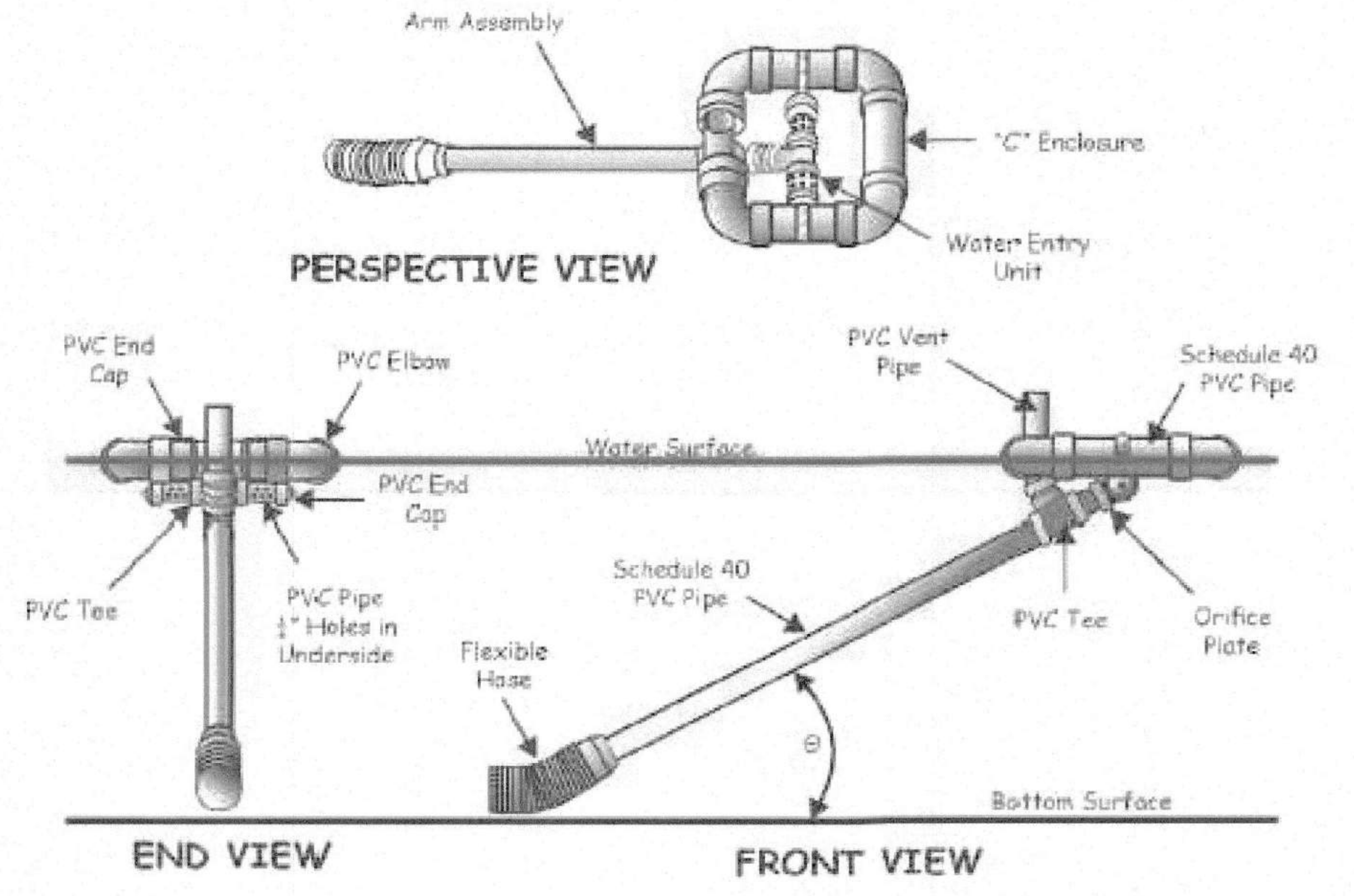


Figure 6.64a Schematic of a skimmer from Pennsylvania Erosion and Sediment Pollution Control Manual, March 2000.

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

WOODFIELD PRESERVE
PHASE 3

GENERAL DETAILS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/30/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_EC6.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

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2700 La Frontera Blvd
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Phone 512.439.4700
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A245-1002

EC6

SHEET NO.
32
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Date\Time : Thu, 30 Nov 2023 - 9:59am User Name : jpiecuch
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

WOODFIELD PRESERVE
PHASE 3

EASEMENT AND DEMO PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 EX1.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

EX1

SHEET NO.
35
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 12:25pm User Name : jpiecuch
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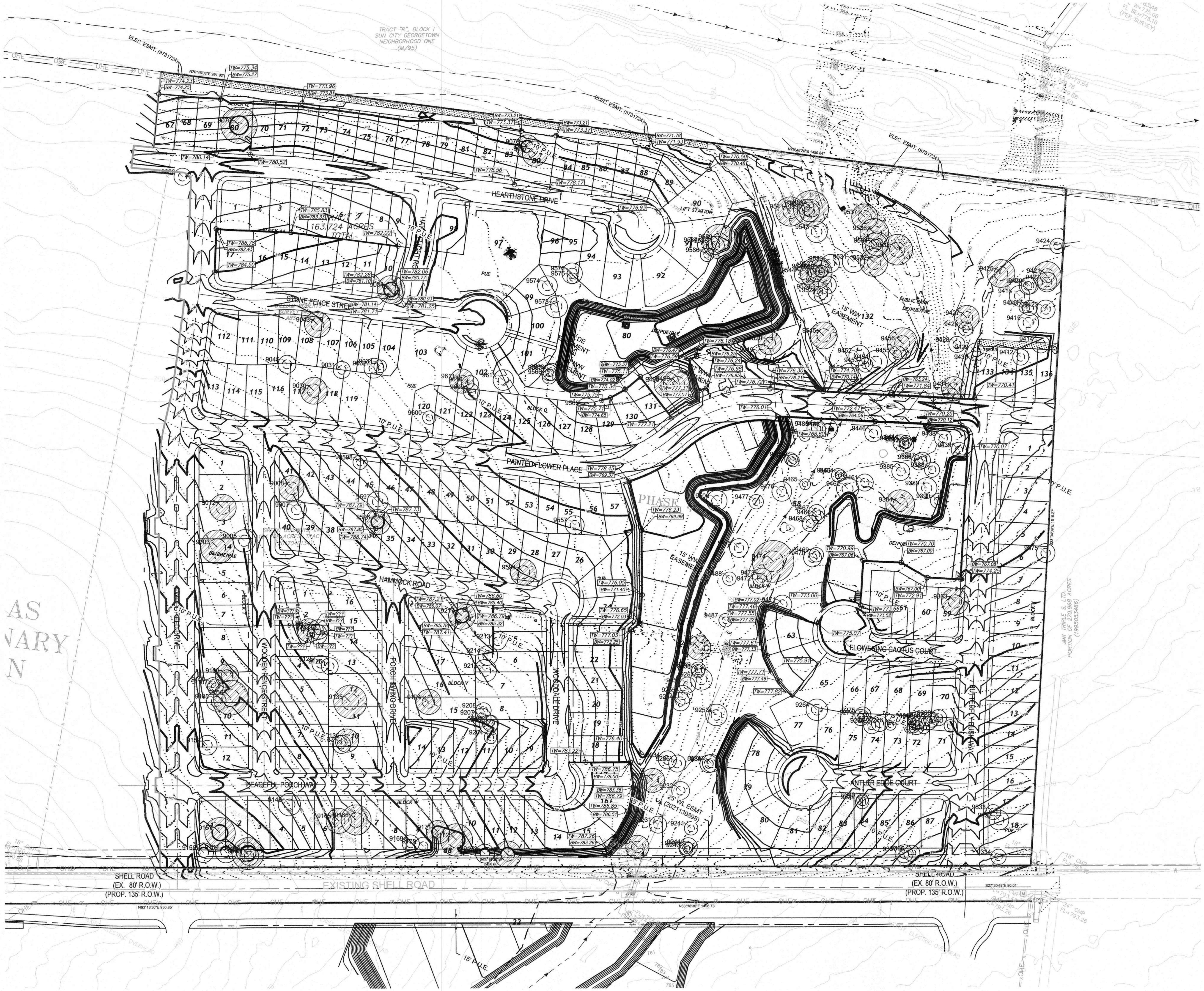

0 100 200
1" = 100'

LEGEND:

·······610·······	EXISTING CONTOURS
——608——	PROPOSED CONTOURS
604.00 TP	TOP OF PAVEMENT ELEVATION
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
604.00 TC	TOP OF CURB ELEVATION
604.00 TG	TOP OF GRADE/GRATE ELEVATION
604.00 TLC	TOP OF LAY DOWN CURB ELEVATION
═══	PROPOSED STORM SEWER LINE
▭	PROPOSED RETAINING WALL
○	PROPOSED TREE WELL

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

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WOODFIELD PRESERVE
PHASE 3

GRADING PLAN

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_GP1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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Phone 512.439.4700
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GP1

SHEET NO.
36
OF 118 SHEETS

2023-XX-CON

Date\Time : Fri, 01 Dec 2023 - 2:58pm User Name : jpiecuch
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0 100 200
1" = 100'

LEGEND:

·······610·······	EXISTING CONTOURS
——608——	PROPOSED CONTOURS
604.00 TP	TOP OF PAVEMENT ELEVATION
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
604.00 TC	TOP OF CURB ELEVATION
604.00 TG	TOP OF GRADE/GRATE ELEVATION
604.00 TLC	TOP OF LAY DOWN CURB ELEVATION
═ ═ ═	PROPOSED STORM SEWER LINE
▭	PROPOSED RETAINING WALL
○	PROPOSED TREE WELL

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

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WOODFIELD PRESERVE
PHASE 3

RETAINING WALL EXHIBIT

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_GP2.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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JOB NUMBER:
A245-1002

GP2

SHEET NO.
37
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 1:24pm User Name : jmidura
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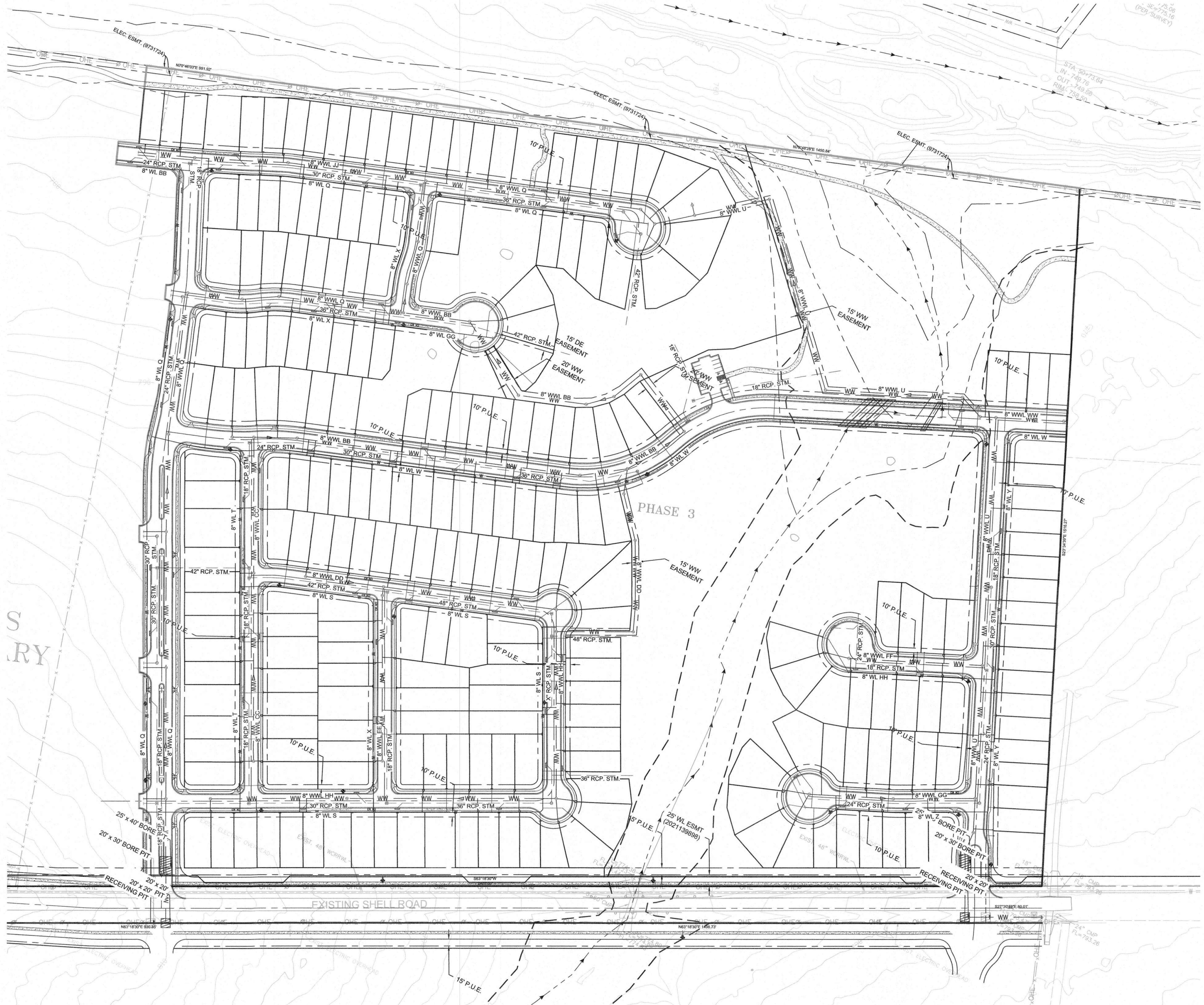

0 100 200

1" = 100'

LEGEND:

	PROPOSED FIRE HYDRANT ASSEMBLY
	EXISTING FIRE HYDRANT
	PROPOSED GATE VALVE
	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
	DOUBLE SANITARY SERVICE LEAD
	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
	SINGLE WASTEWATER PRESSURE SERVICE LEAD

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

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WOODFIELD PRESERVE
PHASE 3
OVERALL UTILITY LAYOUT

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_UT0.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED
11-30-2023

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JOB NUMBER:
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UT0

SHEET NO.
54
OF 118 SHEETS

2023-XX-CON

Date/Time : Fri, 01 Dec 2023 - 1:25pm
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Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Woodfield Preserve**
Date Prepared: **11/20/2023**

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-348A.
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-348A Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93026(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% 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 = **Williamson**
Total project area included in plan * = **281.25** acres
Predevelopment impervious area within the limits of the plan * = **0.43** acres
Total post-development impervious area within the limits of the plan* = **116.71** acres
Total post-development impervious cover fraction * = **0.41**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **107654** lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = **15**

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

Drainage Basin/Outfall Area No. = 7

Total drainage basin/outfall area = **30.22** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **15.69** acres
Post-development impervious fraction within drainage basin/outfall area = **0.52**
$L_{M\ THIS\ BASIN}$ = **14522** lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** **(Batch Detention Basin)**
Removal efficiency = **91** percent

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

RG-348A 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 = **30.22** acres
A_I = **15.69** acres
A_P = **14.54** acres
L_R = **16033** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = **14800** lbs.

F = **0.92**

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

Rainfall Depth = **2.00** inches
Post Development Runoff Coefficient = **0.49**
On-site Water Quality Volume = **107771** cubic feet

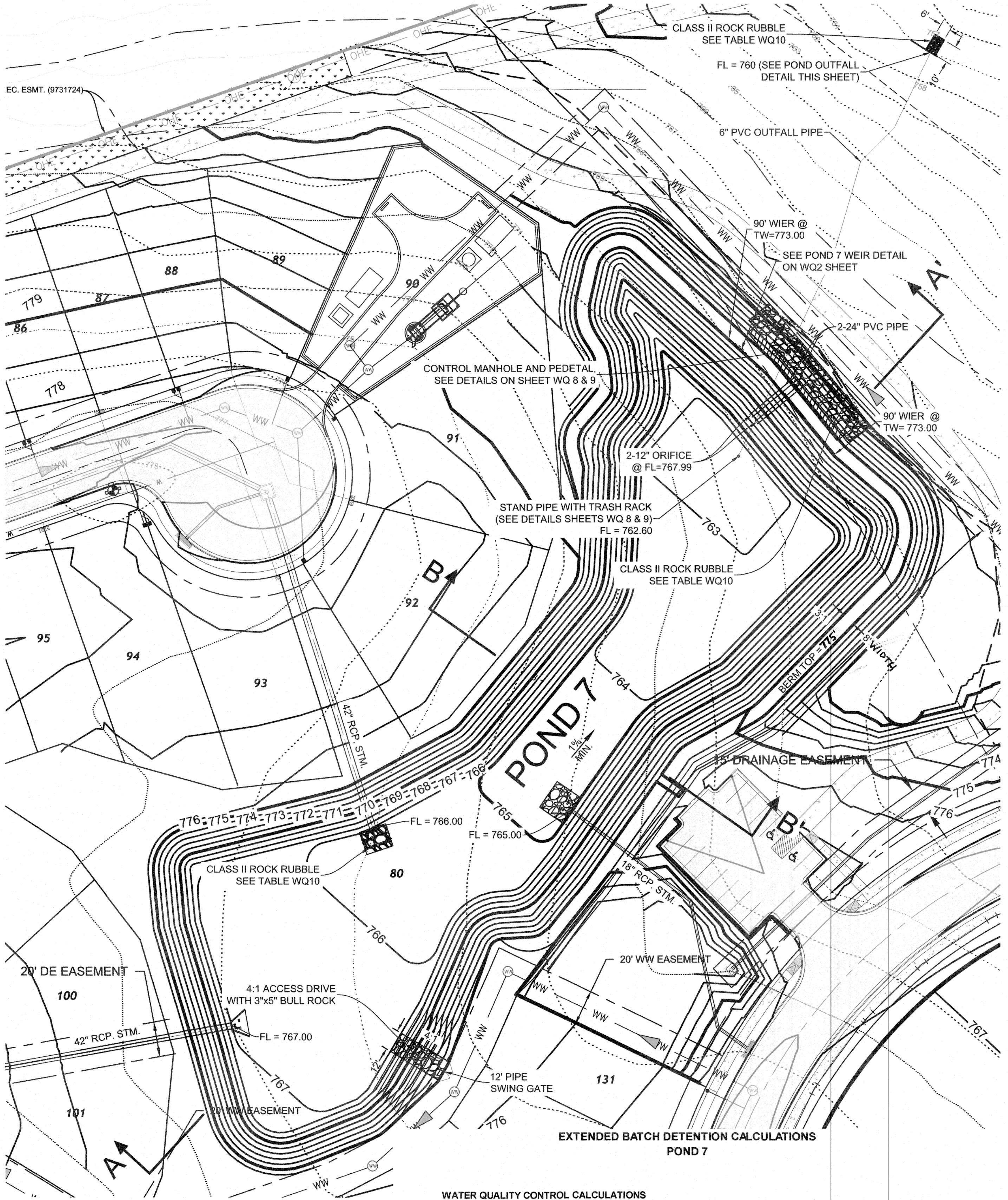
Calculations from RG-348A Pages 3-36 to 3-37

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 = **21554**
Total Capture Volume (required water quality volume(s) x 1.20) = 129326 cubic feet
The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348A Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = **129326** cubic feet



N

0 40 80
1" = 40'

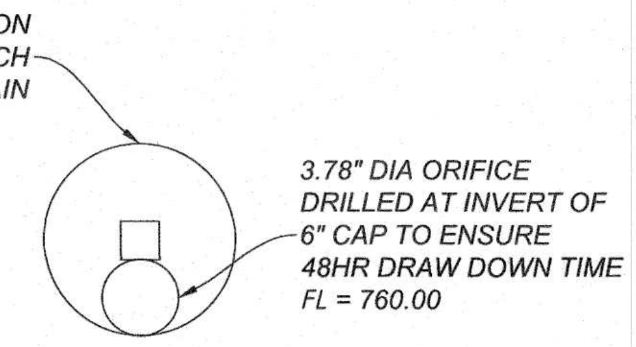
LEGEND:

—○—	PROPOSED FENCE
·····780·····	EXISTING CONTOURS
—700—	PROPOSED CONTOURS
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
▬	PROPOSED RETAINING WALL
○	PROPOSED SHADE TREE

NOTES:

1. COMPACT SUBGRADE TO 95% DENSITY MINIMUM 12 INCHES BELOW POND
2. 12 INCHES MINIMUM TOPSOIL AT POND BOTTOM.
3. SEE STRUCTURAL PLANS FOR WALL DETAILS.
4. CONTRACTOR TO USE DEWATERING SKIMMER DURING CONSTRUCTION, SEE EROSION CONTROL SHEET FOR LOCATION.
5. THE PROPOSED POND SHALL BE LOCATED WITHIN A DRAINAGE EASEMENT LOT TO BE DEDICATED PER FINAL PLAT.

POND OUTFALL DETAIL



FILTRATION DRAIN
OUTLET ORIFICE CAP

SCALE: 1" = 6"

EXTENDED BATCH DETENTION CALCULATIONS
POND 7

WATER QUALITY CONTROL CALCULATIONS

25-year Peak Flow Rate	201.7 cfs
100-year Peak Flow Rate	256.8 cfs

	Required	Provided
Water Quality Volume	129,326 cf	129,847 cf
Water Quality Elevation	767.999 ft MSL	767.999 ft MSL
WQV Height Above Pond Bottom	Max 5.00 ft	4.999 ft
Length of WQV Weir	85 ft	90 ft (or using HEC-HMS design)
Head above Weir on Design Flow (100yr Storm)	Max 1.00 ft	0.97 ft

WATER QUALITY STAGE/STORAGE RELATIONSHIPS

BATCH DETENTION POND

	STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)
Orifice FL	762.60	0	0	0	0.00000
Pond Bot	763.00	3,693	492	492	0.01130
	764.00	12,746	7,766	8,259	0.18960
	765.00	19,065	15,800	24,059	0.55232
	766.00	28,675	23,707	47,766	1.09656
	767.00	43,783	35,964	83,730	1.92217
WQV	767.999	48,587	46,118	129,847	2.98089
	768.00	48,591	49	129,896	2.98200
	769.00	52,591	50,578	180,474	4.14311
	770.00	56,659	54,612	235,086	5.39684
	771.00	60,815	58,725	293,811	6.74498
	772.00	65,017	62,904	356,715	8.18906
	773.00	69,275	67,135	423,850	9.73026
	774.00	73,627	71,440	495,290	11.37029
	775.00	78,001	75,803	571,094	13.11050

UNDERDRAIN PIPE ORIFICE OPENING		
Avg Head=	4.00	ft
48 hour=	172,800	sec
Average Flow (WQV/48 Hour)=	0.75143	cfs
Orifice Area (Q/(0.6*(2gh)^0.5))=	0.07804	sf
Orifice Area=	11.24	in^2
Orifice Diameter=	3.78	in
Orifice Diameter Used=	3.78	in
Drawdown time =	48.00	hours

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WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND 7 SECTIONS

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ1.dwg

JUSTIN D. MIDURA
128809
2-26-2024

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2700 La Frontera Blvd
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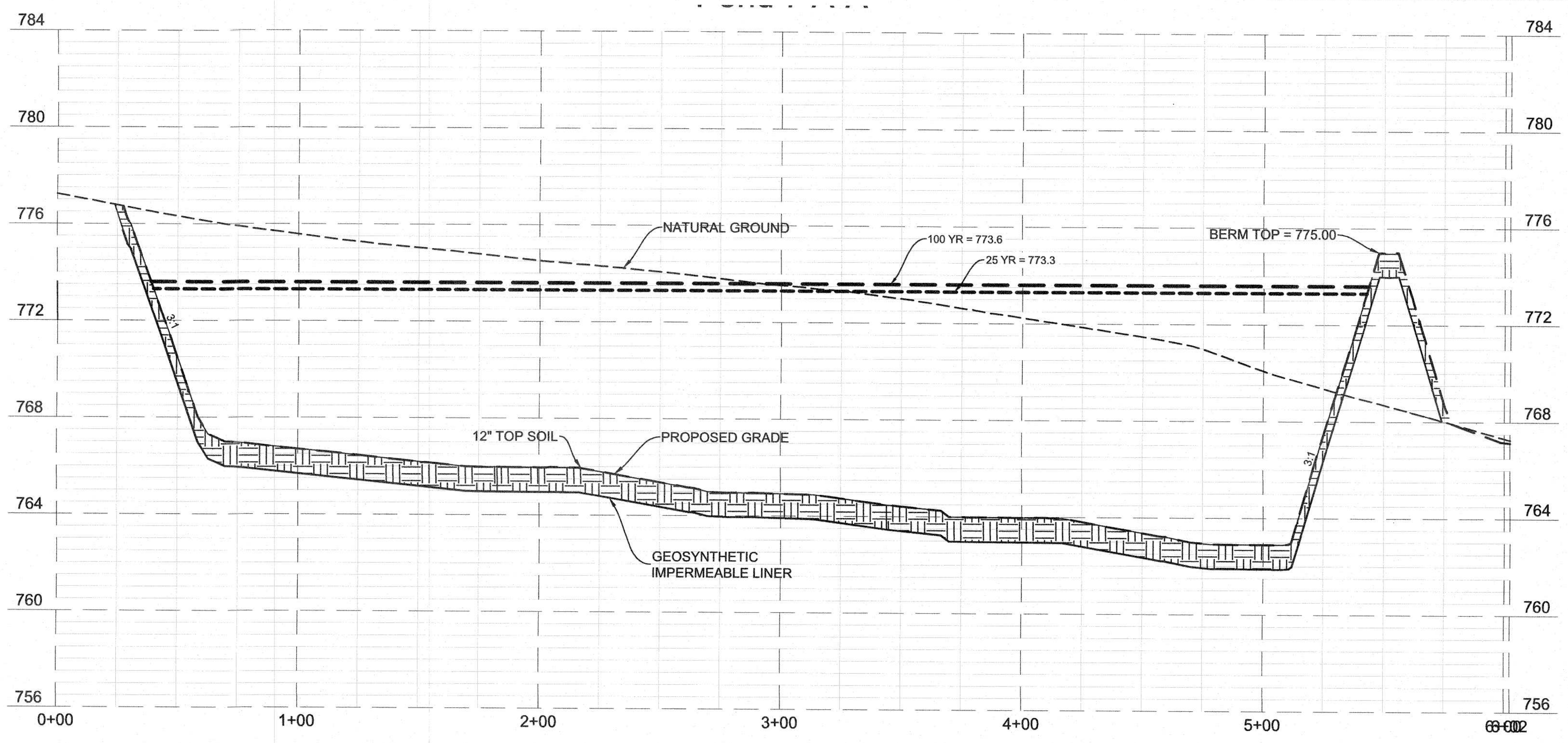
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

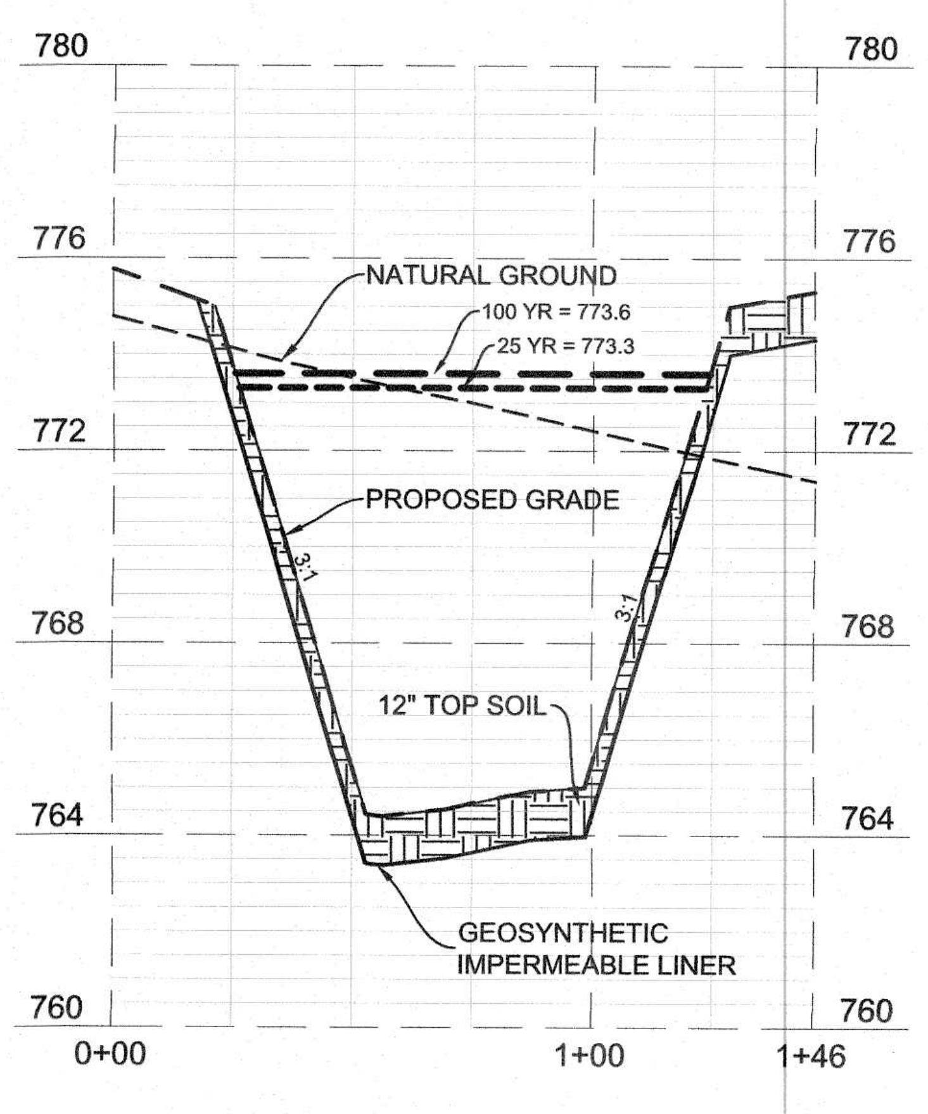
JOB NUMBER:
A245-1002

WQ1

SHEET NO.
56
OF 118 SHEETS



SECTION A-A'
STA 0+00 - STA. 6+00
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

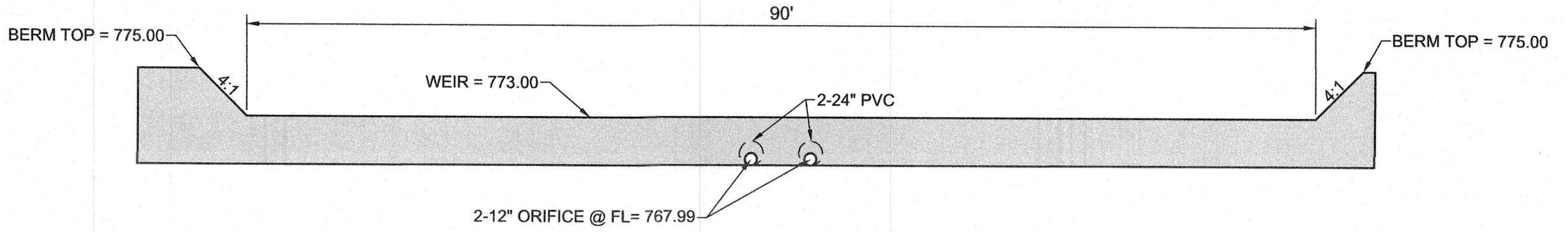


SECTION B-B'
STA 0+00 - STA. 1+50
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

Table 3-7 Geotextile Fabric Specifications (COA, 2004)

Property	Test Method	Unit	Specification (min)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified



POND 7 WEIR DETAIL
SCALE : 1" = 10'

Orifice Equation
Q = C*A*[(2*g*H)^(1/2)]

Weir Equation
Q = C*L*H ^(3/2)

							ORIFICE 1	ORIFICE 2		
							D = 1 ft	D = 1 ft	WEIR	
							g = 32.2 ft/s^2	g = 32.2 ft/s^2	L = 90 ft	
							C = 0.6	C = 0.6	C = 3	
					Orifice	Weir	A = 0.79 ft^2	A = 0.79 ft^2		
STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)	H (ft)	H (ft)	Q (cfs)	Q (cfs)	Q (cfs)	Q Total (cfs)
762.60	0	0	0	0.000	0.000	0.00	0.00	0.00	0.00	0.00
763.00	3,693	492	492	0.011	0.000	0.00	0.00	0.00	0.00	0.00
764.00	12,746	7,766	8,259	0.190	0.000	0.00	0.00	0.00	0.00	0.00
765.00	19,065	15,800	24,059	0.552	0.000	0.00	0.00	0.00	0.00	0.00
766.00	28,675	23,707	47,766	1.097	0.000	0.00	0.00	0.00	0.00	0.00
767.00	43,783	35,964	83,730	1.922	0.000	0.00	0.00	0.00	0.00	0.00
767.999	48,587	46,118	129,847	2.981	0.000	0.00	0.00	0.00	0.00	0.00
768.00	48,591	49	129,896	2.982	0.001	0.00	0.12	0.12	0.00	0.24
769.00	52,591	50,578	180,474	4.143	1.001	0.00	3.81	3.81	0.00	7.61
770.00	56,659	54,612	235,086	5.397	2.001	0.00	5.38	5.38	0.00	10.76
771.00	60,815	58,725	293,811	6.745	3.001	0.00	6.59	6.59	0.00	13.18
772.00	65,017	62,904	356,715	8.189	4.001	0.00	7.61	7.61	0.00	15.22
773.00	69,275	67,135	423,850	9.730	5.001	0.00	8.51	8.51	0.00	17.01
774.00	73,627	71,440	495,290	11.370	6.001	1.00	9.32	9.32	270.00	288.64
775.00	78,001	75,803	571,094	13.111	7.001	2.00	10.06	10.06	763.68	783.80

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

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND 7 SECTIONS

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ2.dwg

JUSTIN D. MIDURA
128809
2-26-2024

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FRN - F-1386

JOB NUMBER:
A245-1002

WQ2

SHEET NO.
57
OF 118 SHEETS

2023-33-CON

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Woodfield Preserve
Date Prepared: 11/20/2023

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-348A.
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-348A Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93026(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% 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 = Williamson
Total project area included in plan * = 281.25 acres
Predevelopment impervious area within the limits of the plan * = 0.43 acres
Total post-development impervious area within the limits of the plan* = 116.71 acres
Total post-development impervious cover fraction * = **0.41**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **107654** lbs.
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 15

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

Drainage Basin/Outfall Area No. = 8

Total drainage basin/outfall area = 34.53 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 16.05 acres
Post-development impervious fraction within drainage basin/outfall area = **0.46**
$L_{M\ THIS\ BASIN}$ = **14860** lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention (Batch Detention Basin)
Removal efficiency = **91** percent

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

RG-348A 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 = 34.53 acres
A_I = 16.05 acres
A_P = **18.48** acres
L_R = **16464** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 14860 lbs.

F = **0.90**

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

Rainfall Depth = **1.70** inches
Post Development Runoff Coefficient = **0.45**
On-site Water Quality Volume = **94852** cubic feet

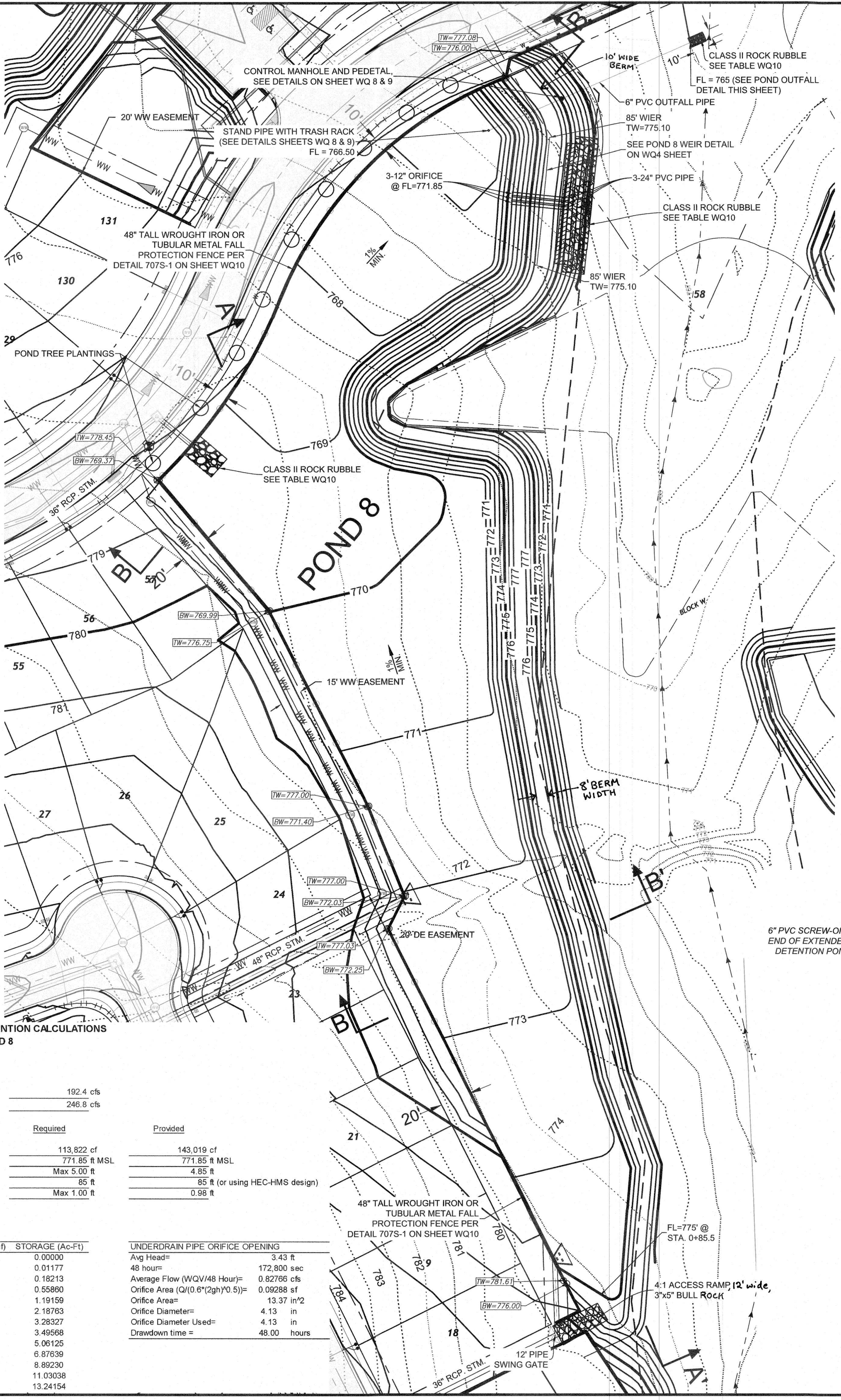
Calculations from RG-348A Pages 3-36 to 3-37

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 = **18970**
Total Capture Volume (required water quality volume(s) x 1.20) = 113822 cubic feet
The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348A Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = **113822** cubic feet



EXTENDED BATCH DETENTION CALCULATIONS
POND 8

WATER QUALITY CONTROL CALCULATIONS

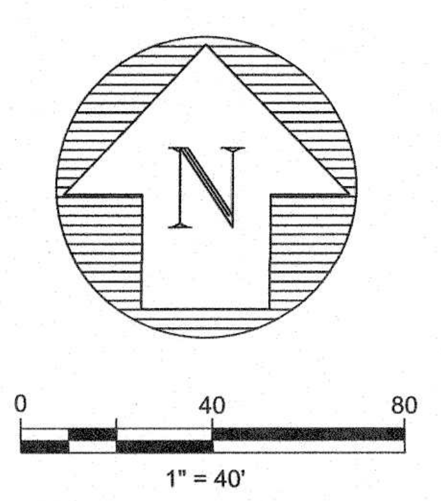
25-year Peak Flow Rate	192.4 cfs	
100-year Peak Flow Rate	246.8 cfs	
	Required	Provided
Water Quality Volume	113,822 cf	143,019 cf
Water Quality Elevation	771.85 ft MSL	771.85 ft MSL
WQV Height Above Pond Bottom	Max 5.00 ft	4.85 ft
Length of WQV Weir	85 ft	85 ft (or using HEC-HMS design)
Head above Weir on Design Flow (100yr Storm)	Max 1.00 ft	0.98 ft

WATER QUALITY STAGE/STORAGE RELATIONSHIPS

BATCH DETENTION POND

	STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)
Orifice FL	766.50	0	0	0	0.00000
Pond Bot	767.00	3,075	513	513	0.01177
	768.00	12,891	7,421	7,934	0.18213
	769.00	20,179	16,399	24,333	0.55860
	770.00	35,700	27,573	51,906	1.19159
	771.00	51,560	43,387	95,293	2.18763
WQV	771.85	60,866	47,726	143,019	3.28327
	772.00	62,508	9,253	152,272	3.49568
	773.00	74,046	68,196	220,468	5.06125
	774.00	84,197	79,067	299,535	6.87639
	775.00	91,479	87,813	387,349	8.89230
	776.00	94,800	93,135	480,483	11.03038
	777.00	97,845	96,318	576,801	13.24154

UNDERDRAIN PIPE ORIFICE OPENING		
Avg Head=	3.43	ft
48 hour=	172,800	sec
Average Flow (WQV/48 Hour)=	0.82766	cfs
Orifice Area (Q/(0.6*(2gh)^0.5))=	0.09288	sf
Orifice Area=	13.37	in^2
Orifice Diameter=	4.13	in
Orifice Diameter Used=	4.13	in
Drawdown time =	48.00	hours

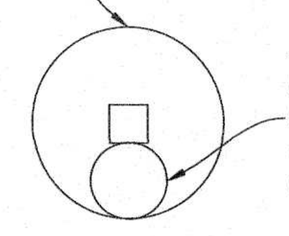


LEGEND:

——○——	PROPOSED FENCE
······700······	EXISTING CONTOURS
——700——	PROPOSED CONTOURS
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
▬▬▬	PROPOSED RETAINING WALL
○	PROPOSED SHADE TREE

NOTES:
1. COMPACT SUBGRADE TO 95% DENSITY MINIMUM 12 INCHES BELOW POND
2. 12 INCHES MINIMUM TOPSOIL AT POND BOTTOM.
3. SEE STRUCTURAL PLANS FOR WALL DETAILS.
4. CONTRACTOR TO USE DEWATERING SKIMMER DURING CONSTRUCTION, SEE EROSION CONTROL SHEET FOR LOCATION.
5. THE PROPOSED POND SHALL BE LOCATED WITHIN A DRAINAGE EASEMENT LOT TO BE DEDICATED PER FINAL PLAT.

POND OUTFALL DETAIL



FILTRATION DRAIN OUTLET ORIFICE CAP

SCALE: 1" = 6"

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

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

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND 8 SECTIONS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ3.dwg

JUSTIN D. MIDURA
128809
3-26-2024

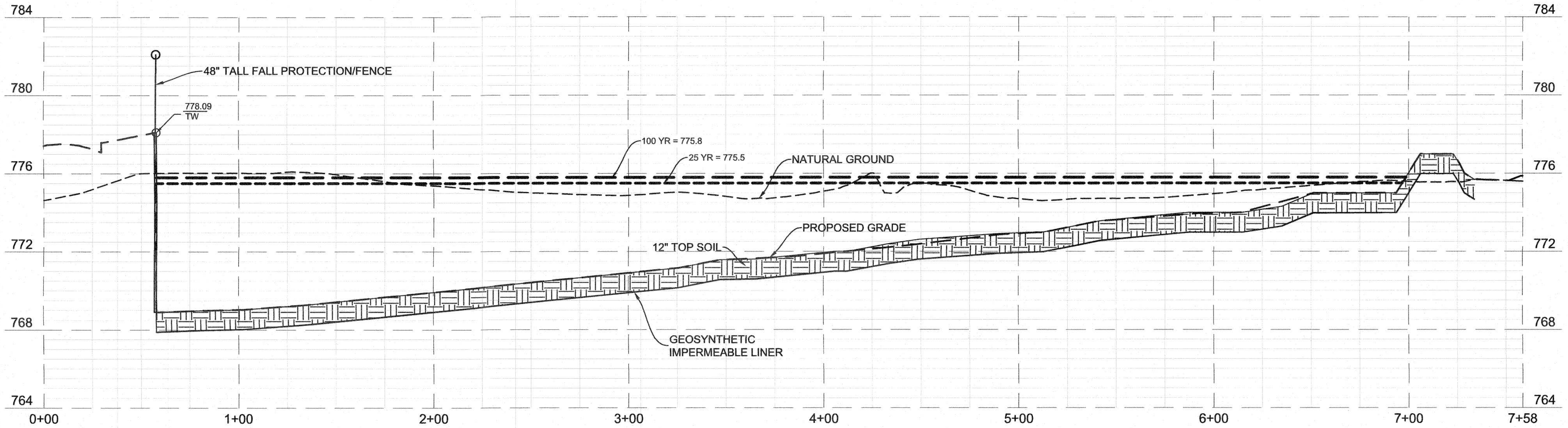
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WQ3

SHEET NO.
58
OF 118 SHEETS

Date\Time : Tue, 27 Feb 2024 - 3:29pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WQ3.dwg



SECTION A-A'
STA 0+00 - STA. 7+50
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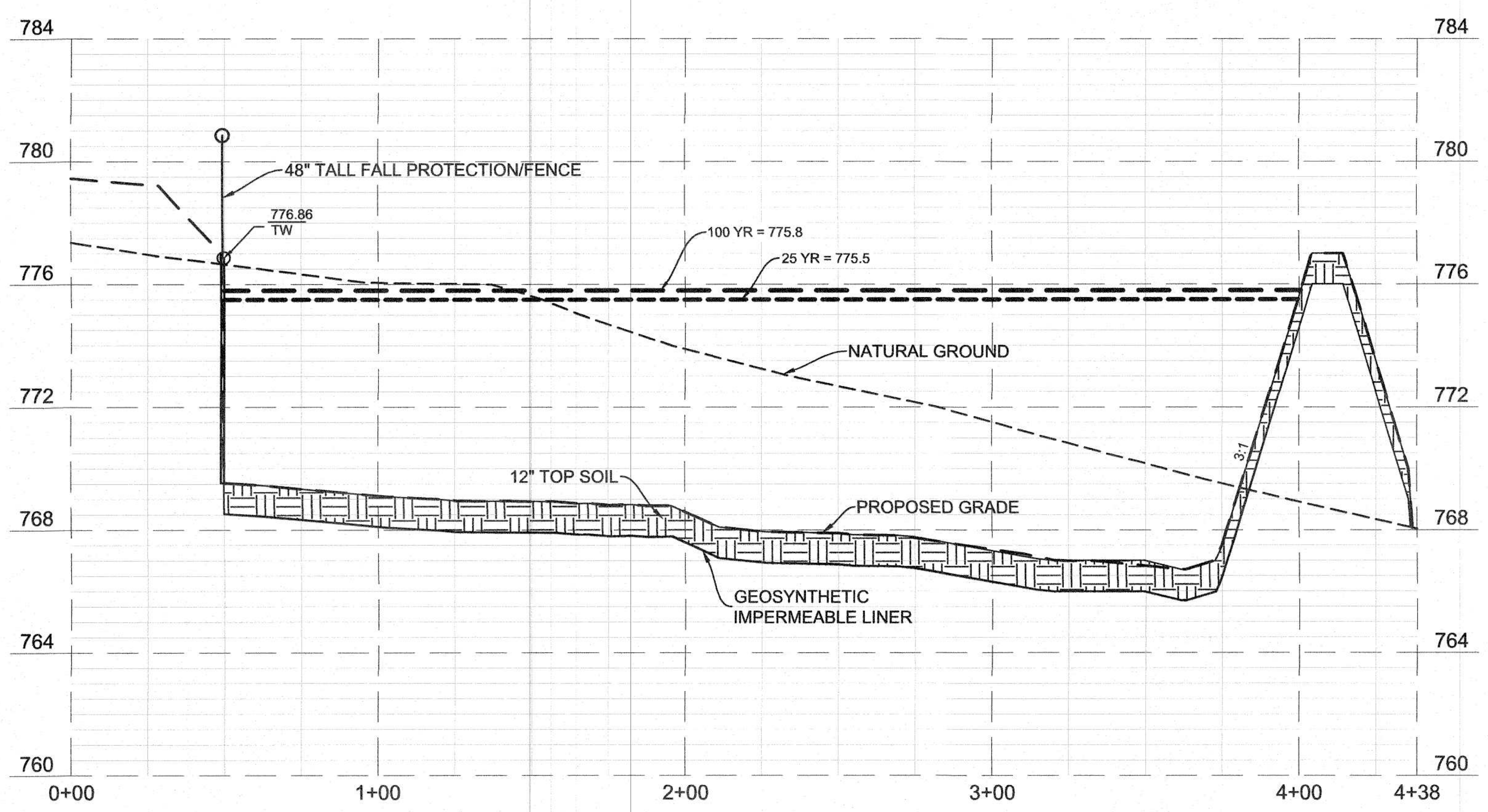
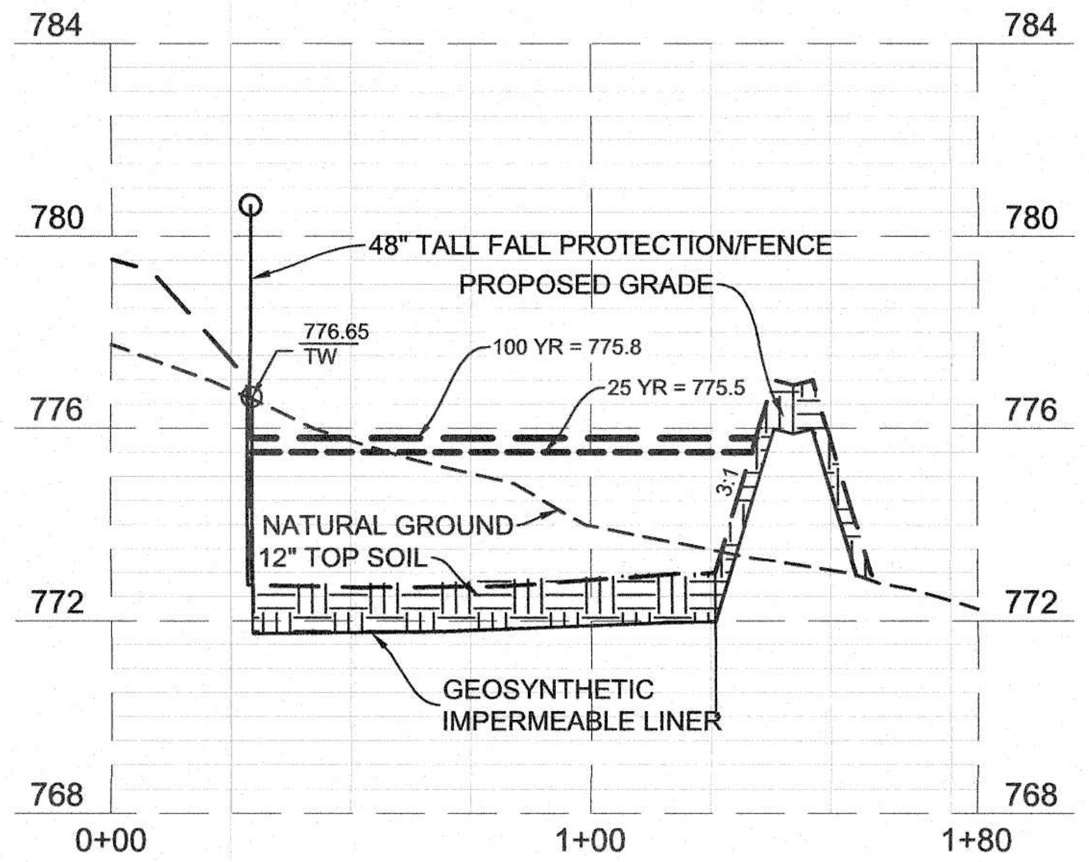
SCALE : 1=4' (VERTICAL)



SECTION B-B'
STA. 0+00 - STA. 4+50
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

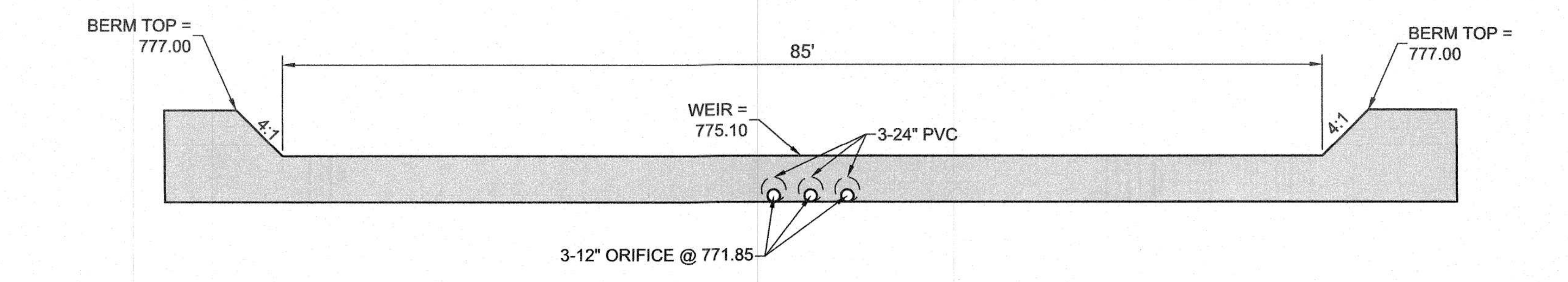


SECTION C-C'
STA 0+00 - STA. 2+00
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

Table 3-7 Geotextile Fabric Specifications (COA, 2004)

Property	Test Method	Unit	Specification (min)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified



POND 8 WEIR DETAIL
SCALE : 1" = 10'

Orifice Equation

Q = C*A*[(2*g*H)^(1/2)]

Weir Equation

Q = C*L*H ^(3/2)

					Orifice	Weir	ORIFICE 1 D = 1 ft g = 32.2 ft/s^2 C = 0.6 A = 0.79 ft^2	ORIFICE 2 D = 1 ft g = 32.2 ft/s^2 C = 0.6 A = 0.79 ft^2	ORIFICE 3 D = 1 ft g = 32.2 ft/s^2 C = 0.6 A = 0.79 ft^2	WEIR L = 85 ft C = 3	
STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)	H (ft)	H (ft)	Q (cfs)	Q (cfs)	Q (cfs)	Q (cfs)	Q Total (cfs)
766.50	0	0	0	0.00	0.00	0.00	0.000	0.000	0.000	0.00	0.000
767.00	3,075	513	513	0.01	0.00	0.00	0.000	0.000	0.000	0.00	0.000
768.00	12,891	7,421	7,934	0.18	0.00	0.00	0.000	0.000	0.000	0.00	0.000
769.00	20,179	16,399	24,333	0.56	0.00	0.00	0.000	0.000	0.000	0.00	0.000
770.00	35,700	27,573	51,906	1.19	0.00	0.00	0.000	0.000	0.000	0.00	0.000
771.00	51,560	43,387	95,293	2.19	0.00	0.00	0.000	0.000	0.000	0.00	0.000
771.85	60,866	47,726	143,019	3.28	0.00	0.00	0.000	0.000	0.000	0.00	0.000
772.00	62,508	9,253	152,272	3.50	0.15	0.00	1.473	1.473	1.473	0.00	4.420
773.00	74,046	68,196	220,468	5.06	1.15	0.00	4.079	4.079	4.079	0.00	12.237
774.00	84,197	79,067	299,535	6.88	2.15	0.00	5.578	5.578	5.578	0.00	16.733
775.00	91,479	87,813	387,349	8.89	3.15	0.00	6.751	6.751	6.751	0.00	20.253
776.00	94,800	93,135	480,483	11.03	4.15	0.90	7.749	7.749	7.749	217.72	240.970
777.00	97,845	96,318	576,801	13.24	5.15	1.90	8.632	8.632	8.632	667.84	693.734

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

WOODFIELD PRESERVE
PHASE 3
WATER QUALITY POND 8 SECTIONS

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ4.dwg

JUSTIN D. MIDURA
128809
2-26-2024

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Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WQ4

SHEET NO.
59
OF 118 SHEETS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Woodfield Preserve**
Date Prepared: **11/20/2023**

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-348A.
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-348A Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93026(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% 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 = **Williamson**
Total project area included in plan * = **281.25** acres
Predevelopment impervious area within the limits of the plan * = **0.43** acres
Total post-development impervious area within the limits of the plan* = **116.71** acres
Total post-development impervious cover fraction * = **0.41**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **107654** lbs.
*** The values entered in these fields should be for the total project area.**

Number of drainage basins / outfalls areas leaving the plan area = **15**

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

Drainage Basin/Outfall Area No. = 9

Total drainage basin/outfall area = **11.82** acres
Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
Post-development impervious area within drainage basin/outfall area = **5.11** acres
Post-development impervious fraction within drainage basin/outfall area = **0.43**
$L_{M\ THIS\ BASIN}$ = **4726** lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Extended Detention** **(Batch Detention Basin)**
Removal efficiency = **91** percent

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

RG-348A 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 = **11.82** acres
A_I = **5.11** acres
A_P = **6.71** acres
L_R = **5249** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = **4730** lbs.

F = **0.90**

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

Rainfall Depth = **1.70** inches
Post Development Runoff Coefficient = **0.42**
On-site Water Quality Volume = **30425** cubic feet

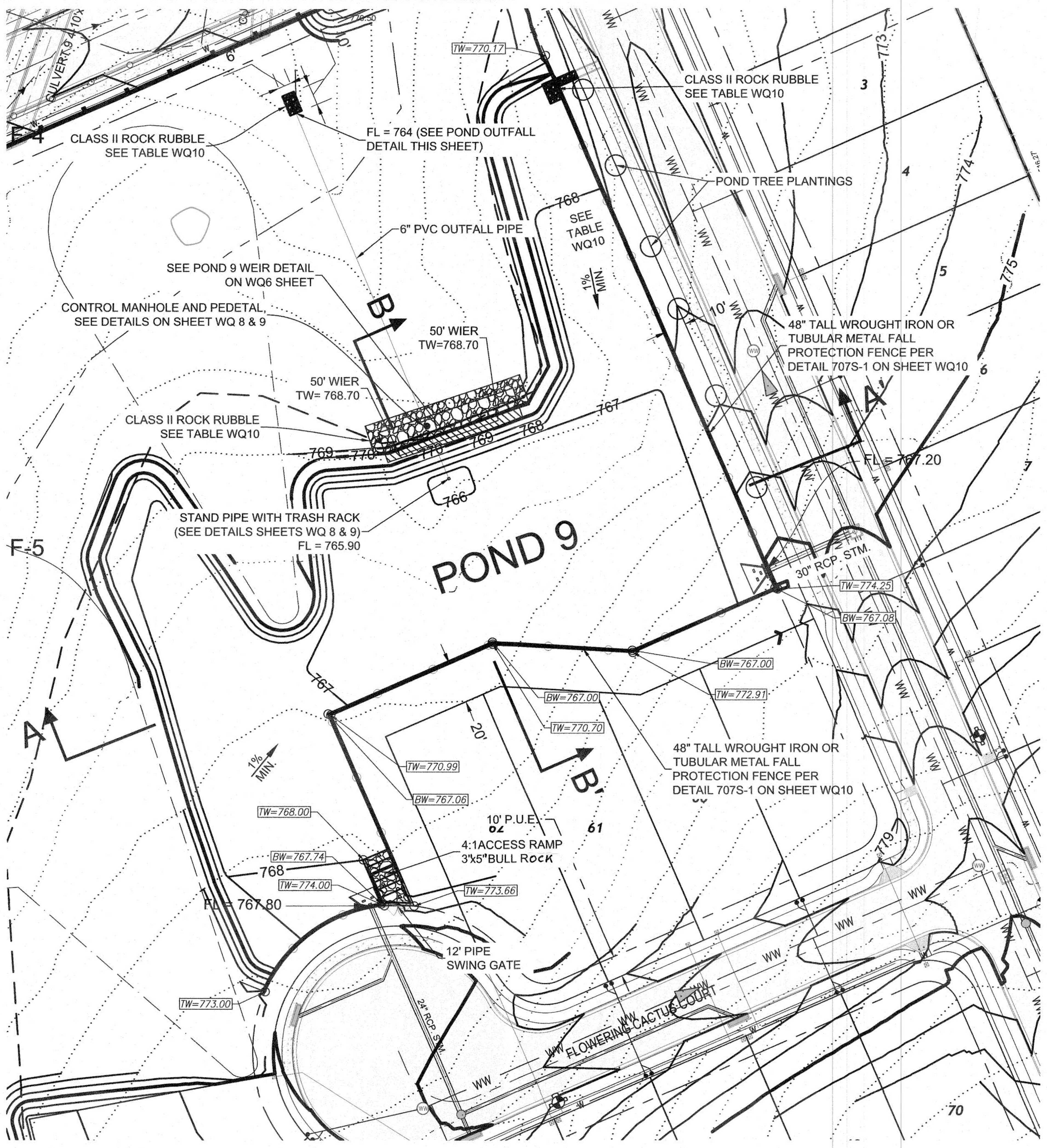
Calculations from RG-348A Pages 3-36 to 3-37

Off-site area draining to BMP = **8.14** acres
Off-site Impervious cover draining to BMP = **0.00** acres
Impervious fraction of off-site area = **0.00**
Off-site Runoff Coefficient = **0.02**
Off-site Water Quality Volume = **1005** cubic feet

Storage for Sediment = **6286**
Total Capture Volume (required water quality volume(s) x 1.20) = 37715 cubic feet
The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348A Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = **37715** cubic feet



N

0 40 80
1" = 40'

LEGEND:

—○—	PROPOSED FENCE
·····700·····	EXISTING CONTOURS
—700—	PROPOSED CONTOURS
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
▬	PROPOSED RETAINING WALL
○	PROPOSED SHADE TREE

NOTES:
1. COMPACT SUBGRADE TO 95% DENSITY MINIMUM 12 INCHES BELOW POND
2. 12 INCHES MINIMUM TOPSOIL AT POND BOTTOM.
3. SEE STRUCTURAL PLANS FOR WALL DETAILS.
4. CONTRACTOR TO USE DEWATERING SKIMMER DURING CONSTRUCTION, SEE EROSION CONTROL SHEET FOR LOCATION.
5. THE PROPOSED POND SHALL BE LOCATED WITHIN A DRAINAGE EASEMENT LOT TO BE DEDICATED PER FINAL PLAT.

EXTENDED BATCH DETENTION CALCULATIONS
POND 9

WATER QUALITY CONTROL CALCULATIONS

25-year Peak Flow Rate	70.0 cfs	
100-year Peak Flow Rate	90.5 cfs	

	Required	Provided
Water Quality Volume	37,715 cf	42,545 cf
Water Quality Elevation	768.20 ft MSL	768.20 ft MSL
WQV Height Above Pond Bottom	Max 5.00 ft	2.20 ft
Length of WQV Weir	30 ft	50 ft (or using HEC-HMS design)
Head above Weir on Design Flow (100yr Storm)	Max 1.00 ft	0.71 ft

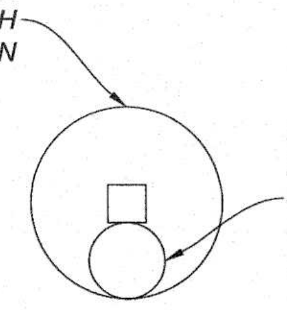
WATER QUALITY STAGE/STORAGE RELATIONSHIPS

BATCH DETENTION POND

	STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)
Orifice FL	765.90	0	0	0	0.00000
Pond Bot	766.00	279	9	9	0.00021
	767.00	18,774	7,114	7,124	0.16354
	768.00	37,840	27,756	34,879	0.80072
WQV	768.20	38,821	7,666	42,545	0.97670
	769.00	42,744	32,613	75,158	1.72540
	770.00	44,987	43,861	119,019	2.73230

UNDERDRAIN PIPE ORIFICE OPENING		
Avg Head=	2.10	ft
48 hour=	172,800	sec
Average Flow (WQV/48 Hour)=	0.24621	cfs
Orifice Area (Q/(0.6*(2gh)^0.5))=	0.03529	sf
Orifice Area=	5.08	in^2
Orifice Diameter=	2.54	in
Orifice Diameter Used=	2.54	in
Drawdown time =	48.00	hours

POND OUTFALL DETAIL



FILTRATION DRAIN
OUTLET ORIFICE CAP
SCALE: 1" = 6"

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811
Know what's below.
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WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND 9 SECTIONS

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ5.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
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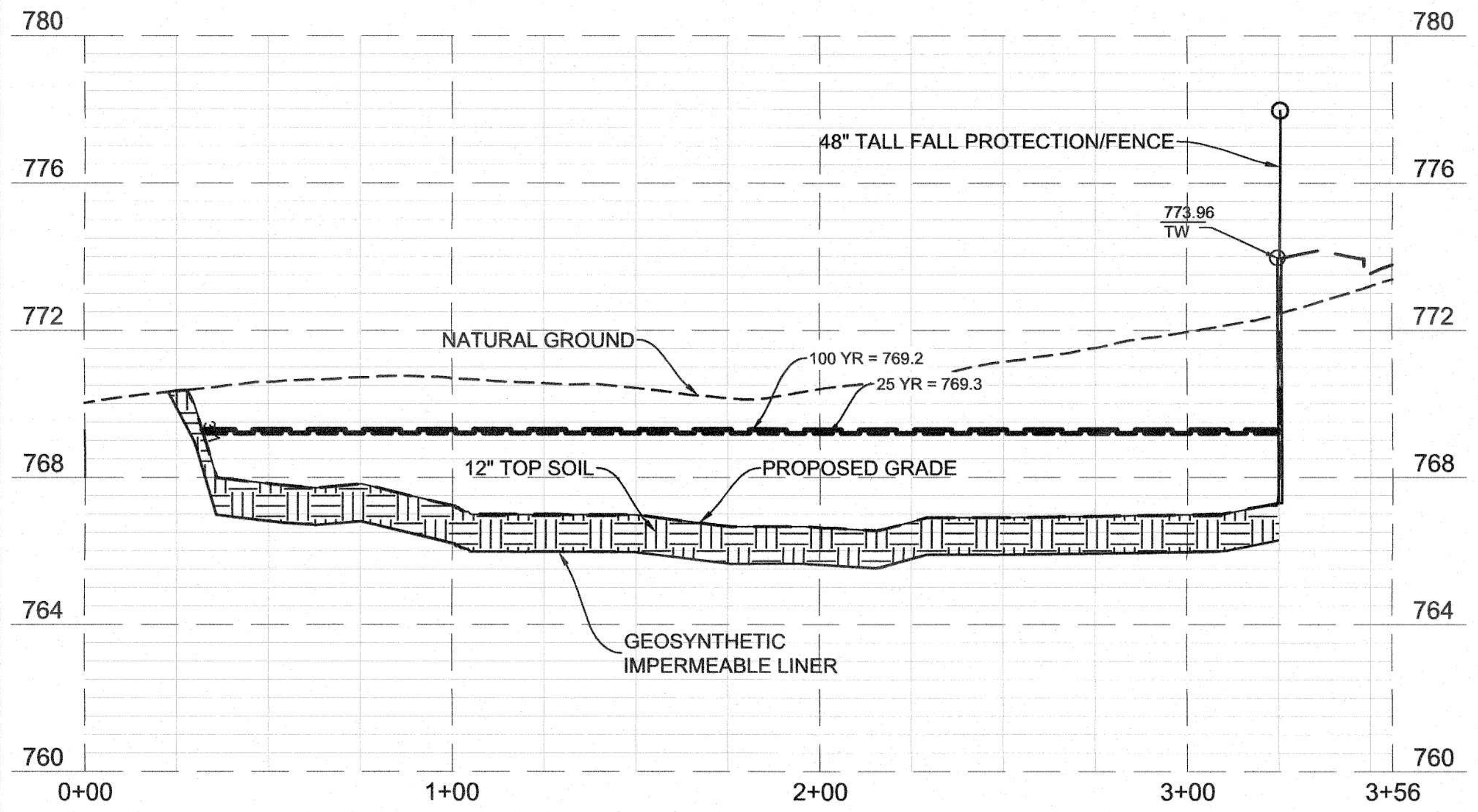
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

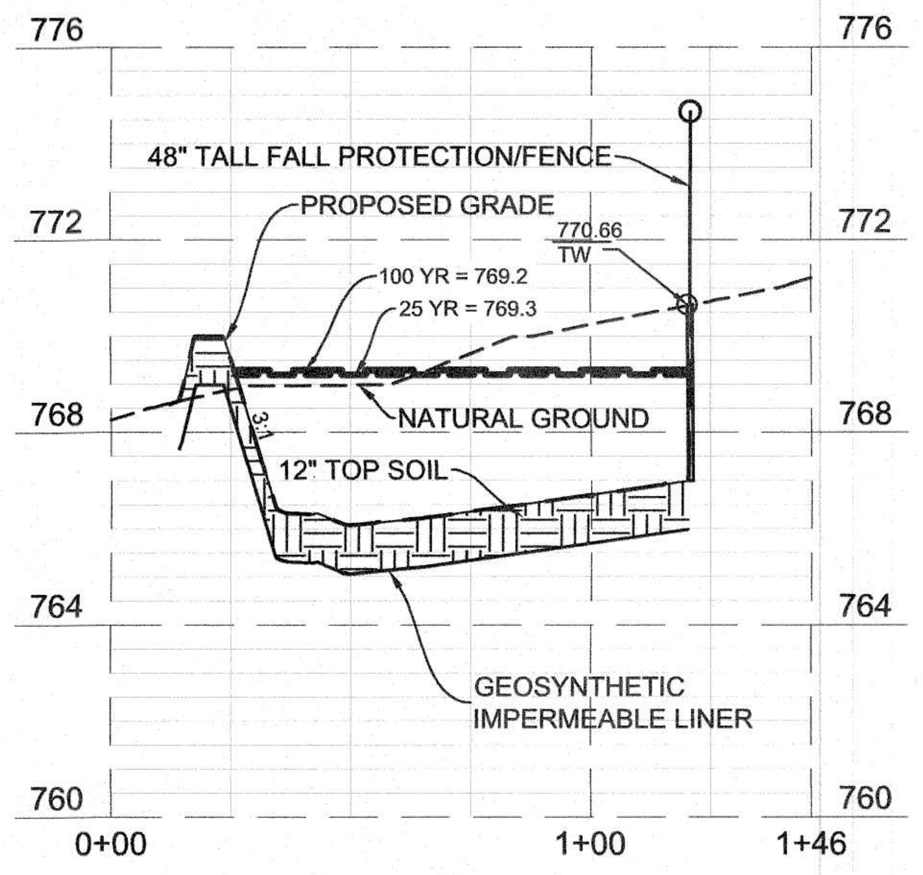
JOB NUMBER:
A245-1002

WQ5

SHEET NO.
60
OF 118 SHEETS



SECTION A-A'
STA 0+00 - STA. 3+50
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

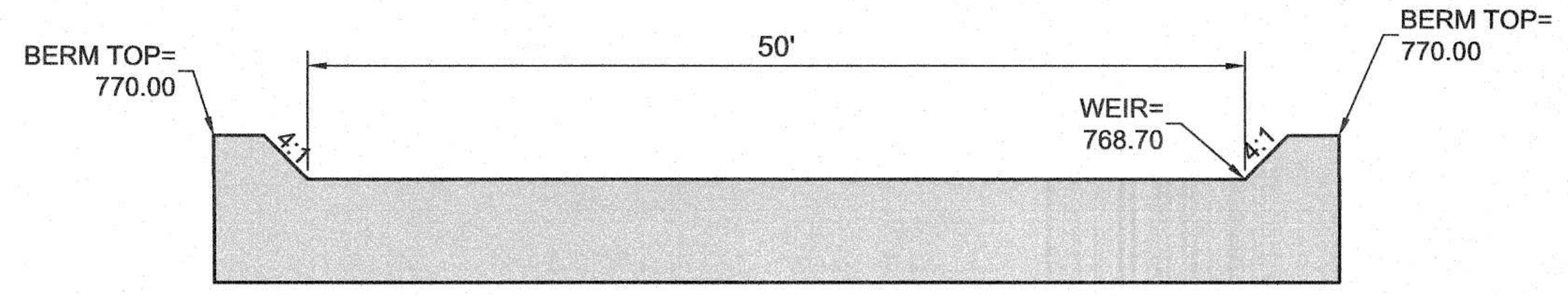


SECTION B-B'
STA. 0+00 - STA. 1+50
SCALE : 1=40' (HORIZONTAL)
SCALE : 1=4' (VERTICAL)

Table 3-7 Geotextile Fabric Specifications (COA, 2004)

Property	Test Method	Unit	Specification (min)
Unit Weight		oz/yd^2	8
Filtration Rate		in/sec	0.08
Puncture Strength	ASTM D-751*	lb	125
Mullen Burst Strength	ASTM D-751	psi	400
Tensile Strength	ASTM D-1682	lb	200
Equiv. Opening Size	US Standard Sieve	No.	80

*modified



POND 9 WEIR DETAIL
SCALE : 1" = 10'

Weir Equation

Q = C*L*H ^(3/2)

						WEIR
						L = 50 ft
						C = 3
STAGE	AREA (sf)	INC. VOL.	STORAGE (cf)	STORAGE (Ac-Ft)	H (ft)	Q (cfs)
765.90	0	0	0	0.00	0.00	0.00
766.00	279	9	9	0.00	0.00	0.00
767.00	18,774	7,114	7,124	0.16	0.00	0.00
768.00	37,840	27,756	34,879	0.80	0.00	0.00
768.20	38,821	7,666	42,545	0.98	0.00	0.00
769.00	42,744	32,613	75,158	1.73	0.30	24.65
770.00	44,987	43,861	119,019	2.73	1.30	222.33

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

Date\Time : Tue, 27 Feb 2024 - 3:30pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WQ6.dwg

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND 9 SECTIONS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ6.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
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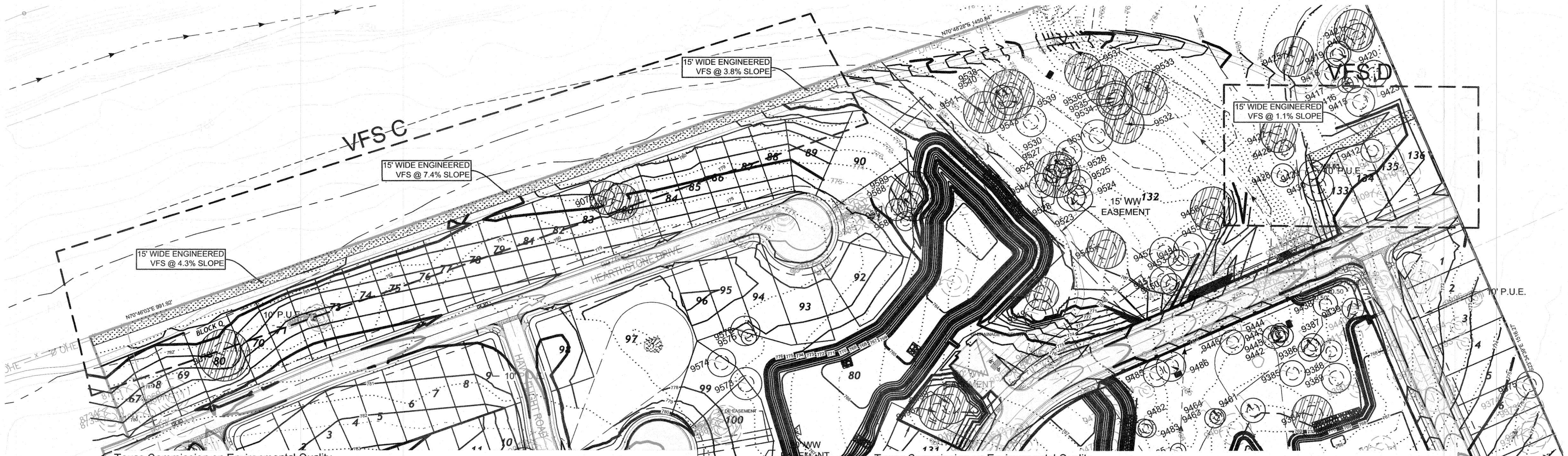
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WQ6

SHEET NO.
61
OF 118 SHEETS

2023-33-CON



LEGEND:

— 610 —	EXISTING CONTOURS
608	PROPOSED CONTOURS
604.00 TP	TOP OF PAVEMENT ELEVATION
604.00 TW	TOP OF WALL ELEVATION
604.00 BW	BOTTOM OF WALL ELEVATION
604.00 TC	TOP OF CURB ELEVATION
604.00 TG	TOP OF GRADE/GRATE ELEVATION
604.00 TLC	TOP OF LAY DOWN CURB ELEVATION
═	PROPOSED STORM SEWER LINE
▨	VEGETATED FILTER STRIP

Texas Commission on Environmental Quality

VFS C

TSS Removal Calculations 04-20-2009

Project Name: Woodfield Preserve
Date Prepared: 11/20/2023

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-348A.
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-348A Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93026(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% 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 = Williamson
Total project area included in plan * = 281.25 acres
Predevelopment impervious area within the limits of the plan * = 0.43 acres
Total post-development impervious area within the limits of the plan* = 116.71 acres
Total post-development impervious cover fraction * = **0.41**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **107654** lbs.
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 15

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

Drainage Basin/Outfall Area No. = 13

Total drainage basin/outfall area = 6.14 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 2.00 acres
Post-development impervious fraction within drainage basin/outfall area = **0.33**
$L_{M\ THIS\ BASIN}$ = **1848** lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips (Batch Detention Basin)
Removal efficiency = **85** percent

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

RG-348A 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 = 6.14 acres
A_I = 2.00 acres
A_P = **4.14** acres
L_R = **1940** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 1848 lbs.

F = **0.95**

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

Rainfall Depth = **2.60** inches
Post Development Runoff Coefficient = **0.33**
On-site Water Quality Volume = **18910** cubic feet

Calculations from RG-348A 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 = **3782**
Total Capture Volume (required water quality volume(s) x 1.20) = 22692 cubic feet
The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

16. Vegetated Filter Strips Designed as Required in RG-348 Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.

Texas Commission on Environmental Quality

VFS D

TSS Removal Calculations 04-20-2009

Project Name: Woodfield Preserve
Date Prepared: 11/20/2023

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-348A.
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-348A Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 28.93026(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 85% 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 = Williamson
Total project area included in plan * = 281.25 acres
Predevelopment impervious area within the limits of the plan * = 0.43 acres
Total post-development impervious area within the limits of the plan* = 116.71 acres
Total post-development impervious cover fraction * = **0.41**
P = **32** inches

$L_{M\ TOTAL\ PROJECT}$ = **107654** lbs.
* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 16

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

Drainage Basin/Outfall Area No. = 14

Total drainage basin/outfall area = 0.77 acres
Predevelopment impervious area within drainage basin/outfall area = 0.00 acres
Post-development impervious area within drainage basin/outfall area = 0.25 acres
Post-development impervious fraction within drainage basin/outfall area = **0.32**
$L_{M\ THIS\ BASIN}$ = **230** lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strips (Batch Detention Basin)
Removal efficiency = **85** percent

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

RG-348A 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 = 0.77 acres
A_I = 0.25 acres
A_P = **0.52** acres
L_R = **241** lbs

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

Desired $L_{M\ THIS\ BASIN}$ = 230 lbs.

F = **0.95**

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

Rainfall Depth = **2.60** inches
Post Development Runoff Coefficient = **0.32**
On-site Water Quality Volume = **2351** cubic feet

Calculations from RG-348A 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 = **470**
Total Capture Volume (required water quality volume(s) x 1.20) = 2821 cubic feet
The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

16. Vegetated Filter Strips Designed as Required in RG-348 Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.

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

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

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ7.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WQ7

SHEET NO.
62
OF 118 SHEETS

Date\Time : Tue, 27 Feb 2024 - 3:31pm User Name : jpiecuch
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Date\Time : Tue, 27 Feb 2024 - 4:29pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WQ8.dwg

smartPOND Valve SPECIFICATION

Continuously Monitored Automated Stormwater System with Valve

1. **Introduction**
The following specifications describe the components, general functions, and applications of a smartPOND Continuously Monitored Automated Stormwater System (C-MASS) with Valve. The system functions as an electronically controlled, solar powered stormwater management device, providing precision management capabilities and real-time data. Using sensors, solar power, an electronic actuator, and an internet-based control interface, the smartPOND valve connects to a specialized perforated riser inside the stormwater impoundment to enable managers to precisely control water retention and detention automatically or in real time.

2. **smartPOND Valve Applications in Stormwater Management**
The smartPOND valve is a device for active Stormwater management. As opposed to passive devices such as floating skimmers or stationary weirs, active water management dramatically increases the efficiency and effectiveness of a detention or retention pond. Where a passive stormwater detention system allows water to leave immediately upon collection, the smartPOND valve can detain newly caught Stormwater and allow it to settle for a programmed period before automatically dewatering the impoundment completely. For stormwater retention systems, it is possible to manage the treatment volume while maintaining a specified amount of capacity for flood storage or other use.

2.1 Pre-Programmed Control
Many functions can be pre-programmed without any human interactions, leaving the valve to automatically receive commands based on environmental conditions and respond as programmed.

2.1.1 Batch Detention Function for Stormwater Quality
The smartPOND valve meets TCEQ Batch Detention specifications for a 91% Total Suspended Solid removal rate. The function proceeds as follows. With the valve in the closed position and the impoundment dry, the system will stand by and wait for a water collection event. At the first sign of water collection, the unit will begin a 12-hour detention timer. At the end of the 12-hour detention period, the valve will open and release all of the water that has been collected. After the water level drops to 0", the valve will remain open for an additional 2 hours to facilitate final drainage, then return to the closed position to stand by for the next water collection event.

2.1.2 Predevelopment Hydrograph Function for Flood Control
The smartPOND valve predevelopment hydrograph function takes in site specific variables to determine a maximum release rate based on predevelopment conditions. The valve reads water depth in the pond every 15 minutes to determine the maximum release rate desirable to ensure the impoundment neither overtops, nor exceeds its maximum release based on predevelopment flows.

2.1.3 Hazmat Function for Spill Containment
smartPOND when specified for hazmat spill containment can be equipped with pollutant specific sensors that when triggered automatically close the valve until the command is overridden.

2.2 Real Time Monitoring
smartPOND comes standard with telemetry available on each unit and access to the user app available at no additional cost for 1 year. This option allows for real time monitoring of the unit and the data that comes along with it. From the real time monitoring app, a user can:
- Control the valve, either open or close
- See the water level
- See if trash or debris is surrounding the inlet
- Get maintenance alerts (Low Battery, Valve Failure, Etc.)
- Maintain specified water level

3. **Components**
The smartPOND valve may be implemented either above or below ground, and is comprised of the following components:

3.1 Hardware and Configuration
The standard smartPOND valve features a cast 6" valve. An extended spool and mounting flange on each side of the valve allows it to be attached to the outfall pipe in various configurations. The valve is actuated with an electric motor connected by an extendable drive shaft for underground applications.

For above ground applications, the entire system including all necessary components for operation assemble into one kit and are housed under a single lockable steel enclosure with the solar panel mounted on top. In this configuration, the unit can be installed on a stable, level pad and be bolted onto the back of the outfall pipe with six ¾" bolts and then switched to the "ON" position.

For underground applications, the valve is installed in a vault or concrete encasement as needed. An extended drive shaft connects between the underground valve and the rest of the components, including the motor and all electronics, which are housed in the lockable steel enclosure directly above ground.

3.2 Electronics and Software Specifications
- **Main board** - The main board of the smartPOND valve's electronics box serves as the main connection terminal for all sensors and additional control boards
- **Motor Controller Board** - The motor controller board of the smartPOND valve regulates the connection between the battery and the motor and receives inputs from the main board to control motor direction. It also powers the main board.
- **Motor** - The smartPOND valve's motor operates on 12-volts and has two wires connecting to the motor controller board. It is mounted on a bracket and connects to the directly to the valve with a driveshaft.
- **Battery** - The smartPOND valve is powered by a 12-volt, 30 amp/hour gel battery. Two terminals at the top connect the power wires to the motor controller board and the solar charge controller to the battery.
- **Solar Panel** - The solar panel of the smartPOND valve is 12-volts with 15 watt charging capability. It connects to a solar charge controller which regulates the voltage and current before connecting with two wires to the positive and negative battery terminals.
- **Sensors**
  - *Pressure Transducer* - The water level sensor is a pressure transducer sensor capable of staying submersed in water indefinitely. It mounts on the side of the smartPOND valve's center spool.
  - *Valve position sensor* - A proximity sensor senses the position of the valve's drive shaft in order to control and determine the position of the valve.
- **(Optional)**
  - *Cell data modem* - A cellular data modem will be required for real time control and alert options as well as predevelopment hydrograph functions.
  - *Hydrocarbon Sensor* - This optional sensor may be fitted to the smartPOND valve to perform specific functions based on the presence of hydrocarbon contamination.

4. **Real Time Monitoring Interface (optional)**
If the real time monitoring option is selected, the smartPOND valve may be monitored in real time through the Autoflow app. Live and historical data from each unit may be viewed in the app, as well as alerts (detailed in section 5).

4.1 Accessing unit data
To access live and historical data in the Autoflow app, select the unit of interest on the home page by clicking on the unit's name. From there, select the "Data" button, and the data page for that unit will be displayed.

4.2 Sending a command
To send a remote-control command to the SmartPOND valve, click the "Send New Command" button on the unit's home page. The unit's current position will be displayed at the top. To change the unit's position, simply select "OPEN" or "CLOSE". Within 1-3 minutes, the unit will move to the new position and update its status in the app.

5. **Alerts**
The smartPOND valve will indicate the following alerts by illuminating an exteriorly visible red LED light
- Low battery
- Loss of function
- Valve malfunction
- Hydrocarbon contamination (optional)

If the telemetry option is selected, the unit will upload the above alerts to the Autoflow app and notify the operator via text or email.

6. **In Case of Failure**
To bypass the smartPOND valve's normal automated functions and control the valve position in case of failure:

6.1 Removal of motor and manual direct control
In case of a total electronic or motor failure, the motor and motor bracket can be uninstalled together by removing the two bolts at the bottom of the motor bracket. With the motor and motor bracket removed, the output shaft on the butterfly valve can be manually controlled with a socket wrench, or any other tool that can grip the output shaft.

7. **Additional Components List**

7.1 Perforated Riser
The smartPOND valve system includes a stackable perforated steel riser which installs on the inlet side of the outfall pipe within the impoundment area. The perforated riser features an 8-inch steel perforated square tube within a 24" round steel mesh tube. At the bottom of the 8-inch square tube, there is a female threaded fitting for a six inch PVC outfall pipe to connect. The steel tube is perforated with 1-inch holes every 4" on center to the height of the impoundment.

7.2 Trash Cage
The trash cage attaches to the perforated riser with a coupling and calder pin. The trash cage will be comprised of steel banding and a 1.5" x 1.5" mesh to prevent floatable's and other contaminants from entering and clogging the perforated riser. The trash cage will sit 0.5" above the bottom of the impoundment to allow the last 0.5" out of the impoundment.

7.3 Valve Stem Extension
The drive shaft/valve stem of the smartPOND system may be extended to any length necessary for instances where the valve will be in an underground vault or manhole. The valve stem will connect the valve to the above ground controls.

8. **Maintenance**

8.1 Grease
The smartPOND valve includes a grease fitting on the valve itself which should be greased twice per year. It is also recommended that a thick, mildly heat-resistant grease be used to avoid grease melting out of the groove in warmer temperatures.

8.2 Flange Bolts
There are 6 bolts connecting the smartPOND valve's flange to the outfall pipe or fixture. During routine maintenance intervals, these bolts should be checked for tightness. All bolts should be tightened evenly.

8.3 Perforated Riser
Silt, sediment, and debris can build up around the perforated riser with time. An annual inspection of the unit is necessary to ensure that excess debris or sediment has not limited the drainage capacity of the perforated riser. To access the perforated riser for maintenance, lift the trash cage off of the riser, dig out any accumulated sediment, and clear all perforations.

8.4 Trash Cage
As a part of routine maintenance, it is advisable to remove trash and debris that has accumulated on the trash cage and properly dispose.

8.5 Solar Panel
On all inspection visits, it is necessary to confirm that the solar panel is facing south and is well secured. The solar panel is commonly utilized by birds and insects. It is important to keep the surface clean of bird litter, insect nests and debris in order to maintain optimal performance.

8.6 Battery
Over time, battery terminals may corrode. Check annually for corrosion and clean as needed. The battery should be replaced every 4 to 6 years.

8.7 Storage
The smartPOND valve is shipped in a near-fully assembled configuration and should be stored likewise. The systems are transported and stored on pallets and must remain secured via straps or steel bands to said pallet at all times. The solar panel is not installed at times of transport or storage and should not be installed until the unit is ready to begin operation. The battery may be stored inside the electronics box and if removed, should never be stored on a concrete surface.

9. **Installation**
The smartPOND valve can be installed in a near-completely assembled configuration. Only the solar panel should be removed during the installation process. There are several ways to install the smartPOND valve with the key being structured support.

9.1 Structural Support
If the smartPOND valve is mounted to a steel pipe in an above ground/fully assembled configuration, the weight of the unit may be supported by the steel pipe. For plastic or concrete pipes, it is recommended that the weight of the unit be supported by either a concrete pad or steel frame. For below ground installations, the upper unit (electronics and actuator) should be fastened to the surface of the concrete vault. For vault installations, see design details for standard vault design.

10. **Important Safety Information and Warnings:**
- Always keep hands clear of the valve and motor when unit is in operation.
- Turn the power switch off when doing any electrical work.
- Do not enter the water when the device is actively draining water
- Always use proper PPE and confined space protocol when servicing a valve beneath ground.

11. **PRODUCTS**
Manufacturer/Supplier/Reseller shall be an established stormwater company that has at least 5 installations of automated stormwater management devices that have been in use and functional for the past 3 or more years.

A. Acceptable smartPOND Valve
"smartBATCH" Automated Batch Detention System
"smartPOND" Automated Detention System

B. Acceptable System Supplier
Convergent Water Technologies, Inc.
(800)711-5428
www.convergentwater.com

C. Authorized Value Added Reseller
Construction EcoServices
(800)456-1000
www.ecosvs.com

12. **Quality Assurance and Performance Specifications**
The quality of all system components and all other appurtenances and their assembly process shall be subject to inspection upon delivery of the system to the work site.Installation is to be performed only by skilled work people with satisfactory record of performance on earthworks, pipe, welding, chamber, or pond/landfill construction projects of comparable size and quality.

NOTE: ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

smartPOND
Automated Stormwater Control

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
CONSTRUCTION ECO SERVICES
832-456-1000
www.ecosvs.com

smartPOND Valve
Specifications

REVISION NO.
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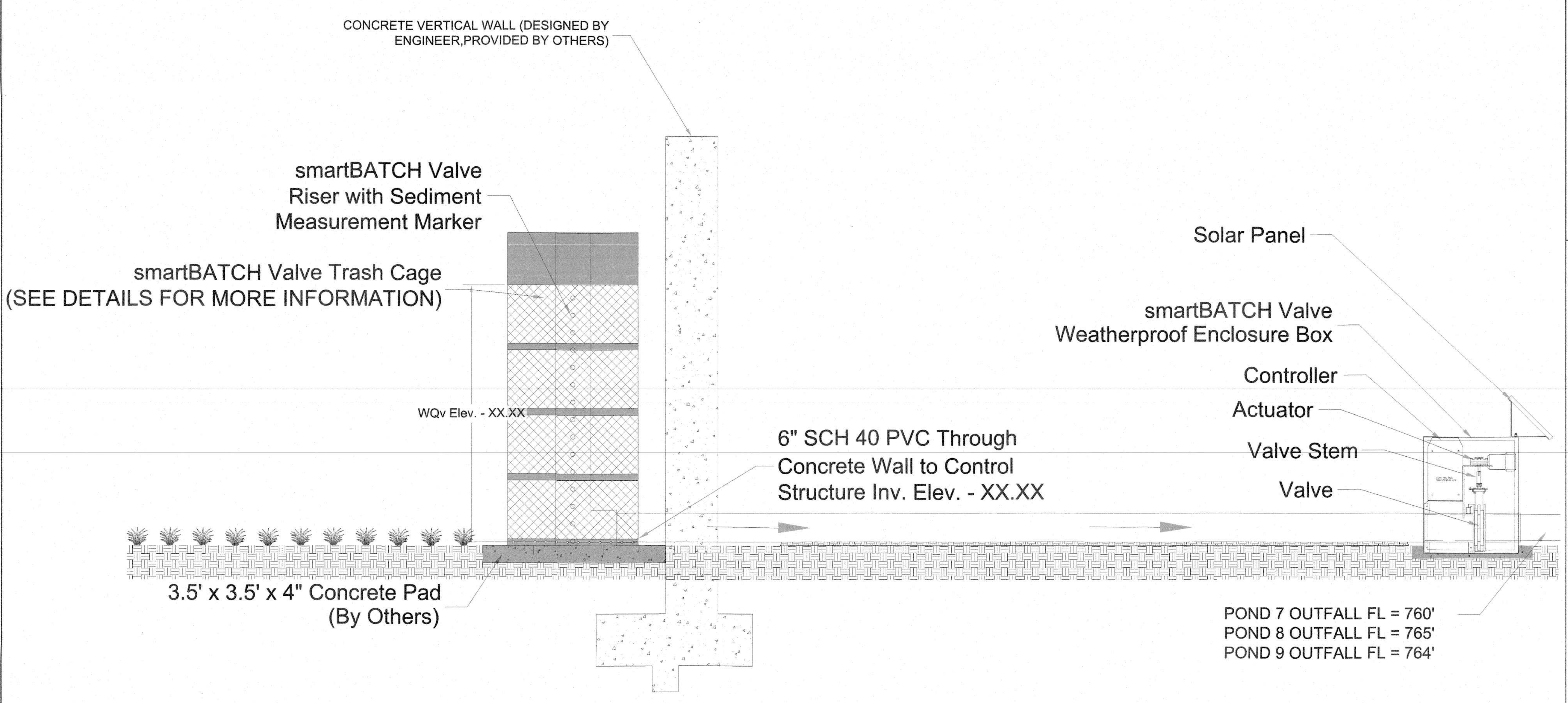
DATE
5/26/2020
SHEET NO.



smartPOND
Automated Stormwater Control

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
CONSTRUCTION ECO SERVICES
832-456-1000
www.ecosvs.com

CONSTRUCTION ECO SERVICES

smartBATCH Valve
with VERTICAL WALL

REVISION NO.
0
DATE
5/29/2020
SHEET NO.

2023-33-CON

SHEET NO.		JOB NUMBER:
63 OF 118 SHEETS	WQ8	A245-1002

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JUSTIN D. MIDURA
128809
2-26-2024

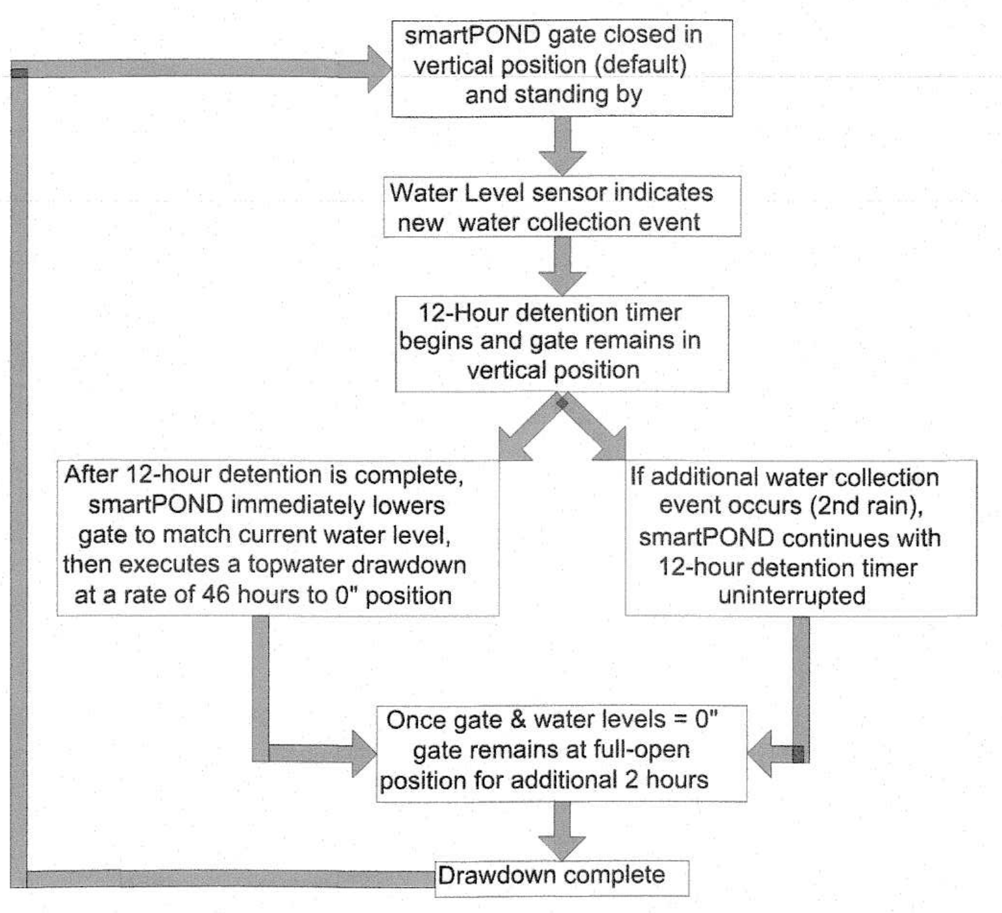
DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ8.dwg

REVISIONS			
NO.	DESCRIPTION	BY	DATE

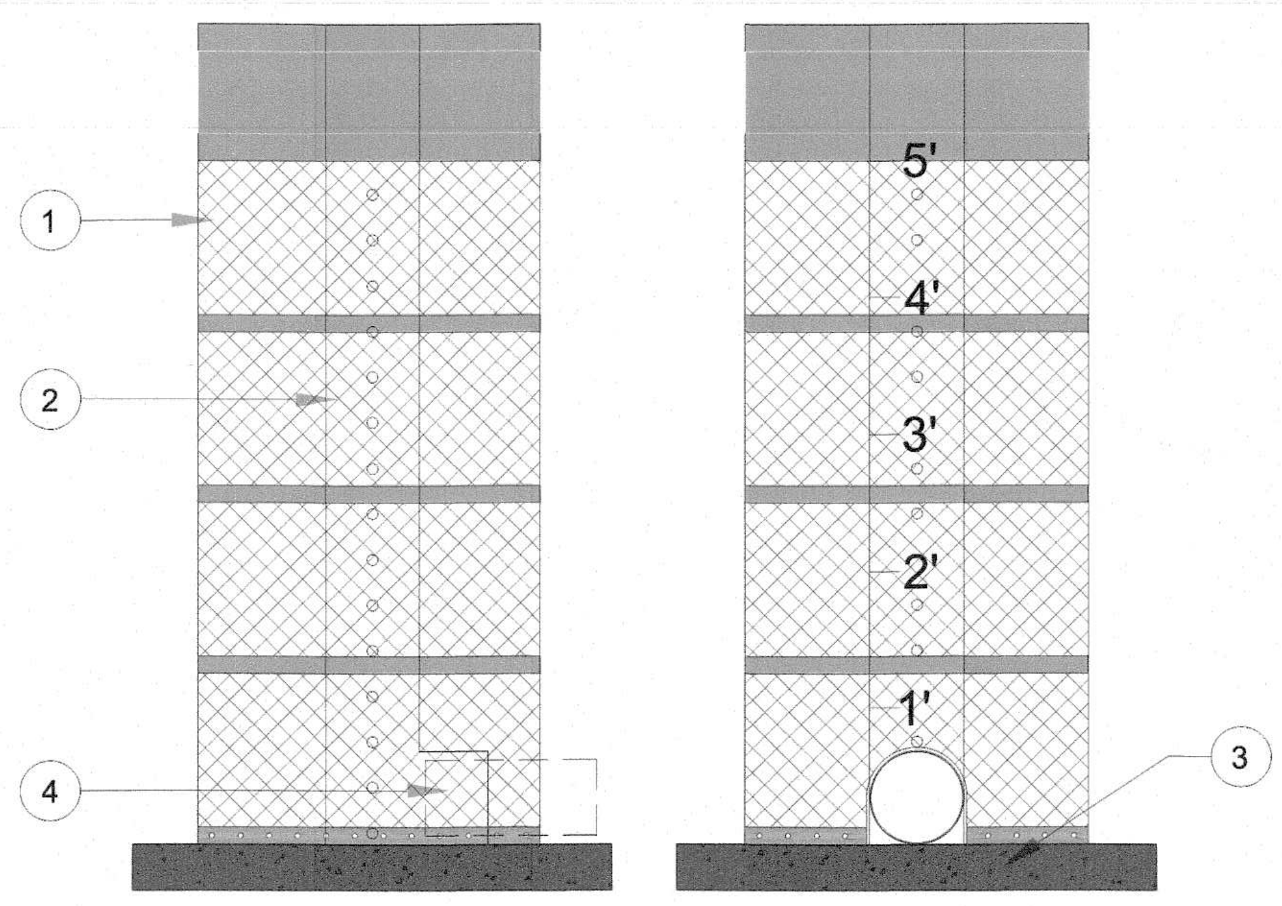
WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND SMARTPOND DETAILS

PROGRAMMABLE LOGIC FLOW CHART

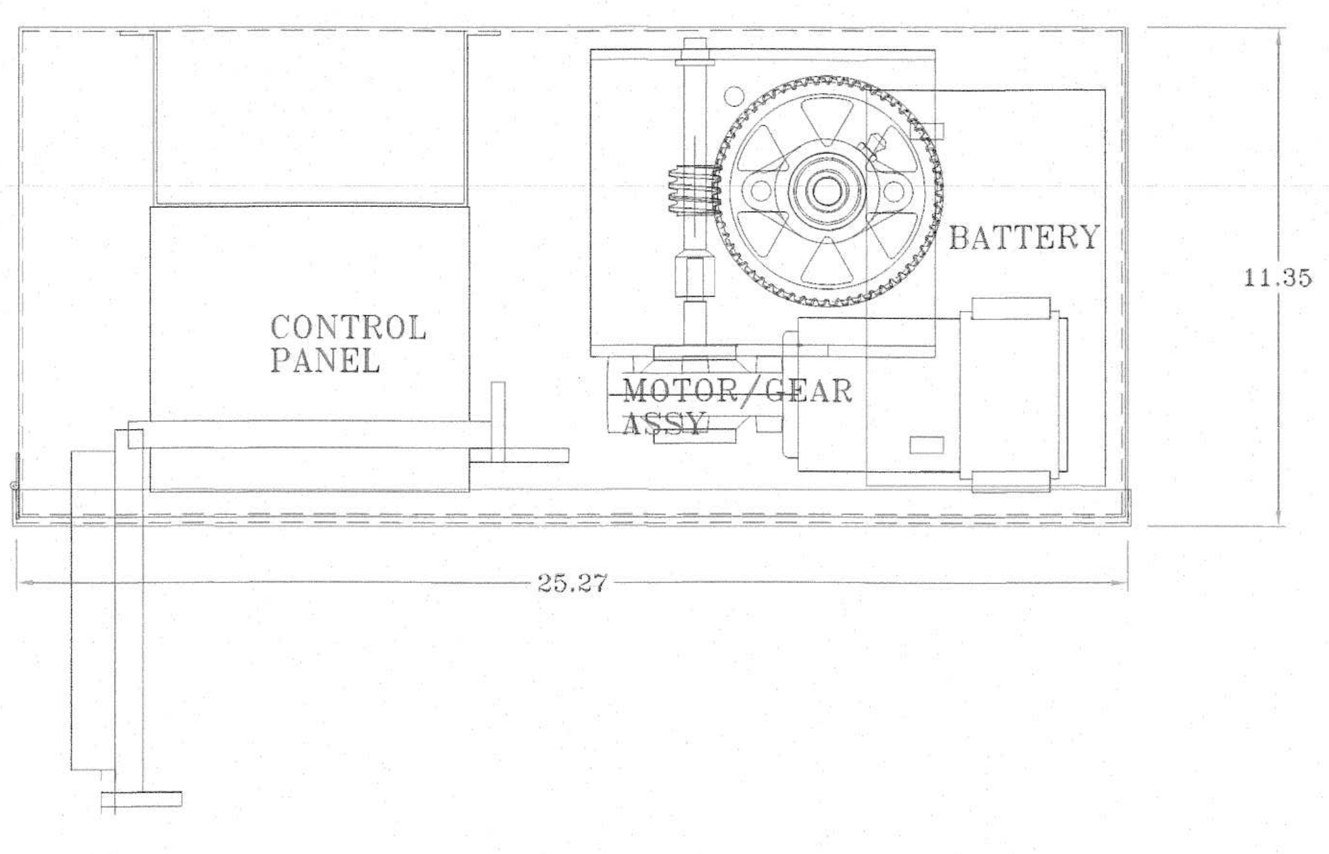


TRASH CAGE WITH PERFORATED RISER PIPE

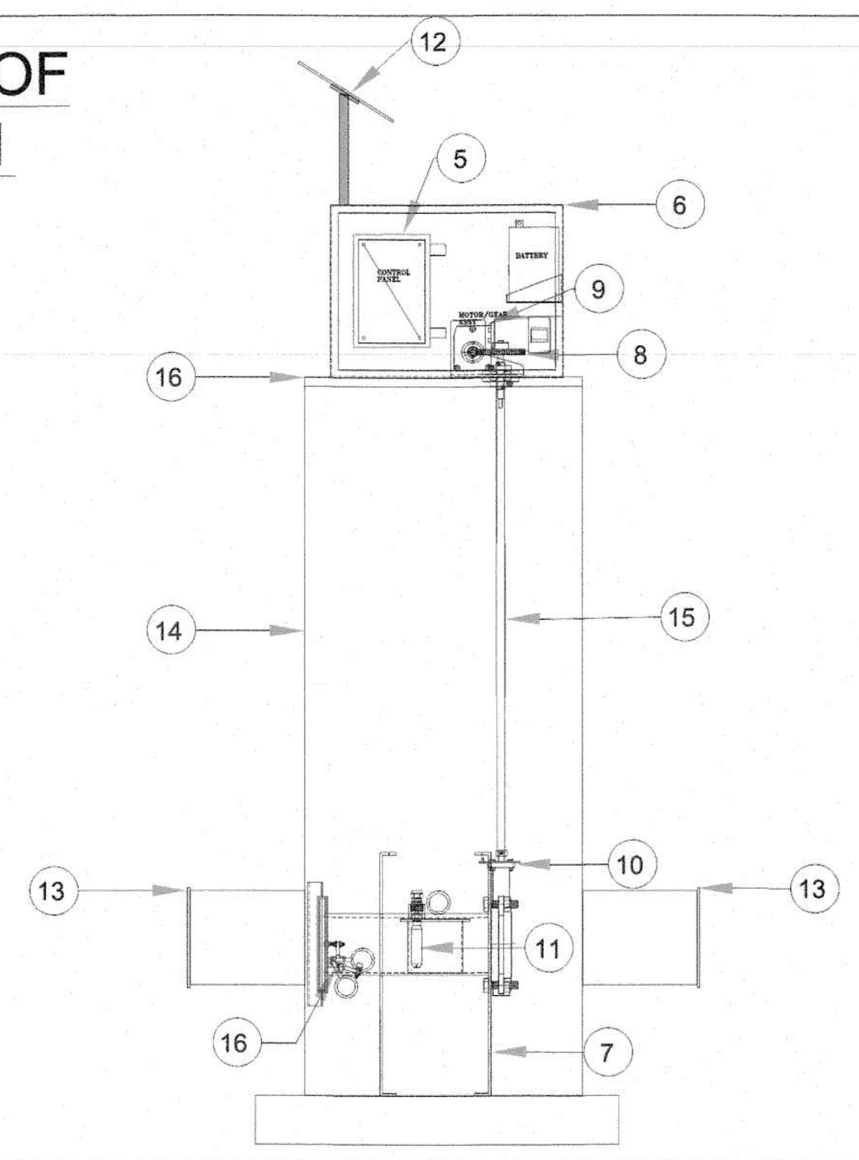


Parts List	
Item	smartPOND Valve Component
1	30" DIAMETER CAGE WITH 1 ½" GALVANIZED MESH SCREEN
2	8" SQUARE PERFORATED TUBING WITH 1" PERFORATION, WITH 4" VERTICAL SPACING ON CENTERS WITH WATER DEPTH MARKER
3	3 ½' X 3 ½' X 4" CONCRETE PAD (BY OTHERS)
4	6" PVC OUTFALL PIPE (BY OTHERS)
5	WEATHERPROOF ELECTRONIC 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	30" DRAIN BASIN
15	VALVE STEM
16	QUICK DISCONNECT VALVE CONNECTION

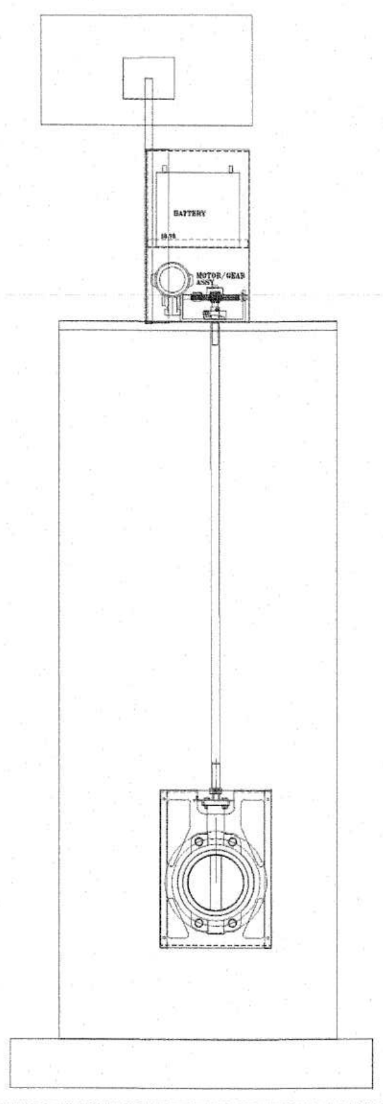
PLAN VIEW OF ENCLOSER



SECTION VIEW OF SMARTBATCH



FRONT VIEW OF SMARTBATCH

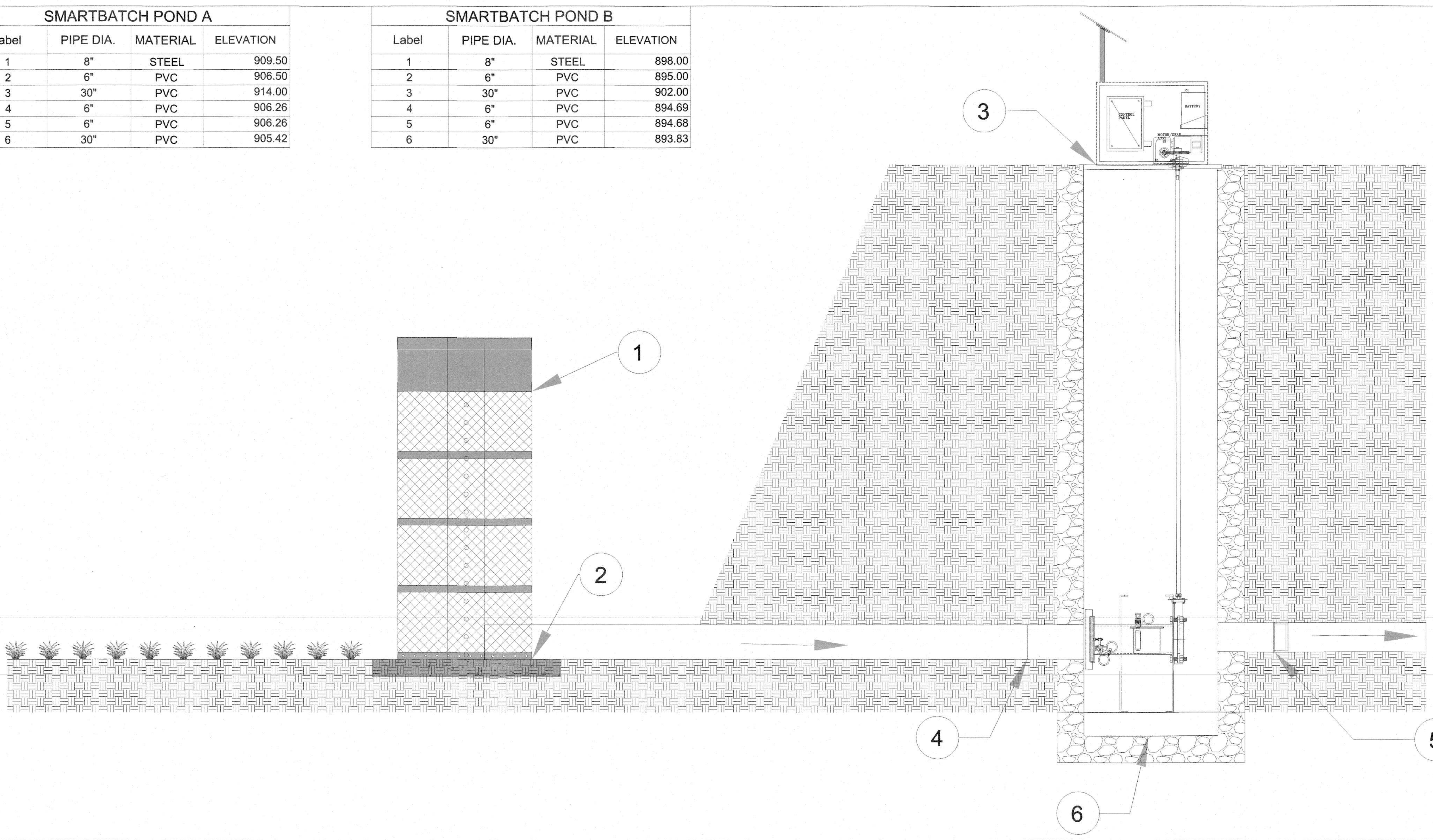


smartBATCH
Automated Batch Detention Systems
FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

SMARTBATCH POND A			
Label	PIPE DIA.	MATERIAL	ELEVATION
1	8"	STEEL	909.50
2	6"	PVC	906.50
3	30"	PVC	914.00
4	6"	PVC	906.26
5	6"	PVC	906.26
6	30"	PVC	905.42

SMARTBATCH POND B			
Label	PIPE DIA.	MATERIAL	ELEVATION
1	8"	STEEL	898.00
2	6"	PVC	895.00
3	30"	PVC	902.00
4	6"	PVC	894.69
5	6"	PVC	894.68
6	30"	PVC	893.83



smartBATCH
Automated Batch Detention Systems
FOR ADDITIONAL INFORMATION PLEASE CONTACT: CONSTRUCTION ECO SERVICES, 832-456-1000, www.ecosvs.com

CONVERGENT WATER TECHNOLOGIES

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JUSTIN D. MIDURA
128809
2-26-2024

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ9.dwg

REVISIONS			
NO.	DESCRIPTION	BY	DATE

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND SMARTPOND DETAILS

JOB NUMBER: A245-1002

WQ9

SHEET NO. 64
OF 118 SHEETS

Date\Time : Tue, 27 Feb 2024 - 9:44am User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WQ10.dwg

FOUNDATION NOTES

1. DESIGN LOADS

   ACTIVE LATERAL EARTH PRESSURE – EQUIVALENT FLUID PRESSURE OF 42 PCF

2. DESIGN ALLOWABLE SOIL BEARING PRESSURE IS 2,000 PSF
3. THE GEOTECHNICAL INVESTIGATION REPORT FOR THIS PROJECT HAS BEEN PREPARED BY:

   MLA LABS, INC.
   2804 LONGHORN BOULEVARD
   AUSTIN, TEXAS 78758
   (512) 873-8899

   THE CONTRACTOR SHALL OBTAIN A COPY OF THIS REPORT AND REVIEW ITS CONTENTS TO BECOME FAMILIAR WITH THE GEOTECHNICAL CONDITIONS THAT EXIST AT THIS SITE AND THE RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL INVESTIGATION.

   ALTERNATIVE MATERIAL PROPOSED FOR USE AS EARTHEN FILL SHOULD BE SUBMITTED TO THE GEOTECHNICAL ENGINEER FOR TESTING.

4. PRIOR TO COMMENCEMENT OF EXCAVATION OPERATIONS, FIELD LOCATE AND ADEQUATELY PROTECT ANY EXISTING STRUCTURES, TREES, UTILITIES AND/OR OTHER PERMANENT ELEMENTS TO REMAIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS.
5. ALL VEGETATION, ORGANIC TOPSOIL, AND ANY OTHER SOFT OR UNSUITABLE MATERIAL SHOULD BE REMOVED FROM BENEATH THE LIMITS OF THE PROPOSED CONSTRUCTION AREA. AFTER STRIPPING OPERATIONS ARE COMPLETED, THE EXPOSED SUBGRADE SHALL BE PROOFROLLED WITH HEAVY CONSTRUCTION EQUIPMENT SUCH AS A 15-TON ROLLER OR EQUIVALENT EQUIPMENT TO DETECT WEAK AREAS AND UNSUITABLE SUBGRADE MATERIALS. ANY UNSUITABLE MATERIALS LOCATED BY PROOFROLLING SHOULD BE REMOVED AND REPLACED WITH COMPACTED SELECT FILL MATERIAL OR SOILS EXHIBITING SIMILAR CLASSIFICATION, MOISTURE CONTENT AND DENSITY AS THE ADJACENT IN-SITU SOILS.
6. EXCAVATIONS FOR STRUCTURES SHALL BE IN ACCORDANCE WITH CITY OF AUSTIN STANDARD SPECIFICATION ITEM NO. 401. FOOTINGS SHALL BE FOUNDED ON WEATHERED LIMESTONE, PROOFROLLED NATURAL SOILS OR COMPACTED SELECT FILL. EXCAVATIONS SHALL BE NEAT AND FREE OF ALL LOOSE MATERIALS AND DEBRIS PRIOR TO PLACEMENT OF CONCRETE. CONTRACTOR SHALL USE CARE TO PROTECT EXCAVATIONS FROM CAVING AND SLOUGHING DUE TO TRAFFIC FROM EQUIPMENT OR WORKMEN. PROPER SITE DRAINAGE SHOULD BE MAINTAINED TO PREVENT PONDING OF SURFACE RUNOFF. ANY WATER ACCUMULATIONS IN EXCESS OF 1 INCH SHALL BE PUMPED OUT PRIOR TO PLACEMENT OF CONCRETE.
7. IN THE EVENT THAT EXCAVATIONS ARE COMPLETED TO A DEPTH GREATER THAN THAT REQUIRED BY THE DRAWINGS, THE CONTRACT SHALL, AT THE ENGINEER'S OPTION, FILL THE OVEREXCAVATION WITH CONCRETE OR COMPACTED SELECT FILL. SELECT FILL SHALL CONSIST OF WELL GRADED CRUSHED LIMESTONE BASE CONFORMING TO THE REQUIREMENTS OF TXDOT 1993 STANDARD SPECIFICATIONS ITEM 247, GRADE 4. FILL SHALL BE PLACED IN LOOSE LIFTS OF MAXIMUM 8 INCHES THICKNESS WITH COMPACTED THICKNESS NOT TO EXCEED 6-INCHES AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR DRY DENSITY AT A MOISTURE CONTENT RANGING FROM -3 TO +3 PERCENT OF THE OPTIMUM VALUE. *CONCRETE* OR FILL REQUIRED TO COMPENSATE THE OVEREXCAVATION SHALL BE AT THE CONTRACTOR'S EXPENSE.
8. REBAR AND CONCRETE FOR FOOTINGS SHALL BE PLACED AS SOON AS PRACTICAL FOLLOWING COMPLETION OF EXCAVATIONS TO PREVENT EXCESSIVE DRYING OR WETTING OF THE SUBGRADE.
9. BACKFILLING OPERATIONS SHALL BE IN ACCORDANCE WITH CITY OF AUSTIN STANDARD SPECIFICATION ITEM NO. 401. SELECT BACKFILL SHALL CONSIST OF FREE DRAINING CRUSHED LIMESTONE BASE MATERIAL. WHERE SHOWN, THE TOP 12 INCHES OF BACKFILL SHALL CONSIST OF A CLAY MATERIAL WITH A MINIMUM PI OF 32. THE CLAY MATERIAL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE STANDARD SPECIFICATION.
10. BACKFILLING OPERATIONS SHALL NOT BEGIN UNTIL CONCRETE WALLS HAVE CURED A MINIMUM OF 7 DAYS. FORMS SHALL REMAIN IN PLACE FOR A MINIMUM OF 7 DAYS. IF DESIRED, FORMS MAY BE REMOVED PROVIDED THE 7 DAY CURING PERIOD. UNDER NO CIRCUMSTANCES SHALL BACKFILLING COMMENCE IN LESS THAN 7 DAYS. THE BACKFILL PLACEMENT AND COMPACTION OPERATIONS SHALL BE CAREFULLY CONTROLLED TO PREVENT OVERCOMPACTION OR DAMAGE TO THE STRUCTURES.
11. THE CONTRACTOR SHALL, AS A MINIMUM, ADHERE TO OCCUPATIONAL SAFETY AND HEALTH (OSHA) REGULATIONS TO PROTECT PERSONNEL AT THAT CONCRETE IS CURED USING WET COTTON MATS FOR THE REMAINDER OF EXCAVATION SITES..

EMBANKMENT

1. EMBANKMENT MATERIAL SPECIFICATIONS AS FOLLOWS:

PERCENT PASSING NO. 200	70% MIN.
LIQUID LIMIT	35% MIN.
PLASTICITY INDEX	18% TO 30%
PERCENT CLAY (FINER THAN 0.002MM)	30%
PERCENT DISPERSION	<35%

2. THE EMBANKMENT FILL SHALL BE PLACED IN LOOSE LIFTS, NOT TO EXCEED 8 INCHES IN THICKNESS, AND COMPACTED TO 95 TO 100 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY TEST METHOD TEX-113-E AND WITH +/- 3 PERCENTAGE POINTS OF OPTIMUM MOISTURE AS DETERMINED BY THE SAME TEST.
3. NATURAL SUBGRADE SHOULD BE CUT SUCH THAT FILL PLACEMENT IS ON RELATIVELY HORIZONTAL SURFACE.
4. EACH SUCCESSIVE LIFT SHOULD BE PLACED HORIZONTALLY AND FILL SHOULD BE BENCHED INTO THE EXISTING NATURAL SUBGRADE.
5. THE EXCESS FILL CAN BE CUT TO SLOPE THE FINAL DESIGN SLOPE.
6. UPON COMPLETION OF THE DAM AND EMBANKMENT THE FILL SHOULD BE PROMPTLY COVERED WITH EROSION CONTROL MATERIAL SUCH AS SEED IMPREGNATED JUTE MESH.

CONCRETE FINISHING

1. REPAIR OF SURFACE DEFECTS – DEFECTIVE AREAS SHALL BE REPAIRED IMMEDIATELY AFTER REMOVAL OF FORMS. HONEYCOMBED AND OTHER DEFECTIVE AREAS SHALL BE REMOVED DOWN TO SOUND CONCRETE. THE DEFECTIVE AND SURROUNDING AREA SHALL BE DAMPENED AND A BONDING GROUT APPLIED TO THE AREA. BONDING GROUT SHALL CONSIST OF APPROXIMATELY ONE PART CEMENT TO ONE PART FINE SAND PASSING A NO. 30 SIEVE. MIX GROUT TO THE CONSISTENCY OF A THICK CREAM AND BRUSH THOROUGHLY INTO THE SURFACE.

   PATCHING MORTAR SHALL BE OF THE SAME MATERIALS AND APPROXIMATELY THE SAME PROPORTIONS AS CONCRETE EXCEPT THAT COARSE AGGREGATE SHALL BE OMITTED. PREPARE MORTAR WITH NO MORE THAN ONE PART CEMENT TO 2½ PARTS SAND. USE WHITE PORTLAND CEMENT FOR PART OF THE GRAY CEMENT TO MIX A MORTAR OF A COLOR TO MATCH THE SURROUNDING CONCRETE. USE NO MORE WATER THAN NECESSARY AND MIX MORTAR TO THE STIFFEST CONSISTENCY THAT WILL PERMIT PLACING.

   AFTER SURFACE WATER FROM THE BONDING GROUT HAS DISSIPATED, THOROUGHLY BRUSH PATCHING MORTAR INTO THE BONDING GROUT.

   IN LIEU OF USE OF BONDING GROUT, A LATEX BONDING AGENT MAY BE USED.

2. UNLESS NOTED OTHERWISE, CONCRETE SURFACES EXPOSED TO VIEW IN THE COMPLETED STRUCTURE SHALL RECEIVE THE FOLLOWING FINISH:
   - A. VERTICAL SURFACES AND TOPS OF WALLS AND OTHER STRUCTURAL ELEMENTS SHALL RECEIVE A CLASS "C" TWO-RUB FINISH EXCEPT WHERE FORM LINERS ARE SPECIFIED.
   - B. TOP SURFACE OF STILLING BASIN FOUNDATION AND OUTLET SLAB SHALL RECEIVE A STEEL TROWELED FINISH.
   - C. TOP SURFACE OF SLOPED CONCRETE SLABS SHALL RECEIVE A LIGHT TO MEDIUM, TRANSVERSE BROOM FINISH OR BELT FINISH.

GENERAL POND AND DAM CONSTRUCTION NOTES

THE GEOTECHNICAL INVESTIGATION REPORT FOR THIS PROJECT HAS BEEN PREPARED BY

MLA LABS, INC.
2804 LONGHORN BOULEVARD
AUSTIN, TEXAS 78758
(512) 873-8899

THE CONTRACTOR SHALL OBTAIN A COPY OF THIS REPORT AND REVIEW ITS CONTENTS TO BECOME FAMILIAR WITH THE GEOTECHNICAL CONDITIONS THAT EXIST AT THIS SITE AND THE RECOMMENDATIONS PRESENTED IN THE GEOTECHNICAL INVESTIGATION.

ALTERNATIVE MATERIAL PROPOSED FOR USE AS EARTHEN FILL SHOULD BE SUBMITTED TO THE GEOTECHNICAL ENGINEER FOR TESTING.

GENERAL POND AND DAM CONSTRUCTION NOTES – SEQUENCE OF CONSTRUCTION

1. INSTALL EROSION CONTROLS AND TREE PROTECTION PER APPROVED PLANS.
2. HOLD PRECONSTRUCTION CONFERENCE.
3. ROUGH-CUT ALL REQUIRED OR NECESSARY PONDS. THE PERMANENT OUTLET STRUCTURE MUST BE CONSTRUCTED PRIOR TO DEVELOPMENT OF ANY EMBANKMENT OR EXCAVATION THAT LEADS TO PONDING CONDITIONS. THE OUTLET SYSTEM MUST CONSIST OF A LOW-LEVEL OUTLET AND AN EMERGENCY OVERFLOW MEETING THE REQUIREMENTS OF THE DRAINAGE CRITERIA MANUAL (SECTION 8.3) AND/OR THE ENVIRONMENTAL CRITERIA MANUAL (SECTION 1.4.2.K) AS REQUIRED. THE OUTLET SYSTEM SHALL BE PROTECTED FROM EROSION AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION UNTIL FINAL RESTORATION IS ACHIEVED.
4. COMPLETE PERMANENT EROSION CONTROL AND SITE RESTORATION. REMOVE TEMPORARY EROSION/SEDIMENTATION CONTROLS AND TREE PROTECTION. RESTORE ANY AREAS DISTURBED DURING REMOVAL OF EROSION/SEDIMENTATION CONTROLS.

MAINTENANCE SPECIFICATIONS

DURING SITE CONSTRUCTION

1. THE SEDIMENT LOAD TO THE SEDIMENTATION CHAMBER MUST BE CAREFULLY MONITORED AND THE SEDIMENT SHALL BE REMOVED WHEN 1/3 OF THE SEDIMENTATION CHAMBER VOLUME IS LOST.
2. UPON COMPLETION OF SITE REVEGETATION, ANY SEDIMENT BUILDUP IN THE FOREBAY EXCEEDING 5% LOSS OF AVAILABLE VOLUME SHALL BE REMOVED; AND IF SEDIMENT BUILDUP IN THE MAIN PORTION OF THE FACILITY EXCEEDS 10% OF THE AVAILABLE VOLUME, THE MAIN BODY OF THE FACILITY SHALL BE MAINTAINED FOR SEDIMENT REMOVAL.

FIRST YEAR – QUARTERLY OR MORE OFTEN AS REQUIRED BY SITE CONDITIONS

1. REMOVE ACCUMULATED TRASH AND DEBRIS.
2. MOW POND AREA IF GRASS EXCEEDS EIGHTEEN (18) INCHES.
3. INSPECT AND REMOVE SEDIMENT FROM POND IF MORE THAN TEN (10) PERCENT OF THE VOLUME IS LOST.
4. INSPECT FOR EVIDENCE OF IMPROPER OPERATION, SUCH AS AREAS OF EROSION, IMPROPER DRAINAGE, VANDALISM, OR STRUCTURAL STORM DAMAGE, AND PERFORM THE REQUIRED CORRECTIVE MAINTENANCE.
5. MONITOR FOR PERCENT SURVIVORSHIP OF PLANTED SPECIES AND PERCENT COVER. REPLANT AS NEEDED TO MAINTAIN 85% SURVIVAL RATE.
6. SEDIMENT REMOVED FROM THIS FACILITY MUST BE TRANSPORTED FOR DEWATERING TO A PERMITTED SITE OR LANDFILL.
7. MONITOR FOR PERCENT COVER OF NUISANCE SPECIES, E.G. CATTAILS, COTTONWOODS AND WILLOWS. REMOVE OR THIN TO LIMIT TO 10% COVERAGE.

SECOND AND THIRD YEARS – SEMI-ANNUALLY

1. REMOVE ACCUMULATED TRASH AND DEBRIS.
2. MOW POND IF GRASS EXCEEDS EIGHTEEN (18) INCHES.
3. CONTROL OF INSECTS, WEEDS, ODORS AND ALGAE WILL BE IMPLEMENTED WHERE REQUIRED TO PREVENT PUBLIC NUISANCE CONCERNS. THE FACILITY SHALL BE EVALUATED SEMIANNUALLY FOR THESE ITEMS.
4. INSPECT AND REMOVE SEDIMENT FROM POND IF MORE THAN FIFTEEN (15) PERCENT OF VOLUME IS LOST.
5. INSPECT FOR EVIDENCE OF IMPROPER OPERATION, SUCH AS AREAS OF EROSION, IMPROPER DRAINAGE, VANDALISM, OR STRUCTURAL STORM DAMAGE, AND PERFORM THE REQUIRED CORRECTIVE MAINTENANCE.
6. MONITOR FOR PERCENT SURVIVORSHIP OF PLANTED SPECIES AND PERCENT COVER. REPLANT AS NEEDED TO MAINTAIN 85% SURVIVAL RATE.
7. MONITOR FOR PERCENT COVER OF NUISANCE SPECIES, E.G. CATTAILS, COTTONWOODS AND WILLOWS. REMOVE OR THIN TO LIMIT TO 10% COVERAGE.

FOURTH YEAR AND BEYOND – SEMI-ANNUALLY

1. REMOVE ACCUMULATED TRASH AND DEBRIS.
2. MOW POND IF GRASS EXCEEDS EIGHTEEN (18) INCHES.
3. INSPECT AND REMOVE SEDIMENT FROM POND IF MORE THAN FIFTEEN (15) PERCENT OF THE VOLUME IS LOST.
4. INSPECT FOR EVIDENCE OF IMPROPER OPERATION, SUCH AS AREAS OF EROSION, IMPROPER DRAINAGE, VANDALISM, OR STRUCTURAL STORM DAMAGE, AND PERFORM THE REQUIRED CORRECTIVE MAINTENANCE.

ANNUALLY

1. CONTROL OF INSECTS, WEEDS, ODORS AND ALGAE WILL BE IMPLEMENTED WHERE REQUIRED TO PREVENT PUBLIC NUISANCE CONCERNS. THE FACILITY SHALL BE EVALUATED SEMIANNUALLY FOR THESE ITEMS.
2. MONITOR FOR PERCENT SURVIVORSHIP OF PLANTED SPECIES AND PERCENT COVER. REPLANT AS NEEDED TO MAINTAIN 85% SURVIVAL RATE.
3. MONITOR FOR PERCENT COVER OF NUISANCE SPECIES, E.G. CATTAILS, COTTONWOODS AND WILLOWS. REMOVE OR THIN TO LIMIT TO 10% COVERAGE.

WATERSTOPS

1. WATERSTOPS SHALL CONSIST OF A FLEXIBLE BUTYL RUBBER AND SWELLABLE CLAY WATERPROOFING COMPOUND THAT SWELLS UPON CONTACT WITH WATER TO FORM A COMPRESSION SEAL. THE INSTALLATION OF THE WATERSTOP SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. AN ACCEPTABLE PRODUCT IS SWELLSTOP WATERSTOP AS MANUFACTURED BY GREENSTREAK PLASTIC PRODUCTS COMPANY, INC., 3400 TREE COURT INDUSTRIAL BLVD., ST. LOUIS, MO 63122, PHONE (800) 325-9504.
2. WATERSTOPS AT EXPANSION JOINTS SHALL BE 9 INCH RIBBED PVC WITH 1" CENTERBULB. ALL OTHER WATERSTOPS SHALL BE 6 INCH RIBBED PVC OR BUTYL RUBBER AND SWELLABLE CLAY WATERPROOFING, SUCH AS SWELLSTOP (SEE ABOVE). WATERSTOPS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
3. PVC WATERSTOPS SHALL BE SPLICED VIA FUSION TECHNIQUES IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. WATERSTOP JUNCTIONS AT BASE OF EXPANSION JOINTS – IF PVC WATERSTOPS IF USED ARE USED FOR BOTH THE EXPANSION JOINTS AND THE CONSTRUCTION JOINT BETWEEN WALL AND FOOTING, THE JUNCTIONS AT THE BASE OF THE EXPANSION JOINT SHALL CONSIST OF A PREFABRICATED FLAT TEE SECTION.

   IF BUTYL RUBBER AND SWELLABLE CLAY TYPE WATERSTOP IS USED AT CONSTRUCTION JOINT BETWEEN WALL AND FOOTING, THEN THE PVC WATERSTOP AT THE EXPANSION JOINT SHALL BE EMBEDDED 3 INCHES MINIMUM INTO THE TOP OF THE FOOTING. THE BUTYL RUBBER AND SWELLABLE CLAY TYPE WATERSTOP SHALL THEN BE CONTINUOUS ACROSS THE VERTICAL EXPANSION JOINT WATERSTOP.

TESTING LABORATORY REQUIREMENTS

THE CONTRACTOR SHALL SECURE THE SERVICES OF A COMMERCIAL TESTING LABORATORY TO PERFORM ALL REQUIRED MATERIALS TESTS AND INSPECTIONS.

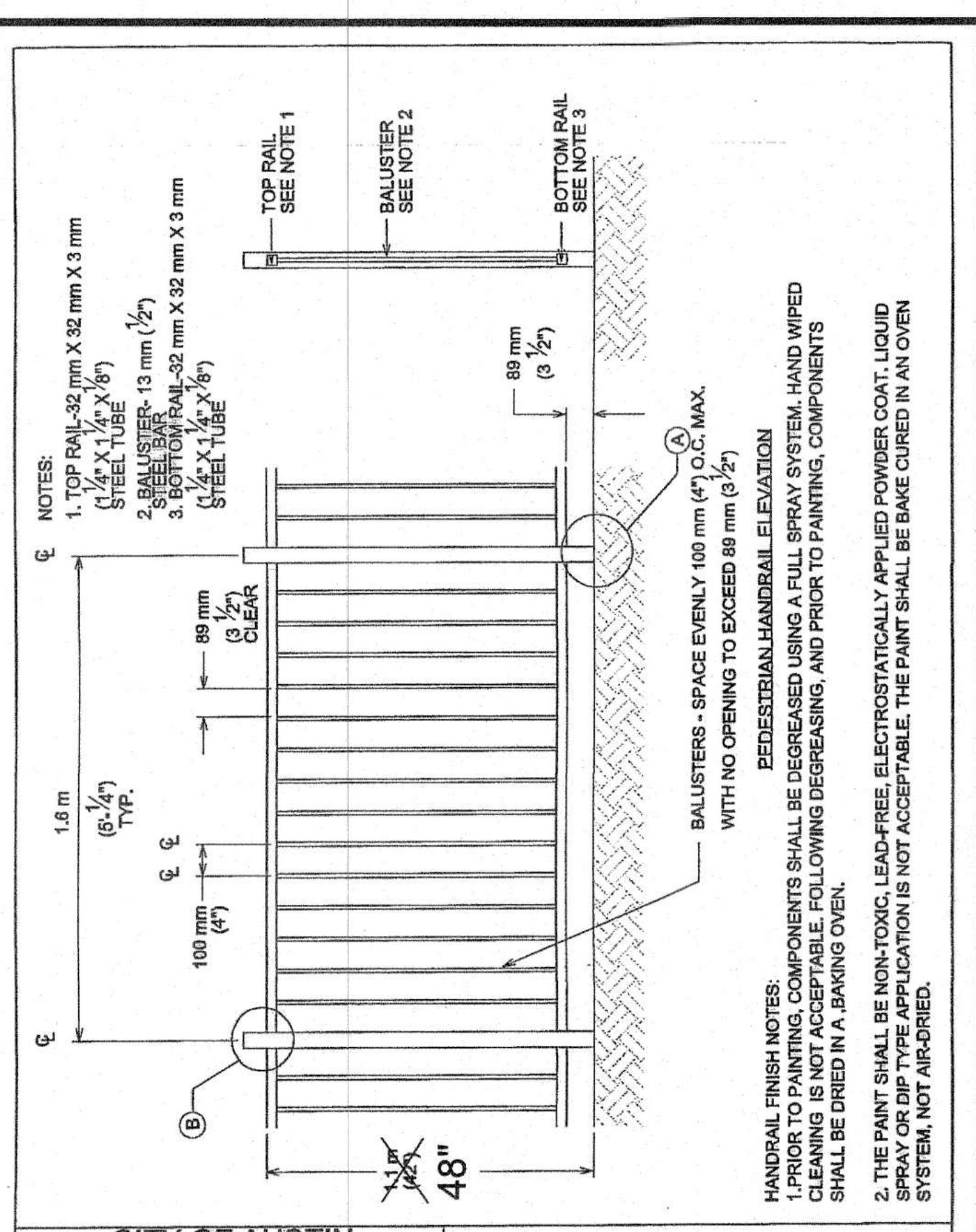
1. ONE SET OF CONCRETE TEST CYLINDERS SHALL BE OBTAINED FOR EVERY 50 CUBIC YARDS OF CONCRETE PLACED, OR ANY PORTION THEREOF PLACED IN A SINGLE DAY, AS FOLLOW:
   - A. FOUR (4) CONCRETE TEST CYLINDERS SHALL BE MOLDED FROM EACH SAMPLE AND CURED ACCORDING TO ASTM C 31. COMPRESSIVE TESTS SHALL BE PERFORMED ON ONE CYLINDER AT 7 DAYS AND TWO CYLINDERS AT 28 DAYS. THE FOURTH CYLINDER SHALL BE RETAINED FOR 56 DAYS AND TESTED ONLY IF THE AVERAGE STRENGTH OF THE 28 DAYS TESTS DO NOT MEET THE MINIMUM REQUIRED COMPRESSIVE STRENGTH.
   - B. A SLUMP TEST AND TEMPERATURE MEASUREMENT SHALL BE PERFORMED FOR EACH SAMPLE.
   - C. COMPUTATION OF WATER/CEMENT RATIO, AS REQUIRED OR DIRECTED BY THE ENGINEER.
2. ADDITIONAL CYLINDERS MAY BE MADE AND TESTED, AS NECESSARY, FOR ACCELERATED REMOVAL OF FORMS OR ERECTION OF MEMBERS TO VERIFY THAT NECESSARY STRENGTHS HAVE BEEN OBTAINED. SUCH CYLINDERS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.
3. REINFORCED CONCRETE CONSTRUCTION – SERVICES ARE TO BE PROVIDED AS FOLLOWS:
   - A. INSPECT EXCAVATIONS AND REINFORCING STEEL PLACEMENT PRIOR TO CONCRETE POURS.
4. THE CONTRACTOR SHALL COOPERATE AND COORDINATE FULLY WITH THE TESTING LABORATORY.
5. IN THE EVENT THAT CONCRETE ELEMENTS OR MEMBERS DO NOT ACHIEVE THE SPECIFIED MINIMUM COMPRESSIVE STRENGTHS, THE ENGINEER MAY REQUIRE ADDITIONAL ANALYSIS, TESTING OR REMOVAL AND REPLACEMENT OF MEMBERS. ANY AND ALL SUCH ADDITIONAL ANALYSIS OR TESTING SHALL BE AT THE CONTRACTOR'S EXPENSE, WHETHER SUCH ANALYSIS OR TESTING DEMONSTRATES ADEQUATE STRENGTH OR NOT. REPLACEMENT OF ANY MEMBERS DEEMED QUESTIONABLE OR INADEQUATE BY THE ENGINEER SHALL BE AT THE CONTRACTOR'S EXPENSE.
6. THE CONTRACTOR SHALL ARRANGE FOR COPIES OF THE INSPECTION AND TESTING REPORTS TO BE SENT TO THE ENGINEER.

Rock Riprap Gradation Table*

Rock Riprap Class by Median Particle Diameter (D50)		D50 (in)		D100 (in)
Class	Diameter (in)	Min	Max	Max
I	6	5.7	6.9	12
II	9	8.5	10.5	18
III	12	11.5	14	24
IV	15	14.5	17.5	30
V	18	17	20.5	36
VI	21	20	24	42
VII	24	23	27.5	48
VIII	30	28.5	34.5	60
IX	36	34	41.5	72
X	42	40	48.5	84

*Per City of Austin ECM 1.4.6.D.5

The rock riprap layer thickness shall be no less than the maximum stone size (D100) or 1.5 times the D50, whichever produces the greater thickness. For applications in drainage channels the riprap layer should be a minimum of 2.0 times as thick as the median stone size specified.



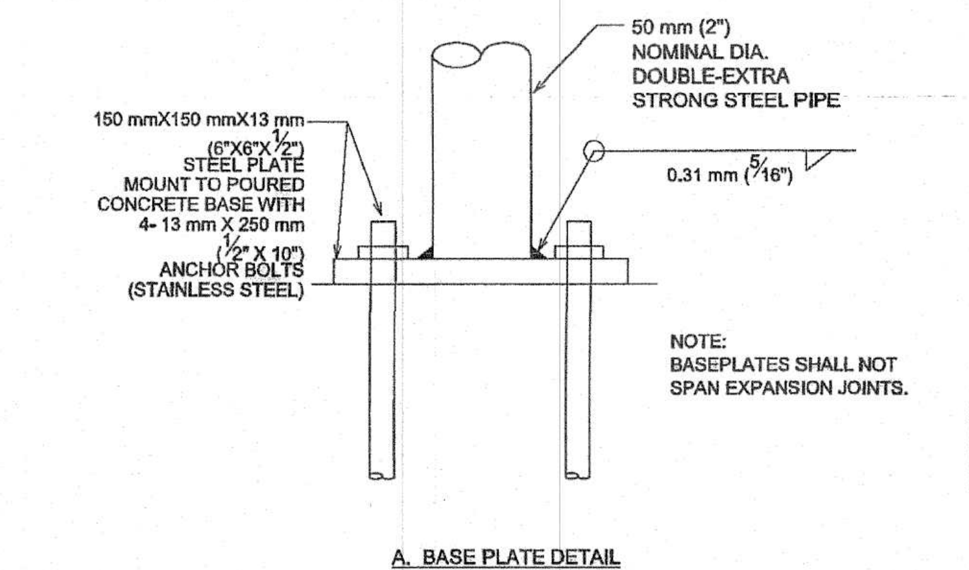
NOTES:
1. TOP RAIL-32 mm X 32 mm X 3 mm (1¼" X 1¼" X ⅛") STEEL TUBE
2. BALUSTER- 13 mm (½") STEEL BAR
3. BOTTOM RAIL-32 mm X 32 mm X 3 mm (1¼" X 1¼" X ⅛") STEEL TUBE

PEDESTRIAN HANDRAIL ELEVATION

HANDRAIL FINISH NOTES:
1.PRIOR TO PAINTING, COMPONENTS SHALL BE DEGREASED USING A FULL SPRAY SYSTEM. HAND WIPED CLEANING IS NOT ACCEPTABLE. FOLLOWING DEGREASING, AND PRIOR TO PAINTING, COMPONENTS SHALL BE DRIED IN A ,BAKING OVEN.

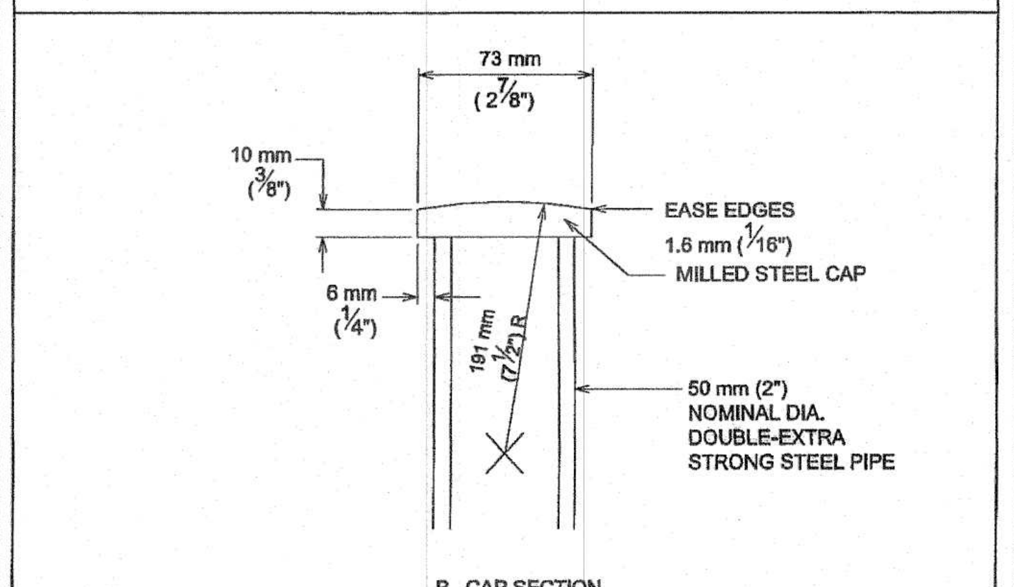
2. THE PAINT SHALL BE NON-TOXIC, LEAD-FREE, ELECTROSTATICALLY APPLIED POWDER COAT. LIQUID SPRAY OR DIP TYPE APPLICATION IS NOT ACCEPTABLE. THE PAINT SHALL BE BAKE CURED IN AN OVEN SYSTEM, NOT AIR-DRIED.

CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS
1/4/11 ADOPTED
PEDESTRIAN HANDRAIL
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 707S-1
1 OF 4



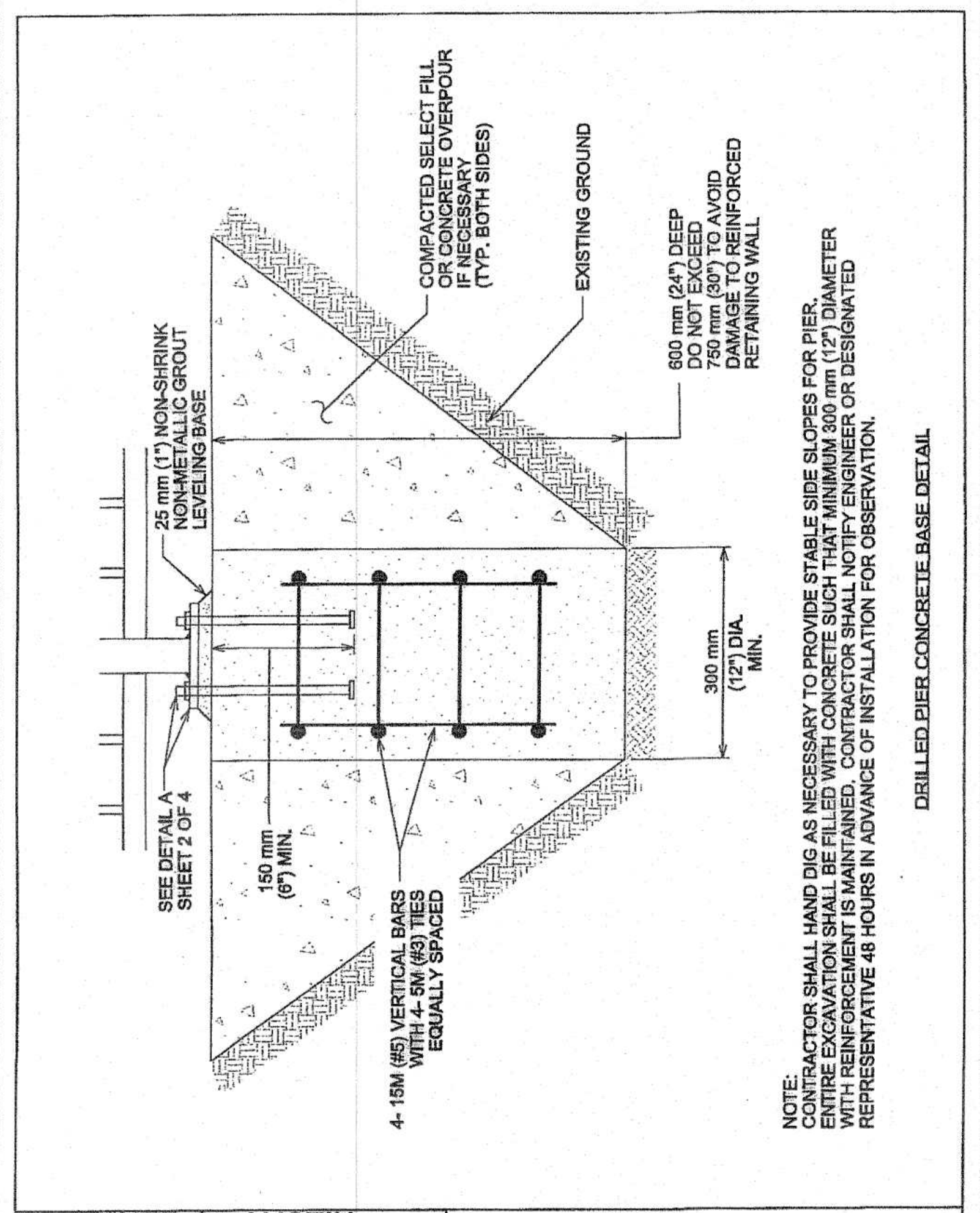
NOTE:
BASEPLATES SHALL NOT SPAN EXPANSION JOINTS.

A. BASE PLATE DETAIL



B. CAP SECTION

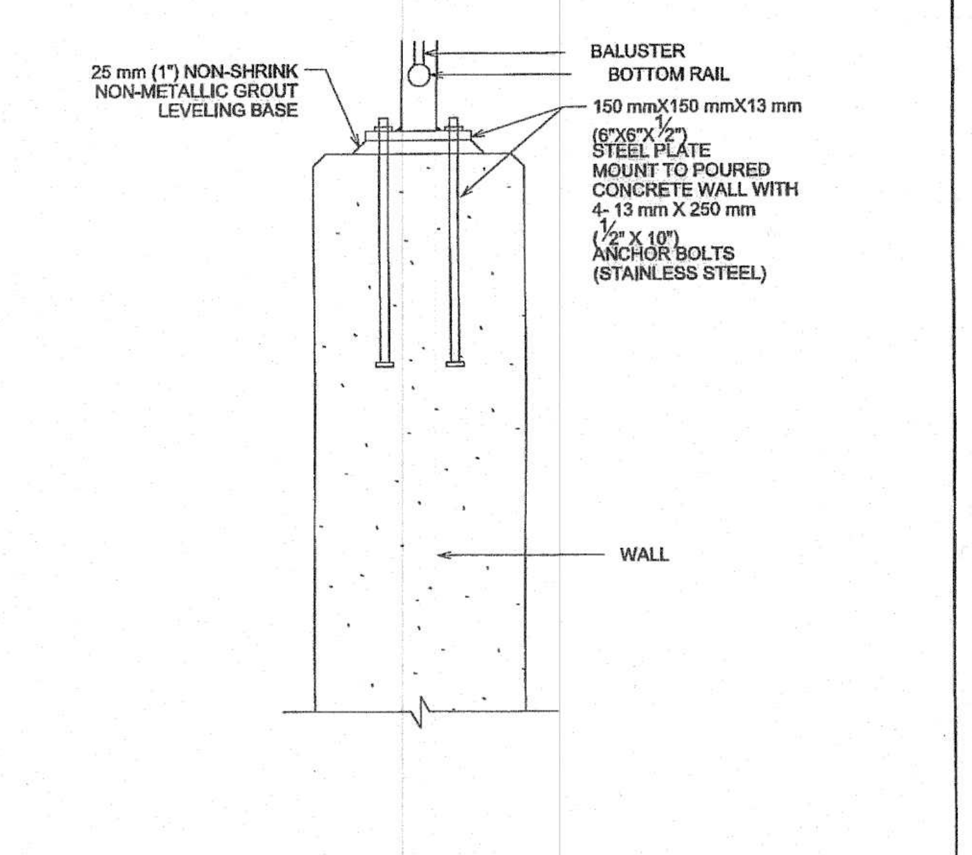
CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS
1/4/11 ADOPTED
PEDESTRIAN HANDRAIL
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 707S-1
2 OF 4



NOTE:
CONTRACTOR SHALL HAND DIG AS NECESSARY TO PROVIDE STABLE SIDE SLOPES FOR PIER. ENTIRE EXCAVATION SHALL BE FILLED WITH CONCRETE SUCH THAT MINIMUM 300 mm (12") DIAMETER WITH REINFORCEMENT IS MAINTAINED. CONTRACTOR SHALL NOTIFY ENGINEER OR DESIGNATED REPRESENTATIVE 48 HOURS IN ADVANCE OF INSTALLATION FOR OBSERVATION.

DRILLED PIER CONCRETE BASE DETAIL

CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS
1/4/11 ADOPTED
PEDESTRIAN HANDRAIL
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 707S-1
3 OF 4



WALL MOUNTING DETAIL

CITY OF AUSTIN
DEPARTMENT OF PUBLIC WORKS
1/4/11 ADOPTED
PEDESTRIAN HANDRAIL
THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
STANDARD NO. 707S-1
4 OF 4

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

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

WOODFIELD PRESERVE
PHASE 3

WATER QUALITY POND NOTES

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WQ10.dwg

JUSTIN D. MIDURA
128809
2-26-2024

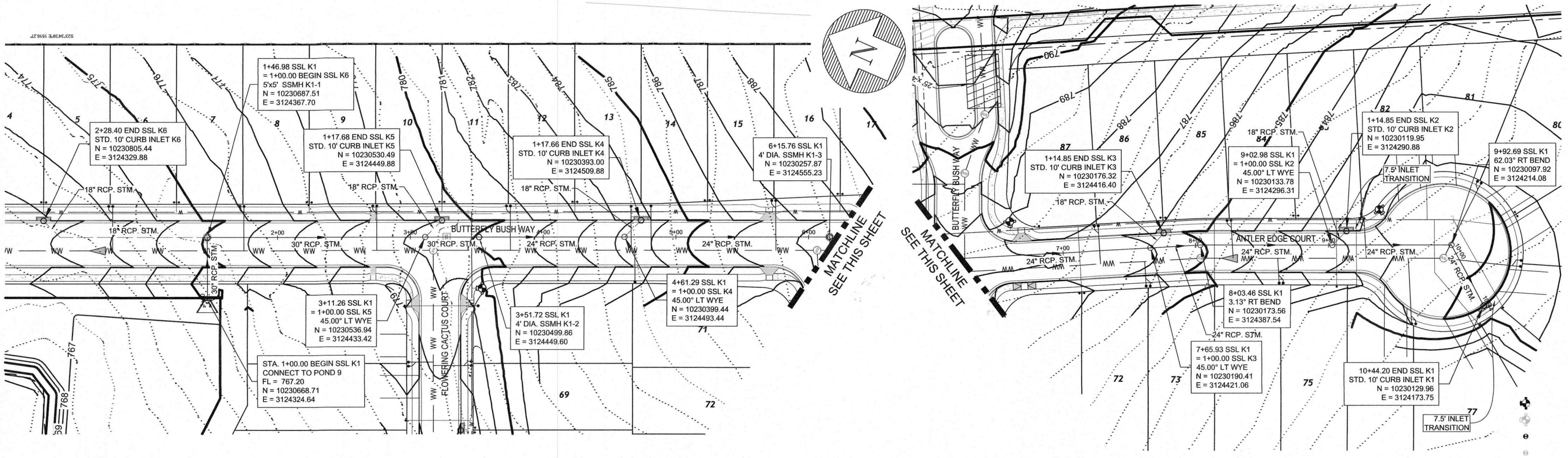
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

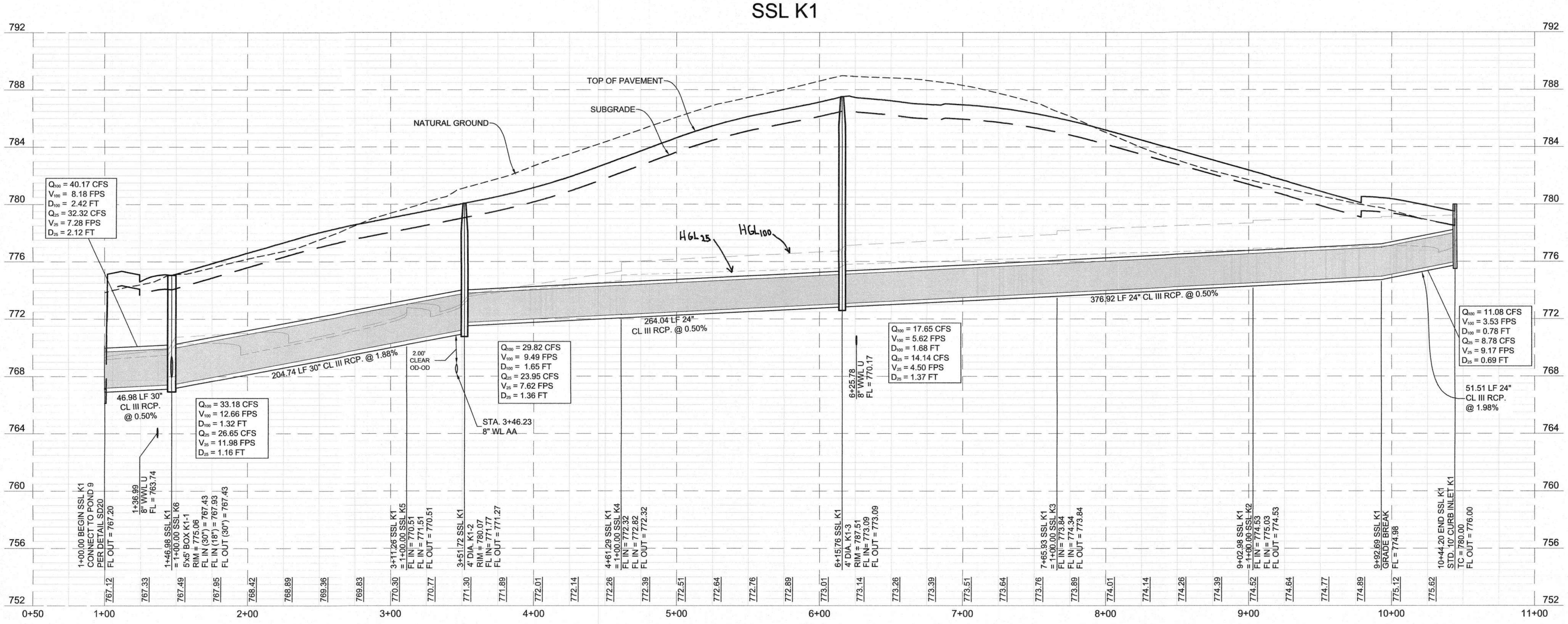
WQ10

SHEET NO.
65
OF 118 SHEETS

2023-33-CON



SSL K1



LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
——	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
——	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
2. REFER TO DETAILS 506S-5, 506S-7, 506S-8, 506S-9 AND/OR 506S-10 FOR MANHOLE CONSTRUCTION. CONTRACTOR MAY SUBSTITUTE JUNCTION BOXES FOR RING MANHOLES WITH APPROVAL OF THE ENGINEER.
3. PIPE STATIONING AND LINEAR FOOTAGE IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS CALCULATED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.
4. INLET CURB TRANSITIONS SHALL BE STANDARD 10' LONG UNLESS OTHERWISE NOTED ON THESE PLANS. THE MINIMUM ALLOWABLE TRANSITION LENGTH SHALL BE 5 FEET.

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

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Know what's below.
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WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE K1 PLAN AND PROFILE
STA 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

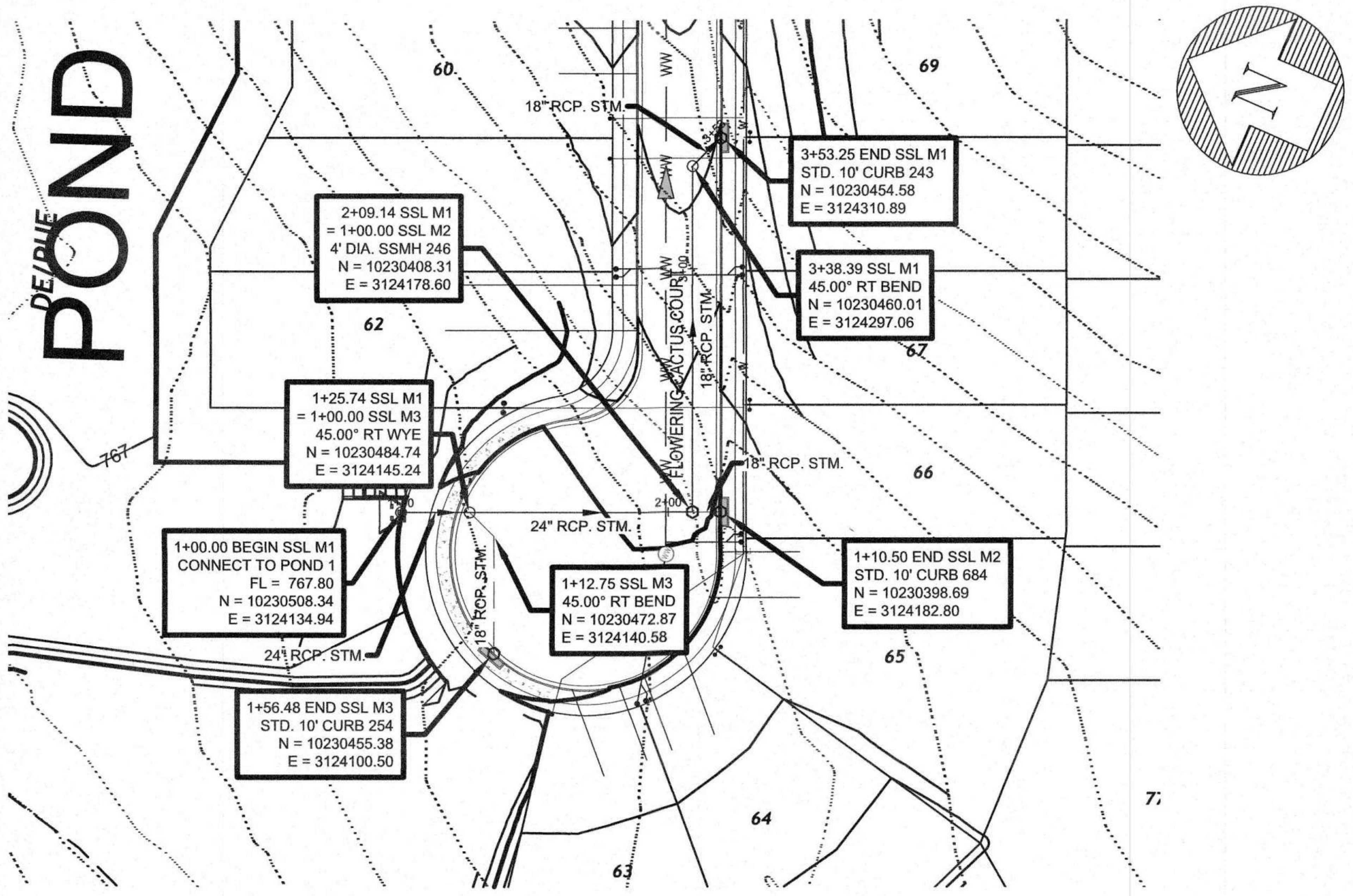
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

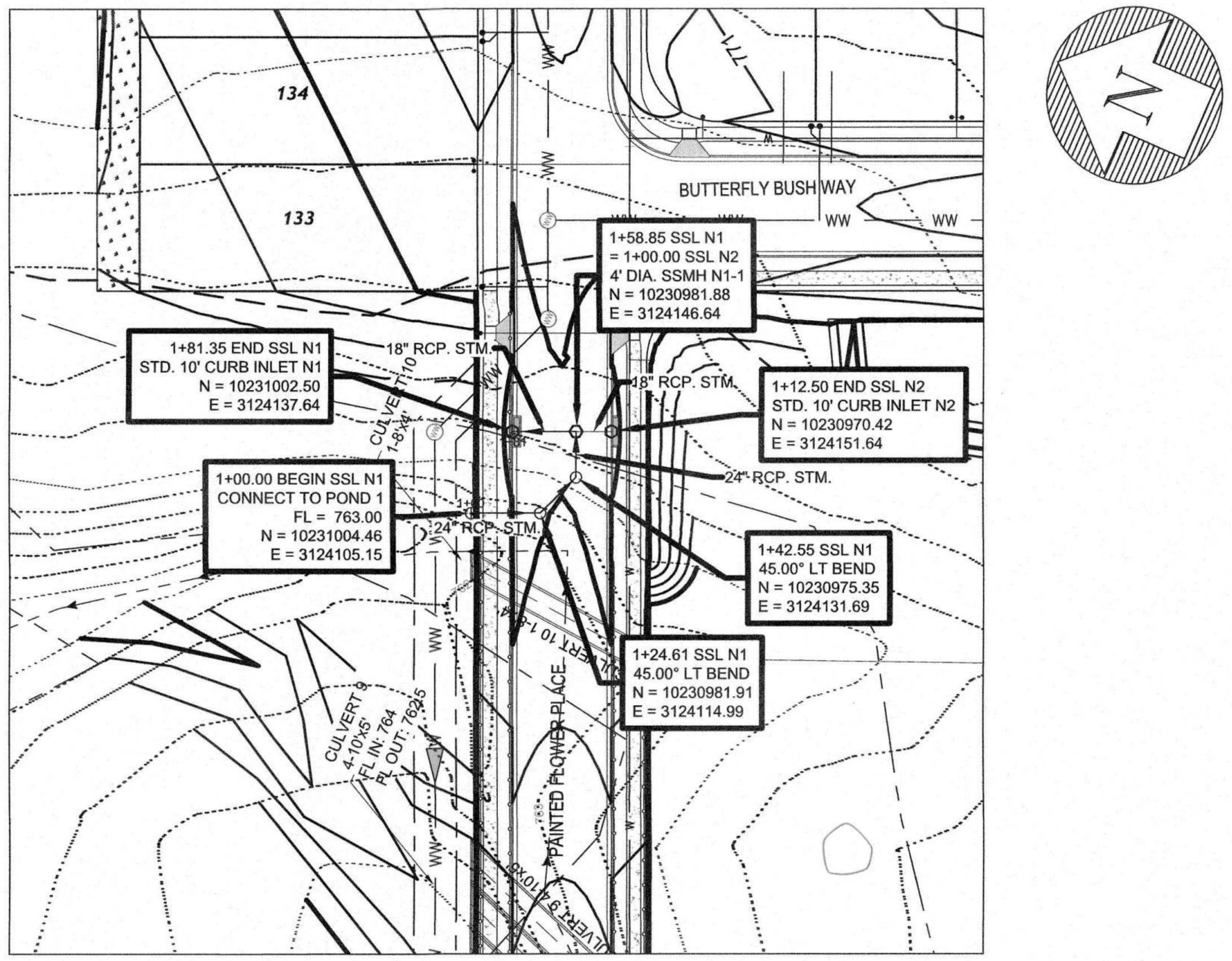
JOB NUMBER:
A245-1002

SS1

SHEET NO.
65
OF 118 SHEETS

User Name: jpiersch
Date/Time: Fri, 01 Dec 2023 - 3:16pm
Path\Name: G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS1.dwg





0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
2. REFER TO DETAILS 506S-5, 506S-7, 506S-8, 506S-9 AND/OR 506S-10 FOR MANHOLE CONSTRUCTION. CONTRACTOR MAY SUBSTITUTE JUNCTION BOXES FOR RING MANHOLES WITH APPROVAL OF THE ENGINEER.
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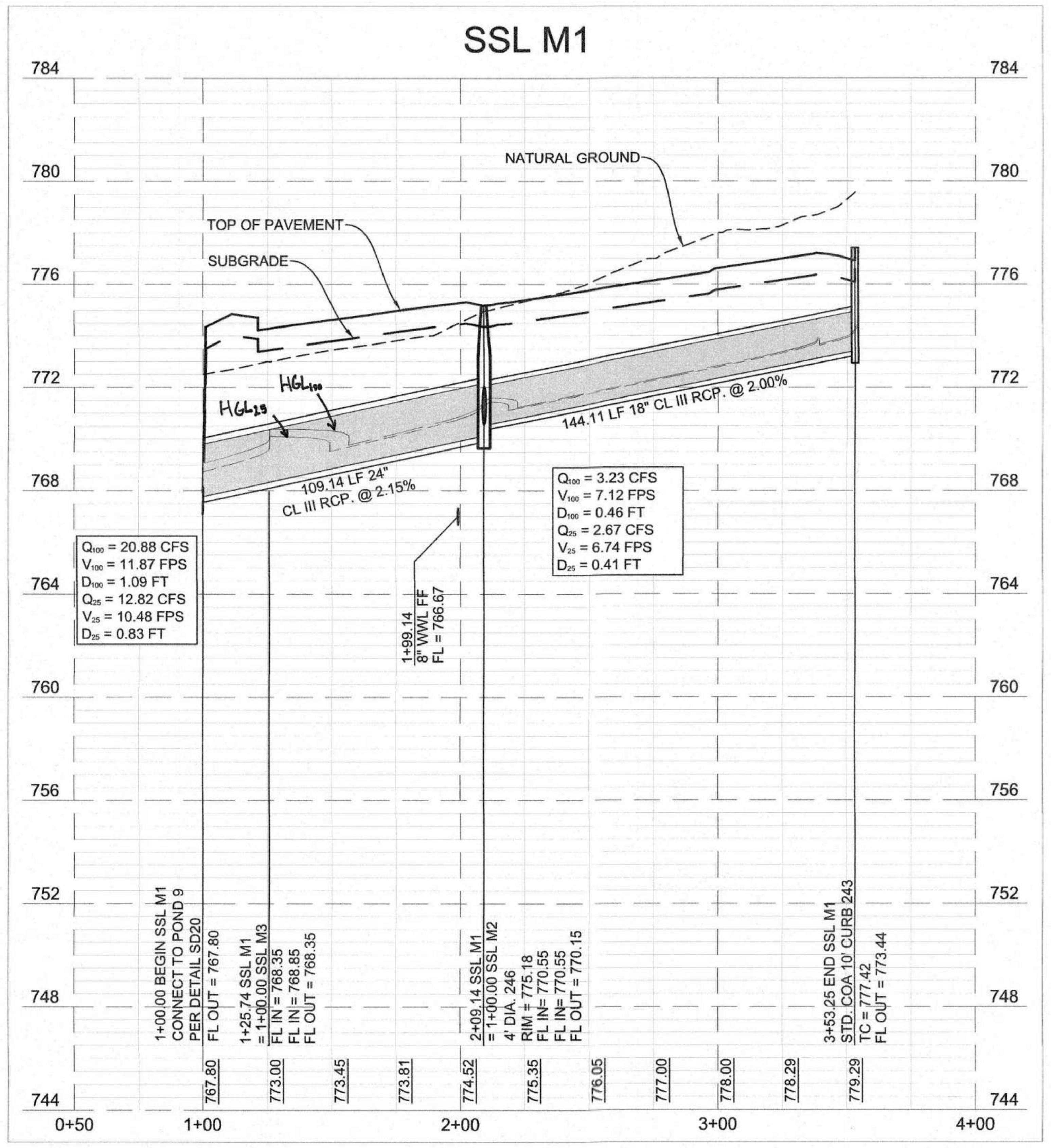
4. INLET CURB TRANSITIONS SHALL BE STANDARD 10' LONG UNLESS OTHERWISE NOTED ON THESE PLANS. THE MINIMUM ALLOWABLE TRANSITION LENGTH SHALL BE 5 FEET.

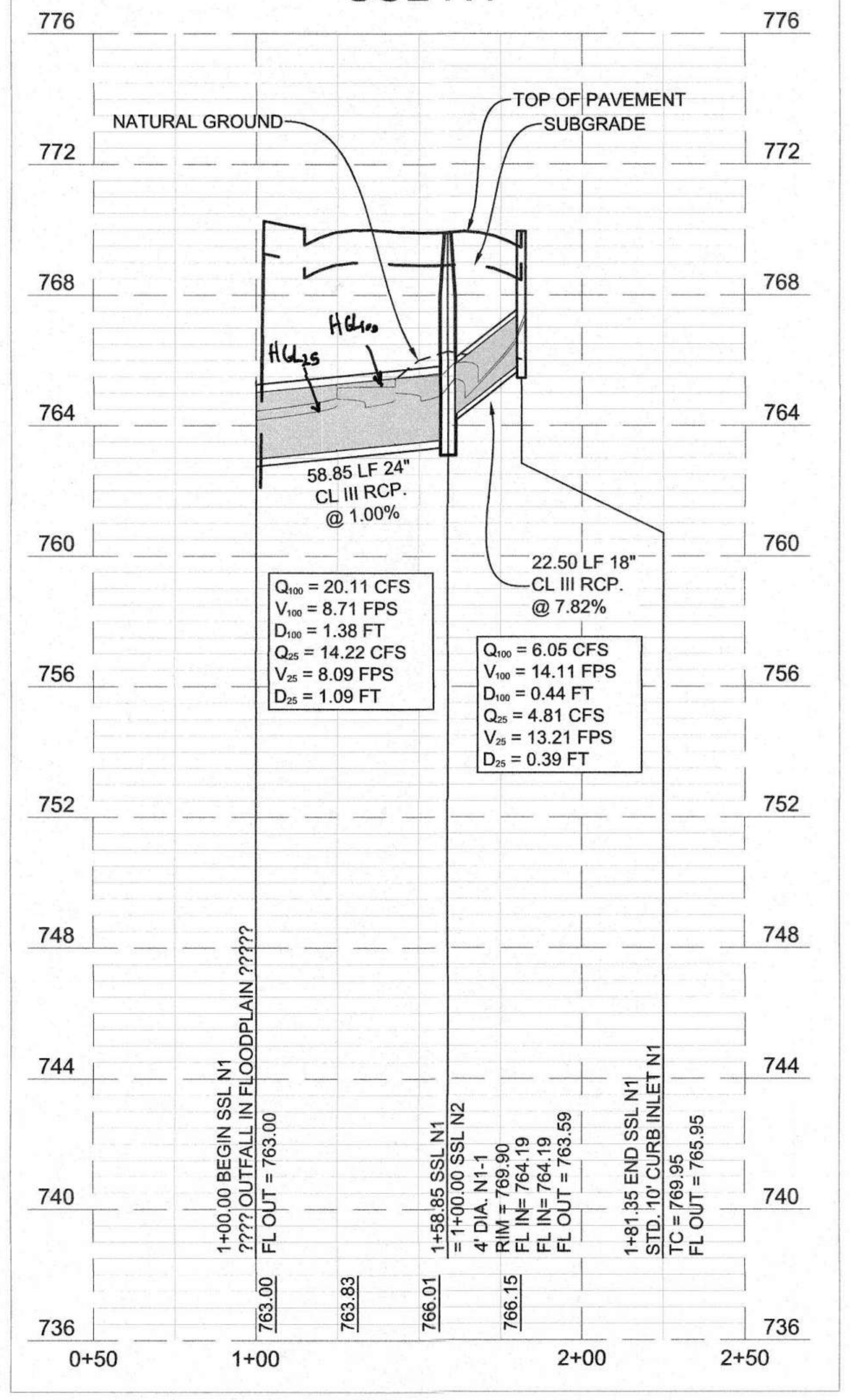
SSL M1



Q_{100} = 20.88 CFS
V_{100} = 11.87 FPS
D_{100} = 1.09 FT
Q_{25} = 12.82 CFS
V_{25} = 10.48 FPS
D_{25} = 0.83 FT

Q_{100} = 3.23 CFS
V_{100} = 7.12 FPS
D_{100} = 0.46 FT
Q_{25} = 2.67 CFS
V_{25} = 6.74 FPS
D_{25} = 0.41 FT

SSL N1



Q_{100} = 20.11 CFS
V_{100} = 8.71 FPS
D_{100} = 1.38 FT
Q_{25} = 14.22 CFS
V_{25} = 8.09 FPS
D_{25} = 1.09 FT

Q_{100} = 6.05 CFS
V_{100} = 14.11 FPS
D_{100} = 0.44 FT
Q_{25} = 4.81 CFS
V_{25} = 13.21 FPS
D_{25} = 0.39 FT

WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE M1 & N1
PLAN AND PROFILES
STA 1+00 TO END

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS2.dwg

JUSTIN D. MIDURA
128809
11-30-2023

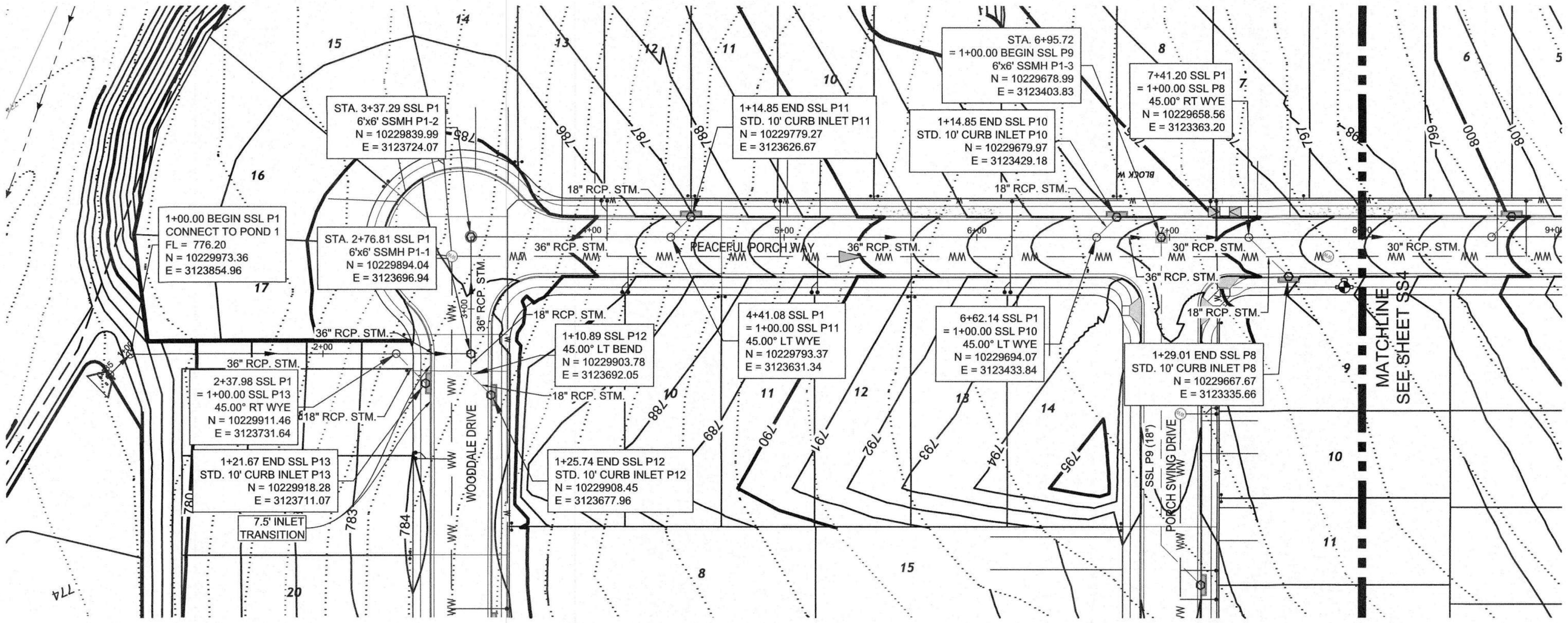
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS2

SHEET NO.
66
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 2:07pm
User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS2.dwg

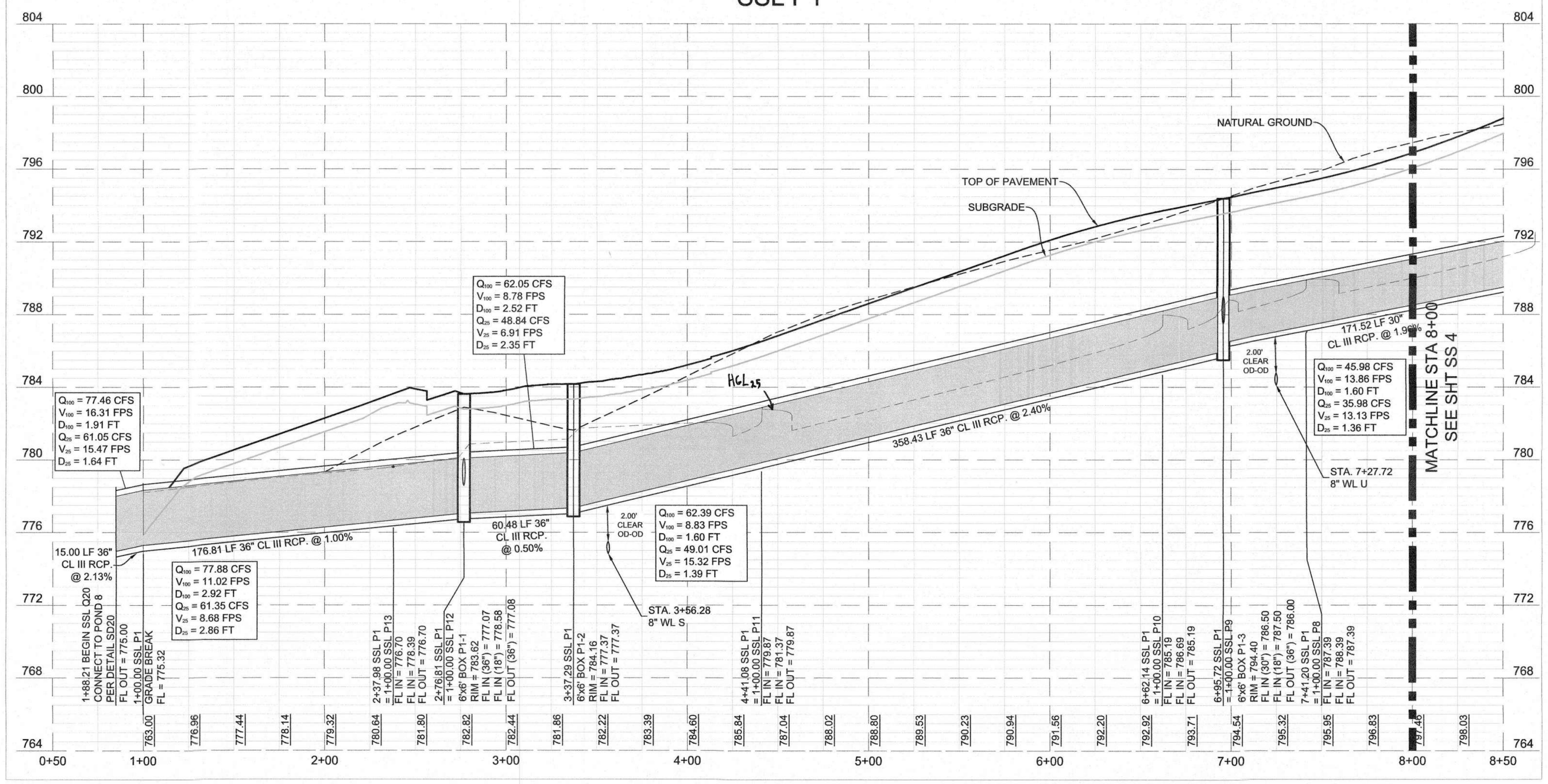


0 40 80
1" = 40'

LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—x—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
—○—	PROPOSED STORM SEWER LINE AND MANHOLE
—x—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
—●—	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—○	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

SSL P1



NOTES:

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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE P PLAN AND PROFILE
STA 1+00 TO 8+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS3.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS3

SHEET NO.
67
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 2:08pm
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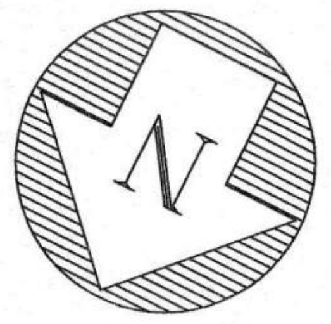
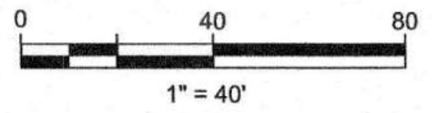
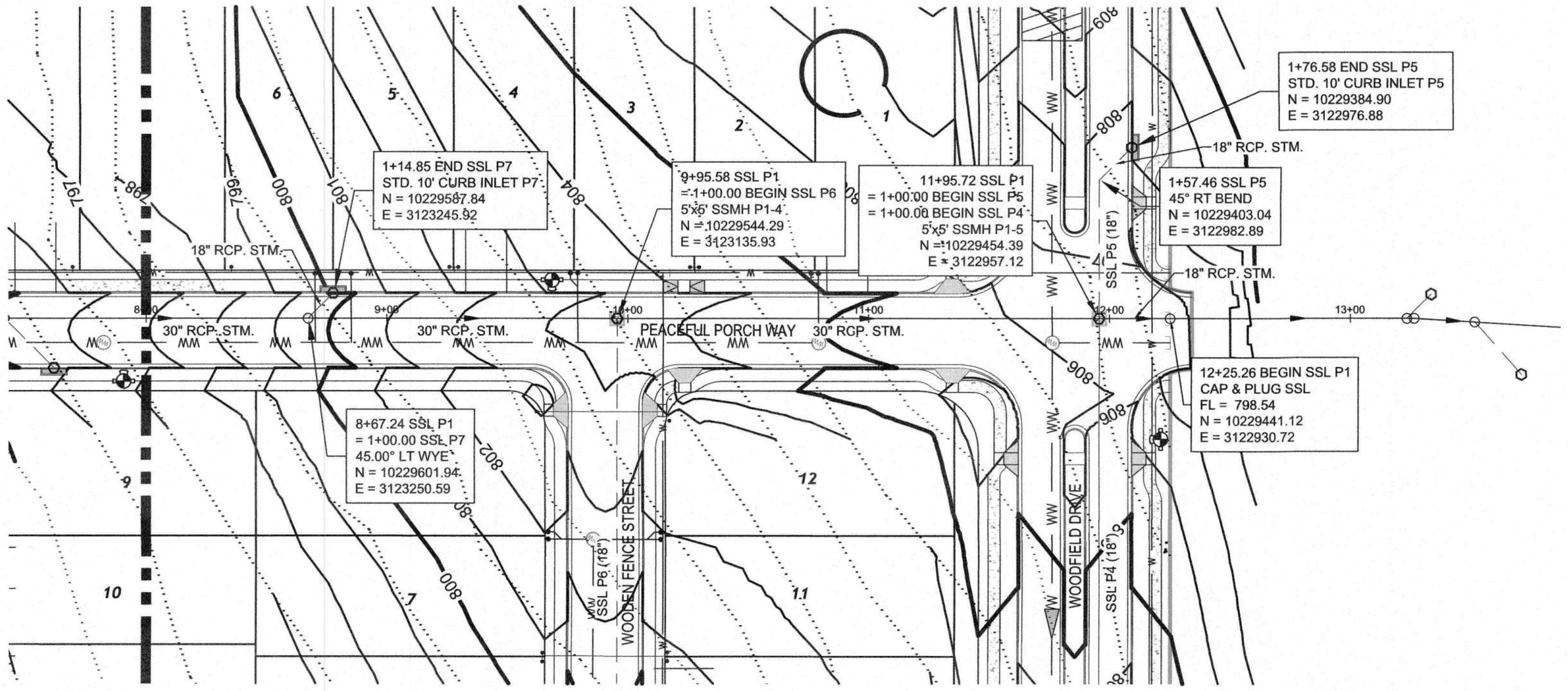
User Name : jmidura

2023-XX-CON



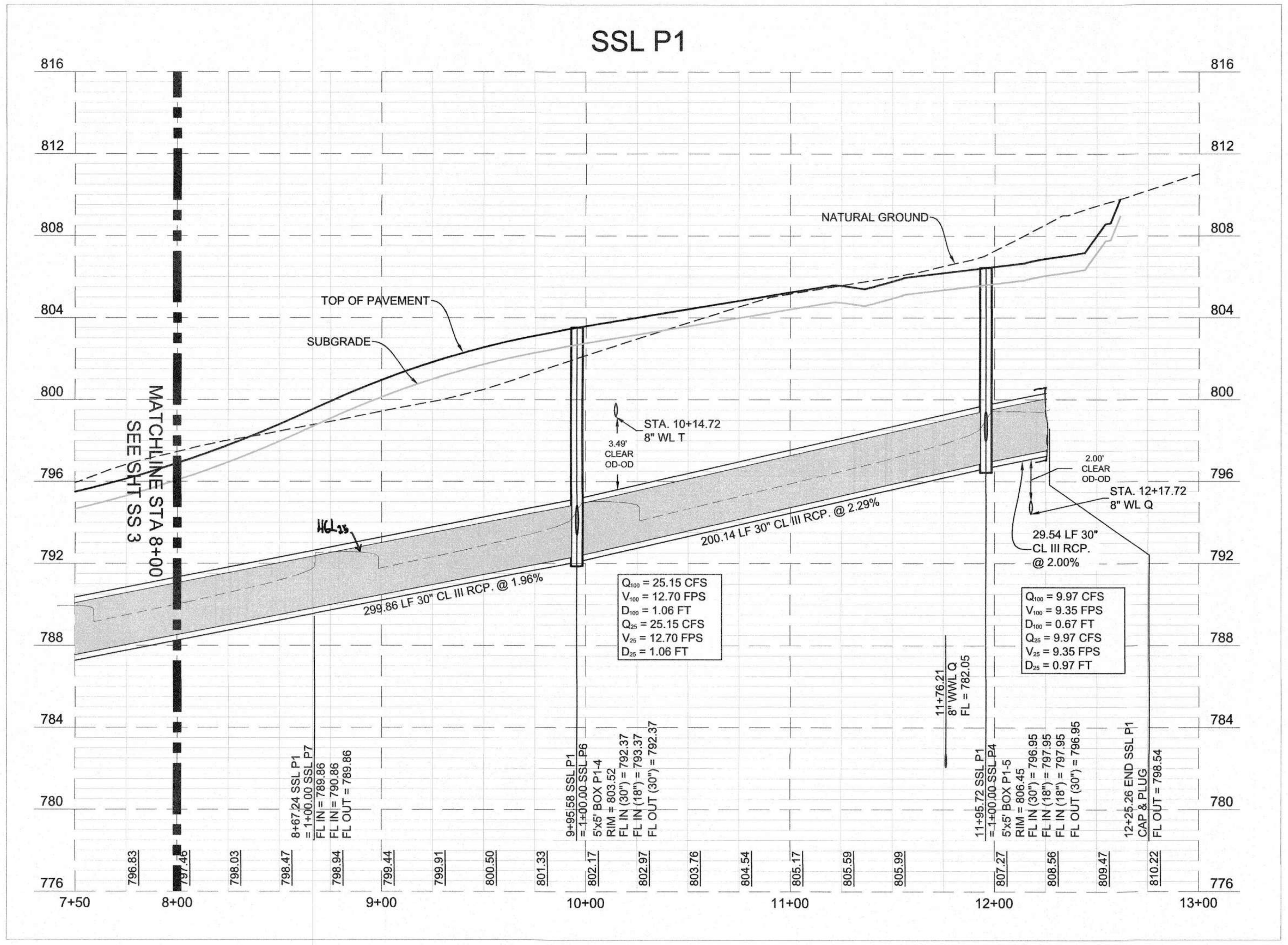




LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

SSL P1



Q_{100} = 25.15 CFS
V_{100} = 12.70 FPS
D_{100} = 1.06 FT
Q_{25} = 25.15 CFS
V_{25} = 12.70 FPS
D_{25} = 1.06 FT

Q_{100} = 9.97 CFS
V_{100} = 9.35 FPS
D_{100} = 0.67 FT
Q_{25} = 9.97 CFS
V_{25} = 9.35 FPS
D_{25} = 0.97 FT

NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
2. REFER TO DETAILS 506S-5, 506S-7, 506S-8, 506S-9 AND/OR 506S-10 FOR MANHOLE CONSTRUCTION. CONTRACTOR MAY SUBSTITUTE JUNCTION BOXES FOR RING MANHOLES WITH APPROVAL OF THE ENGINEER.
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811
Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE P PLAN AND PROFILE
STA 8+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS4.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED
PROFESSIONAL ENGINEER
11-30-2023

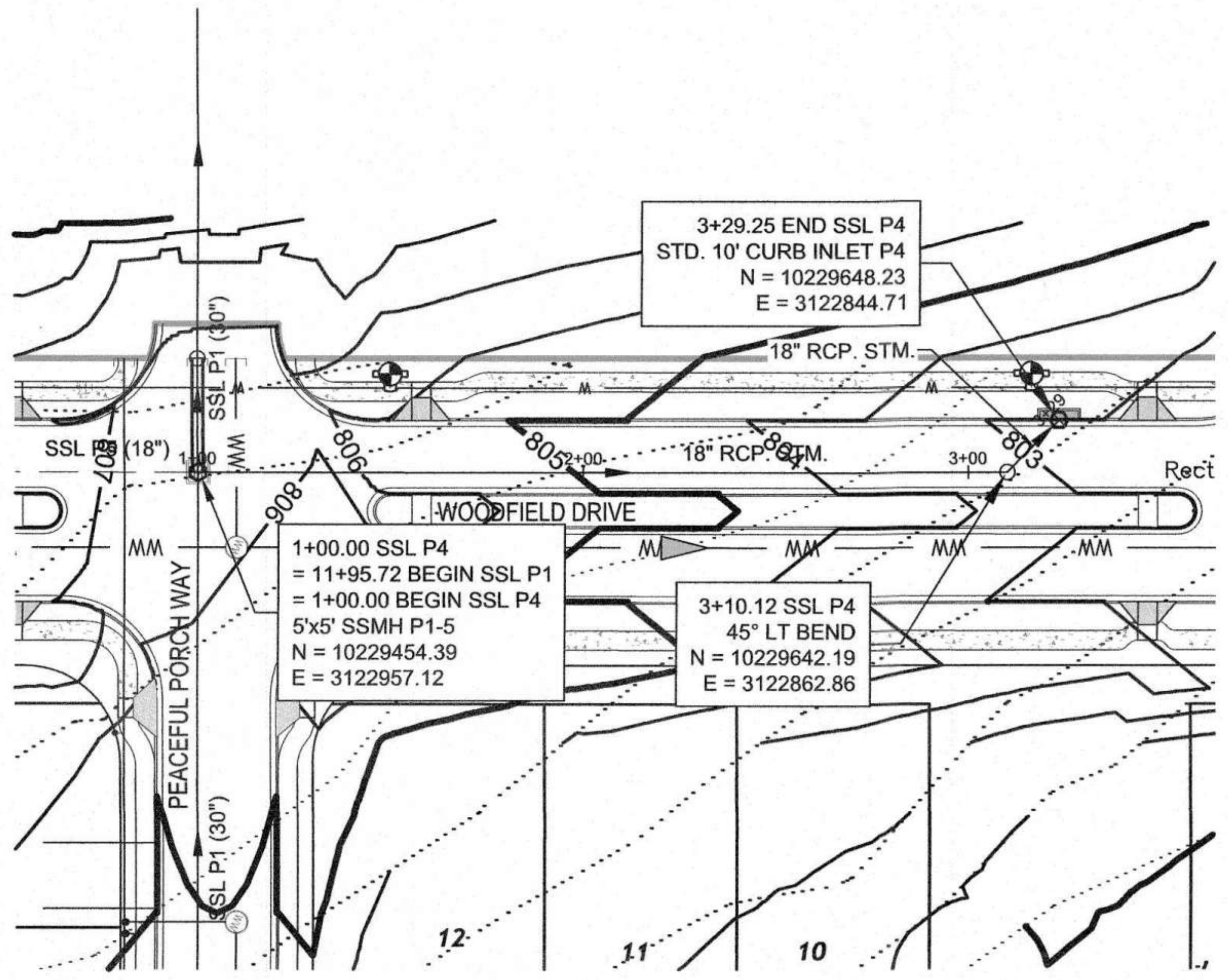
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

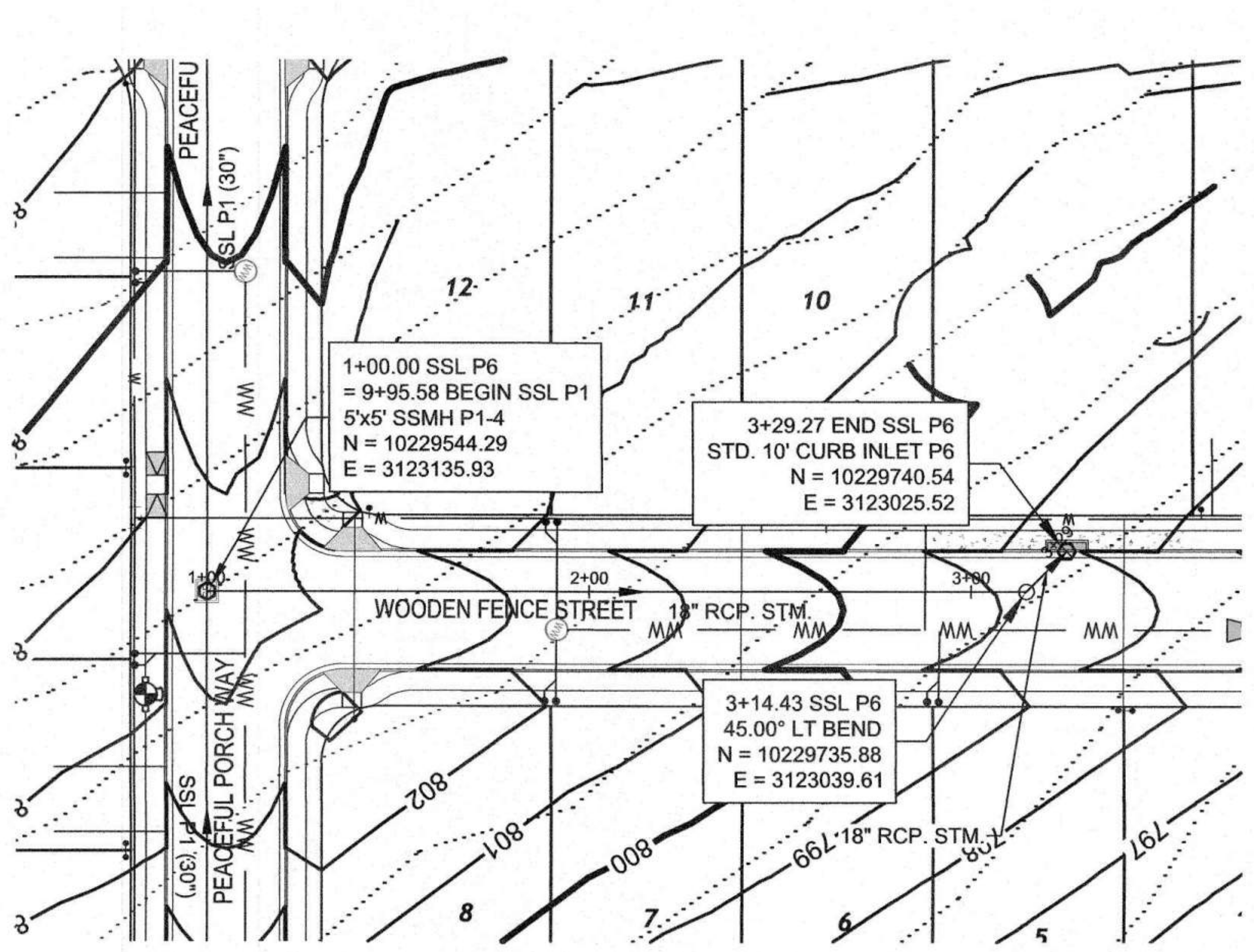
JOB NUMBER:
A245-1002

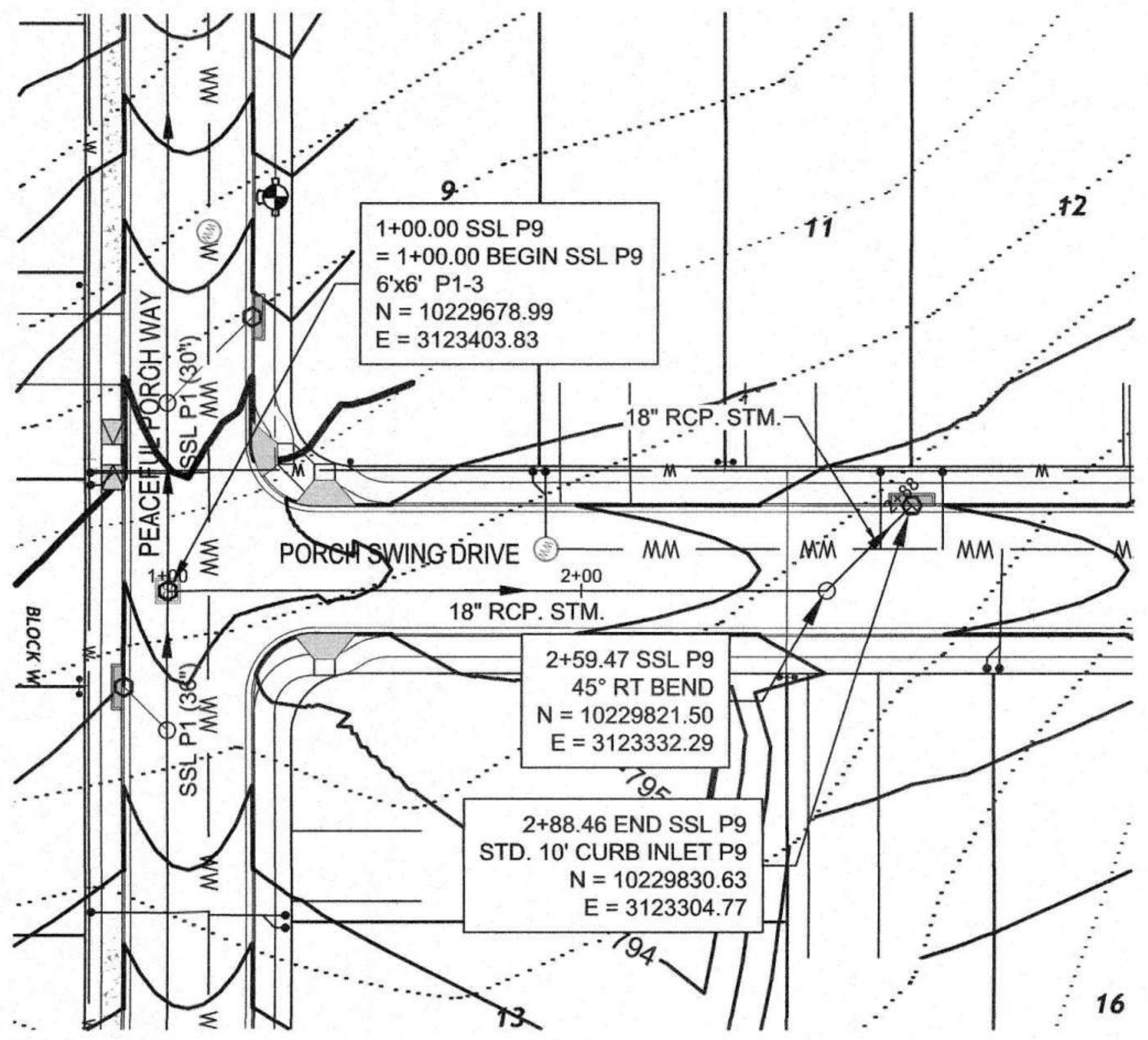
SS4

SHEET NO.
68
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 2:08pm User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS4.dwg





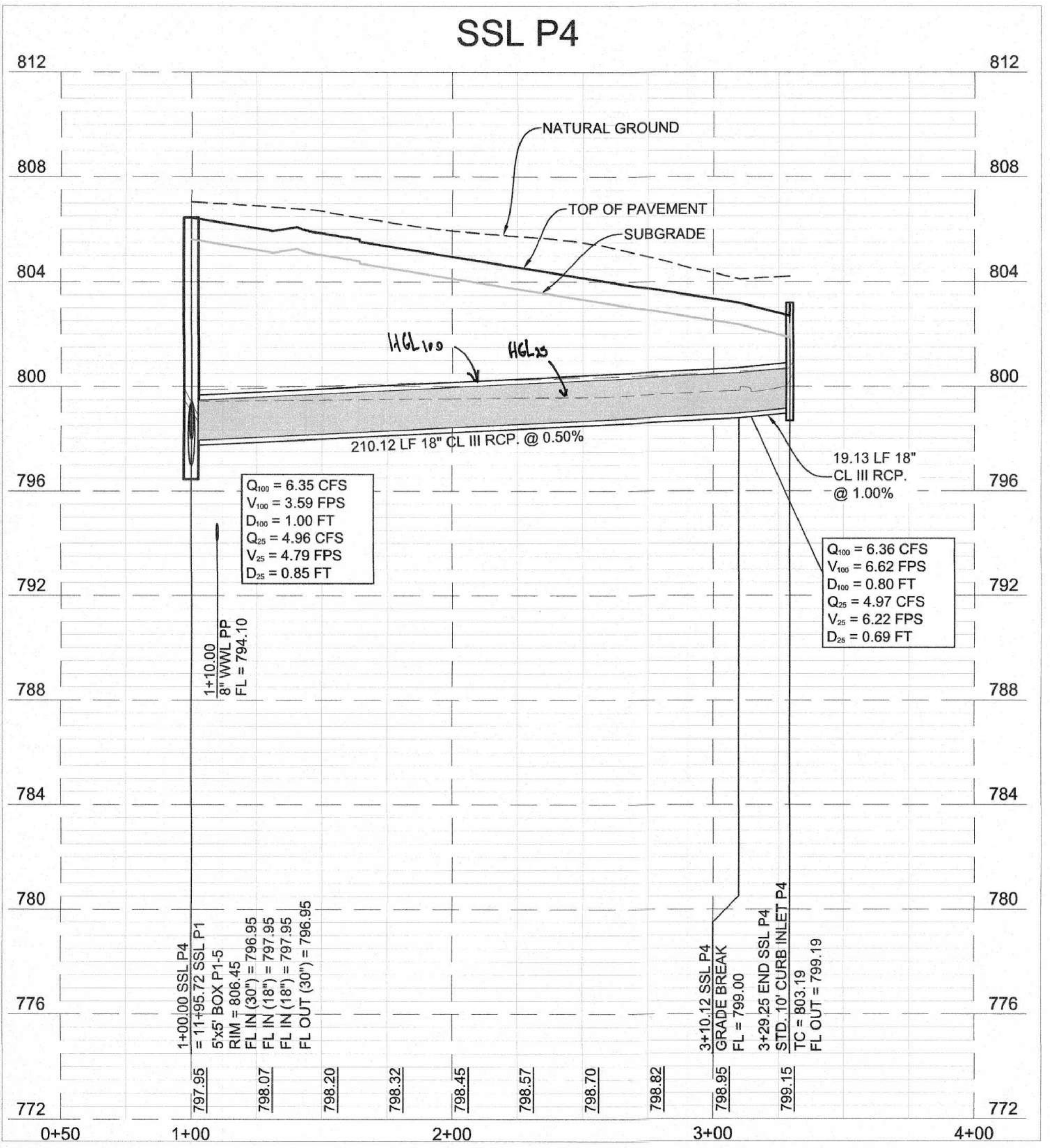


0 40 80
1" = 40'

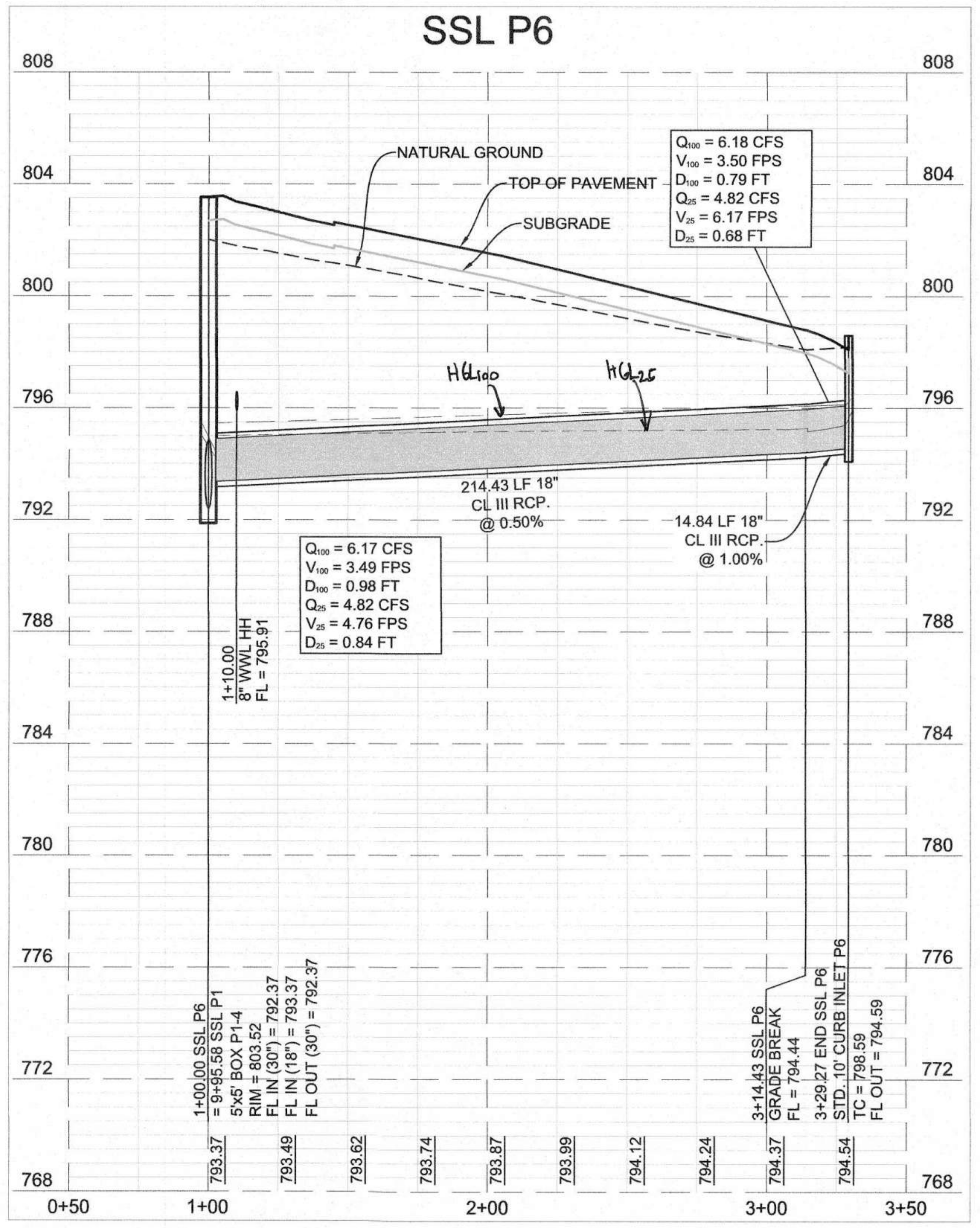
LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—·—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
—○—	PROPOSED STORM SEWER LINE AND MANHOLE
—·—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
—●—	EXISTING STORM SEWER LINE
—	DOUBLE SANITARY SERVICE LEAD
—	SINGLE SANITARY SERVICE LEAD
—○	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—	SINGLE WASTEWATER PRESSURE SERVICE LEAD

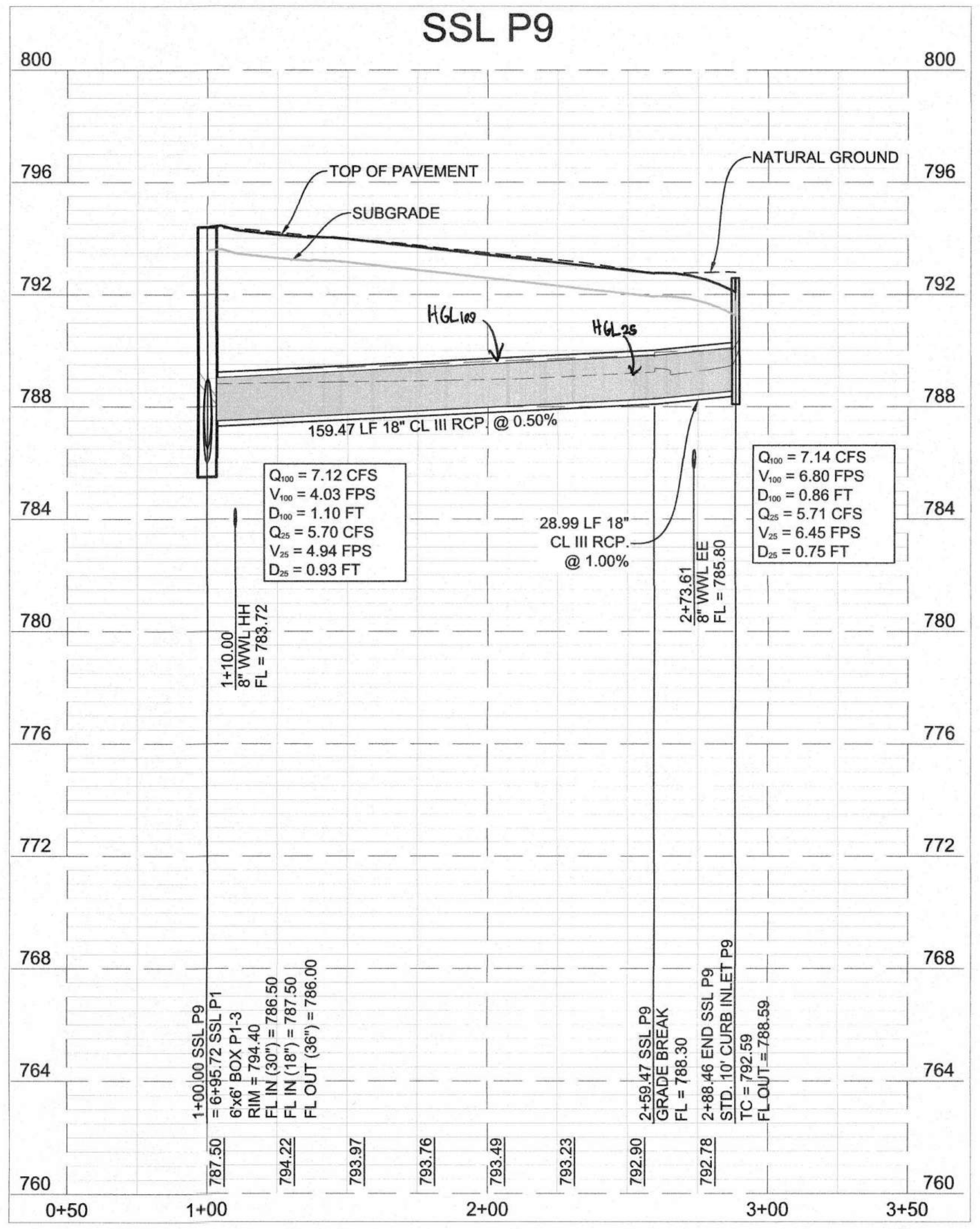
SSL P4



SSL P6



SSL P9



NOTES:

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WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINES P4, P6, & P9
PLAN AND PROFILE
STA 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS5.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

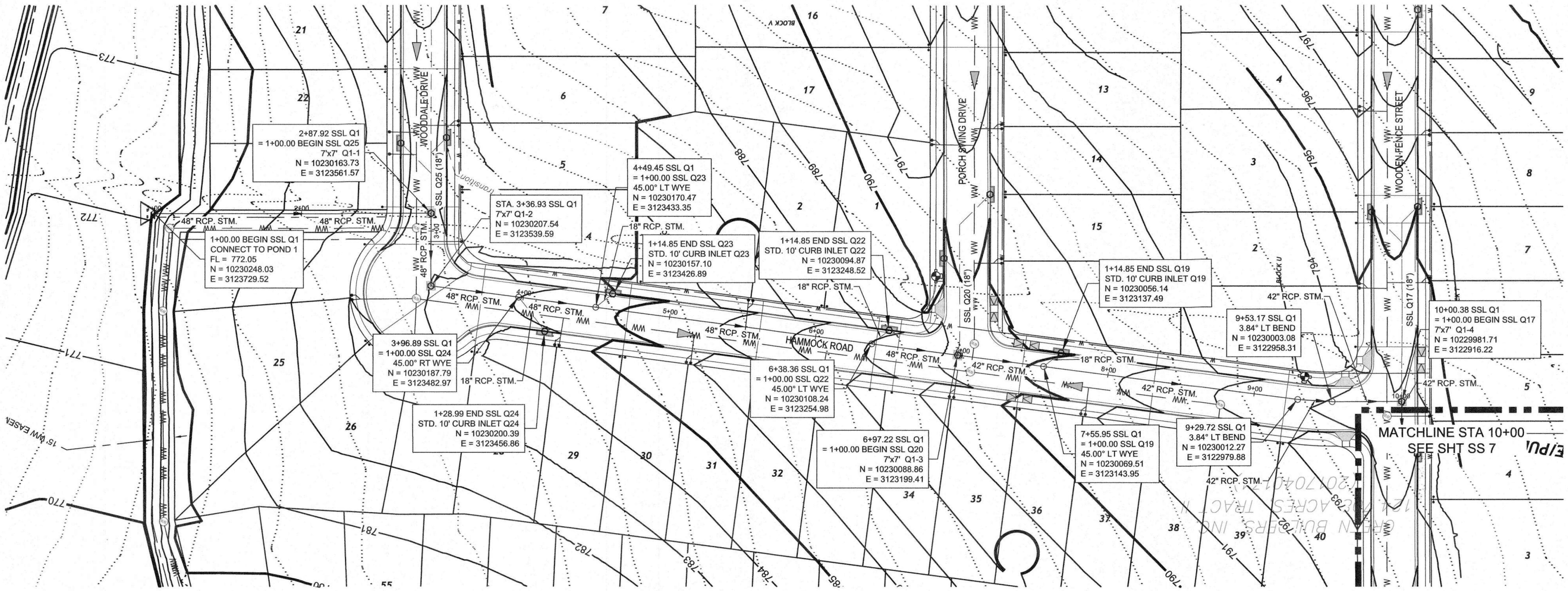
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

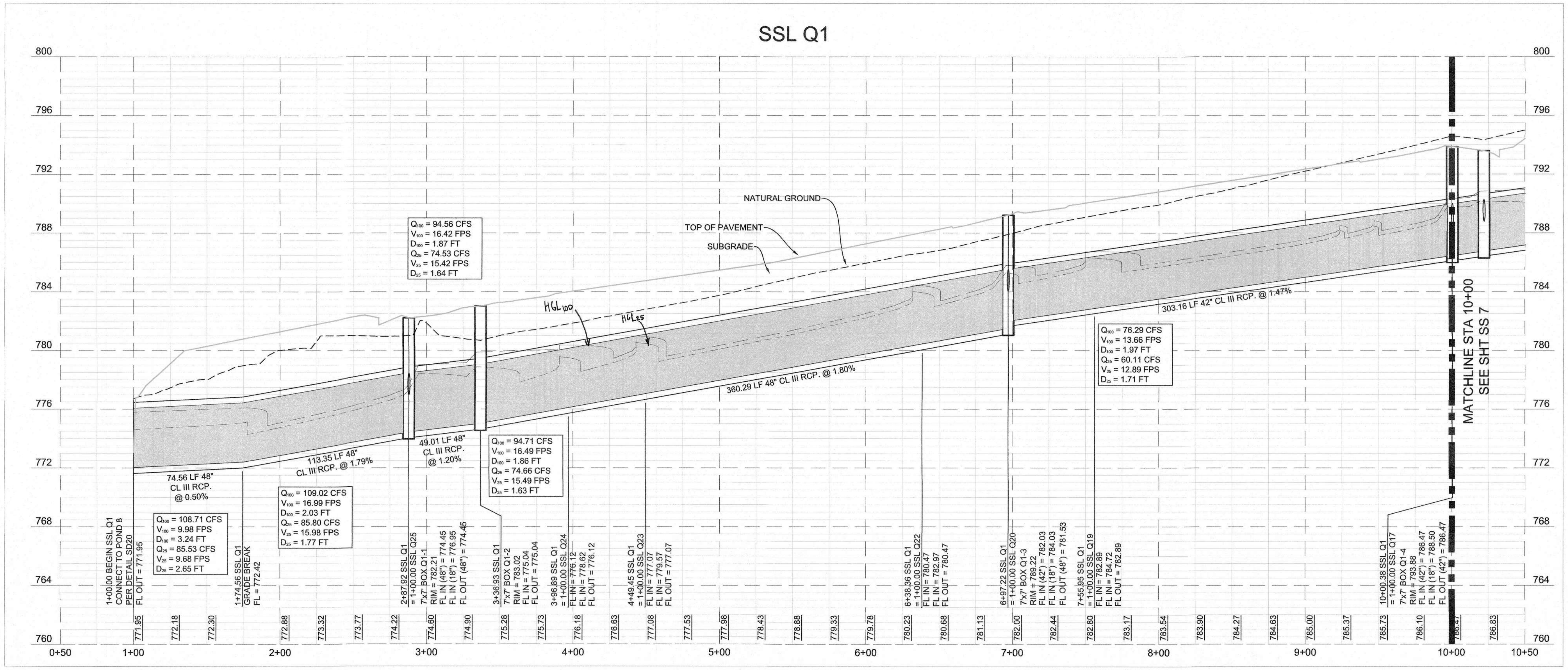
SS5

SHEET NO.
69
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 2:09pm User Name : jmidura
PathName : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS5.dwg



SSL Q1



Q_{100} = 108.71 CFS
V_{100} = 9.98 FPS
D_{100} = 3.24 FT
Q_{25} = 85.53 CFS
V_{25} = 9.68 FPS
D_{25} = 2.65 FT

Q_{100} = 109.02 CFS
V_{100} = 16.99 FPS
D_{100} = 2.03 FT
Q_{25} = 85.80 CFS
V_{25} = 15.98 FPS
D_{25} = 1.77 FT

Q_{100} = 94.56 CFS
V_{100} = 16.42 FPS
D_{100} = 1.87 FT
Q_{25} = 74.53 CFS
V_{25} = 15.42 FPS
D_{25} = 1.64 FT

Q_{100} = 94.71 CFS
V_{100} = 16.49 FPS
D_{100} = 1.86 FT
Q_{25} = 74.66 CFS
V_{25} = 15.49 FPS
D_{25} = 1.63 FT

Q_{100} = 76.29 CFS
V_{100} = 13.66 FPS
D_{100} = 1.97 FT
Q_{25} = 60.11 CFS
V_{25} = 12.89 FPS
D_{25} = 1.71 FT

LEGEND:

✥	PROPOSED FIRE HYDRANT ASSEMBLY
✥	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
o	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—∠	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—o	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE Q1 PLAN AND PROFILE
STA 1+00 TO 10+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS6.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS6

SHEET NO.
70
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 2:10pm
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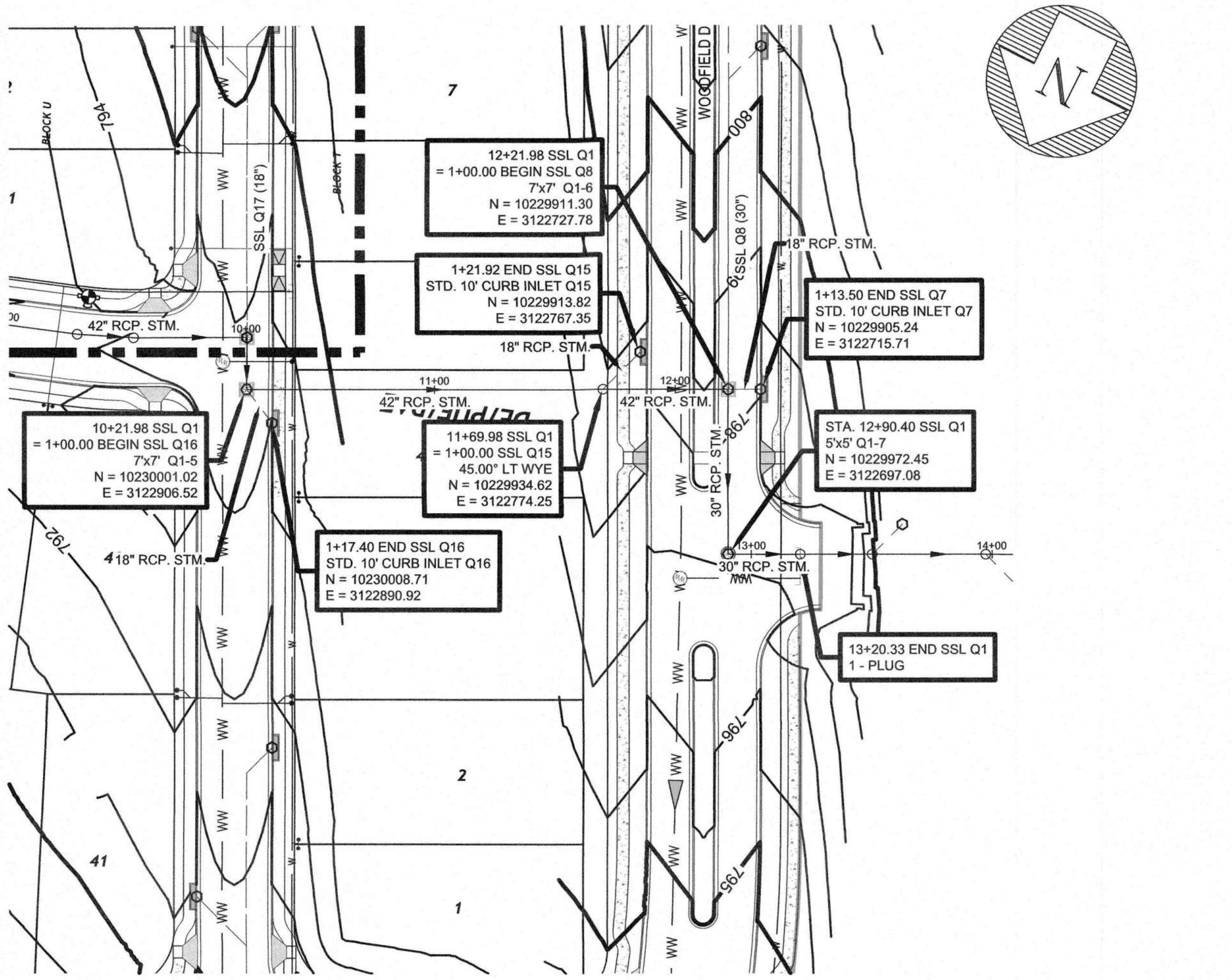
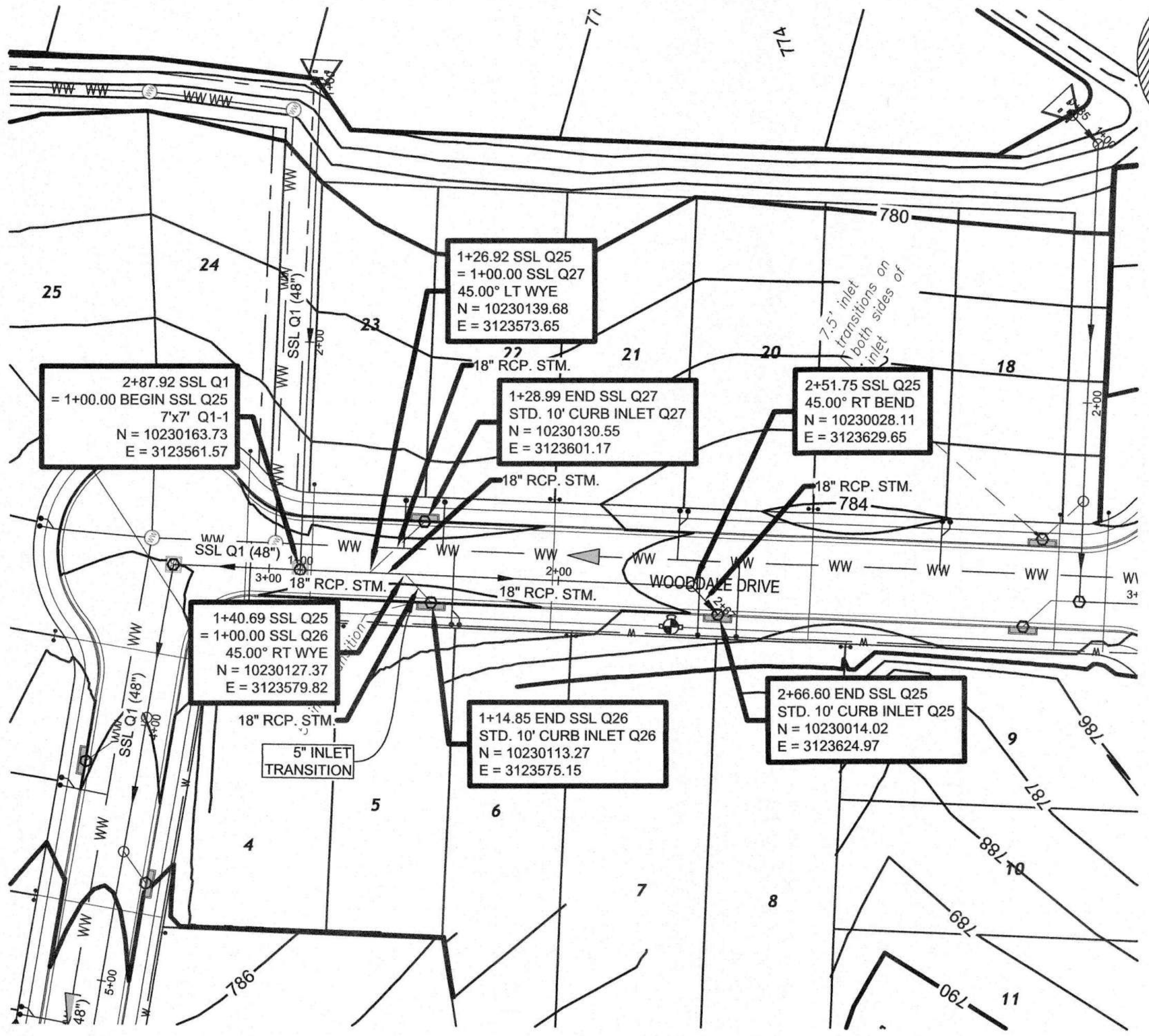
User Name : jmidura





0 40 80
1" = 40'

LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

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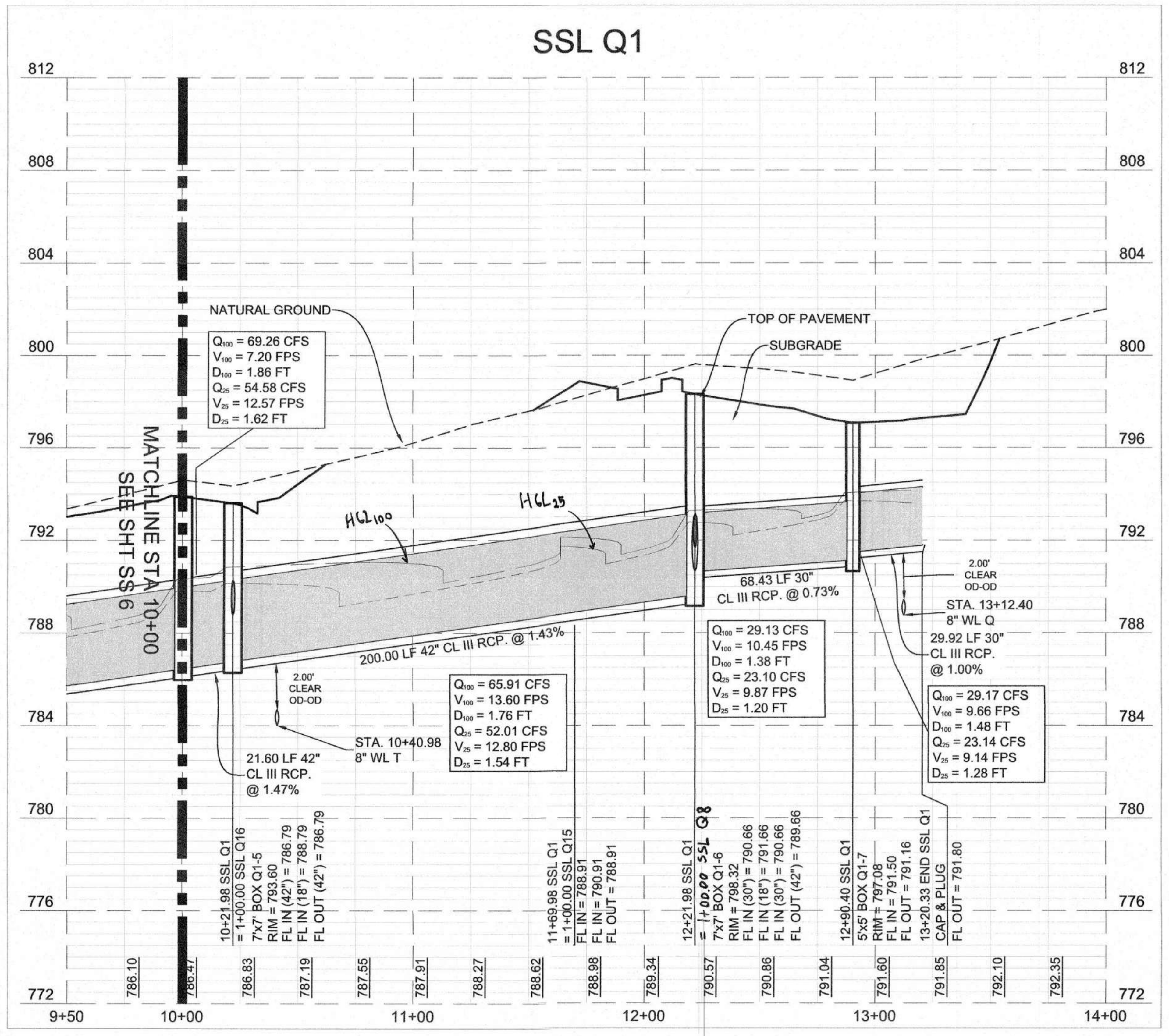
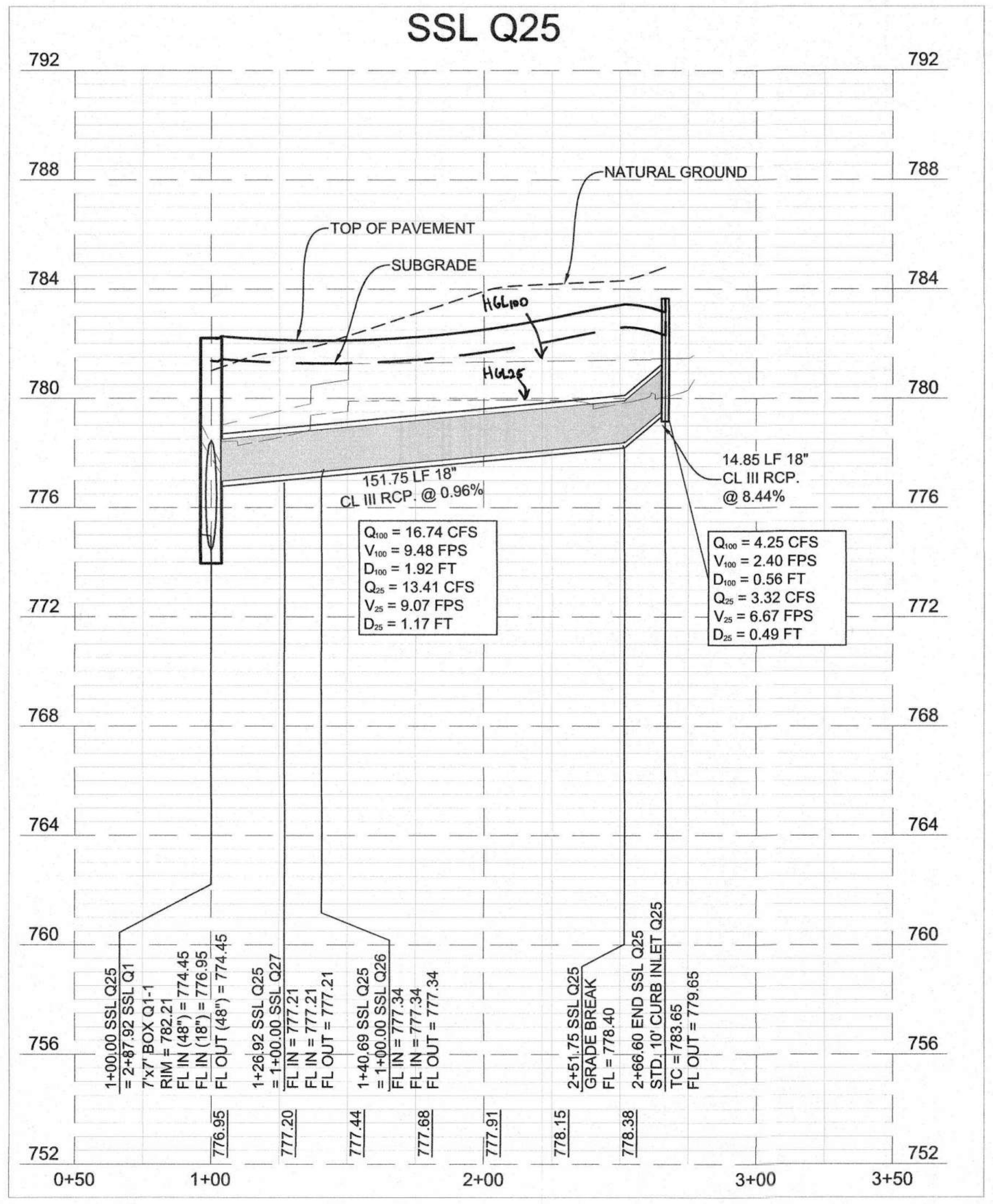
SSL Q1



SSL Q25



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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE PLAN AND PROFILES
Q1 STA 10+00 TO END
Q25 STA 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS7.dwg

JUSTIN D. MIDURA
128809
11-30-2023

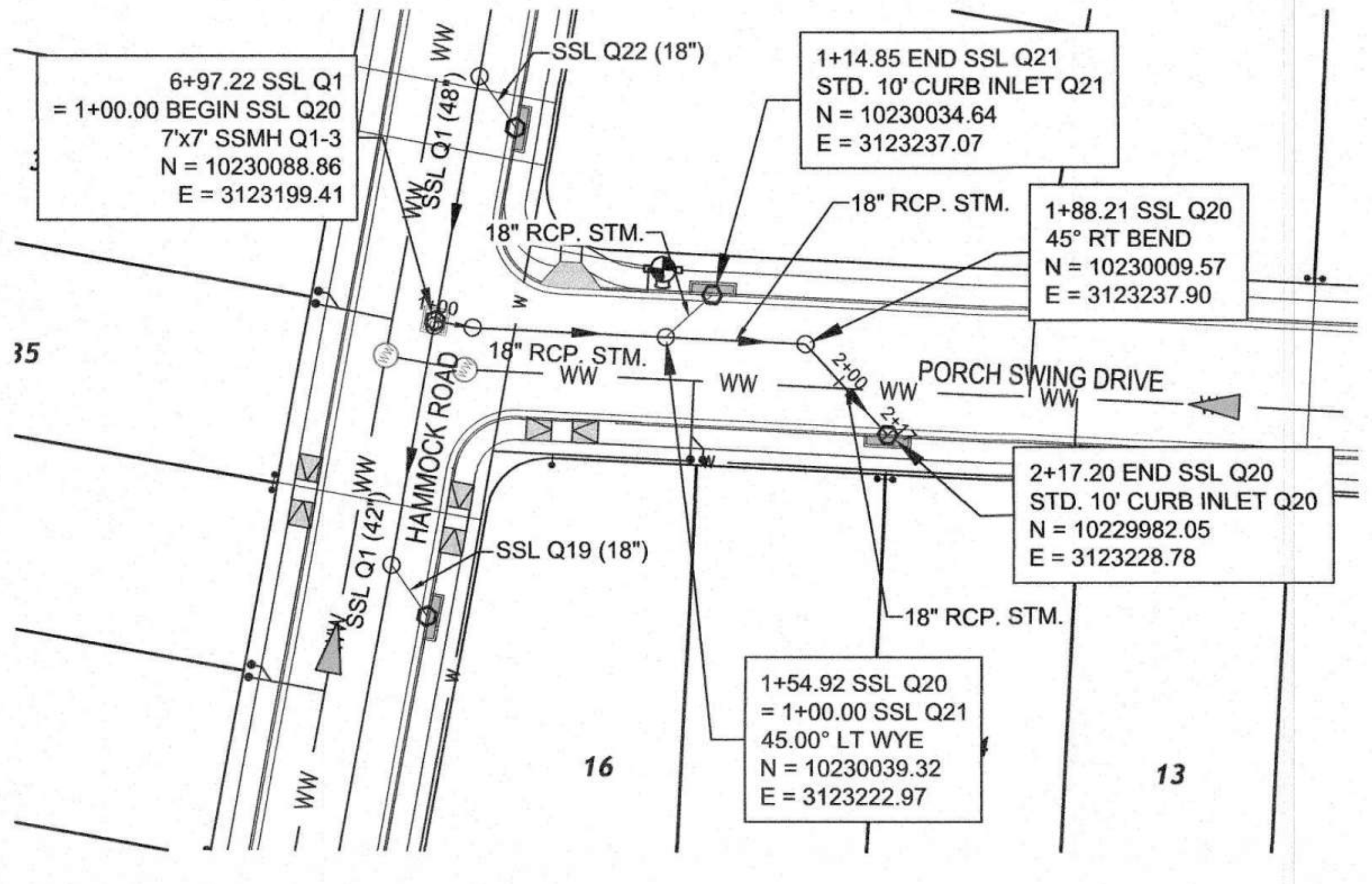
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

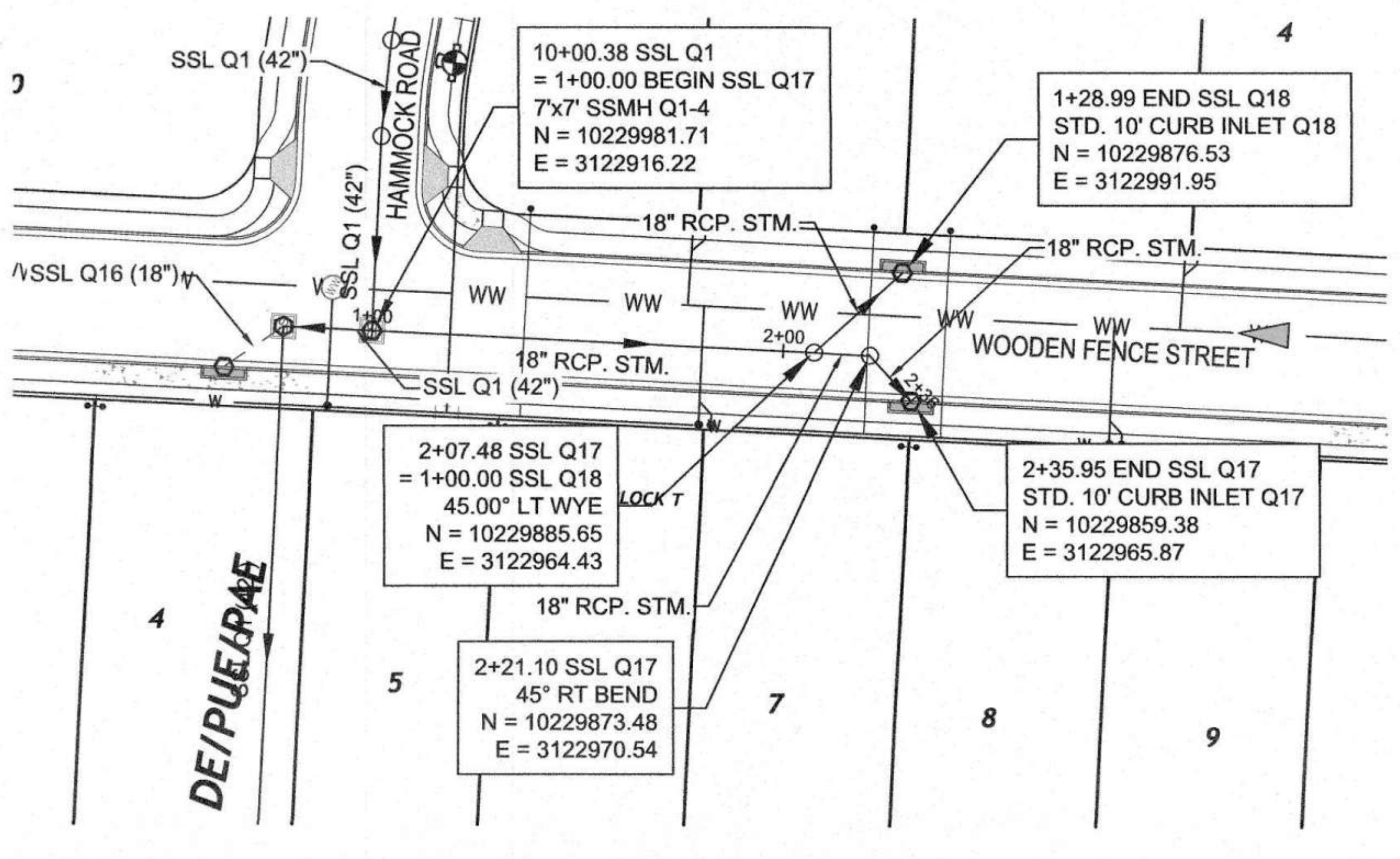
JOB NUMBER:
A245-1002

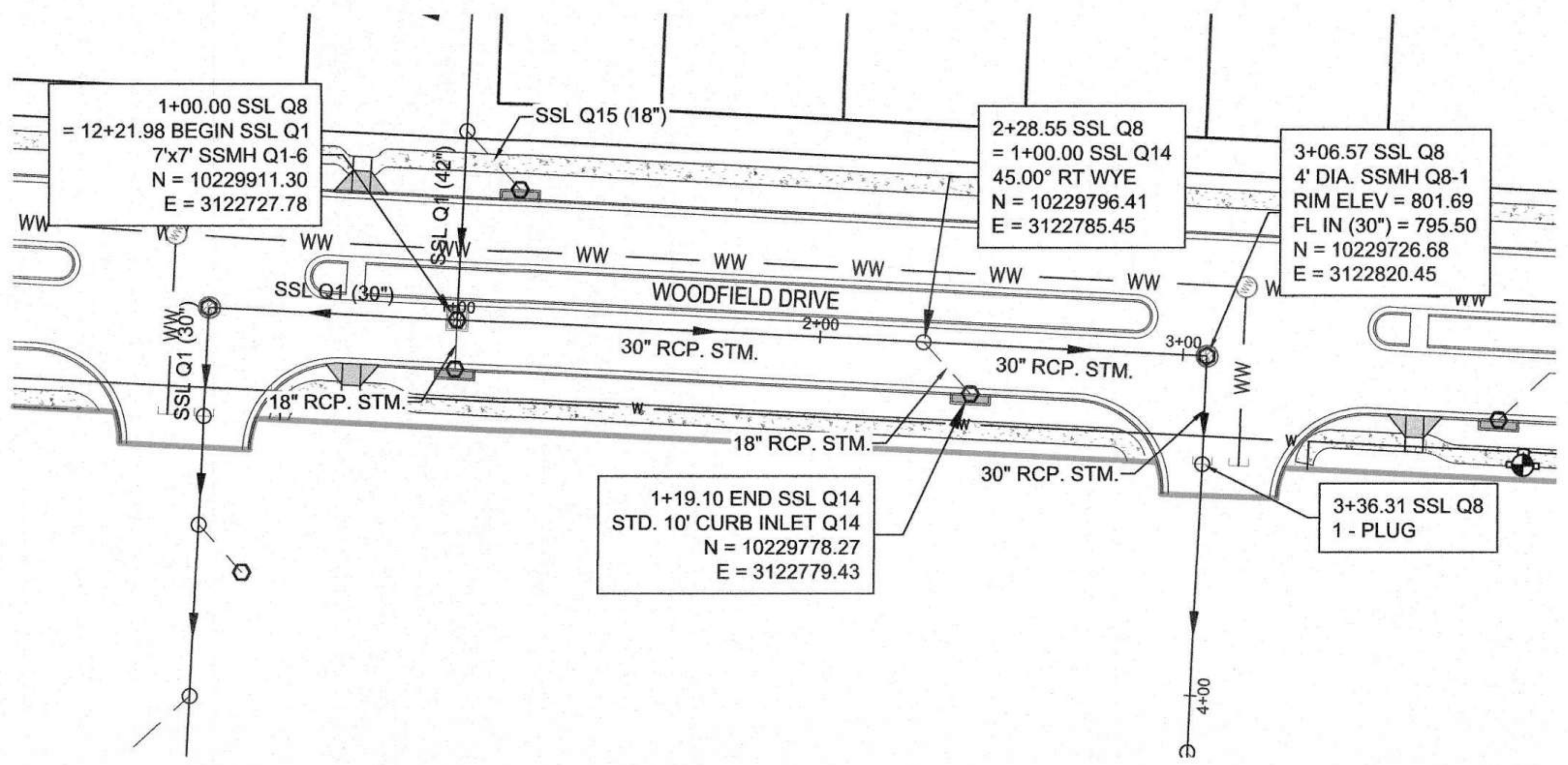
SS7

SHEET NO.
71
OF 118 SHEETS

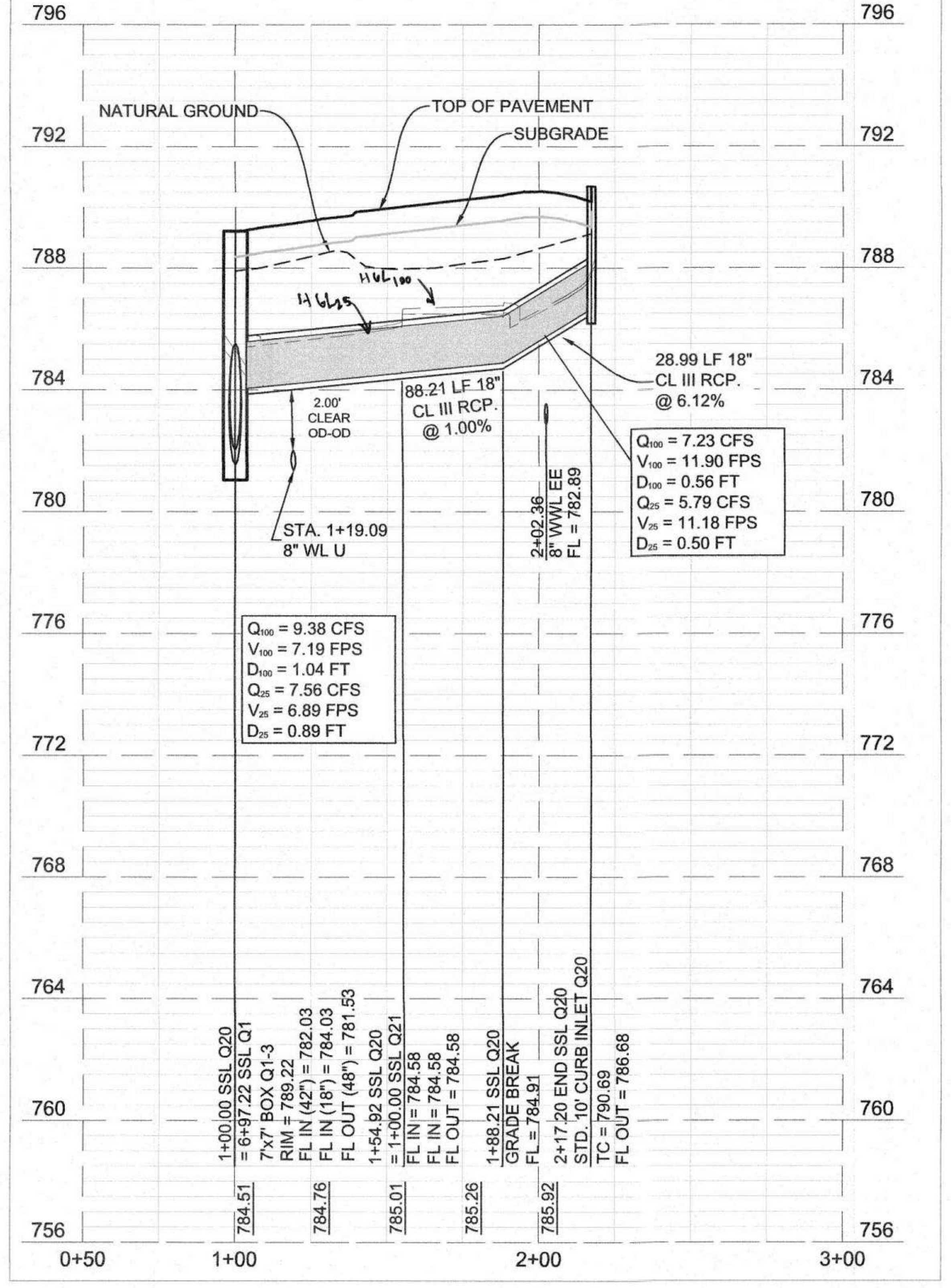
Date/Time : Fri, 01 Dec 2023 - 2:11pm
User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS7.dwg



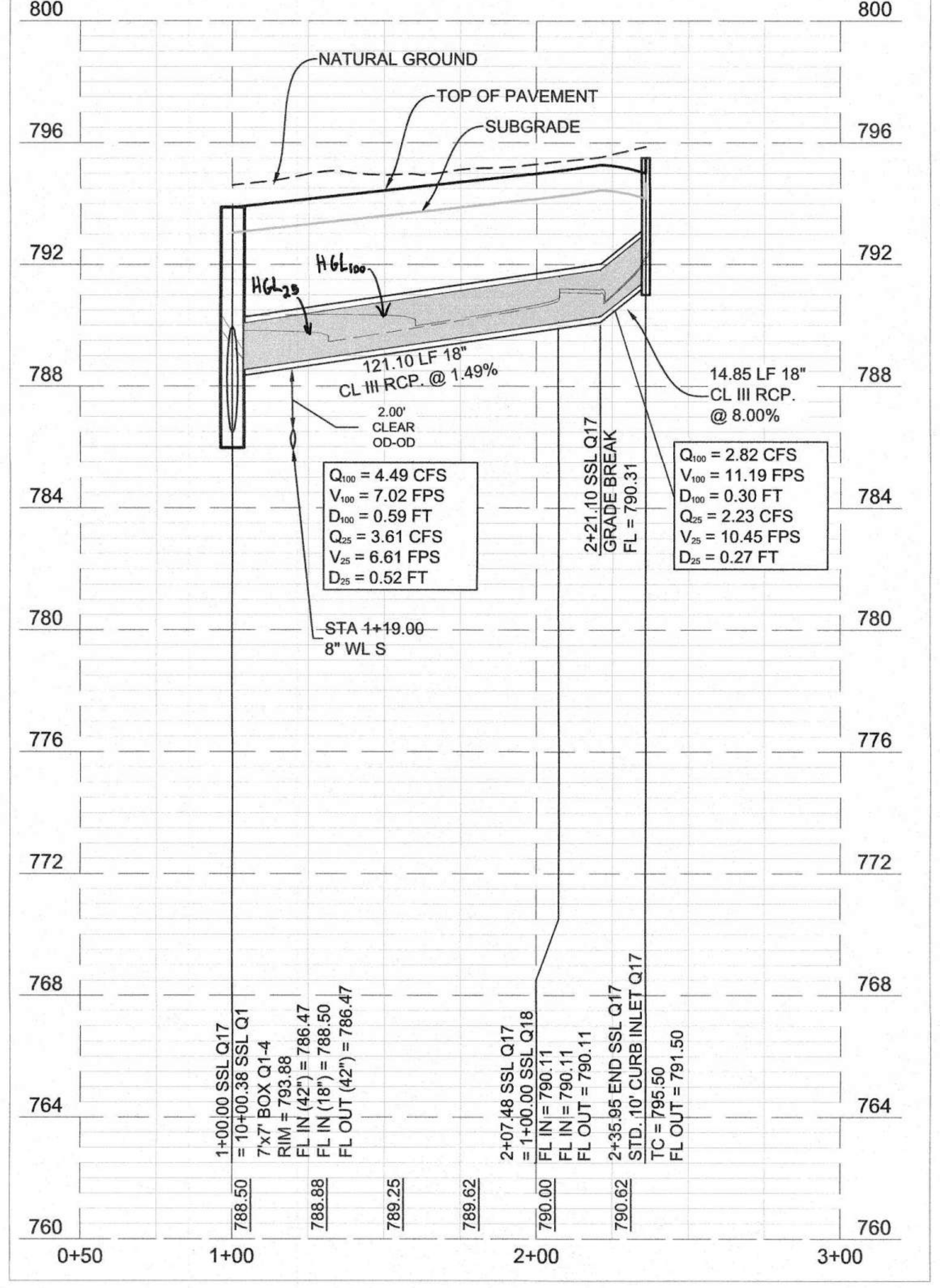




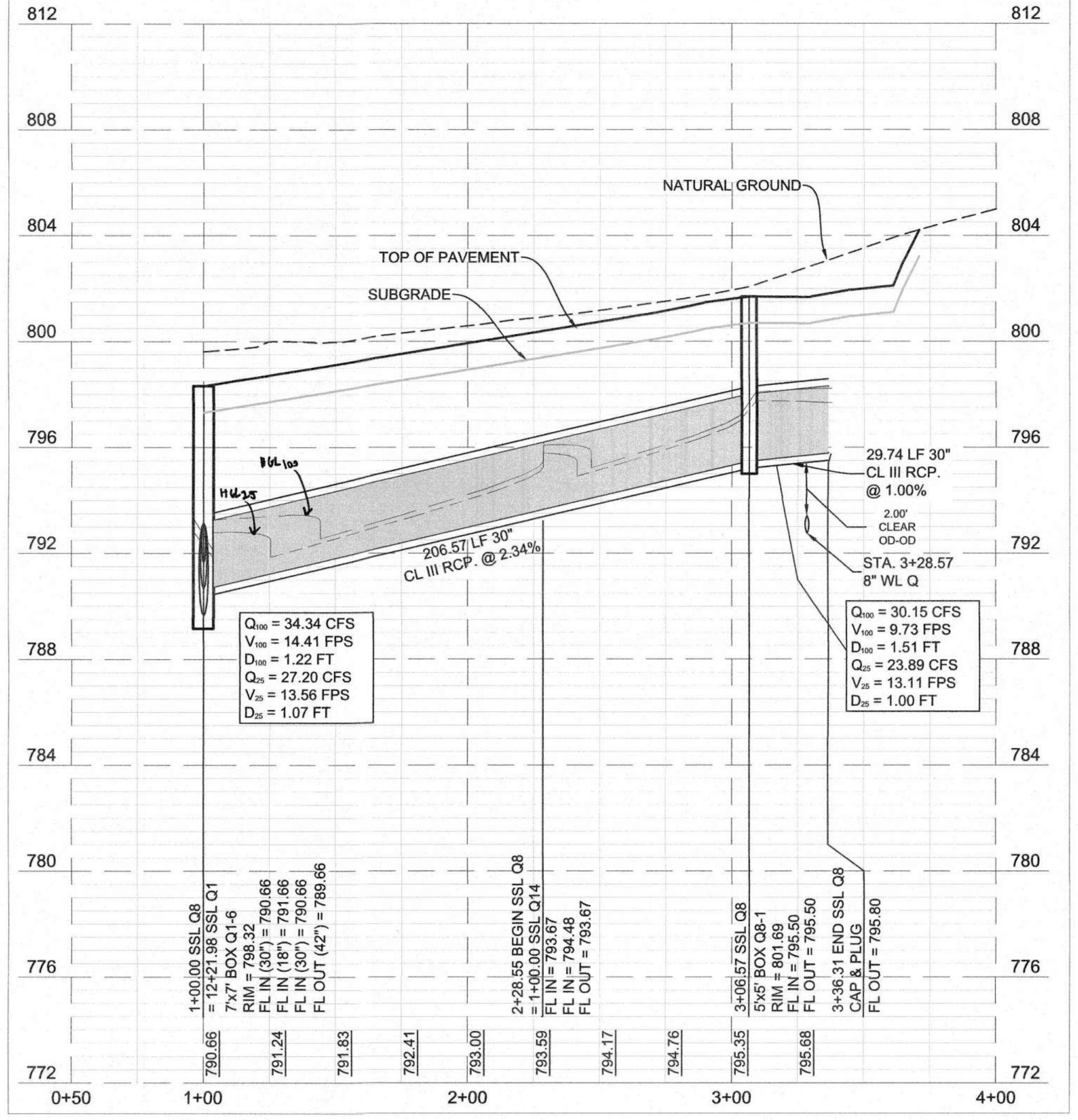
SSL Q20

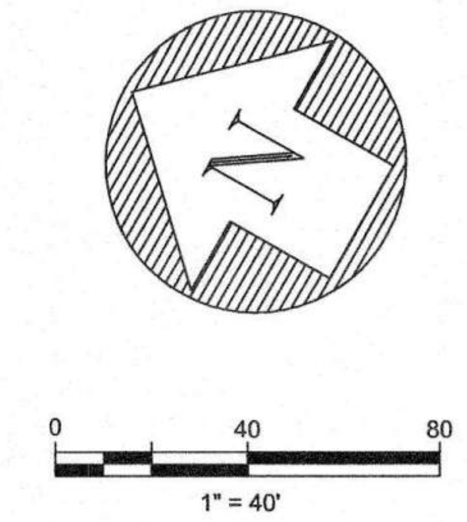


SSL Q17



SSL Q8





LEGEND:

✥	PROPOSED FIRE HYDRANT ASSEMBLY
✥	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—w—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—w—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
2. REFER TO DETAILS 506S-5, 506S-7, 506S-8, 506S-9 AND/OR 506S-10 FOR MANHOLE CONSTRUCTION. CONTRACTOR MAY SUBSTITUTE JUNCTION BOXES FOR RING MANHOLES WITH APPROVAL OF THE ENGINEER.
3. PIPE STATIONING AND LINEAR FOOTAGE IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS CALCULATED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.
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LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.

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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINES Q8, Q17, & Q20
PLAN AND PROFILE
STA 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS8.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS8

SHEET NO.
72
OF 118 SHEETS

User Name : jmidura
Date\Time : Fri, 01 Dec 2023 - 2:12pm
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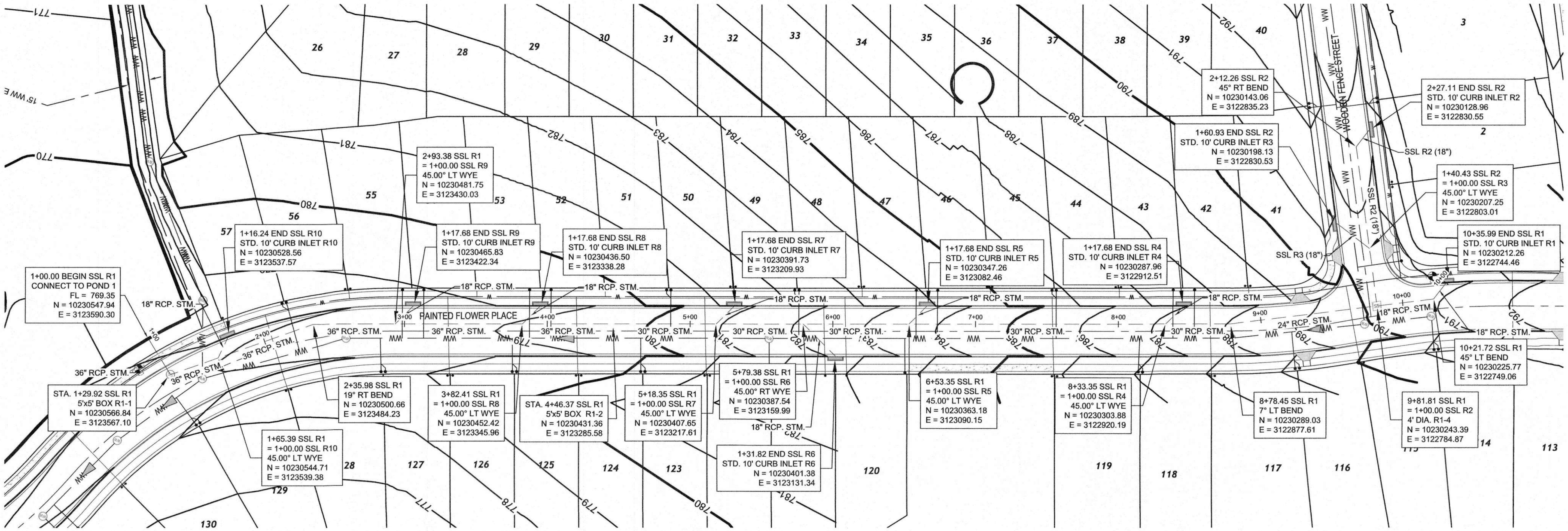
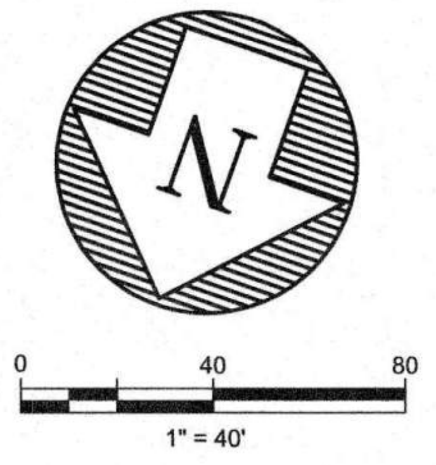


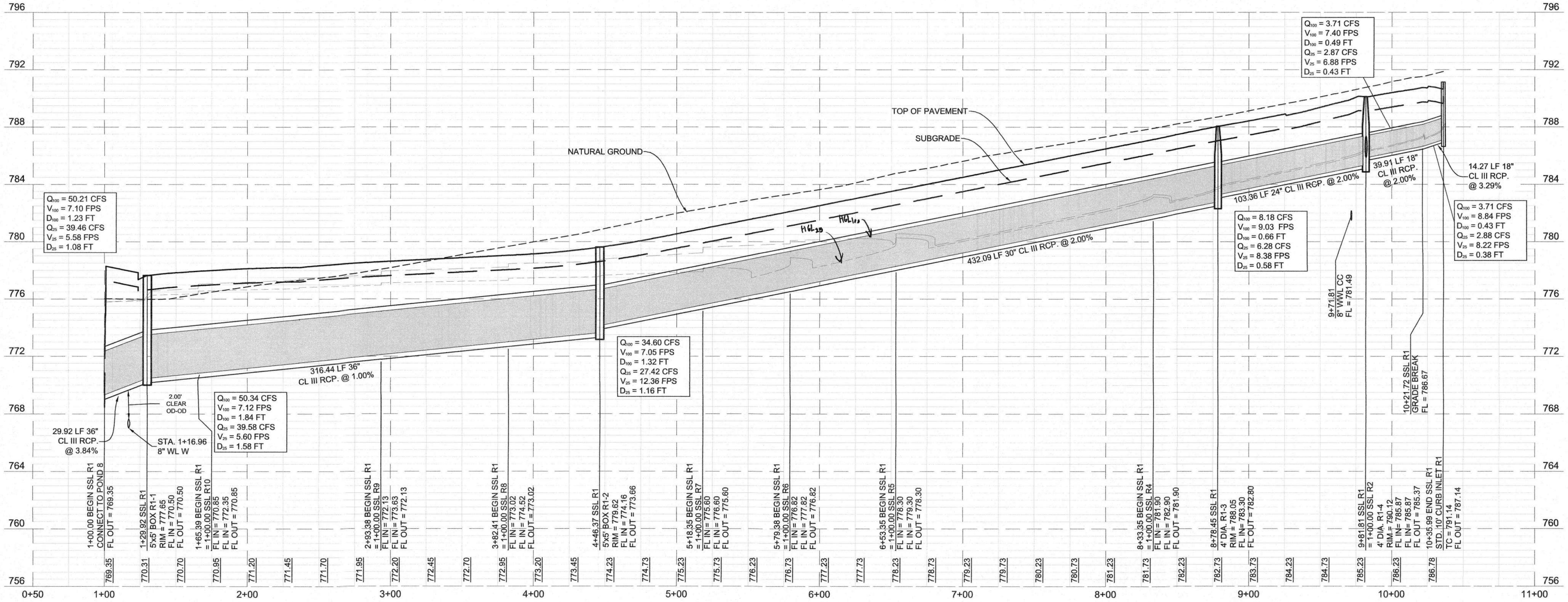


LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

SSL R1

(HORIZONTAL/VERTICAL = 40'/4')



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PROFILE LINE LEGEND

— — — —	100-YR HGL
- - - - - -	25-YR HGL
- - - - - -	NATURAL GROUND
———	PROPOSED PAVEMENT

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

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE R1 PLAN AND PROFILE
STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS9.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS9

SHEET NO.
73
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 3:15pm
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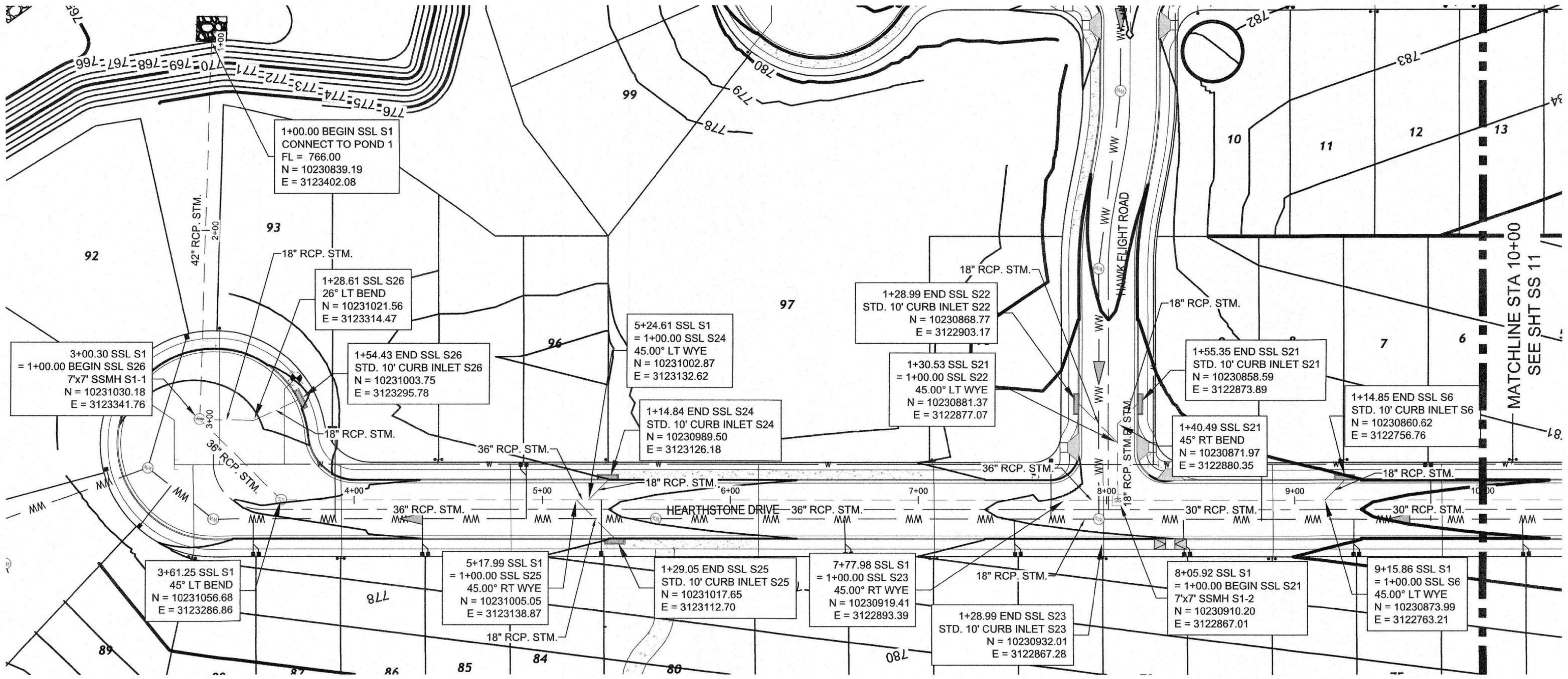


N

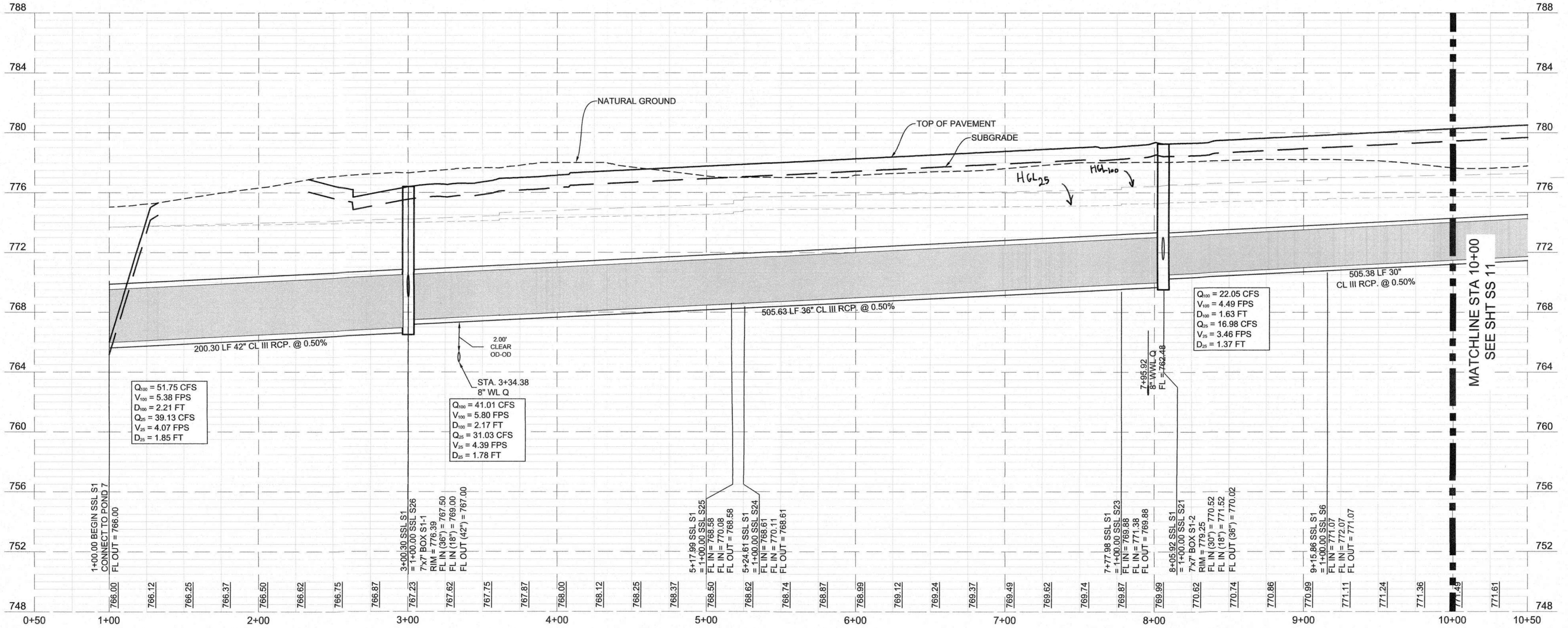
0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

SSL S1

(HORIZONTAL/VERTICAL = 40'/4')



NOTES:

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PROFILE LINE LEGEND

— — —	100-YR HGL
- - - -	25-YR HGL
- - - -	NATURAL GROUND
———	PROPOSED PAVEMENT

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE S1 PLAN AND PROFILE
STA. 1+00 TO 10+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS10.dwg

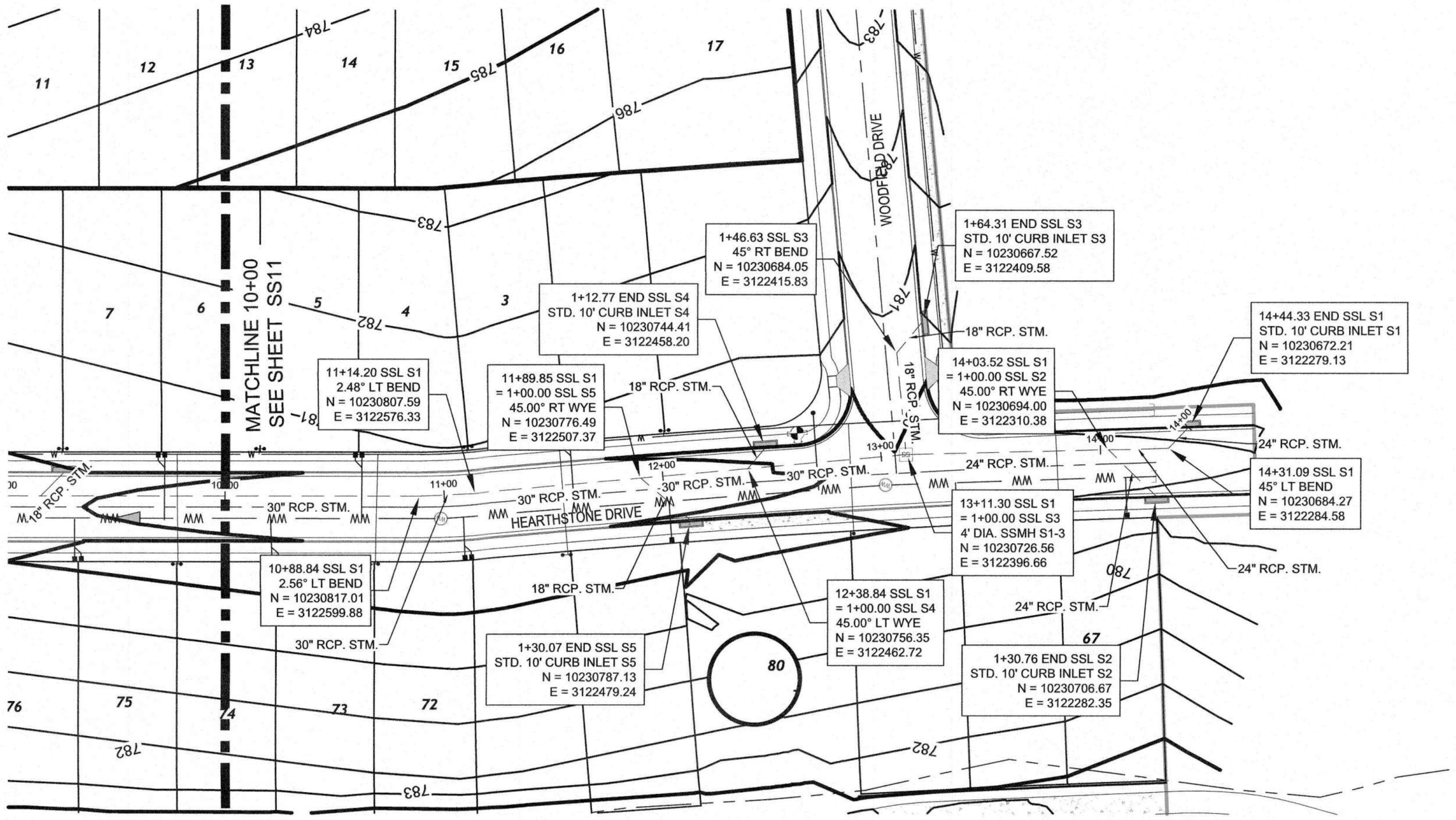
JUSTIN D. MIDURA
128809
11-30-2023

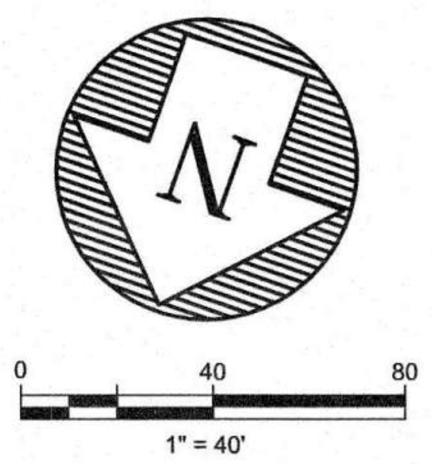
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

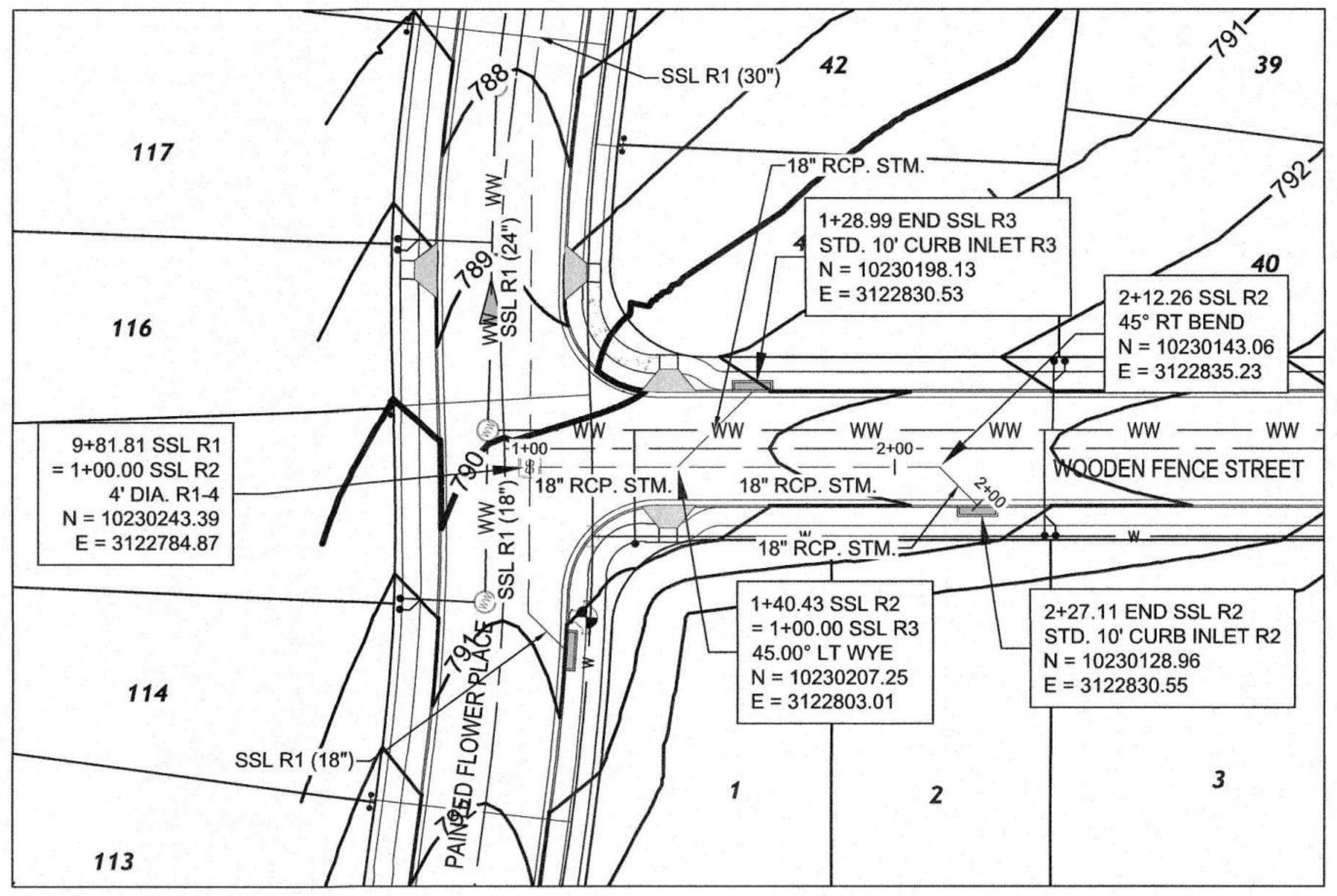
JOB NUMBER:
A245-1002

SS10

SHEET NO.
74
OF 118 SHEETS







LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

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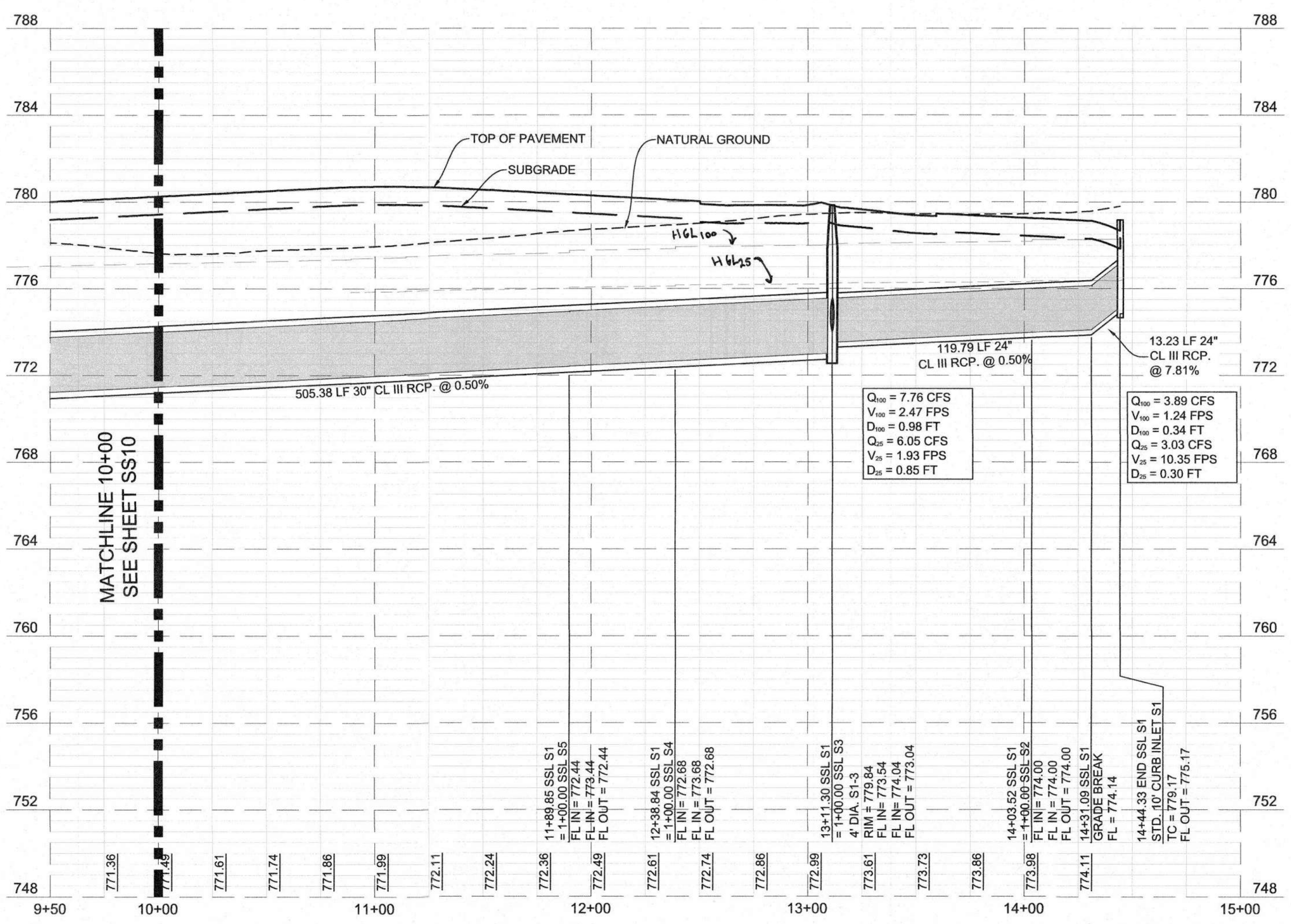
PROFILE LINE LEGEND

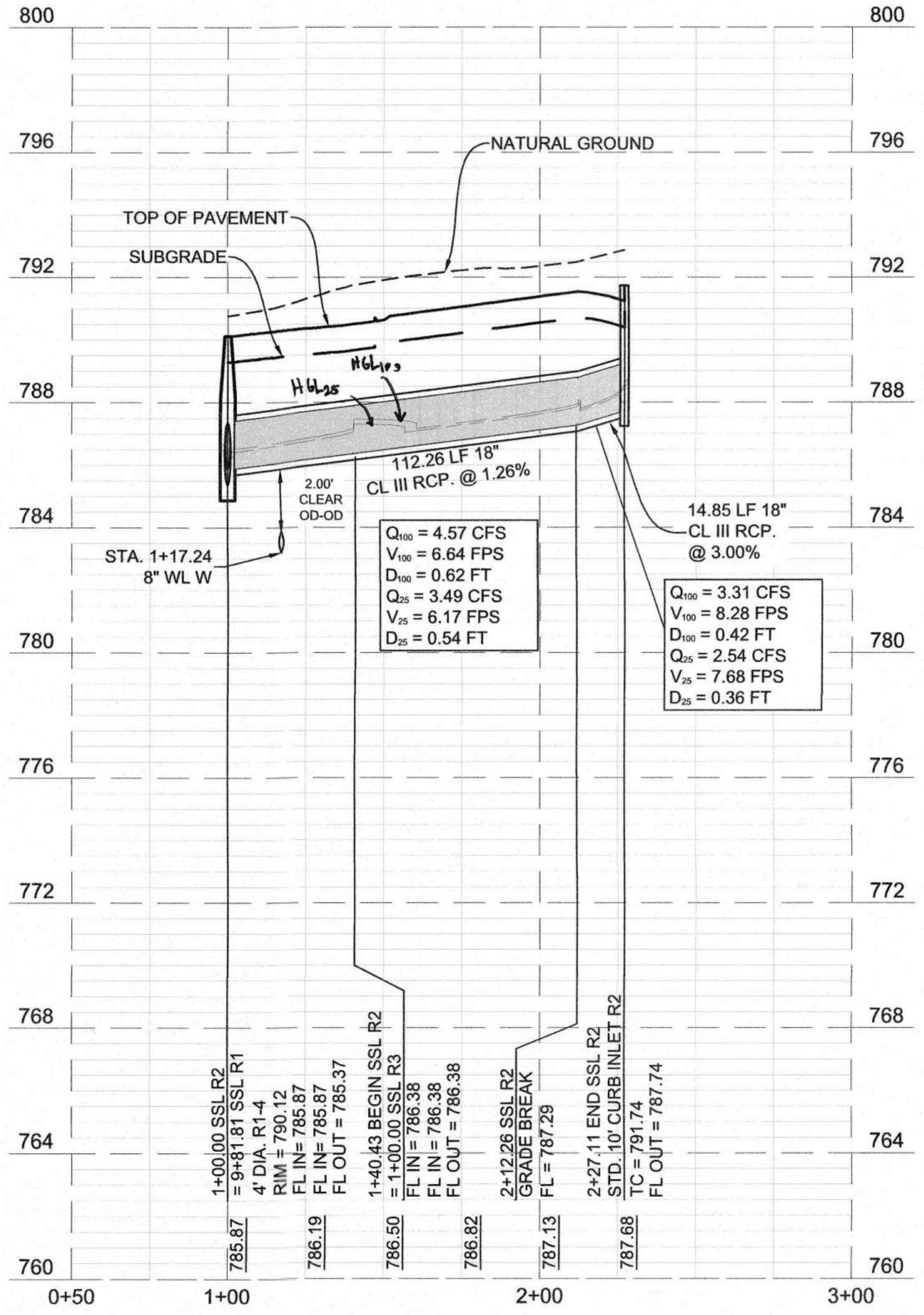
- 100-YR HGL
- 25-YR HGL
- NATURAL GROUND
- PROPOSED PAVEMENT

SSL S1

(HORIZONTAL/VERTICAL = 40'/4')



SSL R2



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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE PLAN AND PROFILE
S1 STA. 10+00 TO END & R2 STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS11.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

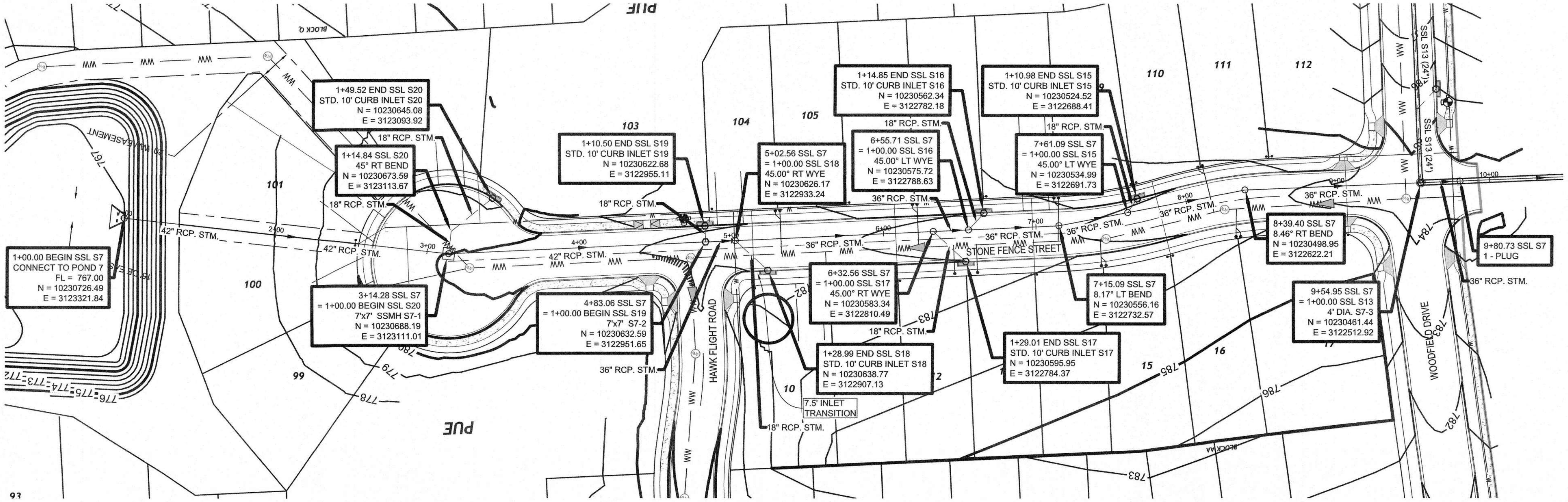
JOB NUMBER:
A245-1002

SS11

SHEET NO.
75
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 3:14pm
User Name : jpleouch
PathName : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS11.dwg

WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE S7 PLAN AND PROFILE
STA. 1+00 TO END

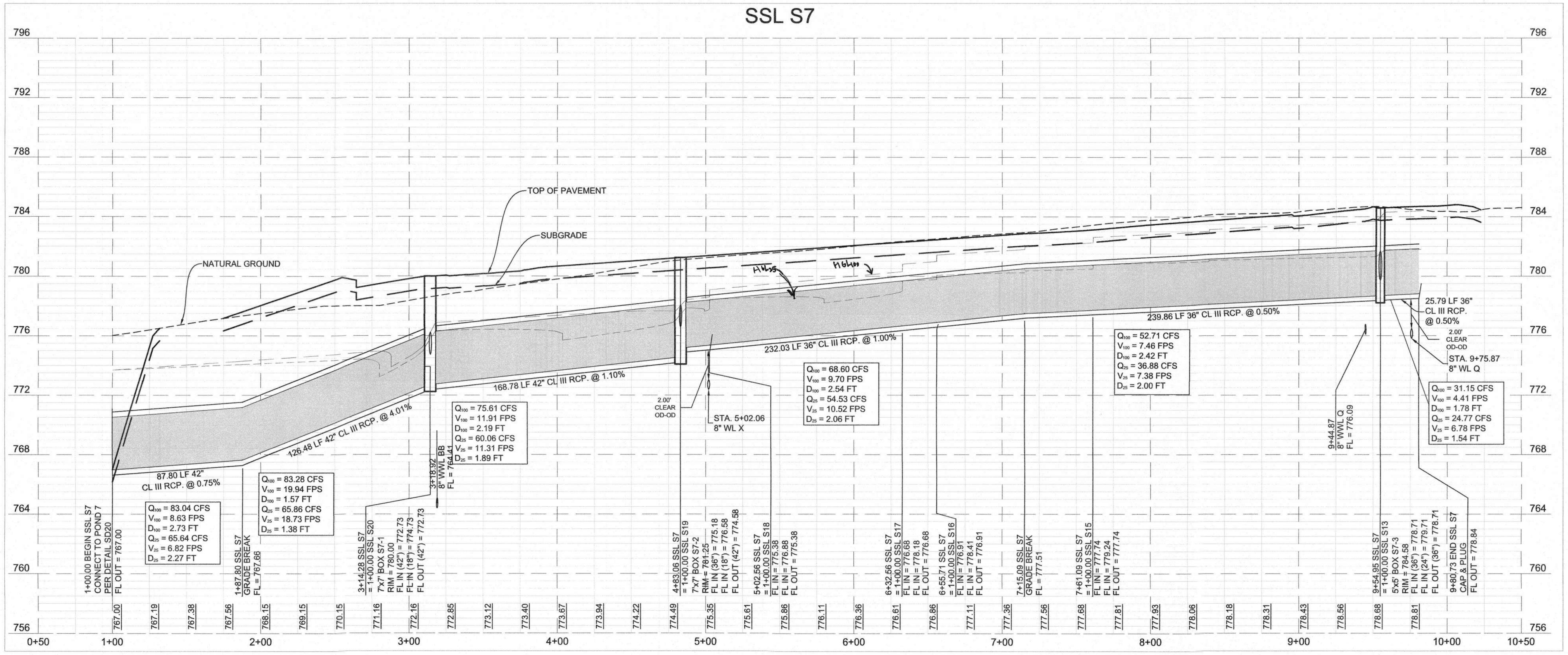


0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

SSL S7



NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
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Know what's below.
Call before you dig.

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS12.dwg

JUSTIN D. MIDURA
128809
11-30-23

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS12

SHEET NO.
76
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 2:14pm
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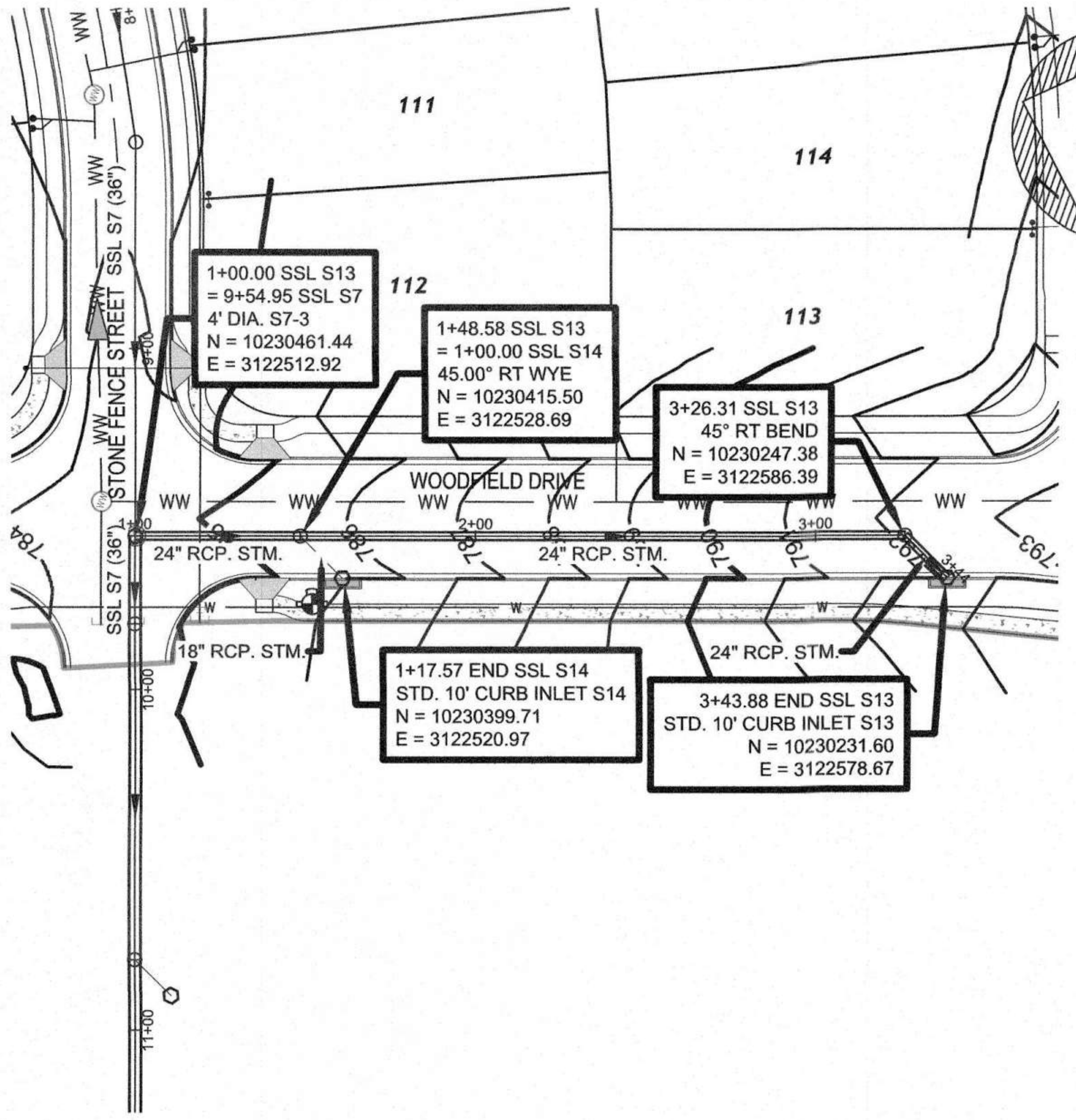
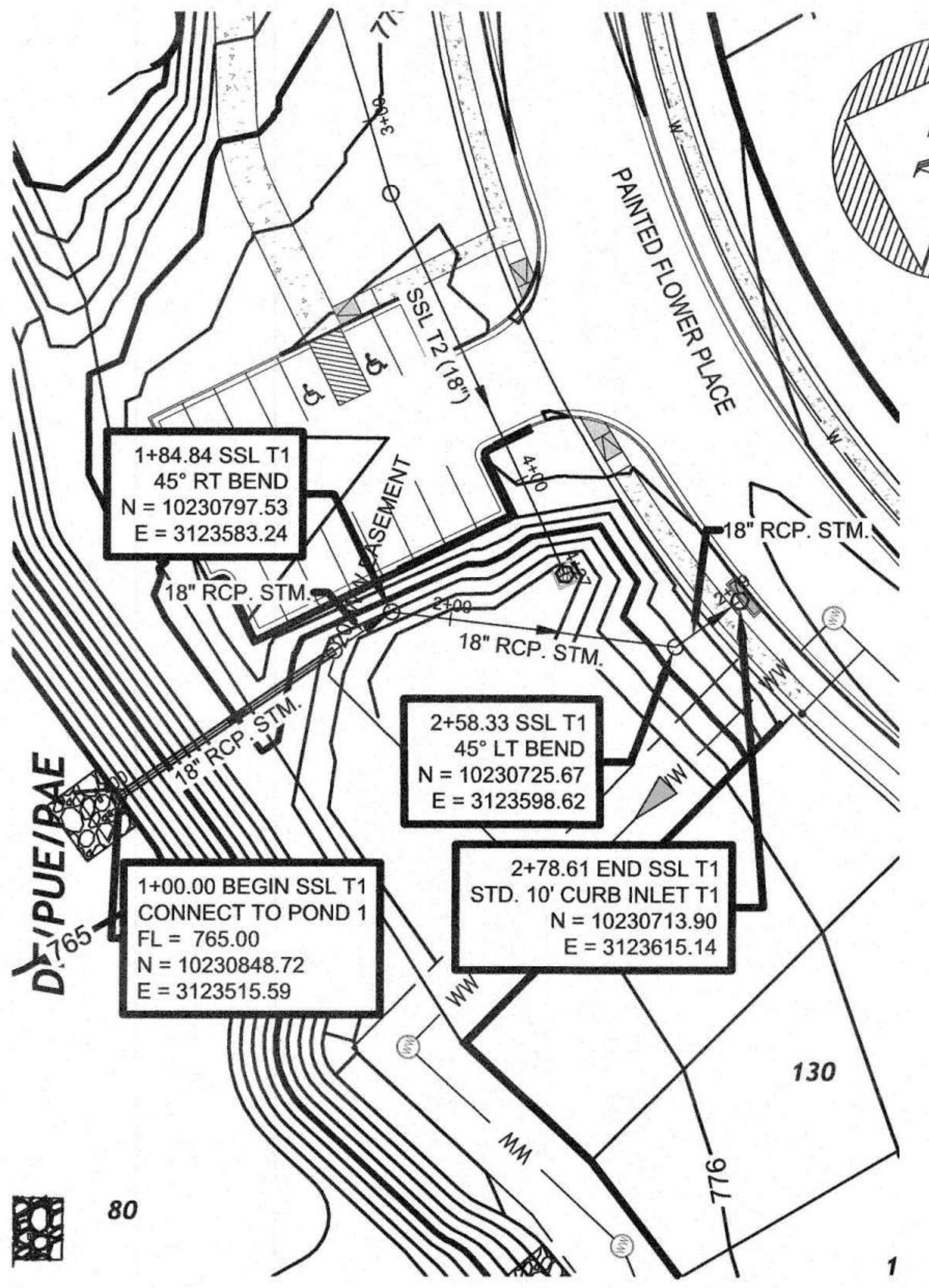
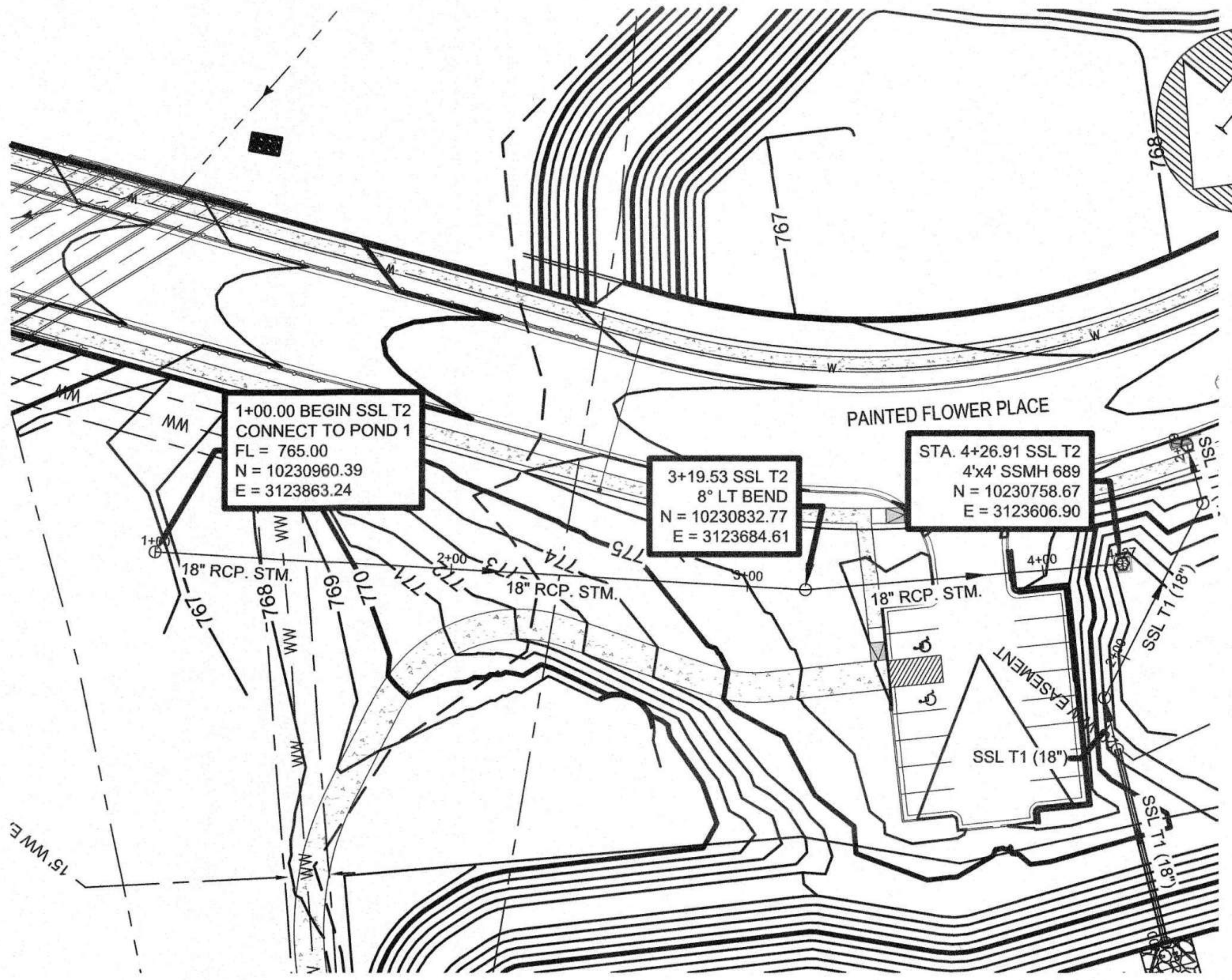
User Name : jmidura





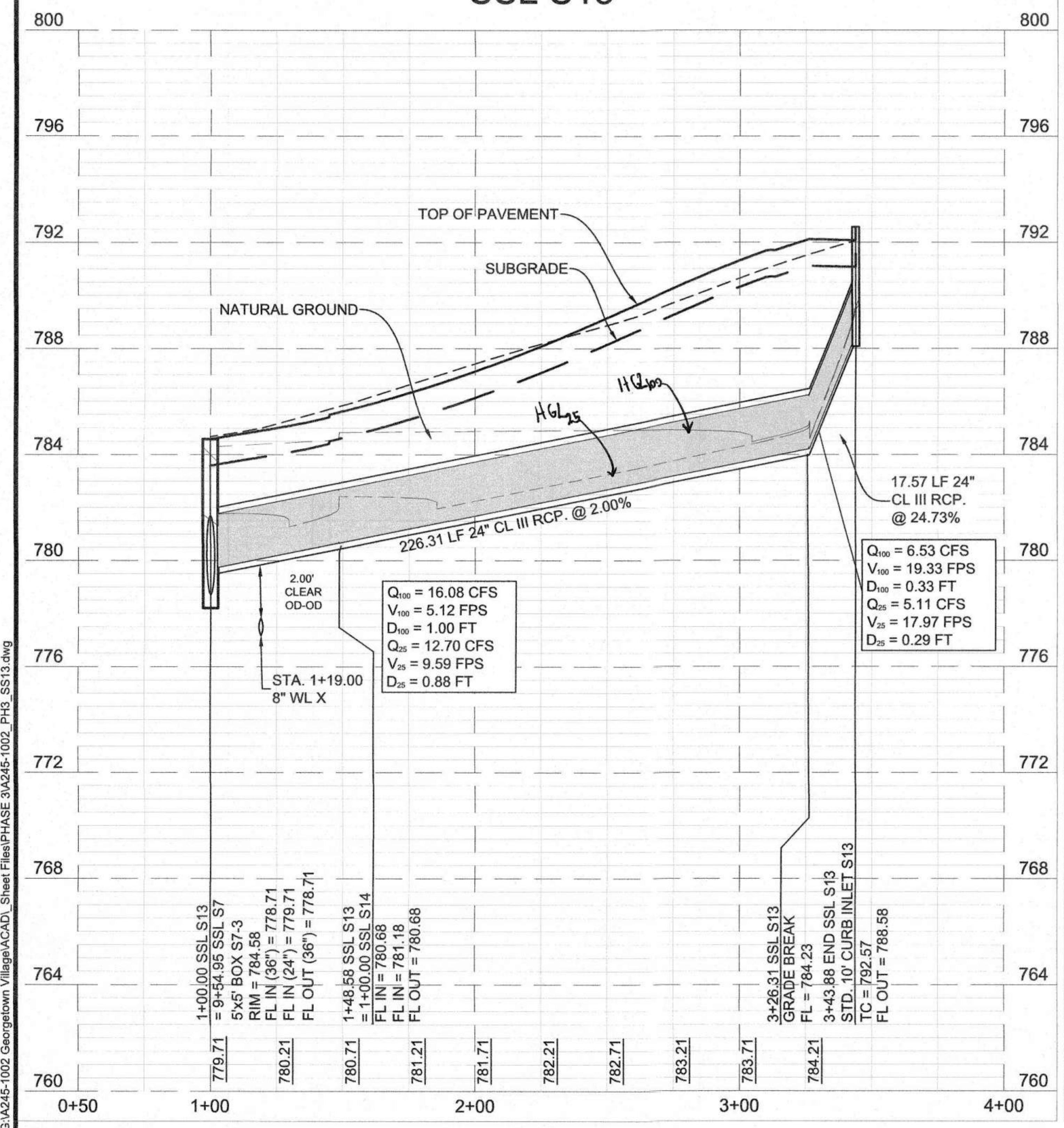


0 40 80
1" = 40'

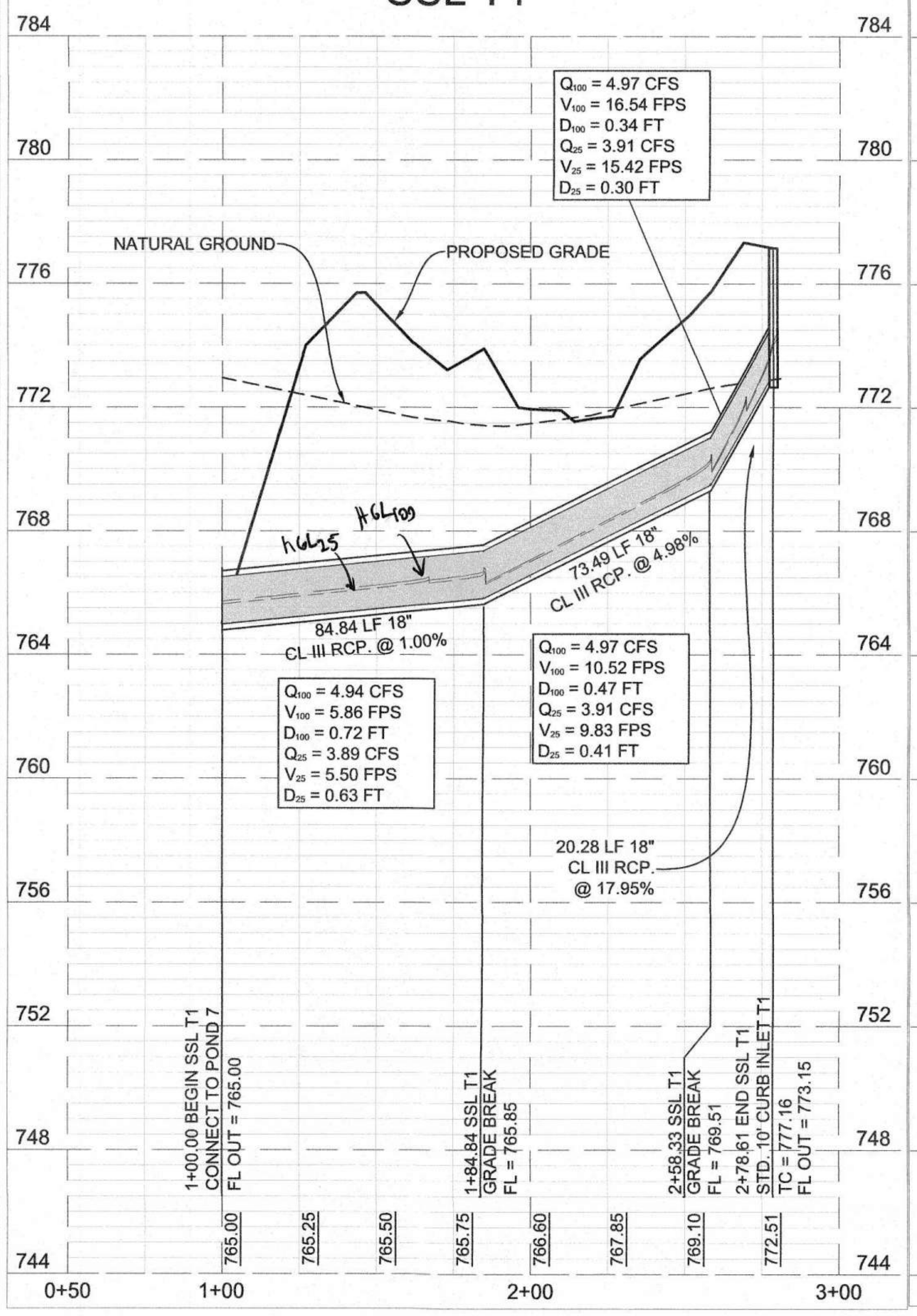
LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

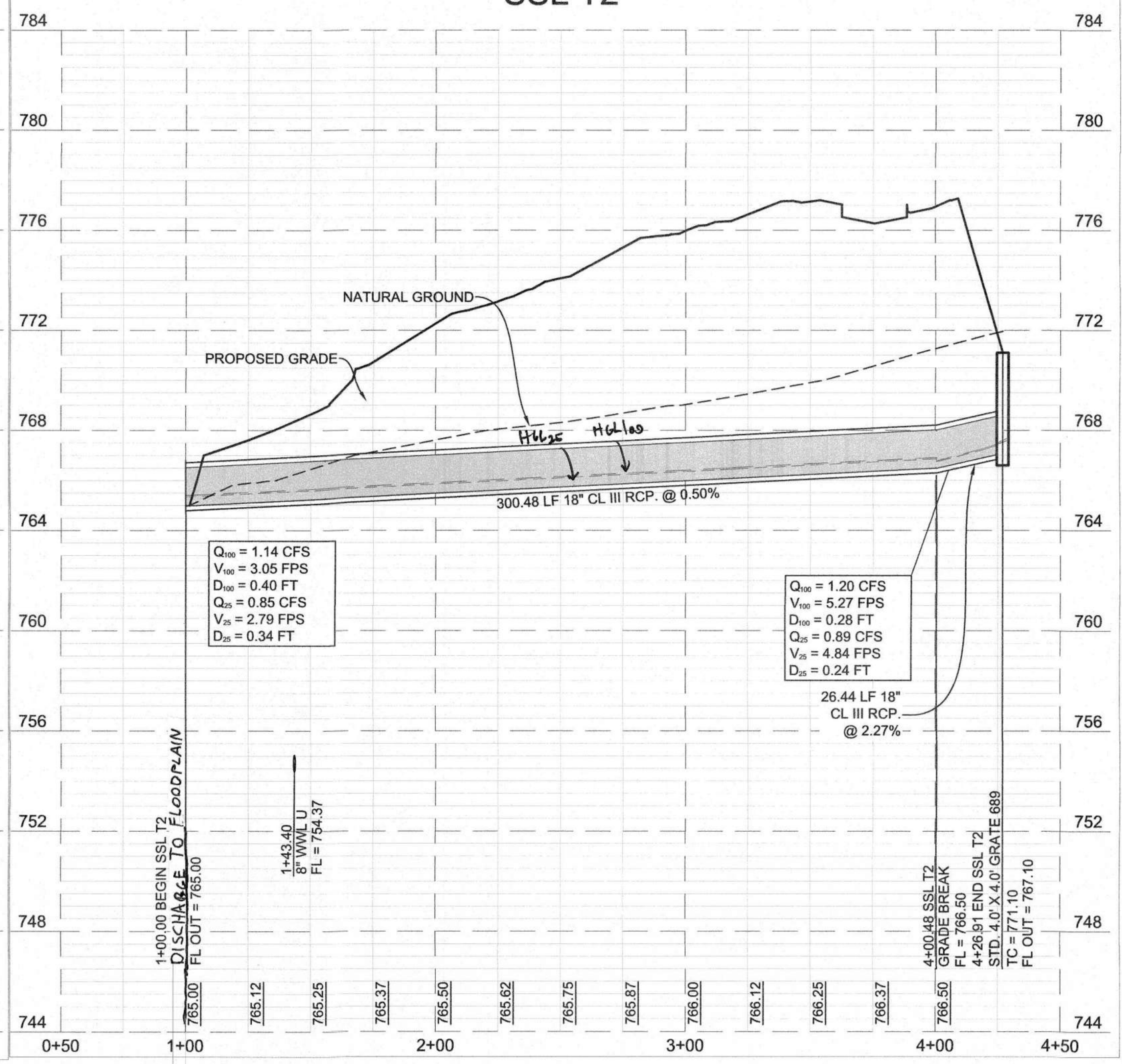
SSL S13



SSL T1



SSL T2



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

WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE PLAN AND PROFILE
SSL S13, T1, & T2
STA. 1+00 to END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS13.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

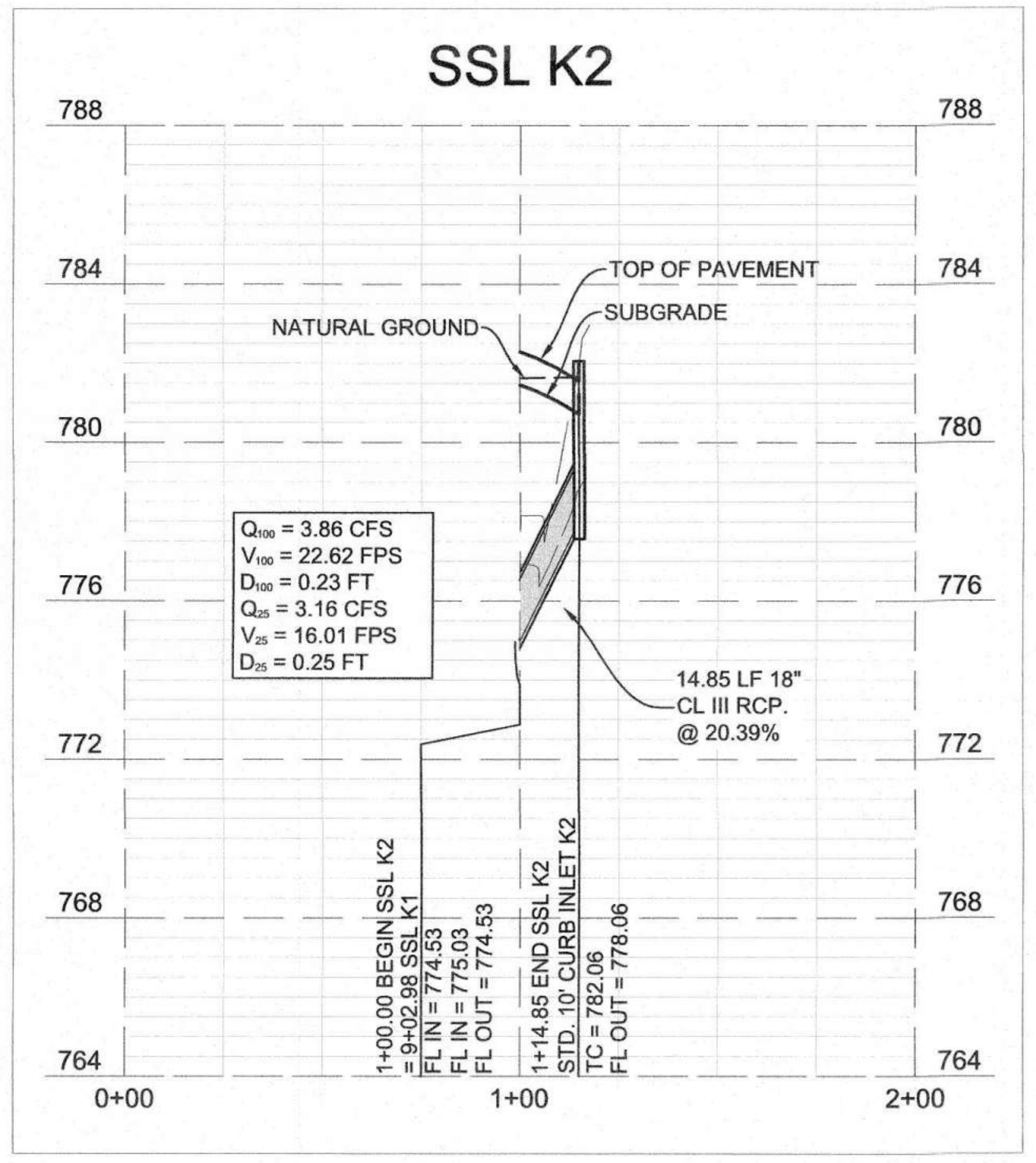
SS13

SHEET NO.
77
OF 118 SHEETS

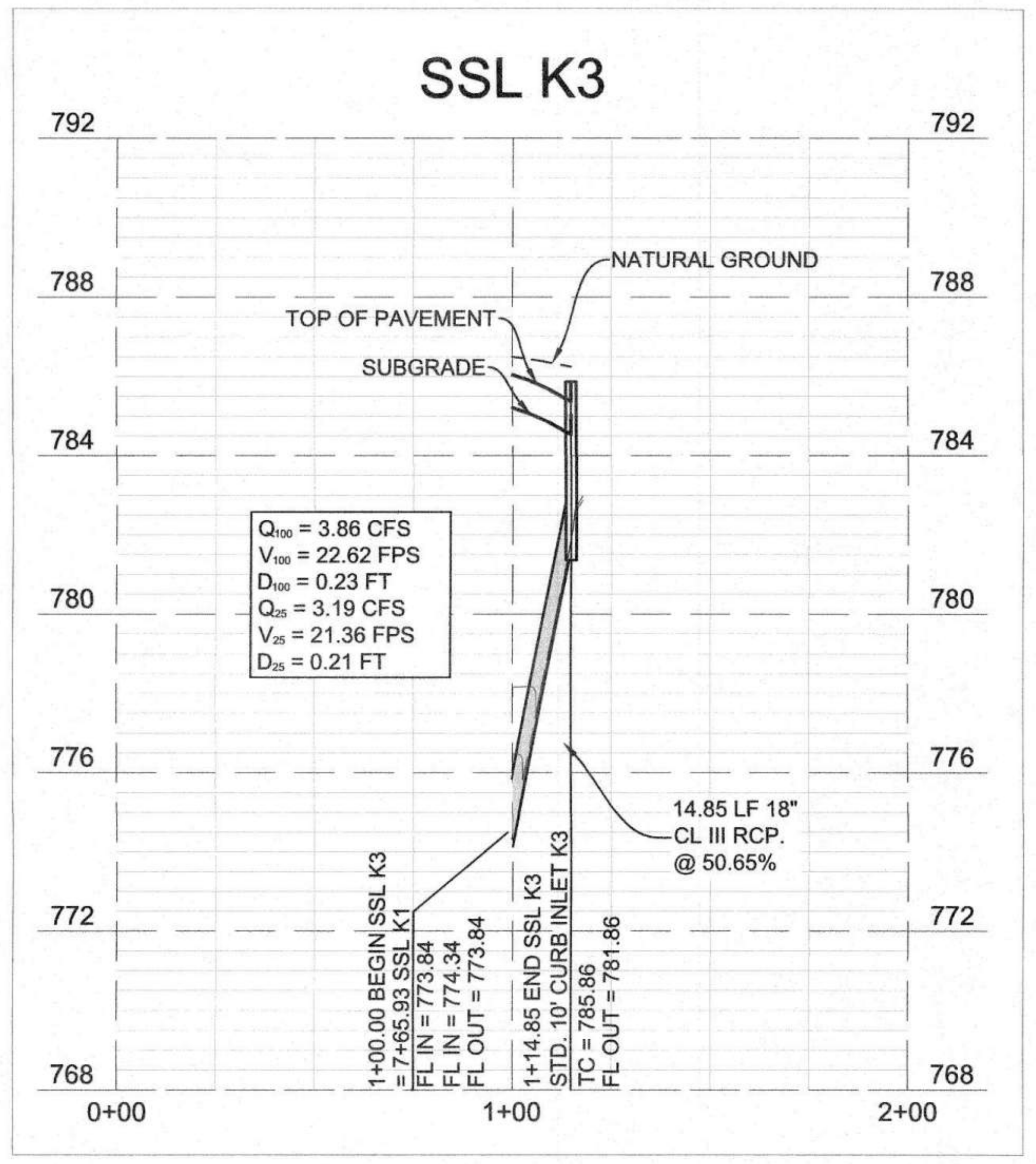
Date\Time : Fri, 01 Dec 2023 - 2:15pm User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS13.dwg

2023-XX-CON

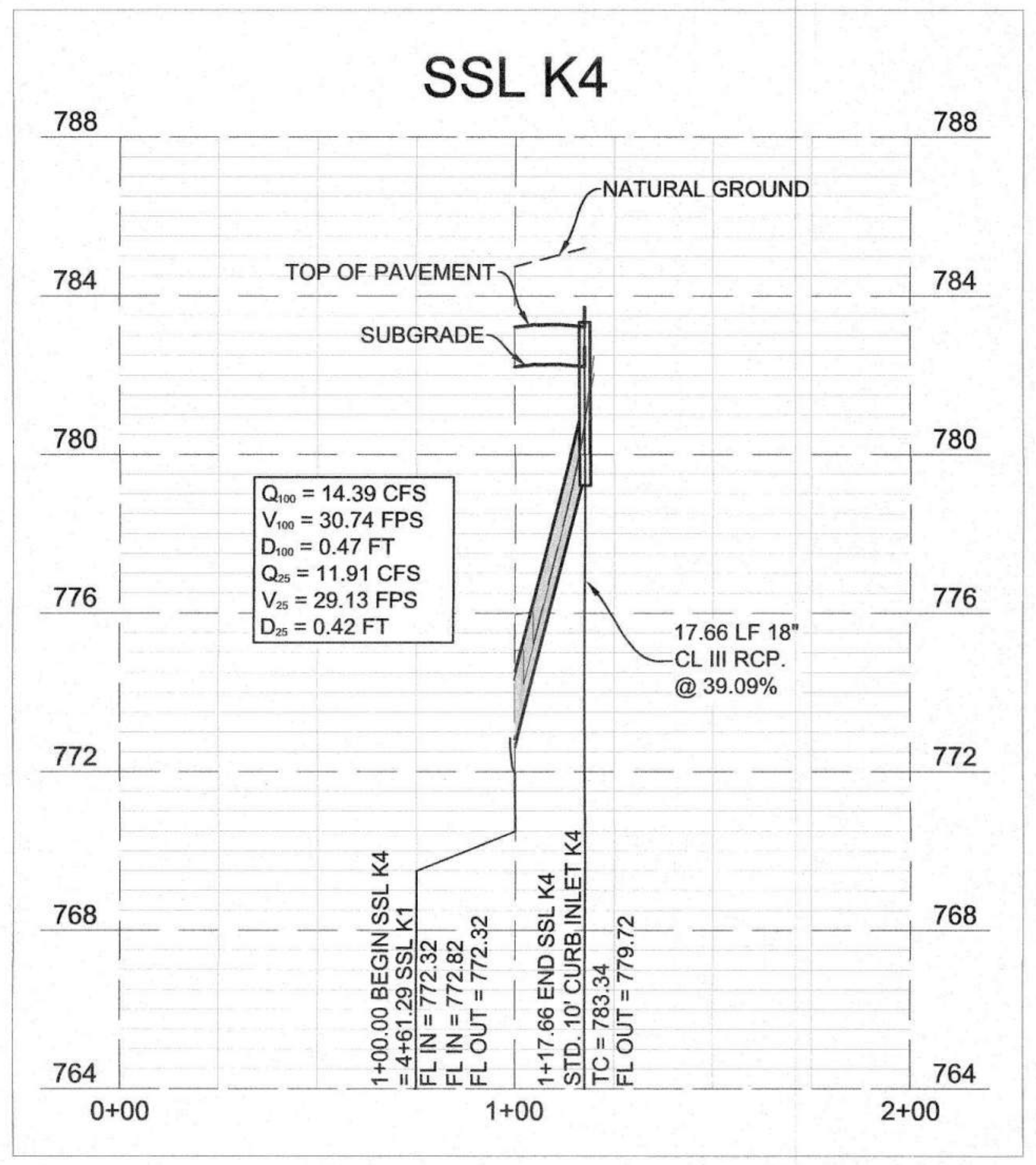
SSL K2



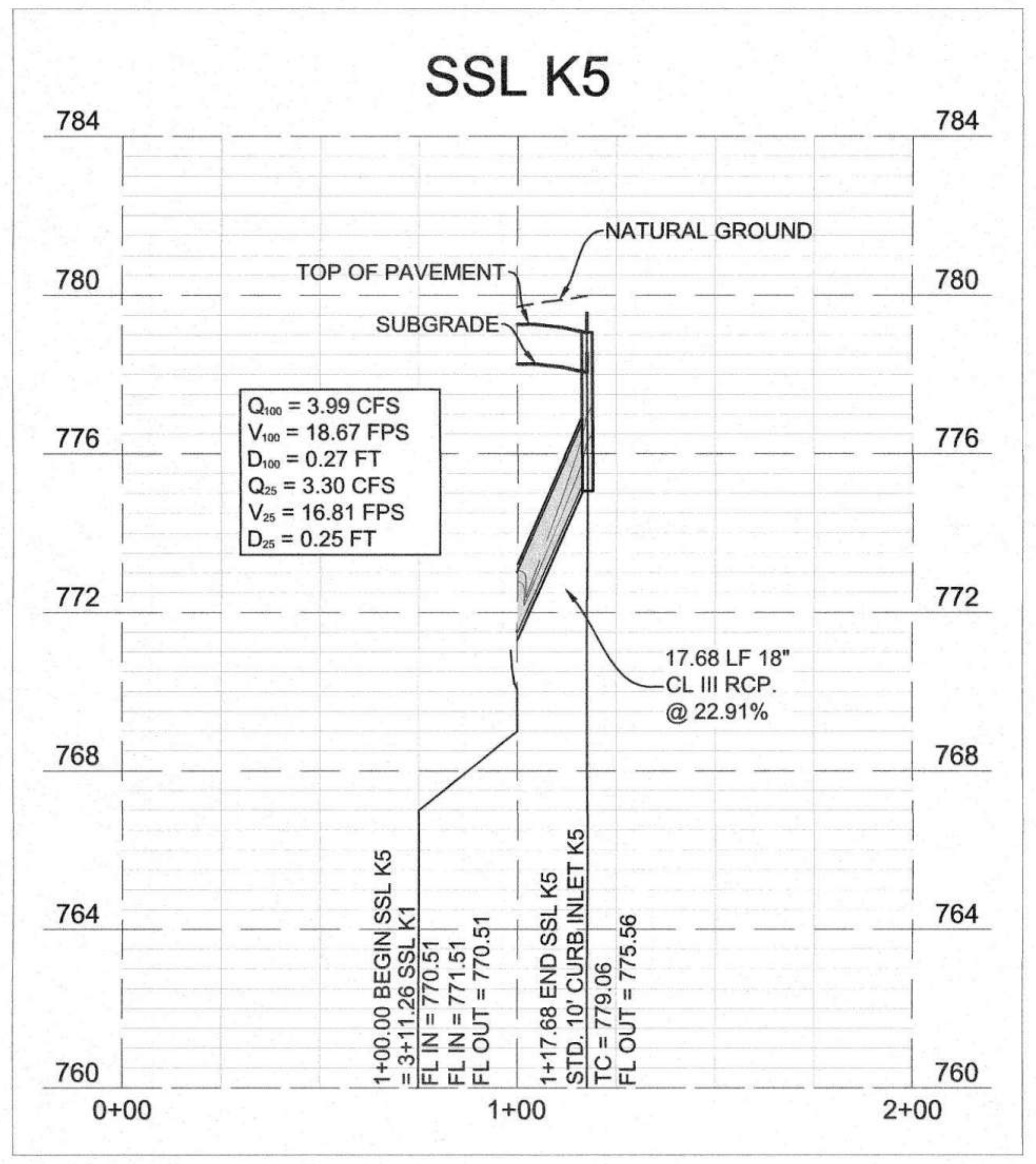
SSL K3



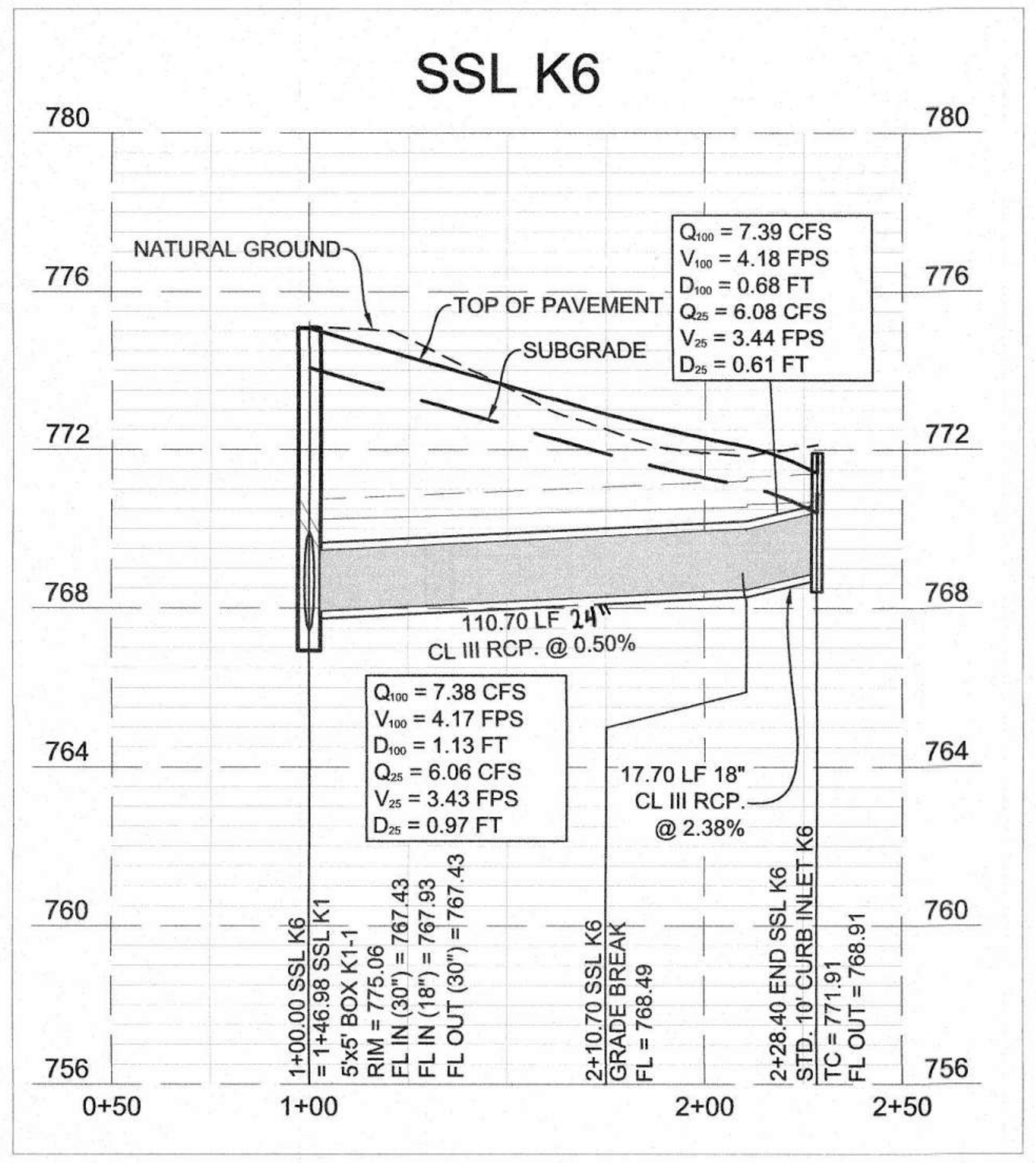
SSL K4



SSL K5



SSL K6



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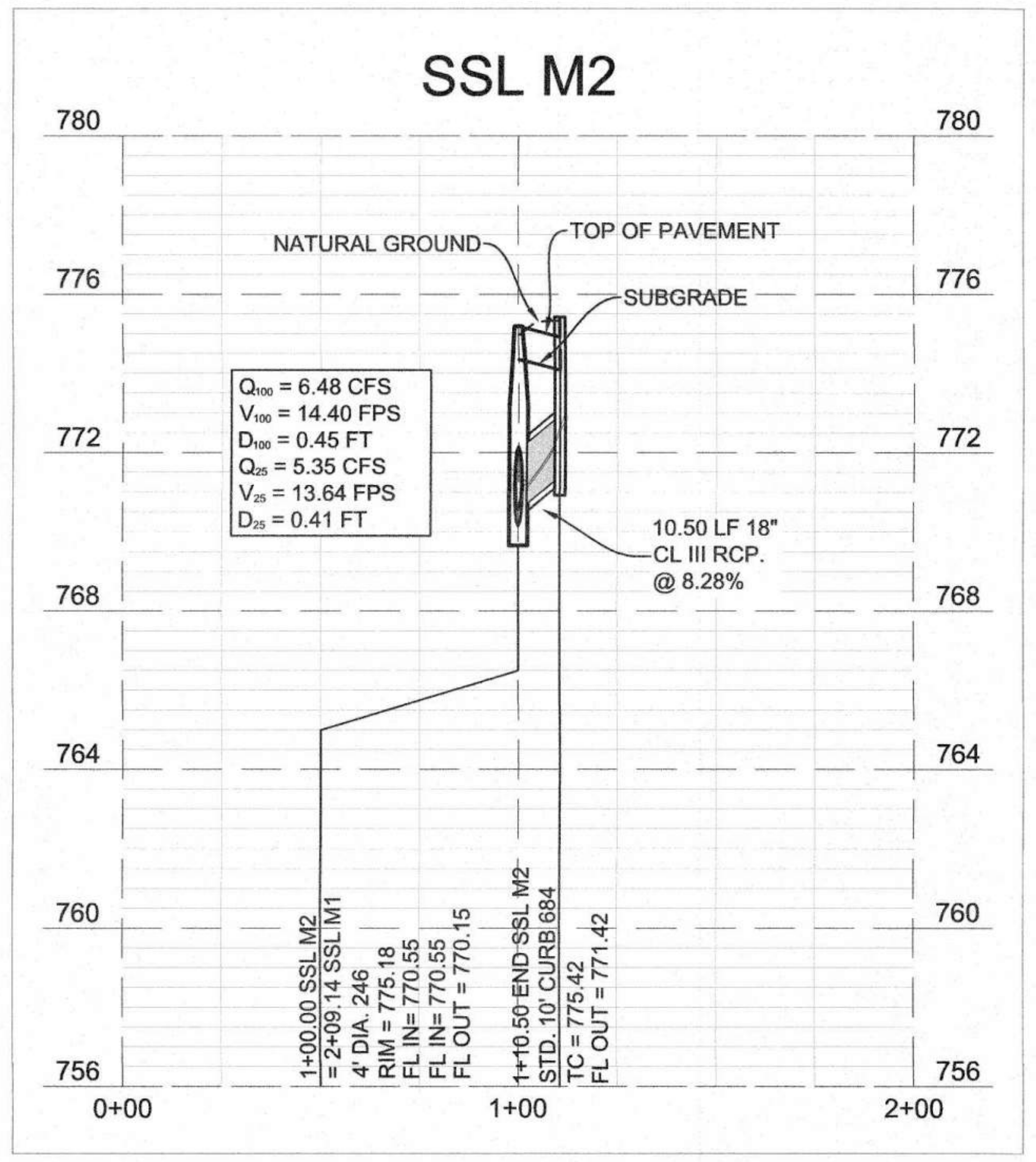

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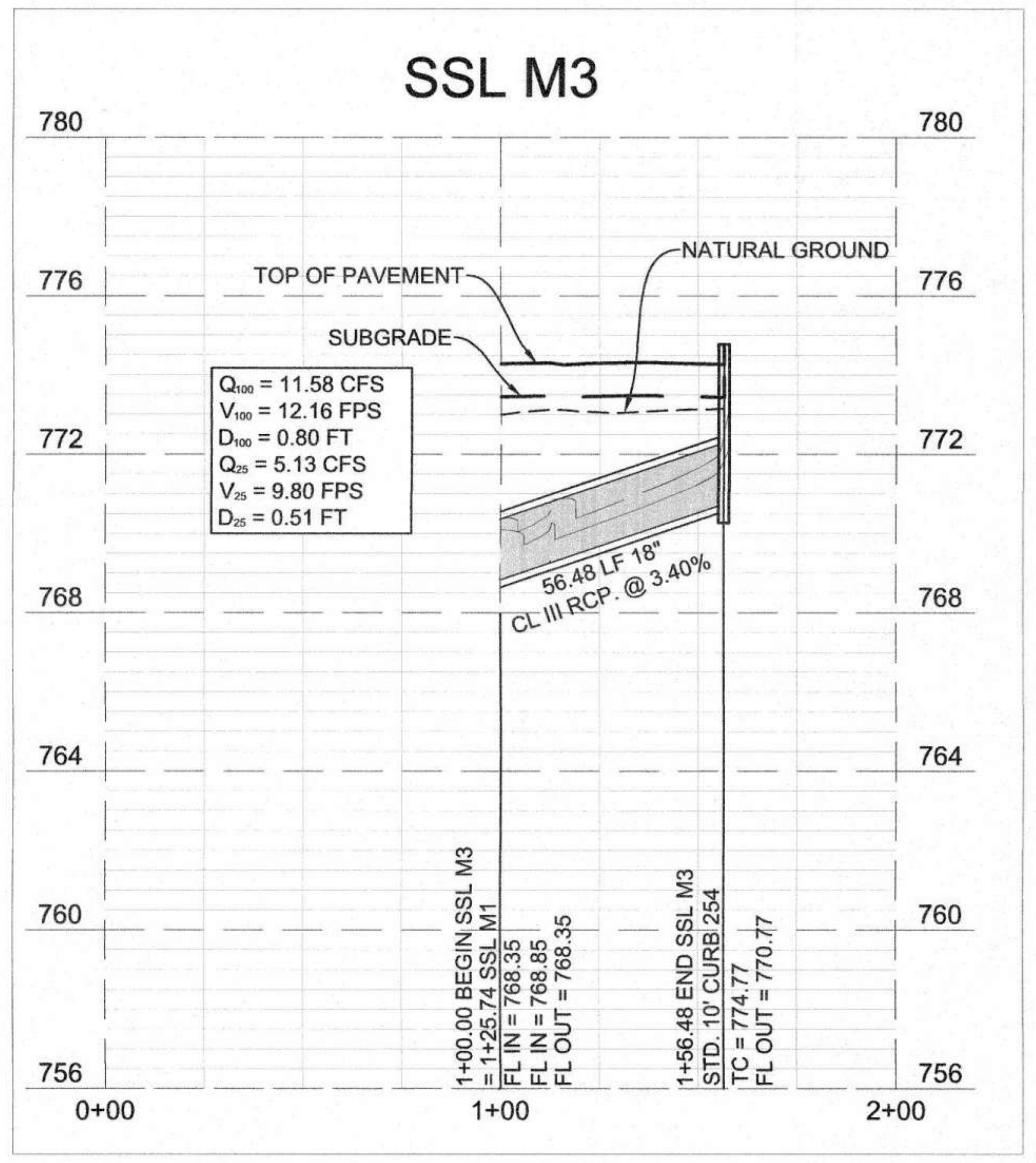
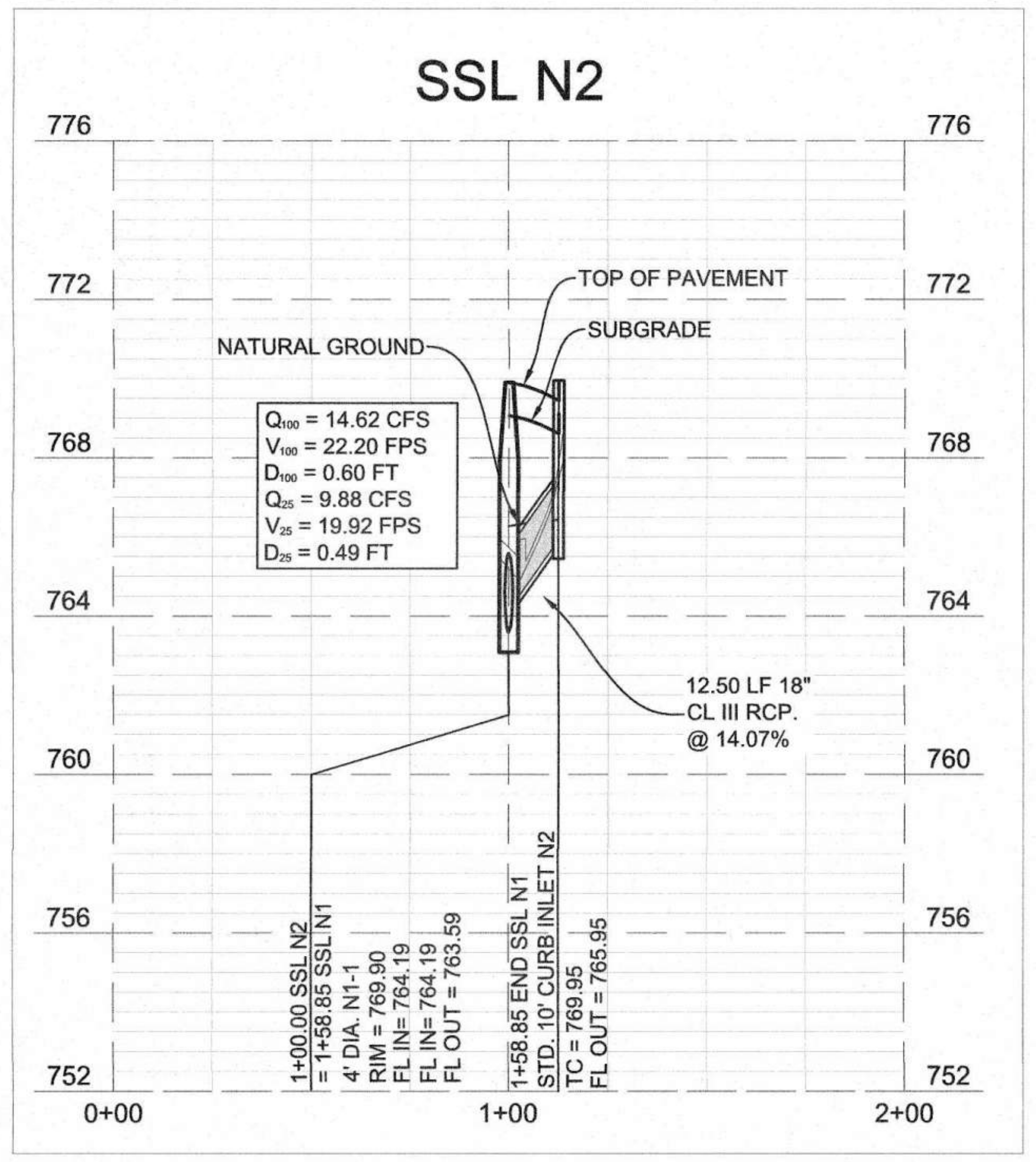


SSL N2



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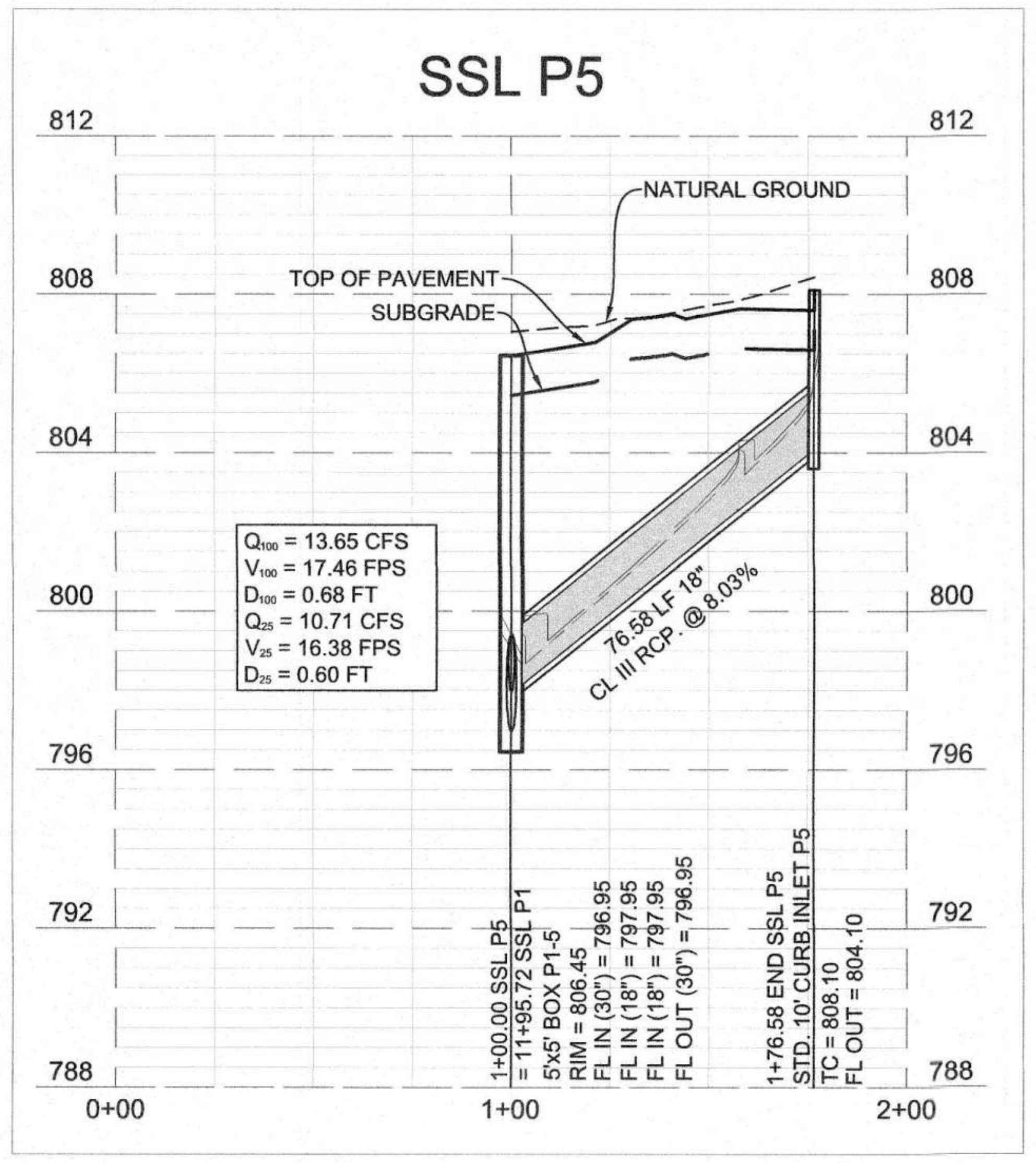

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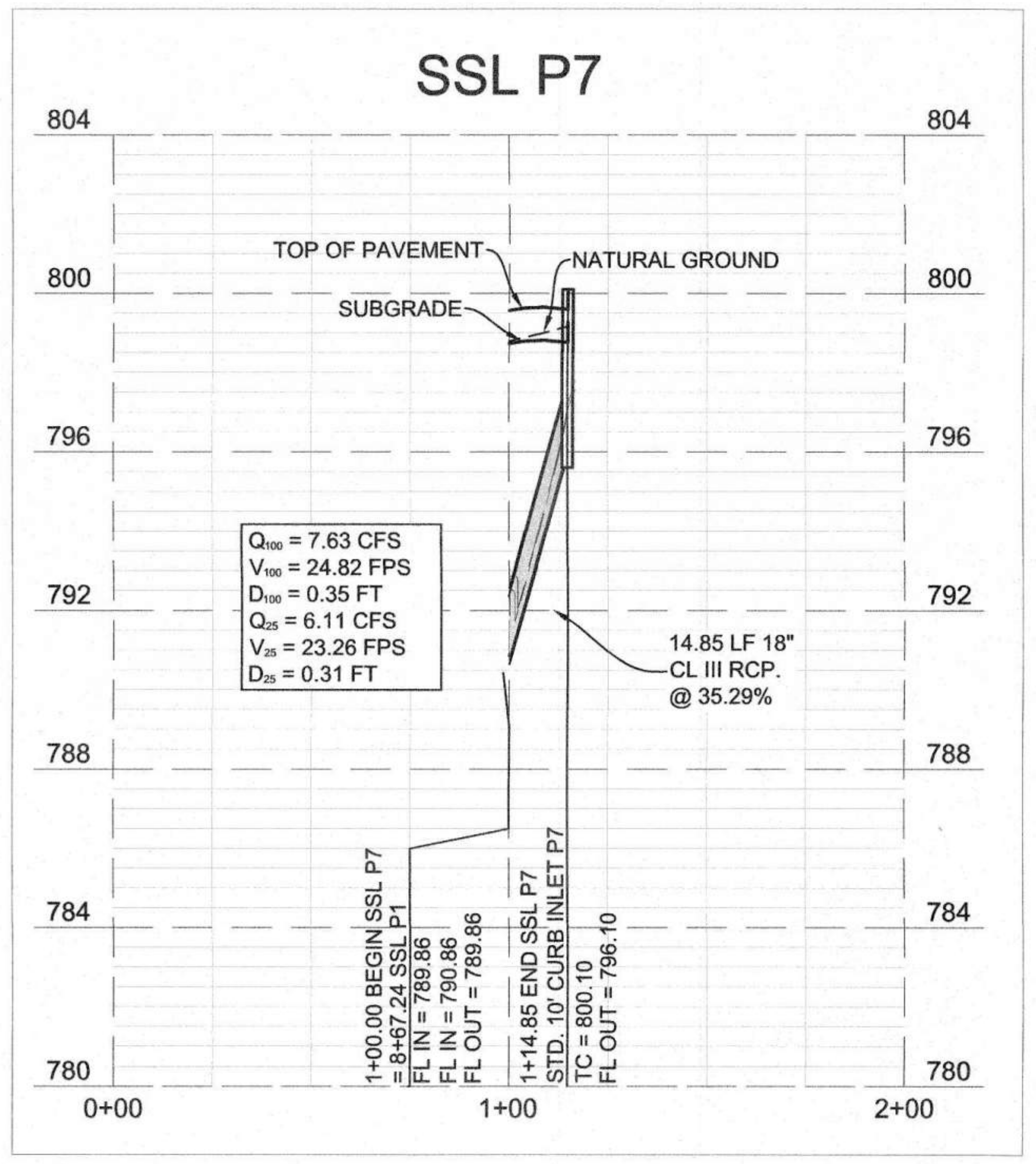

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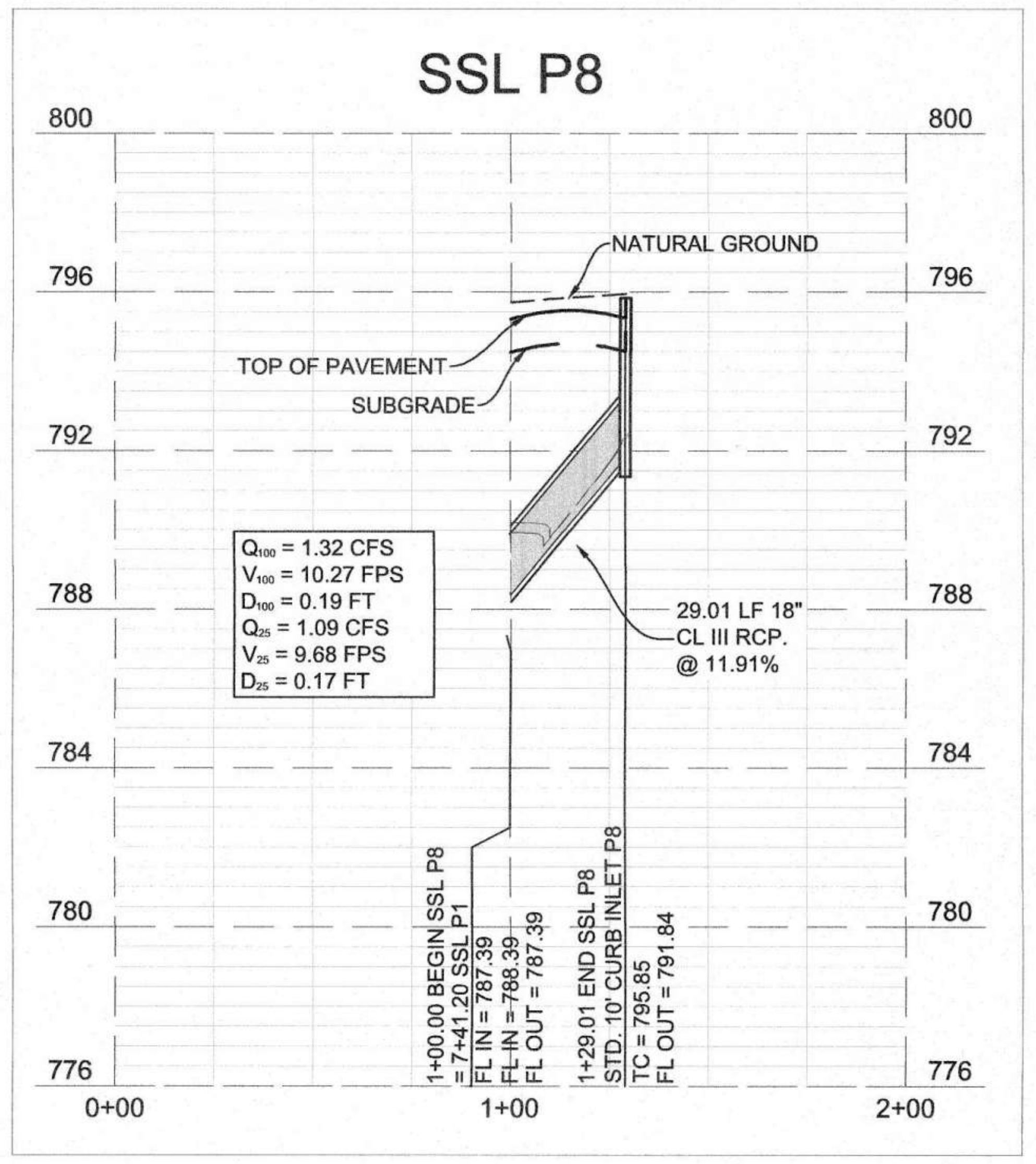

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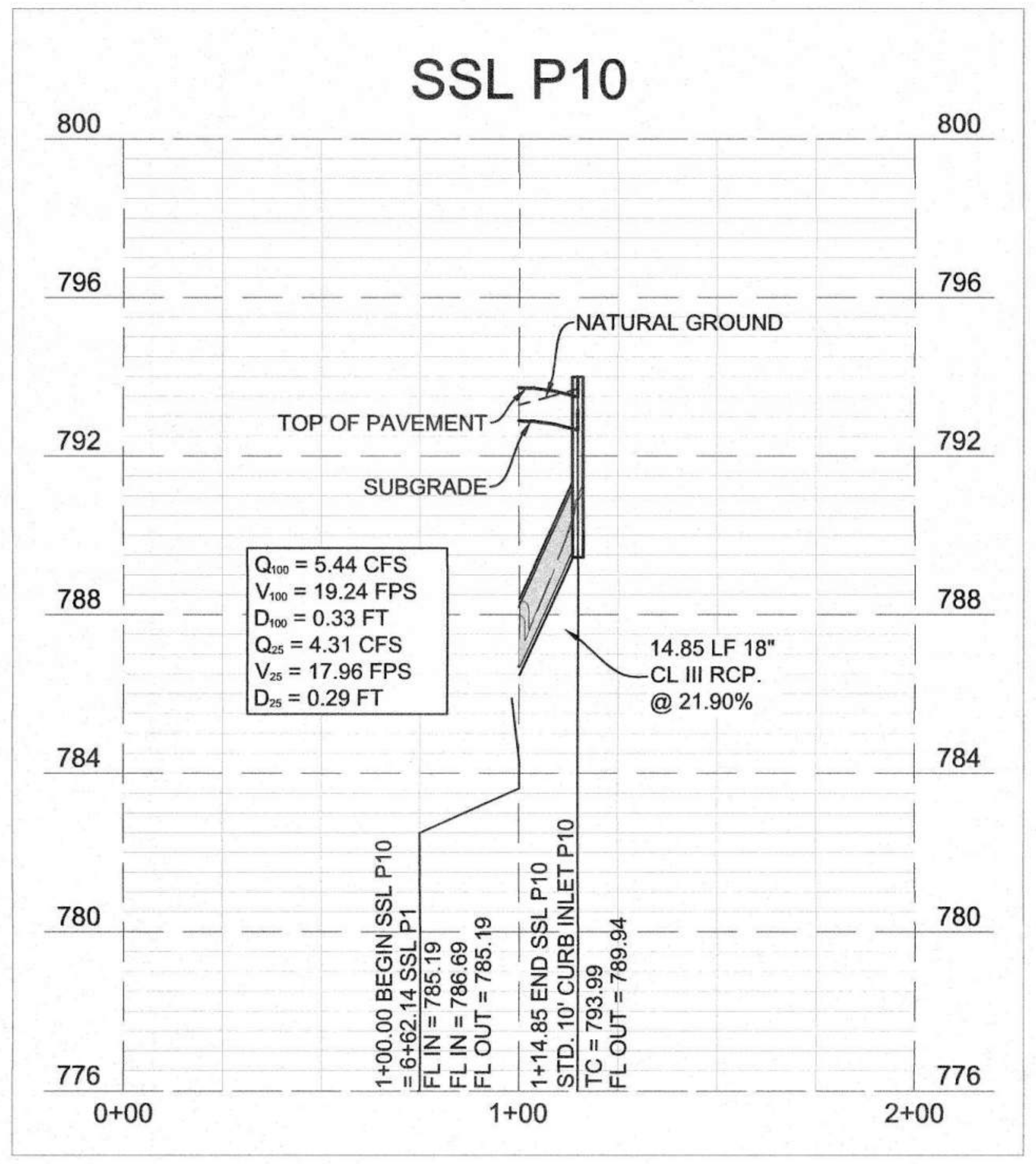

LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

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WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE LATERAL PROFILES
K2, K3, K4, K5, K6, M2, M3, N2, P5, P7, P8, & P10

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS14.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

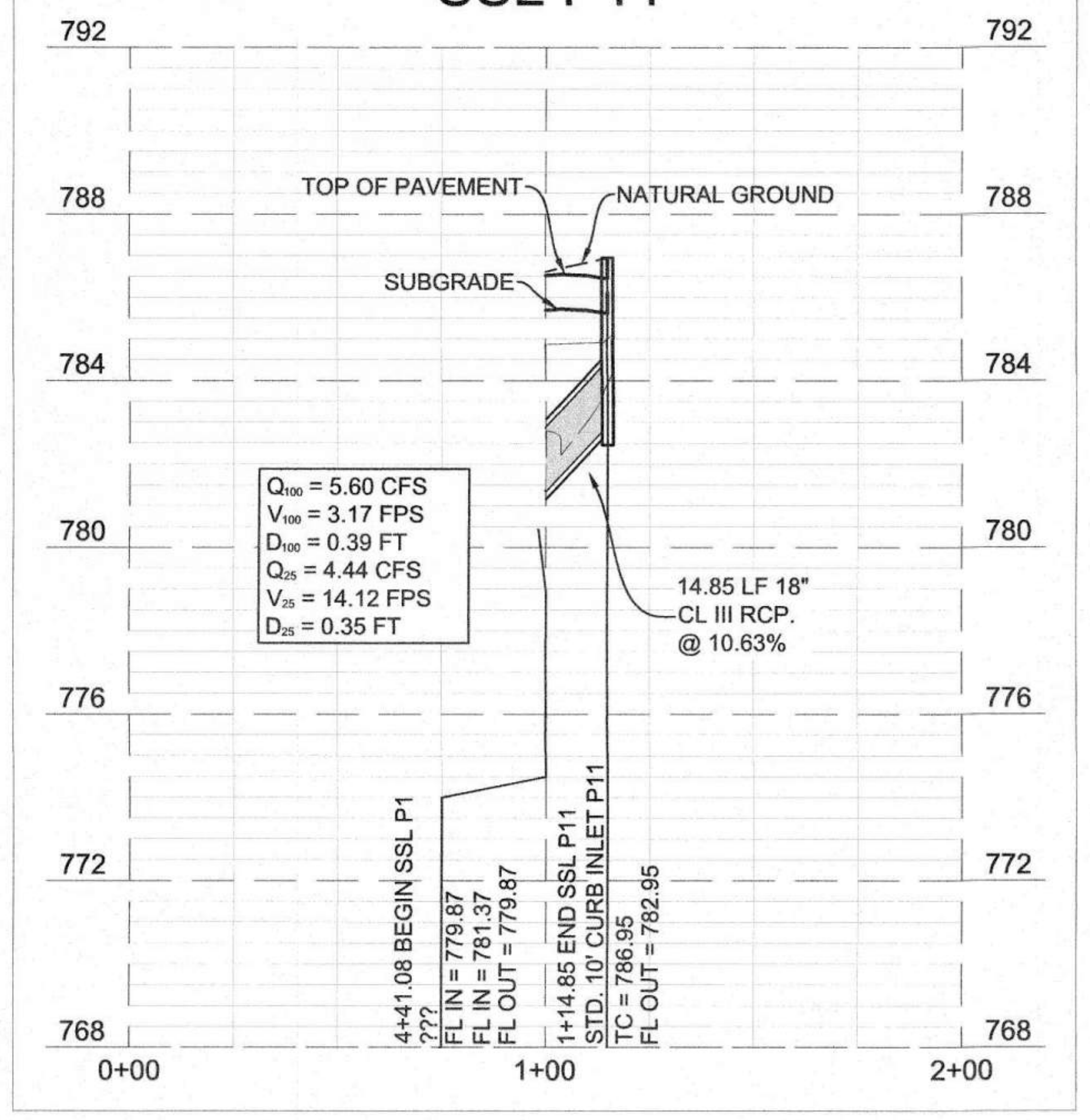
SS14

SHEET NO.
78
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 2:17pm
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS14.dwg
User Name : jmidura

2023-XX-CON

SSL P11



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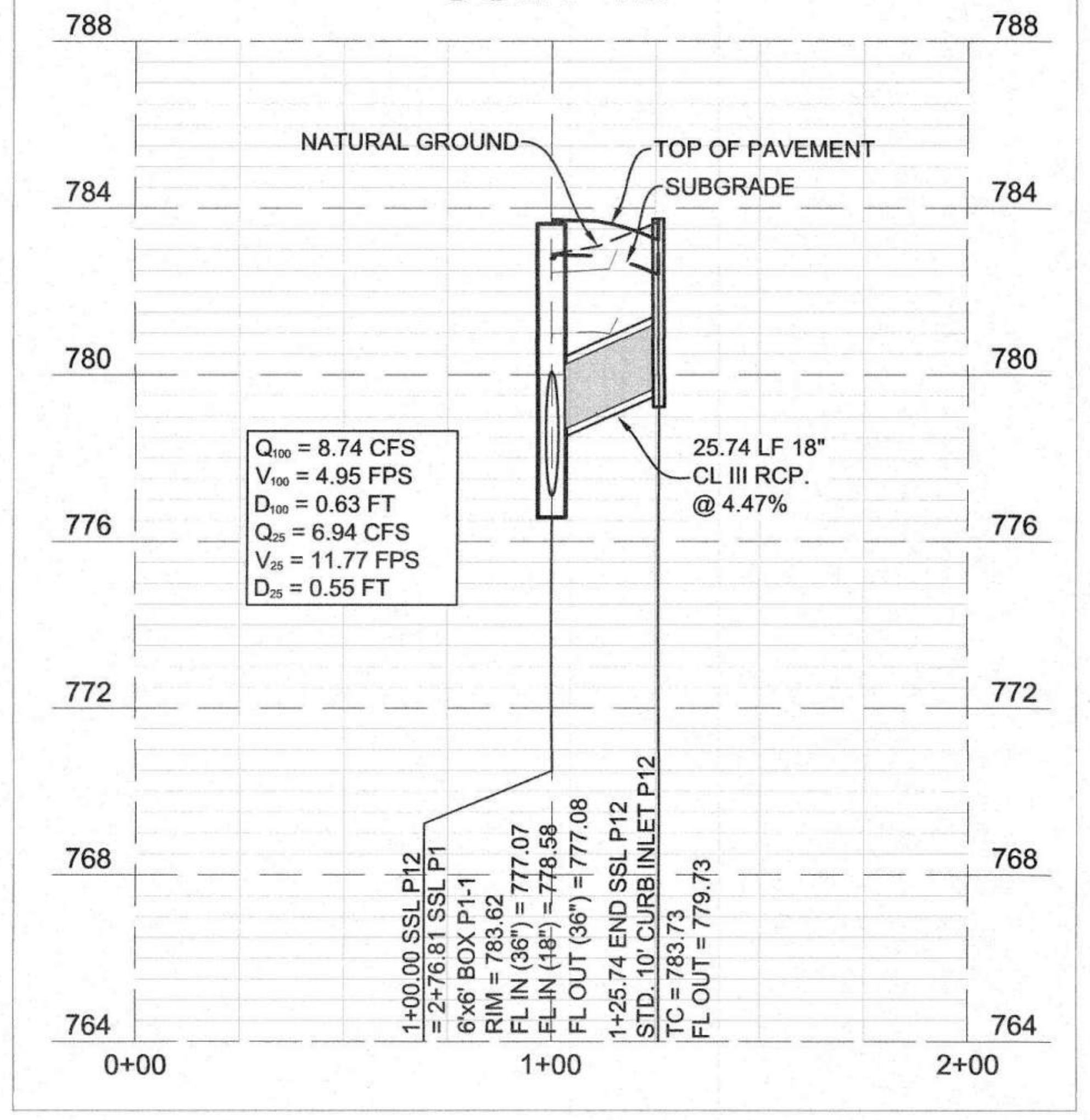

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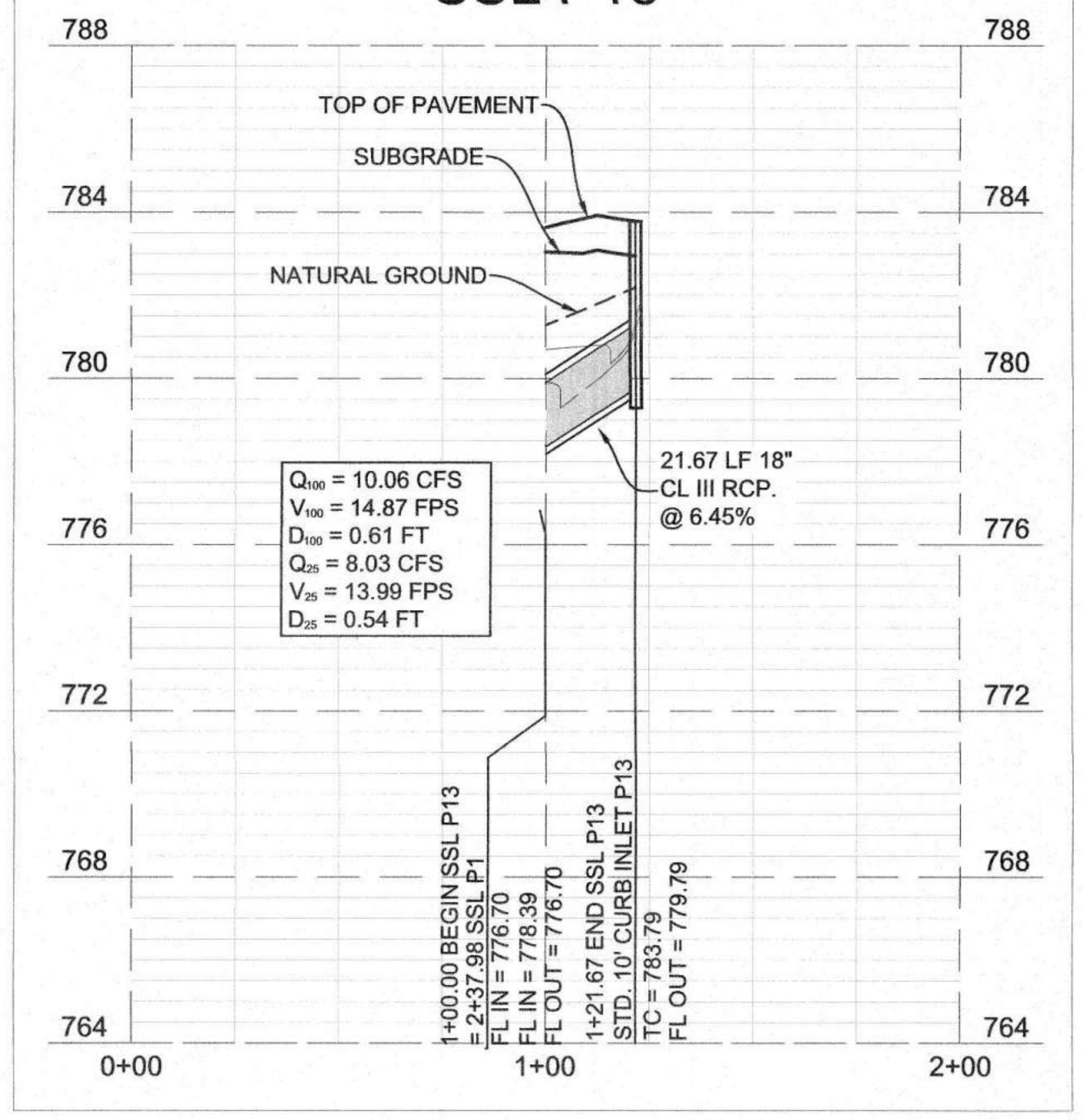

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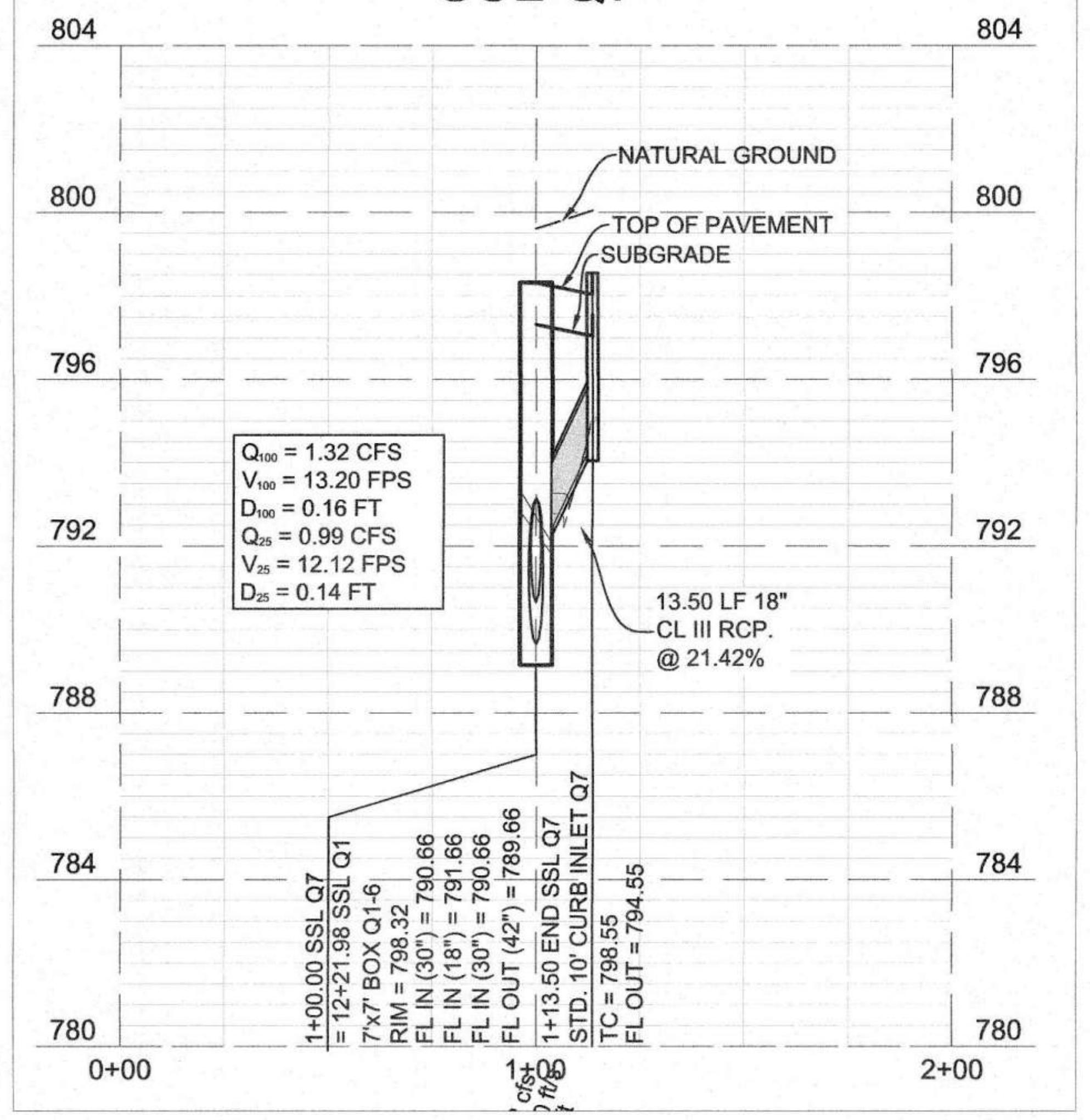

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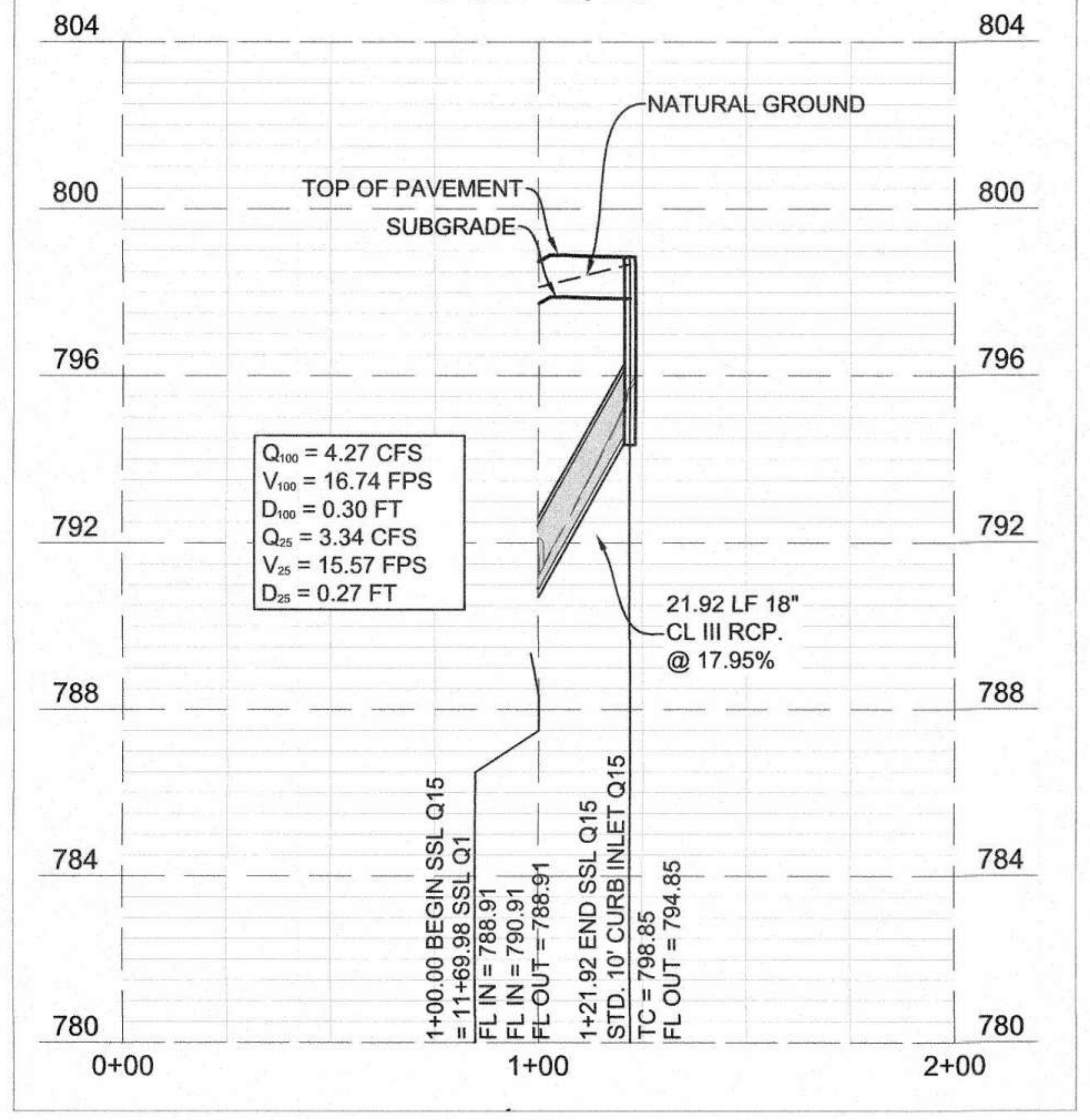

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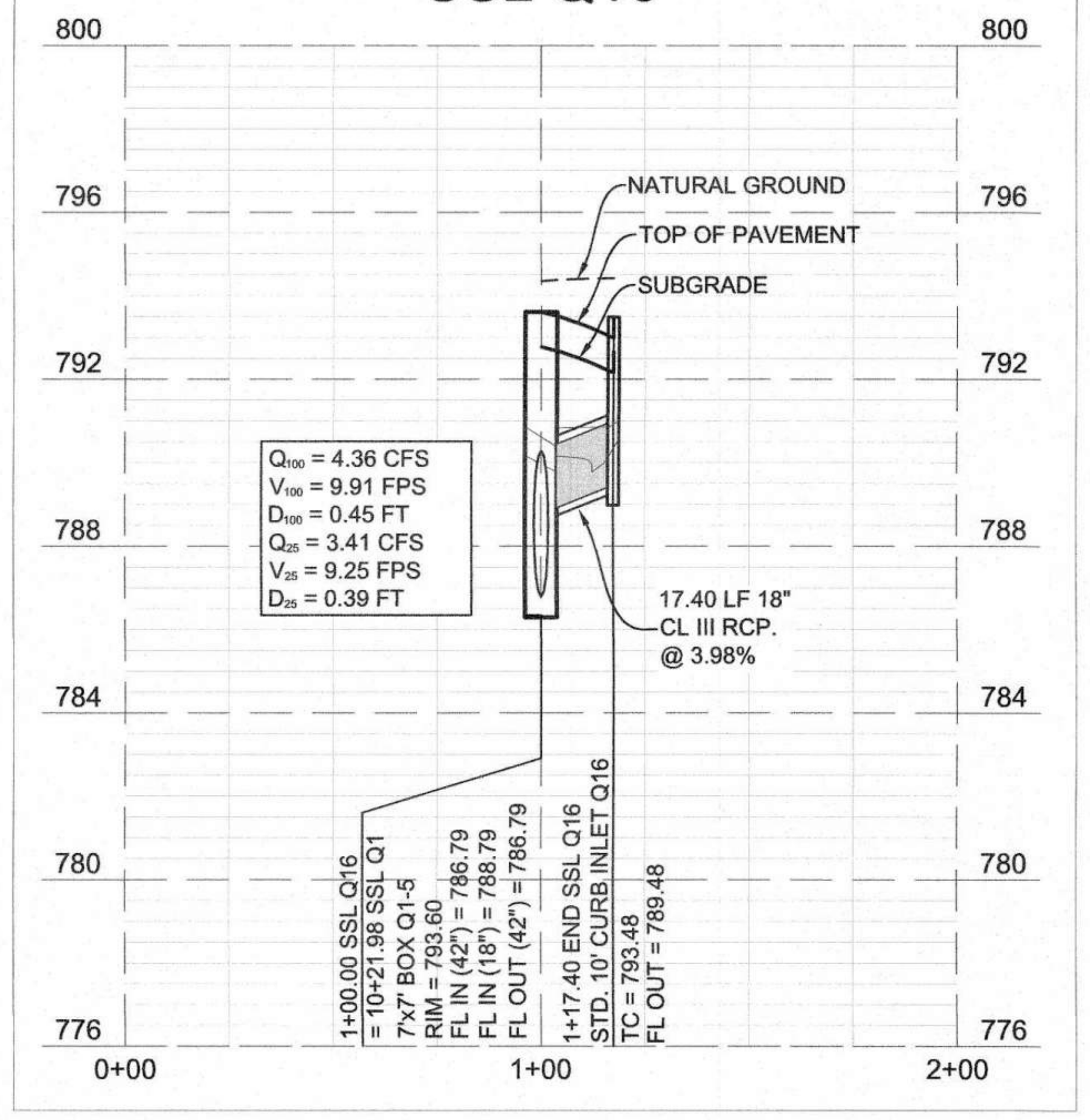

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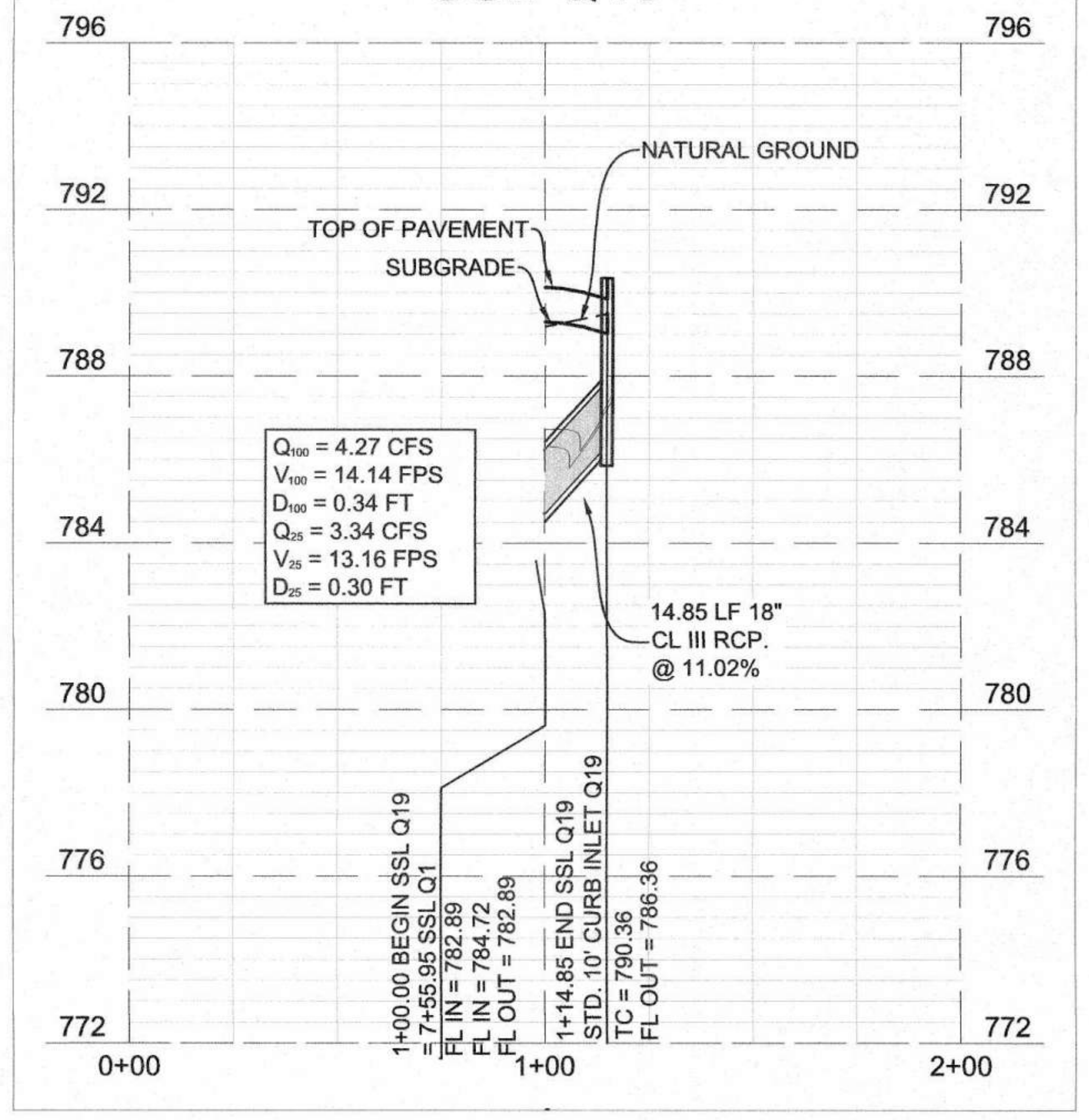

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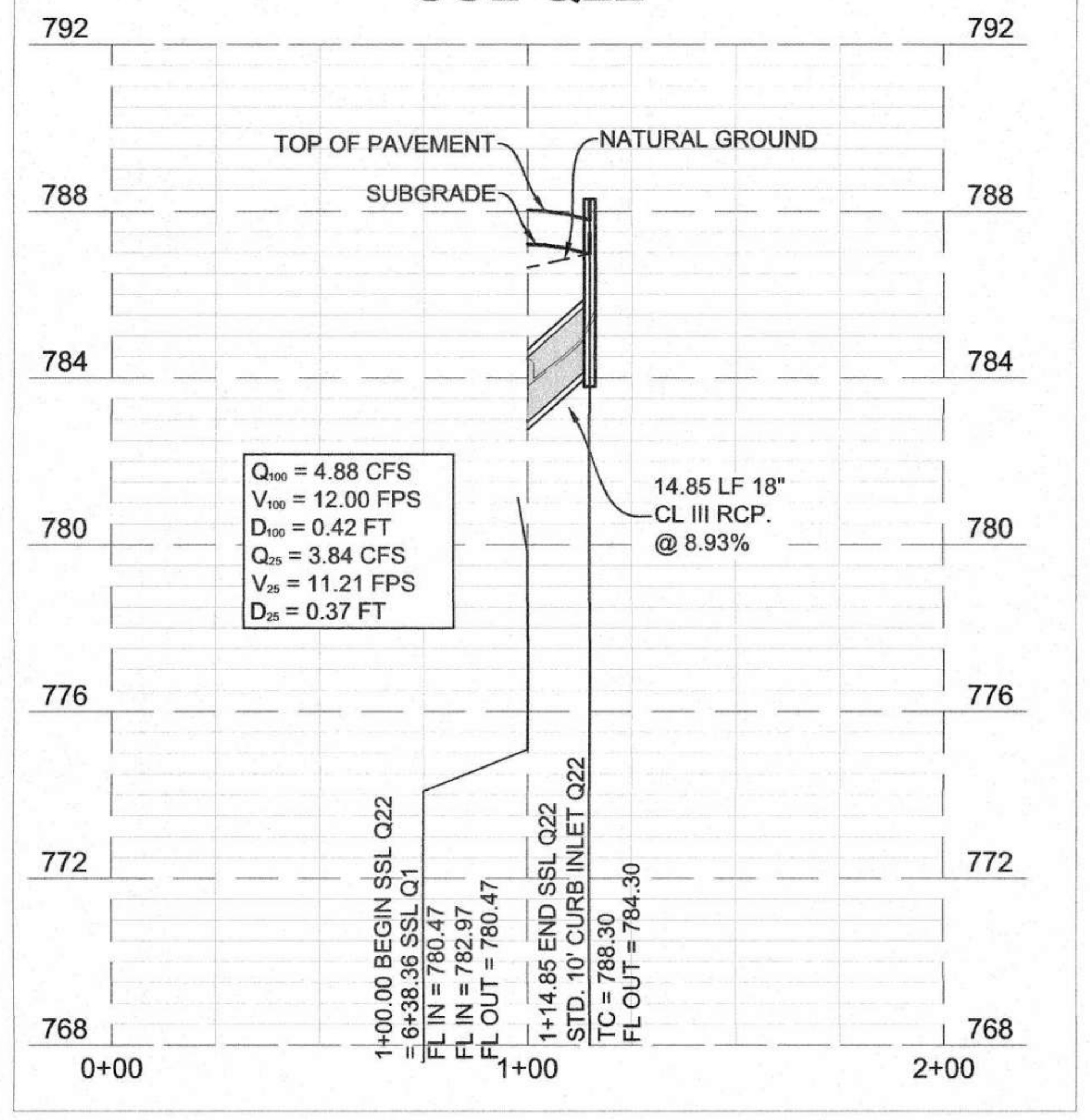

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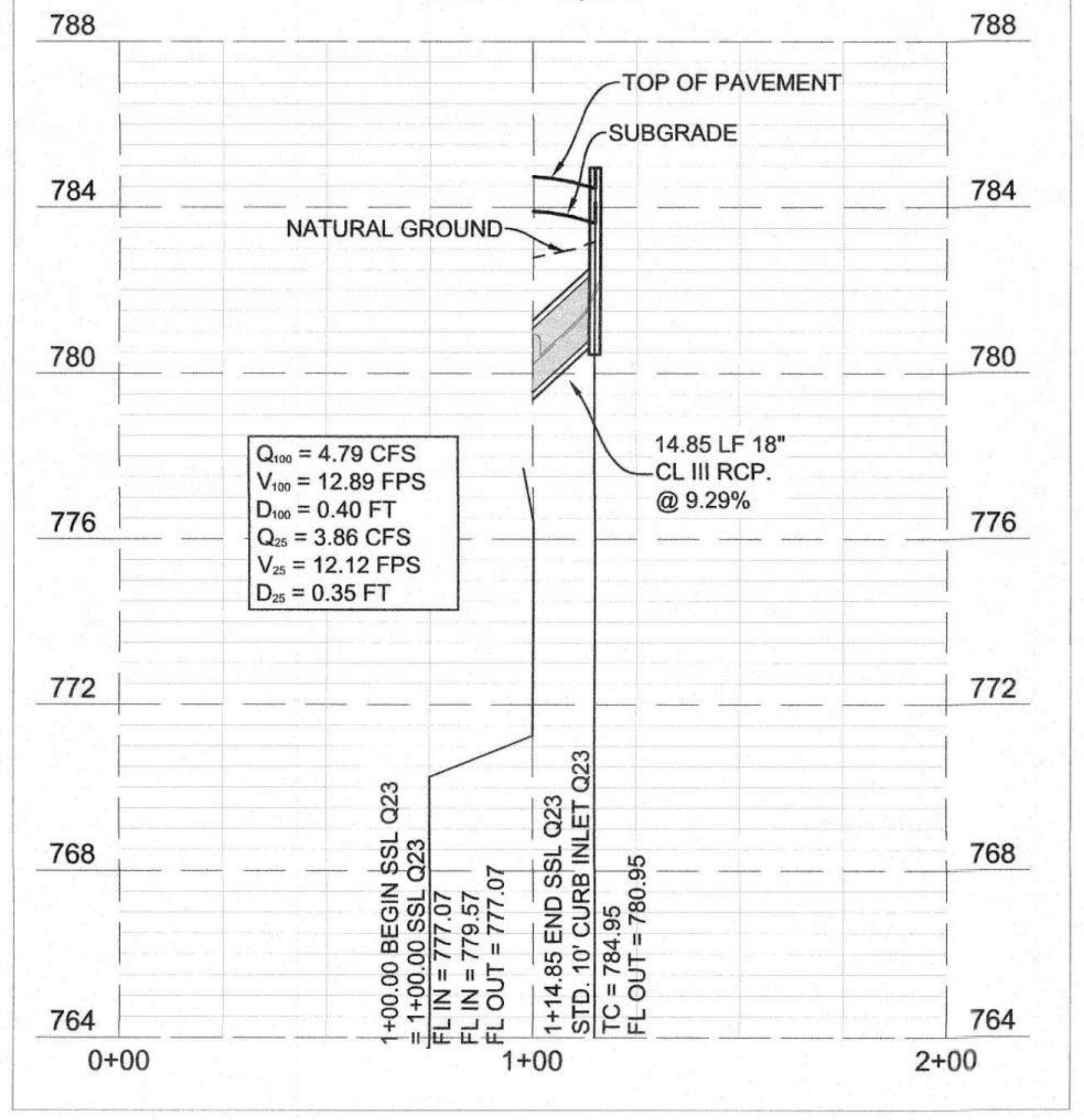

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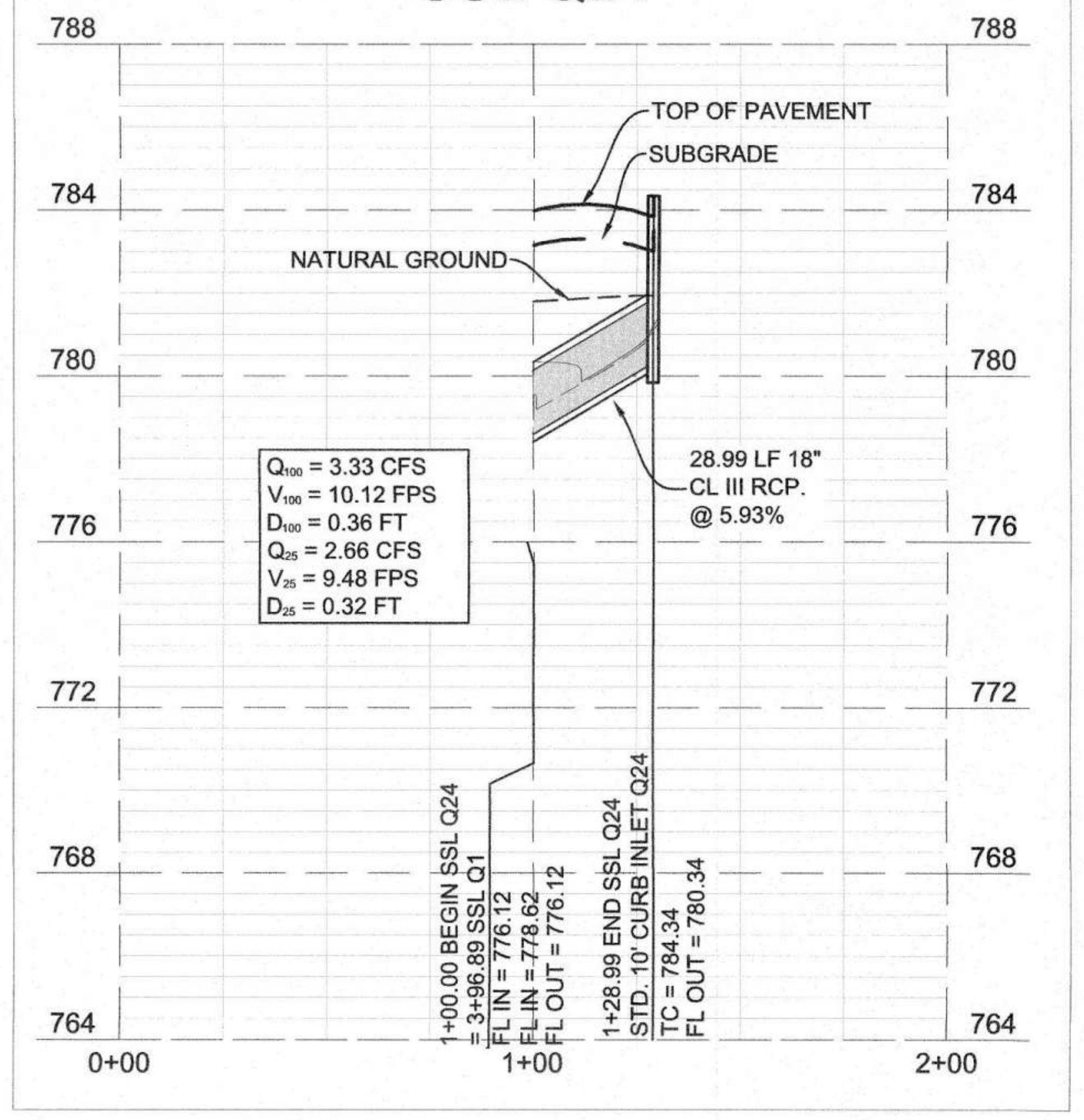

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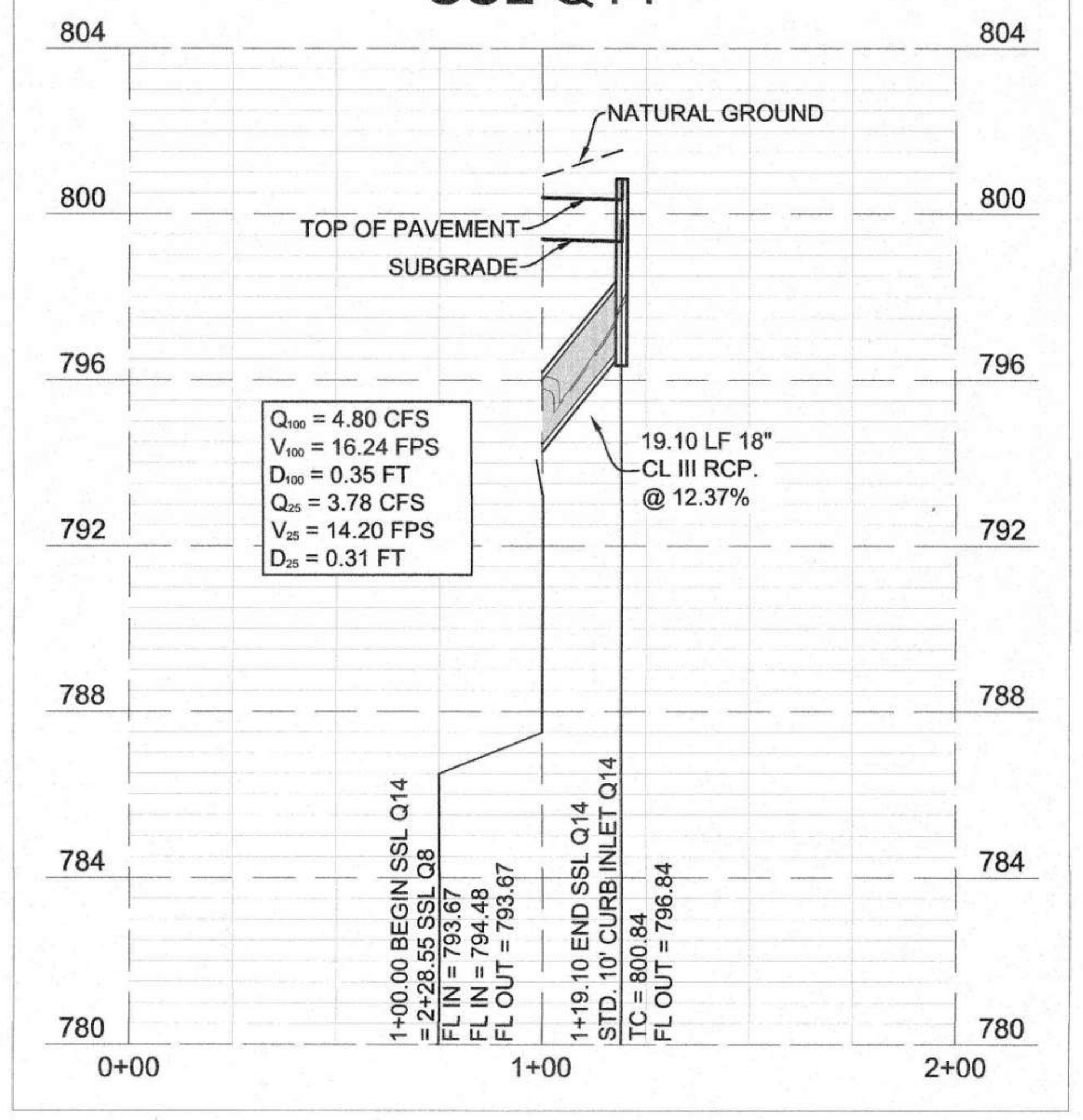
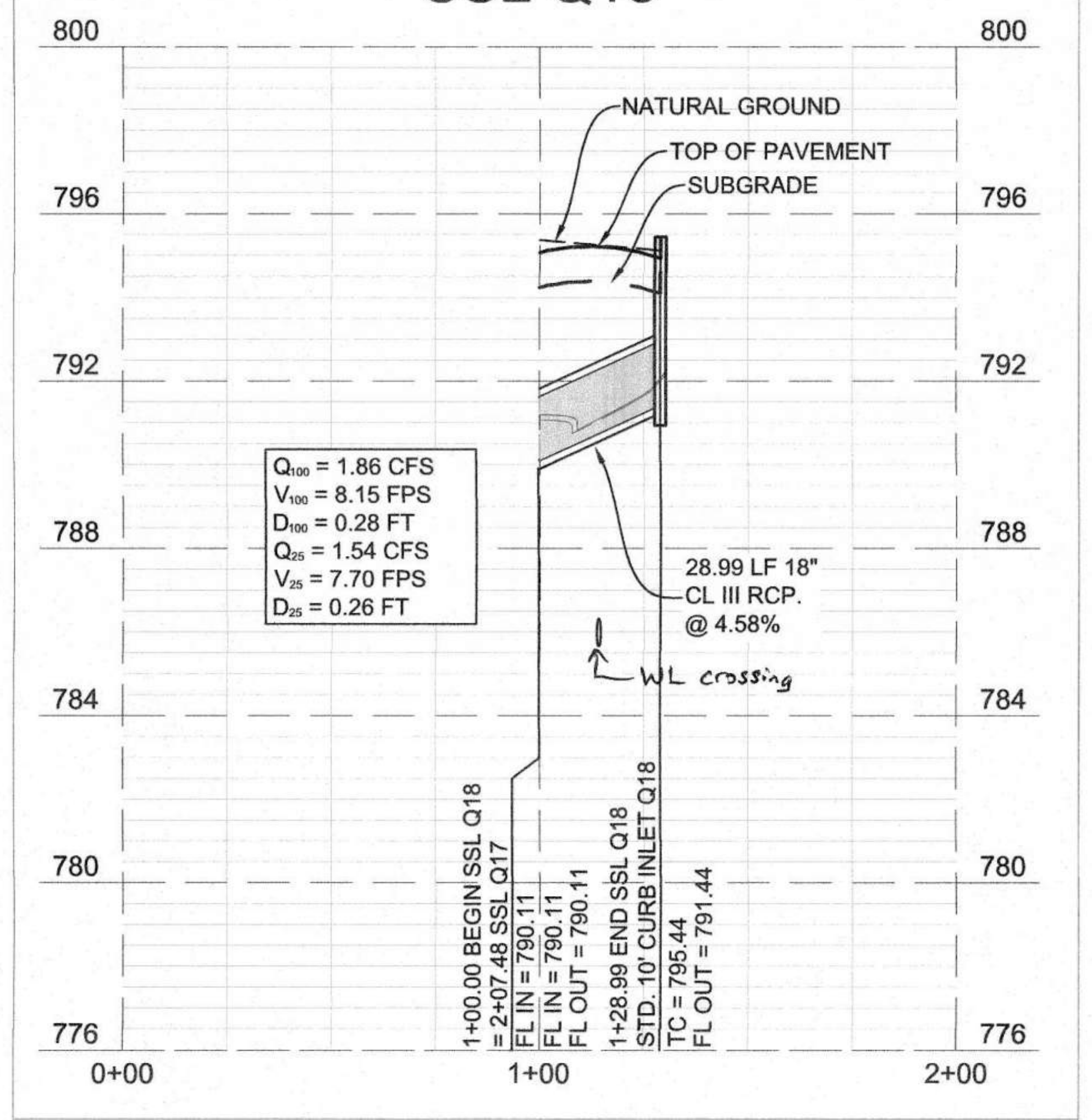


SSL Q18



LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
⊖	PROPOSED GATE VALVE
⊖	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—∠	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

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WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE LATERAL PROFILES P11, P12, P13, Q7, Q15, Q16, Q19, Q22, Q23, Q24, Q14, & Q18

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS15.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

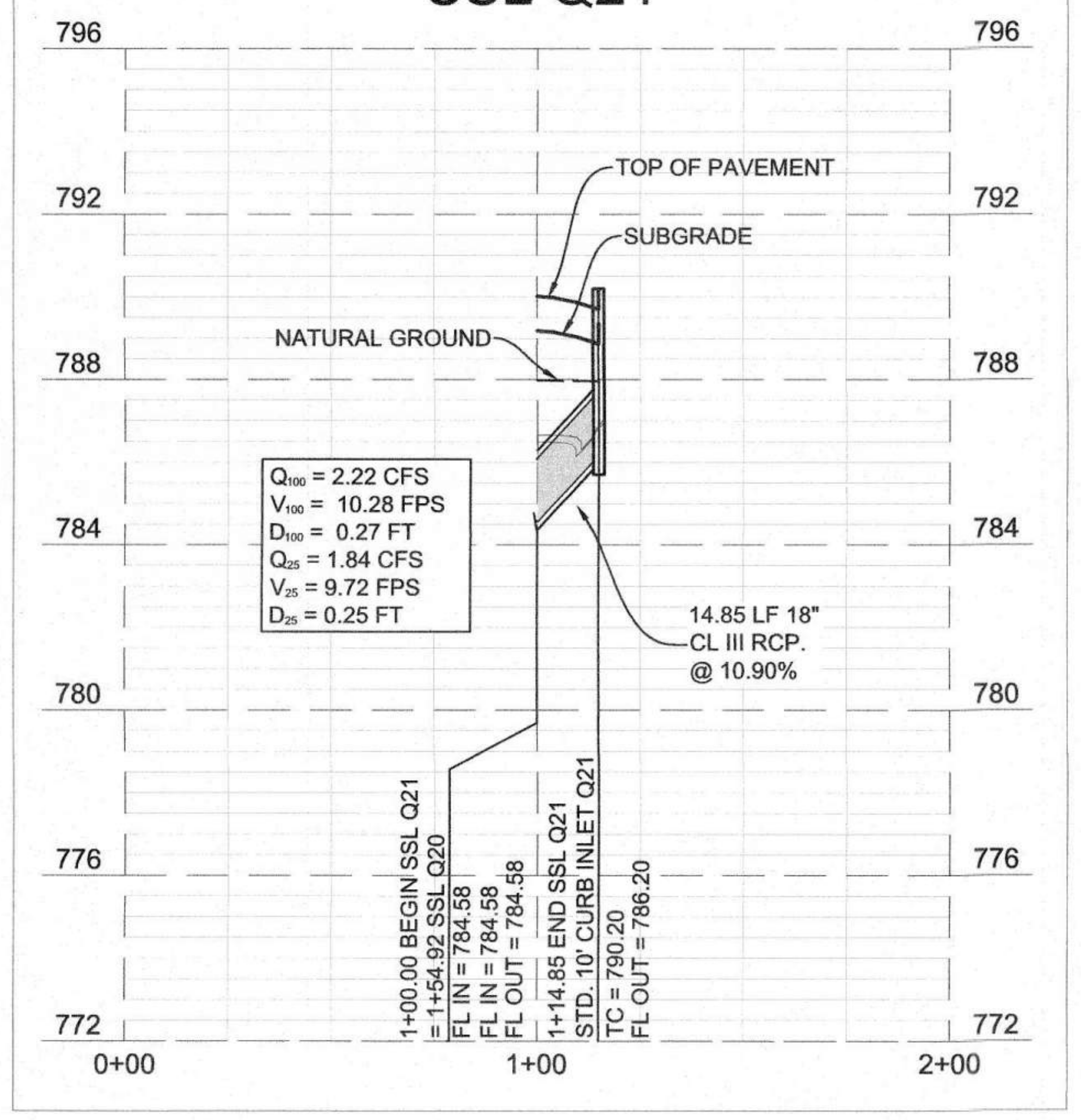
JOB NUMBER: A245-1002

SS15

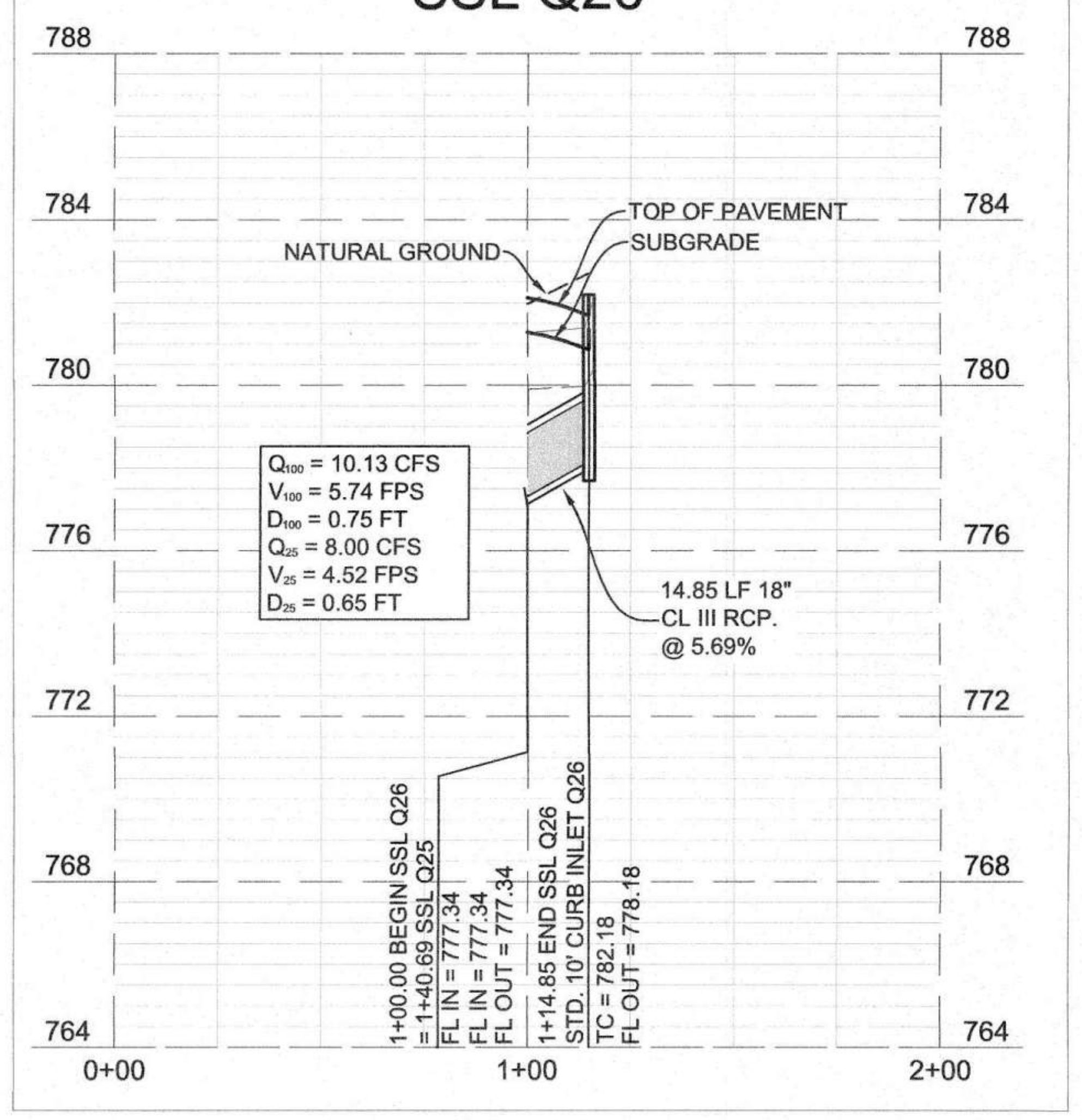
SHEET NO. 79 OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 2:18pm User Name : jmidura
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS15.dwg

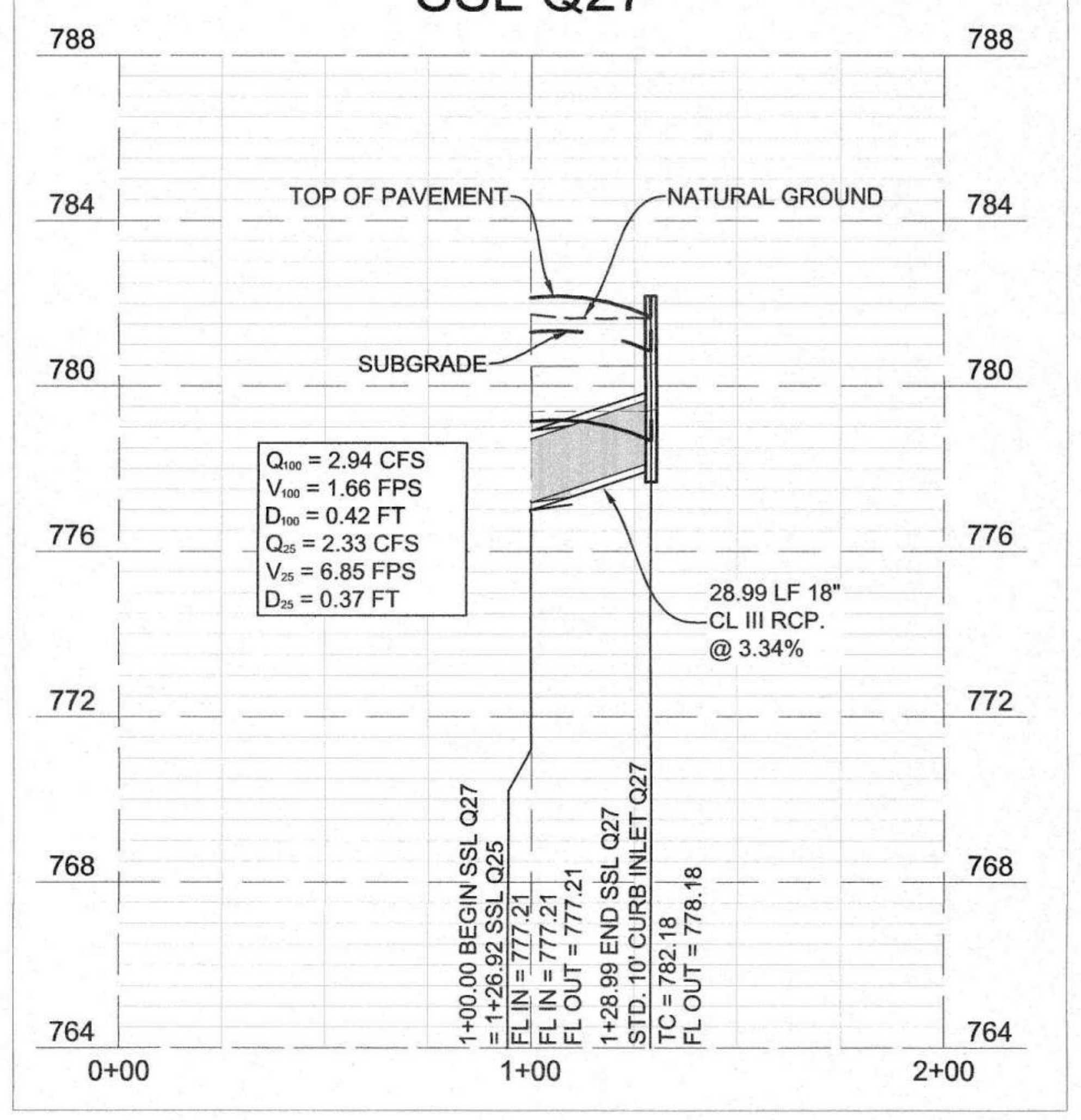
SSL Q21



SSL Q26



SSL Q27



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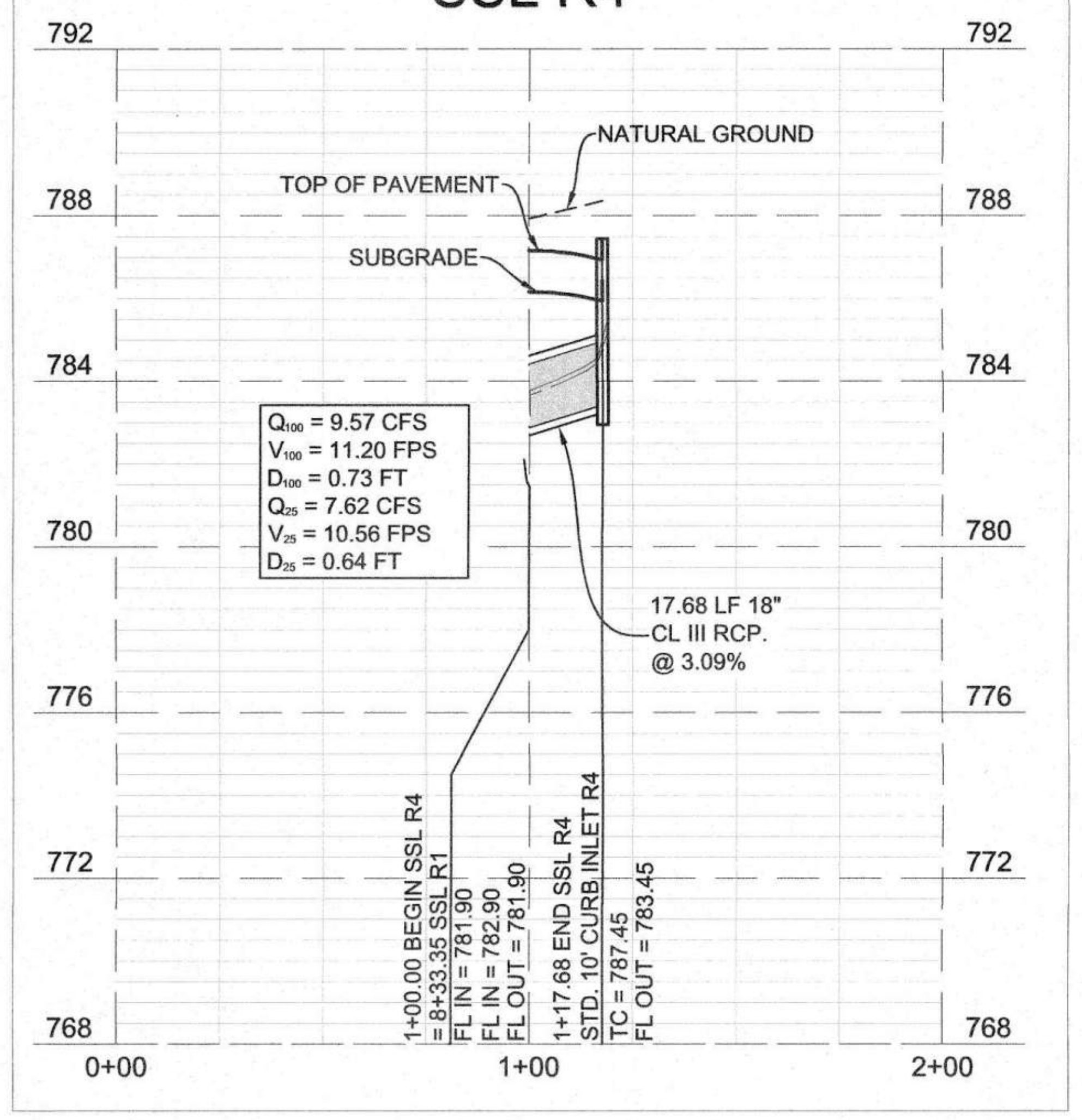

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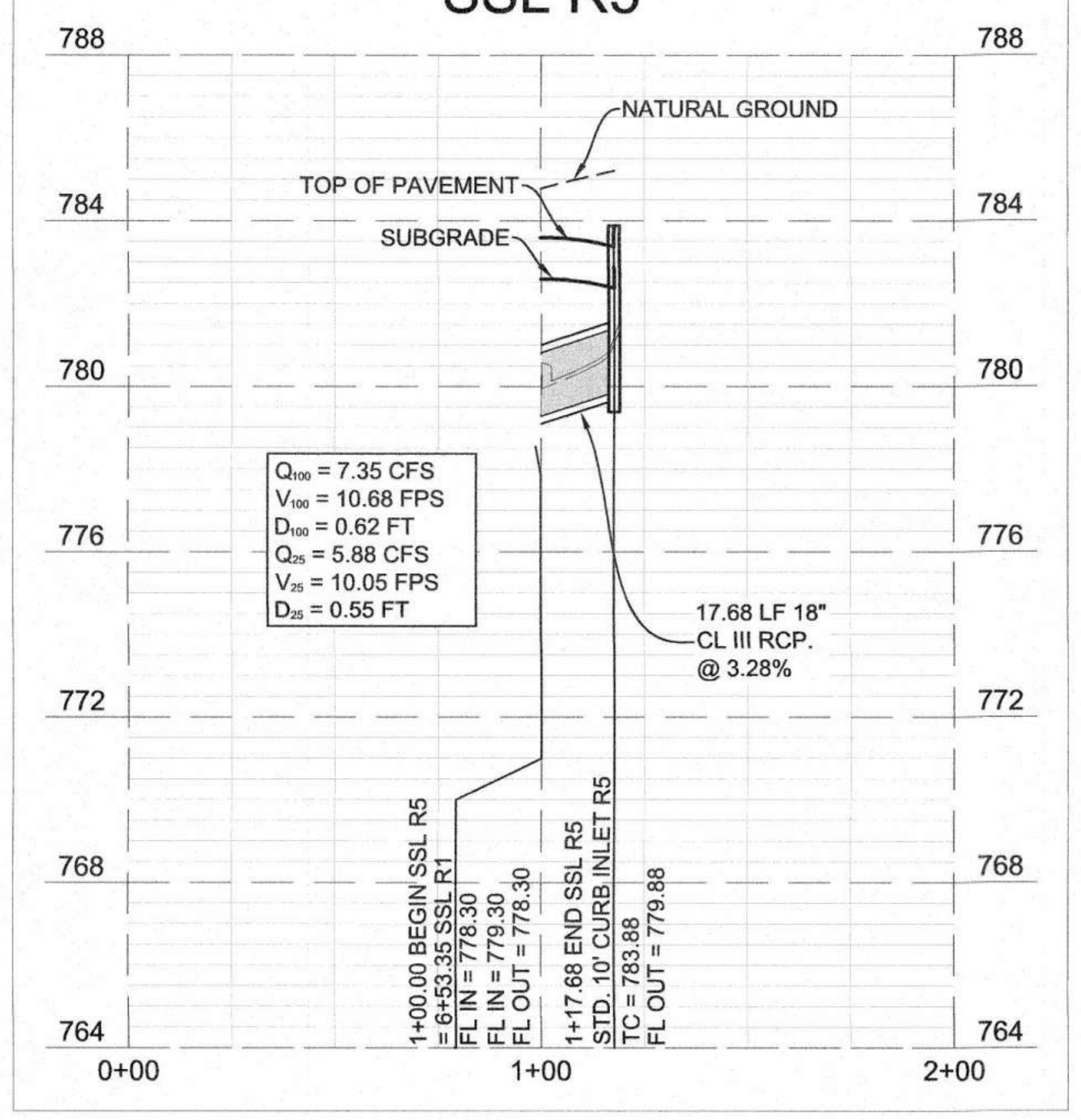

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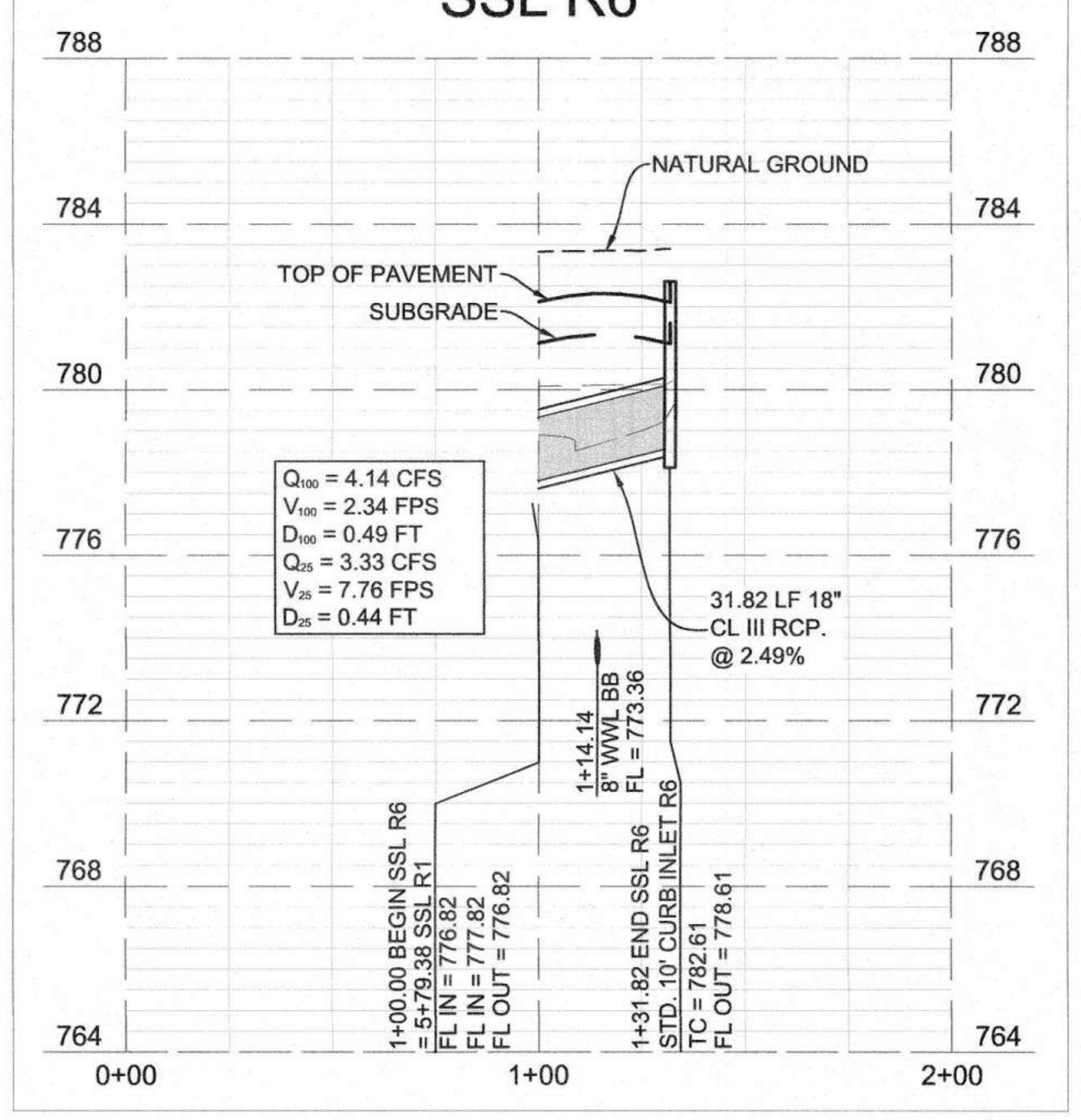

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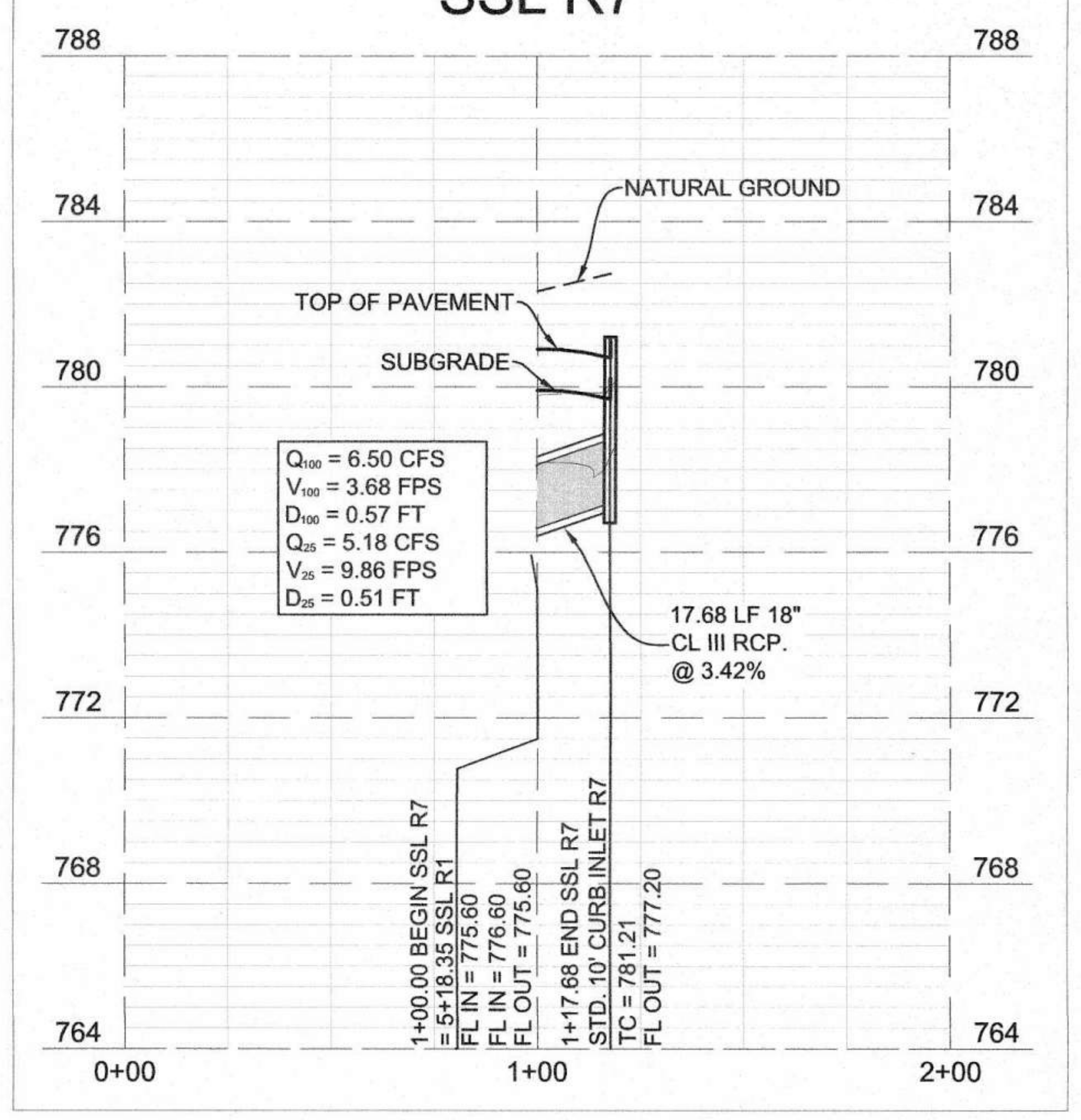

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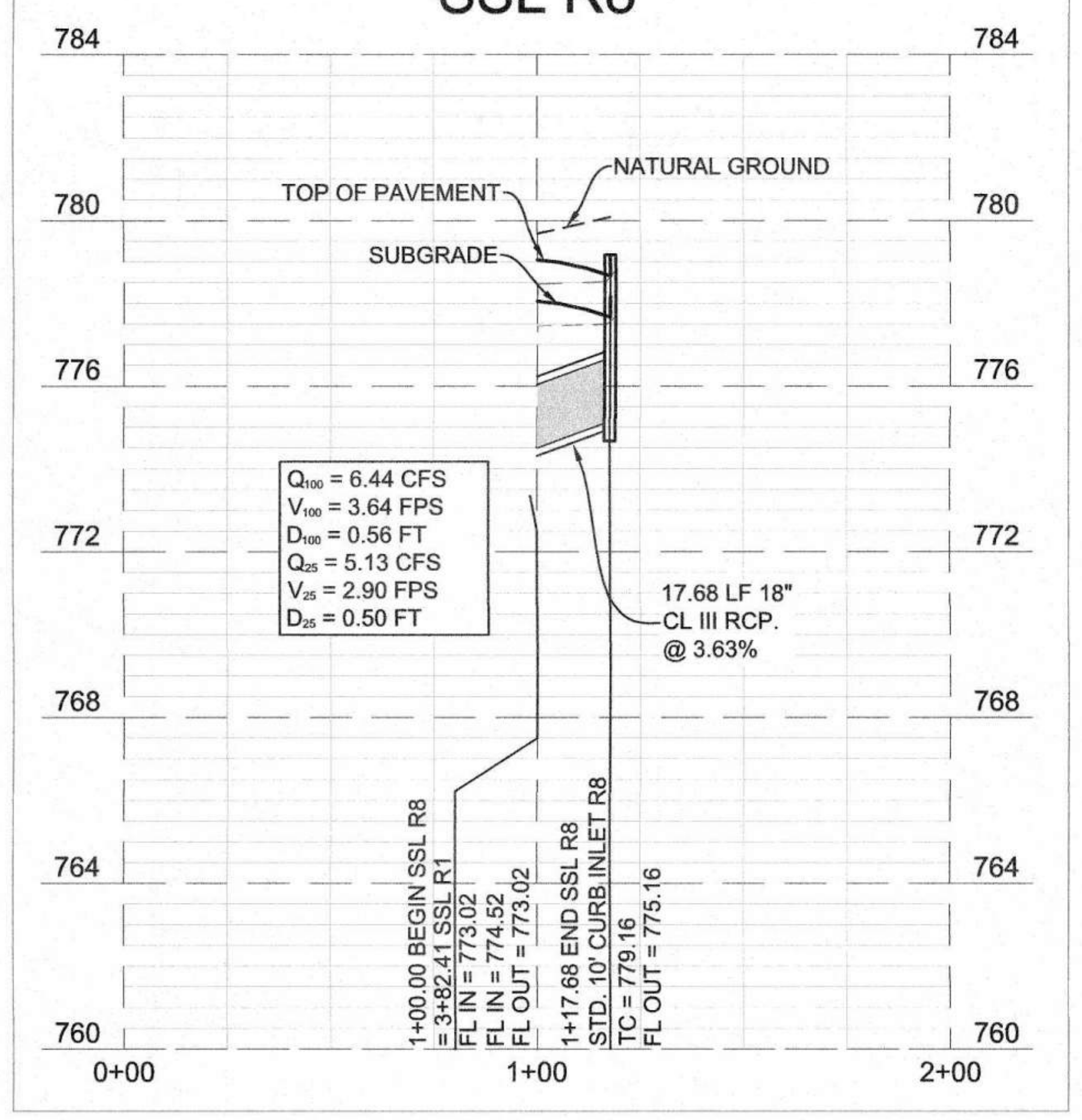

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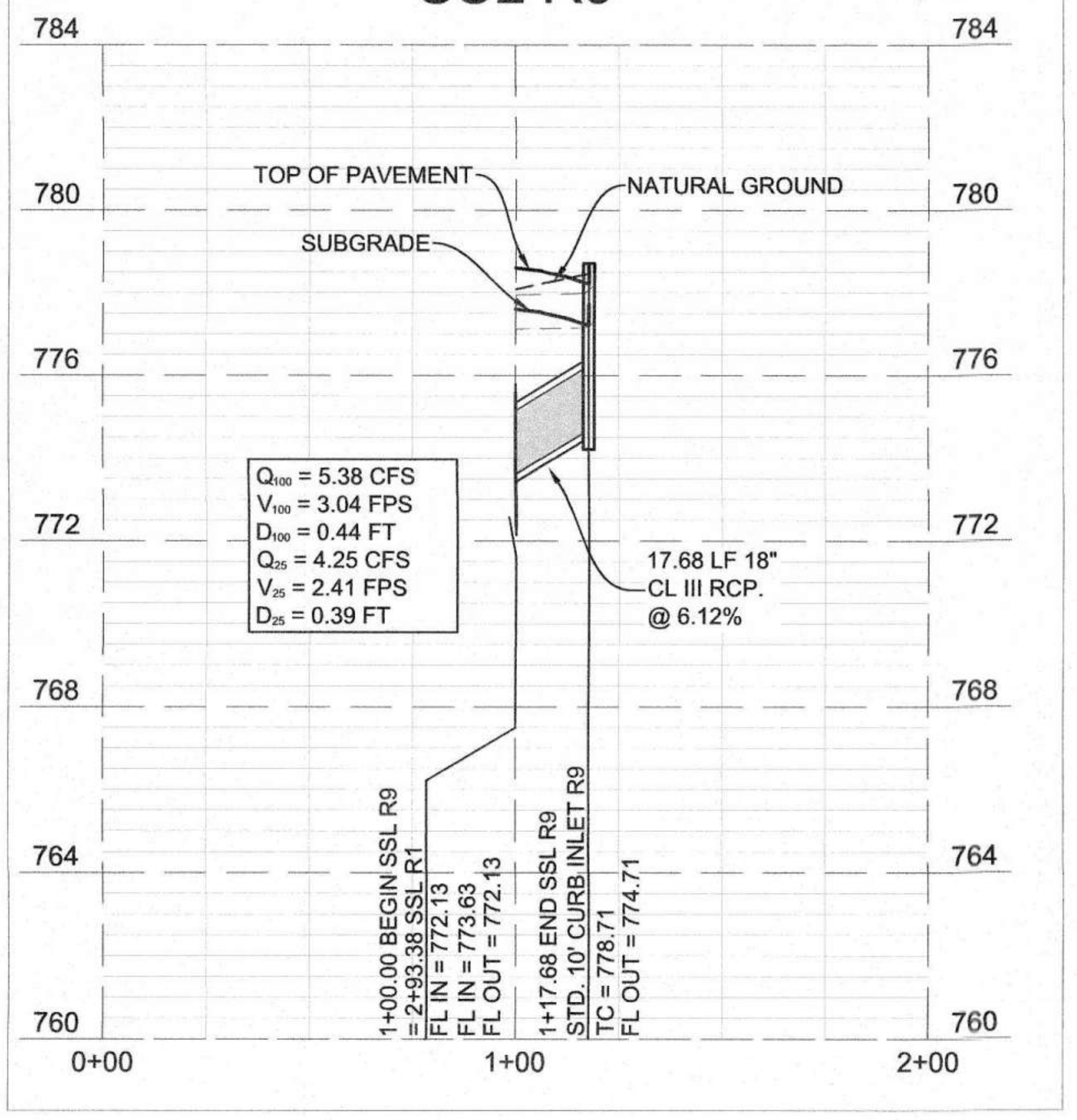

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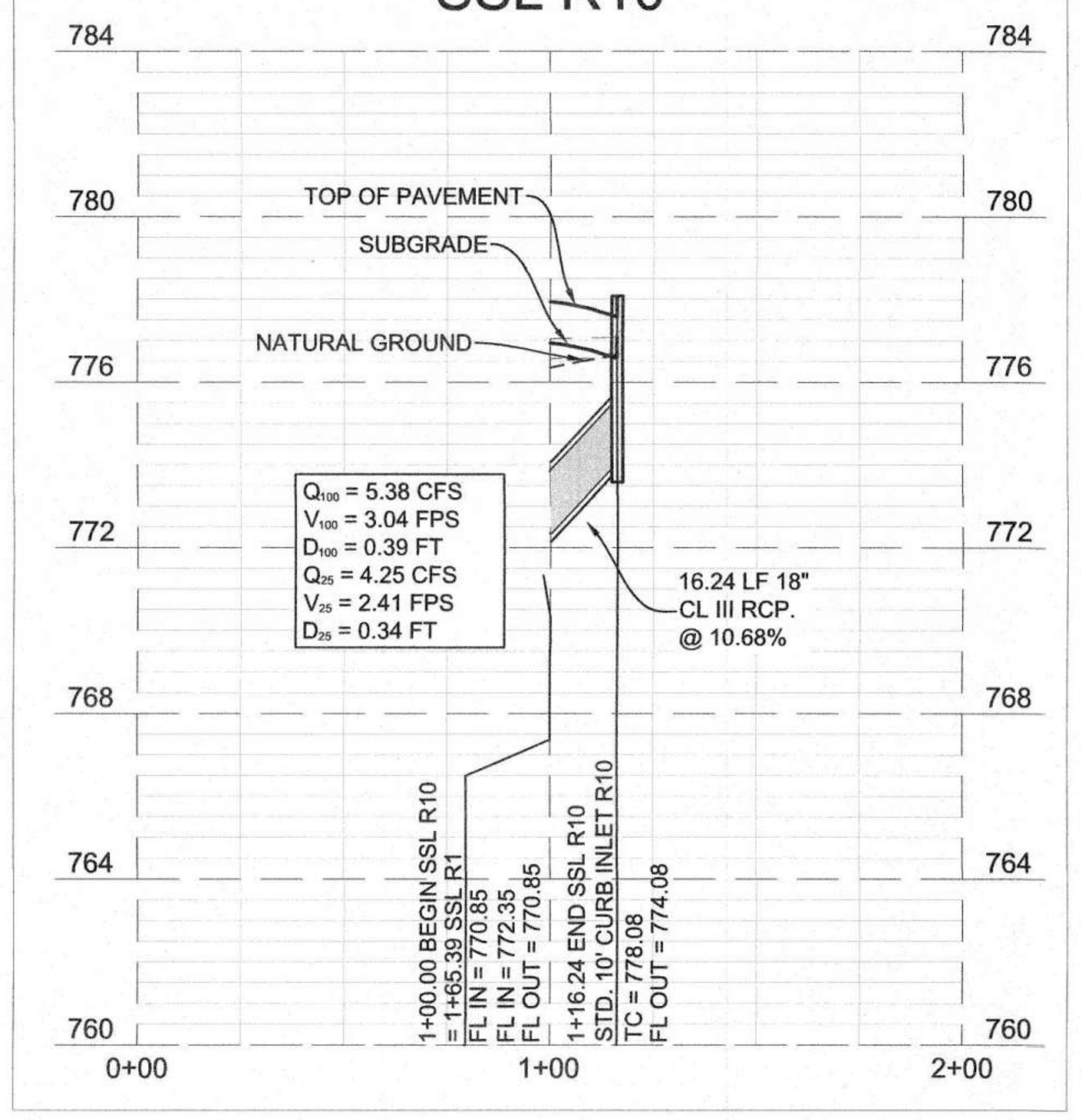

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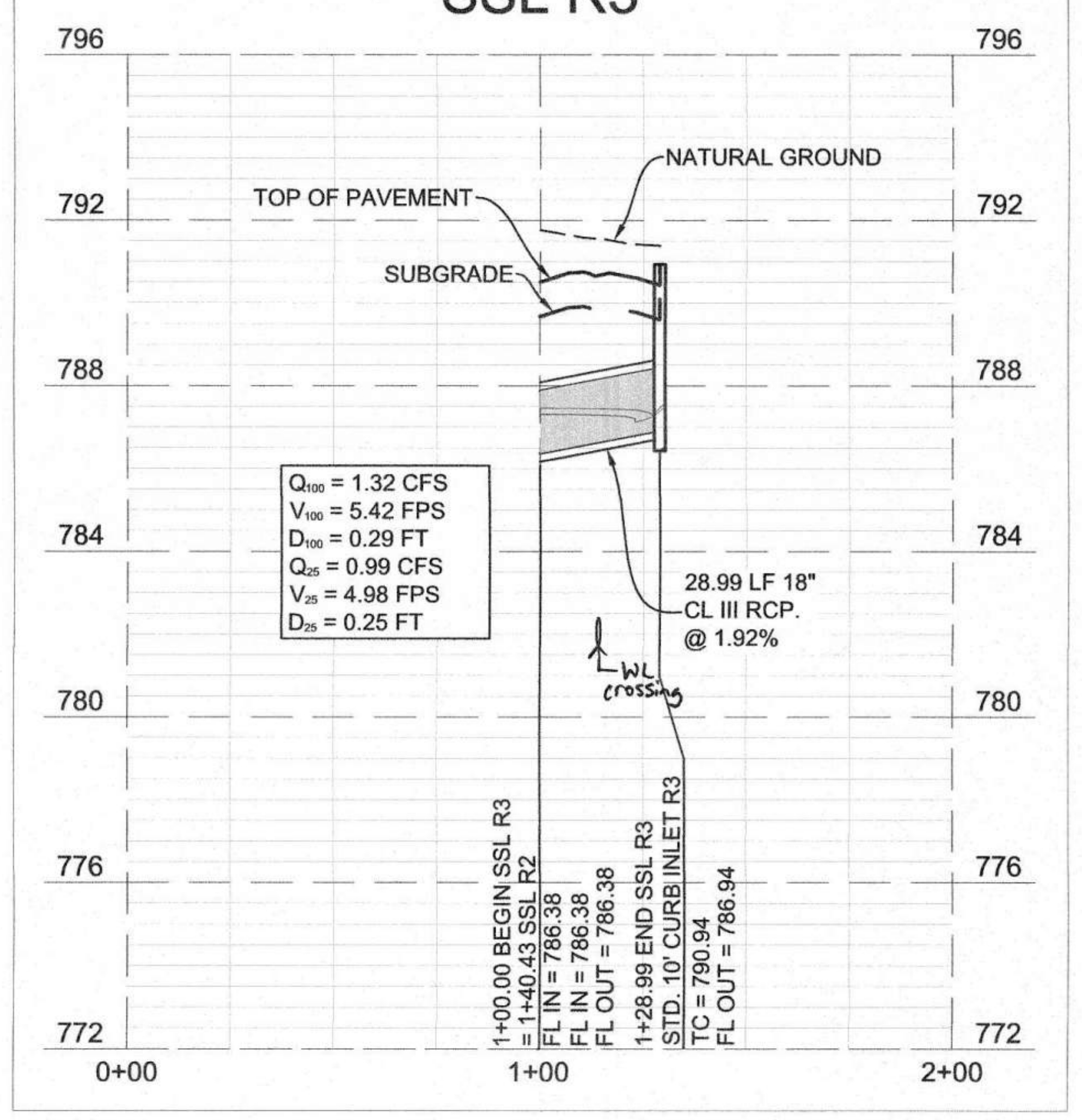
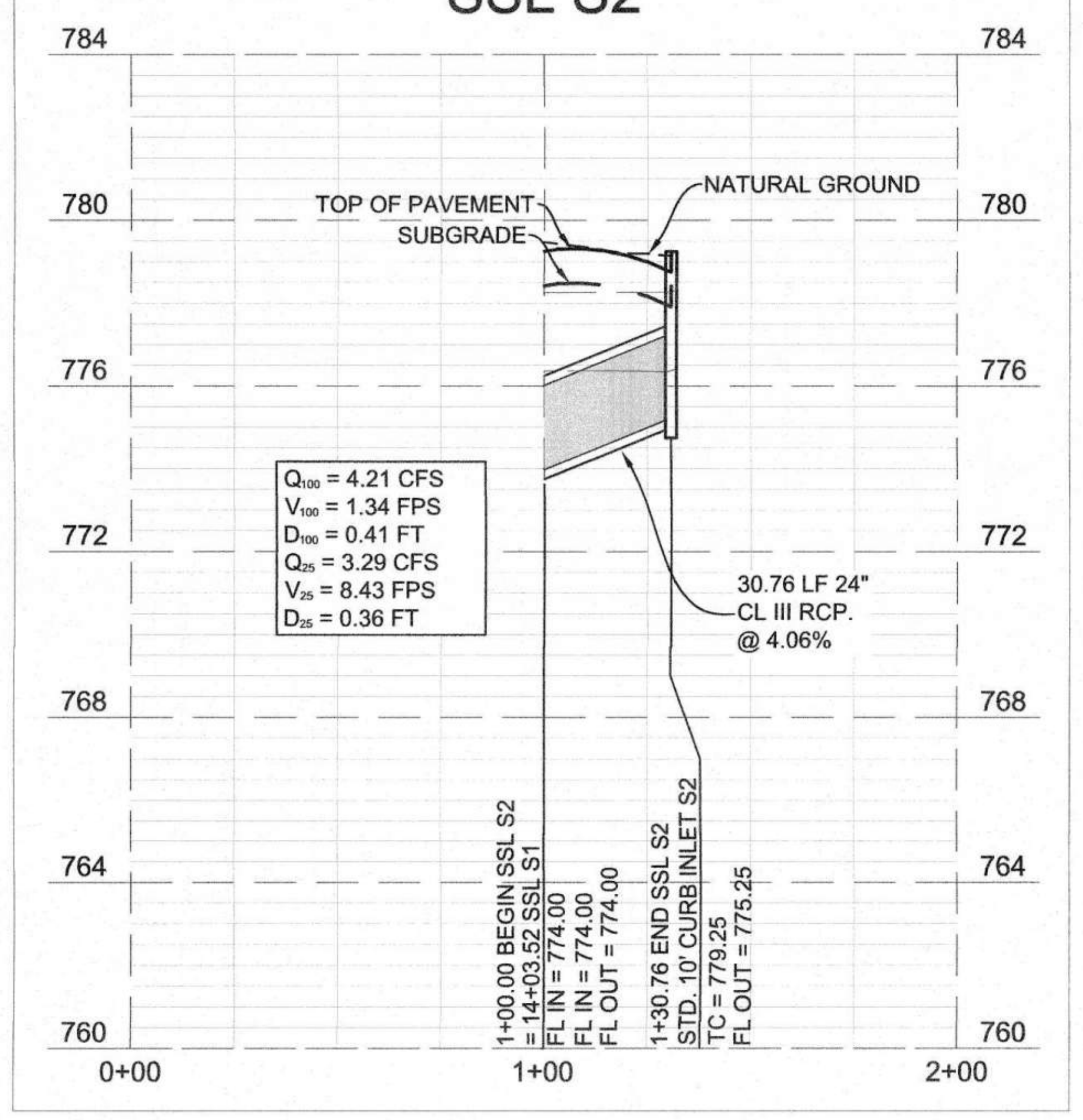


SSL S2



LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

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WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE LATERAL PROFILES
Q21, Q26, Q27, R4, R5, R6, R7, R8, R9, R10, R3, S2

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS16.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

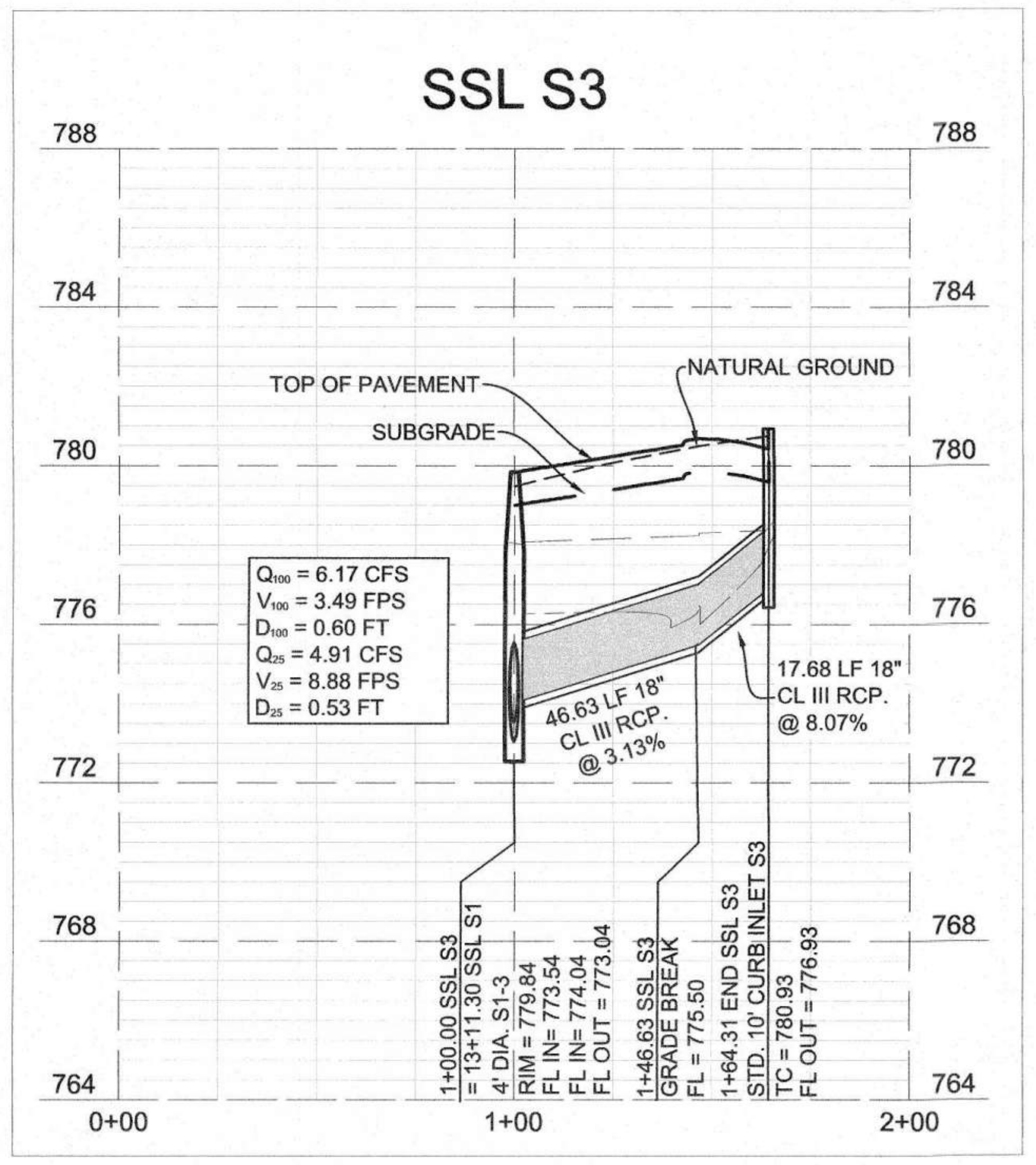
JOB NUMBER:
A245-1002

SS16

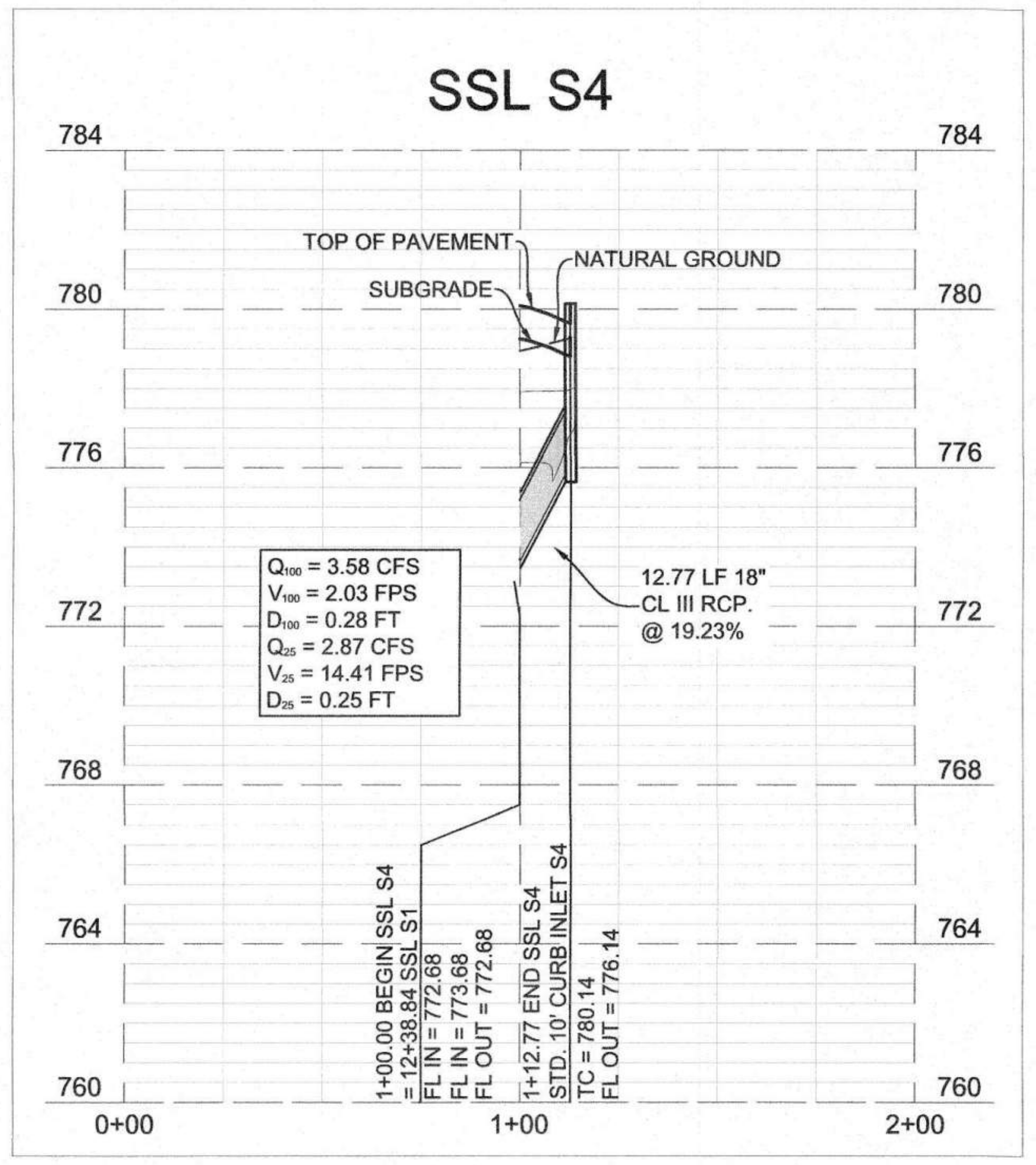
SHEET NO.
80
OF 118 SHEETS

User Name : jmidura
Date/Time : Fri, 01 Dec 2023 - 2:20pm
PathName : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_SS16.dwg

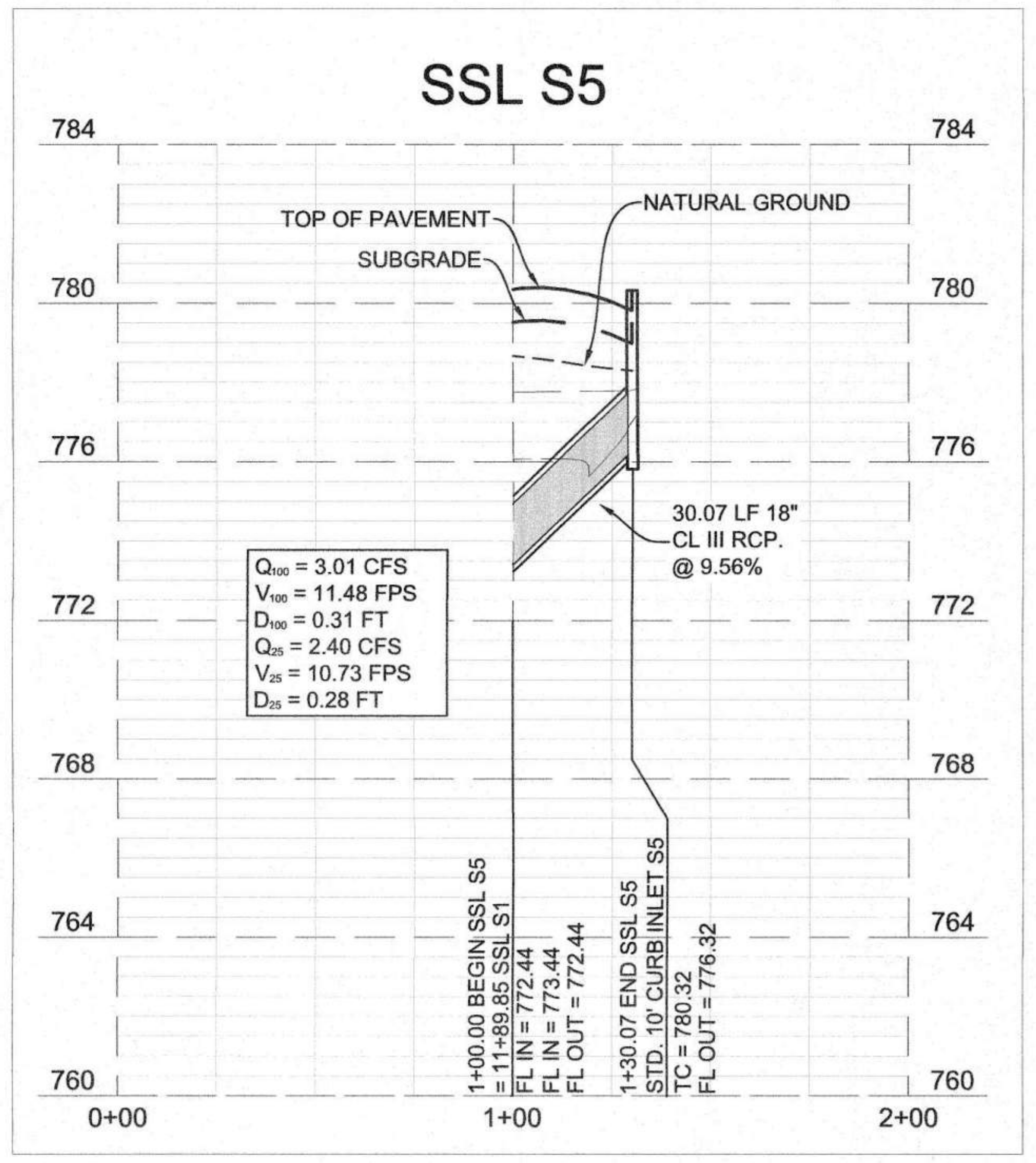
SSL S3



SSL S4



SSL S5



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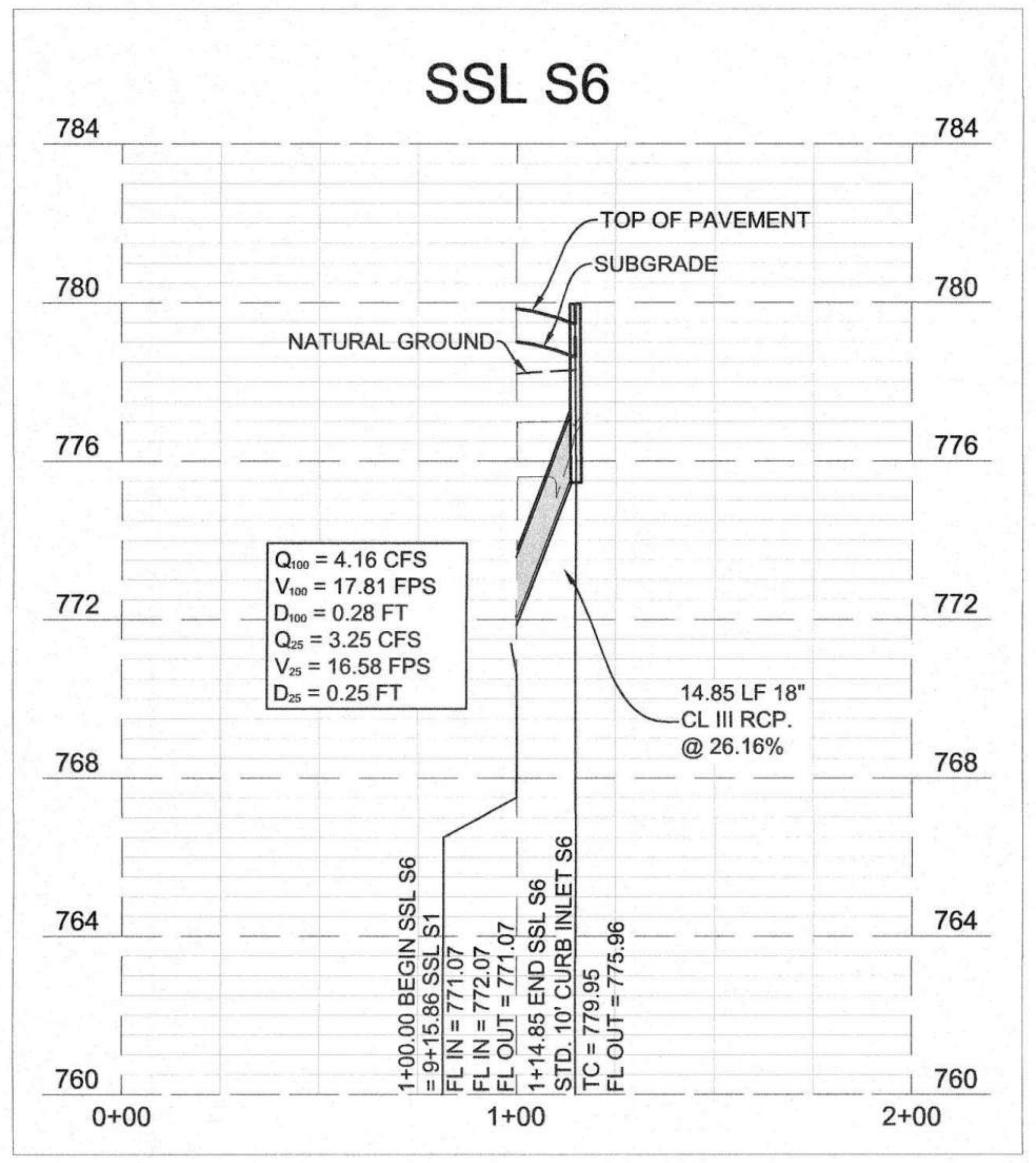

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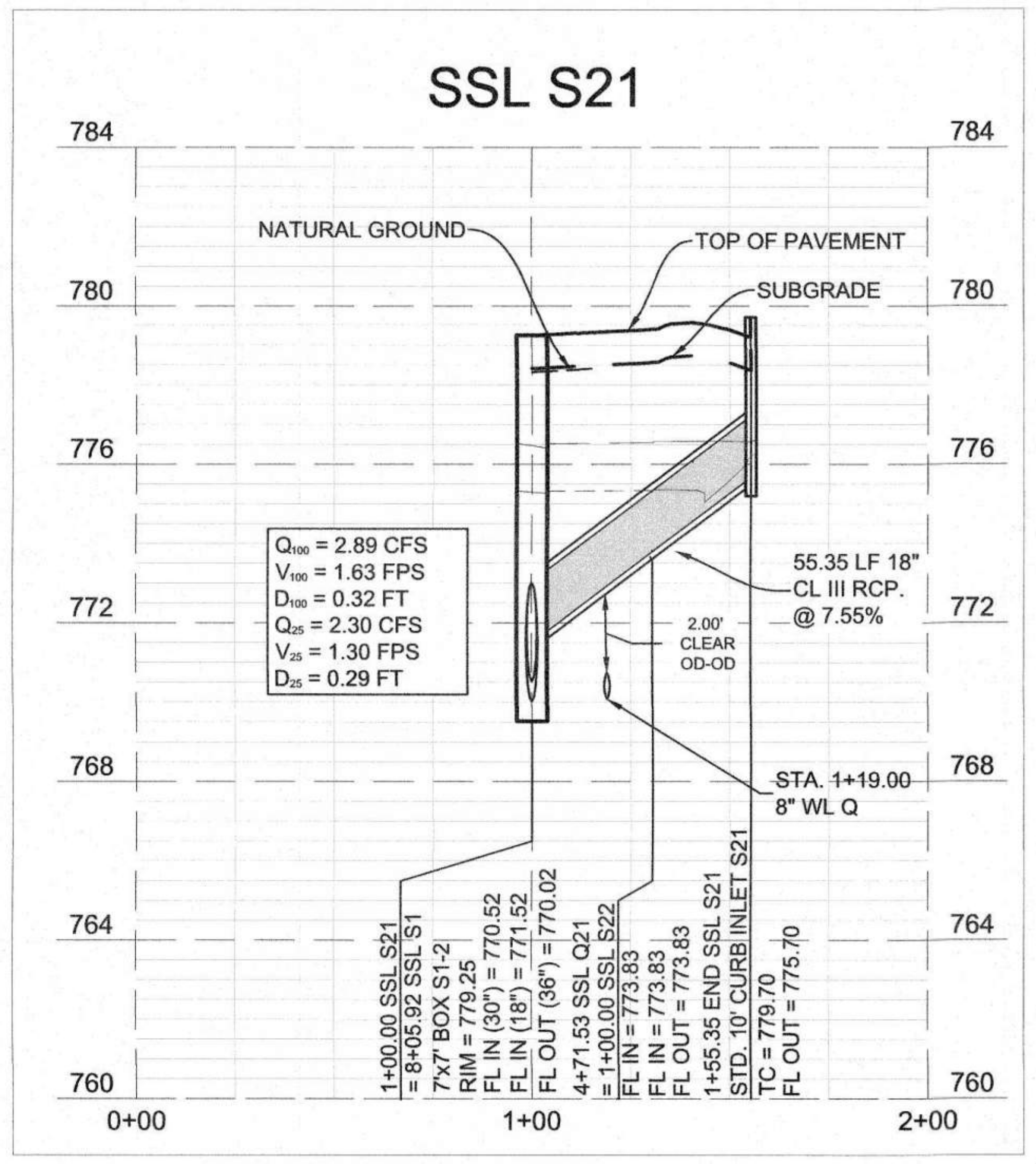

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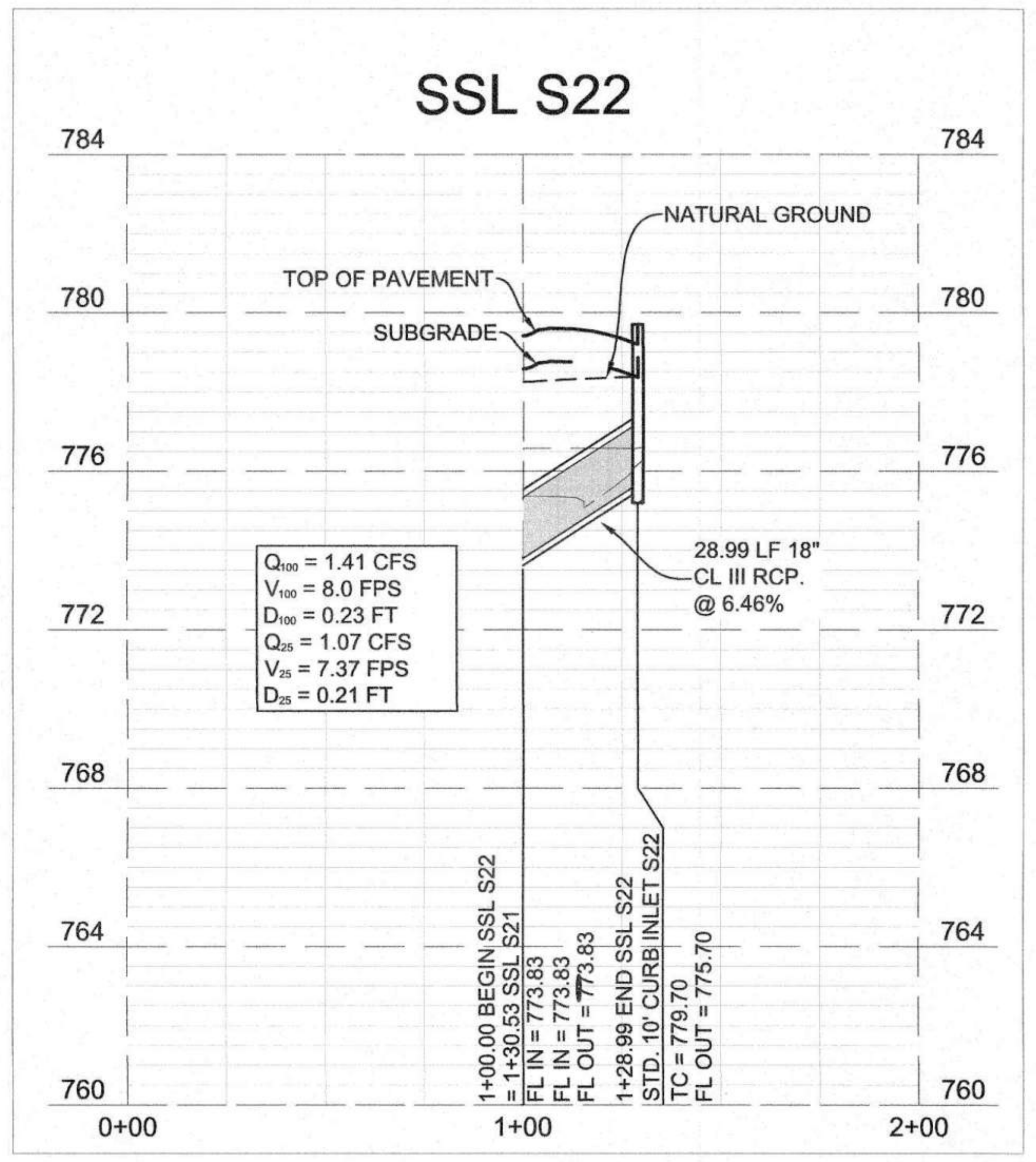

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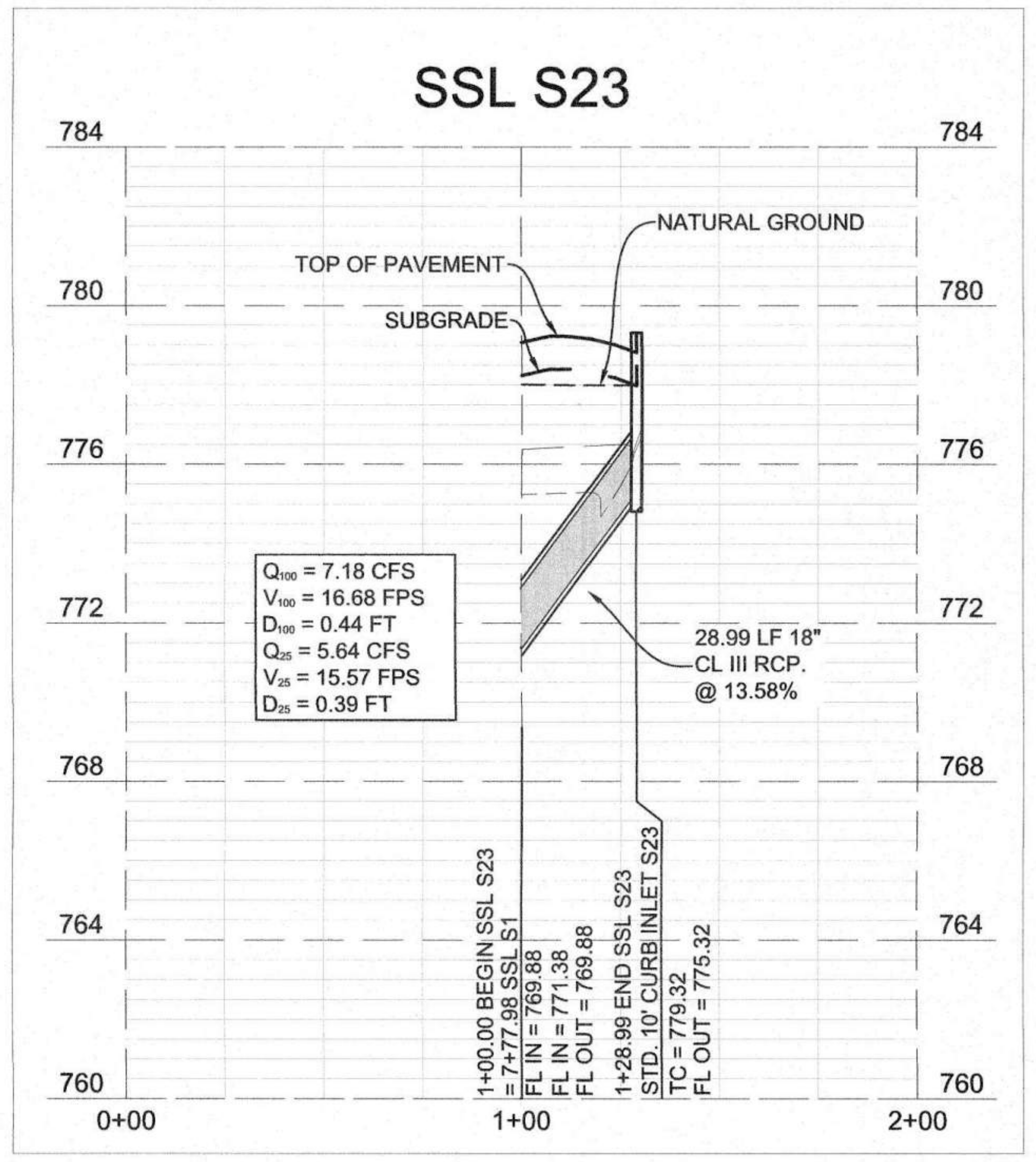

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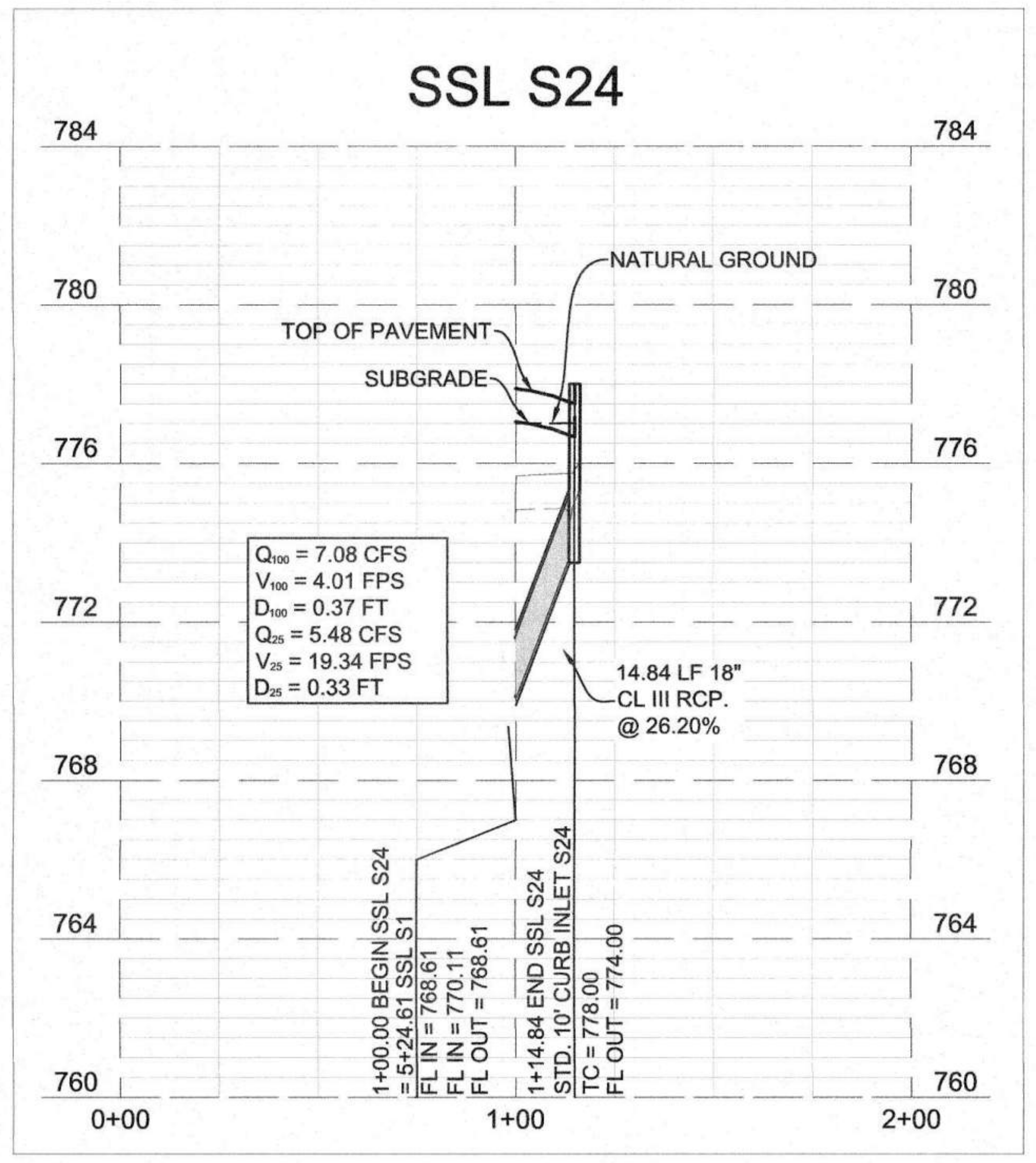

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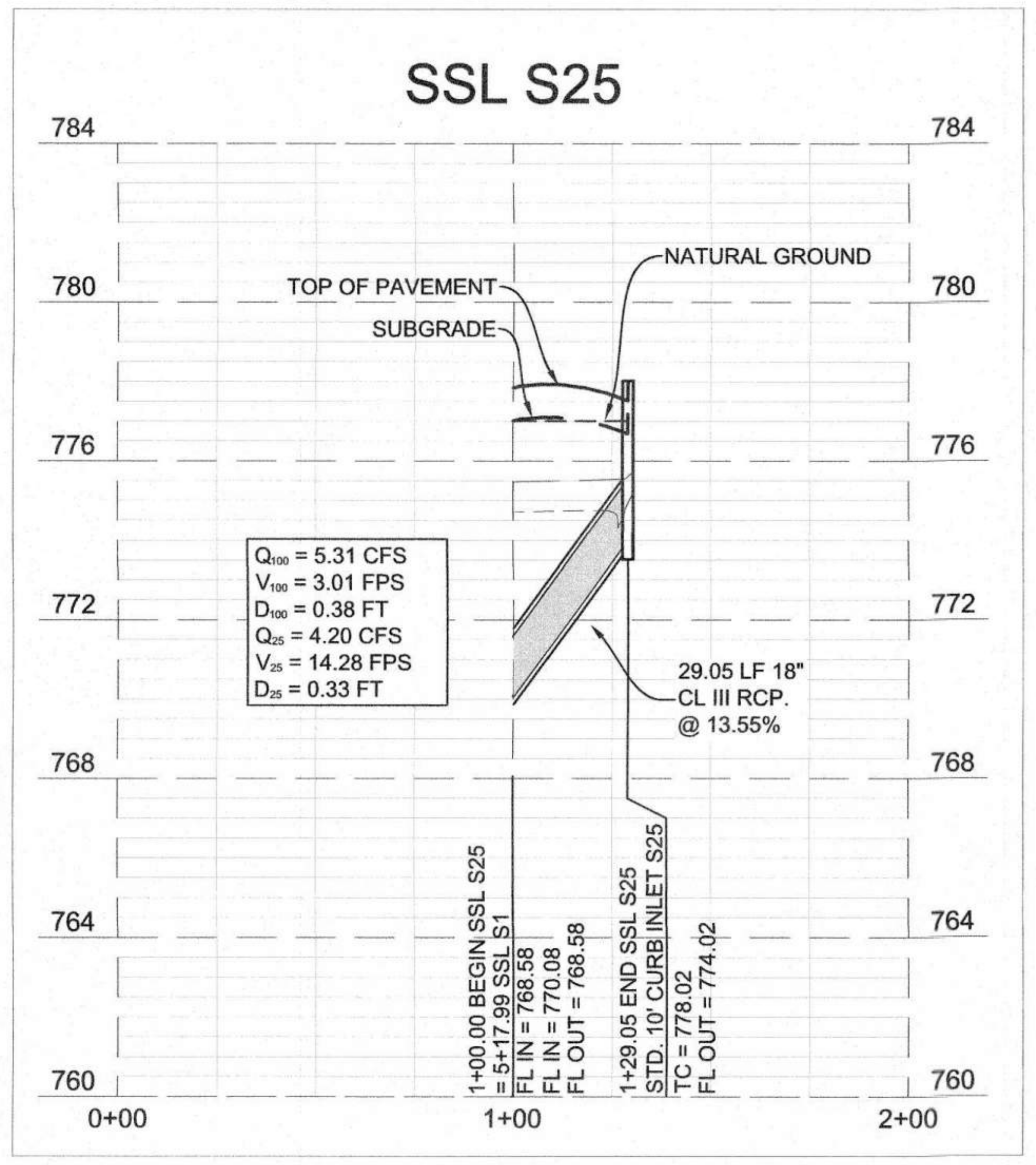

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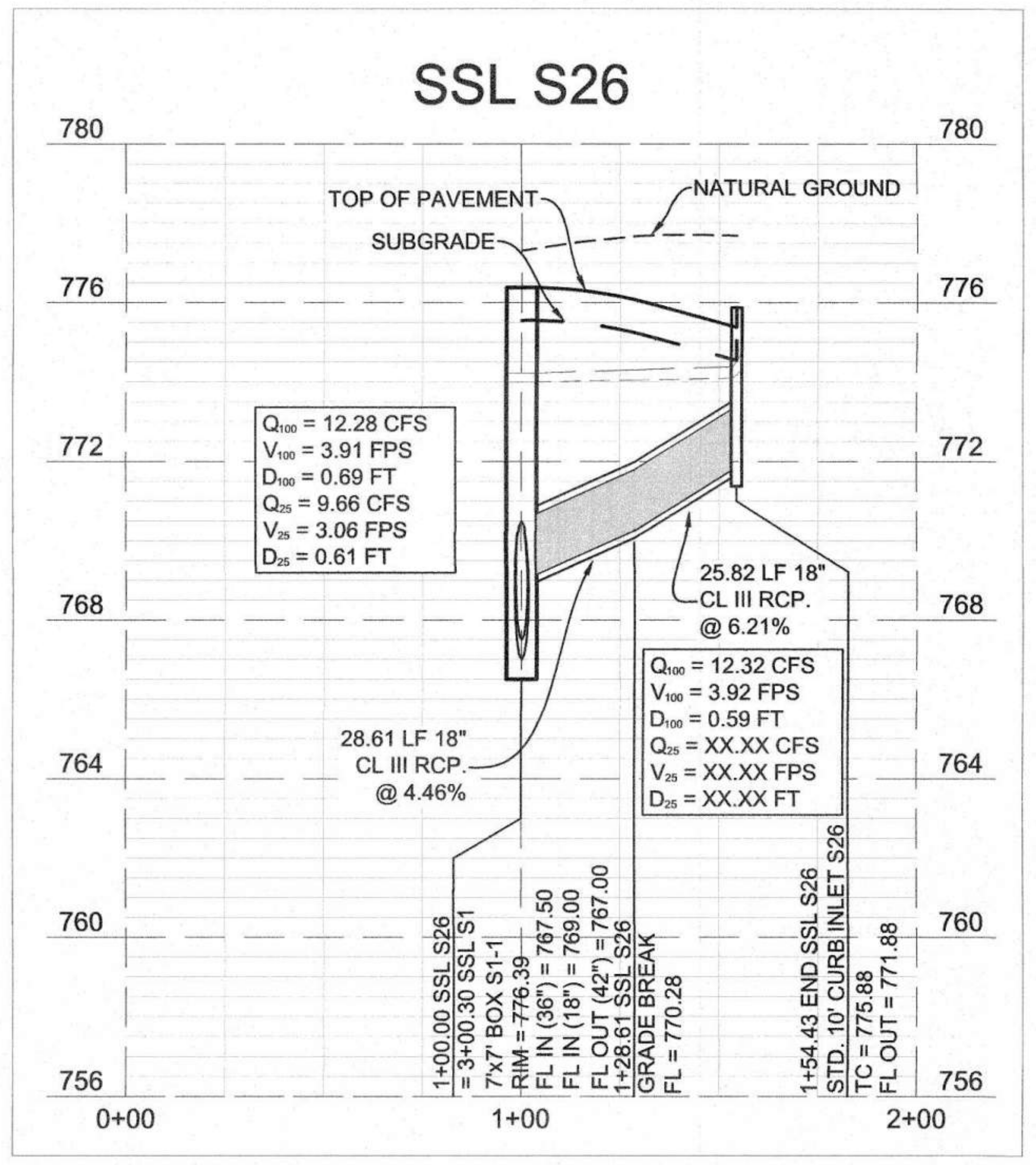

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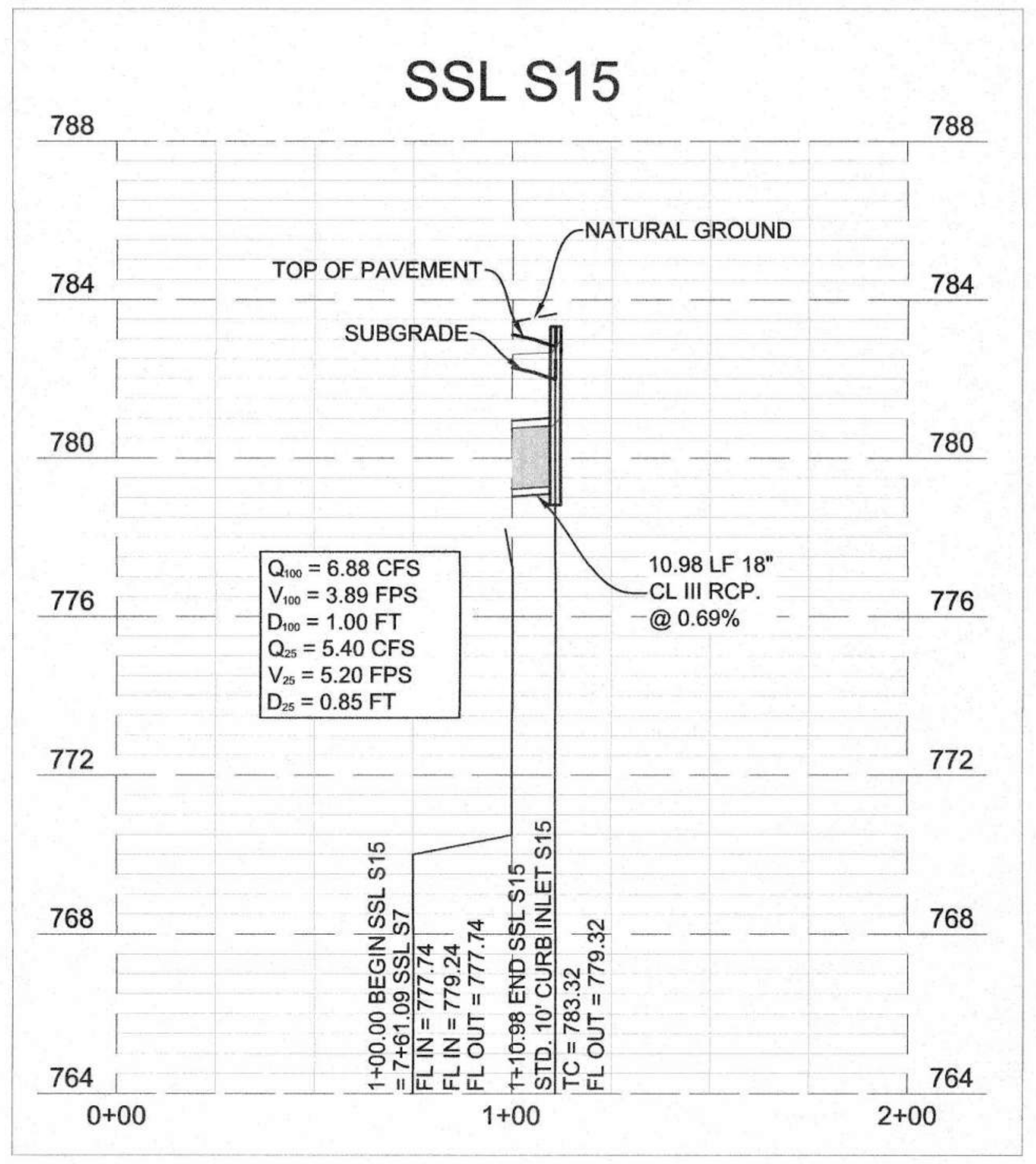

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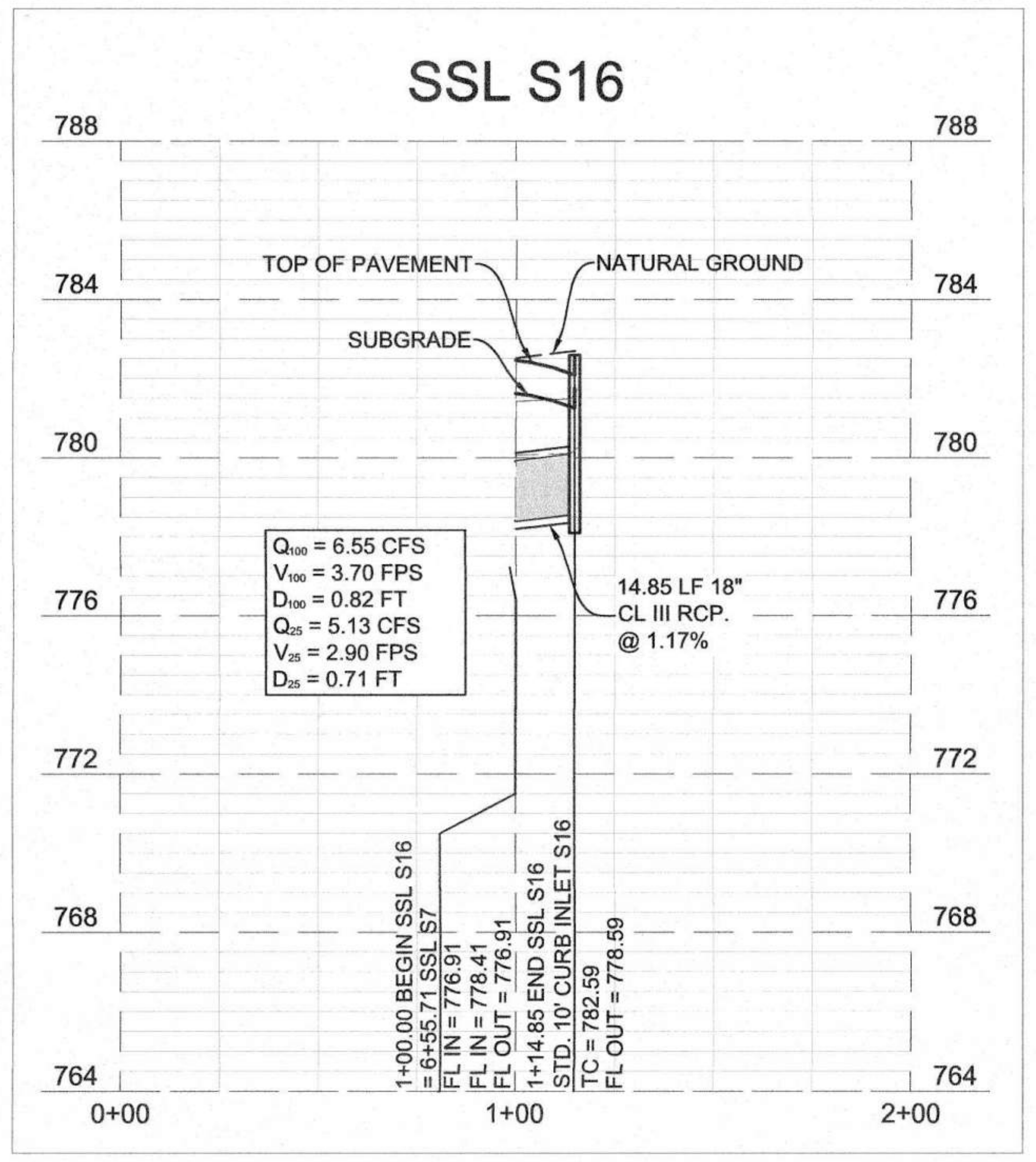

LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
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DOUBLE WATER SERVICE LEAD
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4. INLET CURB TRANSITIONS SHALL BE STANDARD 10' LONG UNLESS OTHERWISE NOTED ON THESE PLANS. THE MINIMUM ALLOWABLE TRANSITION LENGTH SHALL BE 5 FEET.

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

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

WOODFIELD PRESERVE
PHASE 3

STORM SEWER LINE LATERAL PROFILES
S3, S4, S5, S6, S21, S22, S23,
S24, S25, S26, S15, & S16

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS17.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS17

SHEET NO.
81
OF 118 SHEETS

Date\Time : Fri, 01 Dec 2023 - 2:21pm
User Name : jmidura
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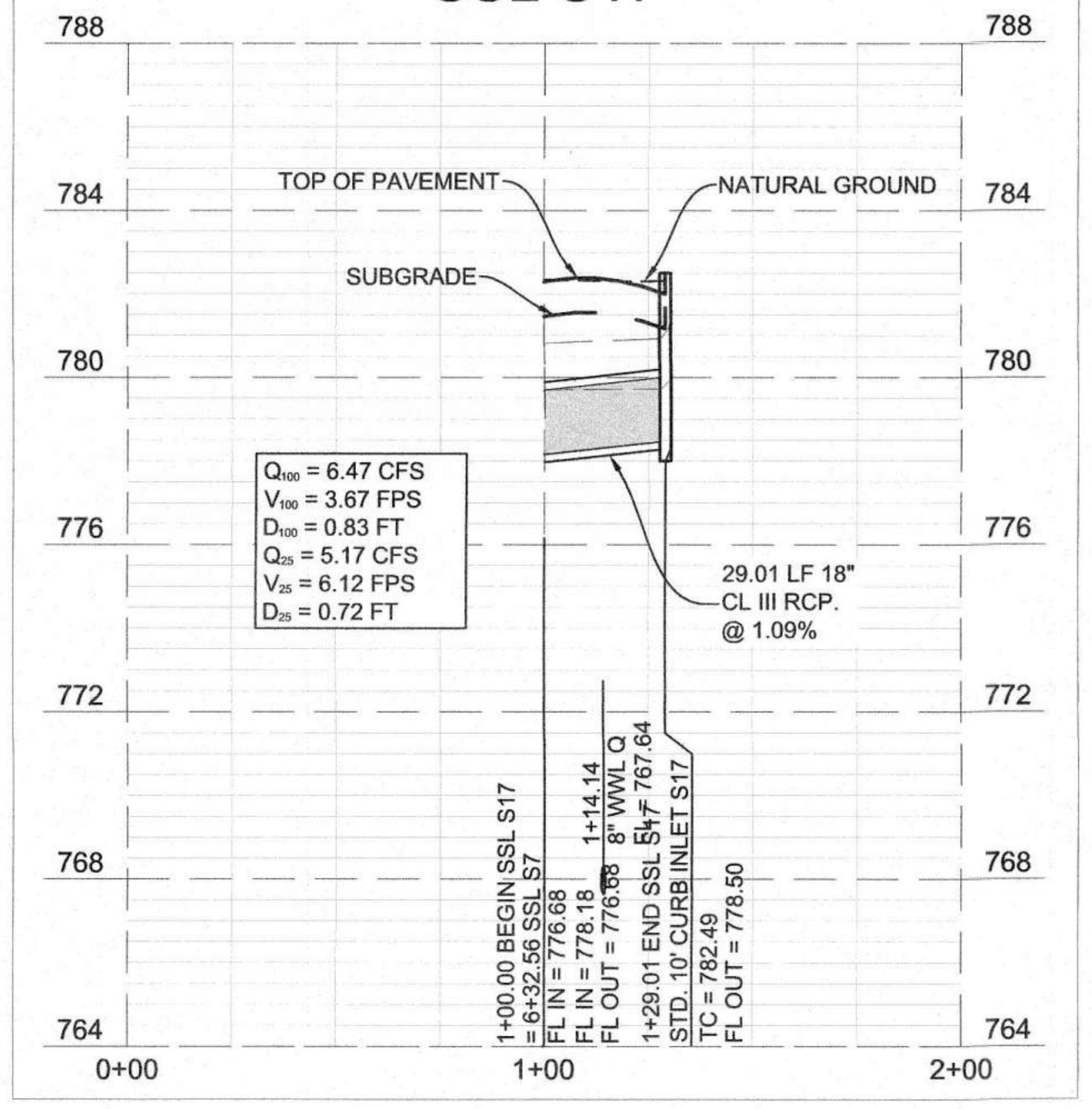
SSL S17



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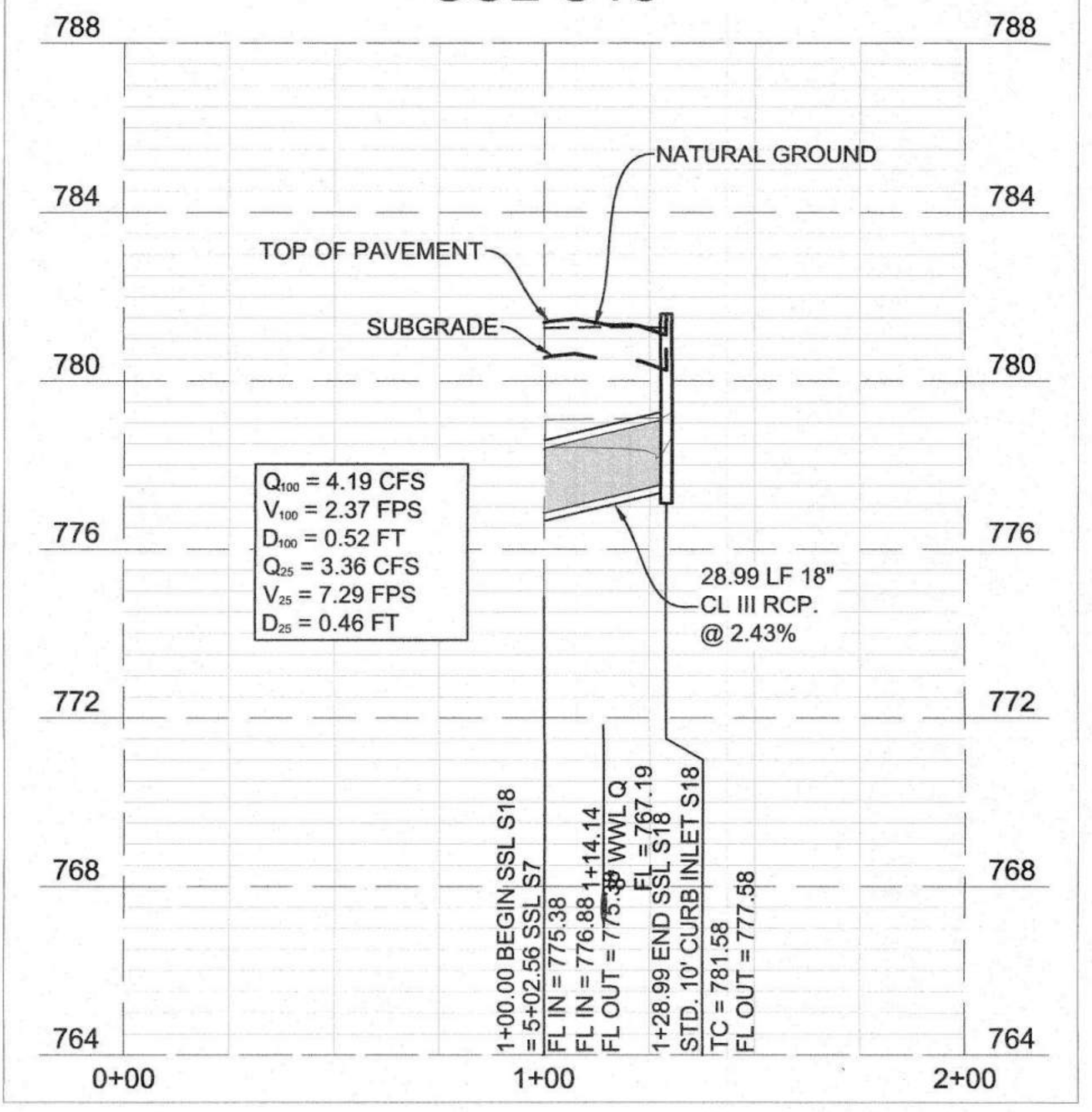

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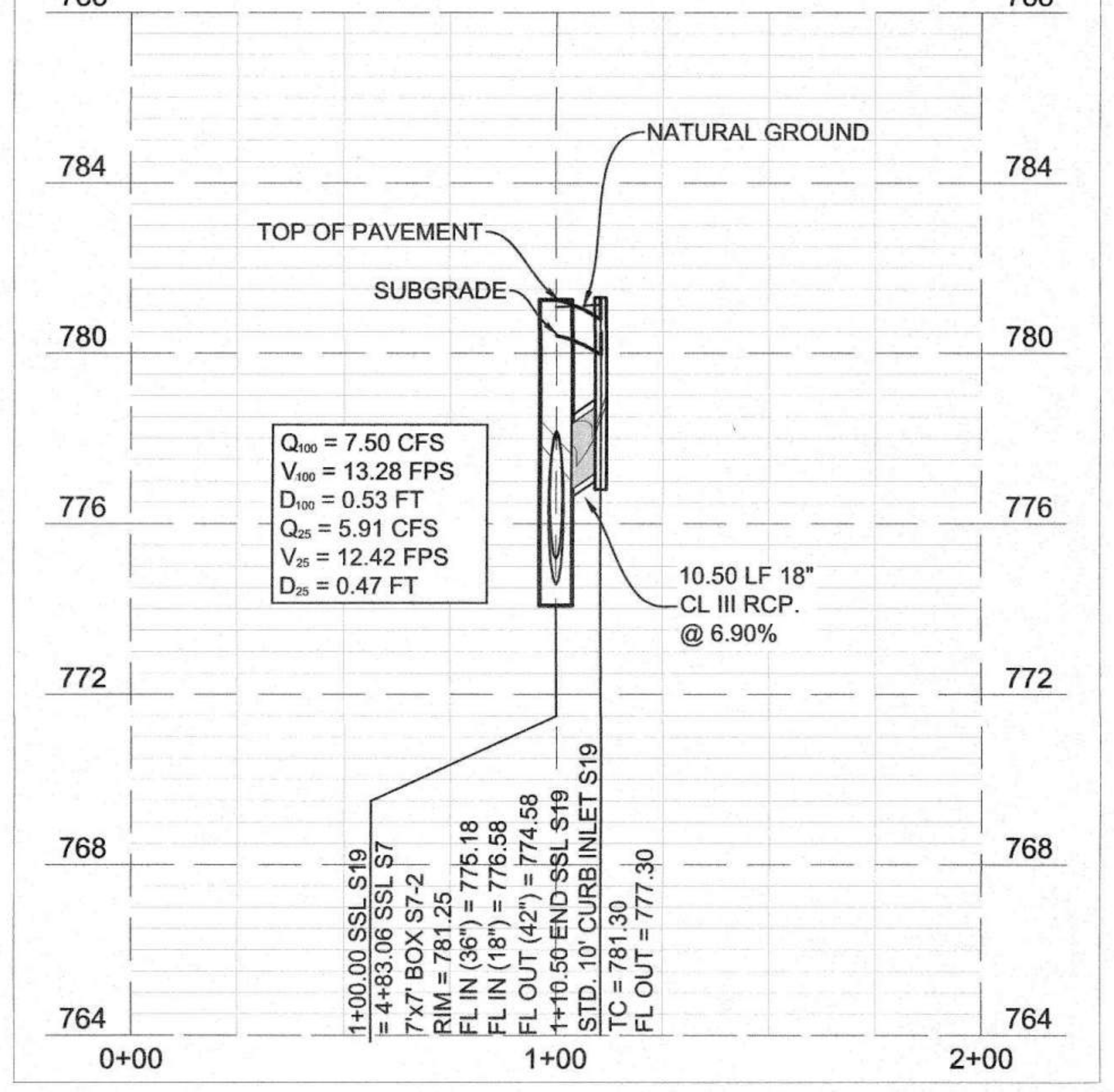

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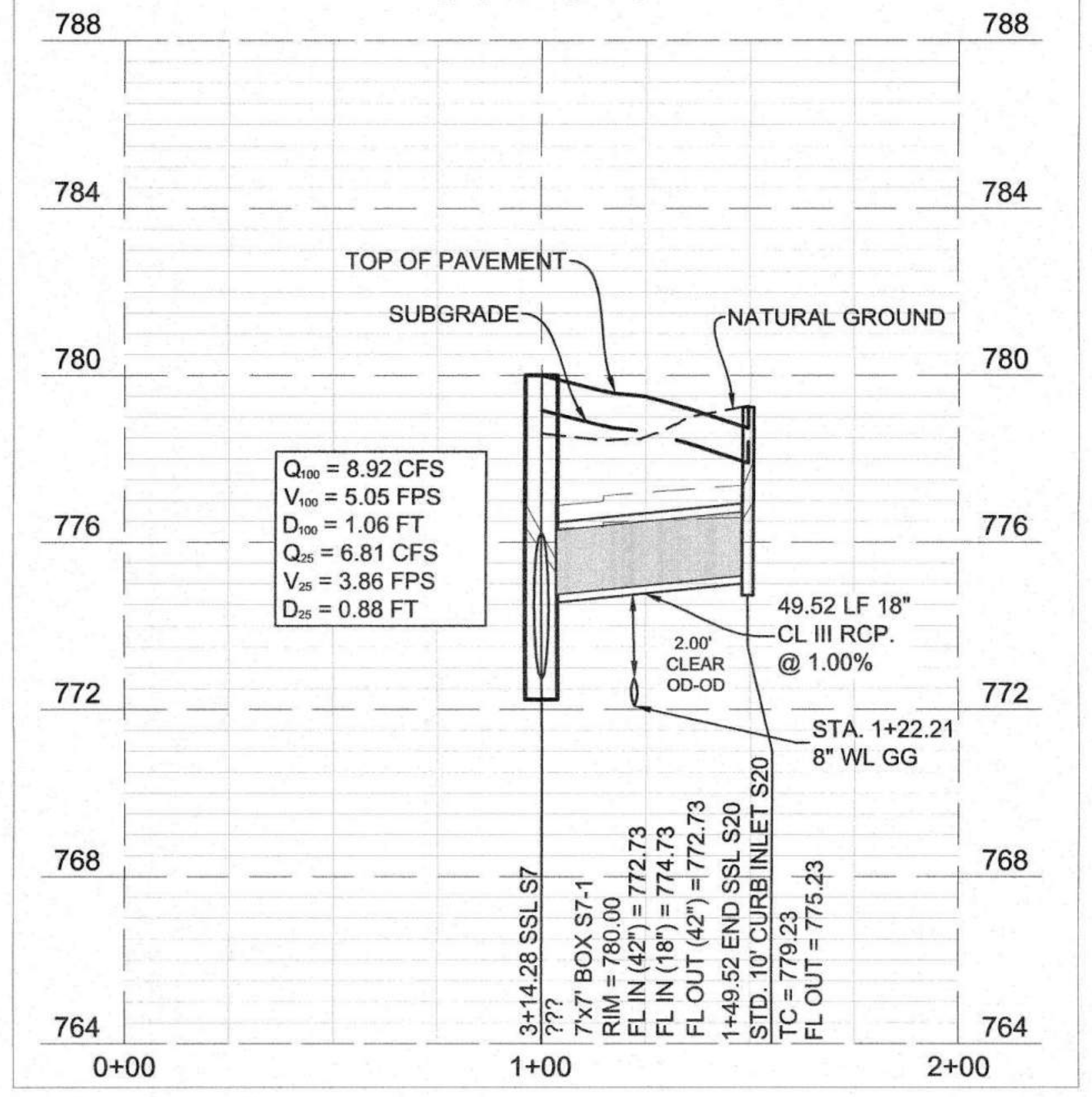

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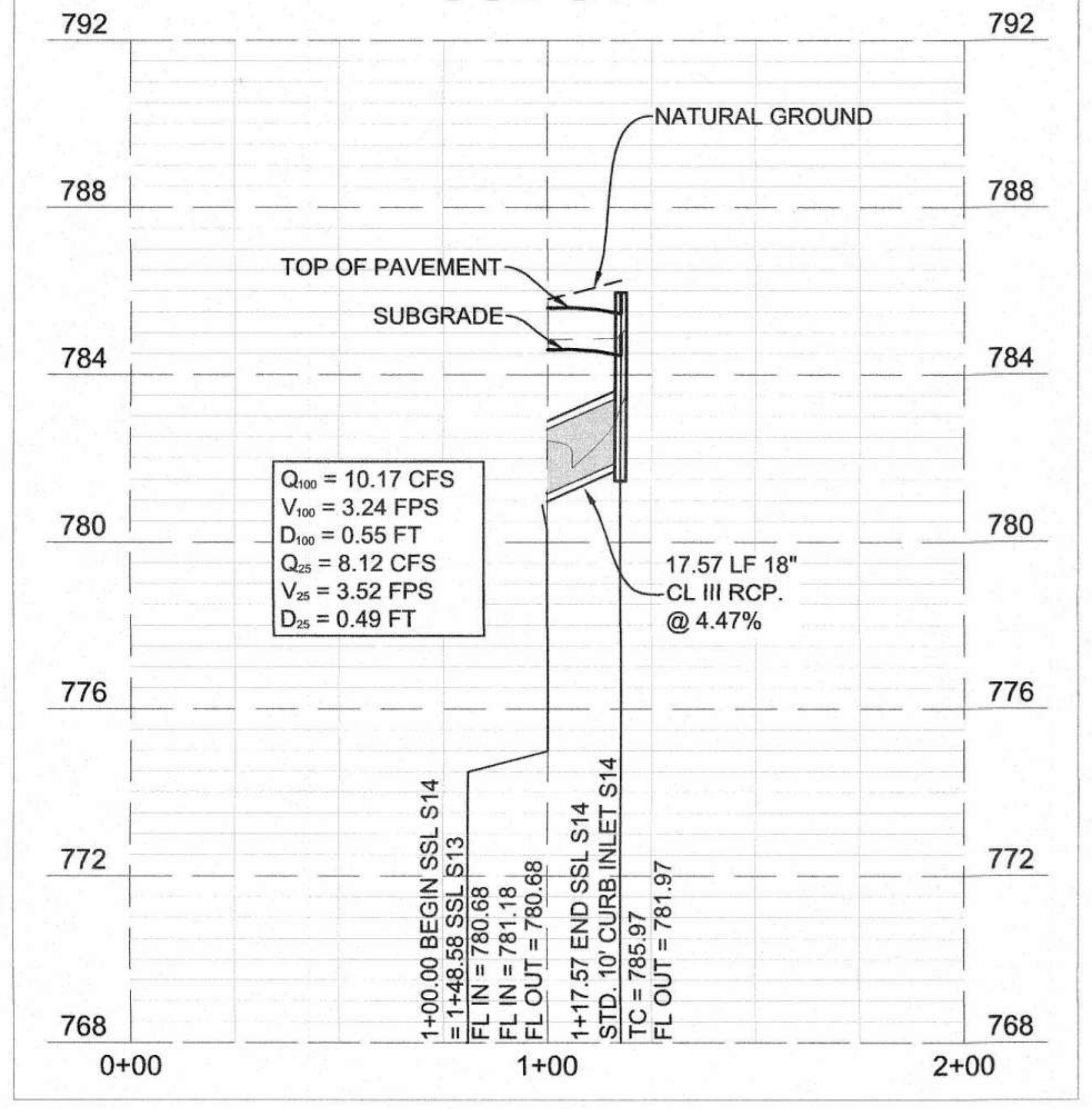

LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—W—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—W—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—○	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. REFER TO DETAILS 508-3 AND/OR 508-4 FOR INLET CONSTRUCTION.
2. REFER TO DETAILS 506S-5, 506S-7, 506S-8, 506S-9 AND/OR 506S-10 FOR MANHOLE CONSTRUCTION. CONTRACTOR MAY SUBSTITUTE JUNCTION BOXES FOR RING MANHOLES WITH APPROVAL OF THE ENGINEER.
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Know what's **below.**
Call before you dig.

WOODFIELD PRESERVE
PHASE 3
STORM SEWER LINE LATERAL PROFILES
S17, S18, S19, S20, & S14

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
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DRAWING NAME: A245-1002_PH3_SS18.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

SS18

SHEET NO.
82
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2023-XX-CON

Date\Time : Fri, 01 Dec 2023 - 2:22pm User Name : jmidura
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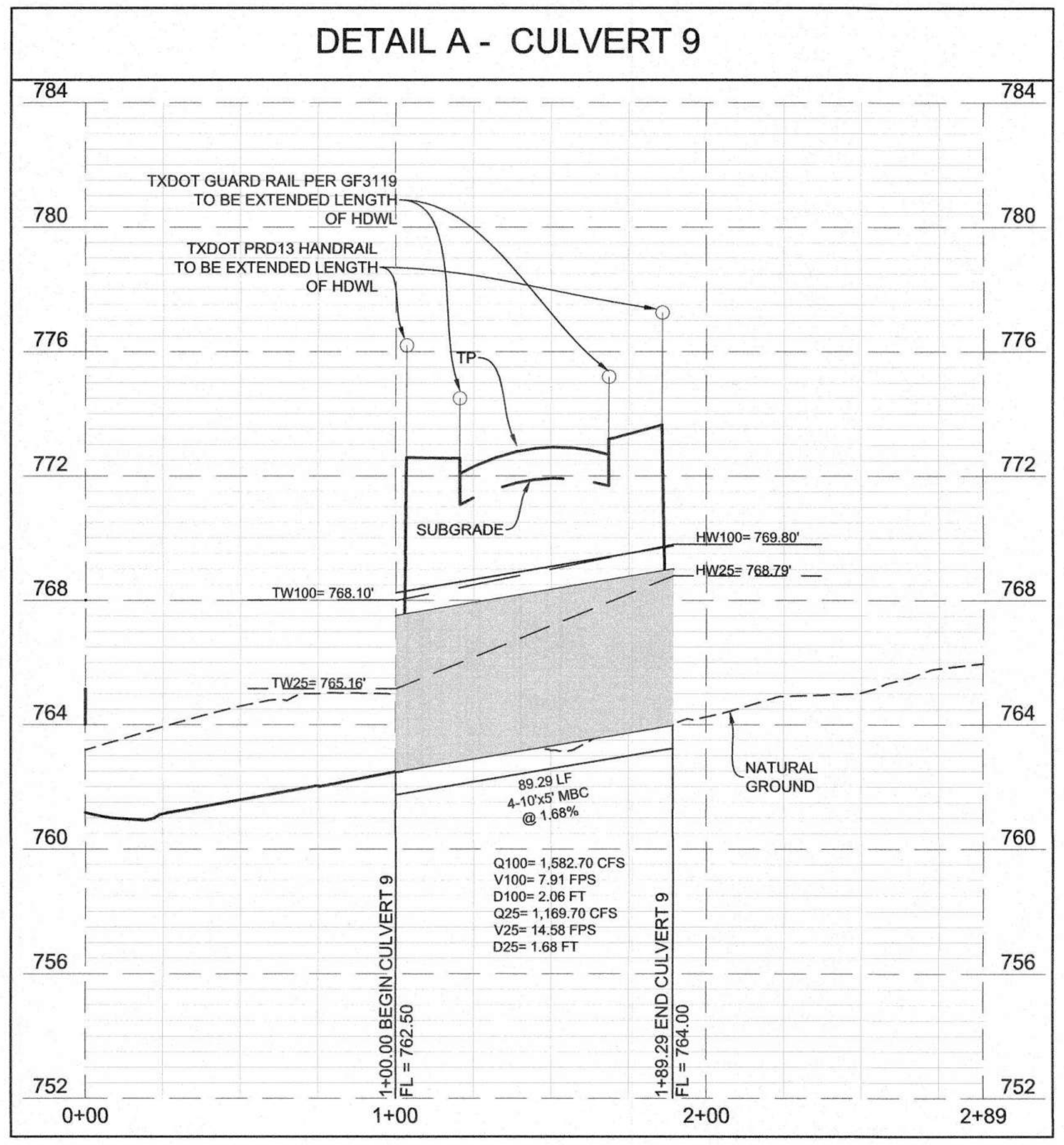
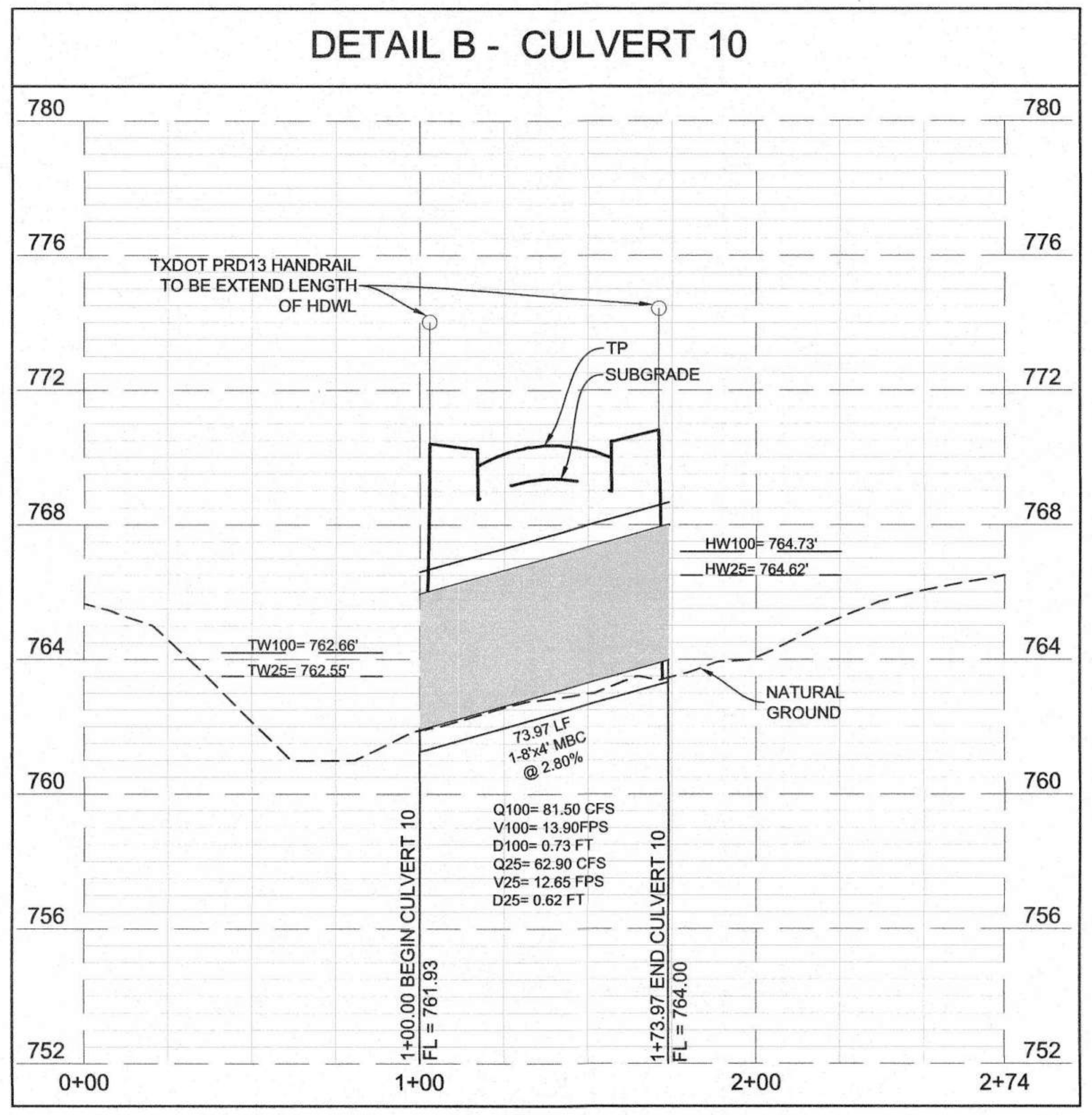
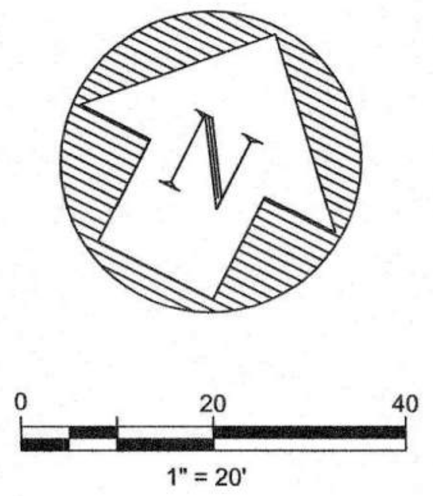
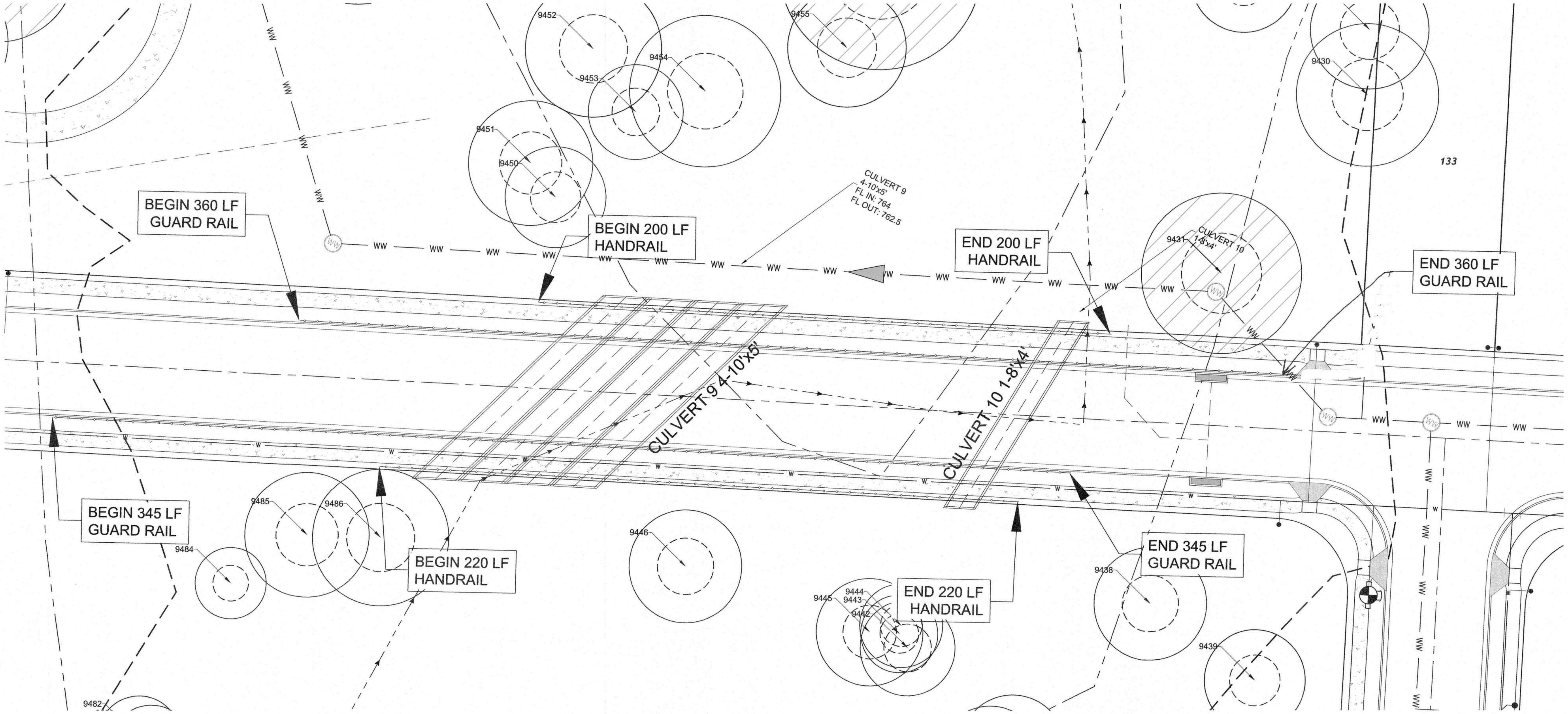


DETAIL A - CULVERT 9



DETAIL B - CULVERT 10





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WOODFIELD PRESERVE
PHASE 3

PRIVATE STORM SEWER LAYOUT

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_SS20.dwg

JUSTIN D. MIDURA
128809
11-30-2023

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Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
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SS19

SHEET NO.
83
OF 118 SHEETS

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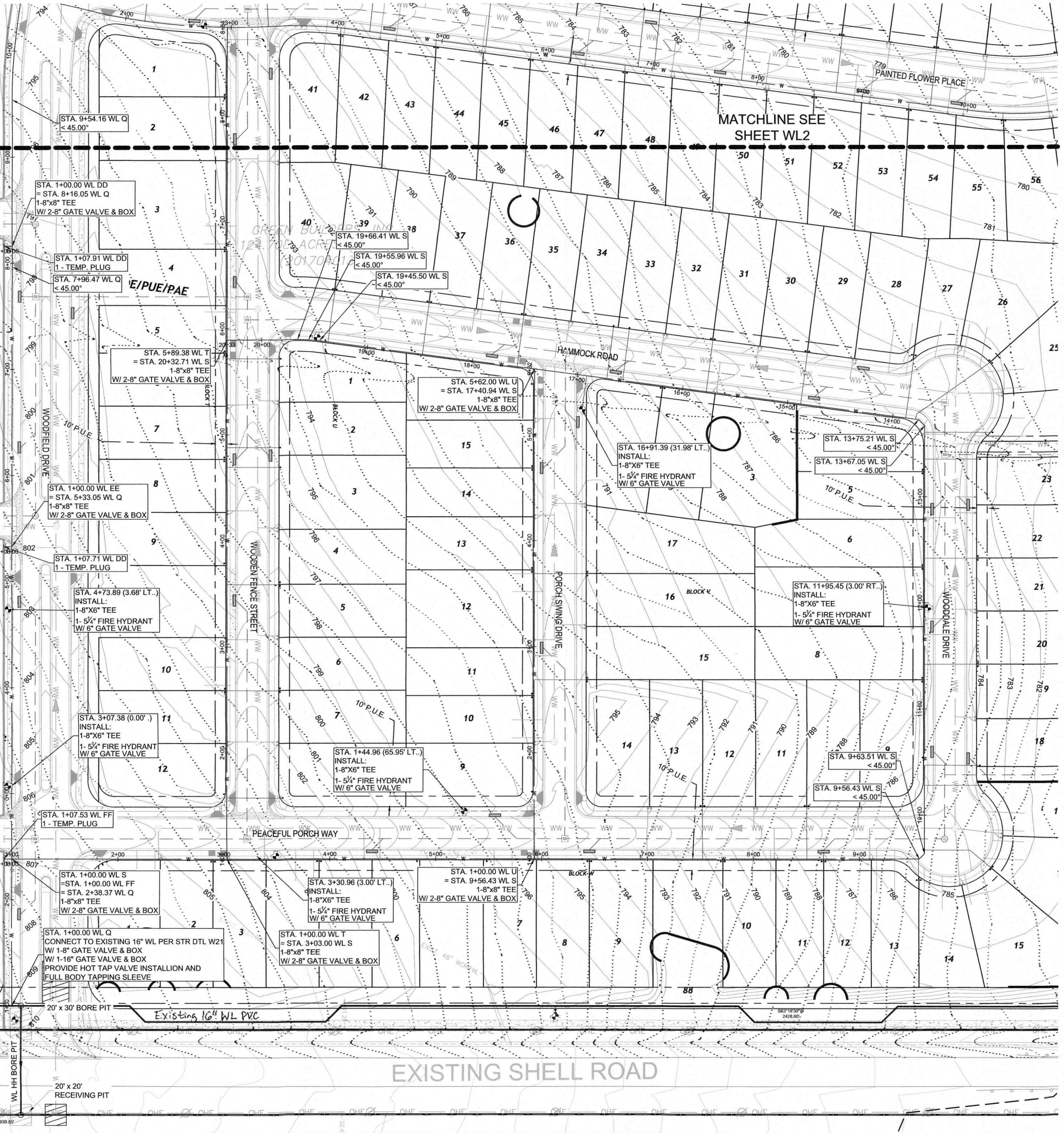
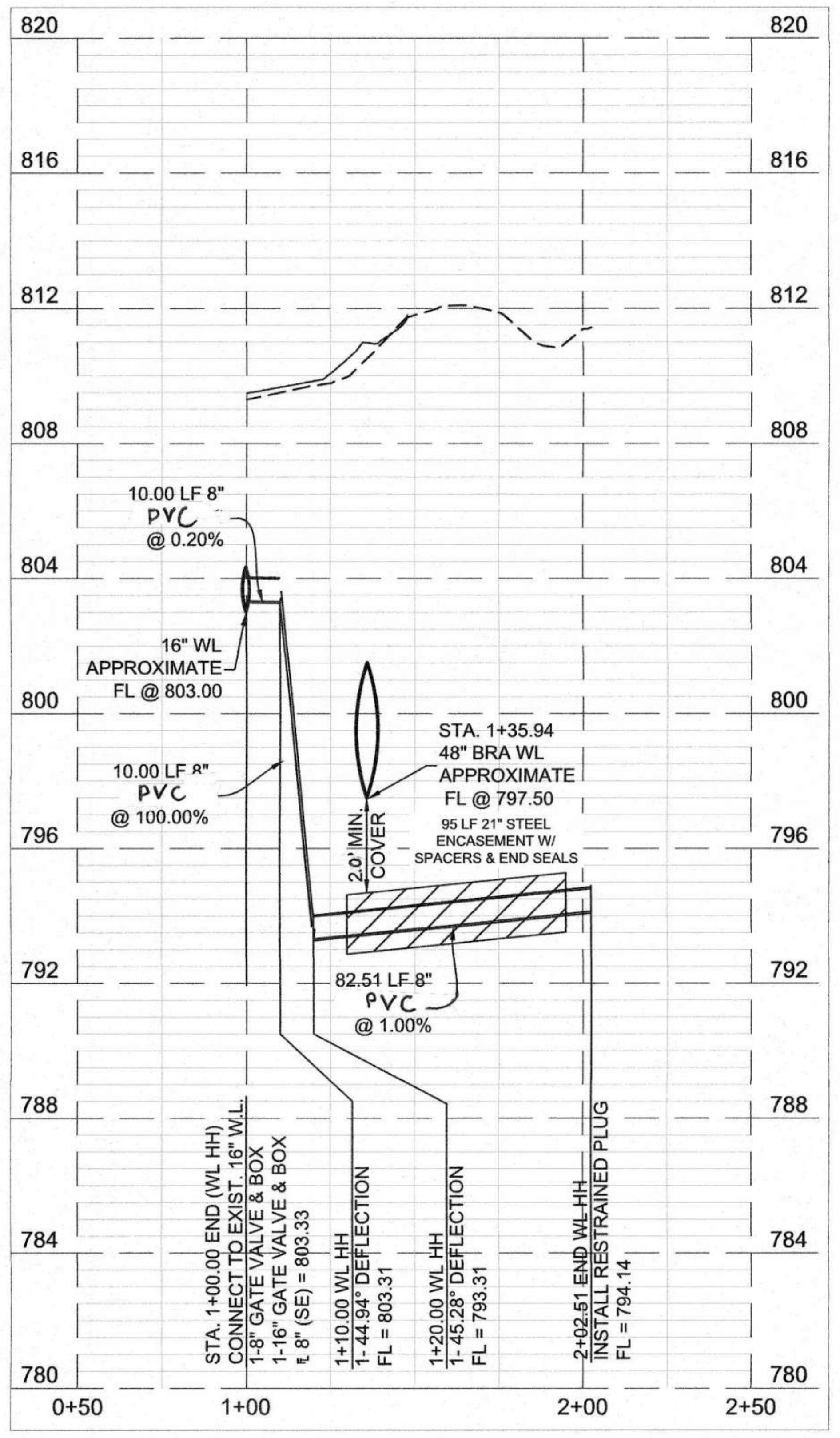
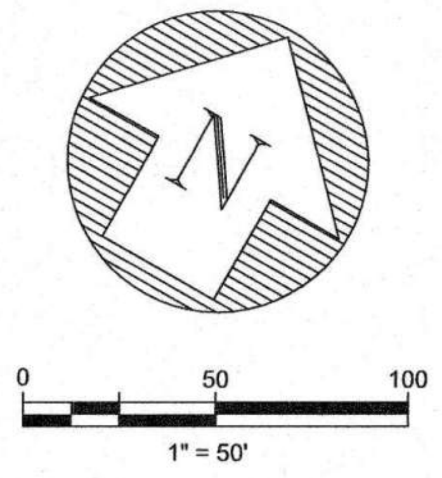


WL HH BORE



BORE NOTES:

1. EXISTING 48" BRA WL LOCATION AND ELEVATIONS BASED ON RECORD DRAWINGS. CONTRACTOR TO POTHOLE BRA WL TO FIELD VERIFY LOCATION OF PIPELINE.
2. EXISTING 48" BRA WL IS THE ONLY KNOWN EXISTING UTILITY CROSSING AT THIS TIME. CONTRACTOR SHALL DETERMINE ALL EXISTING UTILITY CROSSINGS PRIOR TO BEGINNING WORK.
3. PROFILES ARE BASED ON GIS TOPOGRAPHY.
4. LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.
5. BORE TO EXTEND MINIMUM 4 FEET HORIZONTALLY PAST OUTSIDE DIAMETER OF EXISTING 48" WL
6. Give Brazos River Authority 48-hr notice before doing any construction activity near the existing 48-inch BRA WL, including potholing and boring. Contact info: Colton Adkins, Phone: (254) 307-9836 Email: colton.adkins@Brazos.org.



LEGEND:

⊕	PROPOSED FIRE HYDRANT ASSEMBLY
⊕	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
—○—	PROPOSED STORM SEWER LINE AND MANHOLE
—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
—●—	EXISTING STORM SEWER LINE
—	DOUBLE SANITARY SERVICE LEAD
—	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. ALL WATER LINE PIPE FITTINGS SHALL HAVE RESTRAINED JOINTS.
2. ALL FITTINGS SHALL HAVE THRUST BLOCKING.
3. ALL WATER LINES TO BE AWWA C900, DR18 PVC CL-235 PSI, 8" WL.
4. ALL FIRE HYDRANT LEADS ARE DUCTILE IRON PER CITY OF GEORGETOWN DETAIL W-10.
5. ALL GATE VALVES TO BE INSTALLED PER COA DETAIL 511-AW-01.
6. ALL WATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL W-04 (SINGLE) AND W-05 (DOUBLE)
7. CONTRACTOR SHALL NOT EXCEED 1° BENDS OR DEFLECTIONS IN WATER LINE PIPE WITHOUT USE OF AN APPROVED FITTING.
8. LA-507.5.7 CITY OF GEORGETOWN FIRE HYDRANT COLOR CODE SYSTEM. PRIVATE FIRE HYDRANT MAINTENANCE SHALL BE IN ACCORDANCE WITH NFPA 291.

A. ALL PRIVATE HYDRANT BARRELS WILL BE PAINTED RED WITH THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD IN PARAGRAPH C OF THIS SECTION TO INDICATE FLOW. IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO TEST AND MAINTAIN THEIR PRIVATE FIRE HYDRANT(S).

B. ALL PRIVATE FIRE HYDRANTS SHOULD BE INSPECTED, MAINTAINED, AND FLOW TESTED ANNUALLY, AND COLOR CODED TO INDICATE THE EXPECTED FIRE FLOW FROM THE HYDRANT DURING NORMAL OPERATION. SUCH COLOR APPLIED TO THE FIRE HYDRANT BY PAINTING THE BONNET THE APPROPRIATE COLOR FOR THE EXPECTED FLOW CONDITION.

C. HYDRANT FLOW CODING STANDARDS. PUBLIC HYDRANTS BARRELS WILL BE PAINTED SILVER, THE HYDRANTS WILL BE FLOW TESTED, AND THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD IN AS FOLLOWS: AT 20 PSI RESIDUAL.

FLOW	COLOR
GREATER THAN 1500 GPM	BLUE
1000- 1500 GPM	GREEN
500-999 GPM	ORANGE
LESS THAN 500 GPM	RED
NOT WORKING	BLACK OR BAGGED

D. AT THE CONCLUSION OF CONSTRUCTION FIRE HYDRANTS SHALL BE FLOW TESTED AND COLOR CODED IN ACCORDANCE WITH CITY'S STANDARDS, AND RESULTS SHALL BE EMAILED TO THE FIRE DEPARTMENT. IFC- LA-507.5.7 FIRE HYDRANT SYSTEMS.

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

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

WATER LINE 'X' PLAN AND PROFILE
STA. 1+00.00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 WL1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WL1

SHEET NO.
84
OF 118 SHEETS

User Name : jpiecuch
Date\Time : Fri, 01 Dec 2023 - 4:36pm
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3 WL1.dwg

N

0 50 100

1" = 50'

LEGEND:

✜	PROPOSED FIRE HYDRANT ASSEMBLY
✜	EXISTING FIRE HYDRANT
⊖	PROPOSED GATE VALVE
⊖	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—∠	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. ALL WATER LINE PIPE FITTINGS SHALL HAVE RESTRAINED JOINTS.
2. ALL FITTINGS SHALL HAVE THRUST BLOCKING.
3. ALL WATER LINES TO BE AWWA C900, DR18 PVC CL-235 PSI, 8" WL.
4. ALL FIRE HYDRANT LEADS ARE DUCTILE IRON PER CITY OF GEORGETOWN DETAIL W-10.
5. ALL GATE VALVES TO BE INSTALLED PER COA DETAIL 511-AW-01.
6. ALL WATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL W-04 (SINGLE) AND W-05 (DOUBLE)
7. CONTRACTOR SHALL NOT EXCEED 1° BENDS OR DEFLECTIONS IN WATER LINE PIPE WITHOUT USE OF AN APPROVED FITTING.
8. LA-507.5.7 CITY OF GEORGETOWN FIRE HYDRANT COLOR CODE SYSTEM. PRIVATE FIRE HYDRANT MAINTENANCE SHALL BE IN ACCORDANCE WITH NFPA 291.

A. ALL PRIVATE HYDRANT BARRELS WILL BE PAINTED RED WITH THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD IN PARAGRAPH C OF THIS SECTION TO INDICATE FLOW. IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO TEST AND MAINTAIN THEIR PRIVATE FIRE HYDRANT(S).

B. ALL PRIVATE FIRE HYDRANTS SHOULD BE INSPECTED, MAINTAINED, AND FLOW TESTED ANNUALLY, AND COLOR CODED TO INDICATE THE EXPECTED FIRE FLOW FROM THE HYDRANT DURING NORMAL OPERATION. SUCH COLOR APPLIED TO THE FIRE HYDRANT BY PAINTING THE BONNET THE APPROPRIATE COLOR FOR THE EXPECTED FLOW CONDITION.

C. HYDRANT FLOW CODING STANDARDS. PUBLIC HYDRANTS BARRELS WILL BE PAINTED SILVER, THE HYDRANTS WILL BE FLOW TESTED, AND THE BONNET PAINTED USING THE HYDRANT FLOW STANDARD IN AS FOLLOWS: AT 20 PSI RESIDUAL.

FLOW	COLOR
GREATER THAN 1500 GPM	BLUE
1000- 1500 GPM	GREEN
500-999 GPM	ORANGE
LESS THAN 500 GPM	RED
NOT WORKING	BLACK OR BAGGED

D. AT THE CONCLUSION OF CONSTRUCTION FIRE HYDRANTS SHALL BE FLOW TESTED AND COLOR CODED IN ACCORDANCE WITH CITY'S STANDARDS, AND RESULTS SHALL BE EMAILED TO THE FIRE DEPARTMENT. IFC- LA-507.5.7 FIRE HYDRANT SYSTEMS.

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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

WATER LINE 'X' PLAN AND PROFILE
STA. 1+00.00 TO END

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 WL2.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WL2

SHEET NO.
85
OF 118 SHEETS

Date/Time : Fri, 01 Dec 2023 - 4:29pm User Name : jlelouch
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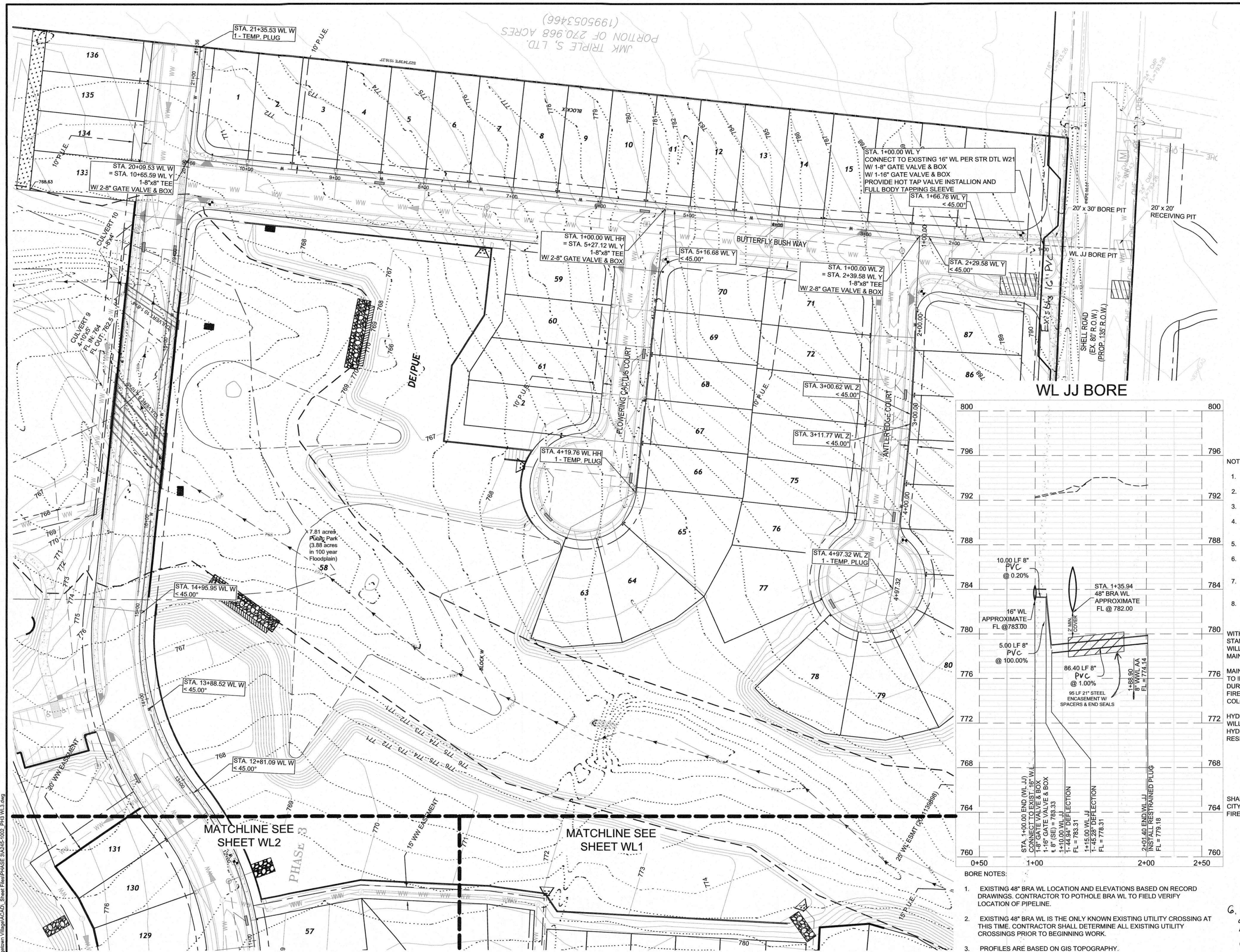
2023-XX-CON



0 50 100

1" = 50'

LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
───	PROPOSED WATER LINE
─ ─ ○ ─ ─	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
─ WL ─ WL ─	EXISTING WATER LINE
─ WW ● WW ─	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
─/	DOUBLE SANITARY SERVICE LEAD
─/	SINGLE SANITARY SERVICE LEAD
─□	DOUBLE WATER SERVICE LEAD
─○	SINGLE WATER SERVICE LEAD
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LESS THAN 500 GPM	RED
NOT WORKING	BLACK OR BAGGED

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811

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

BORE NOTES:

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WOODFIELD PRESERVE
PHASE 3

WATER LINE 'X' PLAN AND PROFILE
STA. 1+00.00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 12/1/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3 WL3.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WL3

SHEET NO.
86
OF 118 SHEETS

2023-XX-CON

Date/Time : Fri, 01 Dec 2023 - 4:37pm
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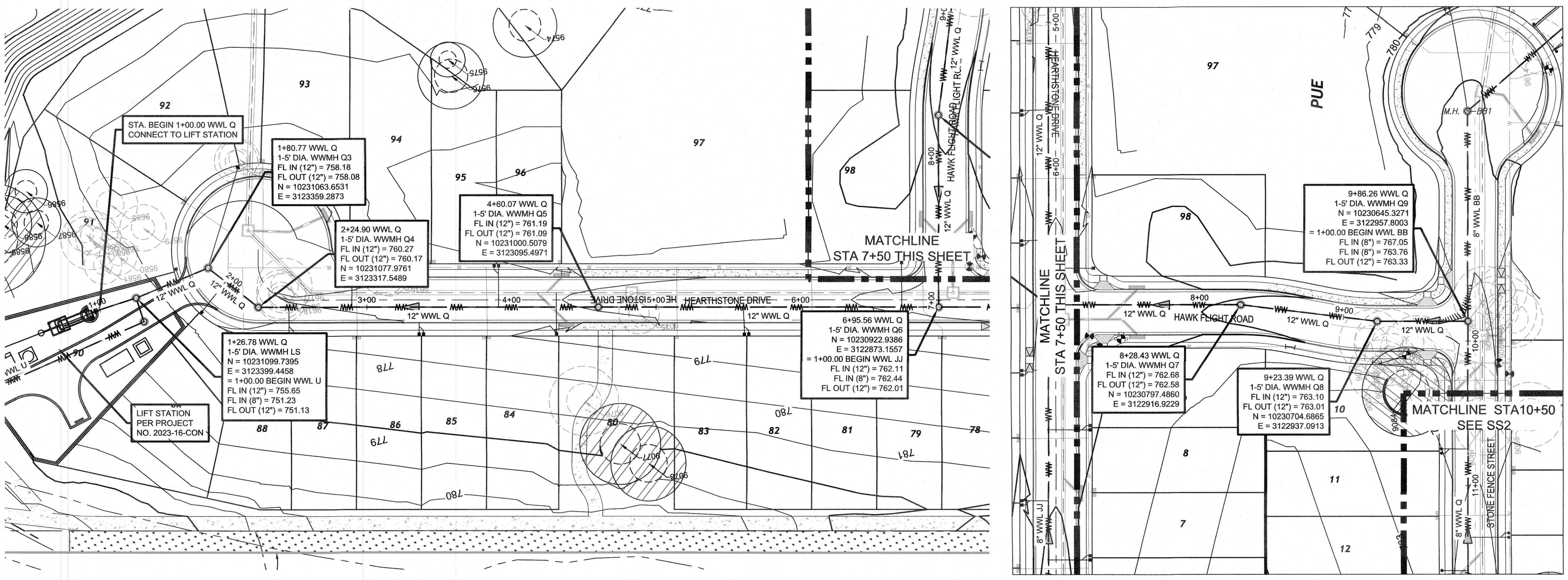
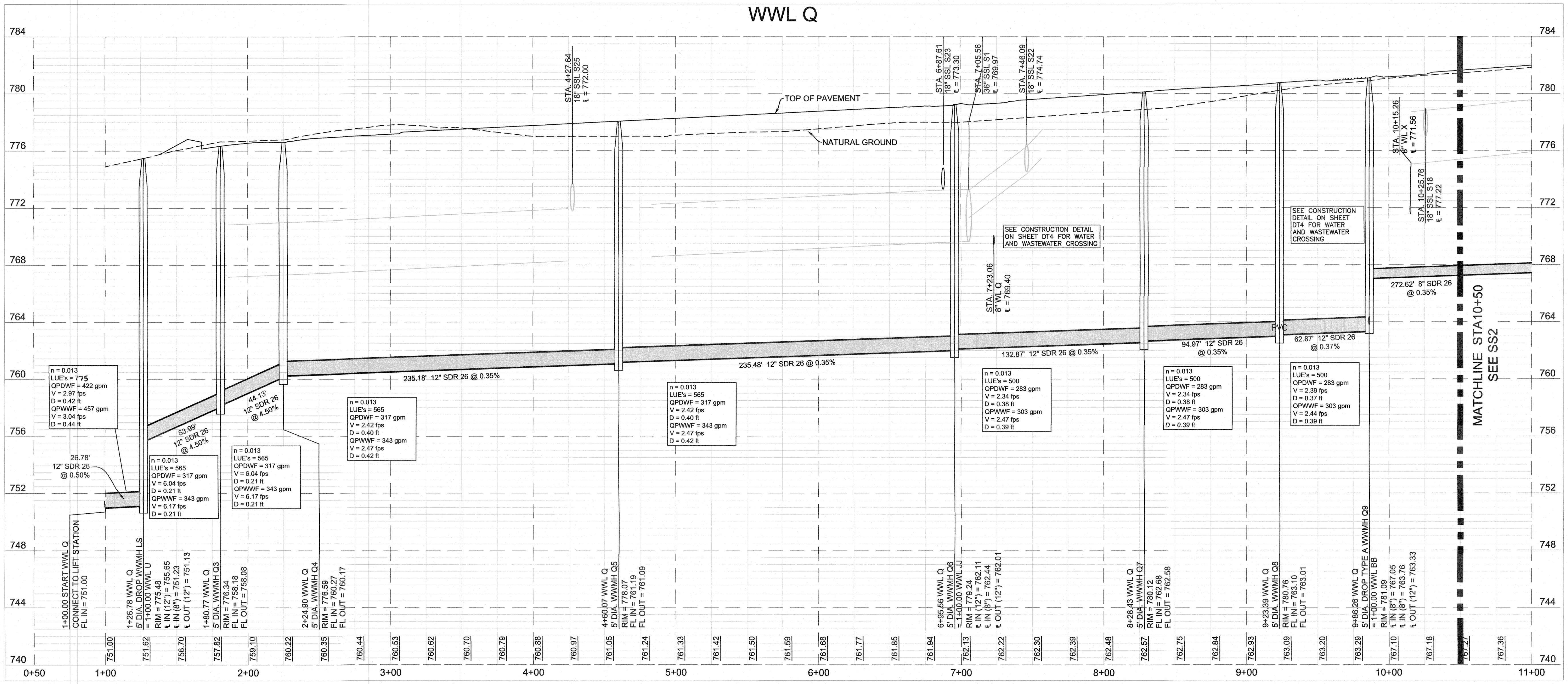
User Name : jdecouch





0 40 80
1" = 40'

LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE Q PLAN AND PROFILE
STA. 1+00 TO 10+50

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW1.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

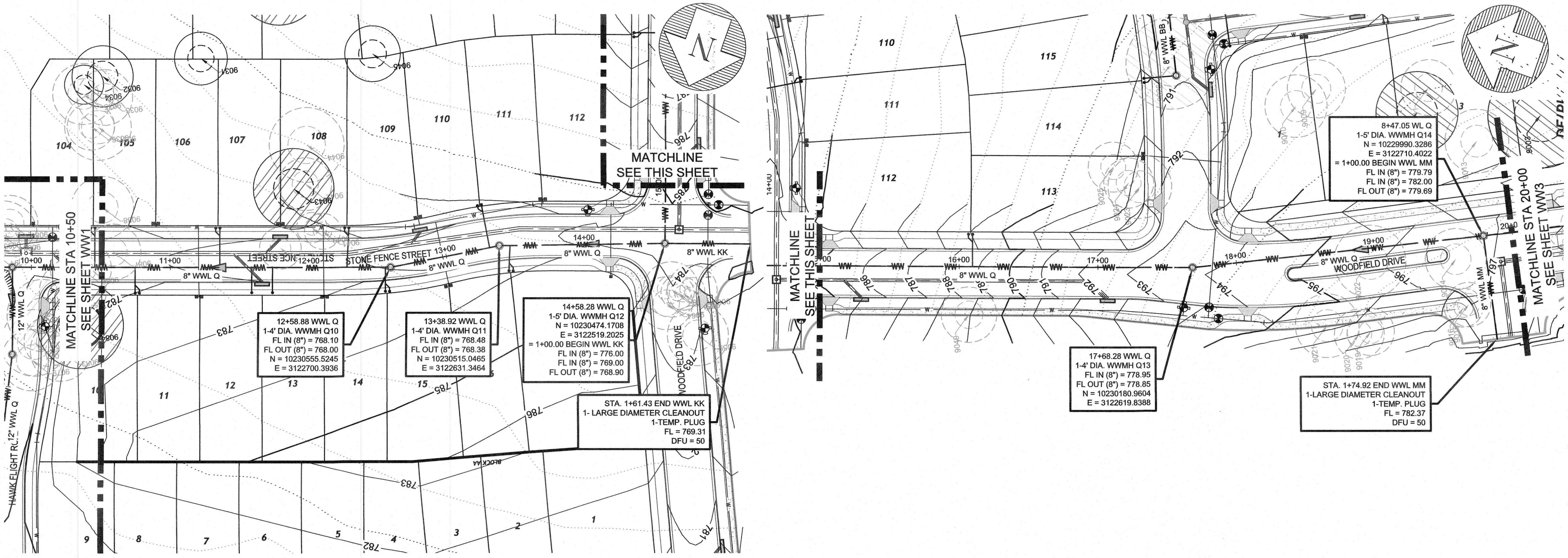
JOB NUMBER:
A245-1002

WW1

SHEET NO.
87
OF 118 SHEETS

Date/Time : Tue, 13 Feb 2024 - 5:11pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW1.dwg

2023-33-CON

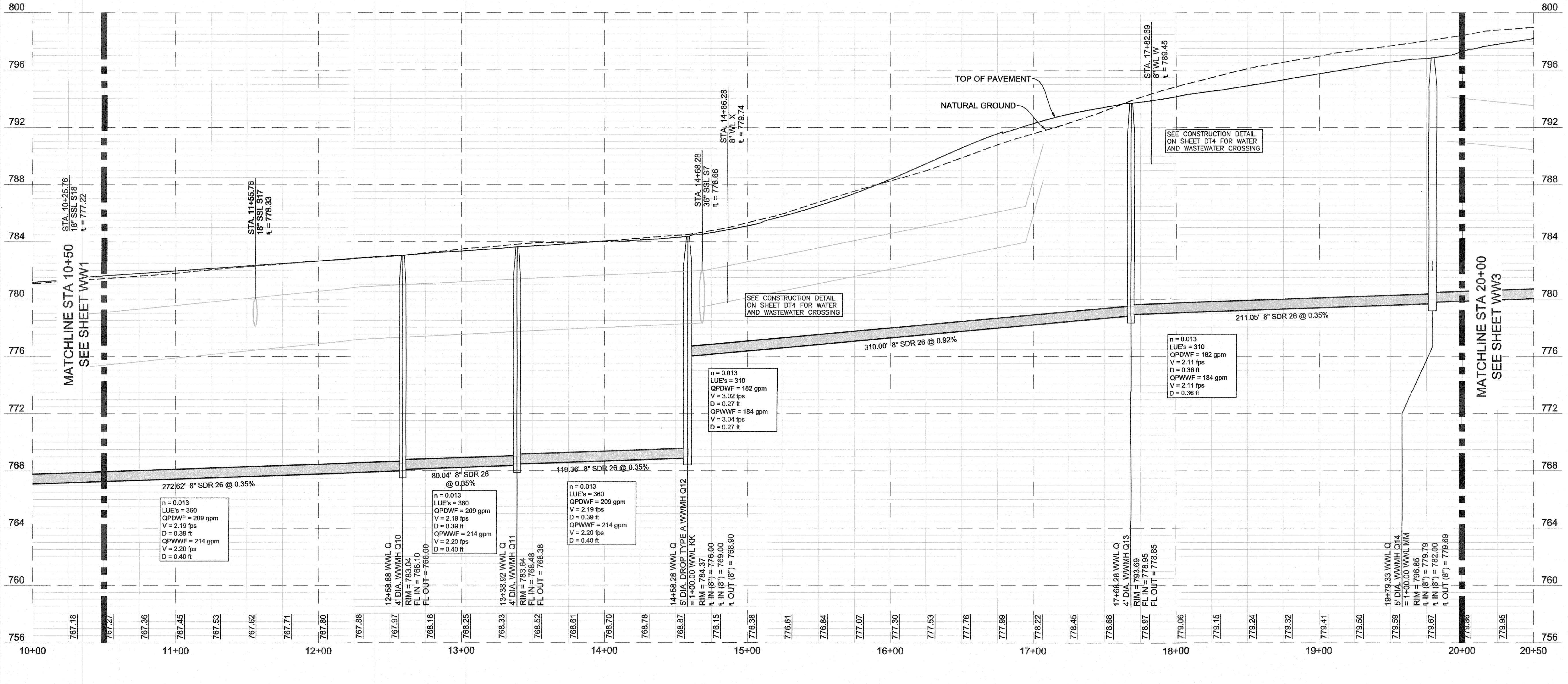


0 40 80
1" = 40'

LEGEND:

PROPOSED FIRE HYDRANT ASSEMBLY
EXISTING FIRE HYDRANT
PROPOSED GATE VALVE
EXISTING GATE VALVE
PROPOSED AIR RELEASE VALVE
EXISTING AIR RELEASE VALVE
PROPOSED PLUG OR CAP
EXISTING PLUG OR CAP
PROPOSED CLEAN OUT
EXISTING CLEAN OUT
PROPOSED WATER LINE
PROPOSED WASTEWATER LINE AND MANHOLE
PROPOSED STORM SEWER LINE AND MANHOLE
EXISTING WATER LINE
EXISTING WASTEWATER LINE AND MANHOLE
EXISTING STORM SEWER LINE
DOUBLE SANITARY SERVICE LEAD
SINGLE SANITARY SERVICE LEAD
DOUBLE WATER SERVICE LEAD
SINGLE WATER SERVICE LEAD
SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL Q



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Know what's below.
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WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE Q PLAN AND PROFILE
STA. 10+50 TO 20+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW2.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

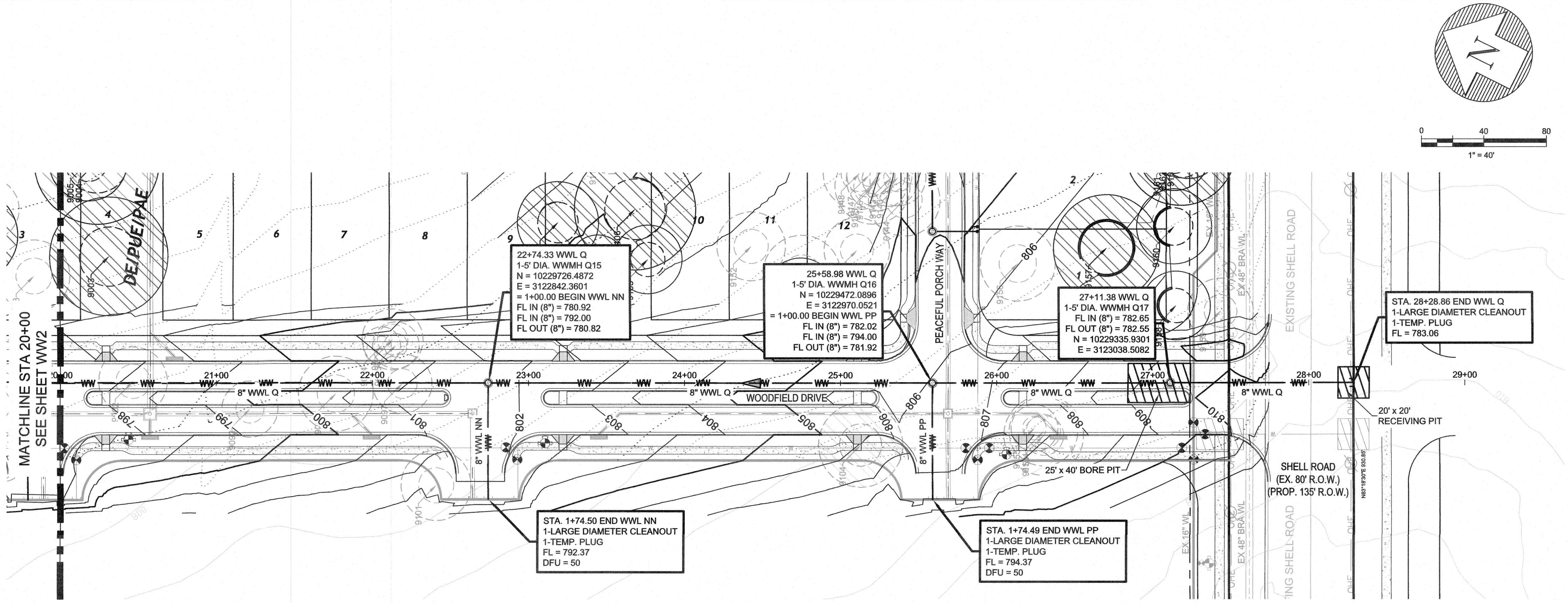
JOB NUMBER:
A245-1002

WW2

SHEET NO.
89
OF 118 SHEETS

Date/Time : Tue, 27 Feb 2024 - 1:46pm
User Name : hhurt
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW2.dwg

2023-33-CON



LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

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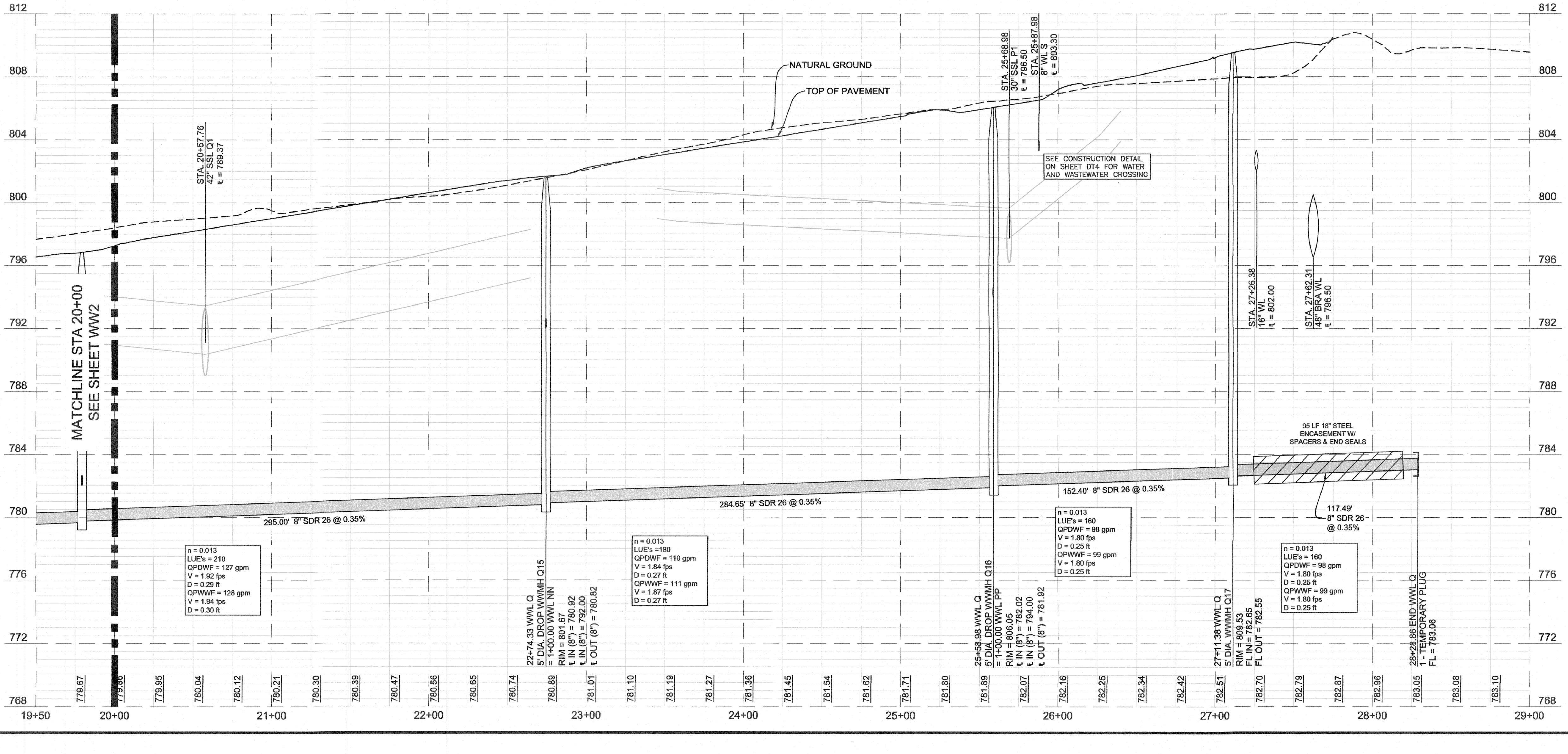
BORE NOTES:

1. EXISTING 48" BRA WL LOCATION AND ELEVATIONS BASED ON RECORD DRAWINGS. CONTRACTOR TO POTHOLE BRA WL TO FIELD VERIFY LOCATION OF PIPELINE.
2. EXIST 16" & 48" WL ARE THE ONLY KNOWN EXISTING UTILITY CROSSINGS AT THIS TIME. CONTRACTOR SHALL DETERMINE ALL EXISTING UTILITY CROSSINGS PRIOR TO BEGINNING WORK
3. PROFILES ARE BASED ON GIS TOPOGRAPHY
4. LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.
5. BORE TO BE EXTENDED MINIMUM 4 FEET HORIZONTALLY PAST OUTSIDE DIAMETER OF EXISTING 48" BRA WL
6. GIVE BRAZOS RIVER AUTHORITY 48-HR NOTICE BEFORE DOING ANY CONSTRUCTION ACTIVITY NEAR THE EXISTING 48" BRA WL, INCLUDING POTHOLING AND BORING.
   CONTACT INFO: COLTON ADKINS
   PHONE: (254)-307-9836
   EMAIL: COLTON.ADKINS@BRAZOS.ORG

WWL Q



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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE Q PLAN AND PROFILE
STA. 20+00 TO END

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW3.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

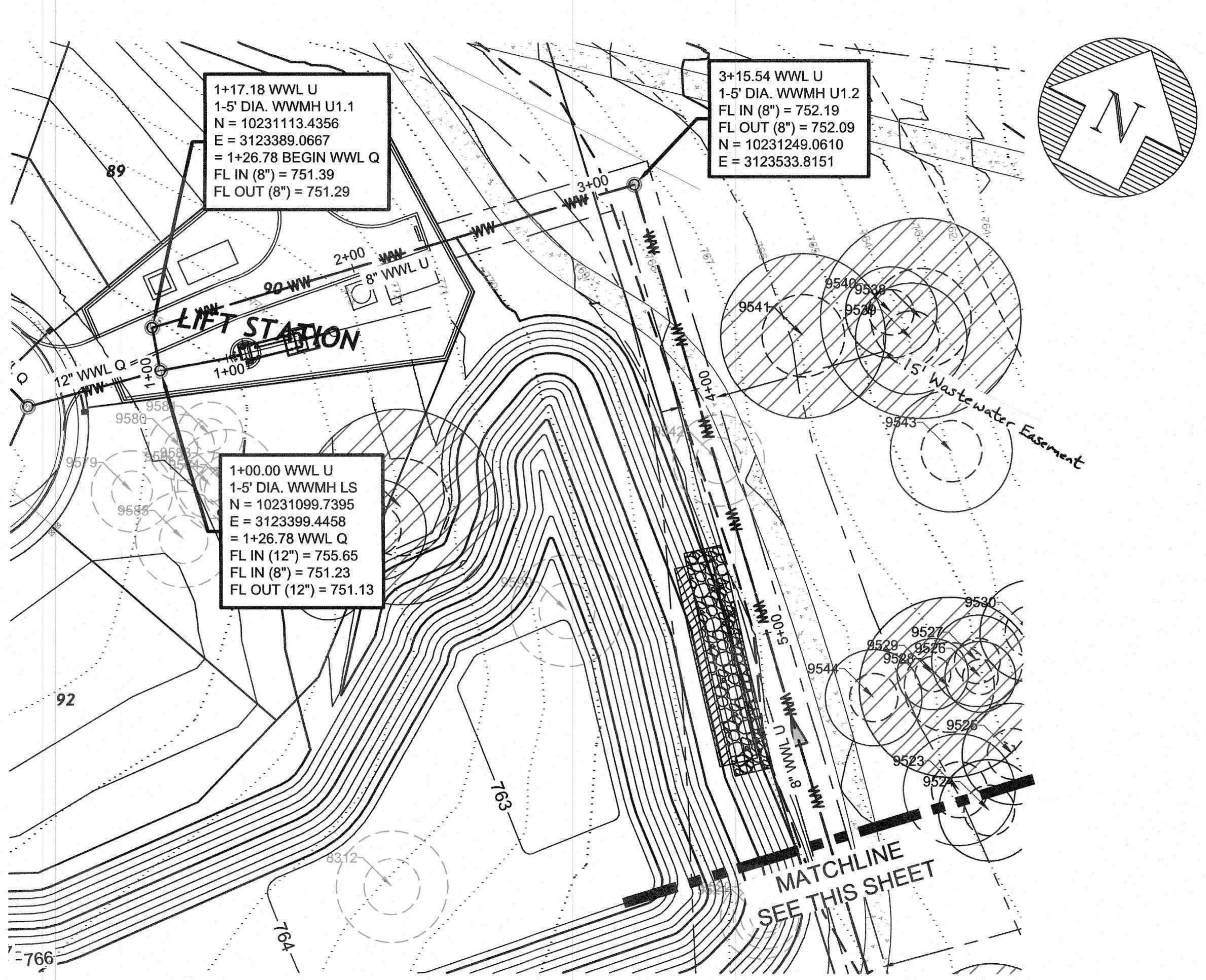
JOB NUMBER:
A245-1002

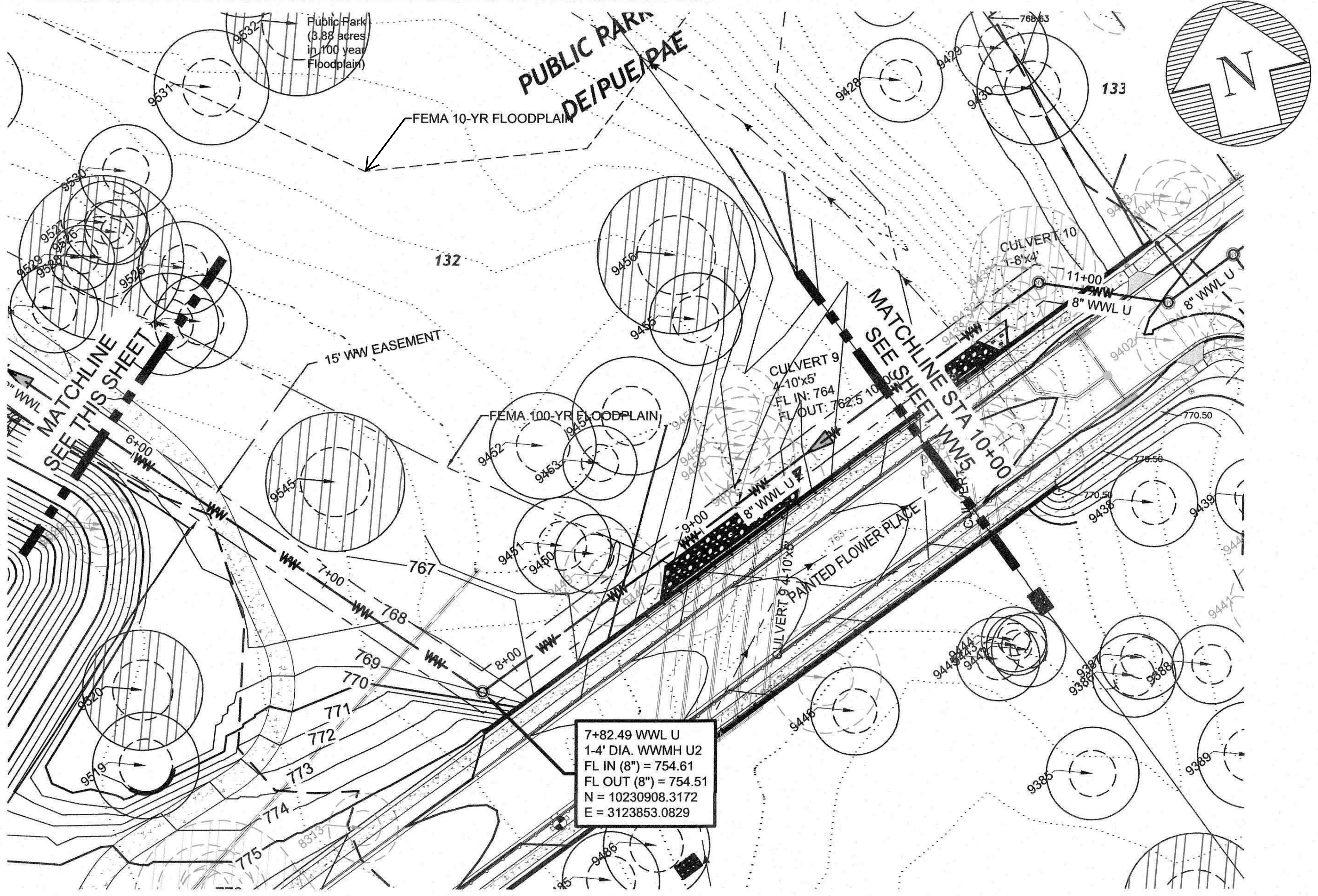
WW3

SHEET NO.
90
OF 118 SHEETS

Date\Time : Tue, 27 Feb 2024 - 11:00am User Name : hhurt
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW3.dwg

2023-33-CON

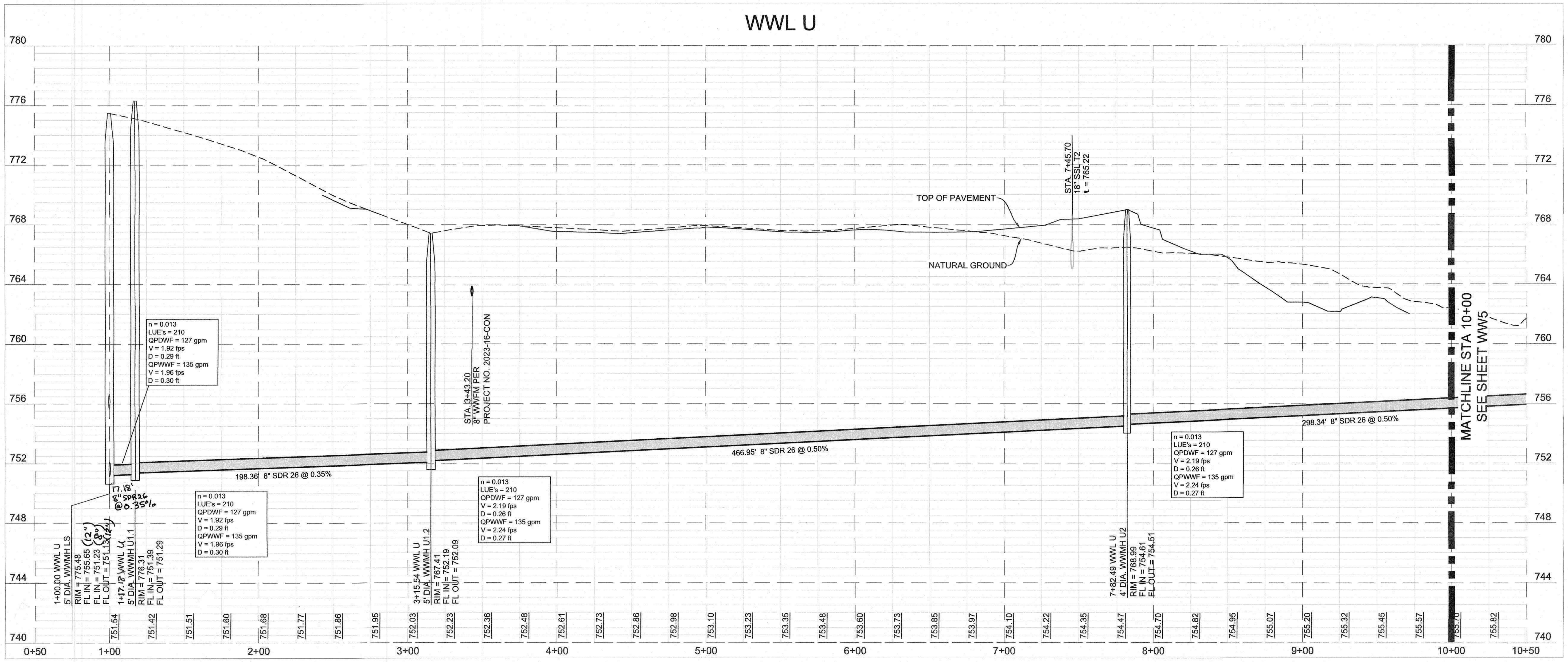




0 40 80
1" = 40'

LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
⊗	PROPOSED GATE VALVE
⊗	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD



NOTES:

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11. BOLTED, WATER-TIGHT MANHOLE COVERS SHALL BE USED FOR WASTEWATER MANHOLES LOCATED IN UNPAVED AREAS
12. AN AIR VENT CONSTRUCTED PER DETAIL WW19 IS REQUIRED IN BOLTED MANHOLES EVERY 1500 LF OR EVERY THIRD MANHOLE

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Call before you dig.

WOODFIELD PRESERVE
PHASE 3
WASTEWATER LINE Q PLAN AND PROFILE
STA. 1+00 TO 10+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW4.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED
PROFESSIONAL ENGINEER
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW4

SHEET NO.
90
OF 118 SHEETS

2023-33-CON

Date\Time : Tue, 13 Feb 2024 - 5:13pm
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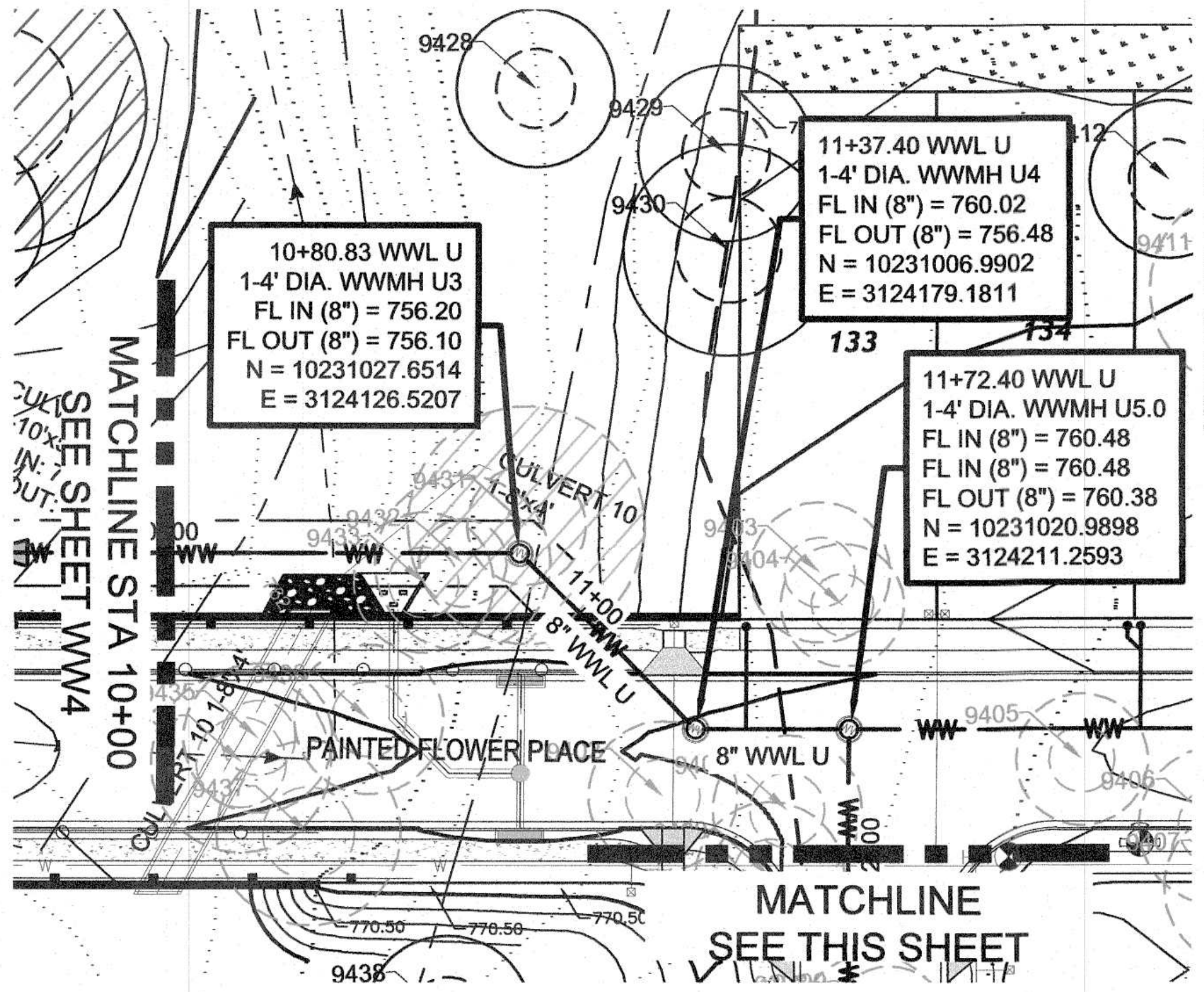
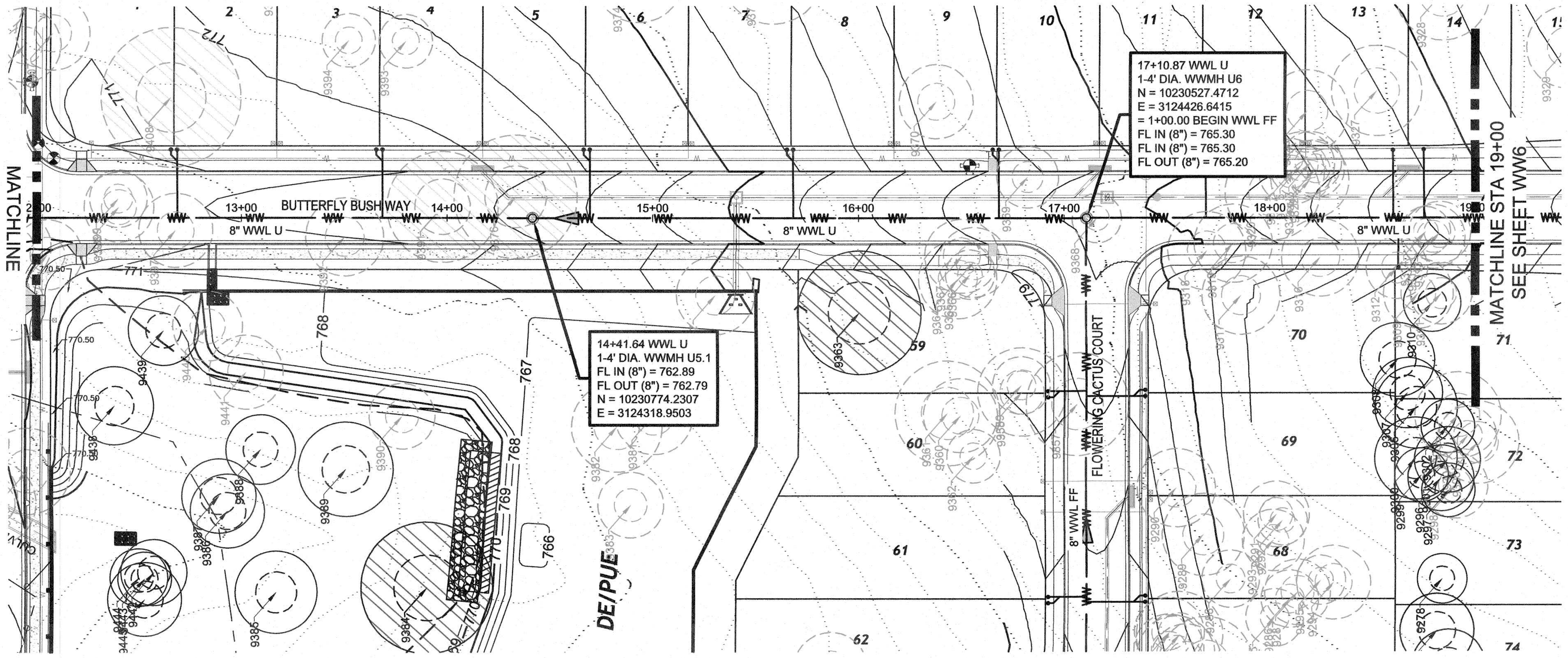
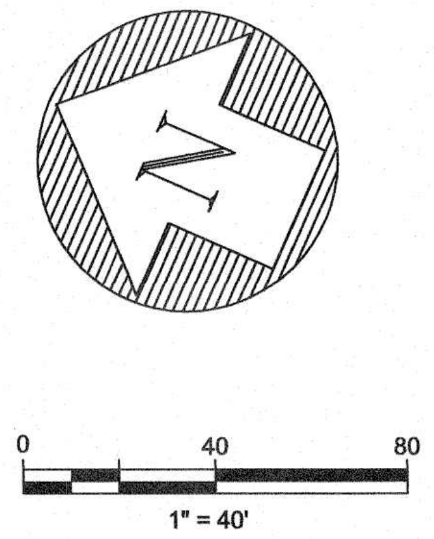
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW4.dwg







LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
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- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
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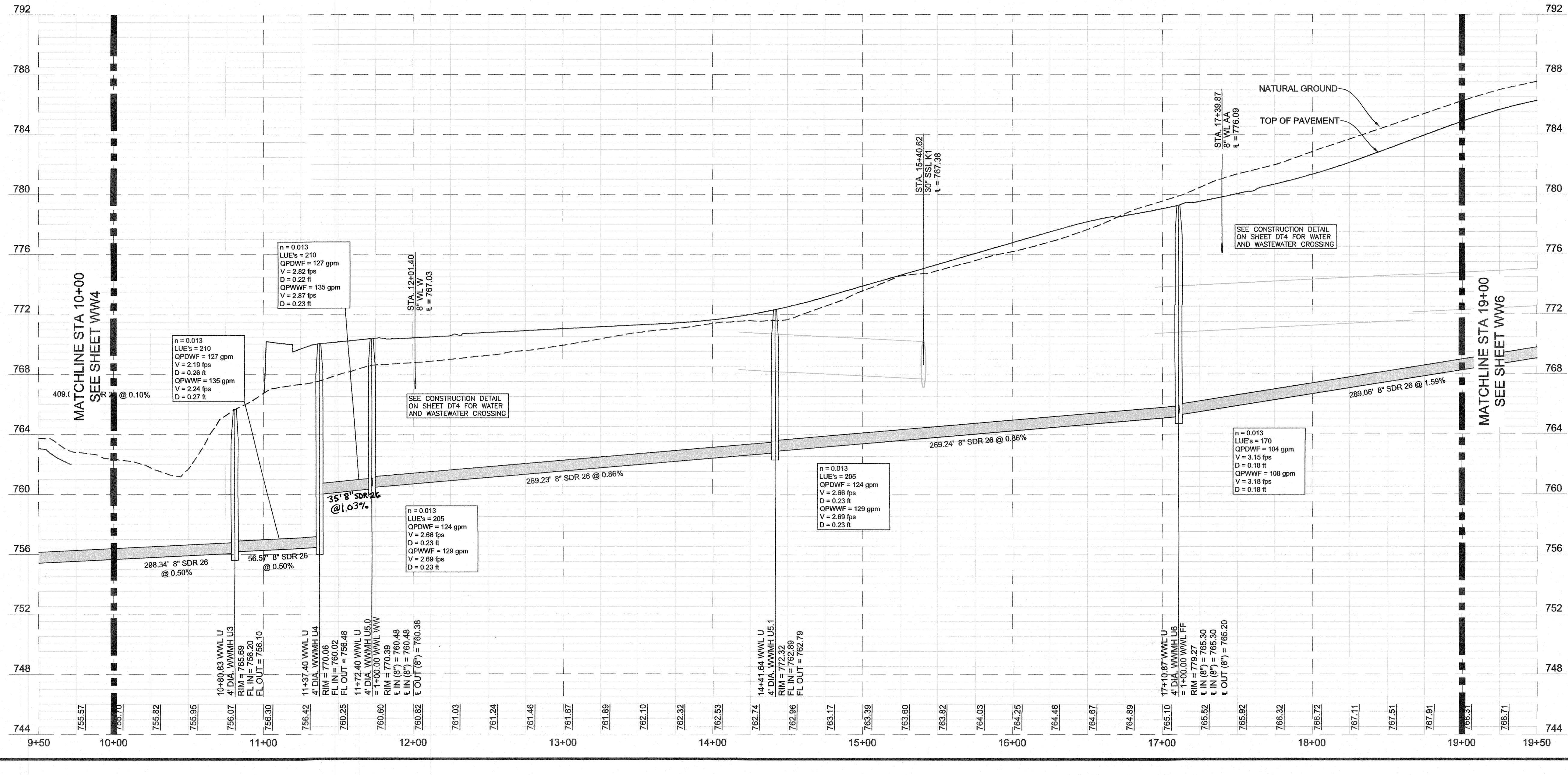
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL U



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WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE U PLAN AND PROFILE
STA. 10+00 TO 19+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW5.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
2-26-2024

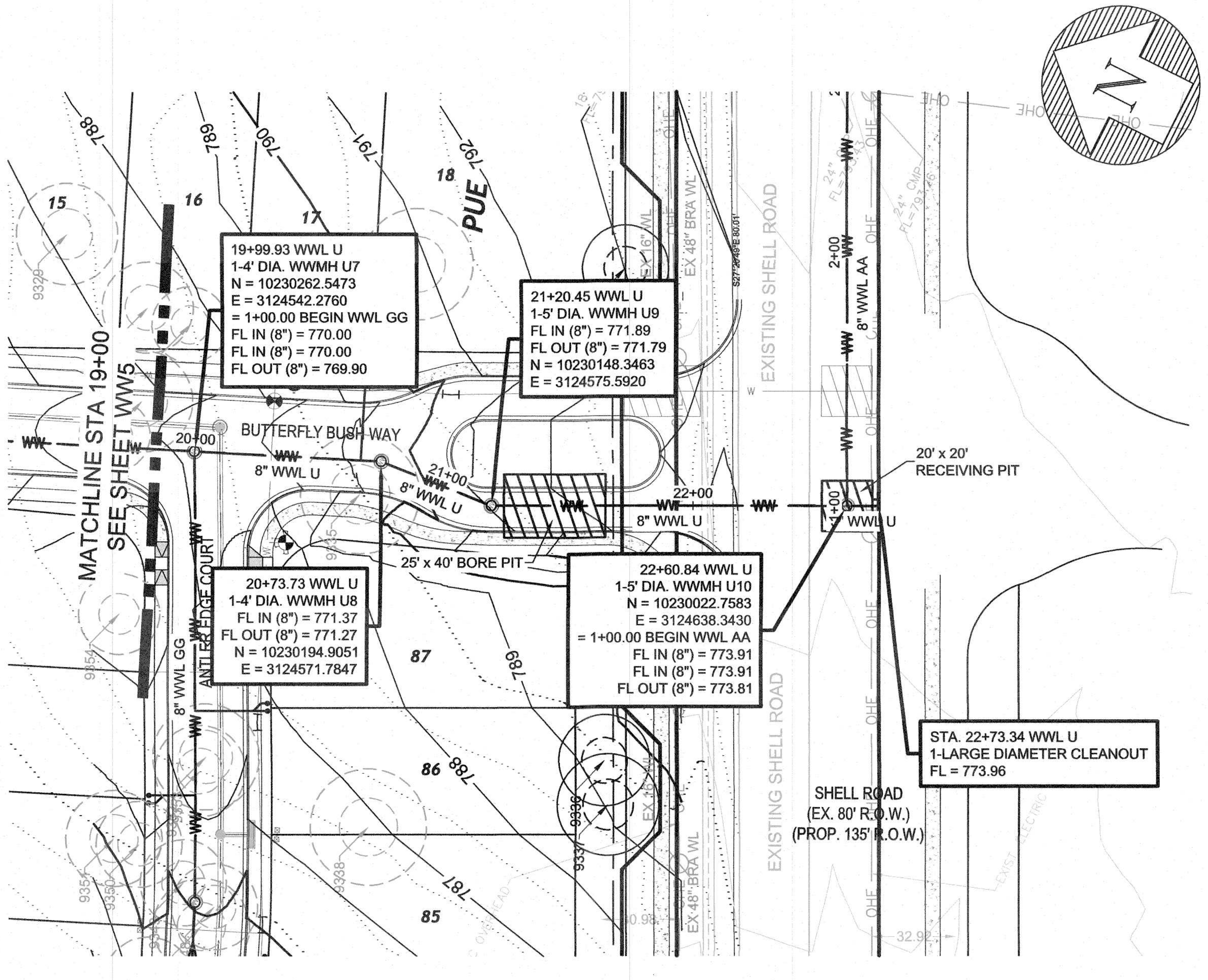
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

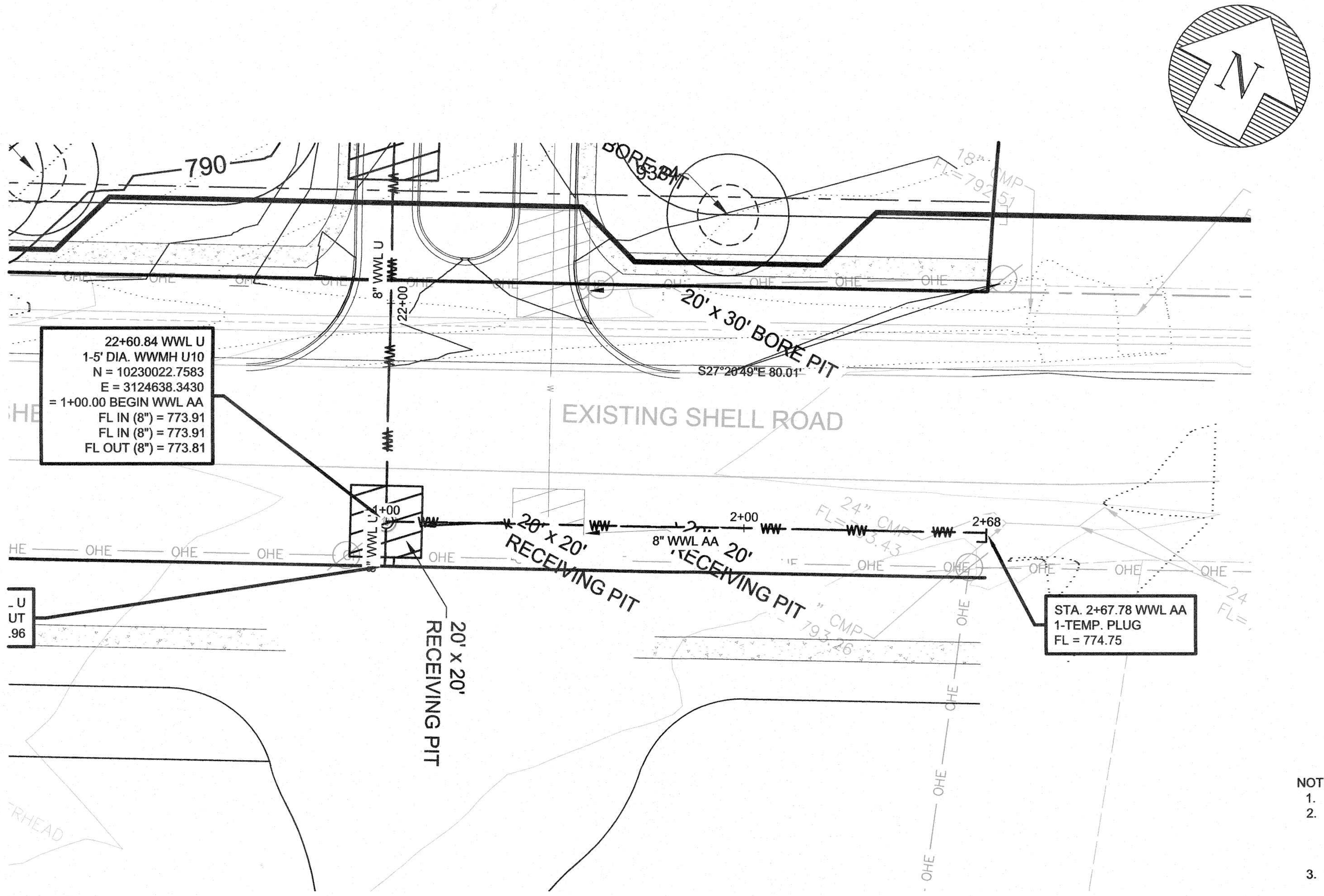
JOB NUMBER:
A245-1002

WW5

SHEET NO.
92
OF 118 SHEETS

Date/Time : Tue, 27 Feb 2024 - 10:41am
User Name : hhurt
PathName : G:\A245-1002 Georgetown Village\ACAD\ Sheet Files\PHASE 3\A245-1002_PH3_WW5.dwg





0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
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- EXISTING AIR RELEASE VALVE
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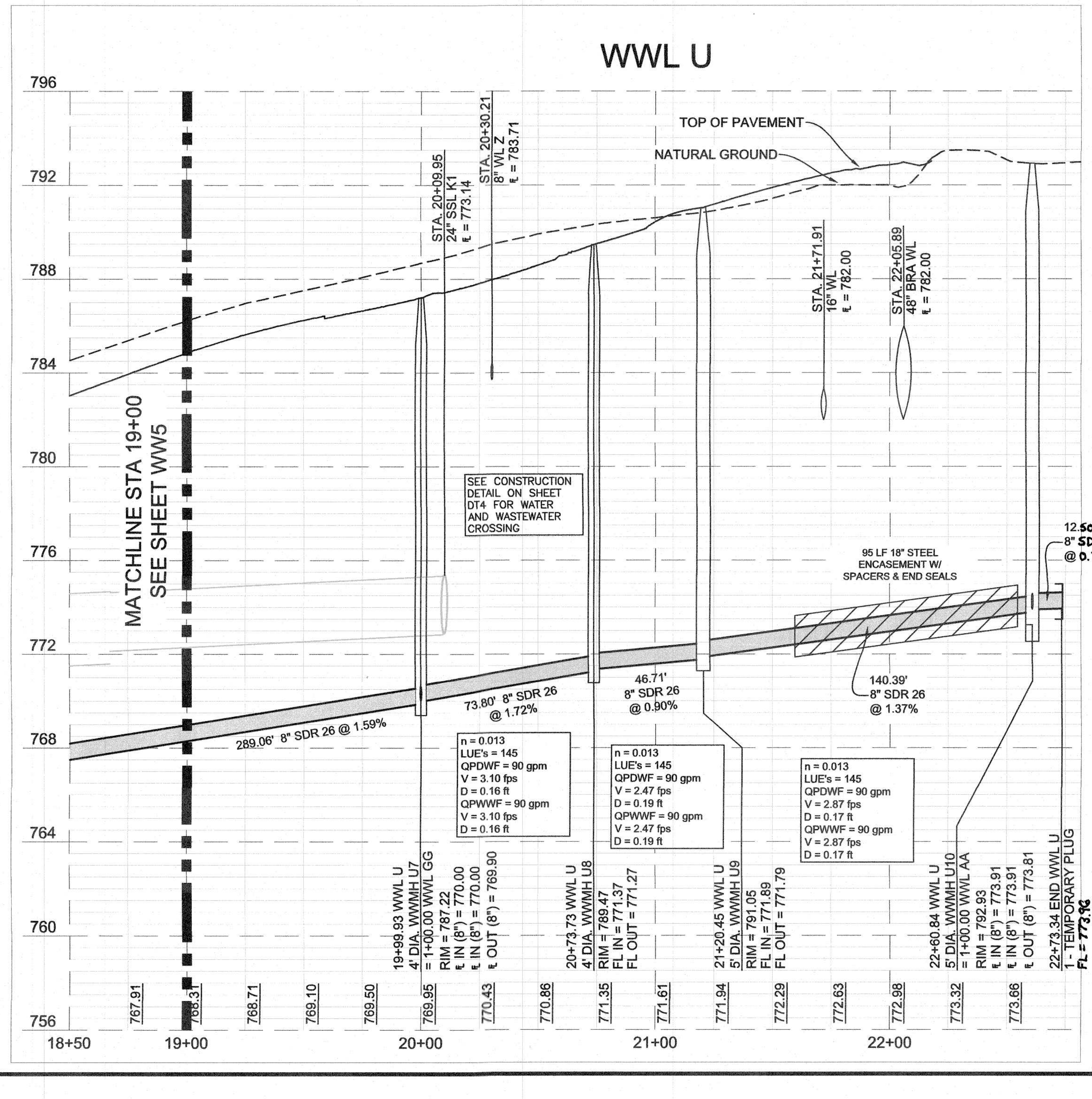
4. ALL MANHOLES OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE BOLTED AND GASKETED WATERTIGHT COVERS.
5. ALL STREETS SHALL BE CONSTRUCTED TO SUBGRADE PRIOR TO PLACEMENT OF WATER AND WASTEWATER LINES. FILL AREAS TO MEET CITY OF AUSTIN SPECIFICATION FOR BACKFILL AND COMPACTION.
6. ALL WASTEWATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL WW13. ALL SERVICES MUST BE PLACED IN RIGHT OF WAY AT PROPERTY LINE. NO SERVICES ARE TO BE LOCATED WITHIN SIDEWALKS OR CURB RAMPS.
7. CONTRACTOR TO VERIFY ALL WASTEWATER LINE GRADE AND ALIGNMENTS AT NO GREATER THAN 50' INTERVALS.
8. SEE PROFILE SHEETS FOR DEEP SERVICE CONNECTIONS AND LOCATIONS.
9. THE USE OF BRICK MANHOLES AND BRICKS TO ADJUST MANHOLES IS PROHIBITED.
10. PIPE STATIONING AND LINEAR FOOTAGE IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS CALCULATED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.

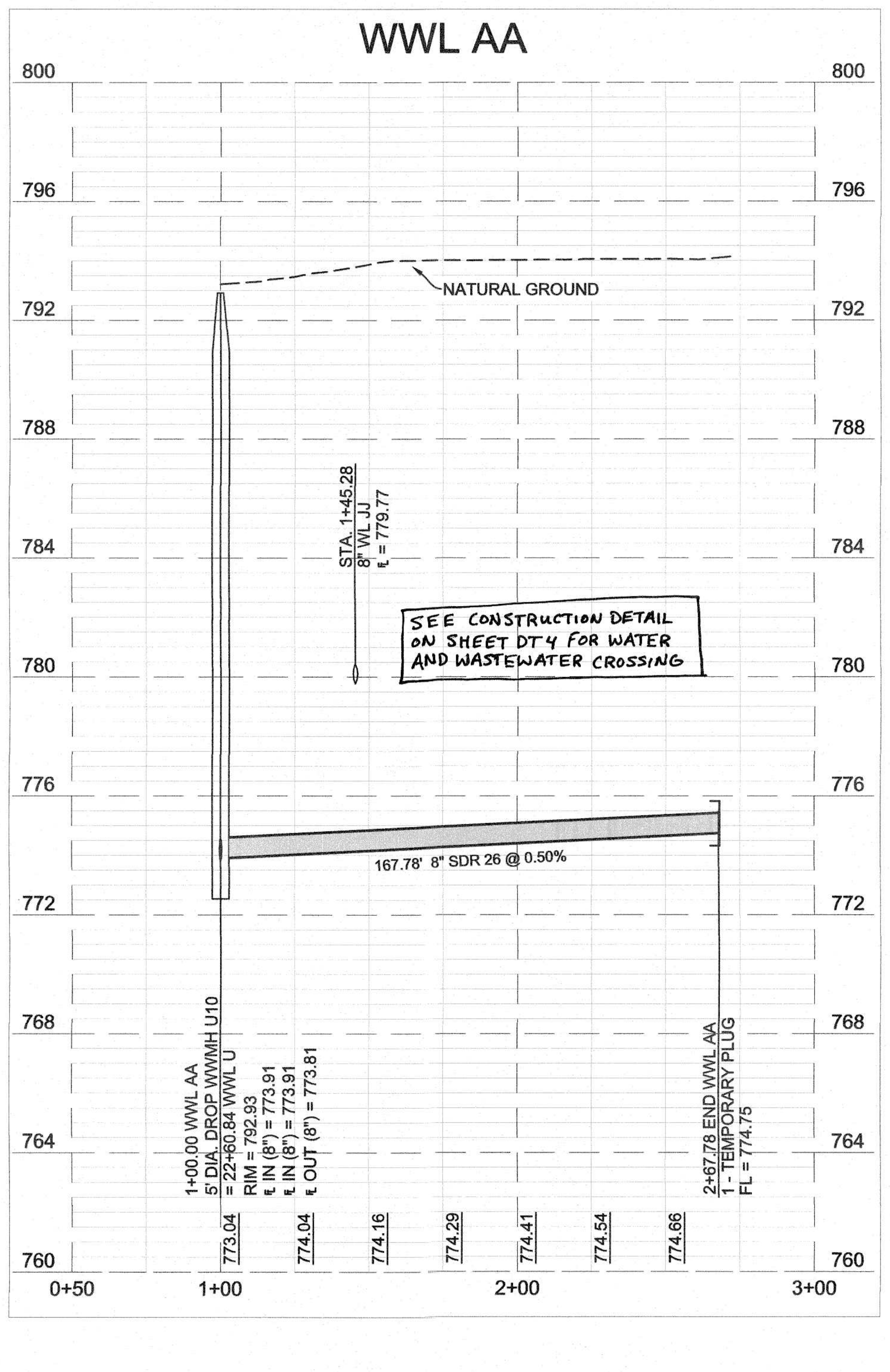
BORE NOTES:

1. EXISTING 48" BRA WL LOCATION AND ELEVATIONS BASED ON RECORD DRAWINGS. CONTRACTOR TO POTHOLE BRA WL TO FIELD VERIFY LOCATION OF PIPELINE.
2. EXIST 16"& 48" WL ARE THE ONLY KNOWN EXISTING UTILITY CROSSINGS AT THIS TIME CONTRACTOR SHALL DETERMINE ALL EXISTING UTILITY CROSSINGS PRIOR TO BEGINNING WORK
3. PROFILES ARE BASED ON GIS TOPOGRAPHY
4. LOCATION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO BEGINNING WORK AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT OCCUR.
5. BORE TO BE EXTENDED MINIMUM 4 FEET HORIZONTALLY PAST OUTSIDE DIAMETER OF EXISTING 48" BRA WL
6. GIVE BRAZOS RIVER AUTHORITY 48-HR NOTICE BEFORE DOING ANY CONSTRUCTION ACTIVITY NEAR THE EXISTING 48" BRA WL, INCLUDING POTHOLING AND BORING.
CONTACT INFO: COLTON ADKINS
PHONE: (254)-307-9836
EMAIL: COLTON.ADKINS@BRAZOS.ORG

WWL U



WWL AA



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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE PLAN & PROFILES
WWL U STA 19+00 TO END
WWL AA STA 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW6.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW6

SHEET NO.
93
OF 118 SHEETS

2023-33-CON

User Name: hhart
Date/Time : Tue, 27 Feb 2024 - 2:59pm
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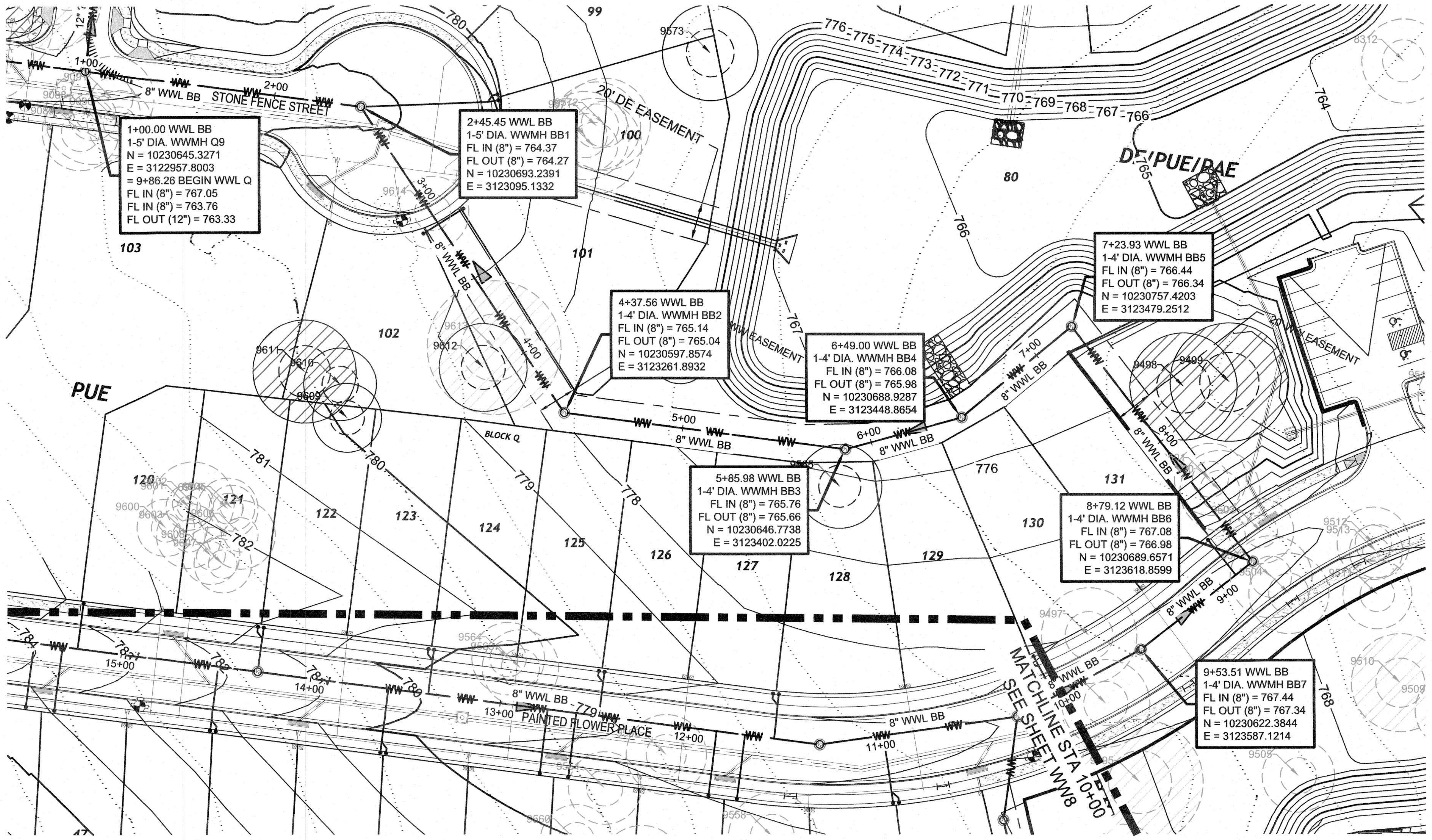

1+00.00 WWL BB
1-5' DIA. WWMH Q9
N = 10230645.3271
E = 3122957.8003
= 9+86.26 BEGIN WWL Q
FL IN (8") = 767.05
FL IN (8") = 763.76
FL OUT (12") = 763.33

2+45.45 WWL BB
1-5' DIA. WWMH BB1
FL IN (8") = 764.37
FL OUT (8") = 764.27
N = 10230693.2391
E = 3123095.1332

4+37.56 WWL BB
1-4' DIA. WWMH BB2
FL IN (8") = 765.14
FL OUT (8") = 765.04
N = 10230597.8574
E = 3123261.8932

5+85.98 WWL BB
1-4' DIA. WWMH BB3
FL IN (8") = 765.76
FL OUT (8") = 765.66
N = 10230646.7738
E = 3123402.0225

6+49.00 WWL BB
1-4' DIA. WWMH BB4
FL IN (8") = 766.08
FL OUT (8") = 765.98
N = 10230688.9287
E = 3123448.8654

7+23.93 WWL BB
1-4' DIA. WWMH BB5
FL IN (8") = 766.44
FL OUT (8") = 766.34
N = 10230757.4203
E = 3123479.2512

8+79.12 WWL BB
1-4' DIA. WWMH BB6
FL IN (8") = 767.08
FL OUT (8") = 766.98
N = 10230689.6571
E = 3123618.8599

9+53.51 WWL BB
1-4' DIA. WWMH BB7
FL IN (8") = 767.44
FL OUT (8") = 767.34
N = 10230622.3844
E = 3123587.1214

N

0 40 80
1" = 40'

LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
⊗	PROPOSED GATE VALVE
⊗	EXISTING GATE VALVE
◐	PROPOSED AIR RELEASE VALVE
◐	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—∠	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:
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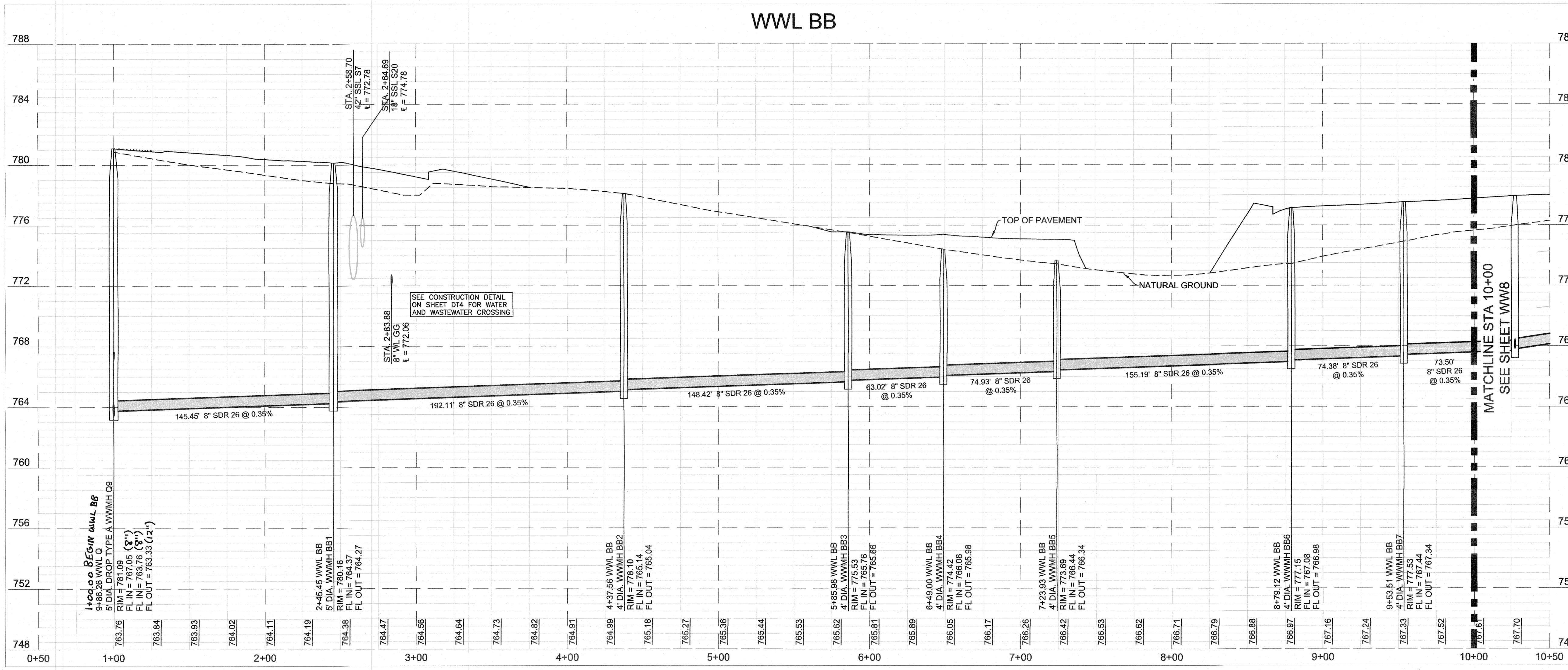
WWL BB



STA. 2+58.70
42" SSL S7
℄ = 772.78

STA. 2+64.69
18" SSL S20
℄ = 774.78

STA. 2+83.88
8" WL GG
℄ = 772.06

SEE CONSTRUCTION DETAIL
ON SHEET DT4 FOR WATER
AND WASTEWATER CROSSING

1+00.00 BEGIN WWL BB
9+86.26 WWL Q
5' DIA. DROP TYPE A WWMH Q9
RIM = 781.09
FL IN = 767.05 (8")
FL IN = 763.76 (8")
FL OUT = 763.33 (12")

2+45.45 WWL BB
5' DIA. WWMH BB1
RIM = 780.16
FL IN = 764.37
FL OUT = 764.27

4+37.56 WWL BB
4' DIA. WWMH BB2
RIM = 778.10
FL IN = 765.14
FL OUT = 765.04

5+85.98 WWL BB
4' DIA. WWMH BB3
RIM = 775.53
FL IN = 765.76
FL OUT = 765.66

6+49.00 WWL BB
4' DIA. WWMH BB4
RIM = 774.42
FL IN = 766.08
FL OUT = 765.98

7+23.93 WWL BB
4' DIA. WWMH BB5
RIM = 773.69
FL IN = 766.44
FL OUT = 766.34

8+79.12 WWL BB
4' DIA. WWMH BB6
RIM = 777.15
FL IN = 767.08
FL OUT = 766.98

9+53.51 WWL BB
4' DIA. WWMH BB7
RIM = 777.53
FL IN = 767.44
FL OUT = 767.34

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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE BB PLAN AND PROFILE
STA. 1+00 TO 10+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW7.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW7

SHEET NO.
93
OF 118 SHEETS

Date\Time : Tue, 13 Feb 2024 - 5:16pm User Name : jpiecuch
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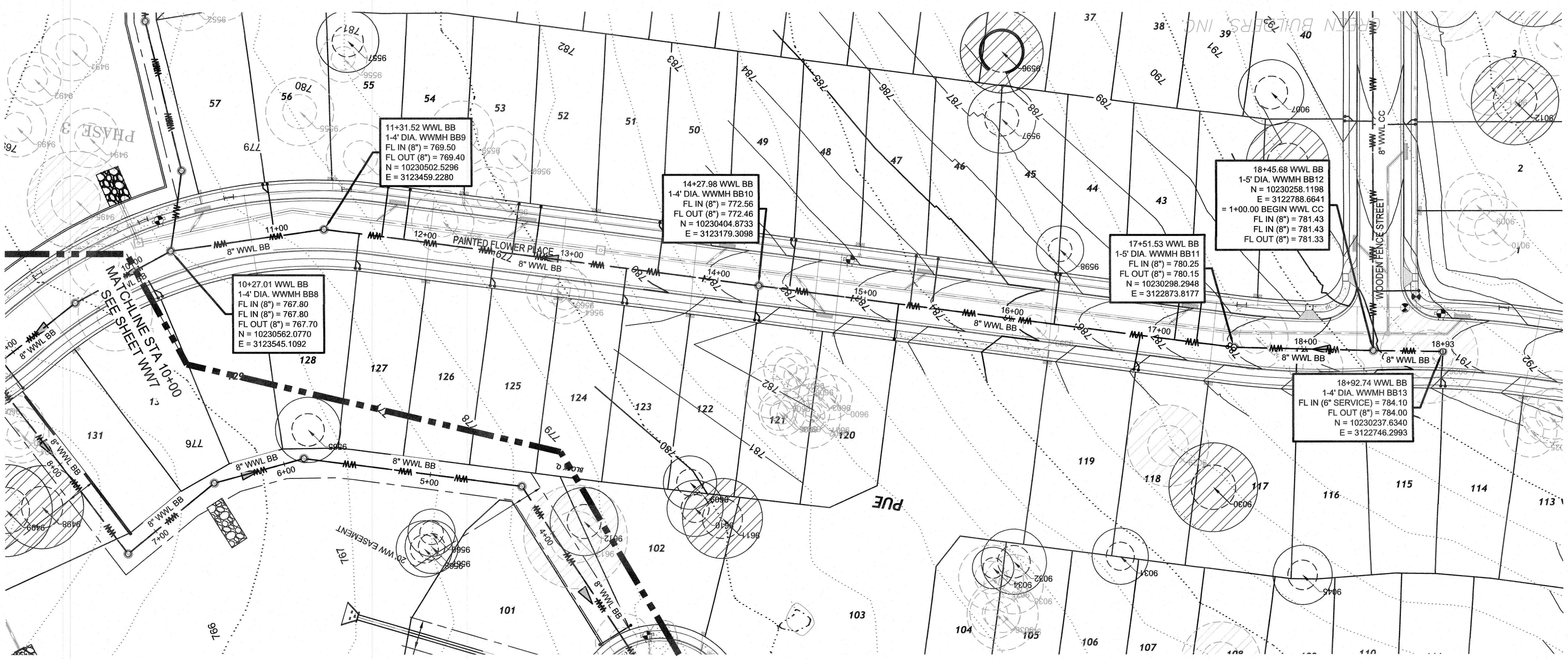

0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

NOTES:

1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
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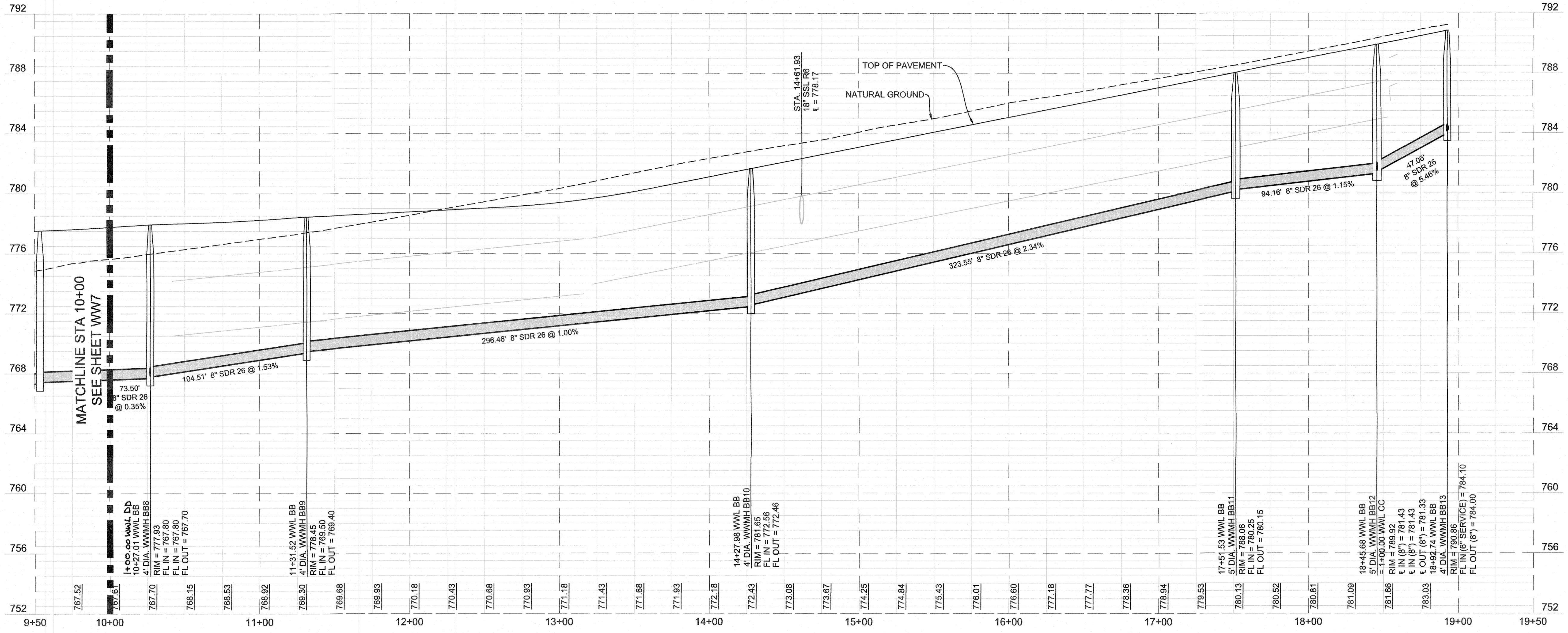
WWL BB



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Know what's below.
Call before you dig.

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE BB PLAN AND PROFILE
STA. 10+00 TO END

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW8.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW8

SHEET NO.
94
OF 118 SHEETS

Date/Time : Tue, 13 Feb 2024 - 5:16pm
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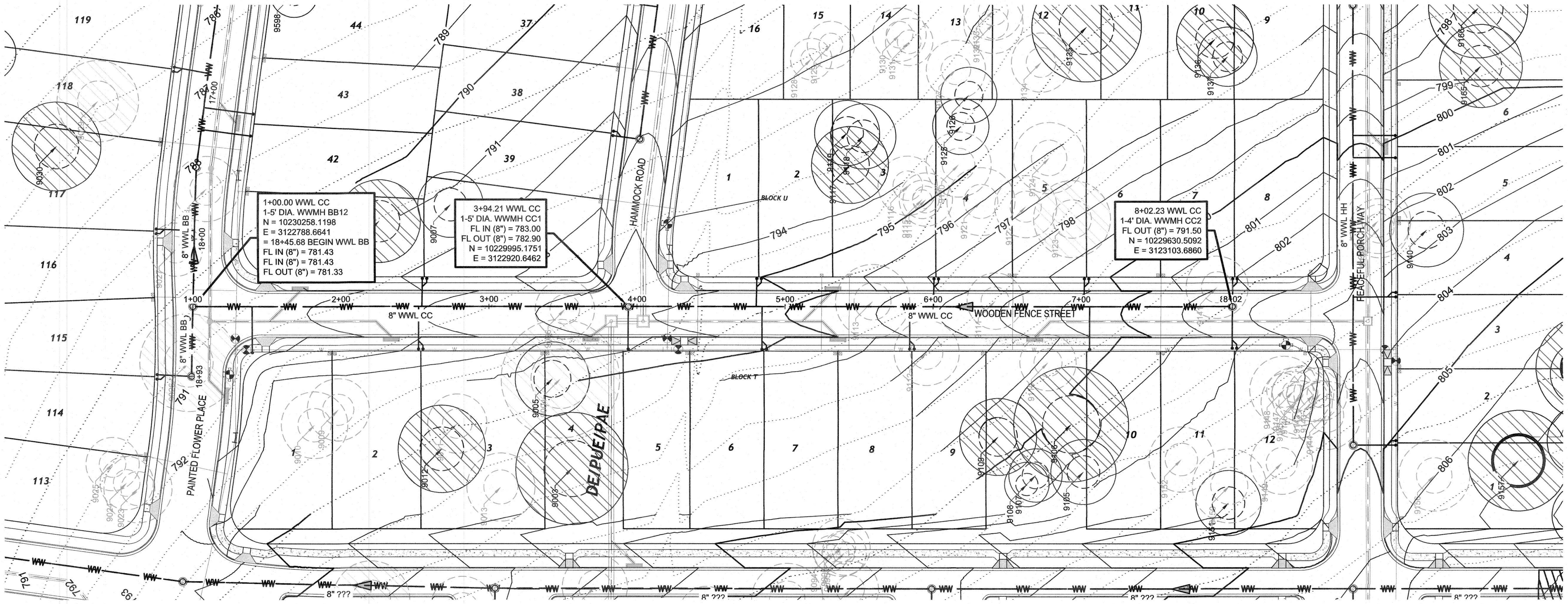
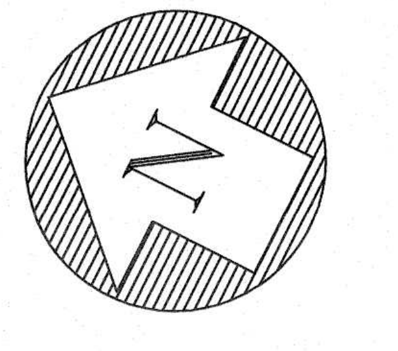
2023-33-CON



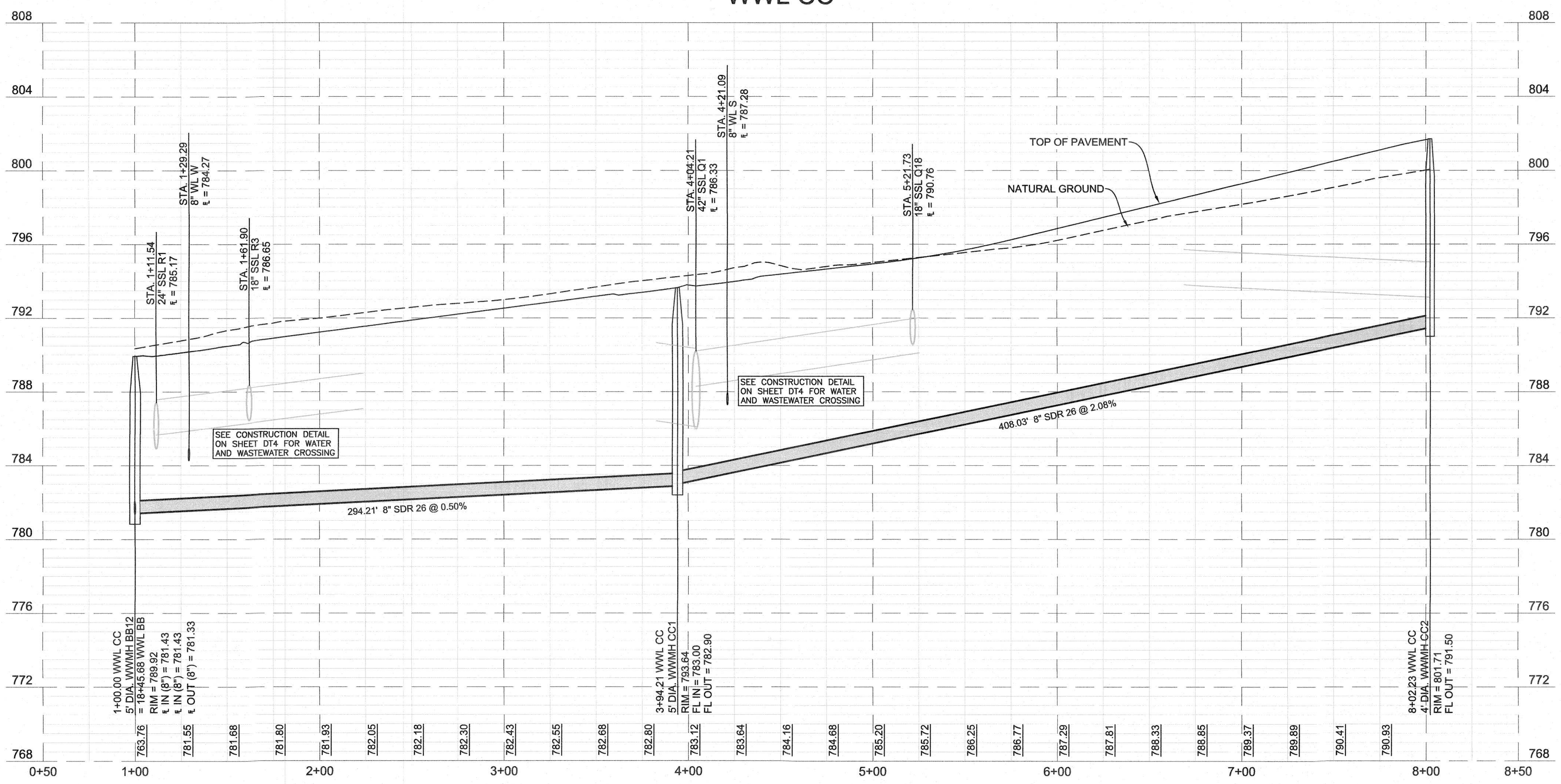


0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL CC



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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE CC PLAN AND PROFILE
STA. 1+00 TO END

REVISIONS			
NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW9.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

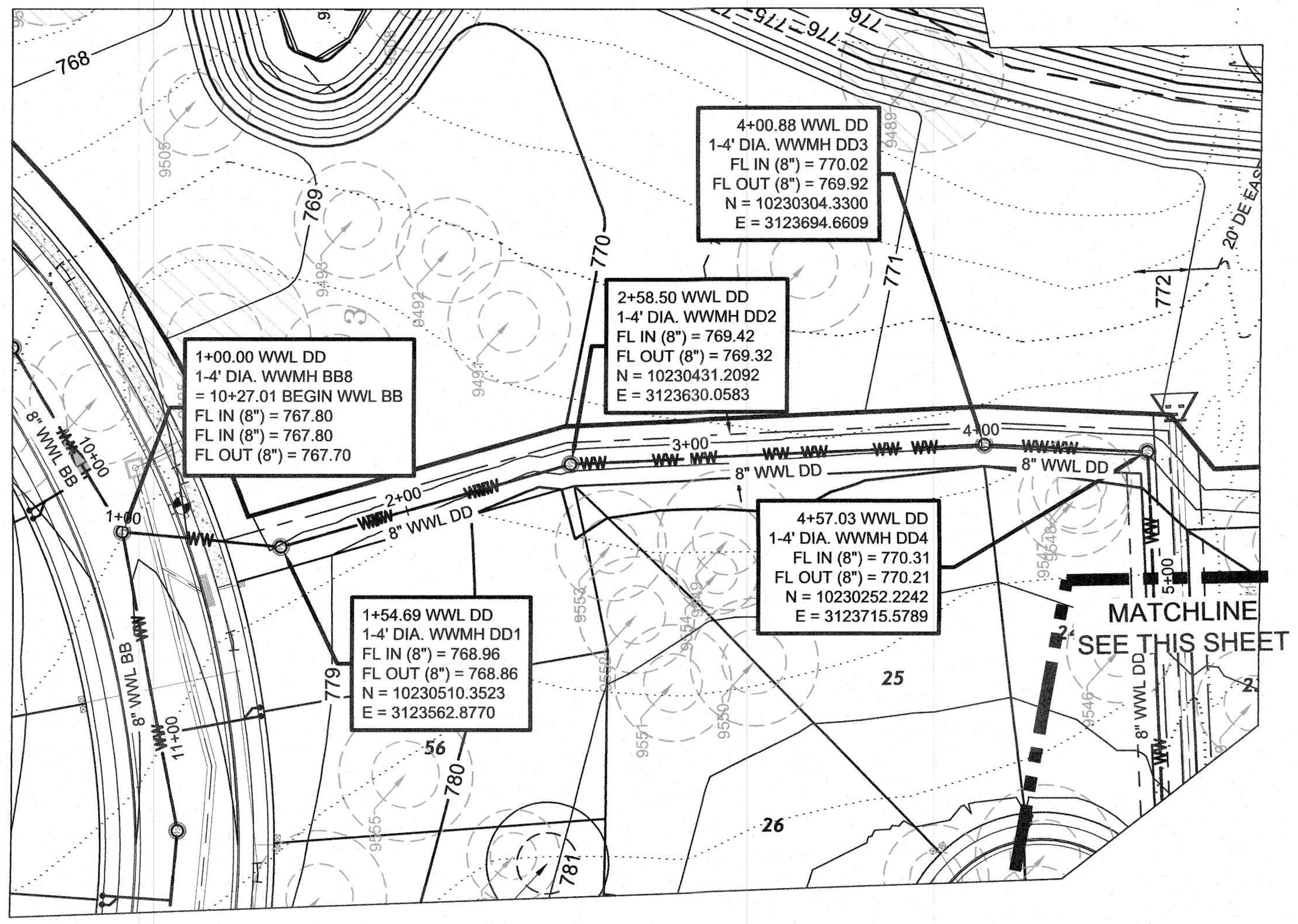
JOB NUMBER:
A245-1002

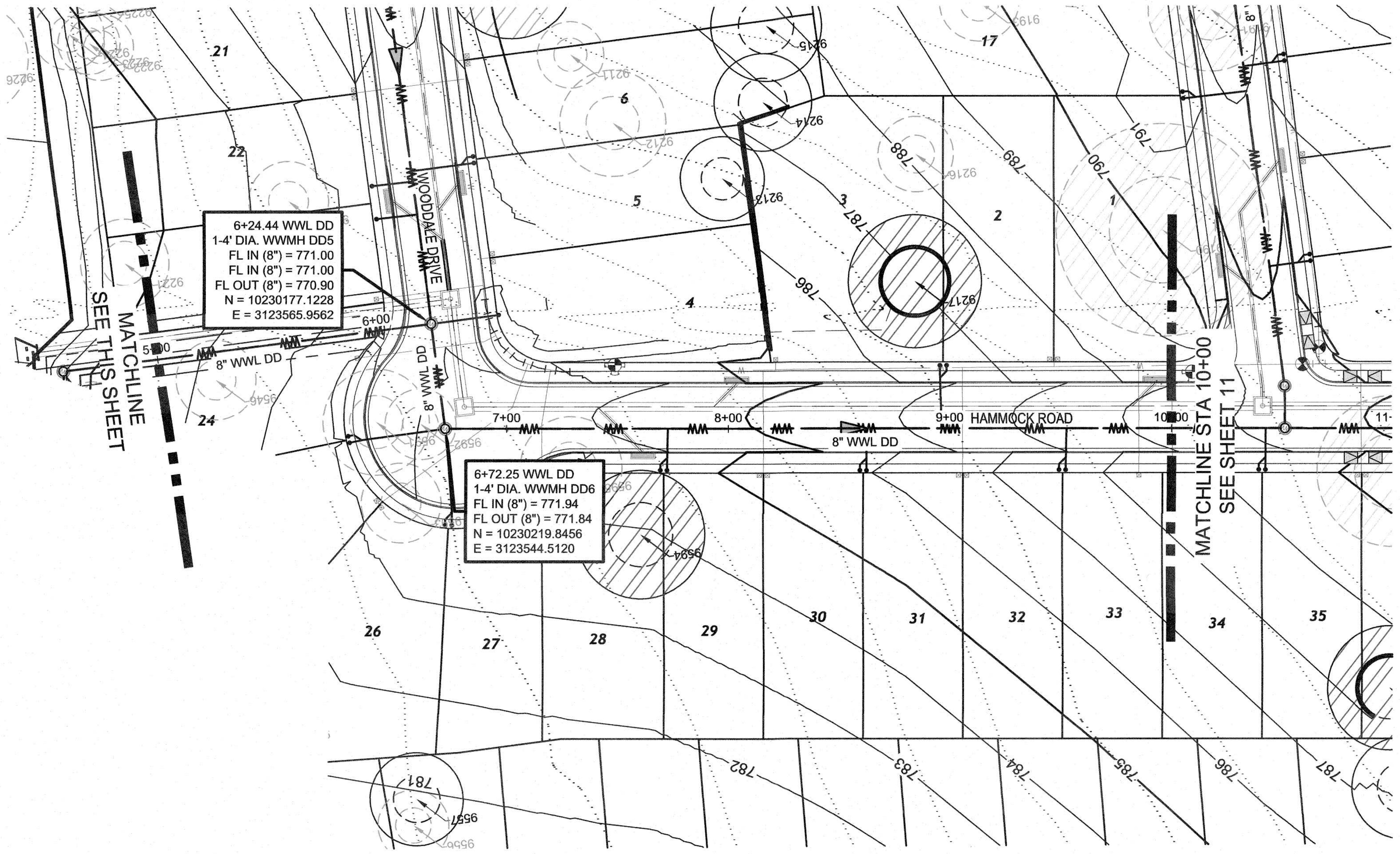
WW9

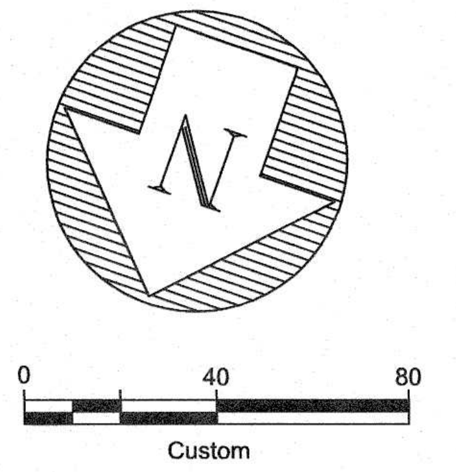
SHEET NO.
95
OF 118 SHEETS

Date\Time : Tue, 13 Feb 2024 - 5:17pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW9.dwg

2023-33-CON







LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
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- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
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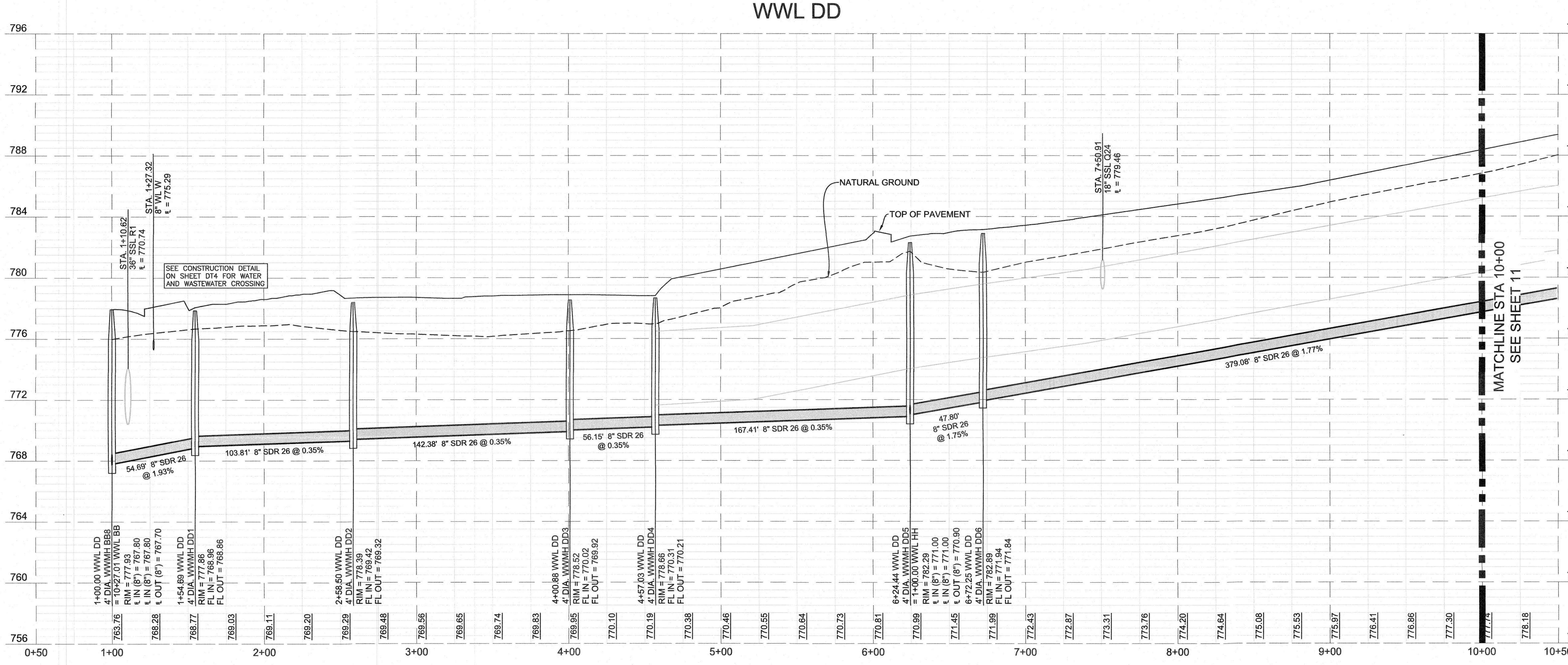
WWL DD



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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE DD PLAN AND PROFILE
STA. 1+00 TO 10+00

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW10.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW10

SHEET NO.
96
OF 118 SHEETS

Date\Time : Tue, 13 Feb 2024 - 5:18pm User Name : jpiecuch
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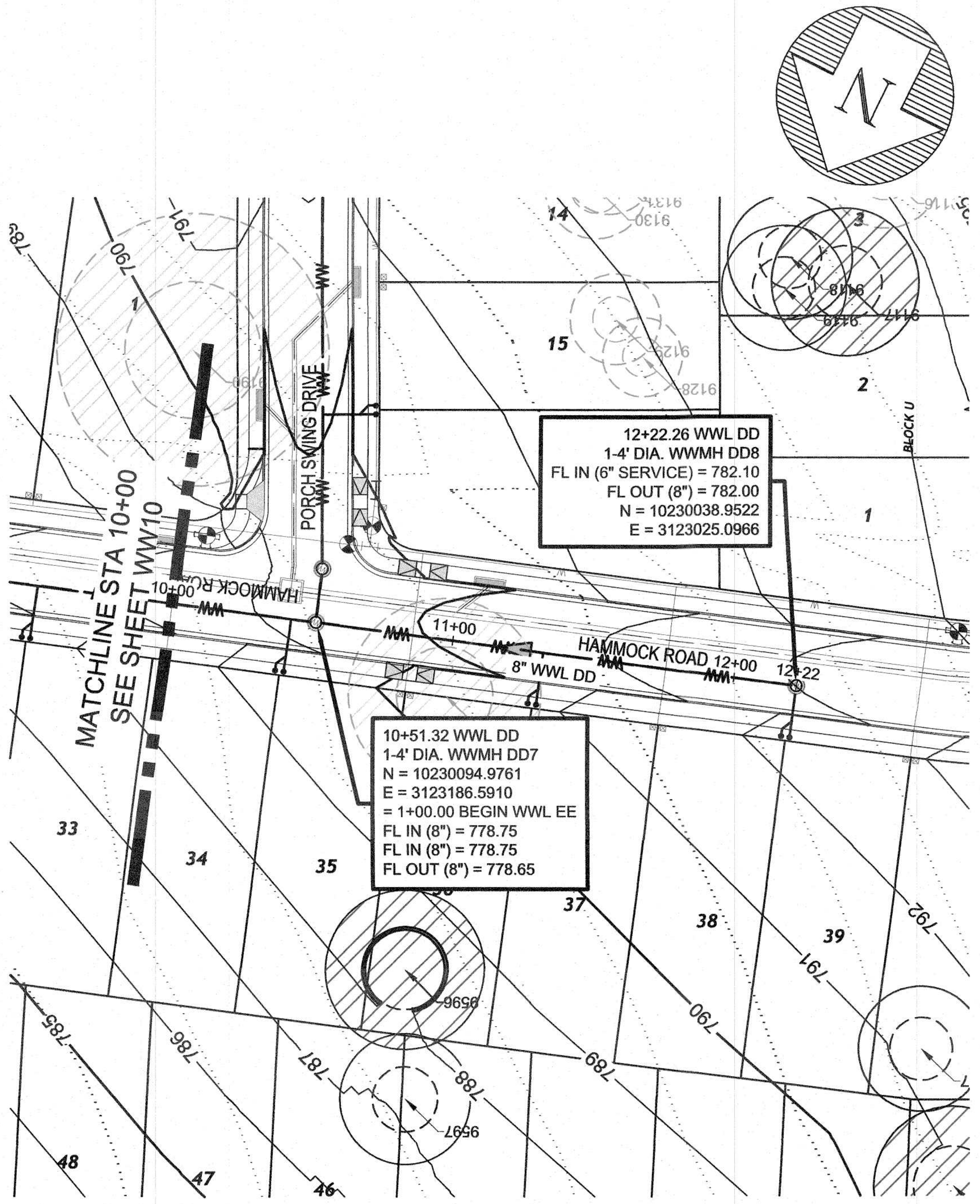
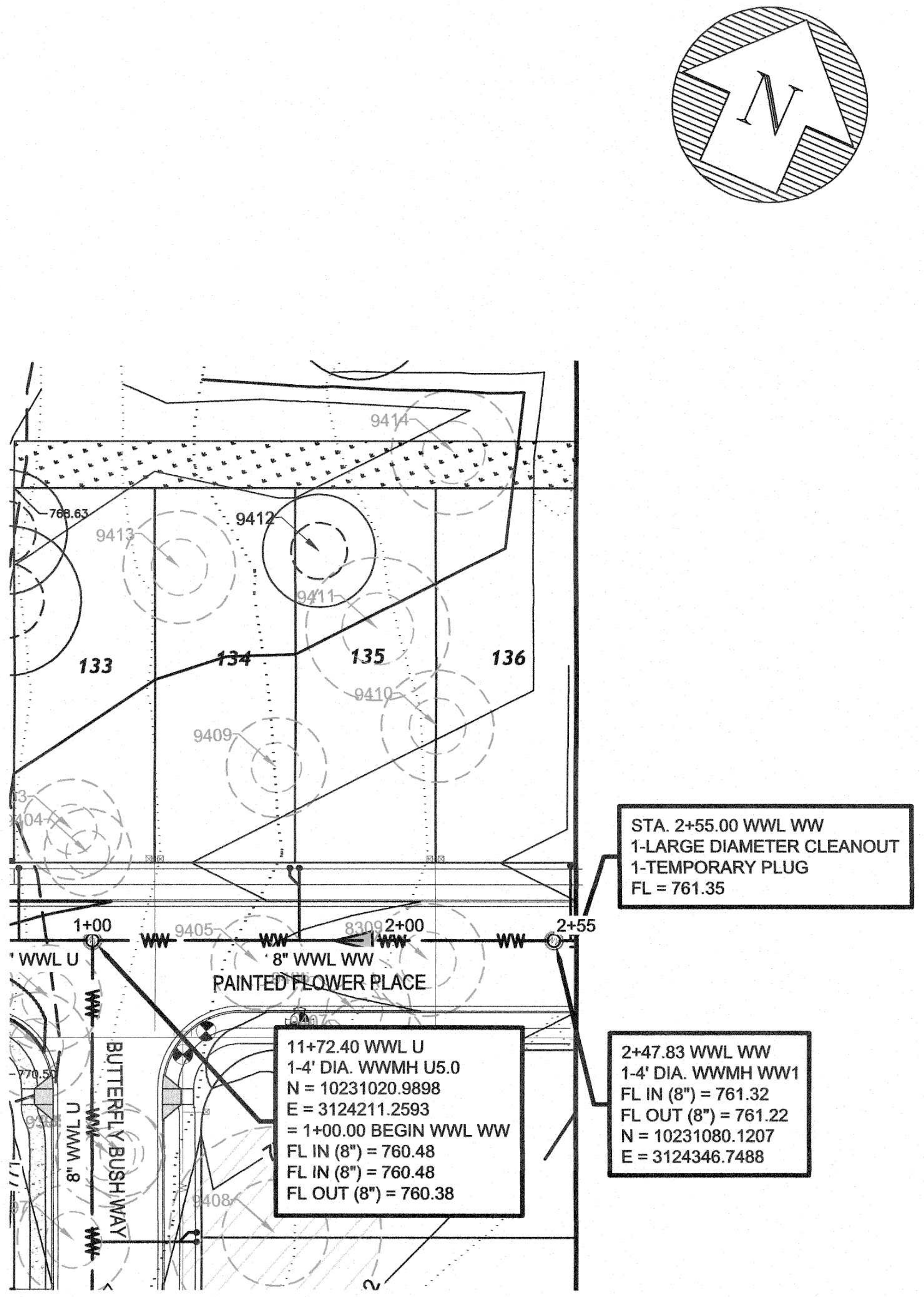


12+22.26 WWL DD
1-4' DIA. WWMH DD8
FL IN (6" SERVICE) = 782.10
FL OUT (8") = 782.00
N = 10230038.9522
E = 3123025.0966

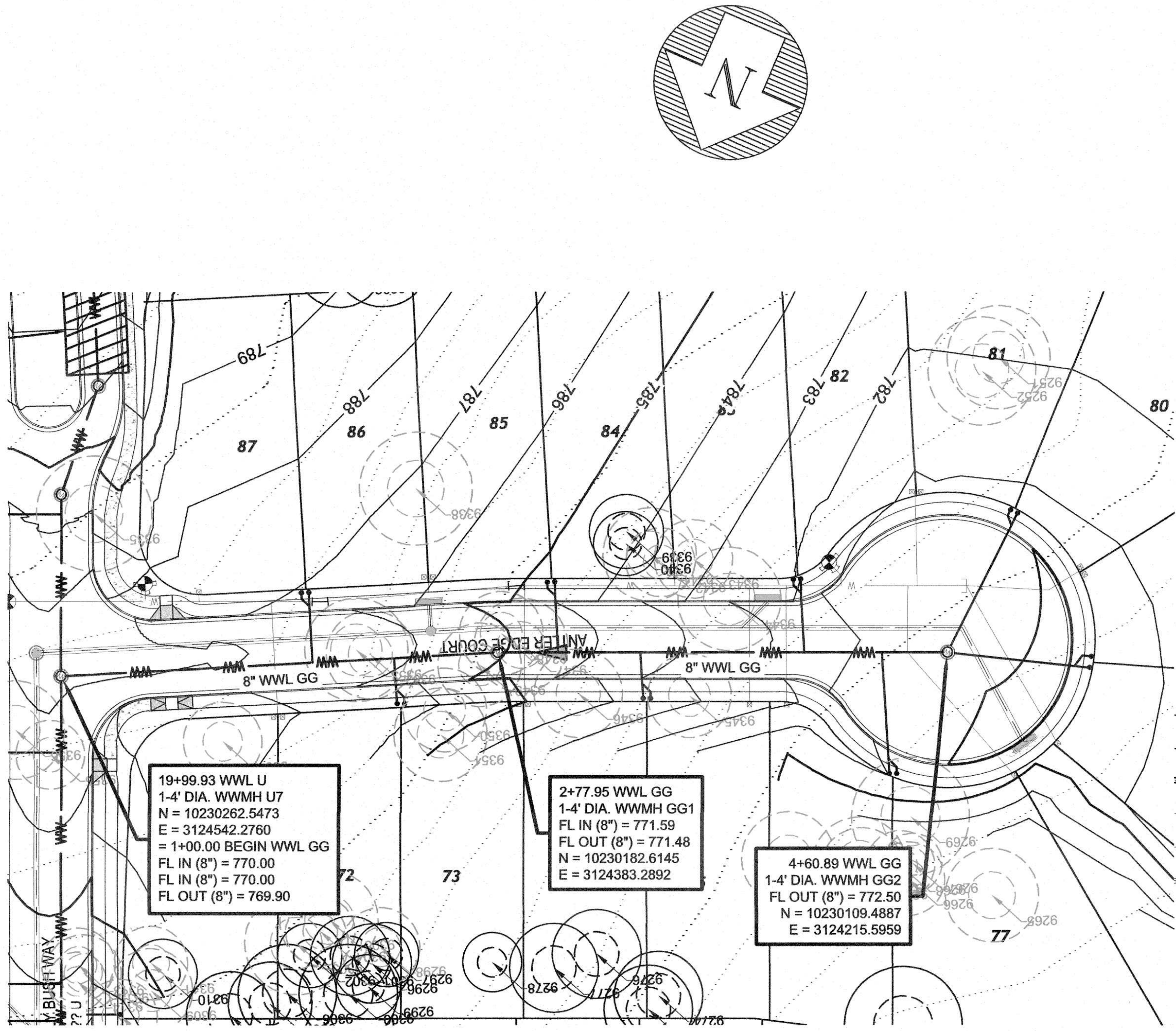
10+51.32 WWL DD
1-4' DIA. WWMH DD7
N = 10230094.9761
E = 3123186.5910
= 1+00.00 BEGIN WWL EE
FL IN (8") = 778.75
FL IN (8") = 778.75
FL OUT (8") = 778.65



STA. 2+55.00 WWL WW
1-LARGE DIAMETER CLEANOUT
1-TEMPORARY PLUG
FL = 761.35

11+72.40 WWL U
1-4' DIA. WWMH U5.0
N = 10231020.9898
E = 3124211.2593
= 1+00.00 BEGIN WWL WW
FL IN (8") = 760.48
FL IN (8") = 760.48
FL OUT (8") = 760.38

2+47.83 WWL WW
1-4' DIA. WWMH WW1
FL IN (8") = 761.32
FL OUT (8") = 761.22
N = 10231080.1207
E = 3124346.7488



19+99.93 WWL U
1-4' DIA. WWMH U7
N = 10230262.5473
E = 3124542.2760
= 1+00.00 BEGIN WWL GG
FL IN (8") = 770.00
FL IN (8") = 770.00
FL OUT (8") = 769.90

2+77.95 WWL GG
1-4' DIA. WWMH GG1
FL IN (8") = 771.59
FL OUT (8") = 771.48
N = 10230182.6145
E = 3124383.2892

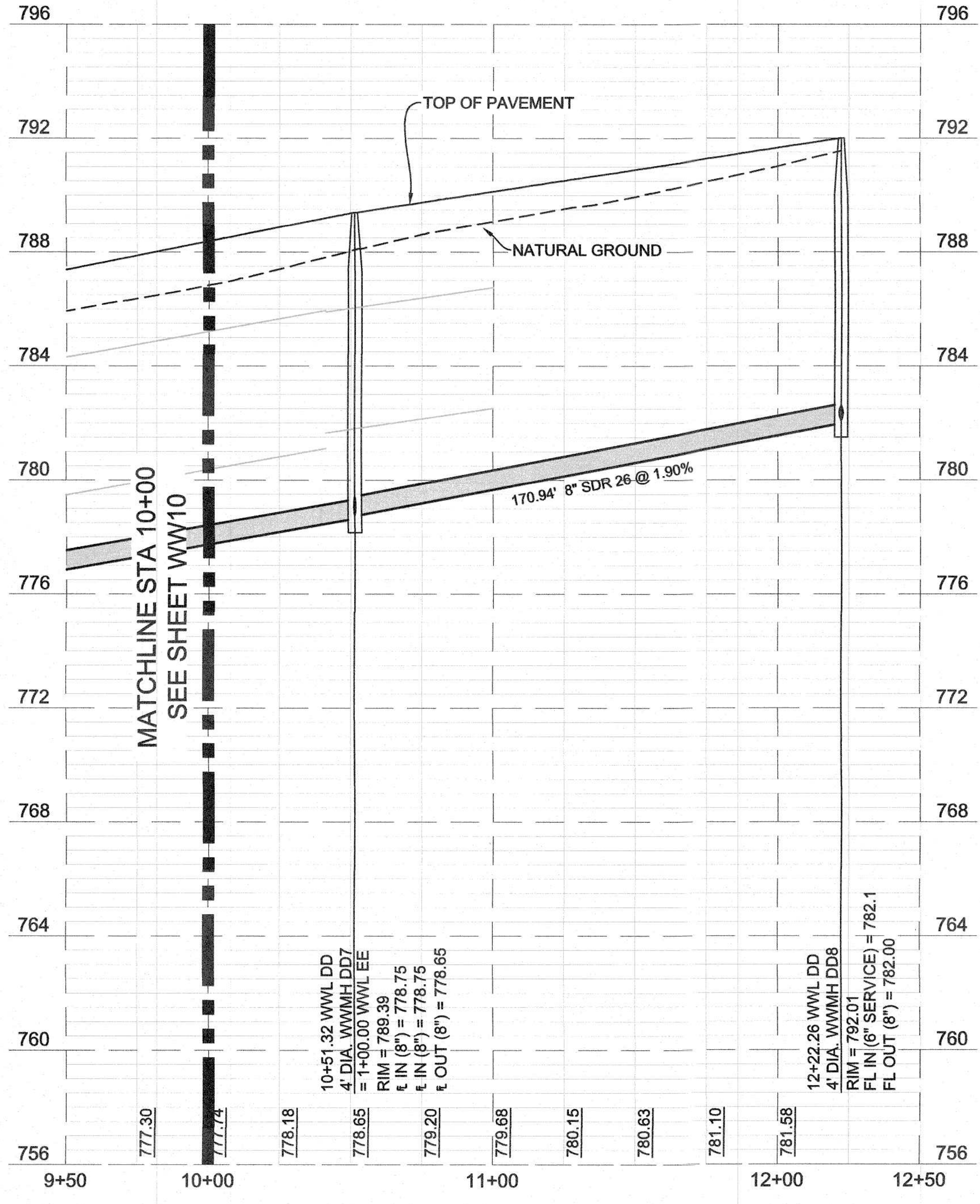
4+60.89 WWL GG
1-4' DIA. WWMH GG2
FL OUT (8") = 772.50
N = 10230109.4887
E = 3124215.5959

0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

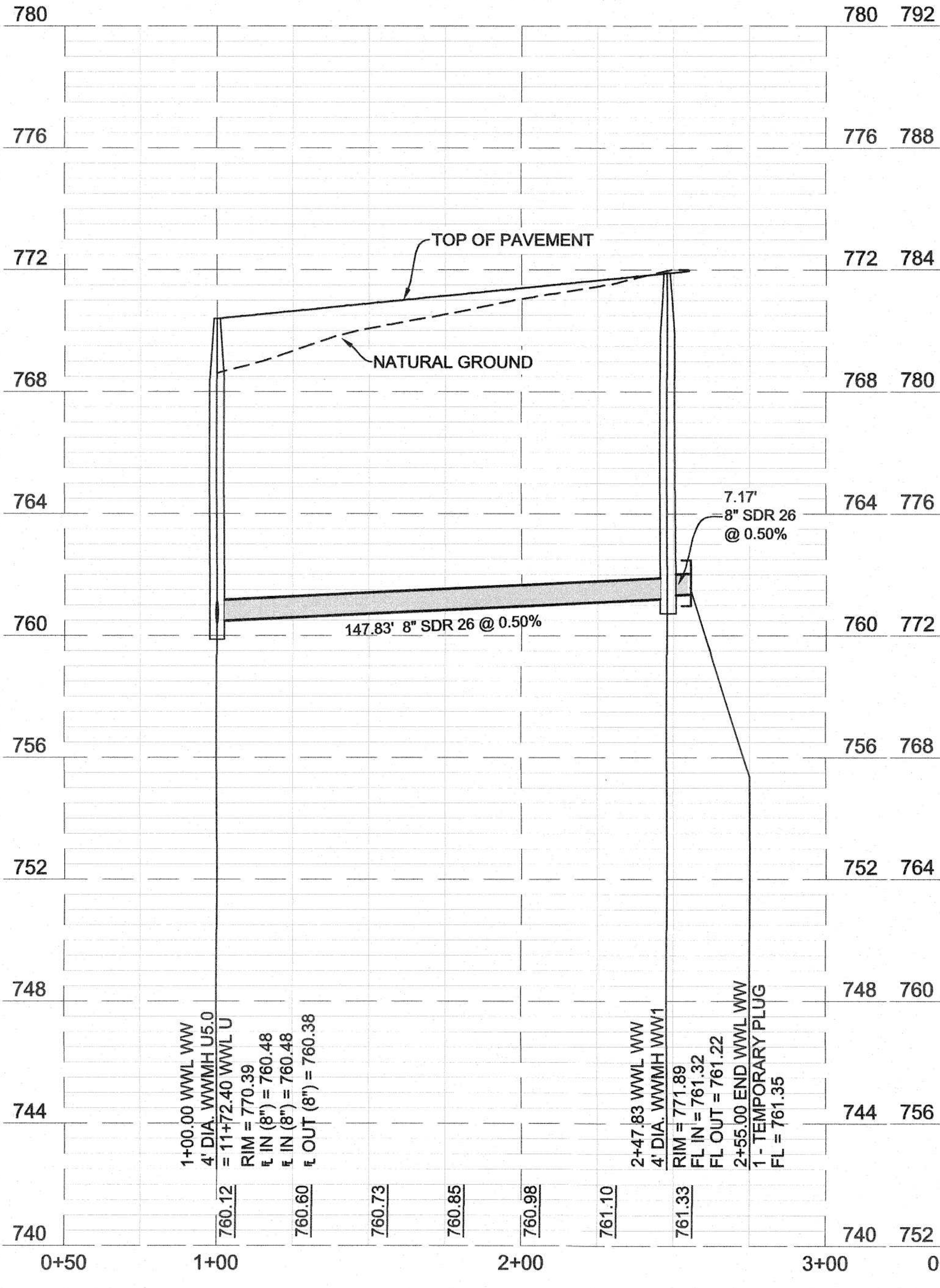
WWL DD



10+51.32 WWL DD
4' DIA. WWMH DD7
= 1+00.00 WWL EE
RIM = 789.39
℄ IN (8") = 778.75
℄ IN (8") = 778.75
℄ OUT (8") = 778.65

12+22.26 WWL DD
4' DIA. WWMH DD8
RIM = 792.01
FL IN (6" SERVICE) = 782.1
FL OUT (8") = 782.00

WWL WW

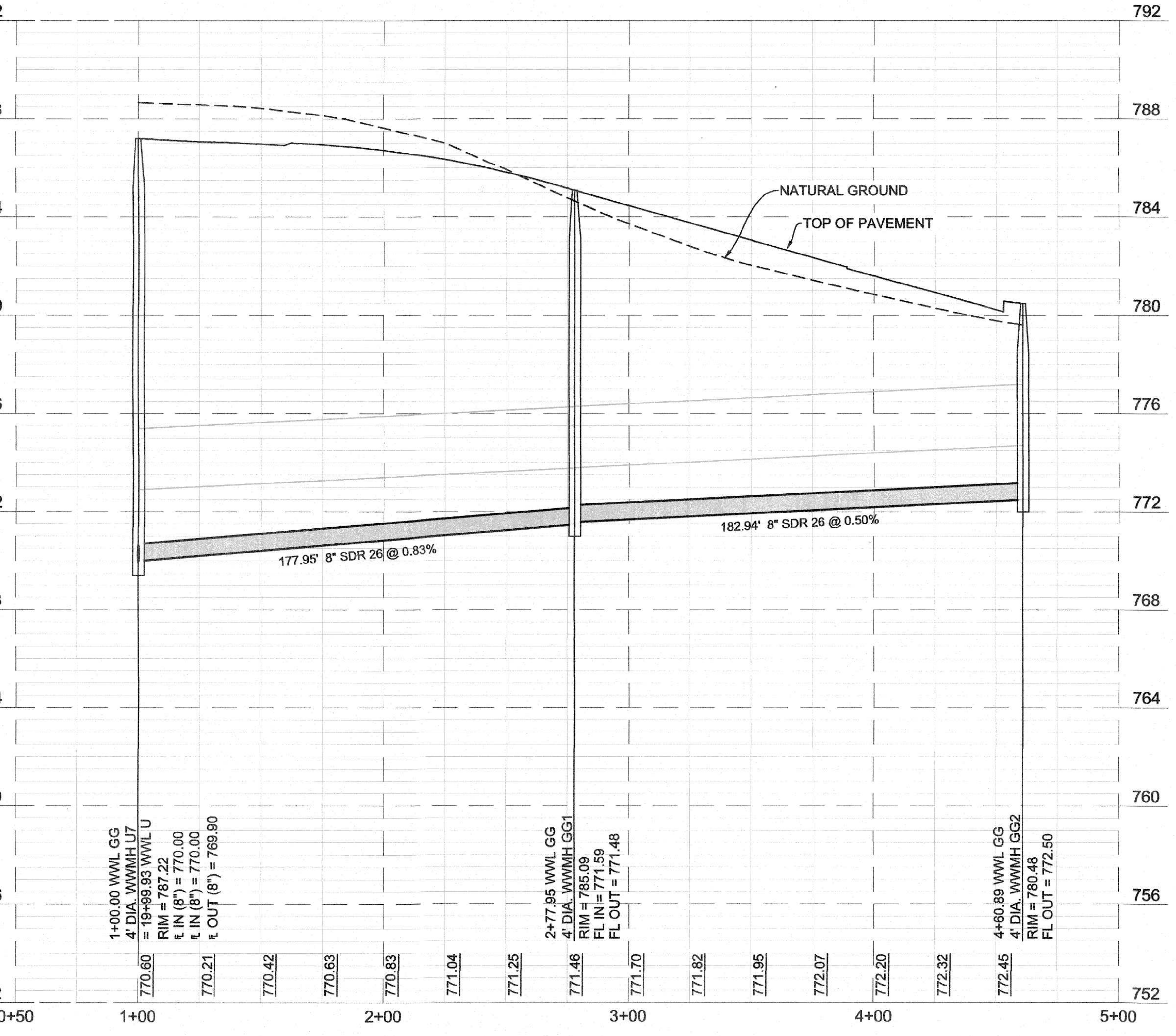


1+00.00 WWL WW
4' DIA. WWMH U5.0
= 11+72.40 WWL U
RIM = 770.39
℄ IN (8") = 760.48
℄ IN (8") = 760.48
℄ OUT (8") = 760.38

2+47.83 WWL WW
4' DIA. WWMH WW1
RIM = 771.89
FL IN = 761.32
FL OUT = 761.22

2+55.00 END WWL WW
1 - TEMPORARY PLUG
FL = 761.35

WWL GG



1+00.00 WWL GG
4' DIA. WWMH U7
= 19+99.93 WWL U
RIM = 787.22
℄ IN (8") = 770.00
℄ IN (8") = 770.00
℄ OUT (8") = 769.90

2+77.95 WWL GG
4' DIA. WWMH GG1
RIM = 785.09
FL IN = 771.59
FL OUT = 771.48

4+60.89 WWL GG
4' DIA. WWMH GG2
RIM = 780.48
FL OUT = 772.50

NOTES:

1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
3. ALL GRAVITY SANITARY SEWER LINES SHALL CONFORM TO ASTM D 3034, PVC, SDR 26 WITH ASTM 3212 JOINTS. GRAVITY SANITARY SEWER LINES CROSSING POTABLE WATER LINES SHALL CONFORM TO 30 TAC 217.53(d).
4. ALL MANHOLES OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE BOLTED AND GASKETED WATERTIGHT COVERS.
5. ALL STREETS SHALL BE CONSTRUCTED TO SUBGRADE PRIOR TO PLACEMENT OF WATER AND WASTEWATER LINES. FILL AREAS TO MEET CITY OF AUSTIN SPECIFICATION FOR BACKFILL AND COMPACTION.
6. ALL WASTEWATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL WW13. ALL SERVICES MUST BE PLACED IN RIGHT OF WAY AT PROPERTY LINE. NO SERVICES ARE TO BE LOCATED WITHIN SIDEWALKS OR CURB RAMPS.
7. CONTRACTOR TO VERIFY ALL WASTEWATER LINE GRADE AND ALIGNMENTS AT NO GREATER THAN 50' INTERVALS.
8. SEE PROFILE SHEETS FOR DEEP SERVICE CONNECTIONS AND LOCATIONS.
9. THE USE OF BRICK MANHOLES AND BRICKS TO ADJUST MANHOLES IS PROHIBITED.
10. PIPE STATIONING AND LINEAR FOOTAGE IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS CALCULATED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.

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

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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINES DD & WW
PLAN AND PROFILE
STA. 10+00 TO END

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 2/27/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW11.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

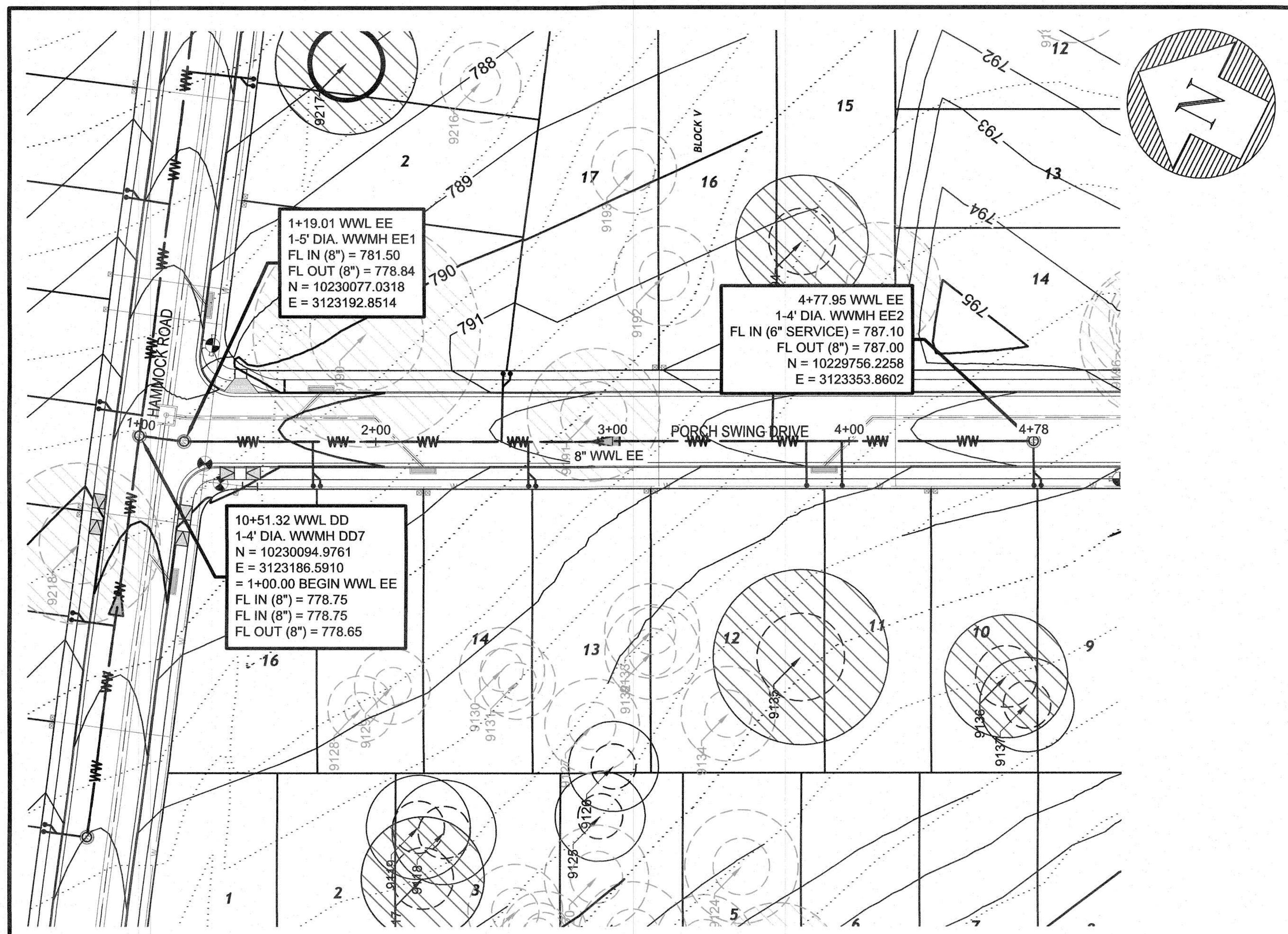
JOB NUMBER:
A245-1002

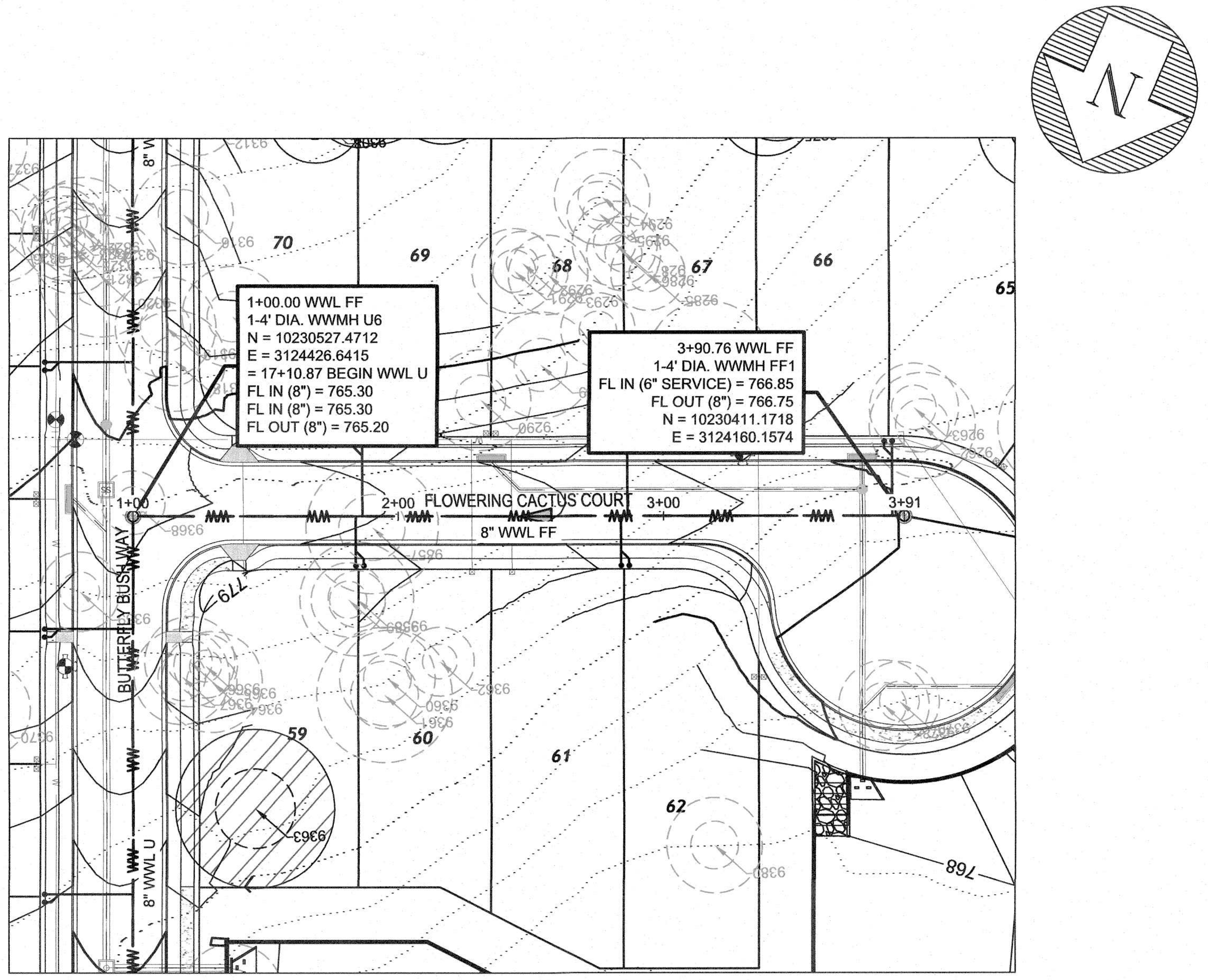
WW11

SHEET NO.
98
OF 118 SHEETS

2023-33-CON

Date\Time : Tue, 27 Feb 2024 - 2:54pm User Name : hhurt
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW11.dwg





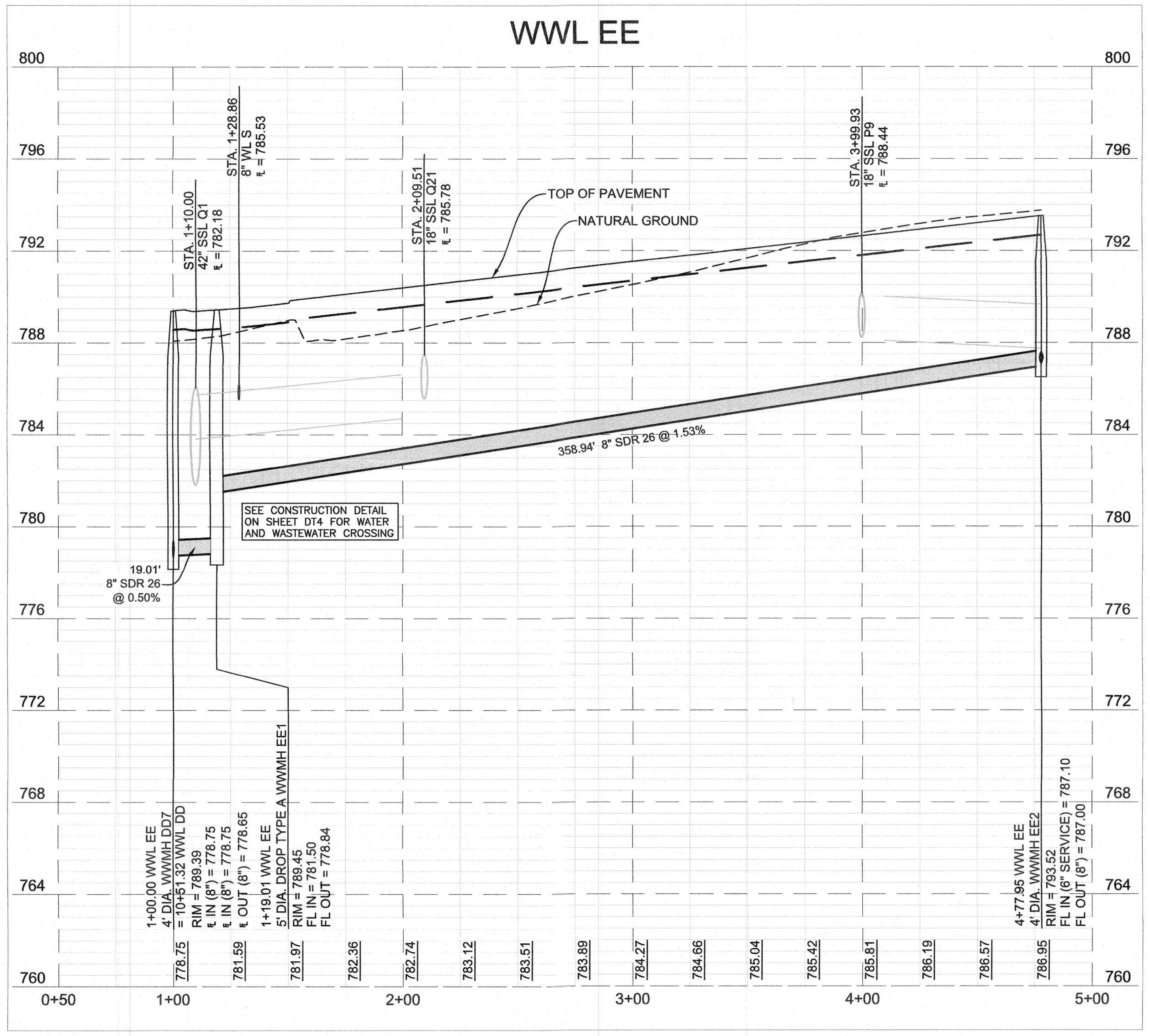
0 40 80

1" = 40'

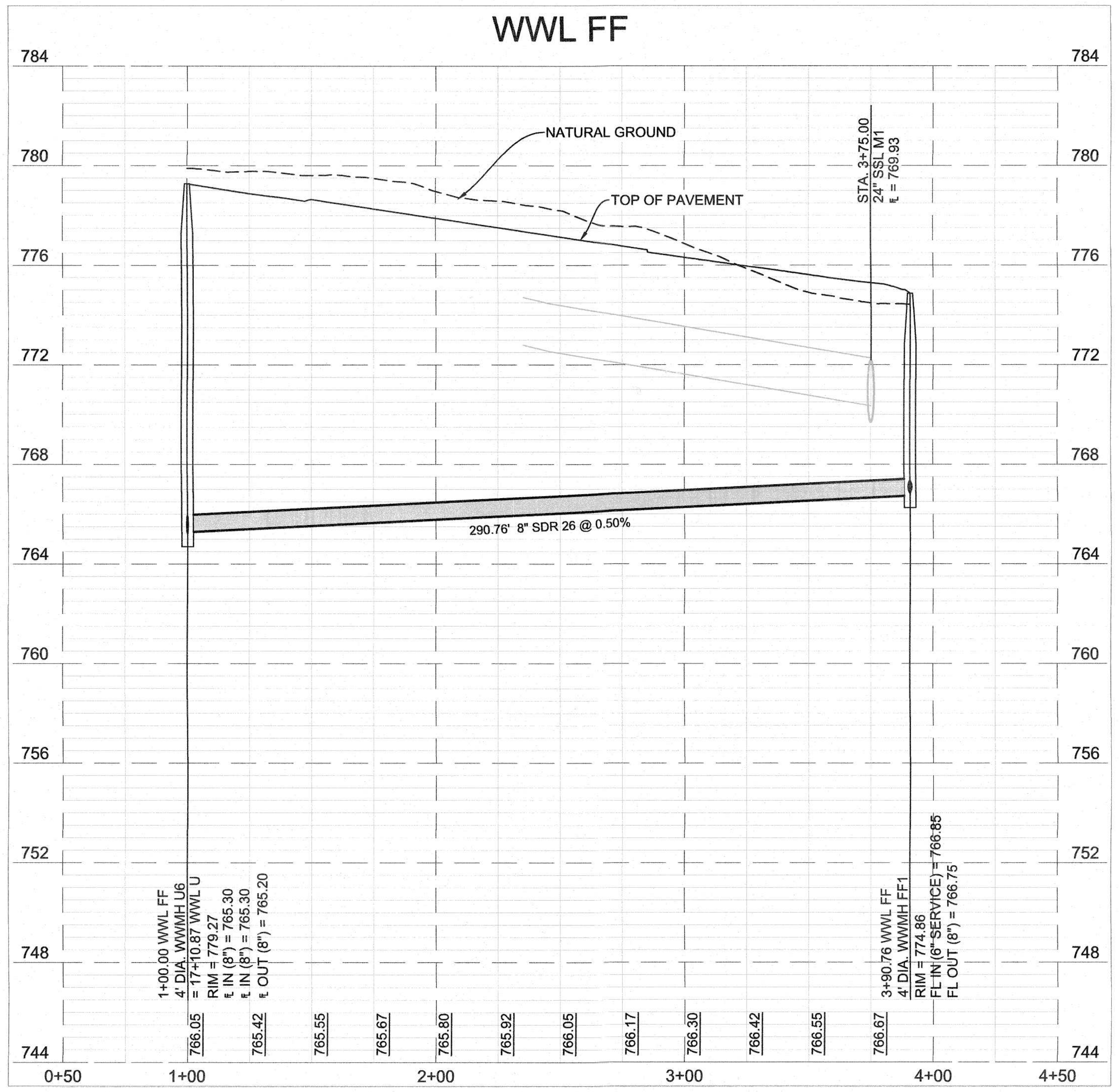
LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
⊗	PROPOSED GATE VALVE
⊗	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
—∠	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL EE



WWL FF



NOTES:

1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
3. ALL GRAVITY SANITARY SEWER LINES SHALL CONFORM TO ASTM D 3034, PVC, SDR 26 WITH ASTM 3212 JOINTS. GRAVITY SANITARY SEWER LINES CROSSING POTABLE WATER LINES SHALL CONFORM TO 30 TAC 217.53(d).
4. ALL MANHOLES OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE BOLTED AND GASKETED WATERTIGHT COVERS.
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6. ALL WASTEWATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL WW13. ALL SERVICES MUST BE PLACED IN RIGHT OF WAY AT PROPERTY LINE. NO SERVICES ARE TO BE LOCATED WITHIN SIDEWALKS OR CURB RAMPS.
7. CONTRACTOR TO VERIFY ALL WASTEWATER LINE GRADE AND ALIGNMENTS AT NO GREATER THAN 50' INTERVALS.
8. SEE PROFILE SHEETS FOR DEEP SERVICE CONNECTIONS AND LOCATIONS.
9. THE USE OF BRICK MANHOLES AND BRICKS TO ADJUST MANHOLES IS PROHIBITED.
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811 Know what's below. Call before you dig.

WOODFIELD PRESERVE
PHASE 3
WASTEWATER LINES EE & FF
PLAN AND PROFILE
STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW12.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
PROFESSIONAL ENGINEER
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

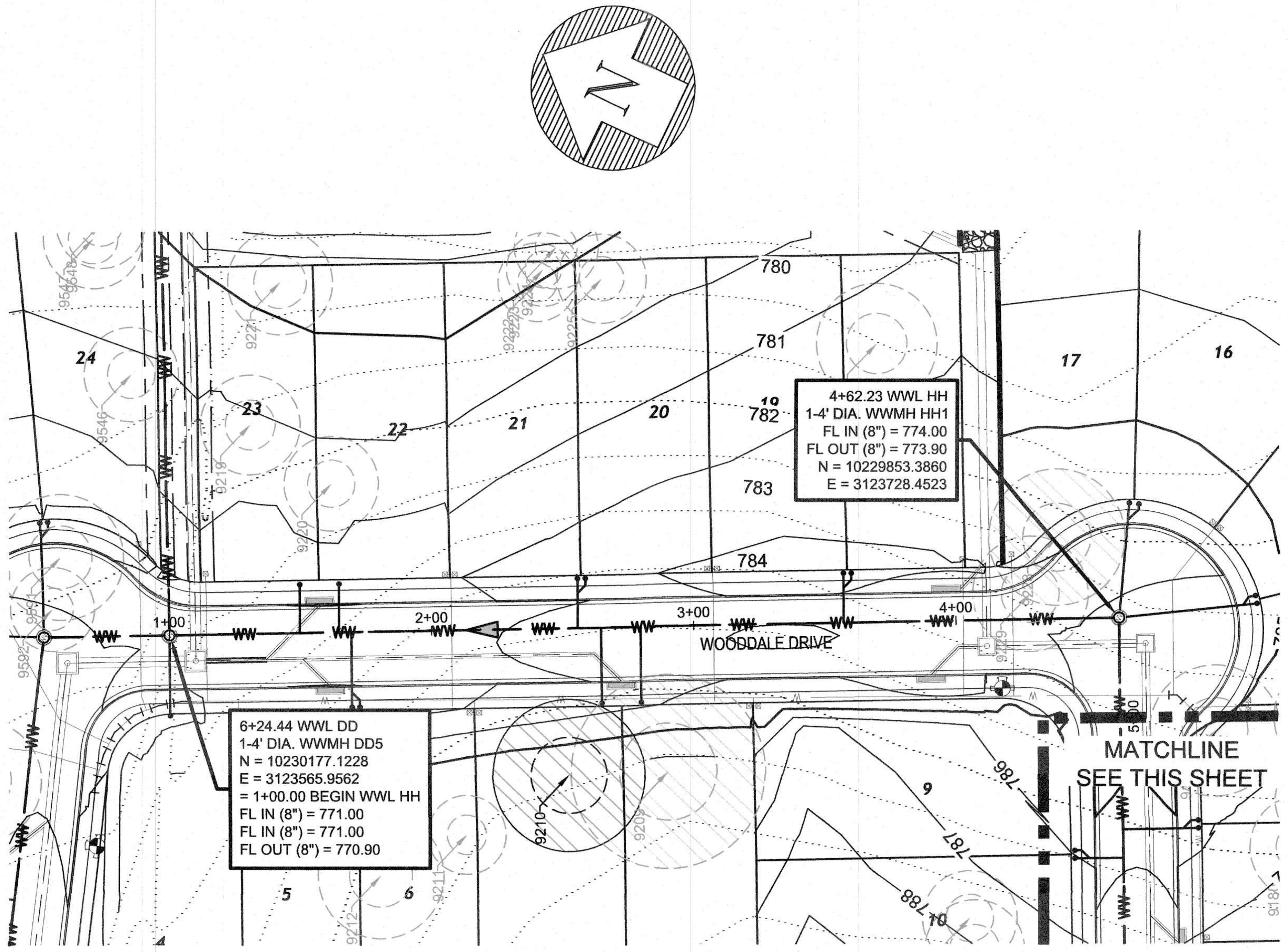
JOB NUMBER:
A245-1002

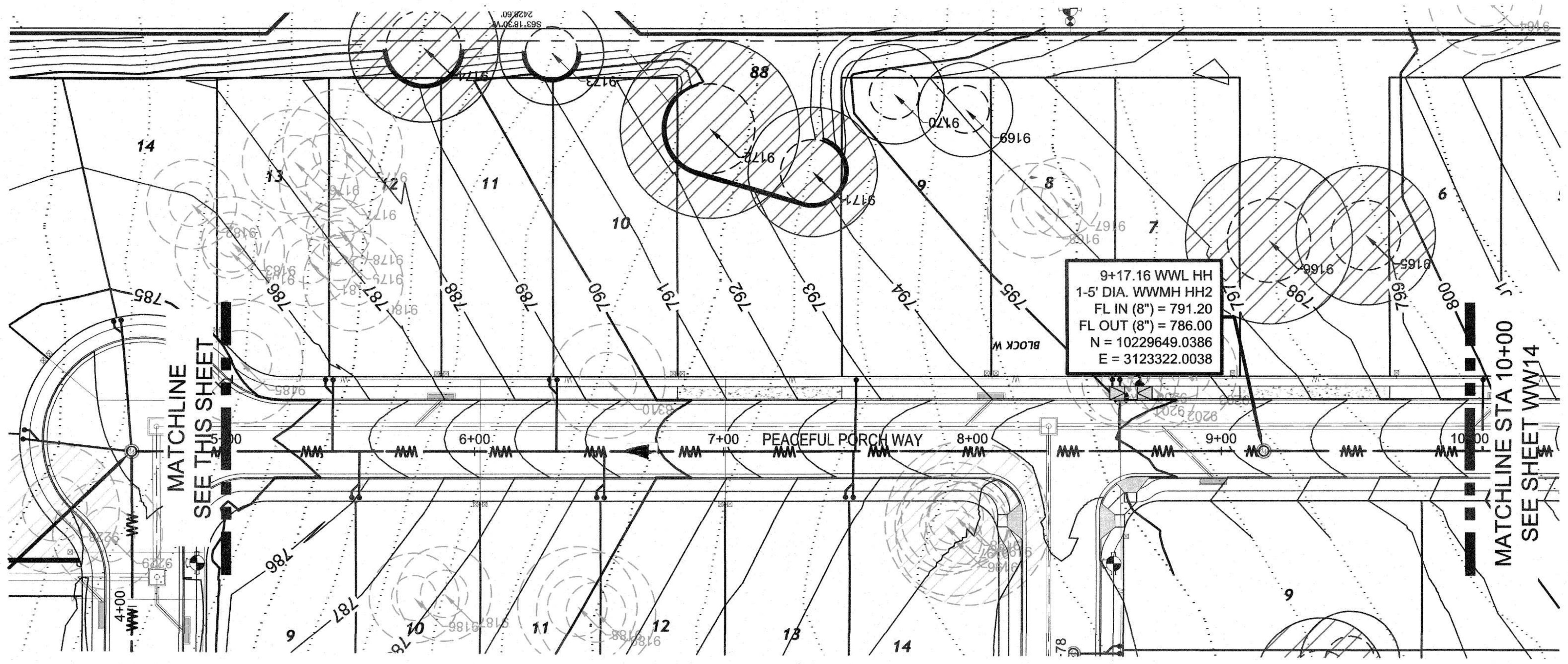
WW12

SHEET NO.
98
OF 118 SHEETS

Date/Time : Tue, 13 Feb 2024 - 5:19pm User Name : jslecuch
Path/Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW12.dwg

2023-33-CON



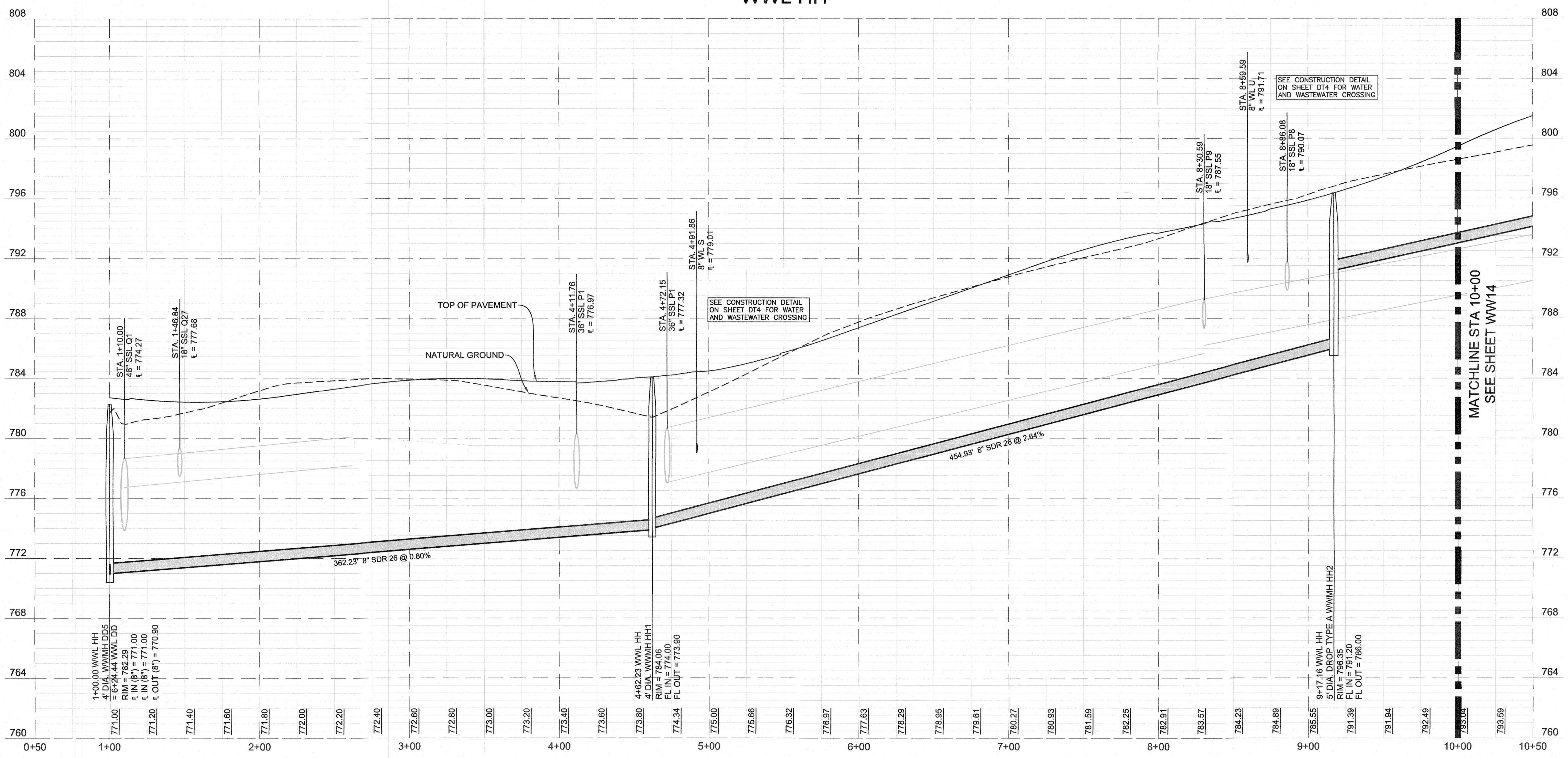


0 40 80
1" = 40'

LEGEND:

- PROPOSED FIRE HYDRANT ASSEMBLY
- EXISTING FIRE HYDRANT
- PROPOSED GATE VALVE
- EXISTING GATE VALVE
- PROPOSED AIR RELEASE VALVE
- EXISTING AIR RELEASE VALVE
- PROPOSED PLUG OR CAP
- EXISTING PLUG OR CAP
- PROPOSED CLEAN OUT
- EXISTING CLEAN OUT
- PROPOSED WATER LINE
- PROPOSED WASTEWATER LINE AND MANHOLE
- PROPOSED STORM SEWER LINE AND MANHOLE
- EXISTING WATER LINE
- EXISTING WASTEWATER LINE AND MANHOLE
- EXISTING STORM SEWER LINE
- DOUBLE SANITARY SERVICE LEAD
- SINGLE SANITARY SERVICE LEAD
- DOUBLE WATER SERVICE LEAD
- SINGLE WATER SERVICE LEAD
- SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL HH



NOTES:

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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINE HH PLAN AND PROFILE
STA. 10+00 TO END

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW13.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW13

SHEET NO.
99
OF 118 SHEETS

2023-33-CON

User Name : jpiecuch
Date\Time : Tue, 13 Feb 2024 - 5:20pm
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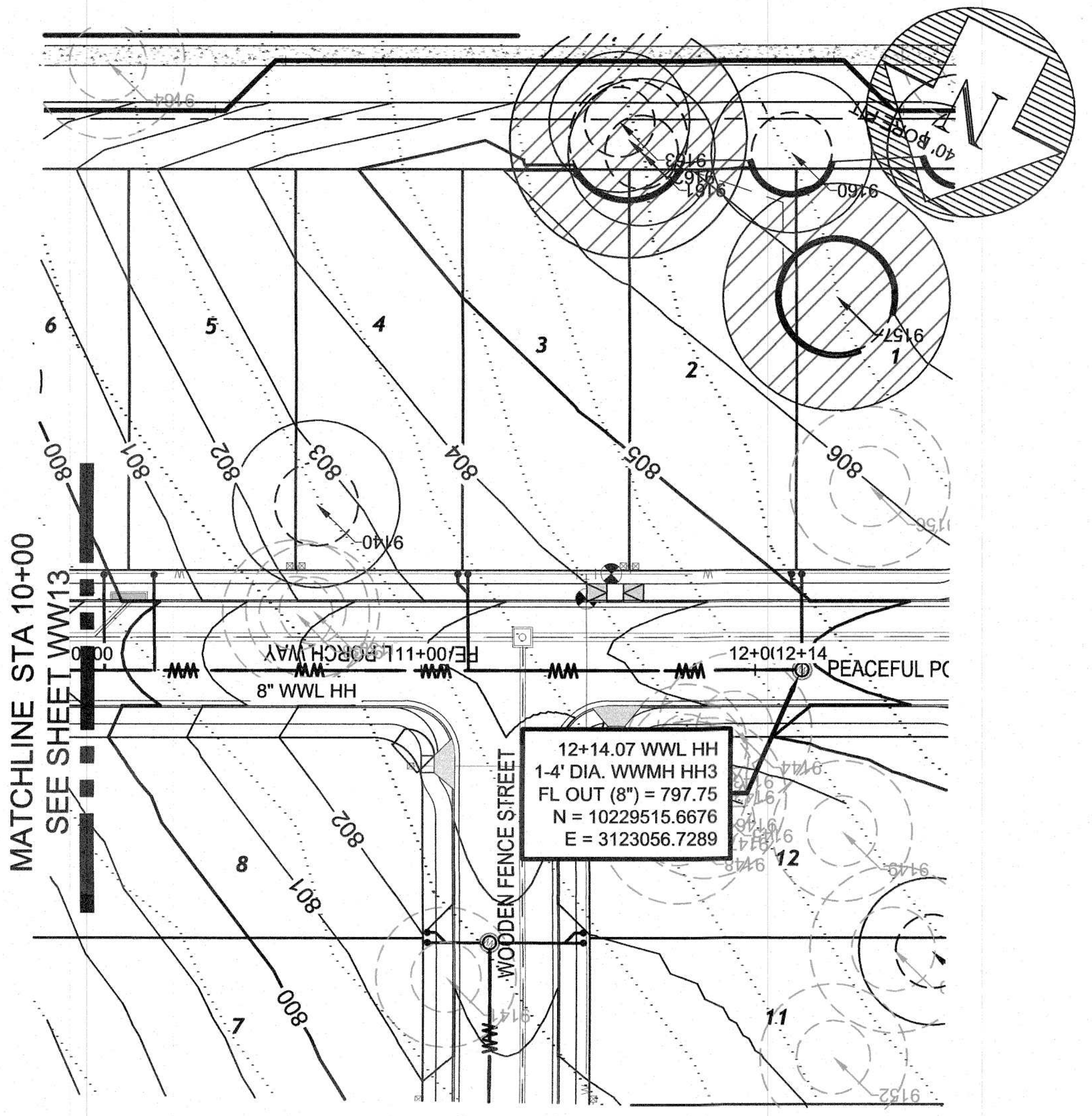
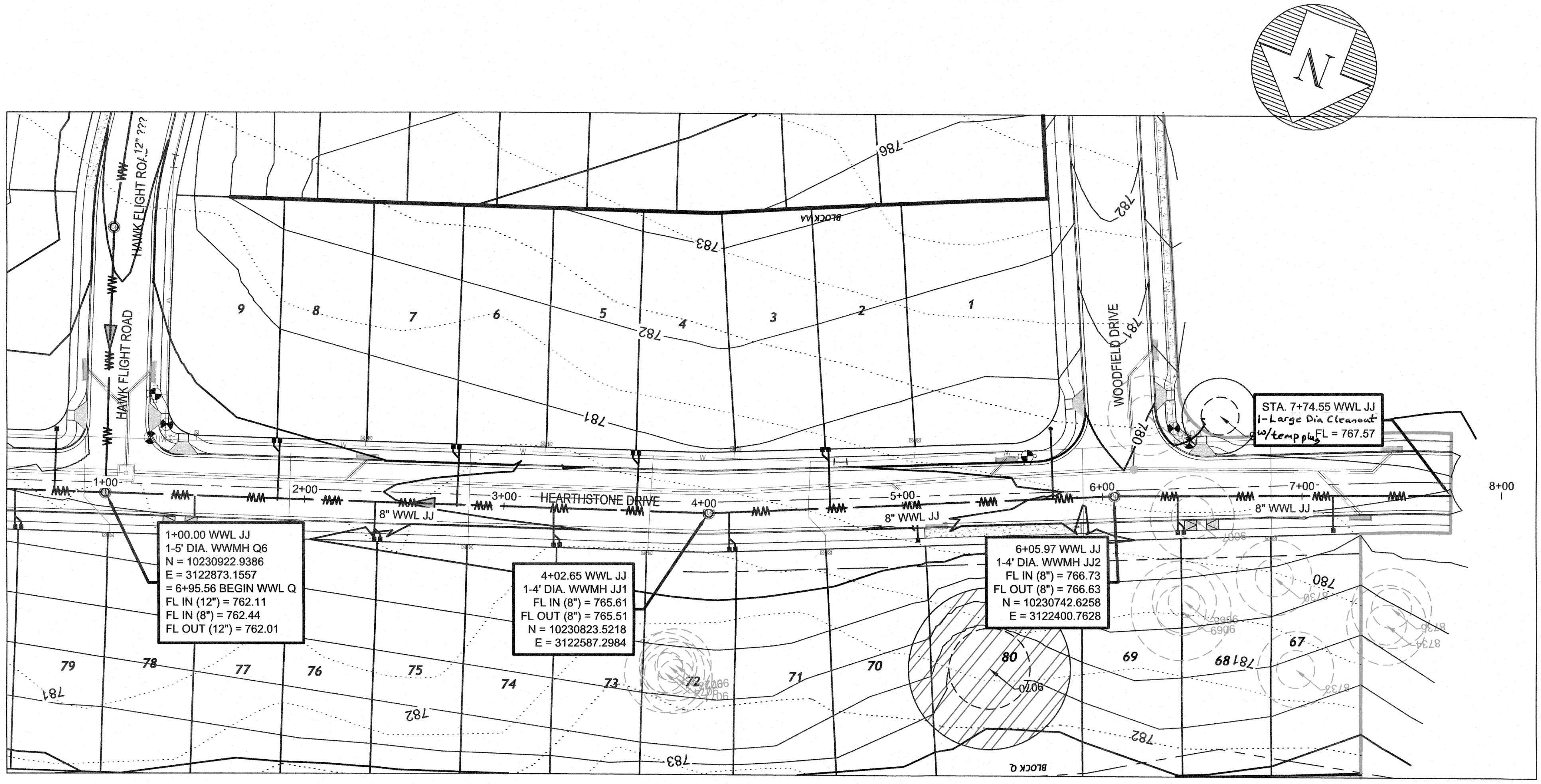


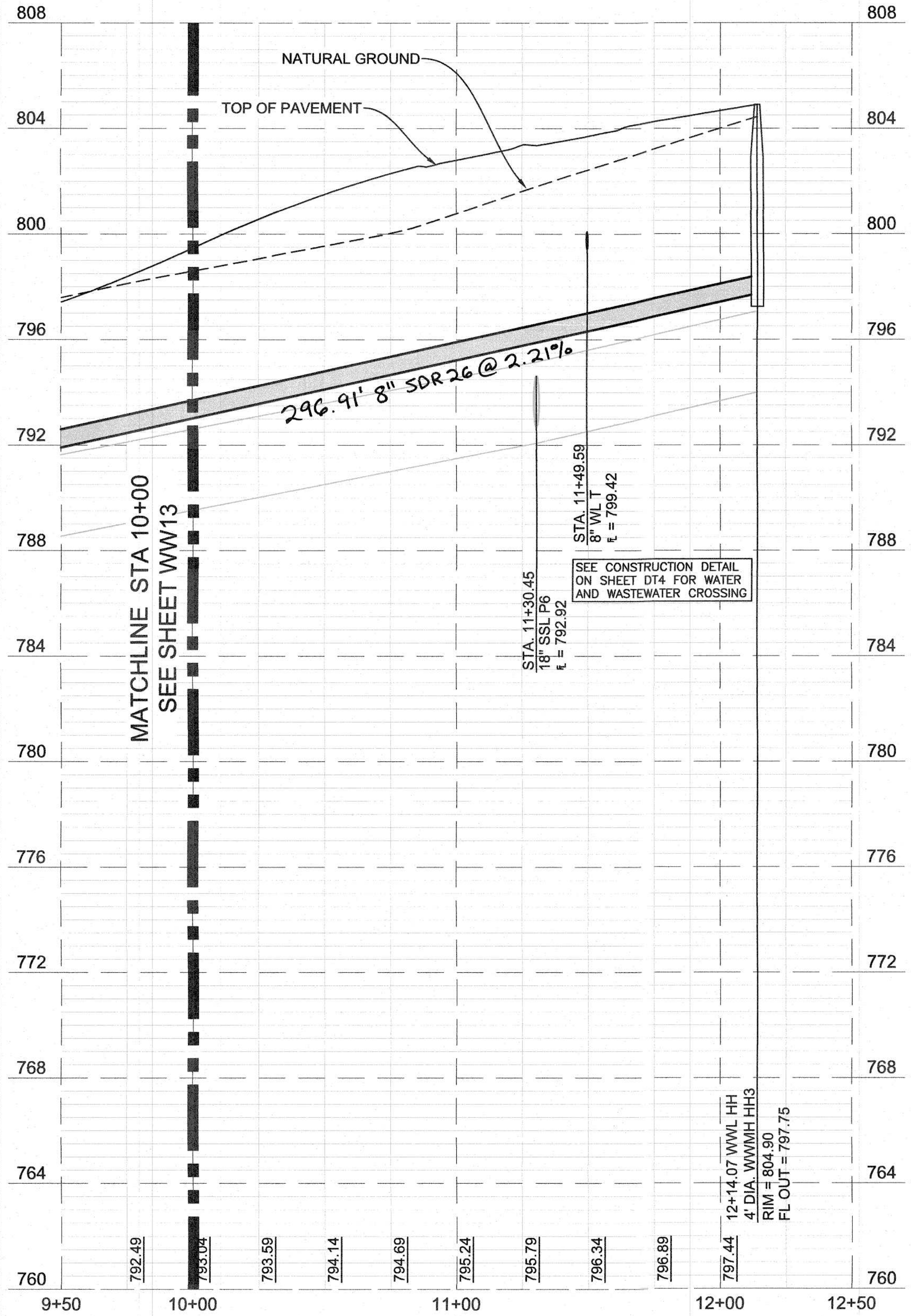


0 40 80
1" = 40'

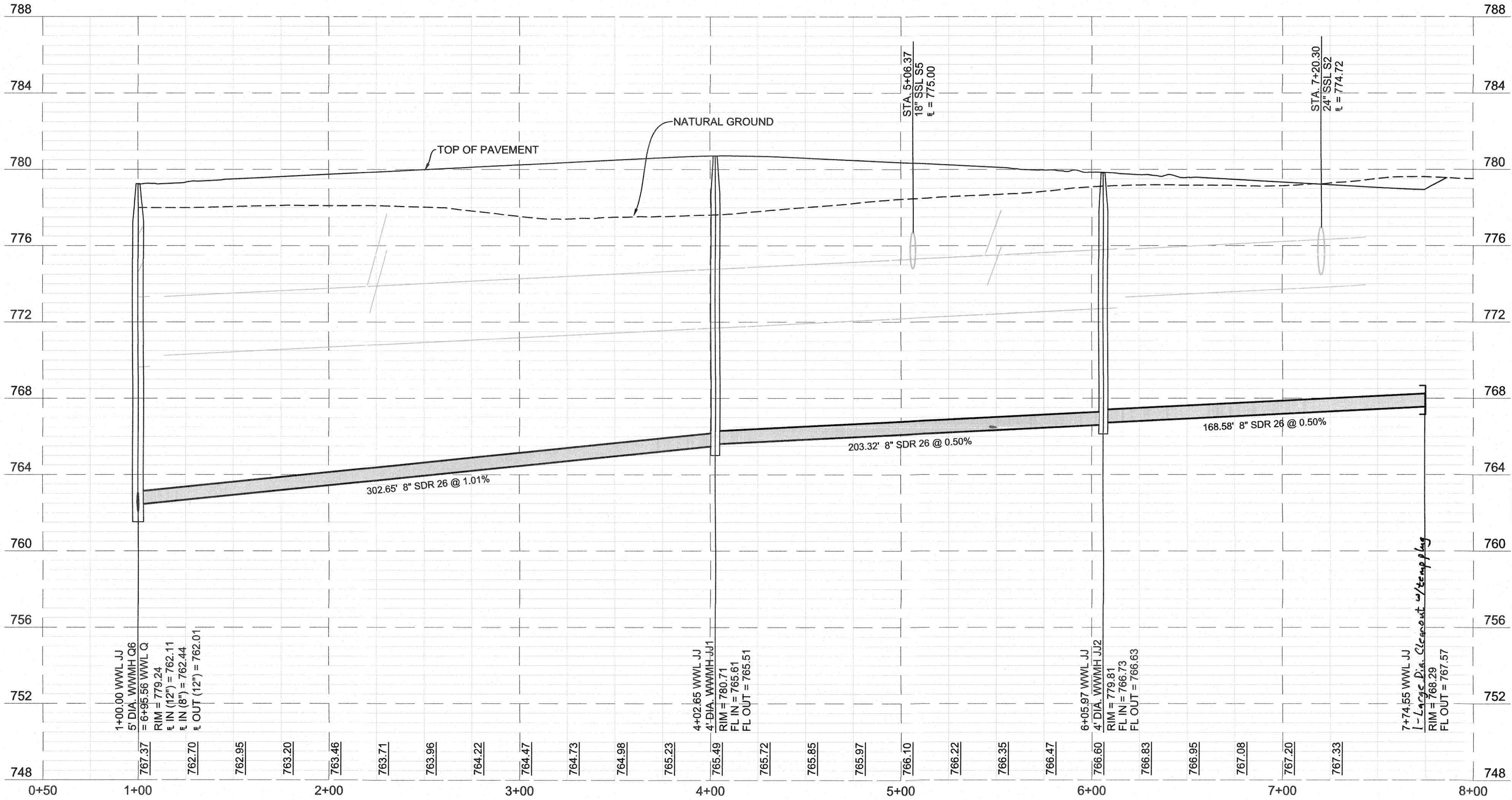
LEGEND:

✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
⊗	PROPOSED GATE VALVE
⊗	EXISTING GATE VALVE
◑	PROPOSED AIR RELEASE VALVE
◑	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—WL—WL—	PROPOSED WATER LINE
—WW—○—WW—	PROPOSED WASTEWATER LINE AND MANHOLE
═○═	PROPOSED STORM SEWER LINE AND MANHOLE
—WL—WL—	EXISTING WATER LINE
—WW—●—WW—	EXISTING WASTEWATER LINE AND MANHOLE
═●═	EXISTING STORM SEWER LINE
⟋	DOUBLE SANITARY SERVICE LEAD
⟋	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD

WWL HH



WWL JJ



NOTES:
1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
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811
Know what's **below.**
Call before you dig.

WOODFIELD PRESERVE
PHASE 3
WASTEWATER LINE PLAN AND PROFE
WWL HH STA. 10+00 TO END
WWL JJ STA. 1+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW14.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

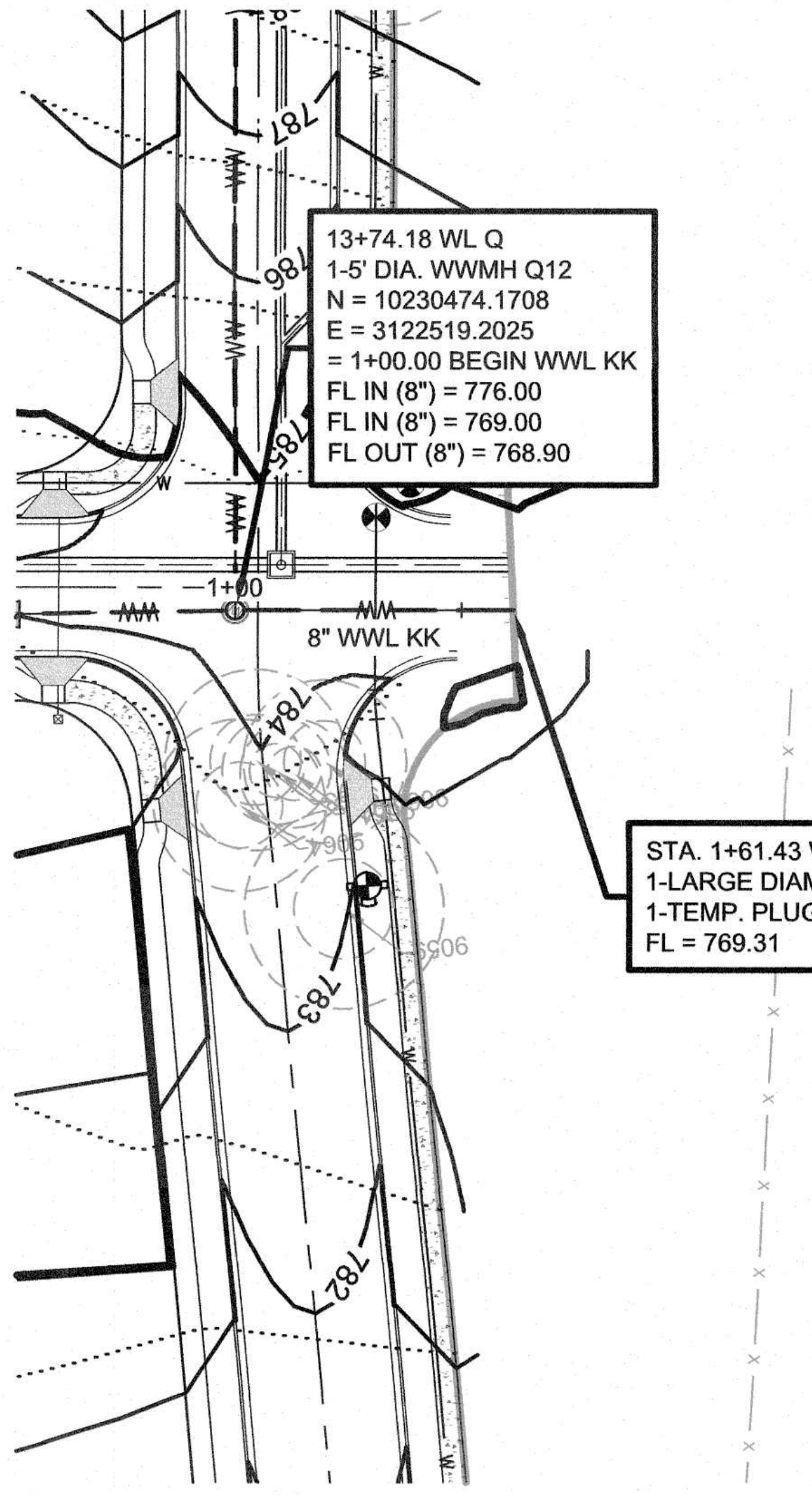
JOB NUMBER:
A245-1002

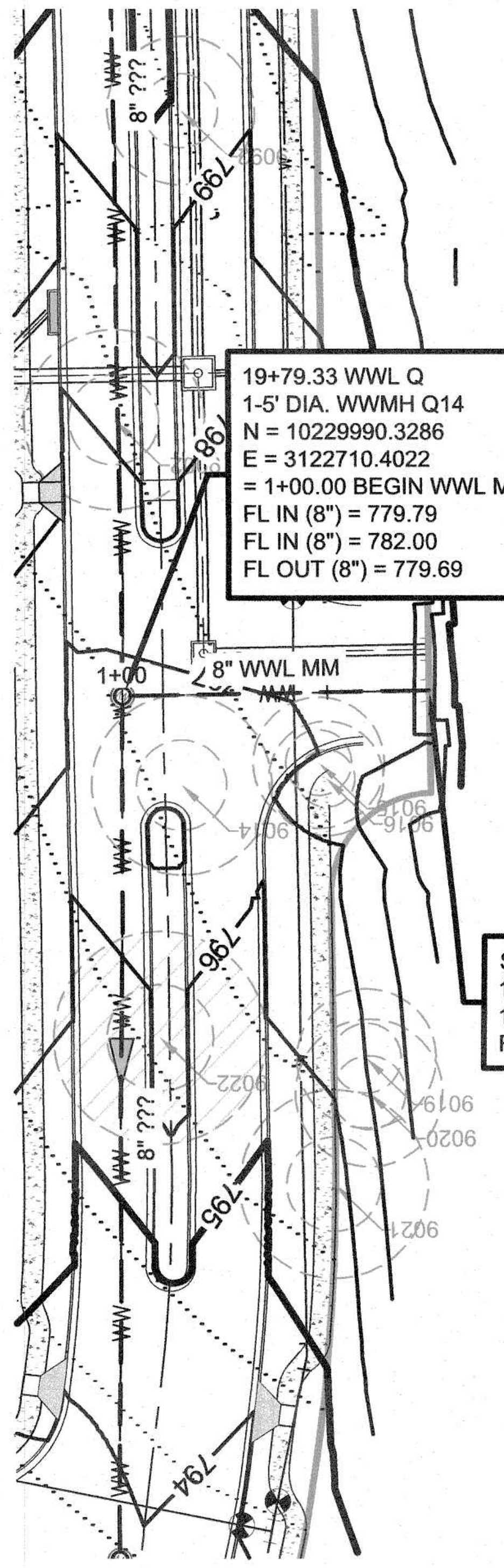
WW14

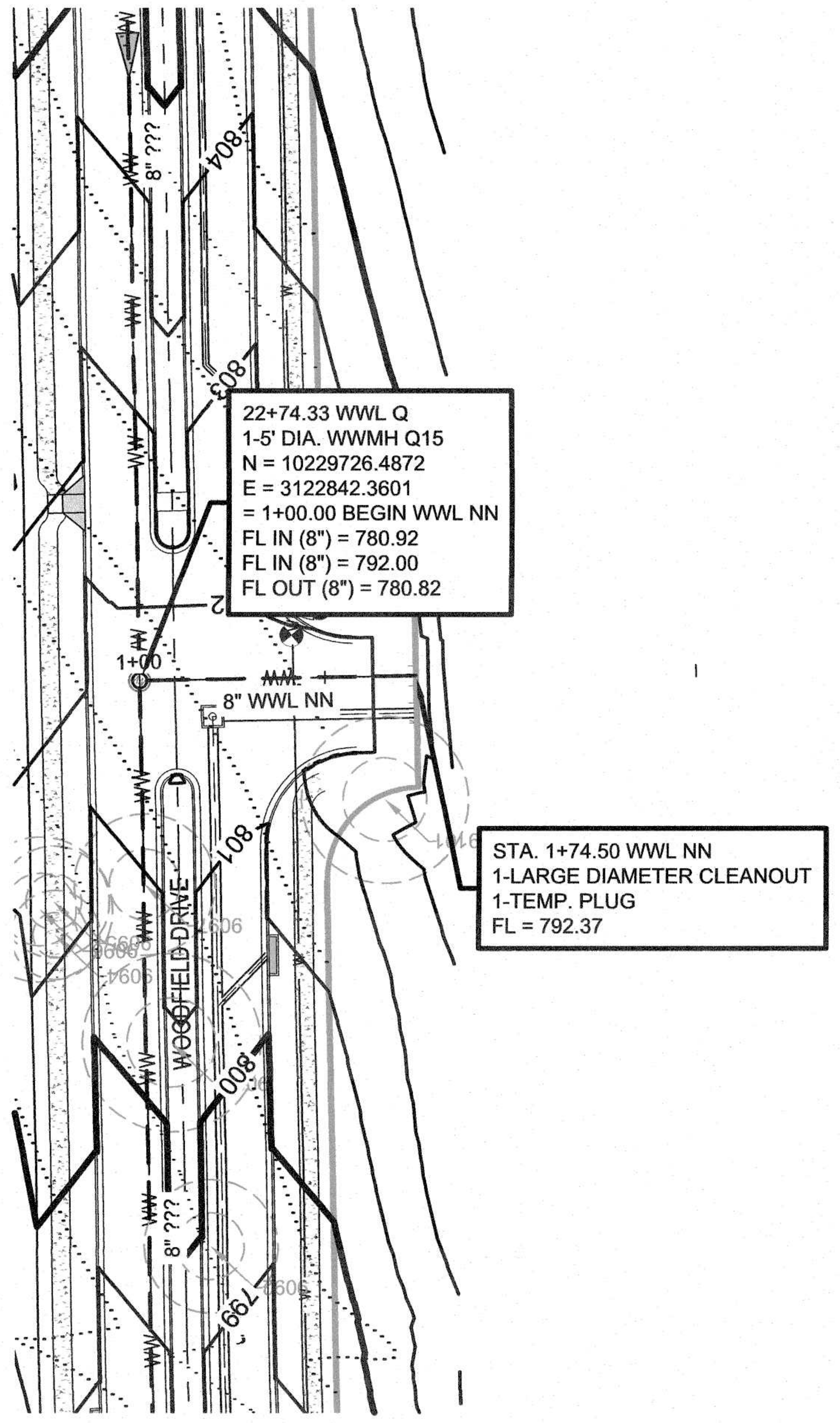
SHEET NO.
100
OF 118 SHEETS

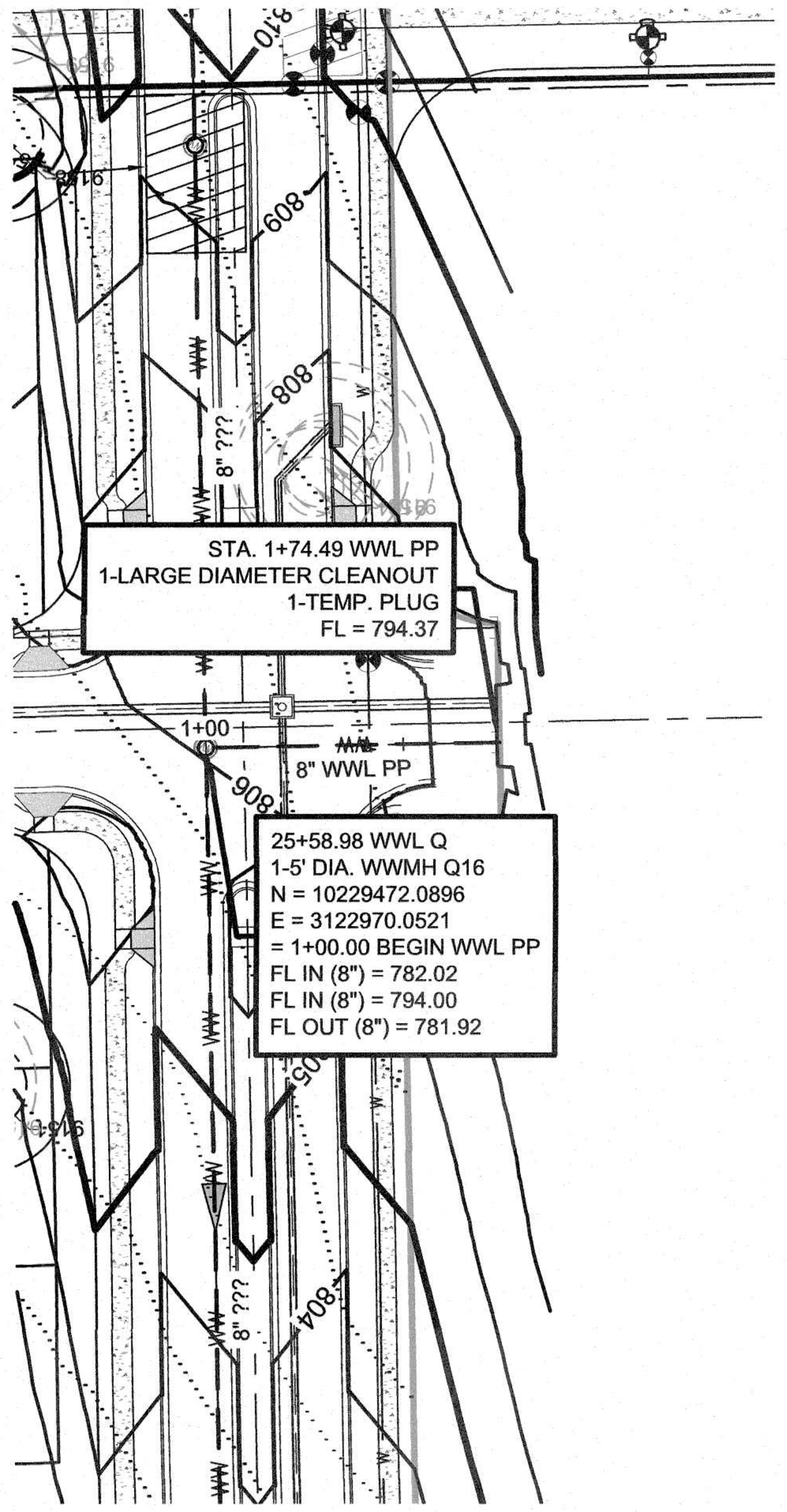
User Name : jsiecuch
Date\Time : Tue, 13 Feb 2024 - 5:21pm
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW14.dwg

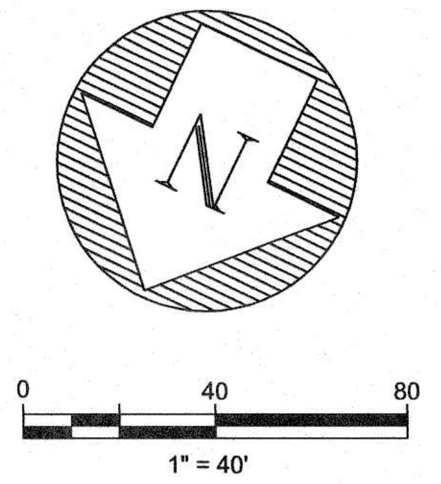
2023-33-CON





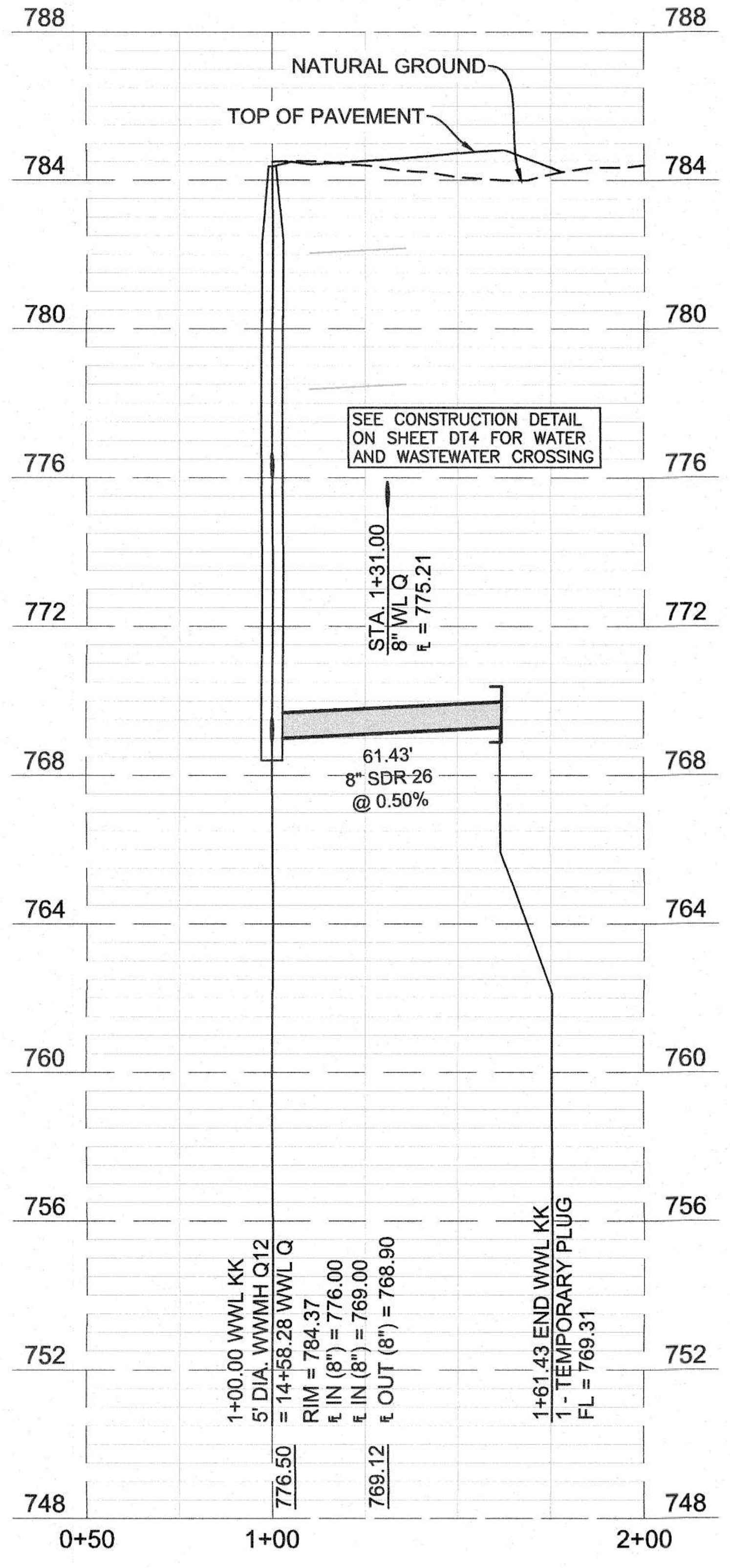




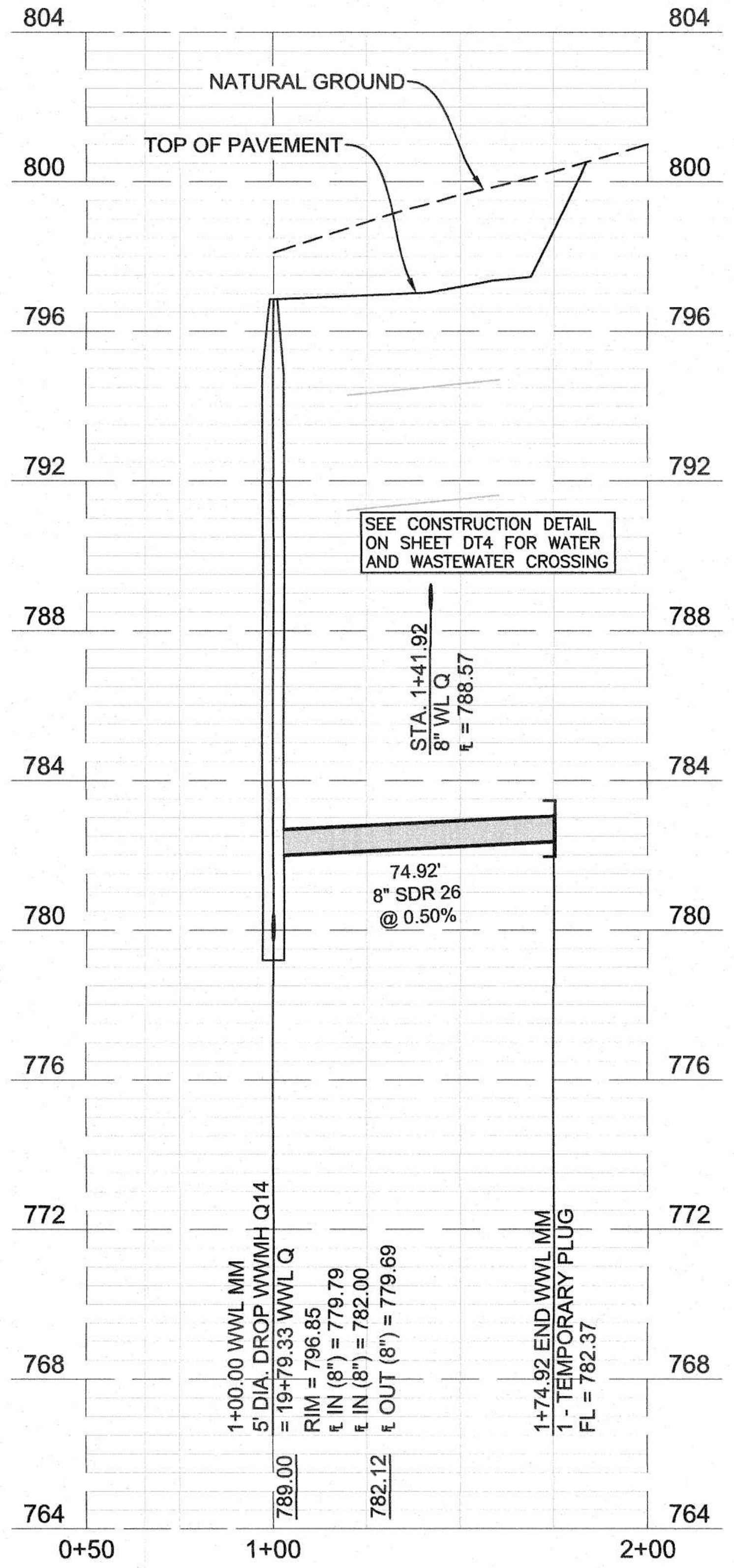


LEGEND:

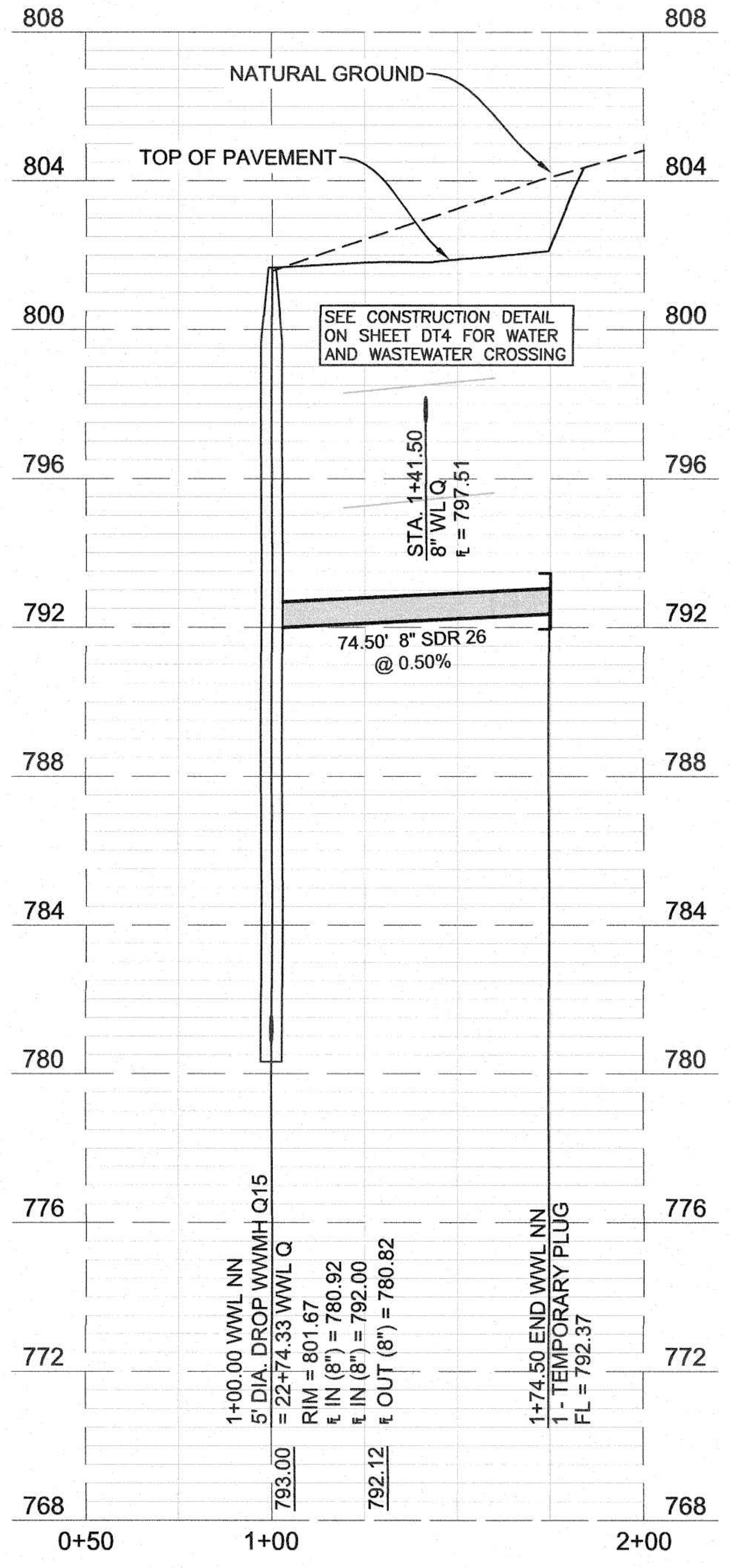
✚	PROPOSED FIRE HYDRANT ASSEMBLY
✚	EXISTING FIRE HYDRANT
●	PROPOSED GATE VALVE
○	EXISTING GATE VALVE
●	PROPOSED AIR RELEASE VALVE
○	EXISTING AIR RELEASE VALVE
]	PROPOSED PLUG OR CAP
]	EXISTING PLUG OR CAP
○	PROPOSED CLEAN OUT
○	EXISTING CLEAN OUT
—	PROPOSED WATER LINE
—○—	PROPOSED WASTEWATER LINE AND MANHOLE
—○—	PROPOSED STORM SEWER LINE AND MANHOLE
—	EXISTING WATER LINE
—●—	EXISTING WASTEWATER LINE AND MANHOLE
—●—	EXISTING STORM SEWER LINE
—/	DOUBLE SANITARY SERVICE LEAD
—/	SINGLE SANITARY SERVICE LEAD
—□	DOUBLE WATER SERVICE LEAD
—○	SINGLE WATER SERVICE LEAD
—◢	SINGLE WASTEWATER PRESSURE SERVICE LEAD



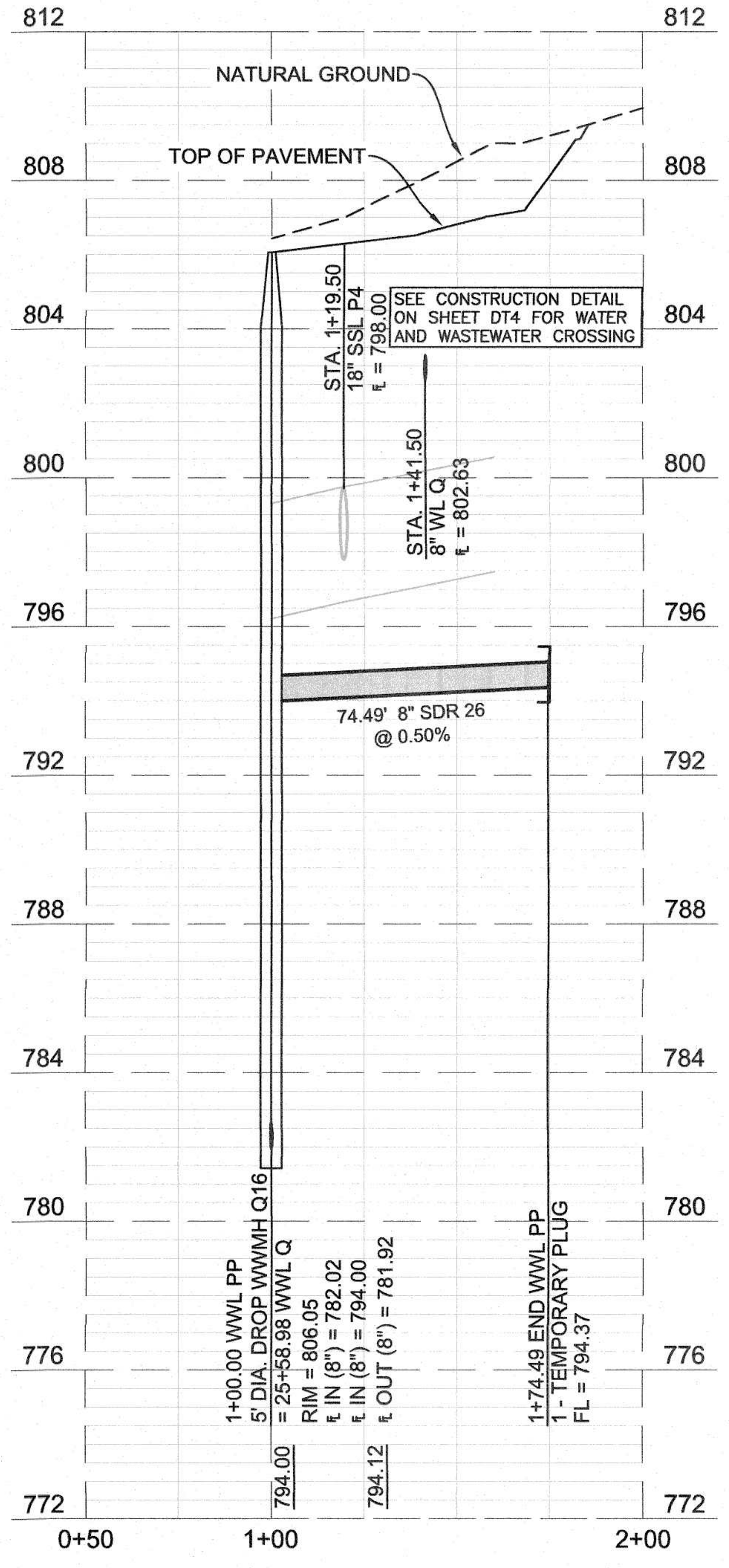
WWL KK



WWL MM



WWL NN



WWL PP

NOTES:

1. ALL WASTEWATER LINES ARE PVC SDR 26.
2. ALL WASTEWATER MANHOLES TO BE CONSTRUCTED PER CITY OF GEORGETOWN DETAIL WW04 OR WW05 (DROP MANHOLE), WW02 OR WW03 (STANDARD MANHOLE), AND TO CITY OF GEORGETOWN DETAILS WW06, WW07, WW07A, WW09, AND WW10.
3. ALL GRAVITY SANITARY SEWER LINES SHALL CONFORM TO ASTM D 3034, PVC, SDR 26 WITH ASTM 3212 JOINTS. GRAVITY SANITARY SEWER LINES CROSSING POTABLE WATER LINES SHALL CONFORM TO 30 TAC 217.53(d).
4. ALL MANHOLES OUTSIDE OF PUBLIC RIGHT OF WAY SHALL HAVE BOLTED AND GASKETED WATERTIGHT COVERS.
5. ALL STREETS SHALL BE CONSTRUCTED TO SUBGRADE PRIOR TO PLACEMENT OF WATER AND WASTEWATER LINES. FILL AREAS TO MEET CITY OF AUSTIN SPECIFICATION FOR BACKFILL AND COMPACTION.
6. ALL WASTEWATER SERVICES TO BE INSTALLED PER CITY OF GEORGETOWN DETAIL WW13. ALL SERVICES MUST BE PLACED IN RIGHT OF WAY AT PROPERTY LINE. NO SERVICES ARE TO BE LOCATED WITHIN SIDEWALKS OR CURB RAMPS.
7. CONTRACTOR TO VERIFY ALL WASTEWATER LINE GRADE AND ALIGNMENTS AT NO GREATER THAN 50' INTERVALS.
8. SEE PROFILE SHEETS FOR DEEP SERVICE CONNECTIONS AND LOCATIONS.
9. THE USE OF BRICK MANHOLES AND BRICKS TO ADJUST MANHOLES IS PROHIBITED.
10. PIPE STATIONING AND LINEAR FOOTAGE IS FROM CENTER OF MANHOLE TO CENTER OF MANHOLE. PIPE SLOPE IS CALCULATED FROM INSIDE FACE OF MANHOLE TO INSIDE FACE OF MANHOLE.

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

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

WOODFIELD PRESERVE
PHASE 3

WASTEWATER LINES KK, LL, MM, & NN
PLAN AND PROFILE
STA. 10+00 TO END

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 2/13/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_WW15.dwg

STATE OF TEXAS
JUSTIN D. MIDURA
128809
LICENSED PROFESSIONAL ENGINEER
2-26-2024

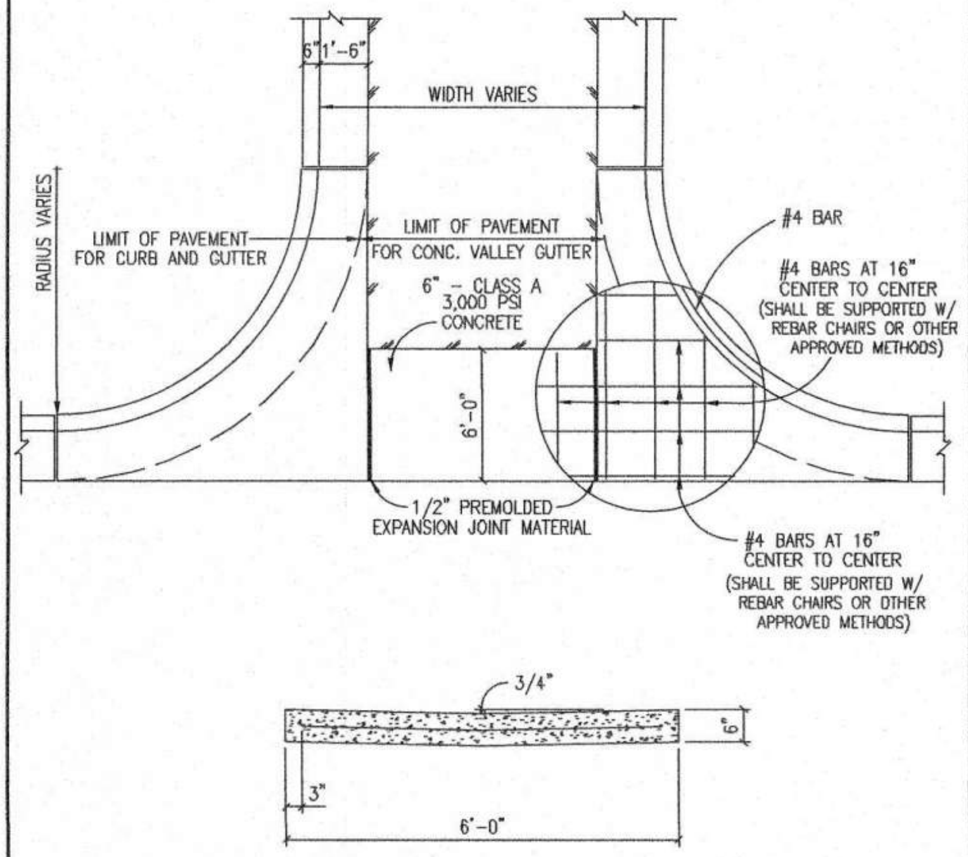
LJA
LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

WW15

SHEET NO.
101
OF 118 SHEETS

Date\Time : Tue, 13 Feb 2024 - 5:25pm User Name : jpiecuch
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_WW15.dwg

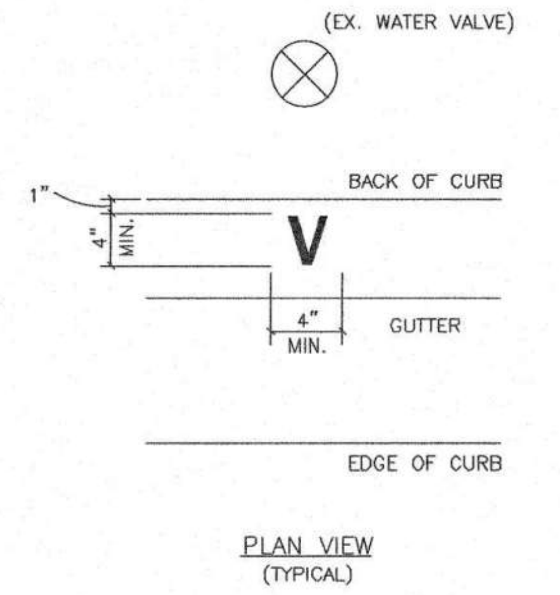


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE VALLEY GUTTER DETAIL

SD03



PLAN VIEW
(TYPICAL)

NOTES:

1. ALL WATER SERVICE, WASTE WATER SERVICE AND VALVE LOCATIONS SHALL BE APPROXIMATLEY MARKED AS FOLLOWS:

WATER SERVICE	"W"	TOP OF CURB
WASTE WATER SERVICE	"S"	TOP OF CURB
VALVE	"V"	TOP OF CURB

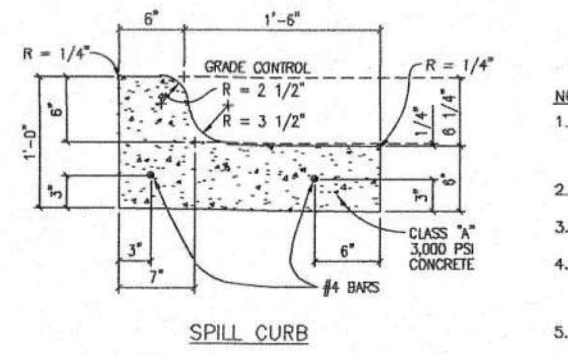
2. LETTERS SHALL HAVE A 1/2" MAX. WIDTH.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

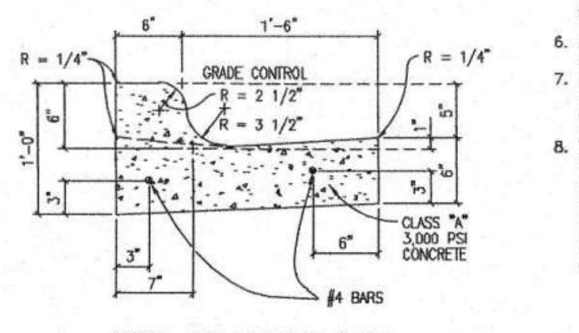
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB STAMP DETAIL

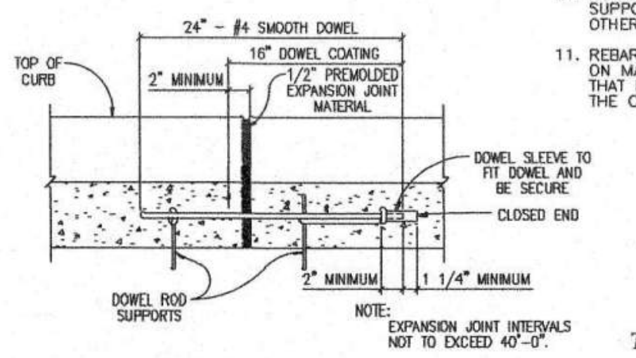
SD05
NTS 1/2003
MRS TRB



SPILL CURB



CATCH AND LAYDOWN CURB



NOTE:
EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0".

CURB DOWEL DETAIL

NOTES:

1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR THE CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. THE FOLLOWING SCHEME OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   - A. ALL CURB AND CURB AND GUTTER (REINFORCED) SHALL HAVE TWO #4 LONGITUDINAL REINFORCING BARS.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

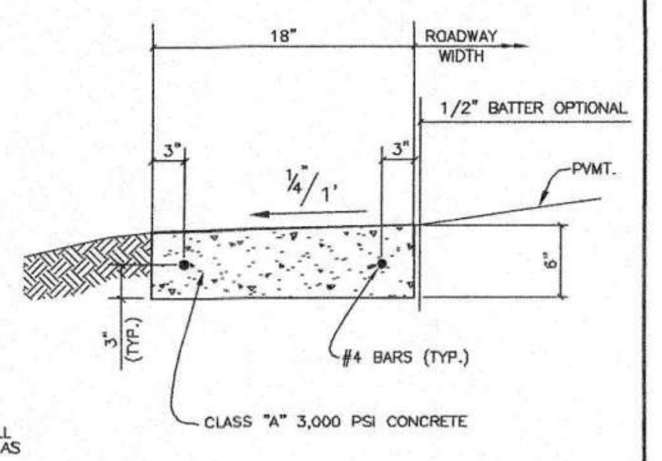
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB AND GUTTER DETAILS

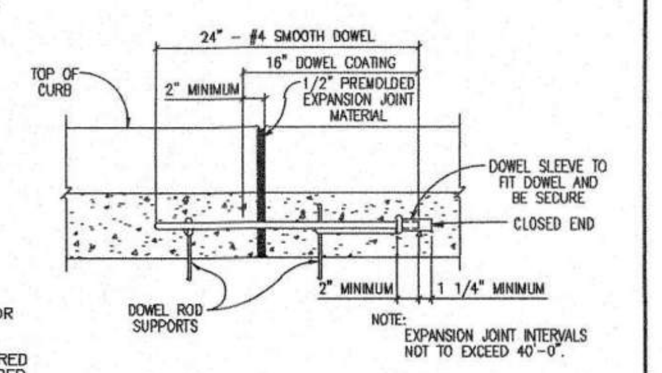
SD06
NTS
MRS TRB

NOTES:

1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR TH CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   - A. CURB AND GUTTER (REINFORCED) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #4.
   - B. ALL TYPES OF CURB (REINFORCED) SHALL HAVE #4 BAR FOR LONGITUDINAL REINFORCEMENT.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.



RIBBON CURB



NOTE:
EXPANSION JOINT INTERVALS NOT TO EXCEED 40'-0".

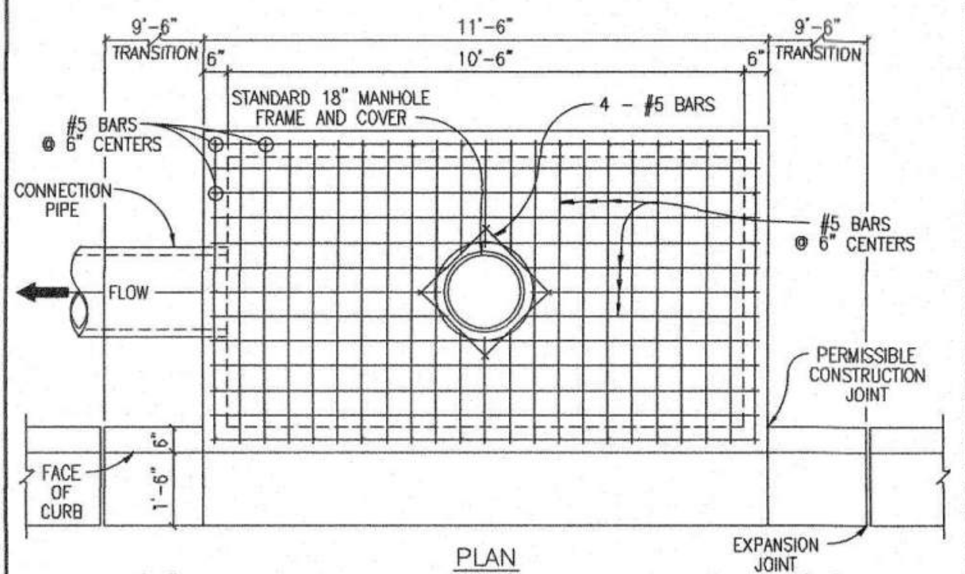
CURB DOWEL DETAIL

The Architect/Engineer assumes responsibility for appropriate use of this standard.

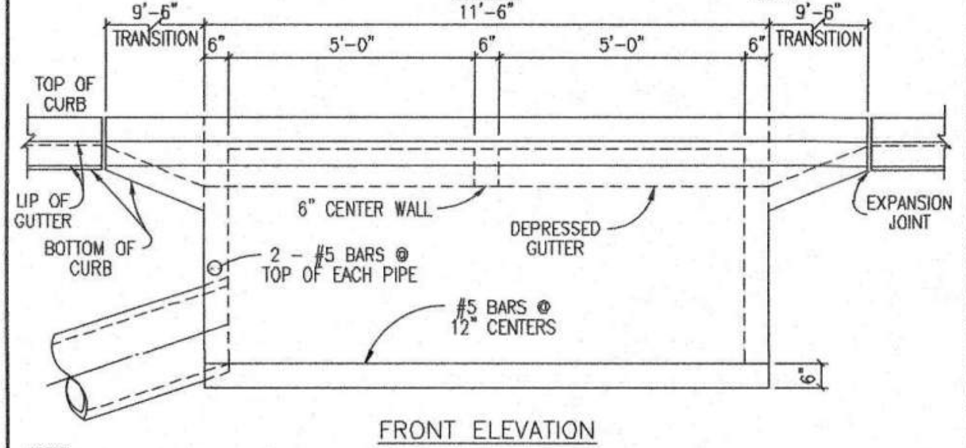
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
RIBBON CURB DETAILS

SD08
NTS 1/2003
MRS TRB



PLAN



FRONT ELEVATION

NOTES:

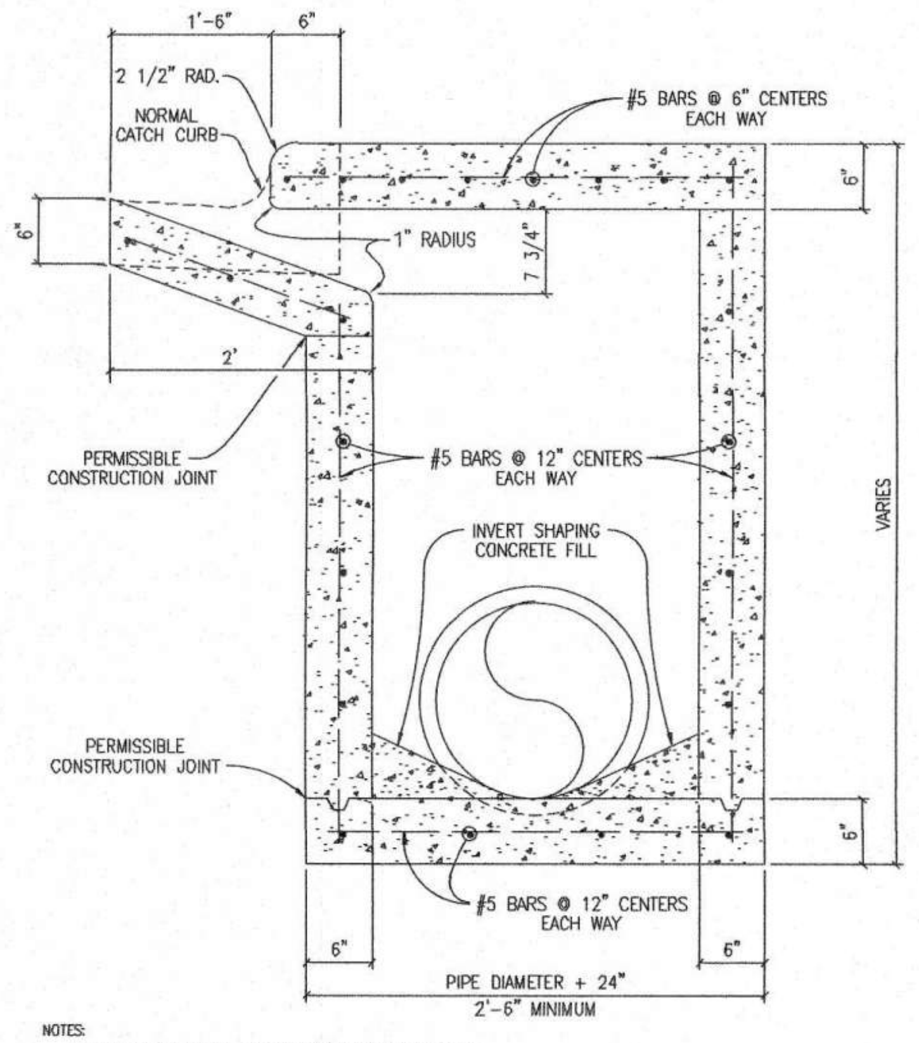
1. ALL CONCRETE SHALL BE CLASS "A" 3,000 PSI CONCRETE.
2. STORM SEWER PIPE MATERIAL TO BE R.C.P. (CLASS III) UNLESS OTHERWISE APPROVED BY THE CITY OF GEORGETOWN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB INLET DETAIL

SD09
NTS 1/2003
MRS TRB



NOTES:

1. ALL CONCRETE SHALL BE CLASS "A" 3,000 PSI CONCRETE.
2. STORM SEWER PIPE MATERIAL TO BE R.C.P. (CLASS III) UNLESS OTHERWISE APPROVED BY THE CITY OF GEORGETOWN.

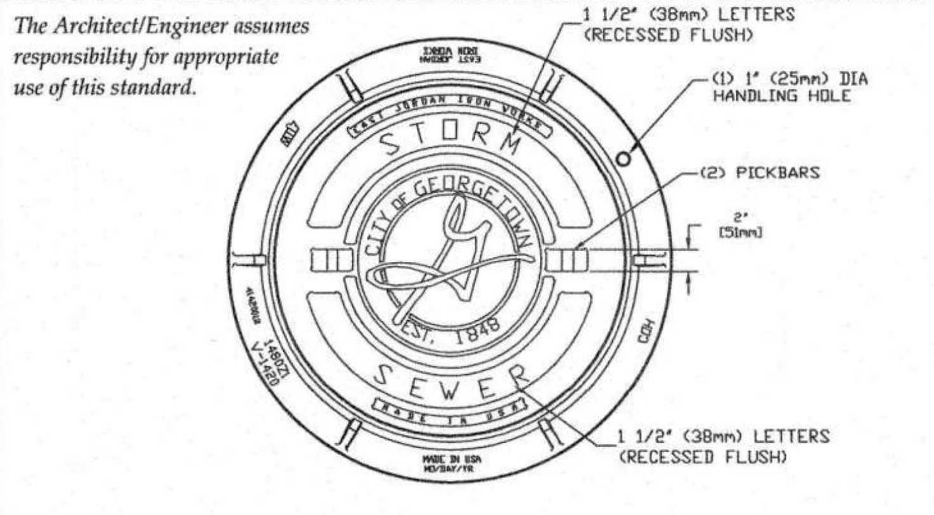
The Architect/Engineer assumes responsibility for appropriate use of this standard.

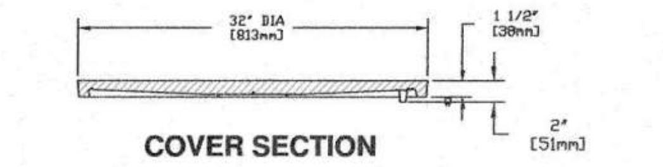
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB DRAIN INLET
TYPICAL SECTION

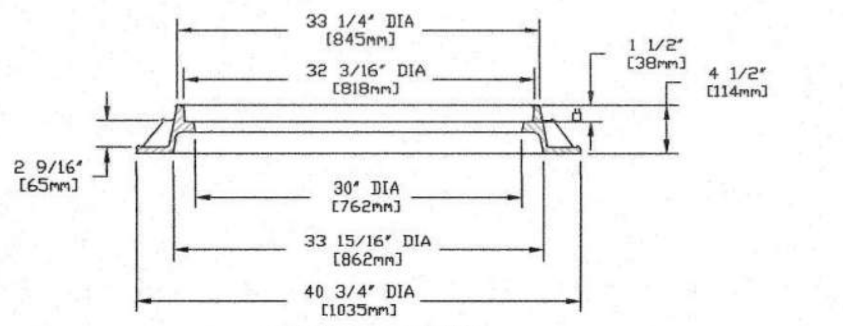
SD10
NTS 1/2003
MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.





COVER SECTION



FRAME SECTION

NOTES:

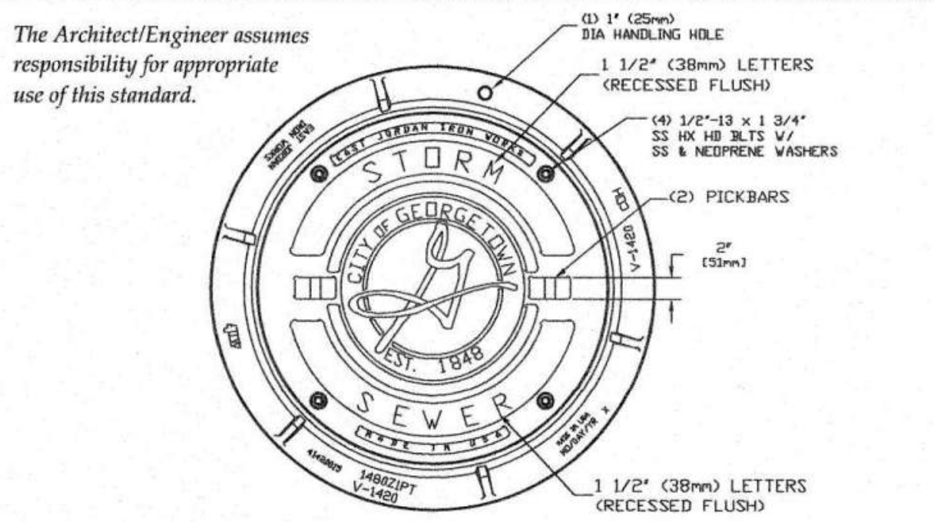
1. STANDARD STORM SEWER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V-1420\1480Z1, COVER TO BE STAMPED WITH "STORM SEWER".
2. STANDARD STORM SEWER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 41420012 00148391.
4. FOR BOLTED STORM SEWER MANHOLE SET REFER TO DETAIL SD11A.

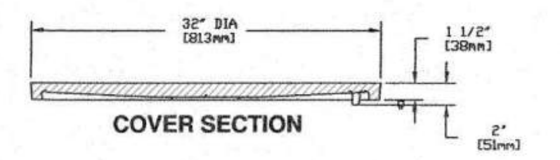
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD STORM SEWER
MANHOLE SET

SD11
NTS 1/2003
MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.





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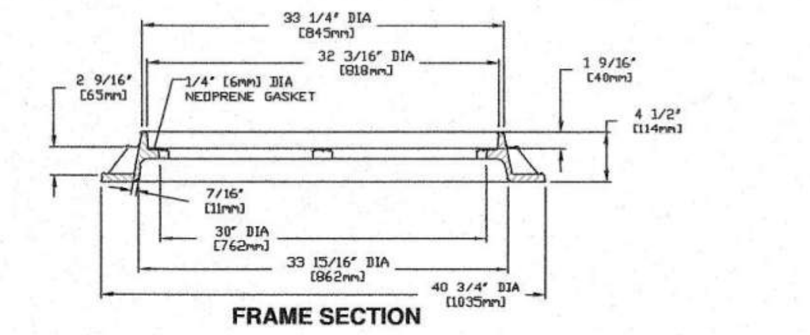


FRAME SECTION

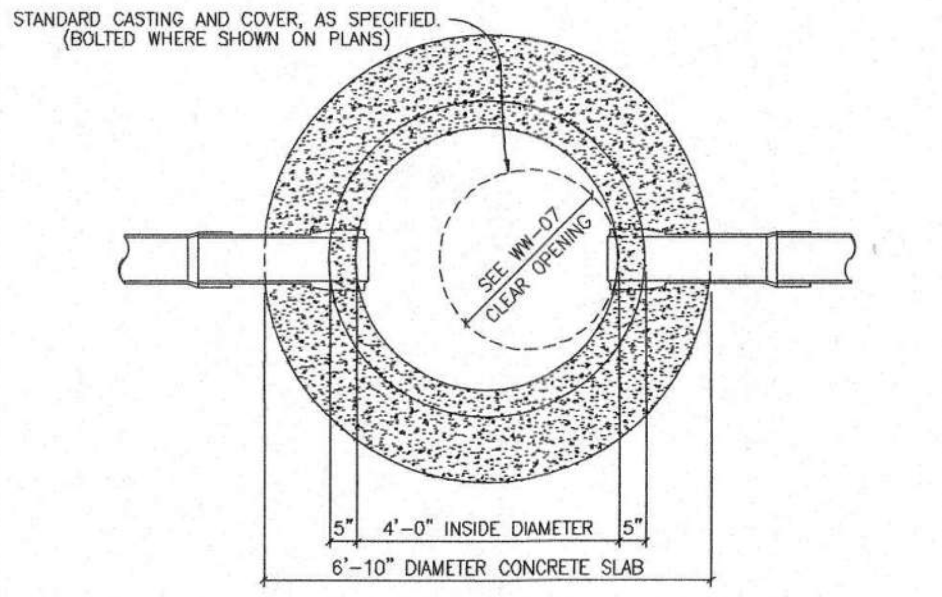
NOTES:

1. BOLTED STORM SEWER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480APT V-1420\1480Z1PT. COVER TO BE STAMPED WITH "STORM SEWER"
2. BOLTED STORM SEWER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 00148393 41420015.
4. FOR STANDARD STORM SEWER MANHOLE SET REFER TO DETAIL SD11.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
BOLTED STORM SEWER
MANHOLE SET

SD11A
NTS 1/2006
MRS TRB



MANHOLE PLAN

CITY OF GEORGETOWN NOTES:

MANHOLE DETAILS SHALL REFLECT THE CITY'S MINIMUM SPECIFICATIONS, AS STATED BELOW:

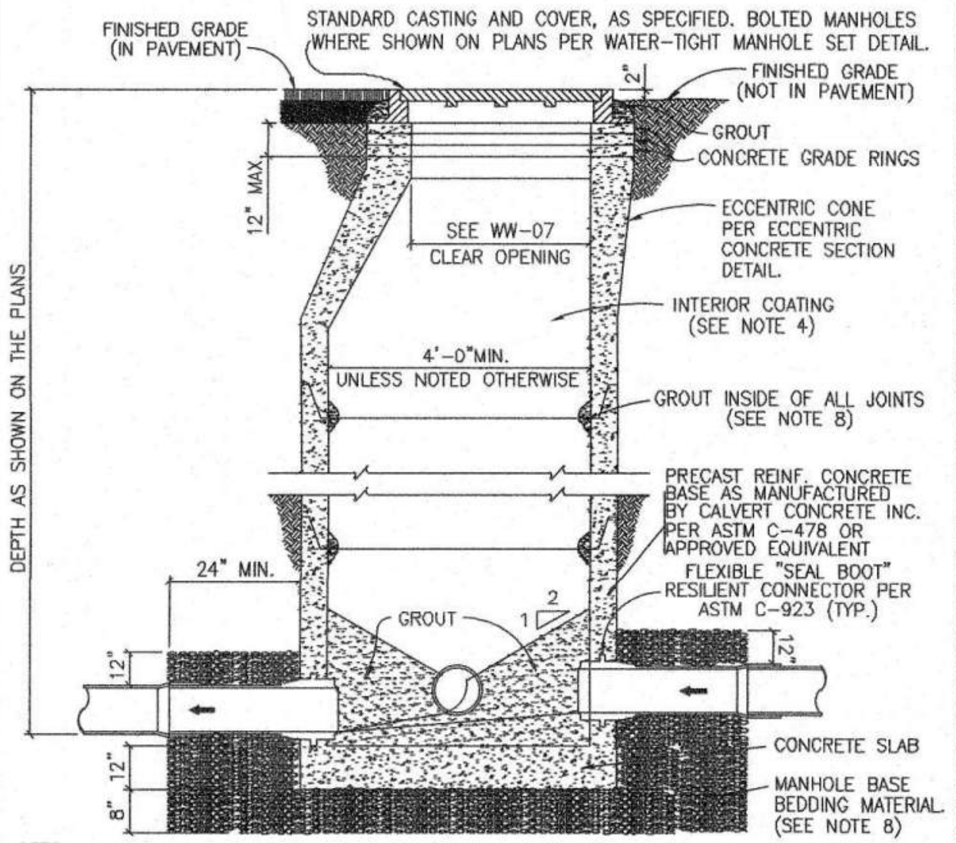
- A. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER O-RING GASKET JOINTS CONFORMING TO ASTM C478, C433 AND C76.
- B. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW-07) OR APPROVED EQUIVALENT.
- C. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER.
- D. ALL MANHOLES SHALL HAVE AN ECCENTRIC CONE.
- E. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF GEORGETOWN, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY CALVERT CONCRETE OR APPROVED EQUAL M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING, AND O-RING JOINT CONFORMING TO ASTM C443.
- F. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
- G. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT (0.1').
- H. GRADE RINGS WITH AN I.D. TO MATCH FRAMES CLEAR OPENING WITH A MAXIMUM OF FIVE (5) GRADE RINGS ARE ALLOWED.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD STORM SEWER
MANHOLE PLAN

SD12
NTS 1/2003
MRS TRB



NOTES:

1. MANHOLES SHALL BE PRECAST ASTM C-478 BELL AND SPIGOT WITH PROFILE GASKET - SINGLE OFF-SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN 80 MIL COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH STORM SEWER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETTED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS-20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.

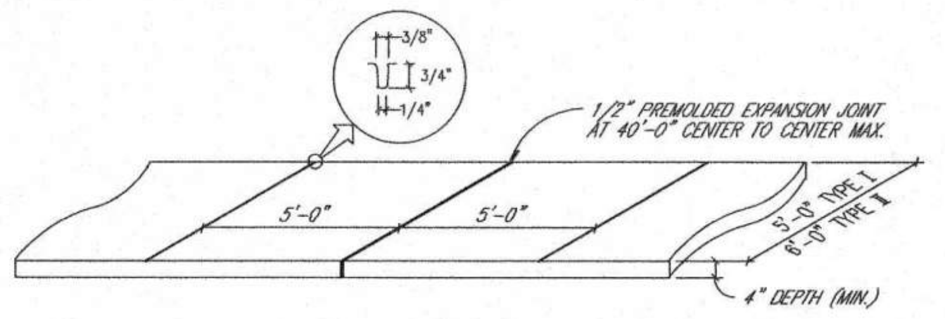
8. MANHOLE BASE BEDDING MATERIAL SPECS. FOR 3/4" WASHED GRAVEL:
SIEVE SIZE 2", PERCENT (%) RETAINED 0
SIEVE SIZE 1 1/2", % RETAINED 0-10
SIEVE SIZE 1", % RETAINED 45-80
SIEVE SIZE 3/4", % RETAINED 85-100
SIEVE SIZE 3/8", % RETAINED 95-100

The Architect/Engineer assumes responsibility for appropriate use of this standard.

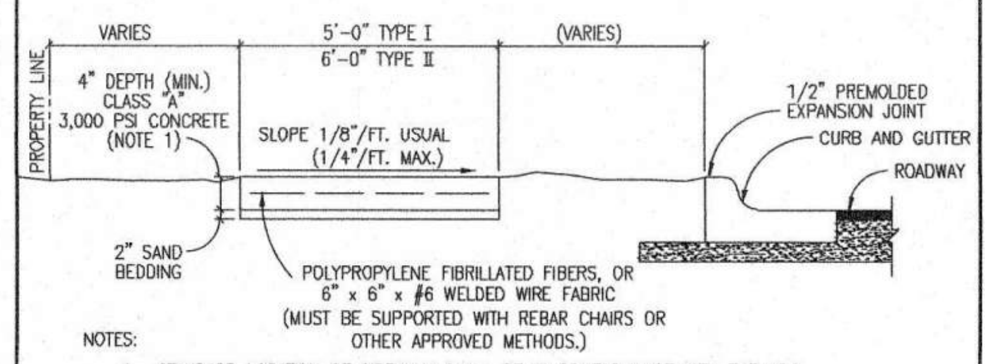
ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD STORM SEWER
MANHOLE - SECTION

SD13
NTS 1/2003
MRS TRB



TYPE I – AS REQUIRED FOR SINGLE FAMILY, DUPLEXES AND TOWNHOUSES, TRIPLEXES AND QUADRAPLEXES.
TYPE II – AS REQUIRED FOR MULTI-FAMILY, OTHER NON-RESIDENTIAL USES AND PARKING LOTS/STRUCTURES.
ALL THOROUGHFARES (COLLECTOR AND ABOVE) REQUIRE TYPE II.



NOTES:

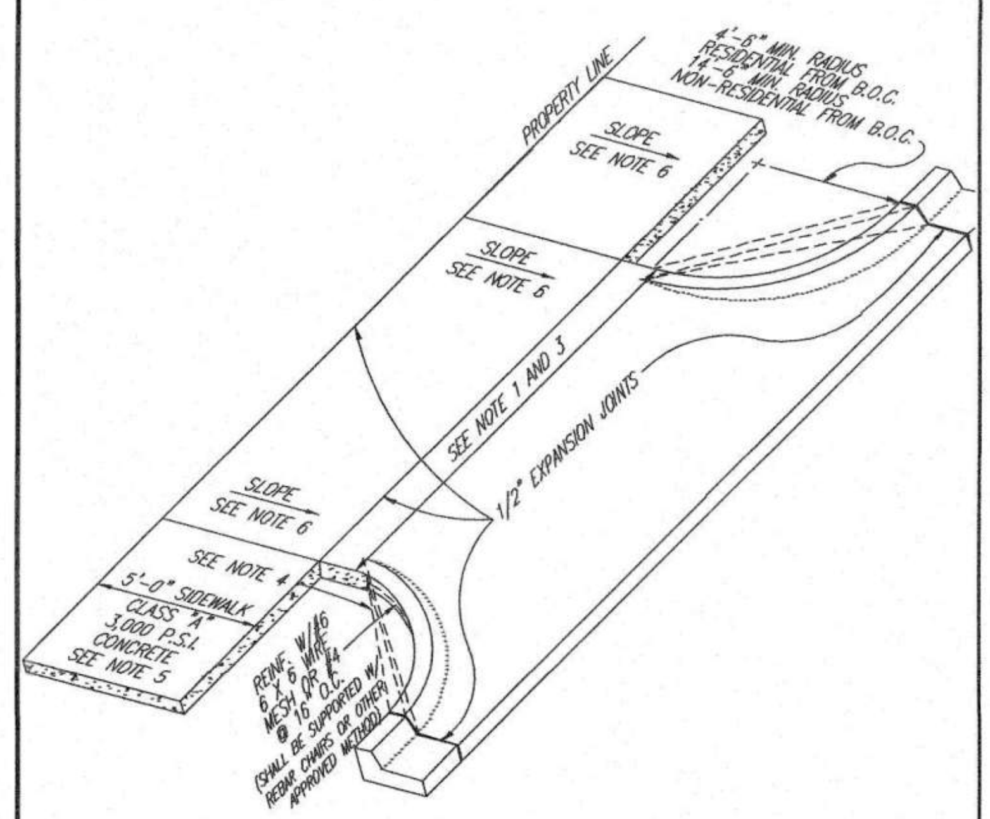
1. STANDARD LOCATION OF SIDEWALK SHALL BE IN CONFORMANCE WITH THE UDC.
2. SIDEWALK SHALL CONFORM TO CURRENT TDLR/TAS STANDARDS.
3. ALL SIDEWALKS SHALL BE SUBMITTED AND APPROVED BY THE REGISTERED ACCESSIBILITY SPECIALIST (RAS) AND ENGINEER OF RECORD.
4. ANY VARIANCE IN TEXTURE, GRADE OR ALIGNMENT SHALL BE APPROVED BY THE REGISTERED ACCESSIBILITY SPECIALIST (RAS) AND BY THE CITY ENGINEER.
5. SLIP DOWEL SHALL BE INSTALLED AT EVERY LONGITUDINAL EXPANSION JOINT (UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER DURING ENGINEERING PLAN REVIEW PRIOR TO FINAL DESIGN).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 6/25/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK SECTION AND JOINT DETAIL

SD14
NTS 1/2003
MRS TRB



NOTES:

1. MAXIMUM WIDTH OF APPROACH SHALL BE 24'-0" FOR RESIDENTIAL, 30'-0" FOR NON-RESIDENTIAL UNDIVIDED AND 45'-0" FOR NON-RESIDENTIAL DIVIDED.
2. DRIVEWAY PERMITS SHALL BE ACQUIRED FROM CITY INSPECTION OFFICE.
3. MINIMUM WIDTH OF APPROACH SHALL BE 10'-0" FOR RESIDENTIAL AND 15'-0" FOR NON-RESIDENTIAL.
4. LINEAR "RADIUS" AT CORNERS, PERMITTED FOR "SINGLE FAMILY" OR "TWO FAMILY" RESIDENTIAL DRIVEWAY APPROACH.
5. SIDEWALK LOCATION SHALL BE APPROVED BY CITY ENGINEER PRIOR TO FINAL DESIGN.
6. SLOPE 1/8" PER FOOT USUAL, SHALL NOT EXCEED 2.0%.
7. DRIVEWAY APPROACH THICKNESS SHALL BE A MIN. OF 6".

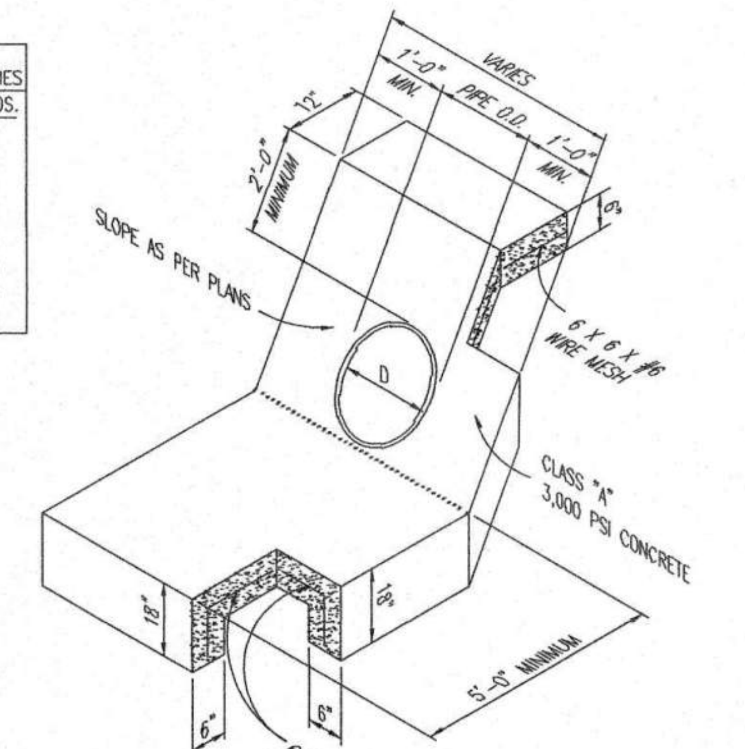
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 6/25/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE DRIVEWAY APPROACH
TYPICAL

SD15
NTS 1/2003
MRS TRB

MINIMUM RIP-RAP QUANTITIES	
PIPE	SQ. YDS.
18"	6.2
24"	6.9
27"	7.8
30"	9.5
36"	10.4
42"	12.0
48"	14.3
54"	16.4



NOTES:

1. WHEN HEADWALLS AND WINGWALLS ARE REQUIRED, THEY SHALL CONFORM TO THE TEXAS DEPARTMENT OF TRANSPORTATION STANDARDS, OR AS DIRECTED BY THE CITY.
2. ENERGY DISSIPATERS SHALL BE REQUIRED IF PIPE VELOCITY IS GREATER THAN 5.0 F.P.S. OR AS DIRECTED BY THE CITY OF GEORGETOWN.
3. SUPPORT REINFORCING WIRE MESH REQUIRED AS SUPPORT FOR APPROACH SLAB AND SHALL BE SUPPORTED BY REBAR CHAIRS OR OTHER APPROVED METHODS.

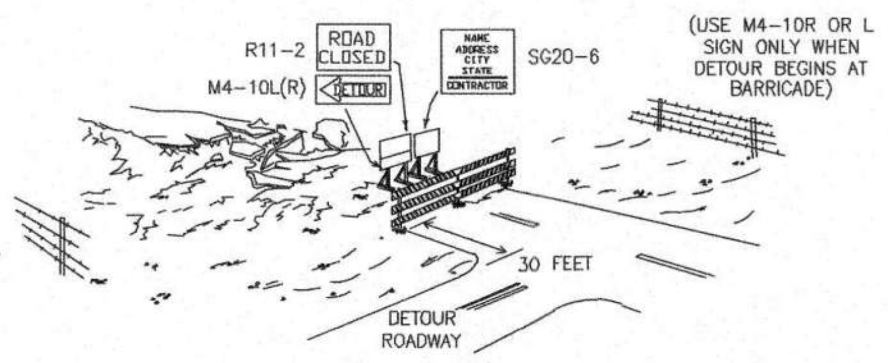
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

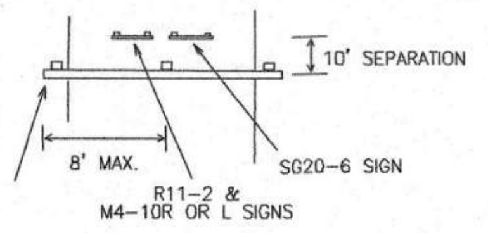
CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL CONCRETE
RIP-RAP AT PIPE

SD19
NTS 1/2003
MRS TRB

EACH ROADWAY OF DIVIDED HIGHWAY
SHALL BE BARRICADED, IN THE SAME MANNER.



PERSPECTIVE VIEW



PLAN VIEW

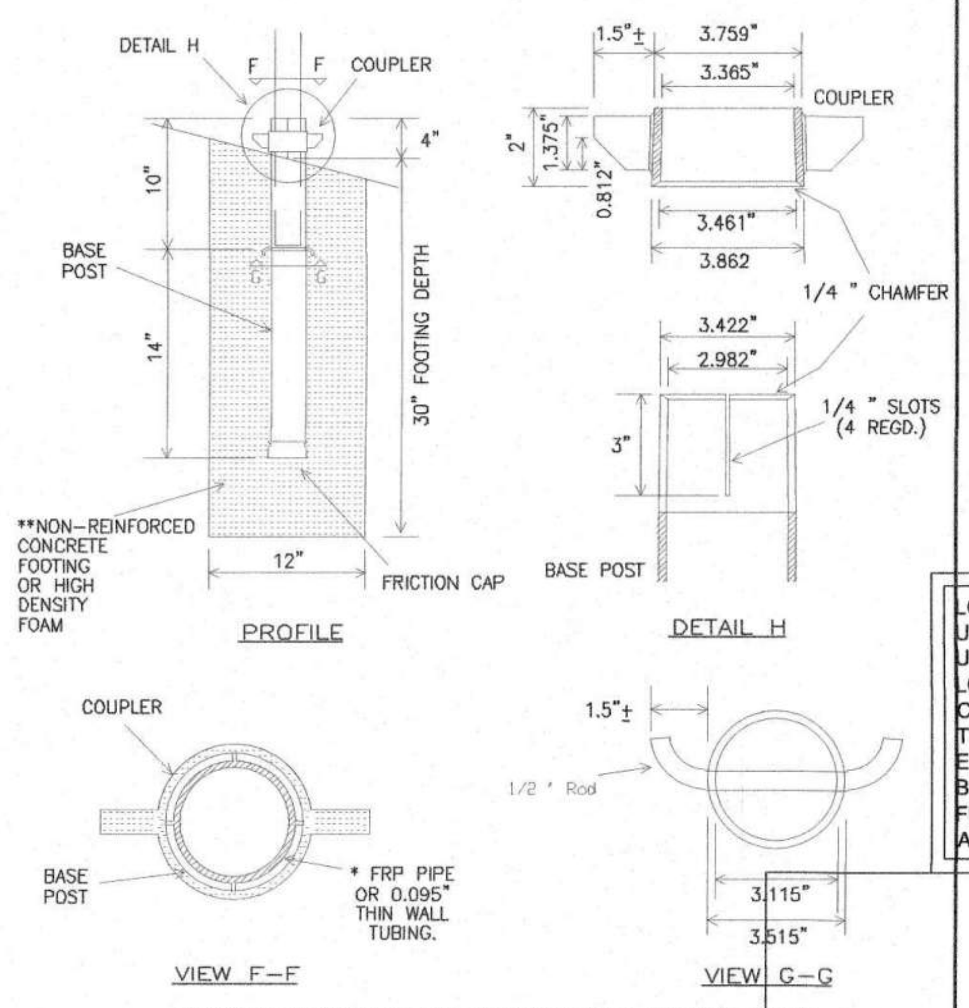
1). R11-2 AND M4-10 SIGNS SHOULD BE MOUNTED ON INDEPENDENT SUPPORTS AT 7' MOUNTING HEIGHT IN CENTER OF ROADWAY.
2). ADVANCE SIGNING, INCLYDE CONSTRUCTION WARNING, SIGNS AND DETOUR SIGNING SHALL BE AS SPECIFIED ELSEWHERE IN THE PLANS.
3). THE THREE RAILS ON TYPE III BARRICADES SHALL BE REFLECTIVE ORANGE AND REFLECTIVE WHITE STRIPES ON ONE SIDE FACING ONE-WAY TRAFFIC AND BOTH SIDES FOR TWO-WAY TRAFFIC.
4). BARRICADE STRIPING SHOULD SLANT DOWNWARD IN THE DIRECTON OF DETOUR.
5). ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPE III CONSTRUCTION BARRICADE

SD22
NTS 1/2003
MRS TRB



PROFILE

DETAIL H

VIEW F-F

VIEW G-G

* PLASTING INSERT MUST BE USED WITH 1/16 " THIN WALL TUBING.
** FOOTING SHALL BE REMOVED AND BACKFILLED WHEN BARRICADE IS REMOVED.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
UNIVERSAL ANCHOR SYSTEM

SD23
NTS 1/2003
MRS TRB

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

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

WOODFIELD PRESERVE
PHASE 3

GENERAL DETAILS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_DT1.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681

Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

DT1

SHEET NO.
106
OF 118 SHEETS

Date\Time : Tue, 28 Nov 2023 - 9:02am User Name : jpiecuch
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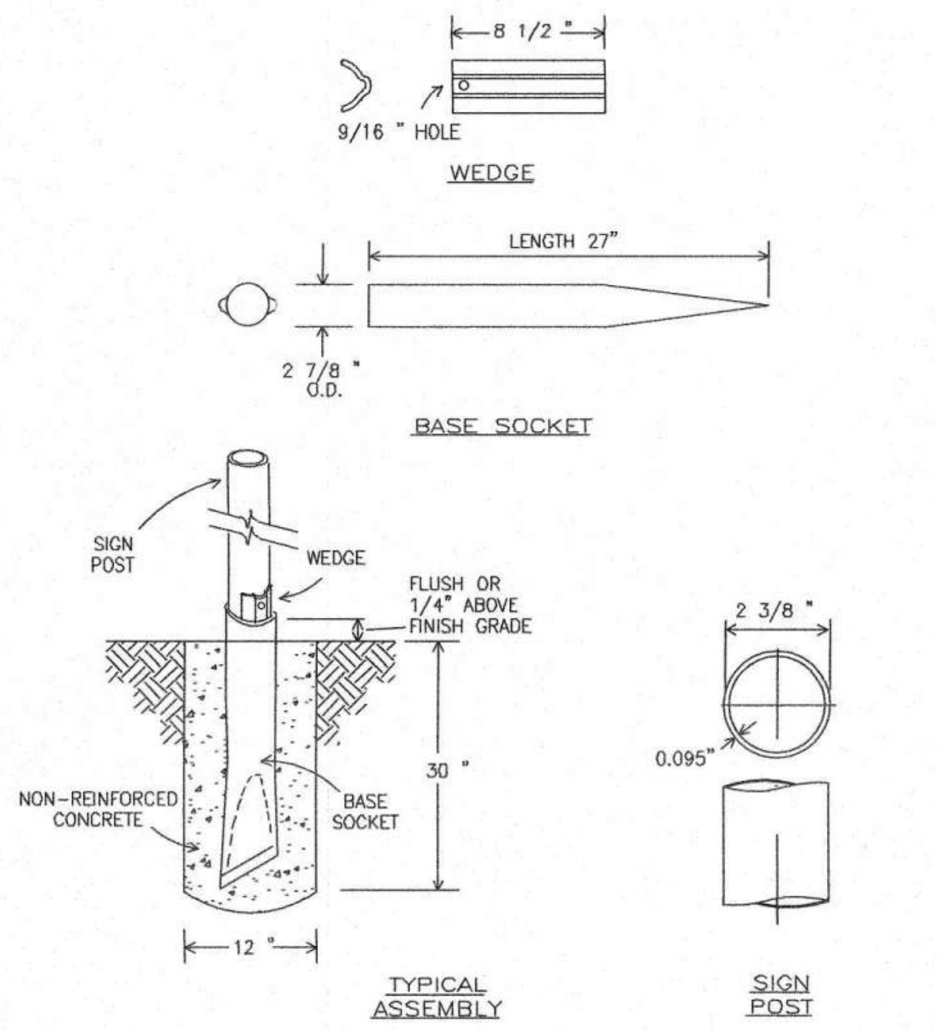
2022-24-CON



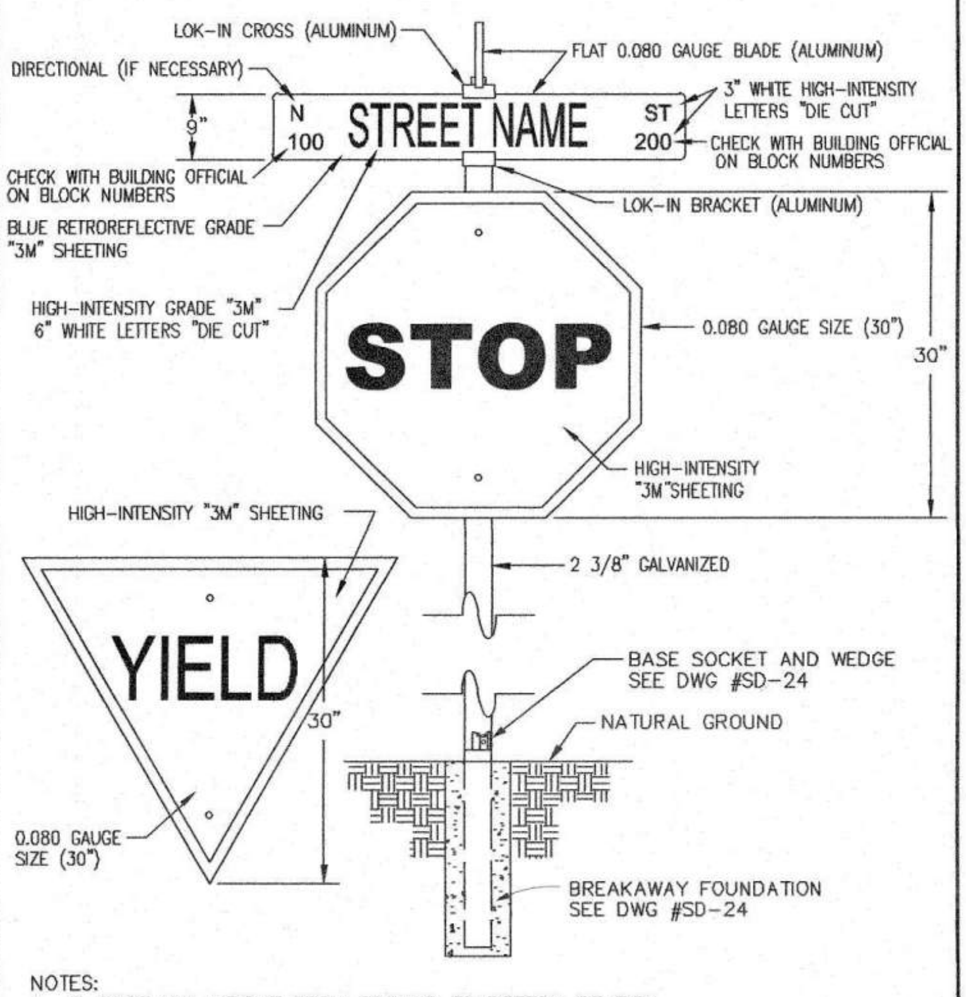
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
POZ-LOC (BREAKAWAY FOUNDATION)

SD24

NTS 1/2003 MRS TRB



NOTES:
1. 7-FOOT MIN. HEIGHT FROM GROUND TO BOTTOM OF SIGN.
2. ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).
3. ALL SIGNAGE SHEETINGS SHALL BE HIGH-INTENSITY "3M" SHEETING.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 1/14/2014 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD STREET SIGN DETAIL

SD25

NTS 1/2003 MRS/AP TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.

NOTES:

1. COMMERCIAL SIDEWALKS WIDTHS – 6'
   RESIDENTIAL SIDEWALKS WIDTHS – 5'
2. ALL SLOPES ARE MAXIMUM ALLOWABLE. FLATTER SLOPES THAT WILL STILL DRAIN PROPERLY ARE ENCOURAGED.
3. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.
4. FOR PURPOSES OF WARNING, THE CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJOINING PEDESTRIAN ROUTES.
5. TEXTURES MAY CONSIST OF PAVERS WITH TRUNCATED DOMED SURFACES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT. SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
6. COLOR CONTRAST, FOR EXAMPLE, MAY BE ACCOMPLISHED WITH COLORED CONCRETE PAVERS THAT HAVE TRUNCATED DOMES WHICH WOULD PROVIDE A CONTRAST WITH TYPICALLY LIGHT COLORED CONCRETE.
7. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, VISIBILITY AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
8. RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND PROVIDE A REFUGE AREA FOR PEDESTRIANS IF THEY ARE UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. MEDIAN CROSSING SHALL BE A MINIMUM OF 5' WIDE. MEDIANS SHIOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR TROUGH THEM.
9. ALL SIDEWALK PLANS AND DETAILS SHALL BE SUBMITTED AND APPROVED BY "REGISTERED ACCESSIBILITY SPECIALIST" (RAS).
10. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GRATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6 INCHES OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL MEET THE REQUIREMENTS OF A RAMP PER TAS 405.THE ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHERE EVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
11. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE OR ACT PROTRUDING OBJECTS.
12. ALL SIDEWALKS SHALL BE DOWELED INTO EXISTING SIDEWALKS, DRIVEWALKS, DRIVEWAYS, INLET BOXES, RETAINING WALLS, ETC.
13. ALL SIDEWALK CROSS-SLOPES SHALL NOT EXCEED 1:50, UNLESS A VARIANCE IS PROVIDED BY TDLR.

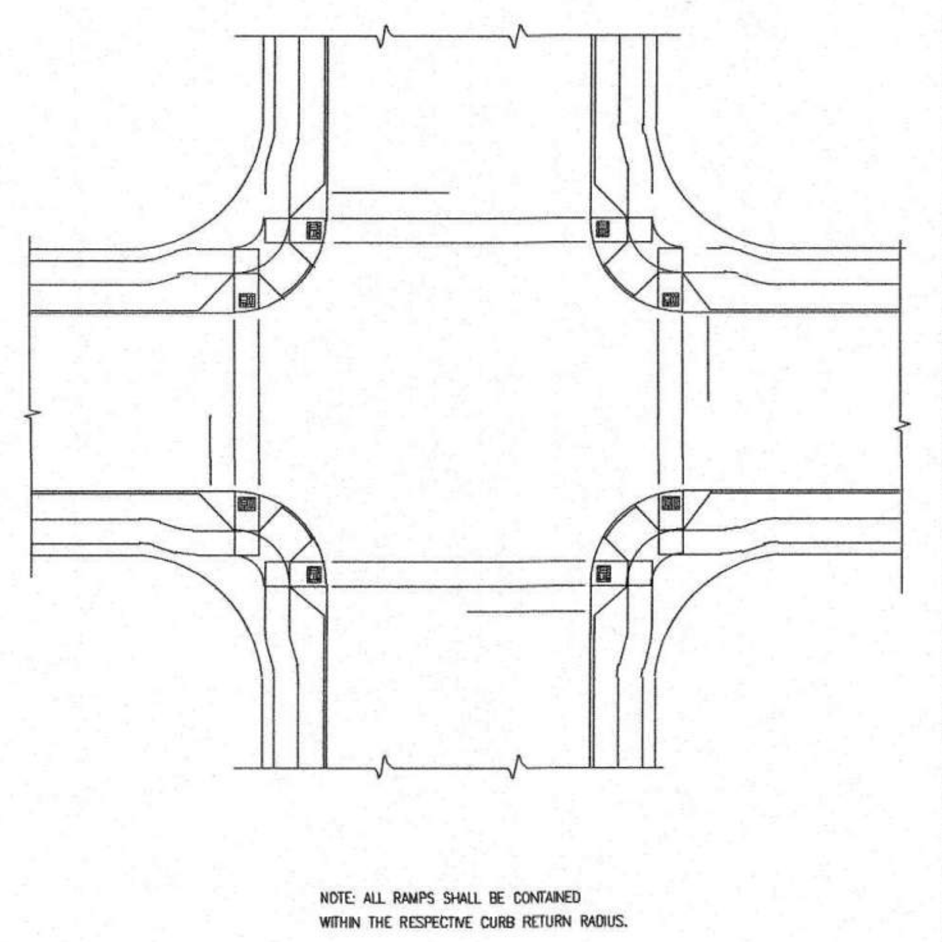
(PENETRATES) A CURB.

REVISED 6/25/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PEDESTRIAN RAMPS GENERAL NOTES

SD28

NTS 1/2003 MRS TRB



NOTE: ALL RAMPS SHALL BE CONTAINED WITHIN THE RESPECTIVE CURB RETURN RADIUS.

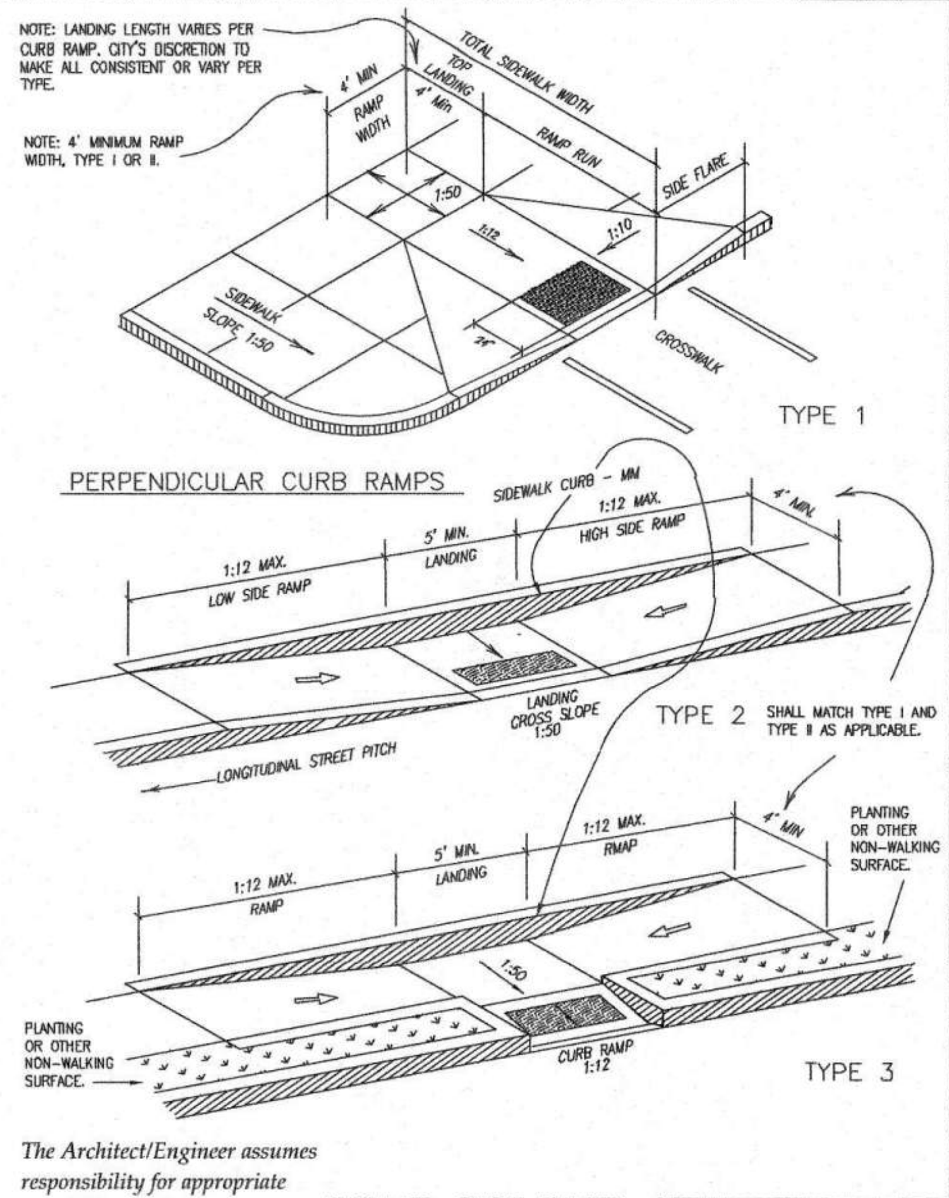
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 6/29/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL INTERSECTON LAYOUT

SD29

NTS 1/2003 MRS TRB



The Architect/Engineer assumes responsibility for appropriate use of this standard.

PARALLEL CURB RAMPS

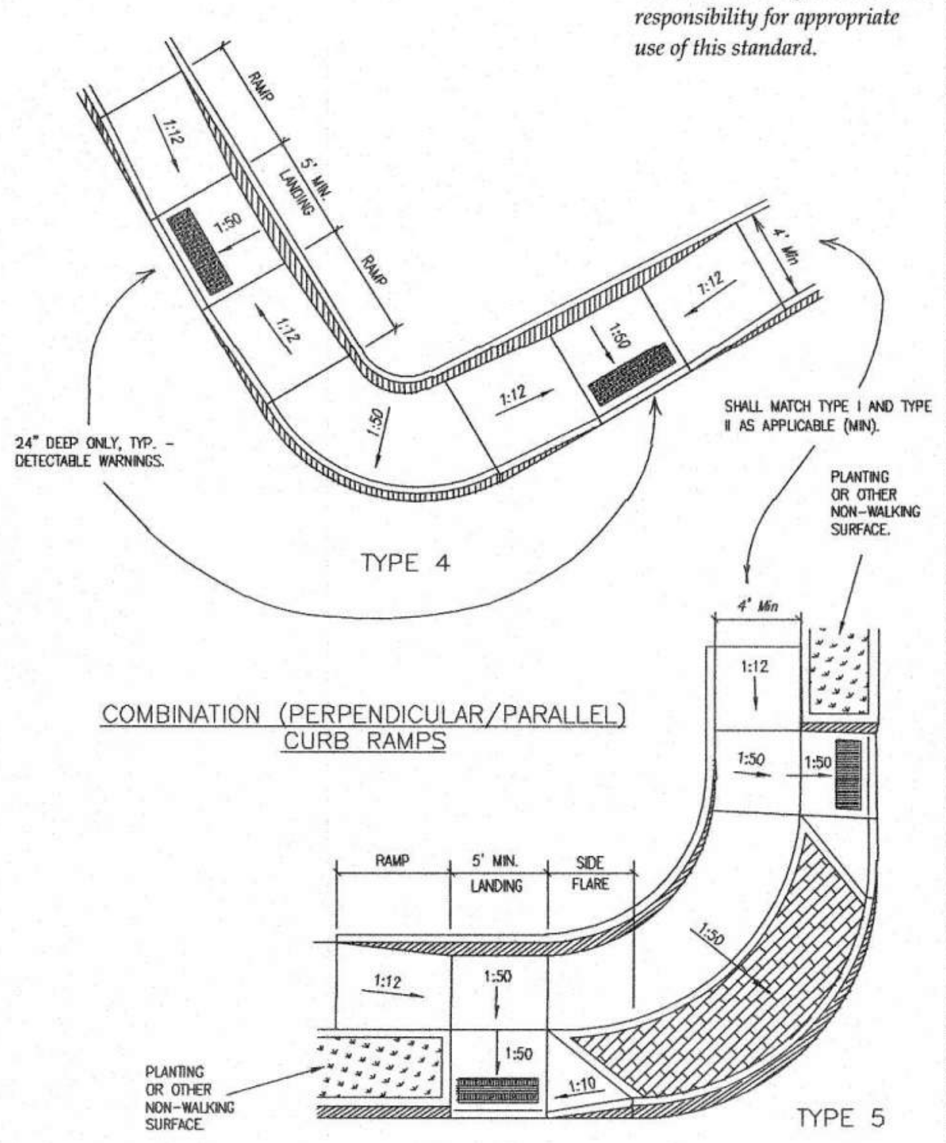
REVISED 6/30/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK RAMP DETAILS
TYPE 1–3

SD31

NTS 1/2003 MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.

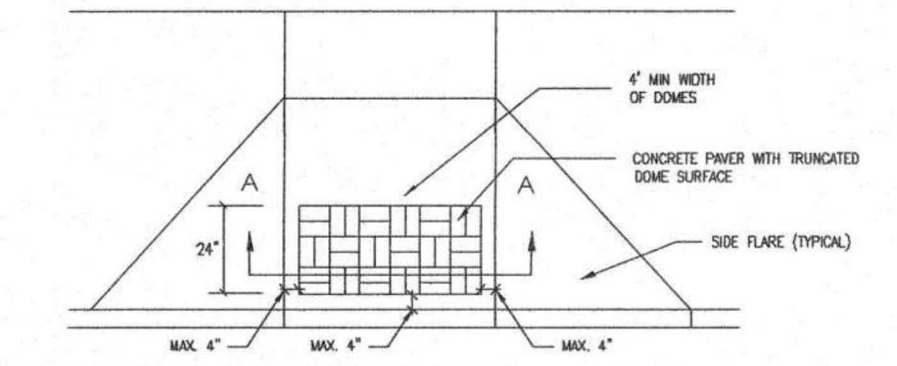


REVISED 7/6/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK RAMP DETAIL TYPES 4 & 5

SD33

NTS 1/2003 MRS TRB



TRUNCATED DOME PATTERN CURB RAMP

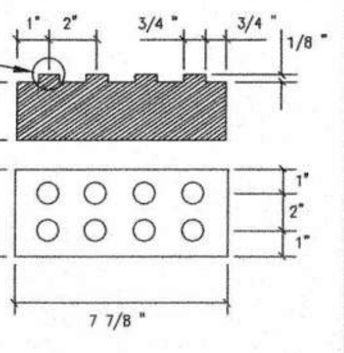
GENERAL NOTES

CONCRETE PAVER UNITS SHALL MEET ALL REQUIREMENTS OF ASTM C-936, C-33, AND SHALL BE LAID IN A TWO BY TWO UNIT BASKET WEAVE PATTERN, UNLESS SHOWN OTHERWISE IN THE PLANS.

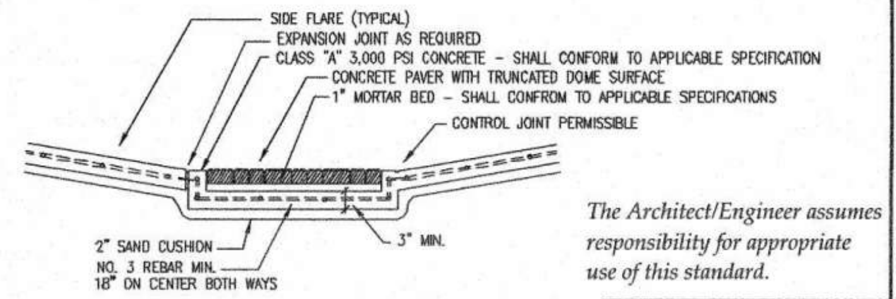
CONCRETE PAVER UNIT SHALL HAVE A TRUNCATED DOME TOP SURFACE FOR DETECTABLE WARNING TO PEDESTRIANS.

CONCRETE PAVER UNIT COLOR FOR THE RAMP SHALL BE A CONTRASTING COLOR TO THE ADJACENT SURFACES. THE COLOR OF THE CONCRETE PAVER UNITS SHALL BE SHOWN ELSEWHERE IN THE PLANS. (ADJACENT SURFACES INCLUDE SIDE FLARES).

CONCRETE PAVER UNITS SHALL BE SAW CUT ONLY AND ANY CUT UNIT SHALL BE NOT LESS THAN 25 PERCENT OF A FULL UNIT.



CONCRETE PAVER WITH TRUNCATED DOME SURFACE



SECTION A–A

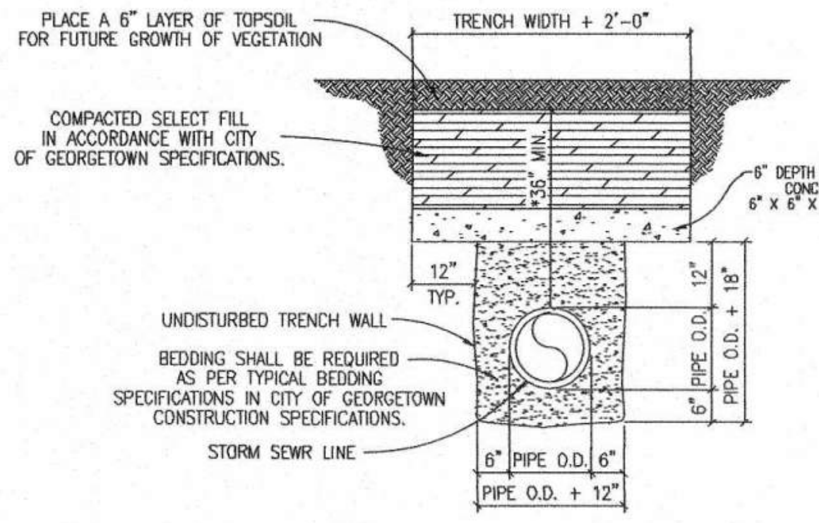
The Architect/Engineer assumes responsibility for appropriate use of this standard.

REVISED 7/7/2015 WBD
REVISED 3/14/2014 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB RAMP TEXTURES TYPE A

SD37

NTS 1/2003 MRS/AP TRB



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

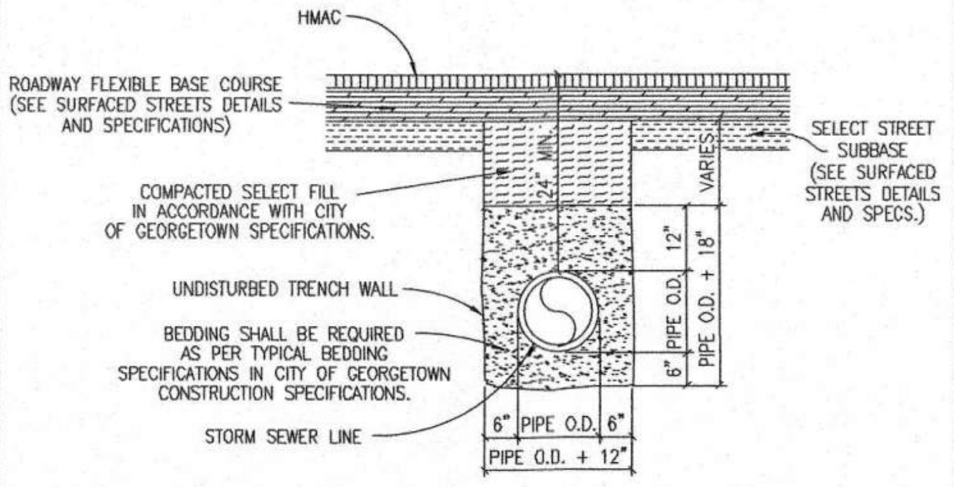
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE TRENCH CAP DETAIL FOR STORM SEWER

SD39

NTS 1/2003 MRS TRB



NOTES:
1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

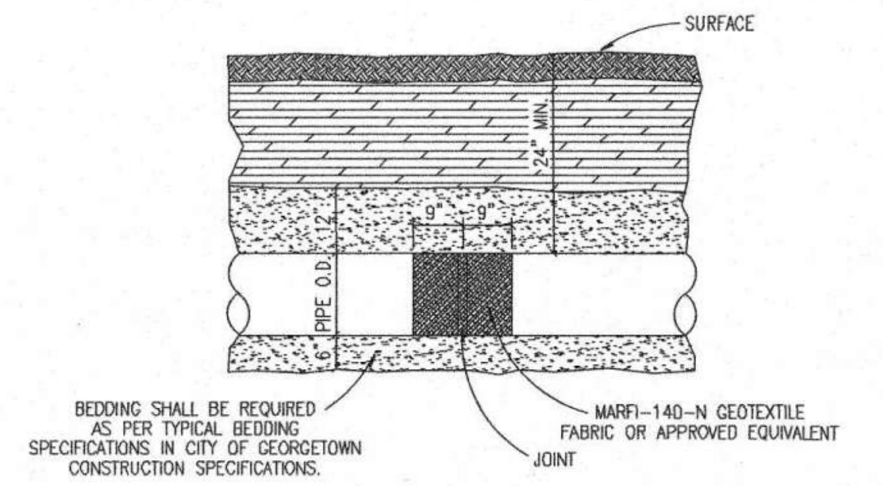
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL
UNDER PROPOSED ROADWAY
FOR STORM SEWER

SD41

NTS 1/2003 MRS TRB



NOTES
1. PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS III UNLESS THE DEPTH OF PIPE REQUIRES A STRONGER CLASS.
2. ALL FITTINGS AND WYES SHALL BE MANUFACTURED AND NOT CONSTRUCTED ON THE PROJECT WITHOUT PRIOR APPROVAL FROM THE CITY.
3. ALL JOINTS SHALL BE WRAPPED WITH MARF1–140–N GEOTEXTILE FABRIC OR APPROVED EQUIVALENT. EACH JOINT SHALL BE WRAPPED WITH 18" WIDE FABRIC CENTERED ON THE JOINT.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL
(PROFILE) FOR STORM SEWER

SD42

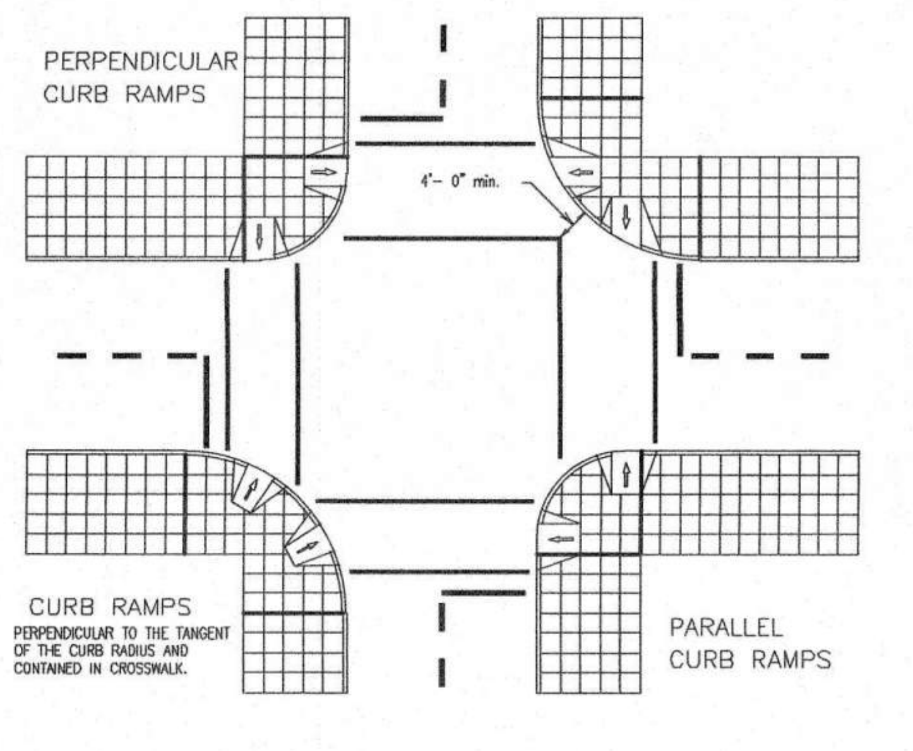
NTS 1/2003 MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.

CURB RAMP

FOR ON-SYSTEM PROJECTS SUCH AS RESTORATION, SEAL COAT AND OVERLAY PROJECTS, PLACEMENT OF CURB RAMPS SHALL BE EVALUATED IN THE FOLLOWING ORDER OF PREFERENCE: PERPENDICULAR, PARALLEL OR COMBINATION.
THE MOST PREFERABLE OPTION THAT IS FEASIBLE AT EACH CORNER SHALL BE PROVIDED.

ALL RAMPS SHALL BE CONTAINED WITHIN THE RESPECTIVE CURB RETURN RADIUS.



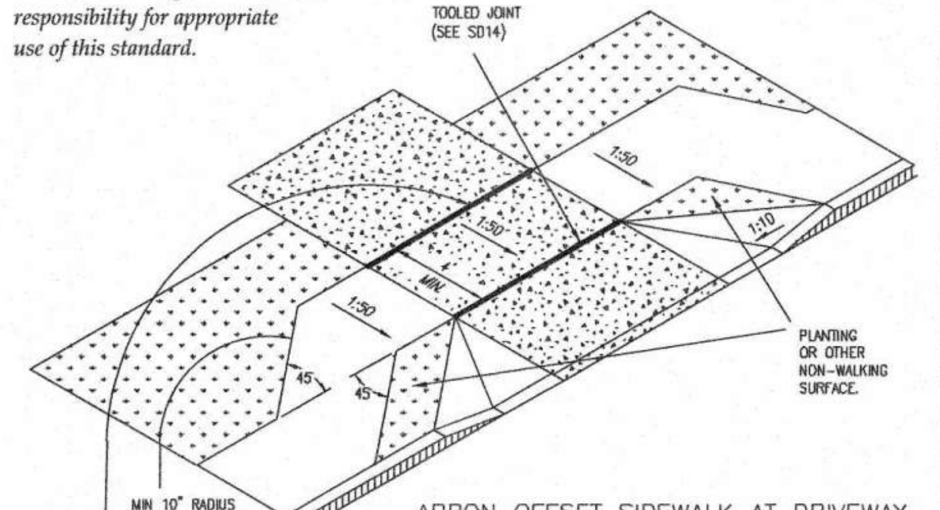
REVISED 6/26/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB RAMP PLACEMENTS AT INTERSECTIONS

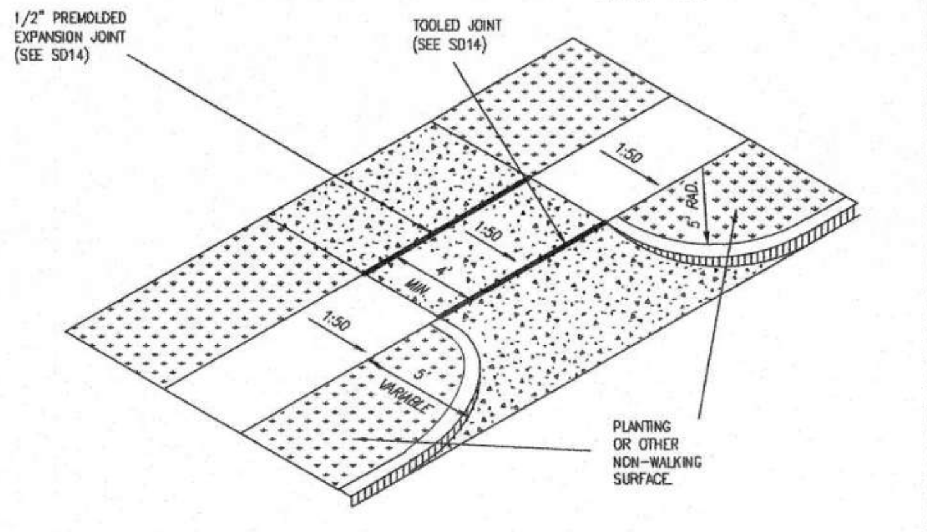
SD30

NTS 1/2003 MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.



APRON OFFSET SIDEWALK AT DRIVEWAY
TYPE 12



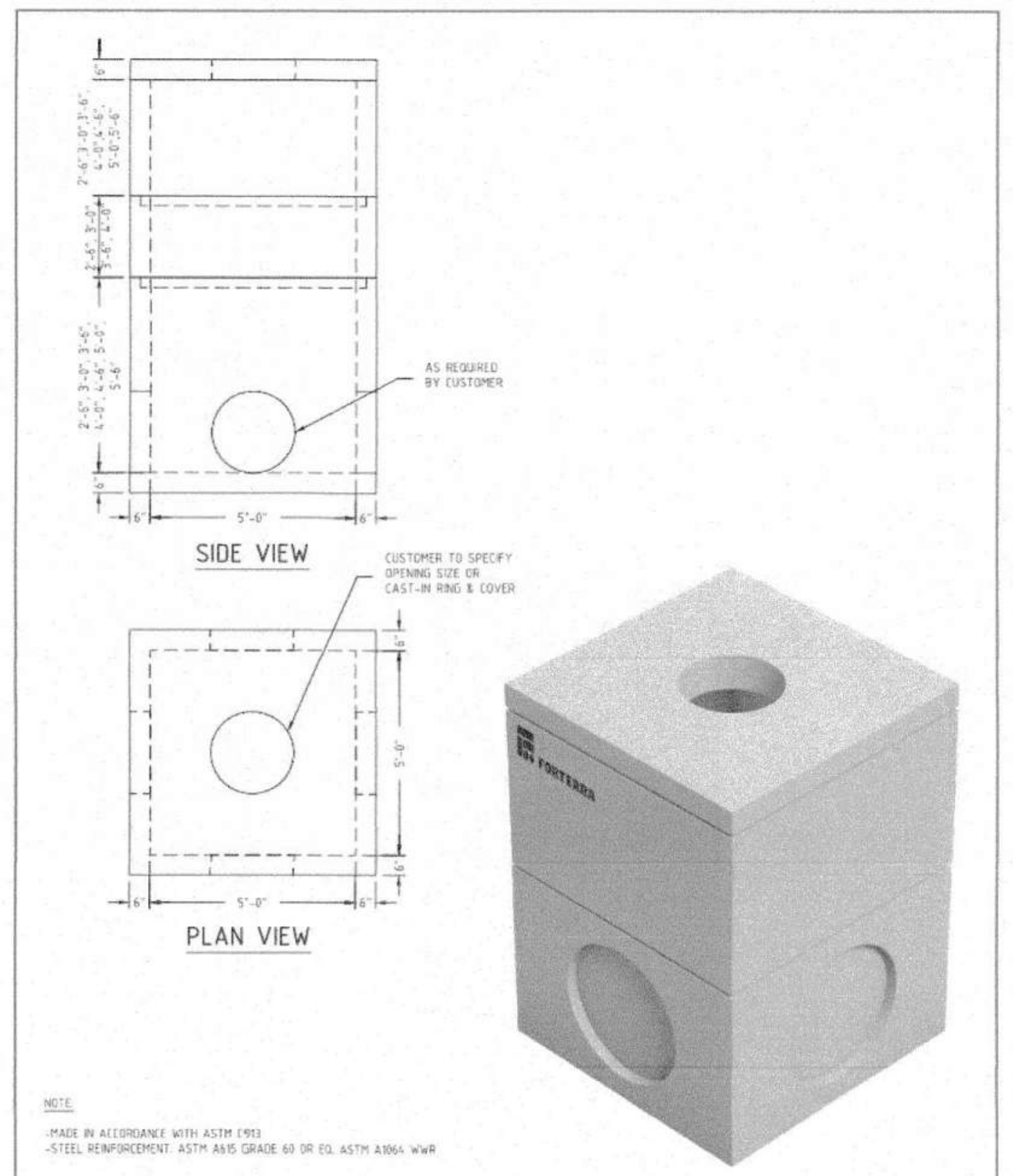
SETBACK SIDEWALK AT DRIVEWAY
TYPE 13

REVISED 7/7/2015 WBD
ADOPTED 6/21/2006 TRB

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DRIVEWAY APRONS TYPES 12 & 13

SD35

NTS 1/2003 MRS TRB



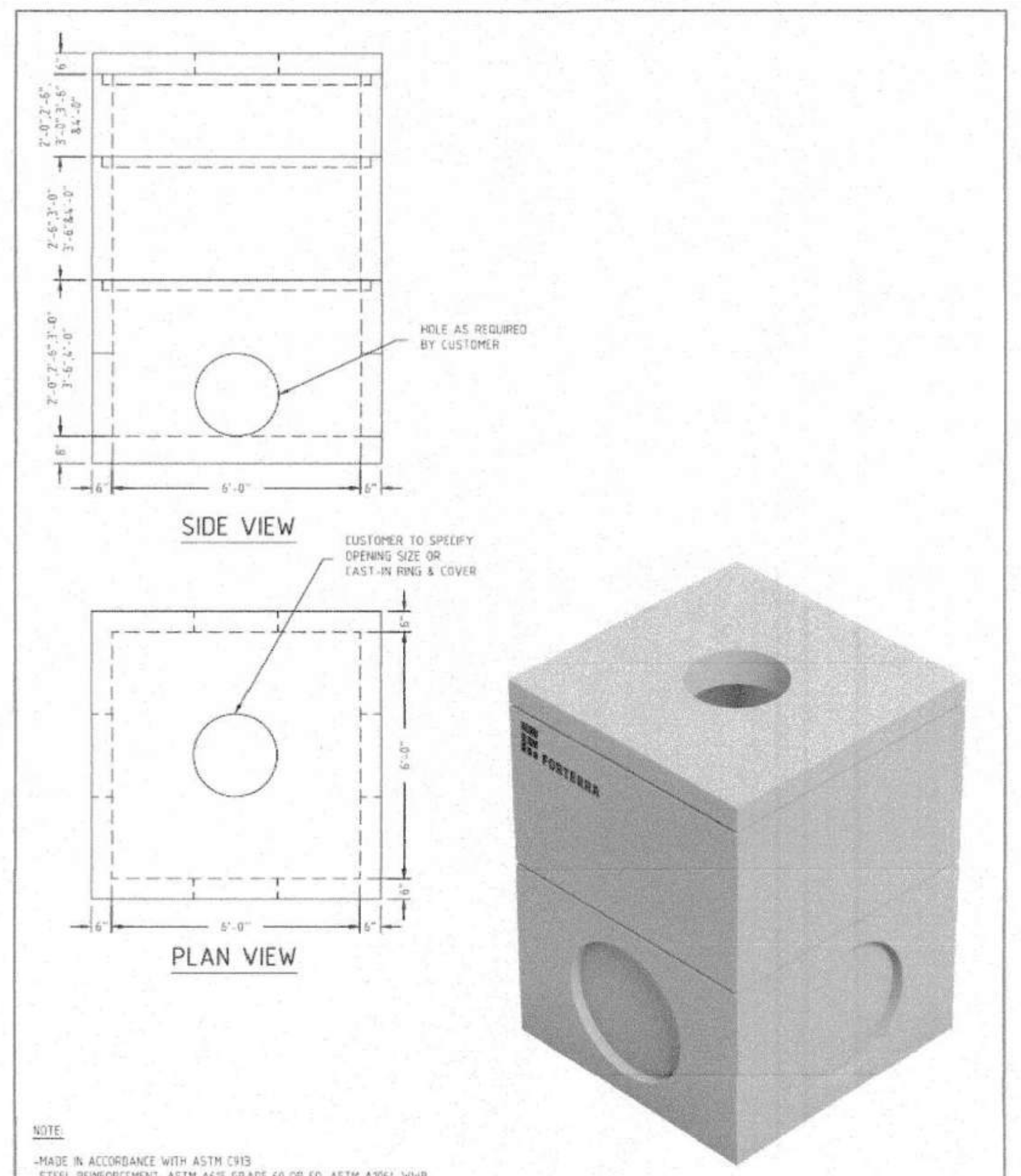
NOTE
-MADE IN ACCORDANCE WITH ASTM C913
-STEEL REINFORCEMENT: ASTM A615 GRADE 60 OR EQ. ASTM A1064 WWR

FORTERRA

REGION, STATE		
AR		
DATE	SECT PAGE	
2018	13.5.5	

STANDARD JUNCTION BOX (2-PIECE)
WITH VARIABLE HEIGHTS
5'-0" X 5'-0"

OR APPROVED EQUAL



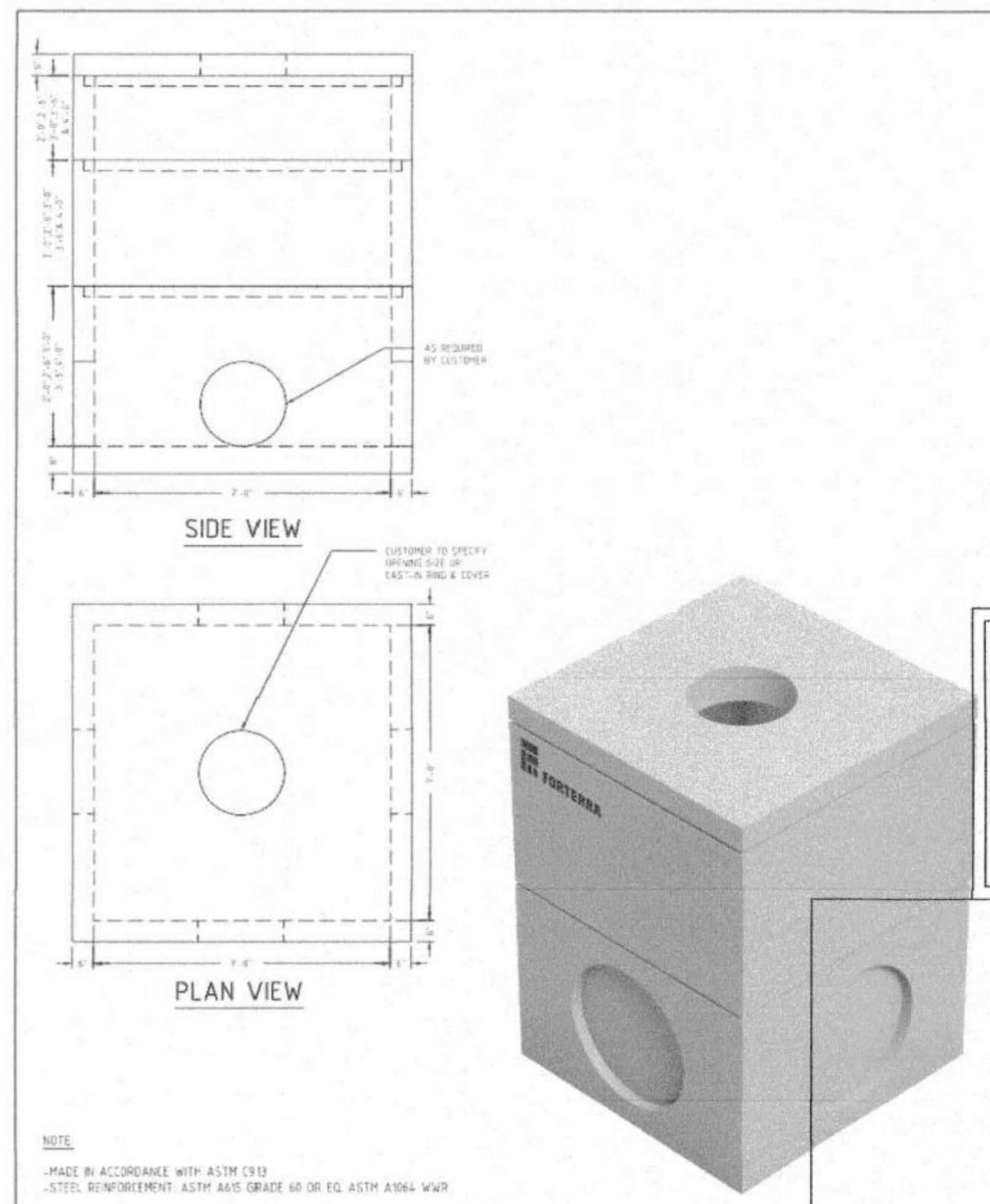
NOTE
-MADE IN ACCORDANCE WITH ASTM C913
-STEEL REINFORCEMENT: ASTM A615 GRADE 60 OR EQ. ASTM A1064 WWR

FORTERRA

REGION, STATE	
AR	
DATE	SECT PAGE
2018	13.5.7

STANDARD JUNCTION BOX (2 PIECE)
WITH VARIABLE HEIGHTS
6'-0" X 6'-0"

OR APPROVED EQUAL



NOTE
-MADE IN ACCORDANCE WITH ASTM C913
-STEEL REINFORCEMENT: ASTM A615 GRADE 60 OR EQ. ASTM A1064 WWR

FORTERRA

REGION, STATE	
AR	
DATE	SECT PAGE
2018	13.5.11

STANDARD JUNCTION BOX (2 PIECE)
WITH VARIABLE HEIGHTS
7'-0" X 7'-0"

OR APPROVED EQUAL

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

811
Know what's **below.**
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WOODFIELD PRESERVE
PHASE 3

GENERAL DETAILS

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_DT2.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

DT2

SHEET NO.
107
OF 118 SHEETS

Date\Time : Tue, 28 Nov 2023 - 9:02am
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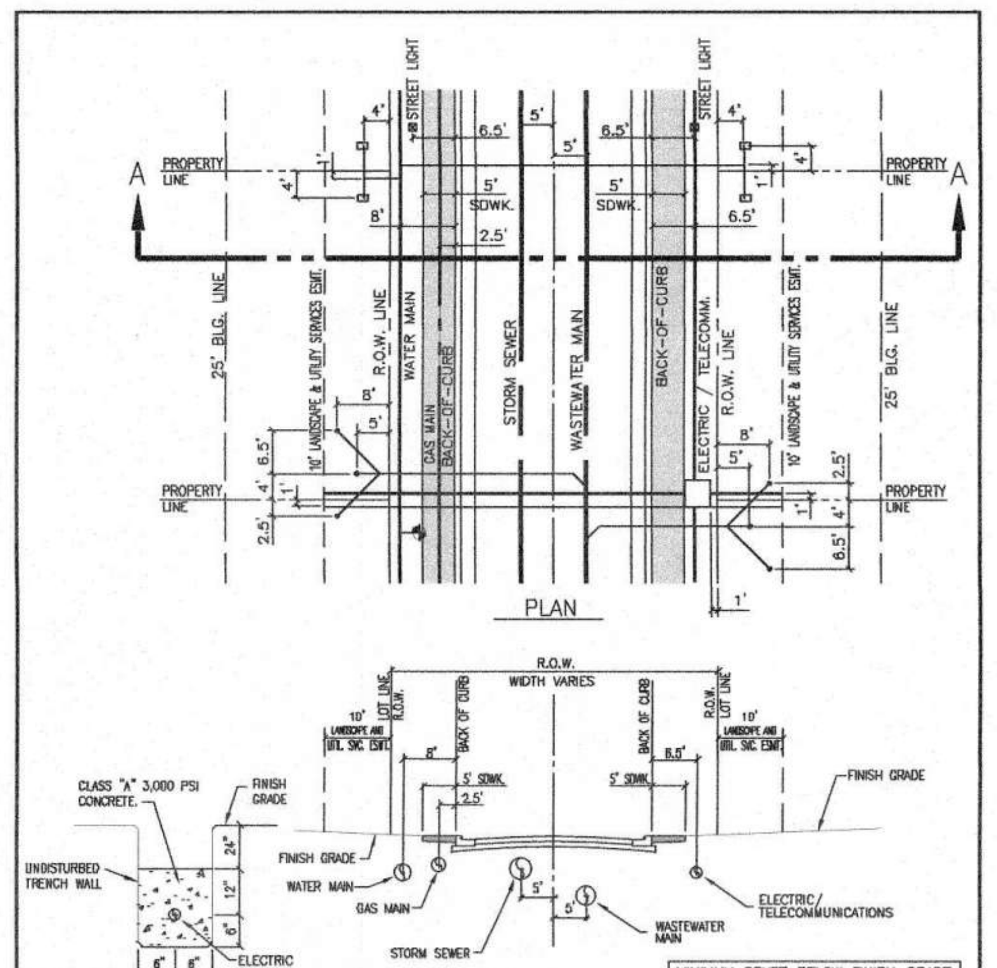


NOTE: WHEN CROSSING A WATER MAIN, THE ELECTRIC CONDUIT MUST BE ENCASED WITH 3,000 PSI RED CONCRETE FOR FIVE (5) FEET BOTH SIDES FROM THE CROSSING POINT.

ELECTRIC CONDUIT CONCRETE ENCASEMENT DETAIL

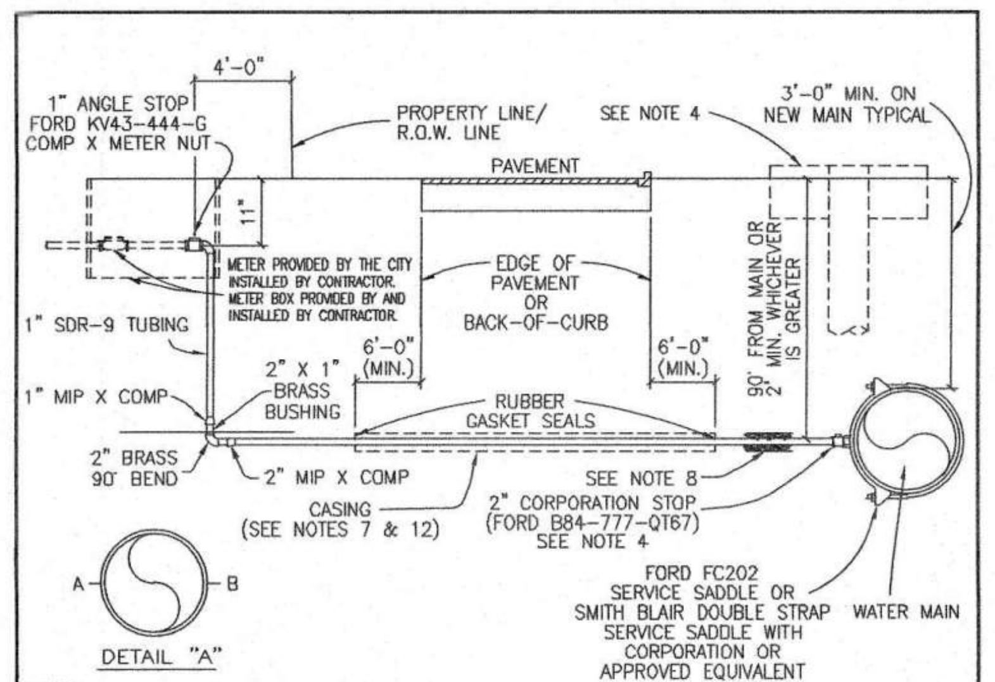
MINIMUM COVER BELOW FINISH–GRADE ALL UTILITIES UNDER ROADWAY – 36"	
ELECTRIC PRIMARY	36"
ELECTRIC SECONDARY	24"
WATER	36"
WASTEWATER	48"
STORM SEWER	36"
GAS	36"
TELECOMMUNICATIONS	36"

CLASSIFICATION	ROW	B–B	PVMT.
LOCAL STREET	50'	28'	24'
RESIDENTIAL STREET	65'	37'	33'
MAJOR COLLECTOR	73'	45'	41'

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
UTILITY ASSIGNMENTS FOR LOCAL STREETS, RESIDENTIAL COLLECTORS AND MAJOR COLLECTORS
W01A
NTS 1/2003
MRS TRB



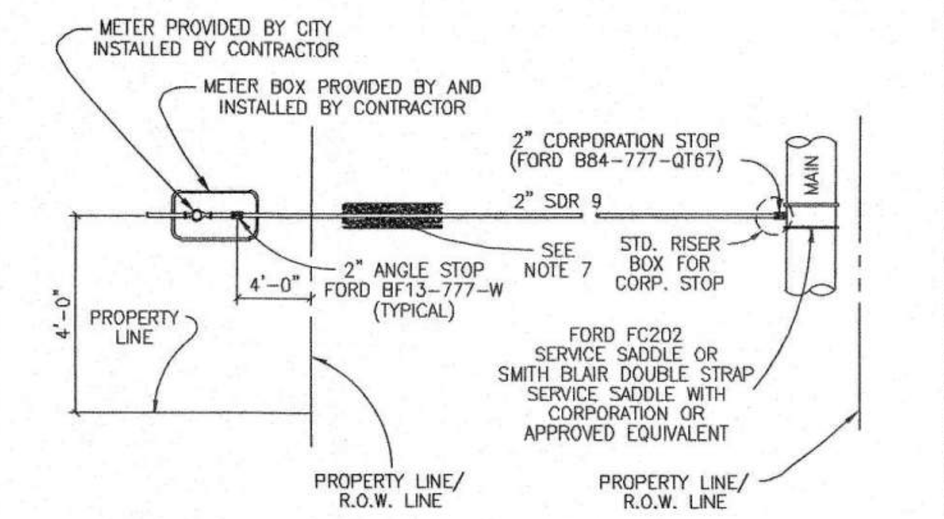
NOTES:

1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED A MINIMUM OF 18" OFFSET AND AT THE CENTERLINE AS SHOWN ON DETAIL "A".
2. WHERE NO SIDEWALK EXISTS, METER BOXES SHALL BE SET TO CONFORM TO FINISHED GRADE.
3. AUTHORIZED SERVICE LINE MATERIAL:
   POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
4. ROTATE THE CORPORATION STOP SO THAT THE OPERATING NUT IS ACTUATED FROM THE VERTICAL POSITION RATHER THAN THE HORIZONTAL. SEE STD. RISER FOR CORP. STOP DETAIL, (DWG # W08).
5. SERVICE LINES SHALL BE CONTINUOUS FROM CORPORATION STOP TO CORPORATION STOP WITH NO FITTINGS IN BETWEEN.
6. SERVICE CASING SHALL NOT BE INSTALLED BY WATER JETTING UNDER ROADWAY.
7. CASING REQUIRED FOR ALL PAVEMENT CROSSINGS. 4" SDR–26 REQUIRED FOR OPEN–CUT. STEEL CASING PIPE REQUIRED FOR JACK AND BORE. LIMITS OF CASING SHOULD EXTEND SIX FEET BEYOND THE EDGE OF PAVEMENT OR BACK–OF–CURB.
8. BEDDING MATERIAL AS PER CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS.
9. ANY VARIATIONS ON FITTINGS MUST BE APPROVED BY THE CITY ENGINEER.
10. METER BOX TO BE CAPABLE OF HOUSING ITRON AUTOMATIC METER READING DEVICE. USE DFW–PLASTICS, INC. PART NO. 1200.SBAMR OR APPROVED EQUAL.
11. ALL SERVICE LINES SHALL BE PLACED 90° PERPENDICULAR TO THE ROADWAY. SEE DETAIL W23.
12. CASING SHALL EXTEND OUT TO WITHIN 4' INSIDE OF THE R.O.W. LINE, ON BOTH SIDES.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 01/23/2013

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL WATER SERVICE–ELEVATION
W03
NTS 1/2013
– MH



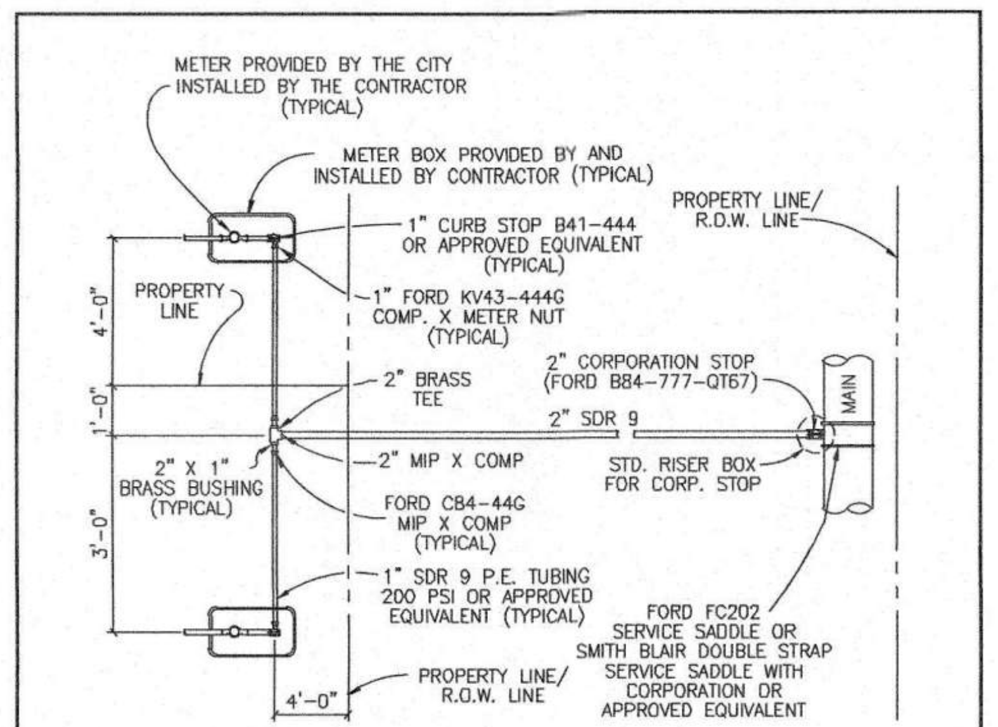
NOTES:

1. AUTHORIZED SERVICE LINE MATERIAL:
   POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
2. ANGLE STOP SHALL BE 1" MINIMUM.
3. 1" ANGLE STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
4. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER SERVICE AND SERVICE LINES LARGER THAN 2" IN DIAMETER SHALL BE HANDLED ON AN INDIVIDUAL BASIS.
5. ANGLE STOPS 1 1/2" AND 2" IN SIZE SHALL BE PROVIDED WITH BOTH A LOCKING CAP AND METER FLANGE.
6. ANGLE STOPS SHALL BE INSTALLED 8" BELOW FINISHED GRADE AND MARKED WITH A 2" X 2" X 48" TREATED WOOD STAKE, PAINTED BLUE.
7. BEDDING MATERIAL AS PER CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS.
8. CASING REQUIREMENTS FOR SERVICE LINES CROSSING ROADWAYS SEE DETAIL W–03 NOTE #7.
9. ANY VARIATIONS ON FITTINGS MUST BE APPROVED BY THE CITY ENGINEER.
10. ALL SERVICE LINES SHALL BE PLACED 90° PERPENDICULAR TO THE ROADWAY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 01/23/2013

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SINGLE WATER SERVICE PLAN
W04
NTS 1/2013
– MH



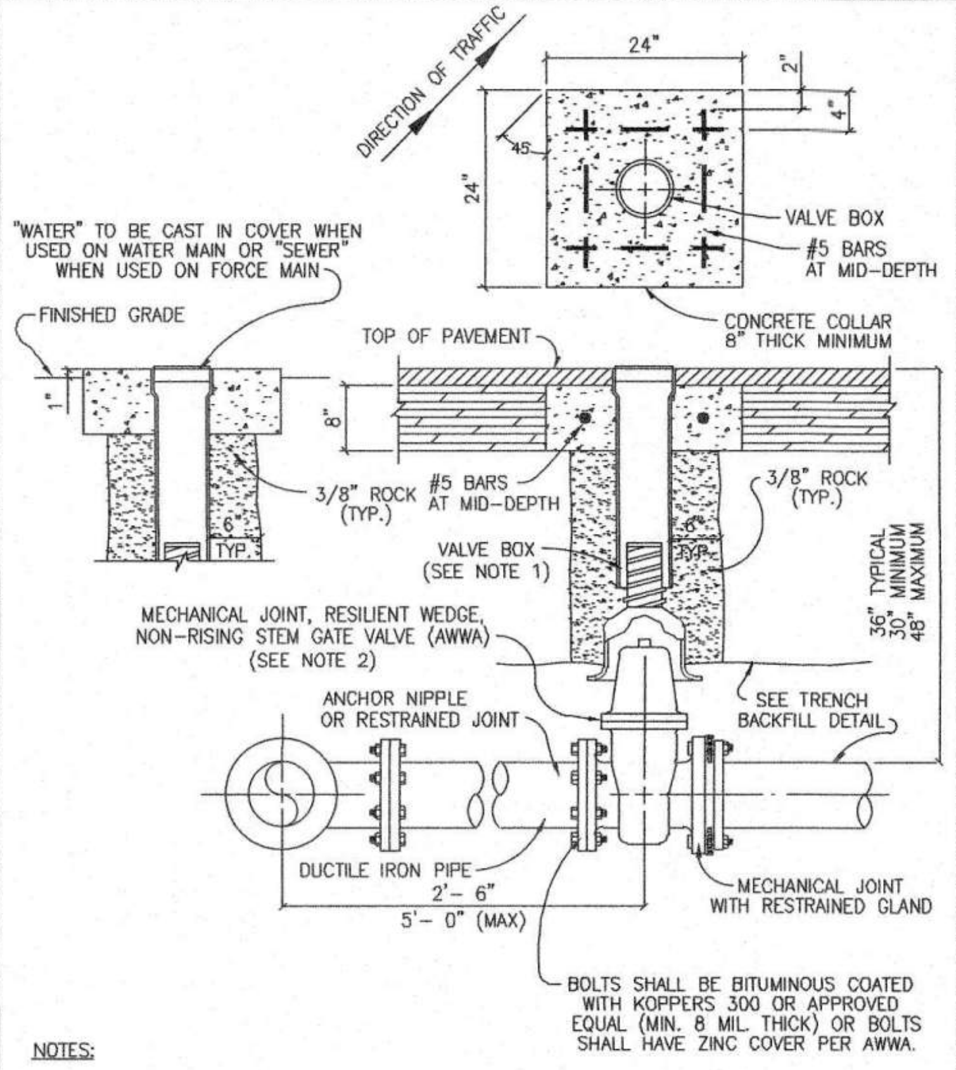
NOTES:

1. AUTHORIZED SERVICE LINE MATERIAL:
   POLYETHYLENE TUBING SHALL BE SDR–9. CLASS 200, SDR TUBING SHALL HAVE STAINLESS STEEL STIFFENERS.
2. ANGLE STOP SHALL BE 1" MINIMUM.
3. 1" ANGLE STOPS WITH 3/4" VALVES SHALL NOT BE PERMITTED.
4. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER SERVICE AND SERVICE LINES LARGER THAN 2" IN DIAMETER SHALL BE HANDLED ON AN INDIVIDUAL BASIS.
5. ANGLE STOPS 1 1/2" AND 2" IN SIZE SHALL BE PROVIDED WITH BOTH A LOCKING CAP AND METER FLANGE.
6. ANGLE STOPS SHALL BE INSTALLED 8" BELOW FINISHED GRADE AND MARKED WITH A 2" X 2" X 48" TREATED WOOD STAKE, PAINTED BLUE.
7. BEDDING MATERIAL AS PER CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS.
8. CASING REQUIREMENTS FOR SERVICE LINES CROSSING ROADWAYS SEE DETAIL W–03 NOTE #7.
9. ANY VARIATIONS ON FITTINGS MUST BE APPROVED BY THE CITY ENGINEER.
10. ALL SERVICE LINES SHALL BE PLACED 90° PERPENDICULAR TO THE ROADWAY.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 01/23/2013

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DOUBLE WATER SERVICE PLAN
W05
NTS 1/2013
– MH



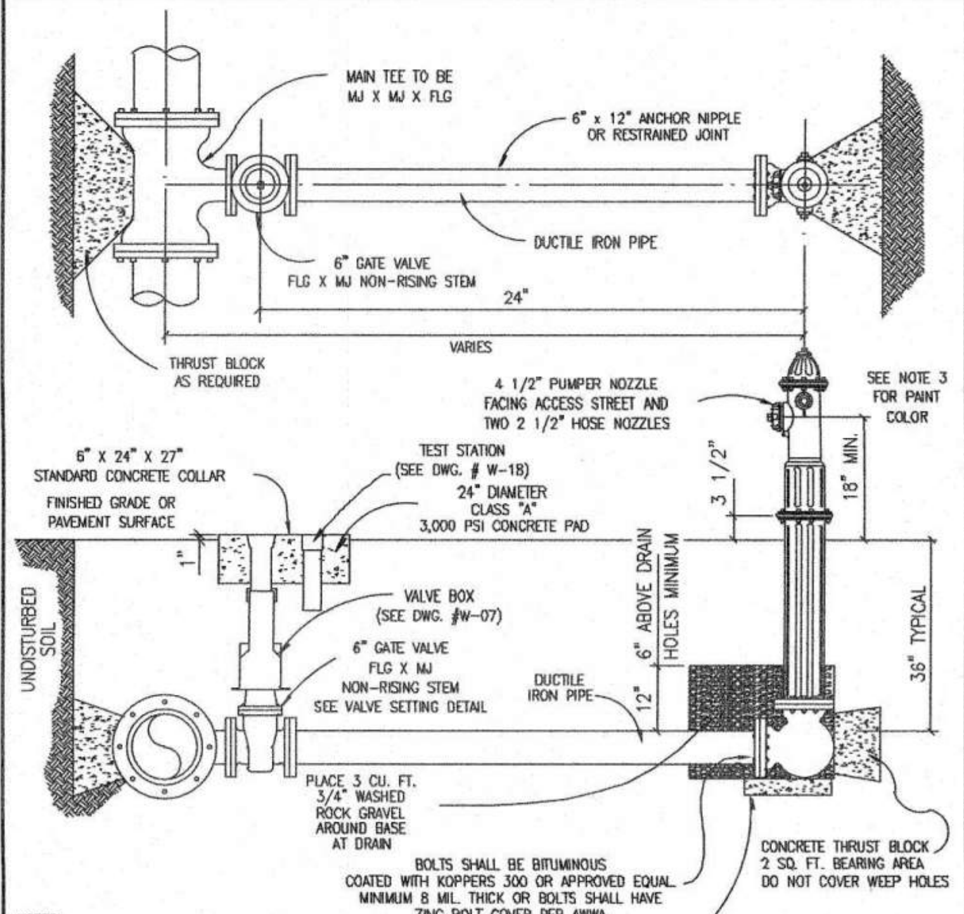
NOTES:

1. VALVE BOX SHALL BE 5 1/4" CAST IRON ADJUSTABLE HAVING AN ADJUSTABLE RANGE OF + OR – 6 INCHES FROM INSTALLED FINISH GRADE.
2. ACCEPTABLE GATE VALVES ARE:
   A. AMERICAN FLOW CONTROL – SERIES 2500
   B. MUELLER – 2360 SERIES
   C. CLOW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL VALVE SETTING
W07
NTS 1/2003
MRS TRB



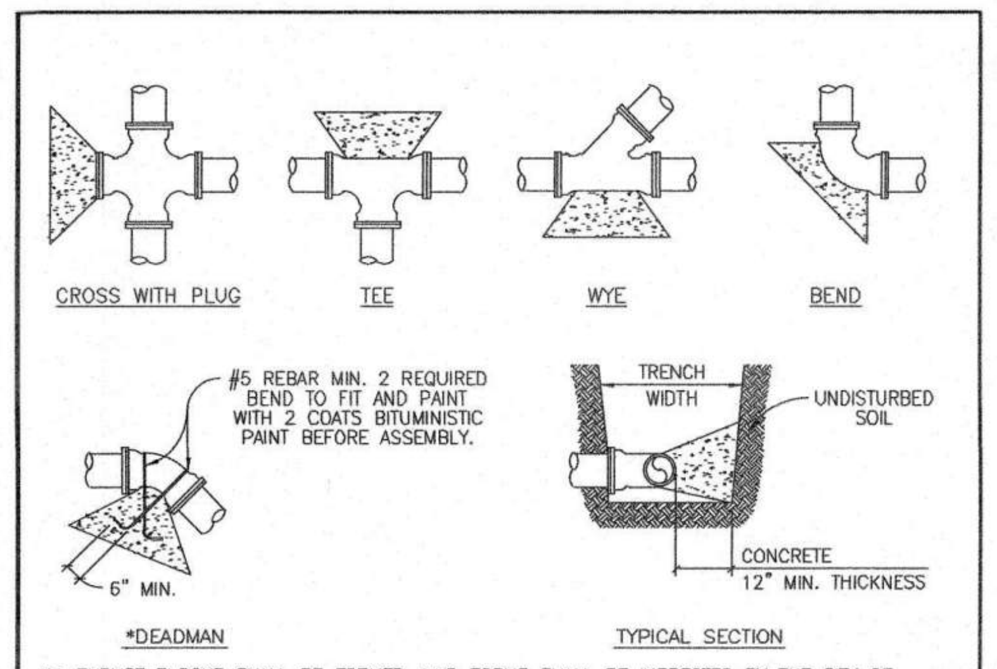
NOTES:

1. FIRE HYDRANT SHALL BE INSTALLED ON SAME SIDE OF ROAD AS WATER MAIN.
2. FIRE HYDRANT SHALL BE INSTALLED PLUMB AND TRUE.
3. ALL FIRE HYDRANT EXTERIORS SHALL BE FACTORY PRIMED AND PAINTED SILVER USING A HIGH GRADE ENAMEL.
4. HEEL AND THRUST BLOCKS TO REST IN UNDISTURBED SOIL.
5. THE ONLY FIRE HYDRANTS ACCEPTABLE ARE:
   A. KENNEDY – K81
   B. AMERICAN DARLING – B84B
   C. CLOW MEDALLION
6. DOUBLE BLUE REFLECTOR "HYE–LITES" BRAND, MANUFACTURED BY PAVEMENT MARKERS INC. TO BE INSTALLED AT CENTERLINE OF STREET PERPENDICULAR TO HYDRANT.
7. ALL METALLIC PIPES AND FITTINGS SHALL BE WRAPPED WITH 8 MILL POLYETHELENE FILM.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL FIRE HYDRANT INSTALLATION
W10
NTS 1/2003
MRS TRB



ALL THRUST BLOCKS SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY THE CITY OF GEORGETOWN PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS FOUR INCHES (4") AND GREATER. CONCRETE SHALL HAVE 2,500 P.S.I. MINIMUM STRENGTH AT TWENTY EIGHT (28) DAYS AND BEAR AGAINST UNDISTURBED STABLE SOILS, AREA OF CONTACT SHALL BE GOVERNED BY PIPE SIZE, MAXIMUM PRESSURE IN PIPE, AND BEARING CAPACITY OF SOIL. PROTECT FITTINGS, BOLTS, ETC. BY COVERING WITH VISQUEEN OR OTHER ACCEPTABLE MATERIAL. CONCRETE SHALL BE A MINIMUM OF TWELVE INCHES (12") THICK.

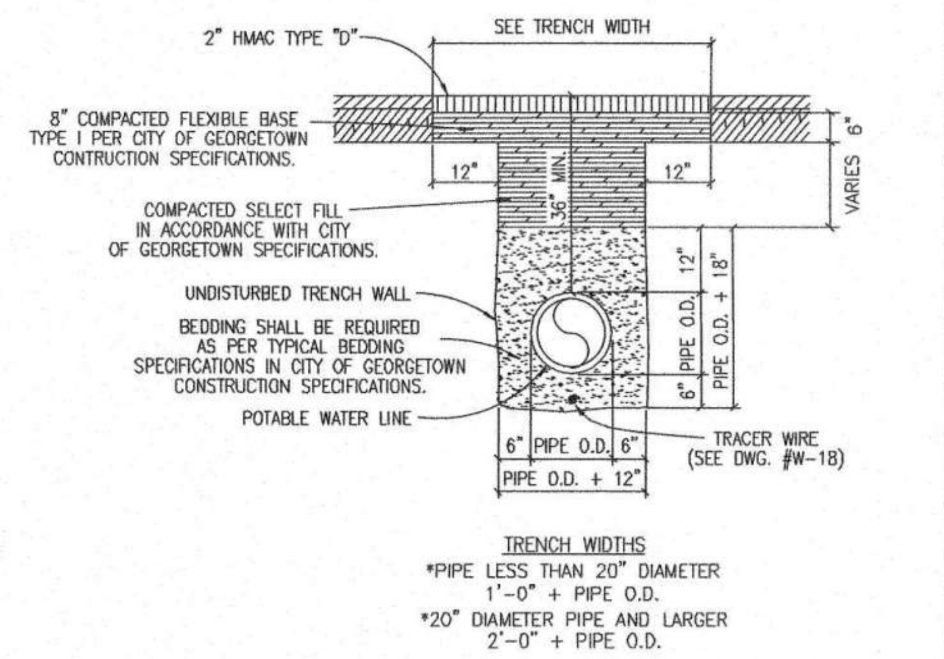
PIPE SIZE	THRUST BLOCK AREA REQUIRED	PIPE SIZE	THRUST BLOCK AREA REQUIRED	REMARKS
4"	2.0 SQ. FT.	18"	30.0 SQ. FT.	VALUES ARE FOR 90° BENDS, BASED ON 2000 P.S.F. SAFE BEARING LOAD AND PIPE PRESSURE OF 150 P.S.I. PLUS 33% SAFETY FACTOR FOR OTHER SOILS AND PRESSURES, THE AREA REQUIRED IS IN DIRECT PROPORTION.
6"	4.0 SQ. FT.	20"	37.0 SQ. FT.	
8"	6.6 SQ. FT.	24"	53.0 SQ. FT.	
10"	10.0 SQ. FT.	27"	80.0 SQ. FT.	
12"	14.0 SQ. FT.	30"	98.0 SQ. FT.	
14"	18.0 SQ. FT.	36"	127.0 SQ. FT.	
16"	24.0 SQ. FT.			

* THE ENGINEER OF RECORD SHALL CALCULATE THE SIZE OF THE DEADMAN REQUIRED AS WELL AS ANY INSTALLATION WHICH IS NOT COVERED BY THE ABOVE.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAIN
W11
NTS 1/2003
MRS TRB



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'–0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'–0" + PIPE O.D.

NOTES:

1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE.
2. BASE MATERIAL SHALL BE IN LIFTS NOT TO EXCEED 6" AND EACH LIFT THOROUGHLY ROLLED OR TAMPED TO SPECIFIED MAXIMUM DENSITY.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE.
5. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
6. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

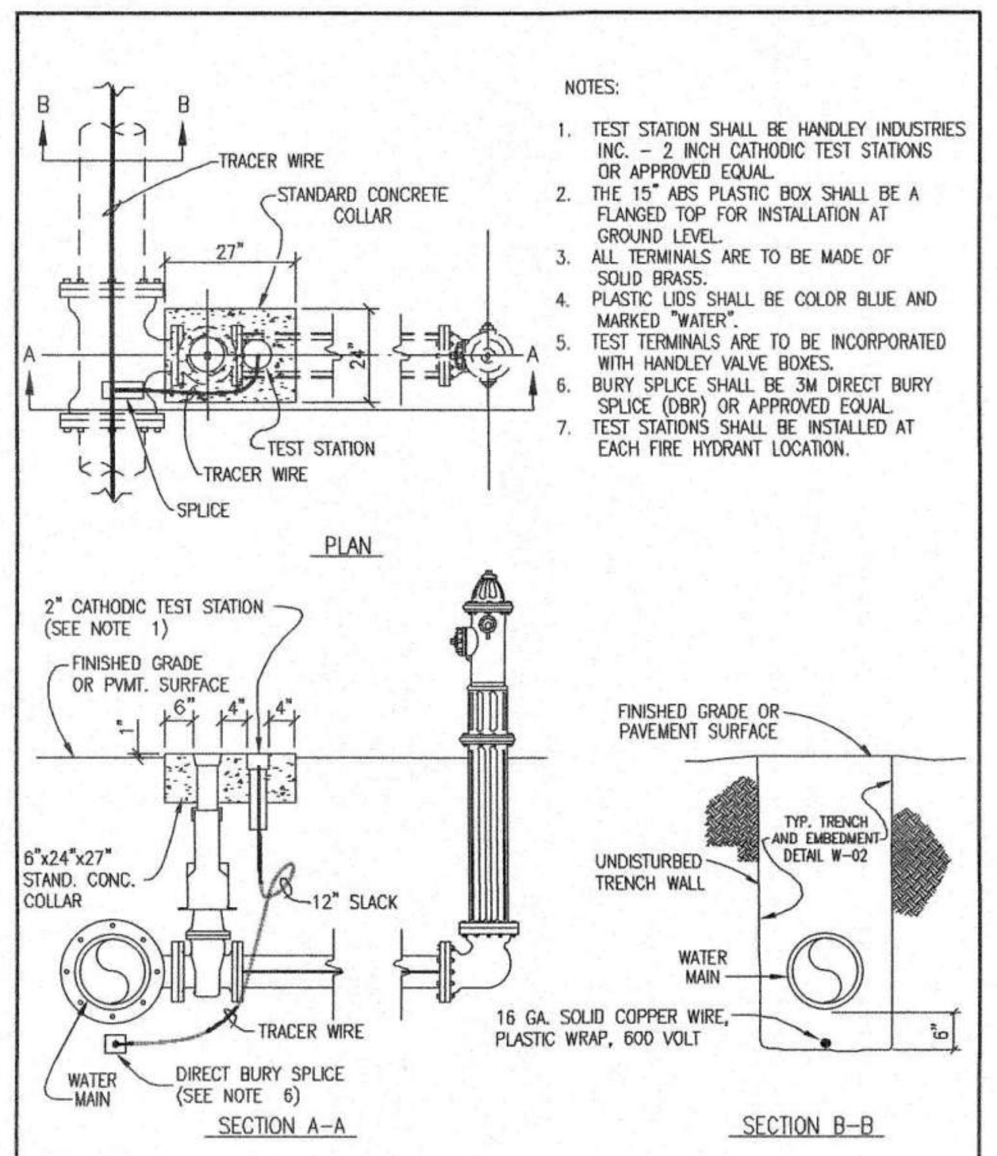
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT AND PAVEMENT REPLACEMENT DETAIL UNDER EXISTING ROADWAY
W17
NTS 1/2003
MRS TRB

NOTES:

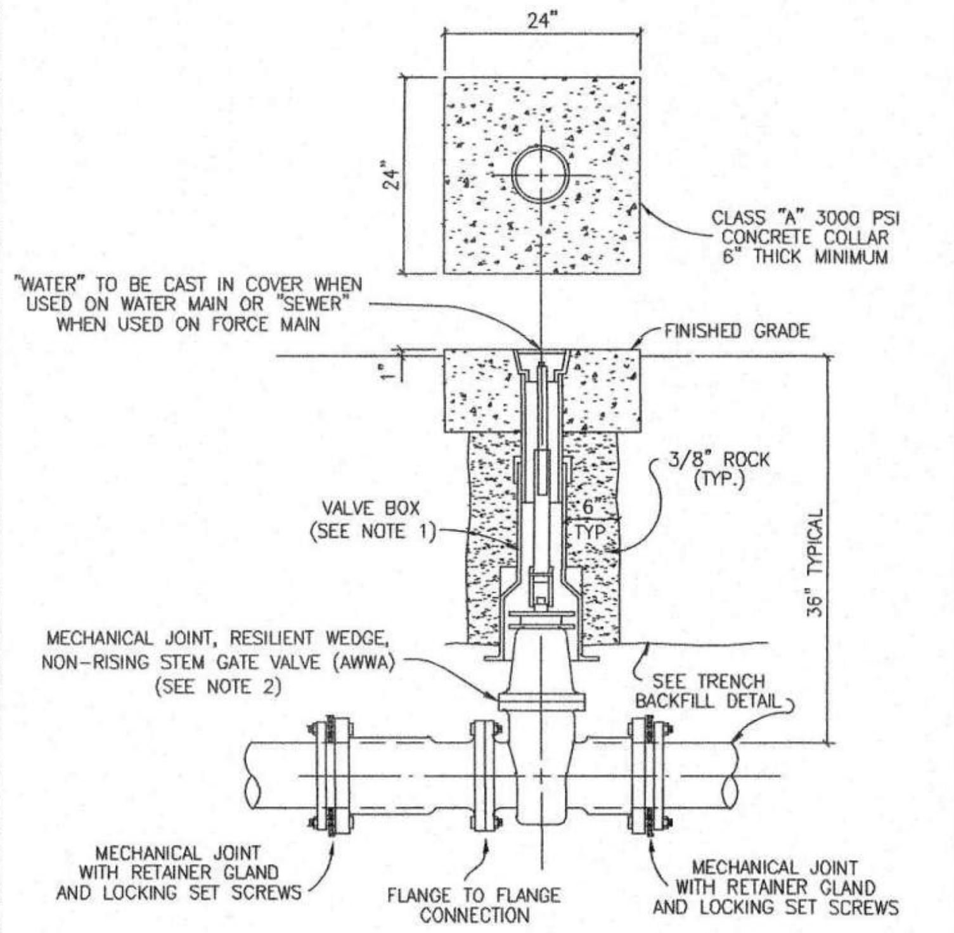
1. TEST STATION SHALL BE HANDLEY INDUSTRIES INC. – 2 INCH CATHODIC TEST STATIONS OR APPROVED EQUAL.
2. THE 15" ABS PLASTIC BOX SHALL BE A FLANGED TOP FOR INSTALLATION AT GROUND LEVEL.
3. ALL TERMINALS ARE TO BE MADE OF SOLID BRASS.
4. PLASTIC LIDS SHALL BE COLOR BLUE AND MARKED "WATER".
5. TEST TERMINALS ARE TO BE INCORPORATED WITH HANDLEY VALVE BOXES.
6. BURY SPLICE SHALL BE 3M DIRECT BURY SPLICE (DBR) OR APPROVED EQUAL.
7. TEST STATIONS SHALL BE INSTALLED AT EACH FIRE HYDRANT LOCATION.



The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRACER WIRE INSTALLATION AND TEST STATION LOCATION
W18
NTS 1/2003
MRS TRB



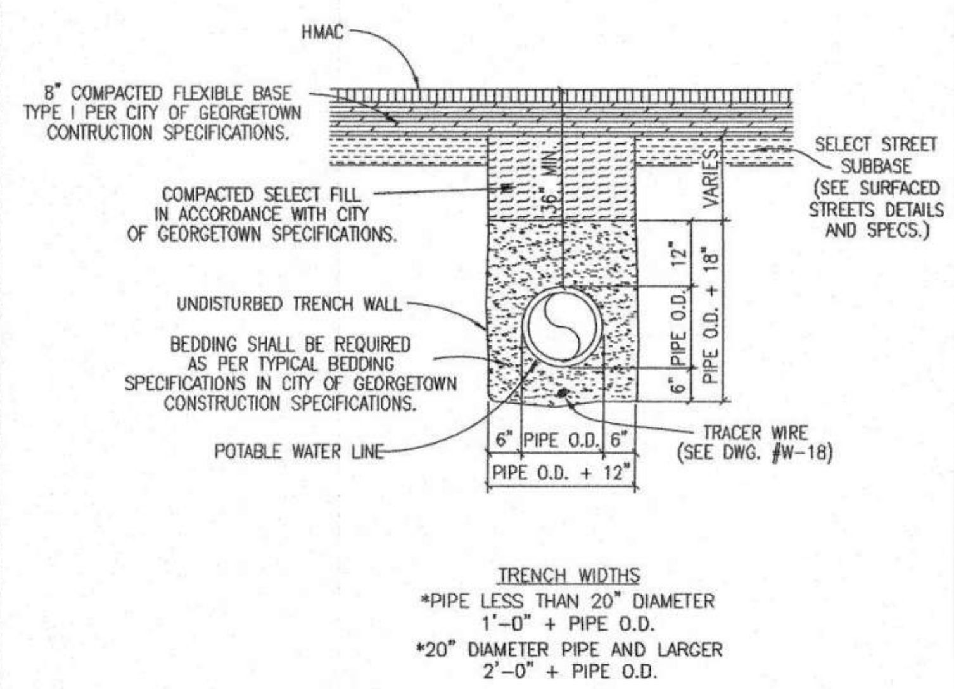
NOTES:

1. SEE VALVE SETTING DETAIL, DWG. #W–07.
2. ACCEPTABLE GATE VALVES ARE:
   A. MUELLER – 2360 SERIES
   B. CLOW

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
INLINE VALVE INSTALLATION
W21
NTS 1/2003
MRS TRB



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'–0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'–0" + PIPE O.D.

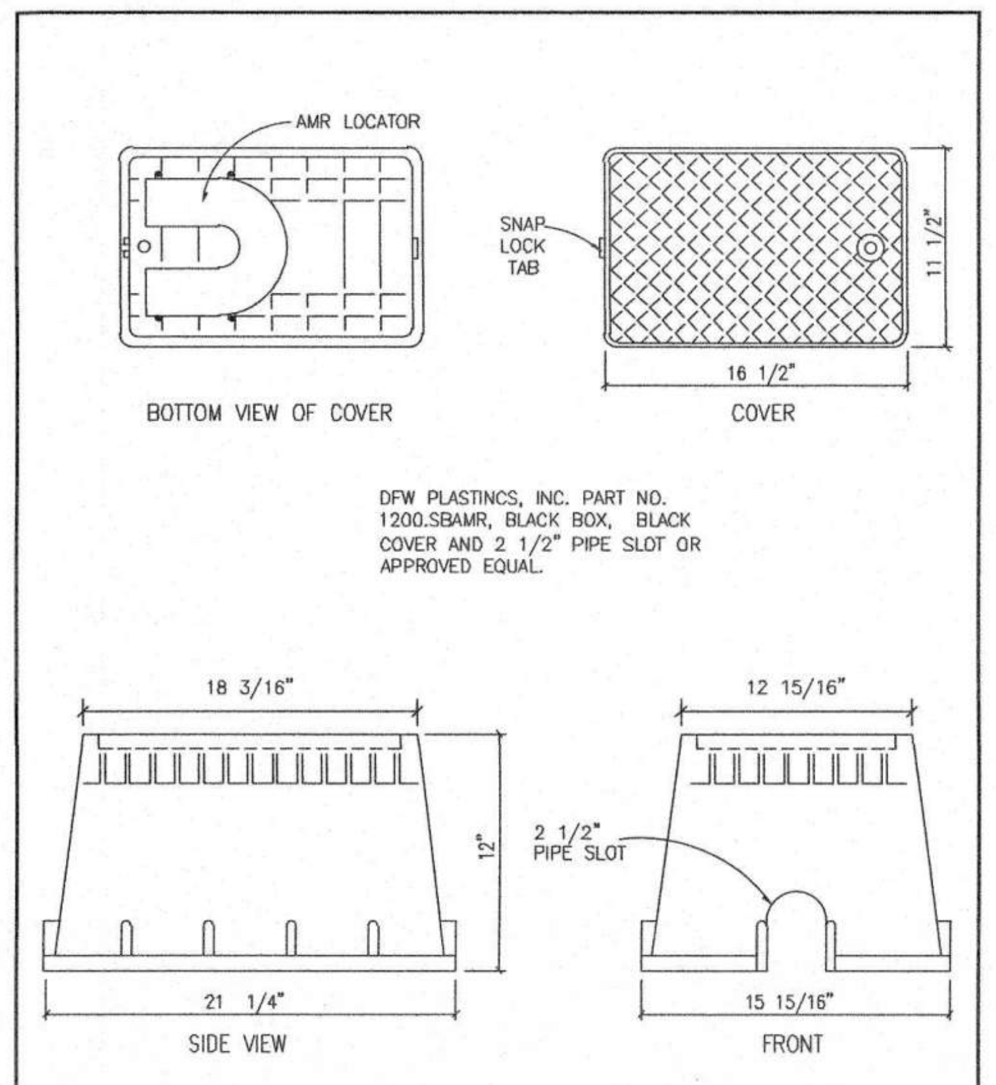
NOTES:

1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY
W22
NTS 1/2003
MRS TRB



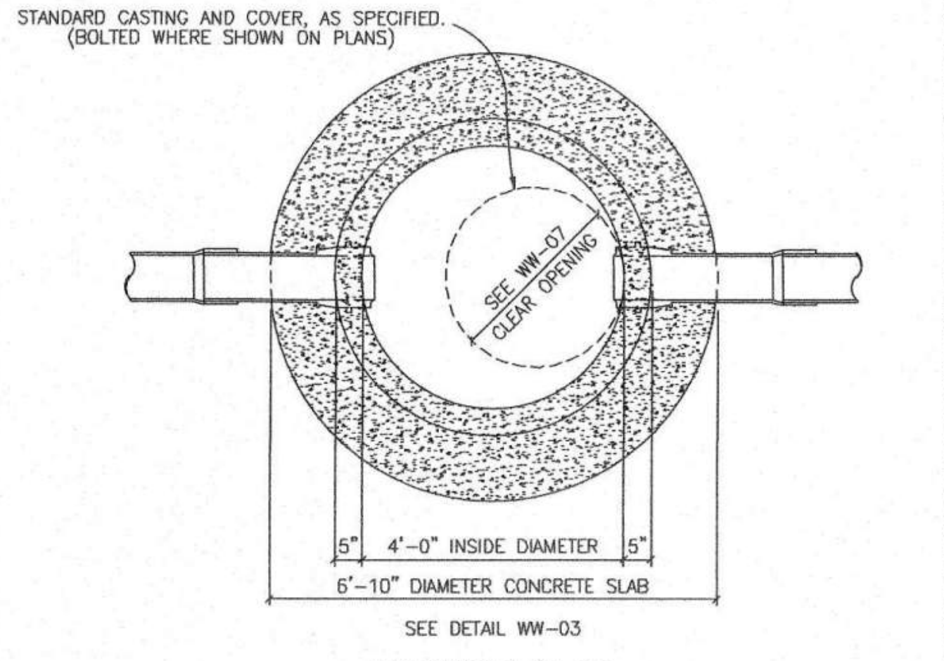
DFW PLASTICS, INC. PART NO. 1200.SBAMR, BLACK BOX, BLACK COVER AND 2 1/2" PIPE SLOT OR APPROVED EQUAL.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
METER BOX (NON–TRAFFIC AREAS)
W23
NTS 1/2003
MRS TRB

STANDARD CASTING AND COVER, AS SPECIFIED. (BOLTED WHERE SHOWN ON PLANS)



SEE DETAIL WW–03

MANHOLE PLAN

CITY OF GEORGETOWN NOTES:

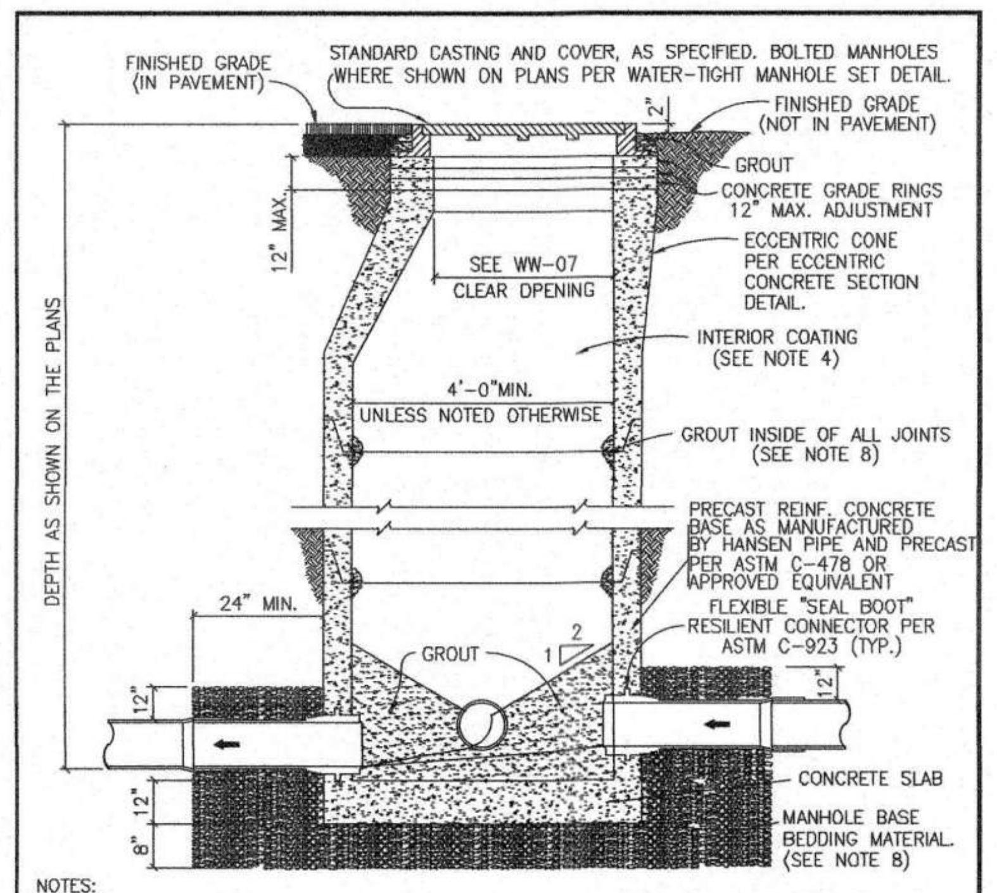
MANHOLE DETAILS SHALL REFLECT THE CITY'S MINIMUM SPECIFICATIONS, AS STATED BELOW:

A. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER PROFILE GASKET – SINGLE OFF–SET JOINT CONFORMING TO ASTM C478, C433 AND C76.
B. ALL MANHOLES SHALL HAVE FRAME AND COVER, AS MANUFACTURED BY EAST JORDAN IRON WORKS (AS PER DETAIL # WW–07) OR APPROVED EQUIVALENT.
C. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME AND COVER.
D. ALL MANHOLES SHALL HAVE AN ECCENTRIC CONE.
E. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF GEORGETOWN, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY HANSEN PIPE AND PRECAST OR APPROVED EQUAL M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING AND WITH PROFILE GASKET – SINGLE OFF–SET JOINT CONFORMING TO ASTM C443.
F. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C–923, SHALL BE CAST INTO BASE SECTION.
G. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE–TENTH OF A FOOT (0.1').
H. GRADE RINGS WITH AN I.D. TO MATCH FRAMES CLEAR OPENING WITH A MAXIMUM ADJUSTMENT OF 12" ARE ALLOWED.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – PLAN
WW02
NTS 1/2003
MRS TRB



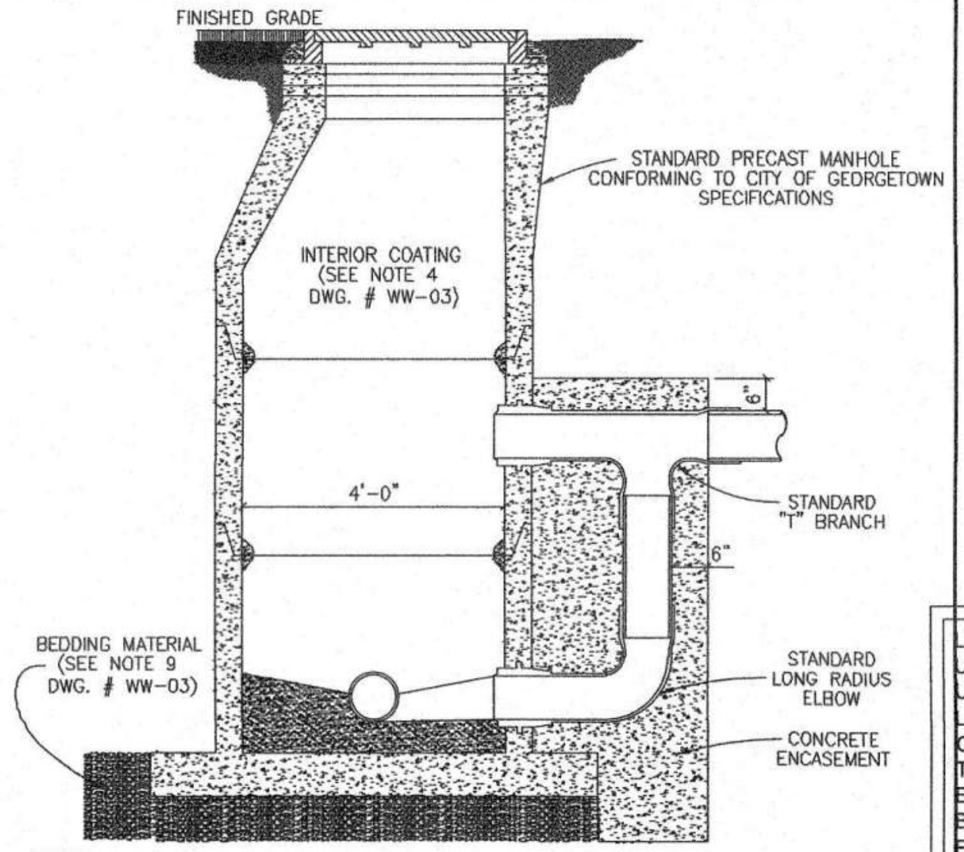
NOTES:

1. MANHOLES SHALL BE PRECAST ASTM C–478 BELL AND SPIGOT WITH PROFILE GASKET – SINGLE OFF–SET JOINTS.
2. SEE PLANS AND MANHOLE SCHEDULE, FOR MANHOLE SIZE, LOCATION, CONFIGURATION, TYPE OF TOP SECTION, VENTING REQUIREMENTS, PIPE SIZE AND TYPES.
3. SEE SPECIFICATIONS ON MATERIALS AND CONSTRUCTION.
4. AN 80 MIL. COAT OF RAVEN LINING SYSTEMS, RAVEN 405 ULTRA HIGH BUILD EPOXY COATING, OR SPRAY WALL EPOXY COATING, OR APPROVED EQUAL, TO BE APPLIED TO ENTIRE INTERIOR OF EACH WASTEWATER MANHOLE AND UNDERSIDE OF FLAT TOPS.
5. ALL MANHOLE COVERS SHALL BE BOLTED AND GASKETTED WHEN MANHOLES ARE LOCATED OUT FROM PAVEMENT.
6. MANHOLES TO BE VENTED ARE IDENTIFIED ON MANHOLE SCHEDULE. REFERENCE MANHOLE VENT DETAIL.
7. MANHOLES ARE TO BE DESIGNED TO RESIST LATERAL AND VERTICAL SOIL FORCES RESULTING FROM MANHOLE DEPTH. ADDITIONALLY, MANHOLES LOCATED IN PAVEMENT TO BE DESIGNED FOR HS–20 TRAFFIC LOADS.
8. GROUT SHALL MEET THE REQUIREMENTS AS STATED BY THE COATING MANUFACTURER.
9. MANHOLE BASE BEDDING MATERIAL SPECS. FOR 3/4" WASHED GRAVEL:
   SIEVE SIZE 2", PERCENT (%) RETAINED 0
   SIEVE SIZE 1 1/2", % RETAINED 0–10
   SIEVE SIZE 1", % RETAINED 45–80
   SIEVE SIZE 3/4", % RETAINED 85–100
   SIEVE SIZE 3/8", % RETAINED 95–100

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD MANHOLE – SECTION
WW03
NTS 1/2003
MRS TRB



NOTES:

1. CONCRETE ENCASEMENT FOR DROP CONNECTION TO BE POURED INTEGRALLY WITH BOTH MANHOLE SLAB AND WALL.
2. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT SEWER IS LOCATED TWO FEET (2') OR MORE ABOVE THE MAIN INVERT CHANNEL.
3. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
4. WHEN P.V.C. IS USED IN SANITARY SEWER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
5. MINIMUM PIPE SIZE FOR DROP IS EIGHT INCHES (8").
6. SEE STANDARD MANHOLE DETAIL (DWG. # WW–03) FOR ADDITIONAL REQUIREMENTS.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DROP CONNECTION–PRECAST MANHOLE TYPE "A"
WW04
NTS 1/2003
MRS TRB

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

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

WOODFIELD PRESERVE
PHASE 3
GENERAL DETAILS

NO.	REVISIONS DESCRIPTION	BY	DATE

DATE: 11/28/2023
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_DT3.dwg

JUSTIN D. MIDURA
128809
11-30-2023

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

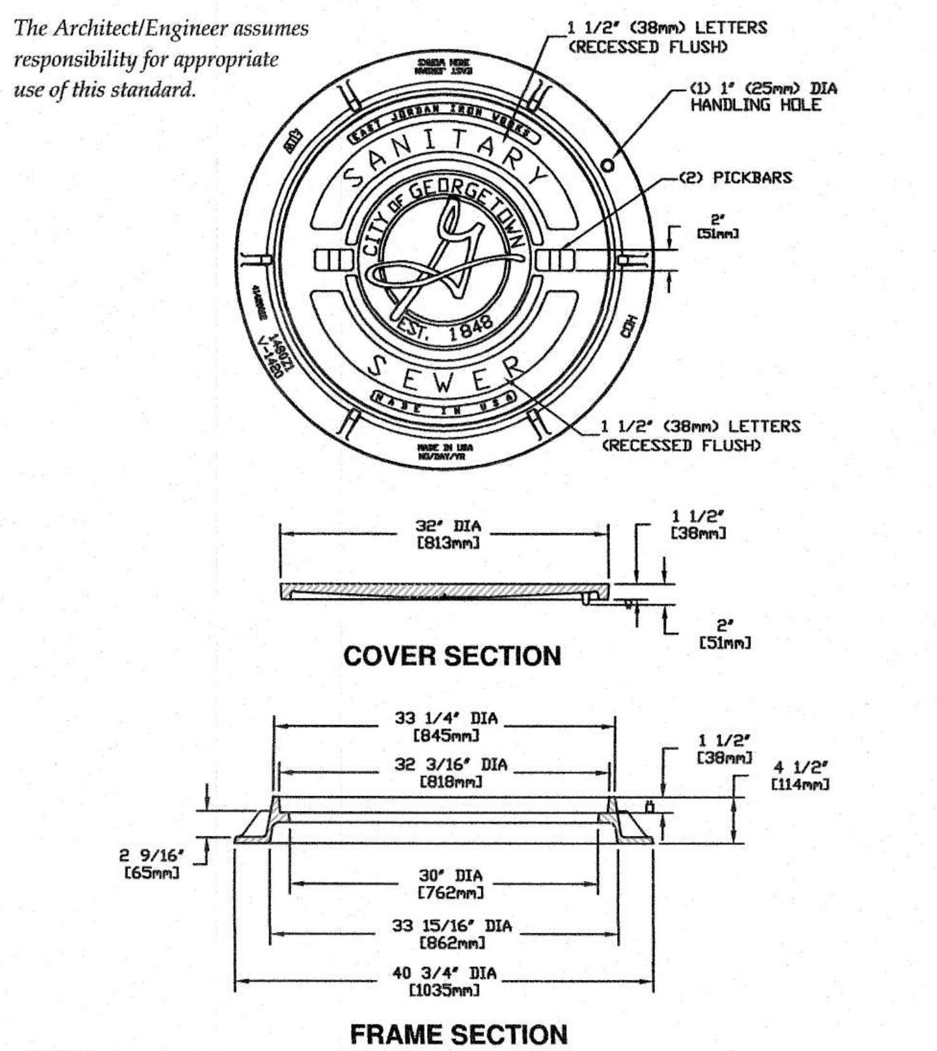
JOB NUMBER:
A245-1002

DT3

SHEET NO.
108
OF 118 SHEETS

User Name : jplecuch
Date/Time : Tue, 28 Nov 2023 - 9:03am
Path/Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_DT3.dwg

The Architect/Engineer assumes responsibility for appropriate use of this standard.



NOTES:

1. STANDARD WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480A V–1420/1480Z1, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. STANDARD WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 41420012 00148390.
4. FOR BOLTED WASTEWATER MANHOLE SET REFER TO DETAIL WW07A.

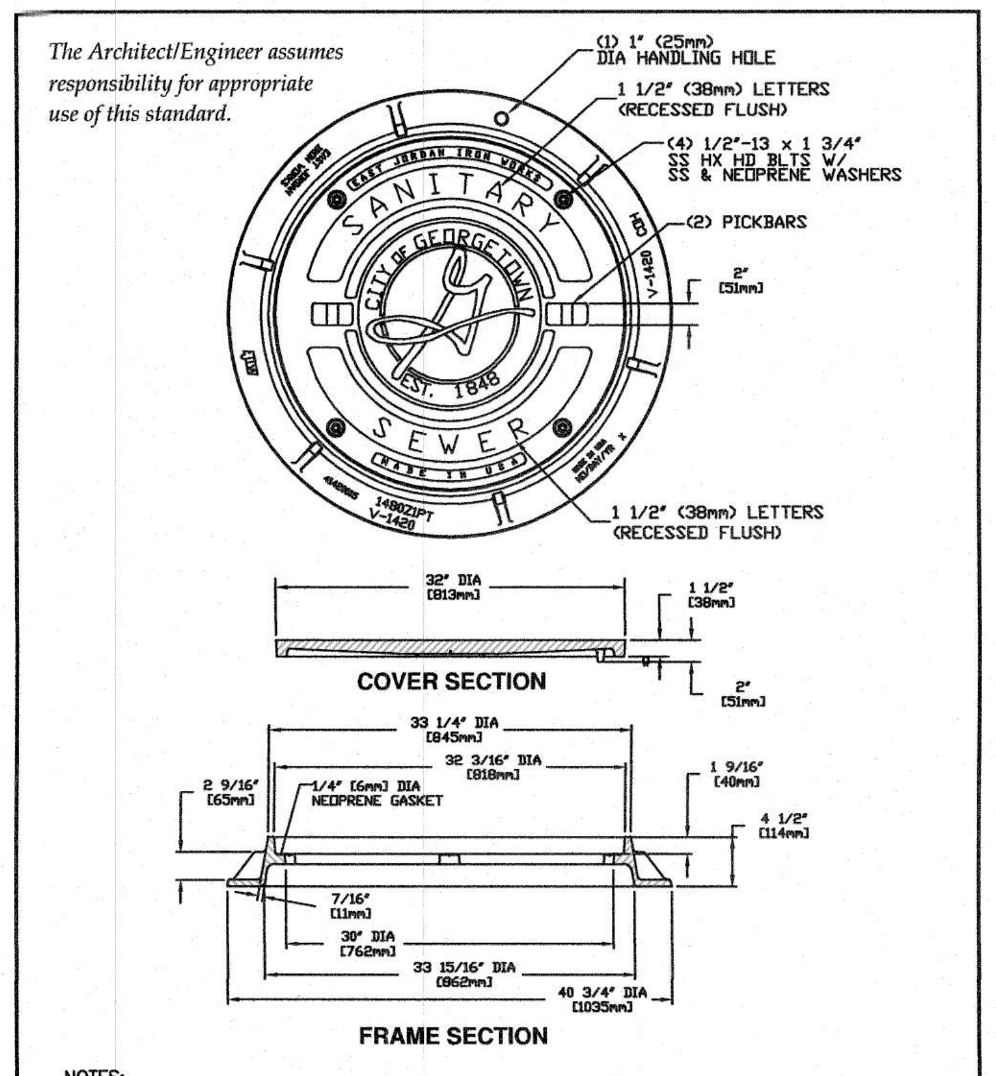
ADOPTED 6/21/2006

GEORGETOWN TEXAS
Georgetown Utility Systems

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
STANDARD WASTEWATER MANHOLE SET

WW07
NTS 1/2003
MRS TRB

The Architect/Engineer assumes responsibility for appropriate use of this standard.



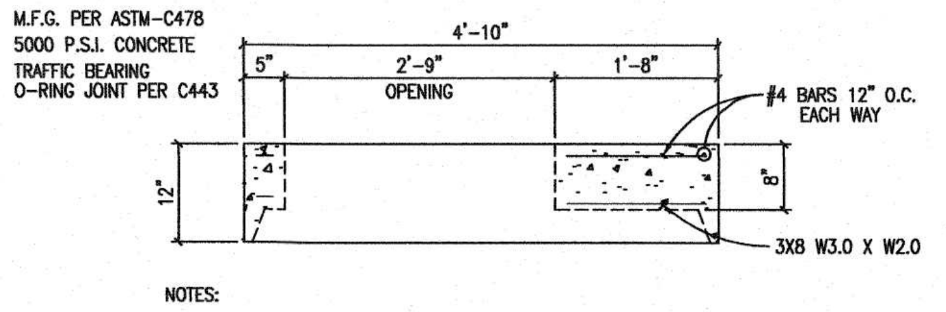
NOTES:

1. BOLTED WASTEWATER MANHOLE SET TO BE EAST JORDAN IRON WORKS, INC. CATALOG NO. 1480APT V–1420/1480Z1PT, COVER TO BE STAMPED WITH "SANITARY SEWER".
2. BOLTED WASTEWATER MANHOLE SET TO BE HEAVY DUTY LOAD RATED.
3. FOR MORE DETAILED SPECIFICATIONS REFER TO EAST JORDAN IRON WORKS, INC. REFERENCE PRODUCT DRAWING 00148392 41420015.
4. FOR STANDARD WASTEWATER MANHOLE SET REFER TO DETAIL WW07.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
BOLTED WASTEWATER MANHOLE SET

WW07A
NTS 1/2006
MRS TRB



NOTES:

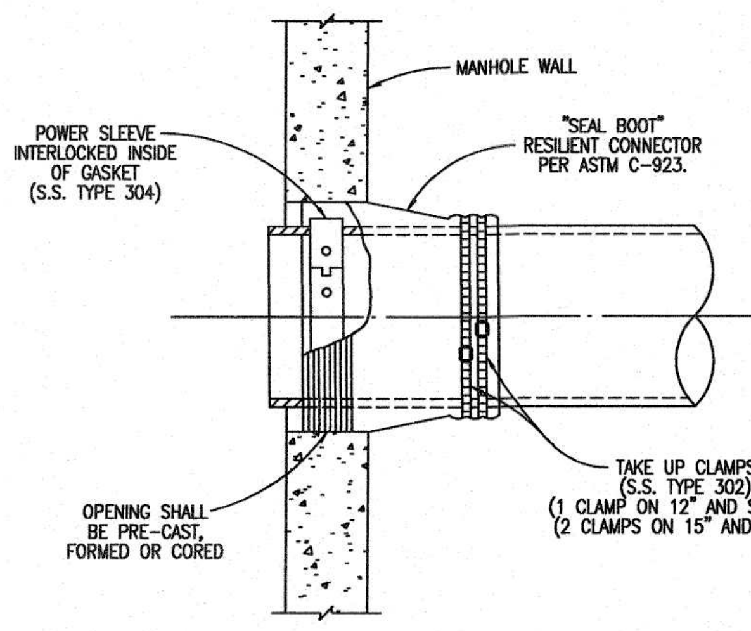
1. AVAILABLE WITH CAST IRON RING AND COVER CAST IN PLACE.
2. PERMITTED ONLY WITH WRITTEN APPROVAL FROM GEORGETOWN UTILITY SYSTEMS, CITY OF GEORGETOWN

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
48" MANHOLE FLAT LID

WW09
NTS 1/2003
MRS TRB

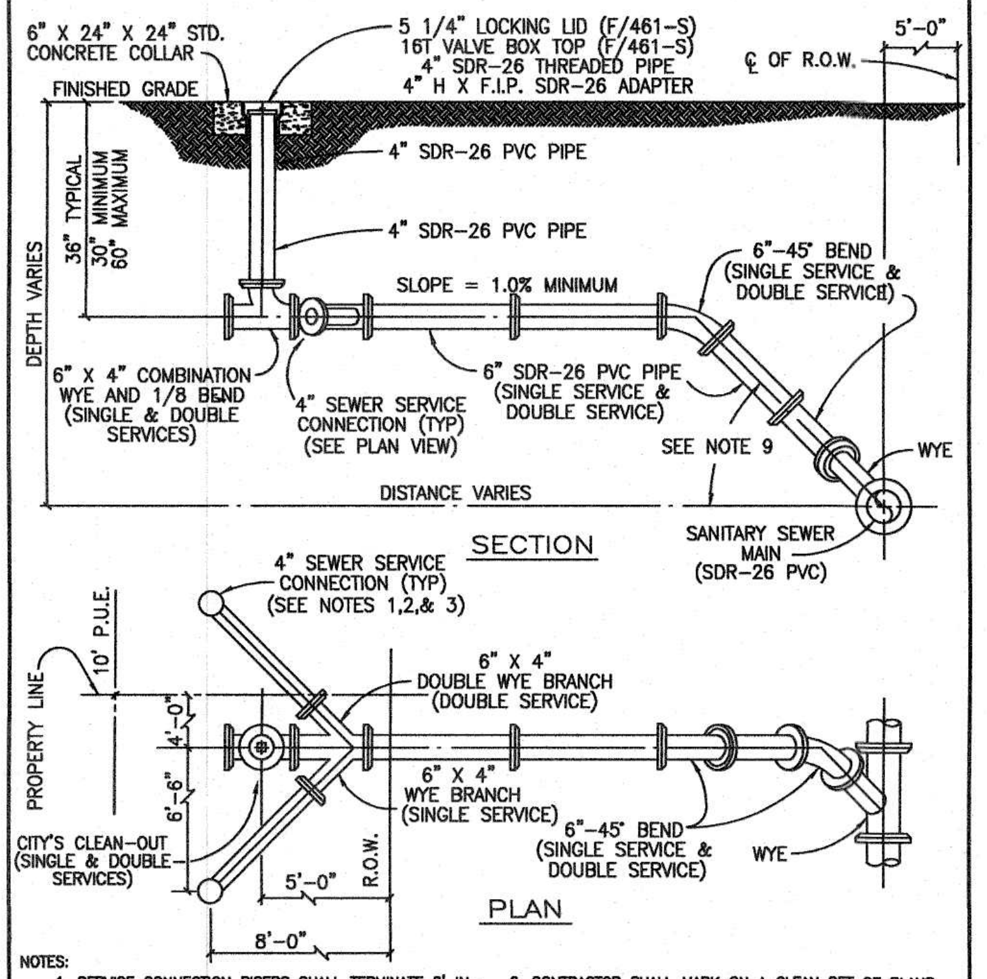


The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
FLEXIBLE "SEAL BOOT" CONNECTOR

WW10
NTS 1/2003
MRS TRB



NOTES:

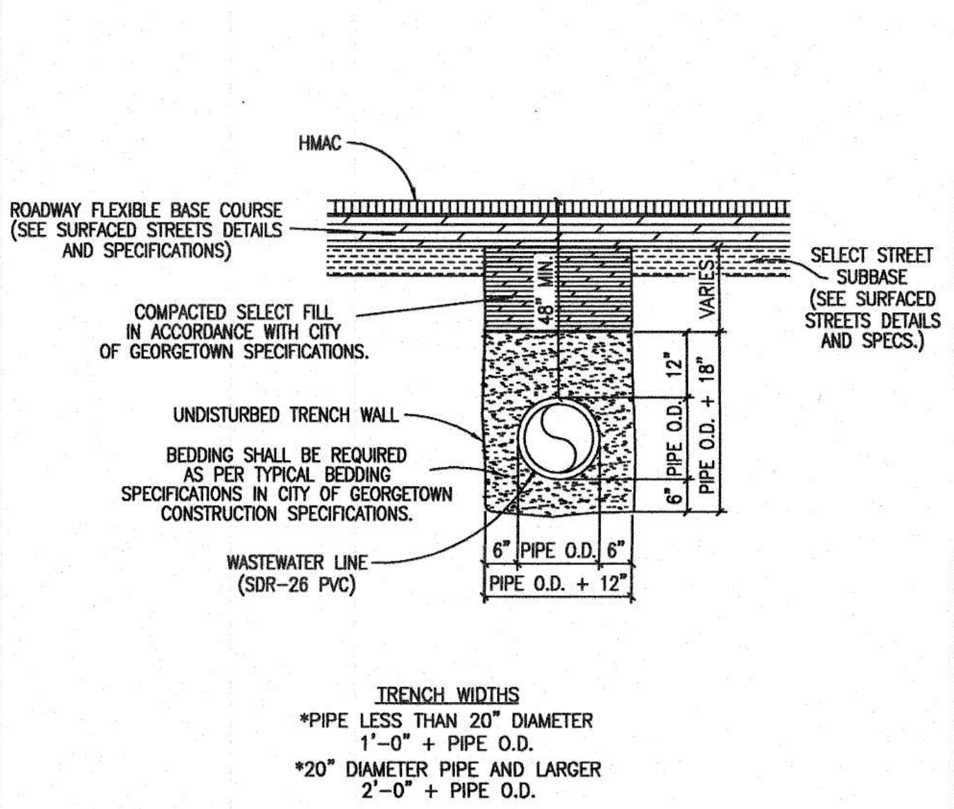
1. SERVICE CONNECTION RISERS SHALL TERMINATE 8' INSIDE THE PROPETY LINE.
2. THE END OF EACH SERVICE CONNECTION RISER SHALL BE EXTENDED 12" ABOVE FINISH GRADE.
3. EACH SERVICE CONNECTION SHALL BE PLUGGED WATER–TIGHT WITH AN APPROVED CAP OR PLUG.
4. FOR P.V.C. INSTALLATIONS, CONNECT TO EXISTING "BELL END" AND CONNECT OPPSITE END WITH P.V.C. TO P.V.C. KNOCK ON SLEEVE.
5. SOLIDLY TAMP BACKFILL AT LEAST ONE FOOT (1'–0") ABOVE TOP OF PIPE. SERVICES UNDER PAVED AREAS SHALL BE BACKFILLED TO THE SAME SPECIFICATIONS AS SHOWN ON PAVEMENT REPLACEMENT DETAIL.
6. CONTRACTOR SHALL MARK ON A CLEAN SET OF PLANS THE FINAL STATIONING OR DISTANCE AND DIRECTION FROM MANHOLE TO EACH SERVICE LATERAL AND GIVE TO ENGINEER FOR RECORD DRAWING PURPOSES.
7. ANY DEVIATION FROM THESE METHODS MUST BE APPROVED BY THE CITY OF GEORGETOWN ENGINEERING DEPARTMENT.
8. SERVICE LINE MATERIAL SHALL BE P.V.C., SDR–26.
9. SEWER SERVICE SLOPE TO BE 45° OFF CENTERLINE OF MAIN.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SEWER SERVICE CONNECTIONS

WW13
NTS 1/2003
MRS TRB



TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'–0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'–0" + PIPE O.D.

NOTES:

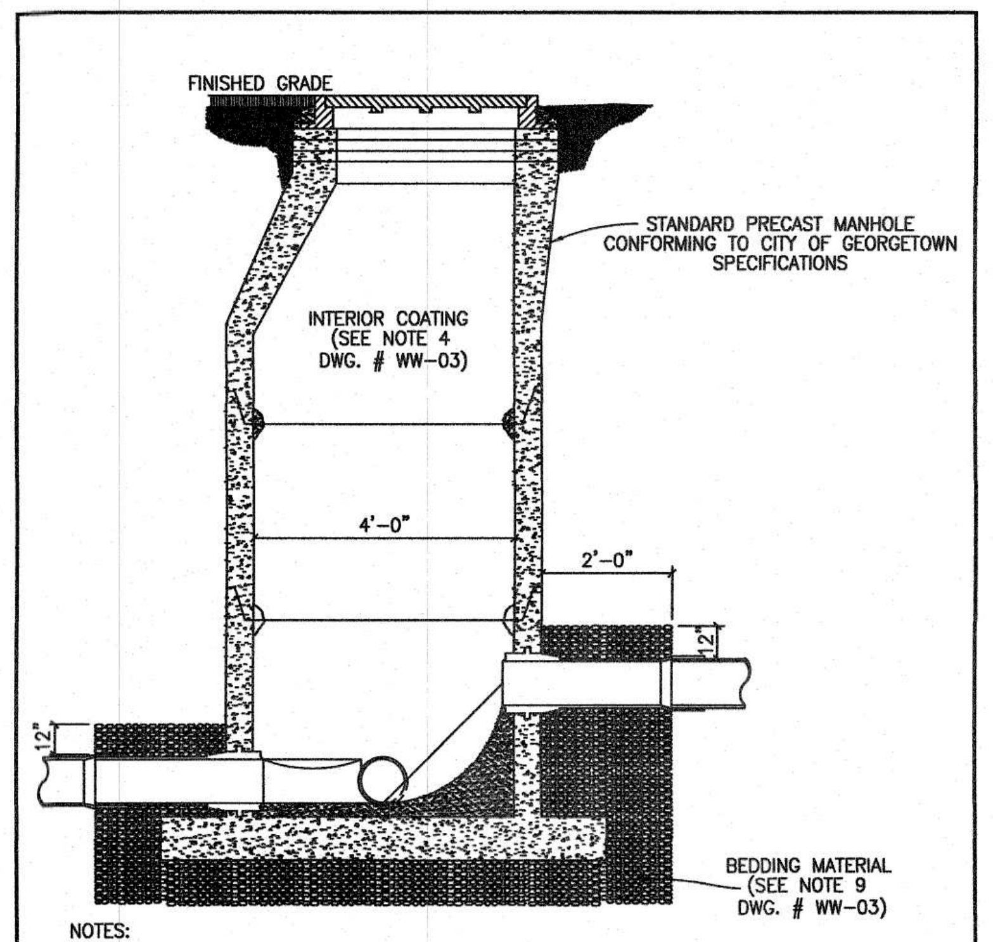
1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY

WW18
NTS 1/2003
MRS TRB



NOTES:

1. TO BE USED WHERE DROP IS SIX INCHES (6") TO TWO FEET (2'–0").
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. CONSTRUCTION OF DROP SHALL PROVIDE AN OVERSIZED SLAB TO EXTEND UNDER THE DROP CONNECTION.
4. MINIMUM PIPE SIZE FOR DROP IS EIGHT INCHES (8").
5. SEE STANDARD MANHOLE DETAIL (DWG. # WW–03) FOR ADDITIONAL REQUIREMENTS.

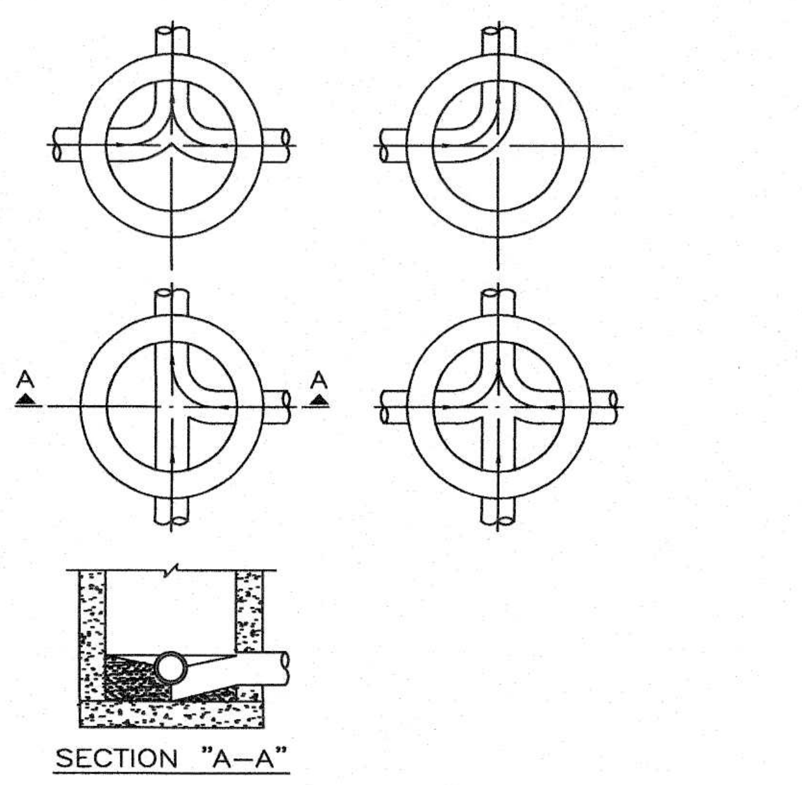
The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DROP CONNECTION–PRECAST MANHOLE TYPE "B"

WW05
NTS 1/2003
MRS TRB

FLOW PATTERNS FOR INVERT CHANNELS



NOTES:

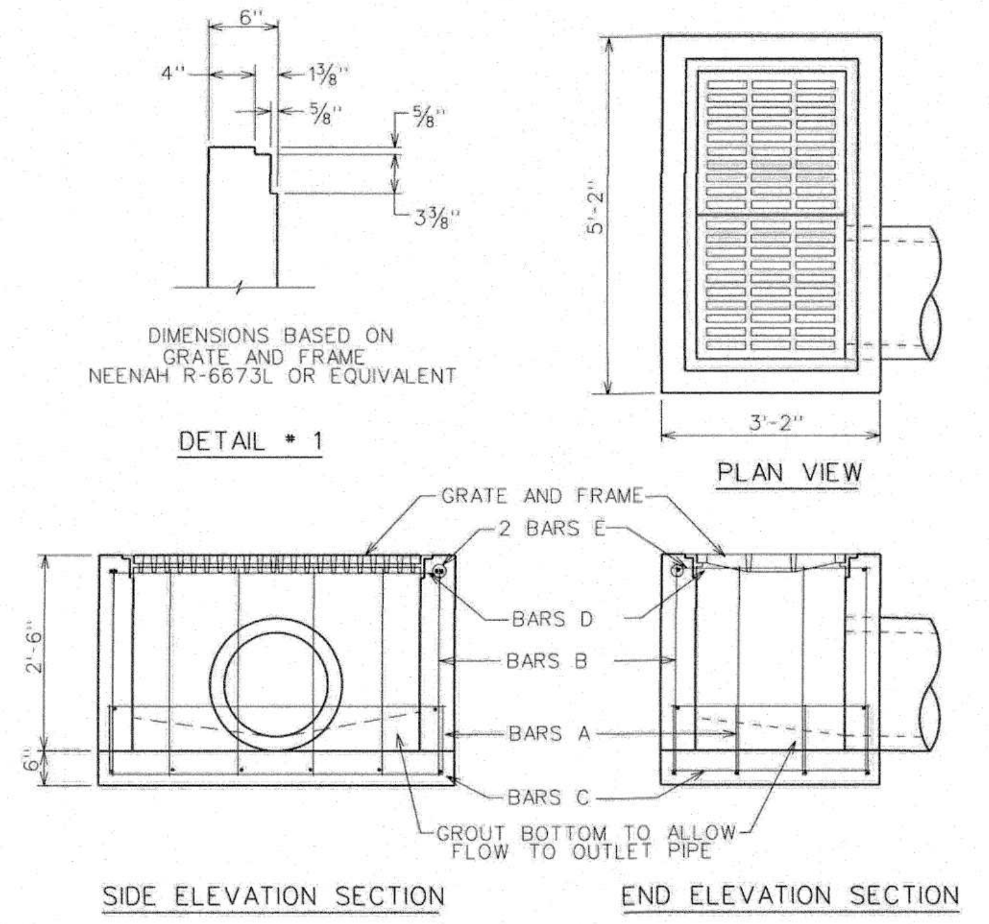
1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE ITSELF WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR 4" DEEP.

The Architect/Engineer assumes responsibility for appropriate use of this standard.

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
FLOW PATTERNS FOR INVERT CHANNELS

WW06
NTS 1/2003
MRS TRB



REINFORCING STEEL SCHEDULE					
BAR	QTY	SIZE	SPACING	LENGTH	WEIGHT
A	4	4	12"	6'-8"	18
B	16	4	12"	3'-0"	32
C	8	4	12"	2'-10"	15
D	4	4	12"	5'-2"	14
E	4	5	12"	2'-10"	12
				TOTAL WEIGHT---91 LB.	

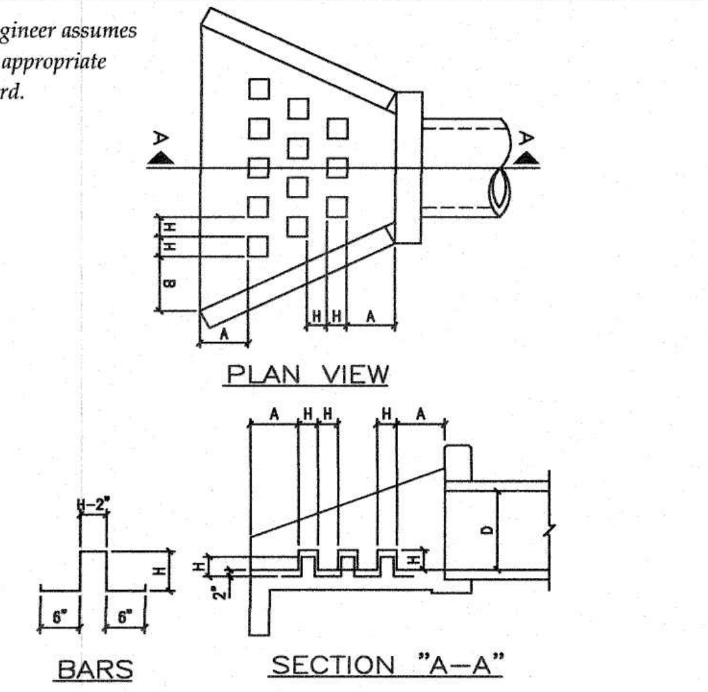
CITY OF AUSTIN
DEPARTMENT OF WATERSHED PROTECTION AND DEVELOPMENT REVIEW
RECORD COPY SIGNED BY ALLEN BRECHER 5/24/88 ADOPTED

STANDARD DROP INLET

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

STANDARD NO. 508-11

The Architect/Engineer assumes responsibility for appropriate use of this standard.



NOTES:

1. USE CLASS "A" CONCRETE, 3,000 PSI AT 28 DAYS, UNLESS NOTED.
2. REINFORCING STEEL – ASTM A615, GRADE 40, UNLESS NOTED.
3. LAP REINFORCING 30 BAR DIAMETERS MIN. AT SPLICES, UNLESS NOTED.
4. CHAMFER EXPOSED EDGES OF CONCRETE 3/4", UNLESS NOTED.
5. PLACE REINFORCING WITH THE CENTER OF THE OUTSIDE BARS 2 INCHES FROM THE SURFACE OF THE CONCRETE.

TABLE OF DIMENSIONS FOR ENERGY DISSIPATOR DETAIL

D PIPE DIAMETER (INCHES)	NUMBER OF ROWS OF DISSIPATORS	NUMBER OF DISSIPATORS IN FRONT ROW	H (INCHES)	A (INCHES)	B (INCHES)
12	1	3	4	4	9.1875
18	2	4	4 1/2	9 1/2	15.5625
24	2	5	6	14 3/4	16 1/2
30	3	6	7 1/2	12 1/2	14 3/8
36	3	6	9	16 1/4	18 5/16
42	3	6	10 1/2	20	22 1/4
48	3	6	12	23 3/4	26 1/4
54	3	6	13 1/2	27 1/2	27 3/4
60	3	6	15	31 1/4	31 5/8

ADOPTED 6/21/2006

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
ENERGY DISSIPATER DETAIL

SD20
NTS 1/2003
MRS TRB

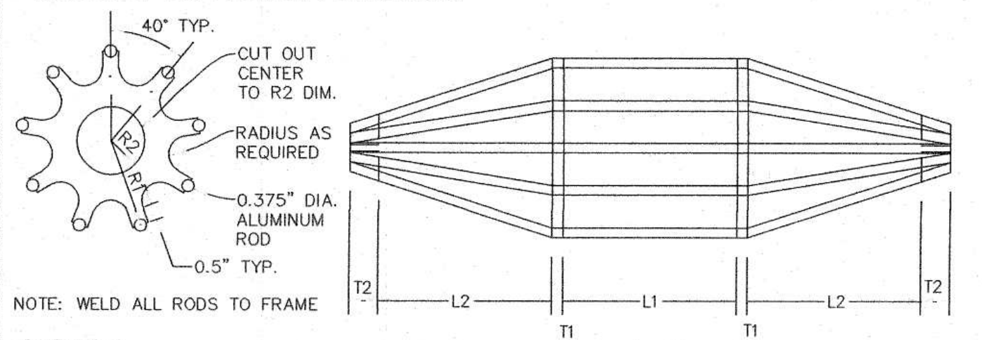
NOTE:
ALL WASTEWATER LINES SHALL BE TESTED IN ACCORDANCE TO TCEQ 30 TAC 217.57(b) AND (c) SPECIFICATIONS BY THE CONTRACTOR INITIALLY AFTER CONSTRUCTION IS COMPLETE, AND BY OWNER 5 YEARS AFTER CONSTRUCTION. MANDRELS SHALL BE SIZED ACCORDING TO THE TABLE SHOWN HEREON. FOR PIPE RUNS CONSISTING OF MULTIPLE PIPE MATERIALS AND/OR ADAPTORS, THE LARGER MANDREL DIAMETER SHALL BE USED FOR THE ENTIRE RUN.

MANDREL DIAMETER SIZES

PIPE MATERIAL	NOMINAL DIAMETER	AVGERAGE ID	5% DEF. MANDREL DIAMETER
SDR 26	6"	5.764"	5.48"
SDR 26	8"	7.715"	7.33"
SDR 26	10"	9.644	9.16"
SDR 26	12"	11.480"	10.91"

NOTE:
1) DIMENSIONS TAKEN FROM UNI–BELL PVC PIPE ASSOCIATION HANDBOOK OF PVC PIPE, SECOND EDITION, OCTOBER 1983.

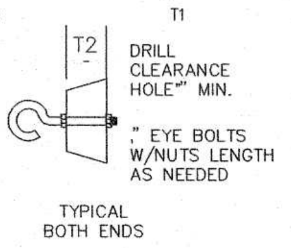
2) CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR PROPOSED PIPE MATERIAL TO ENGINEER TO VERIFY ACTUAL PIPE DIMENSIONS.



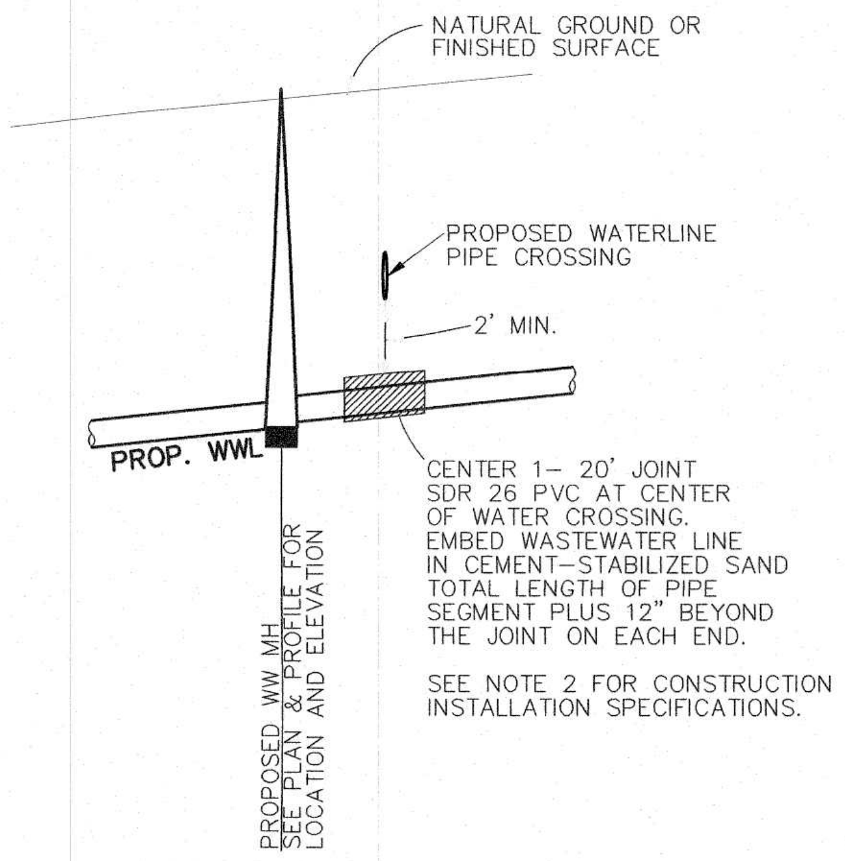
NOTE: WELD ALL RODS TO FRAME

DIMENSIONS

PIPE SIZE	L1	L2	R2	T1	T2	ROD DIA.	5% R1
6"	6"	6"	0.75"	0.375"	1.0"	0.375"	2.78"
8"	6"	6"	1.25"	0.375"	1.0"	0.375"	3.73"
10"	8"	8"	1.50"	0.375"	1.0"	0.375"	4.66"
12"	8"	8"	1.75"	0.375"	1.0"	0.375"	5.55"
15"	9"	9"	2.00"	0.375"	1.0"	0.375"	6.79"



TYPICAL MANDREL DETAIL



WATER AND WASTEWATER CROSSING DETAIL

NOT TO SCALE

NOTES:

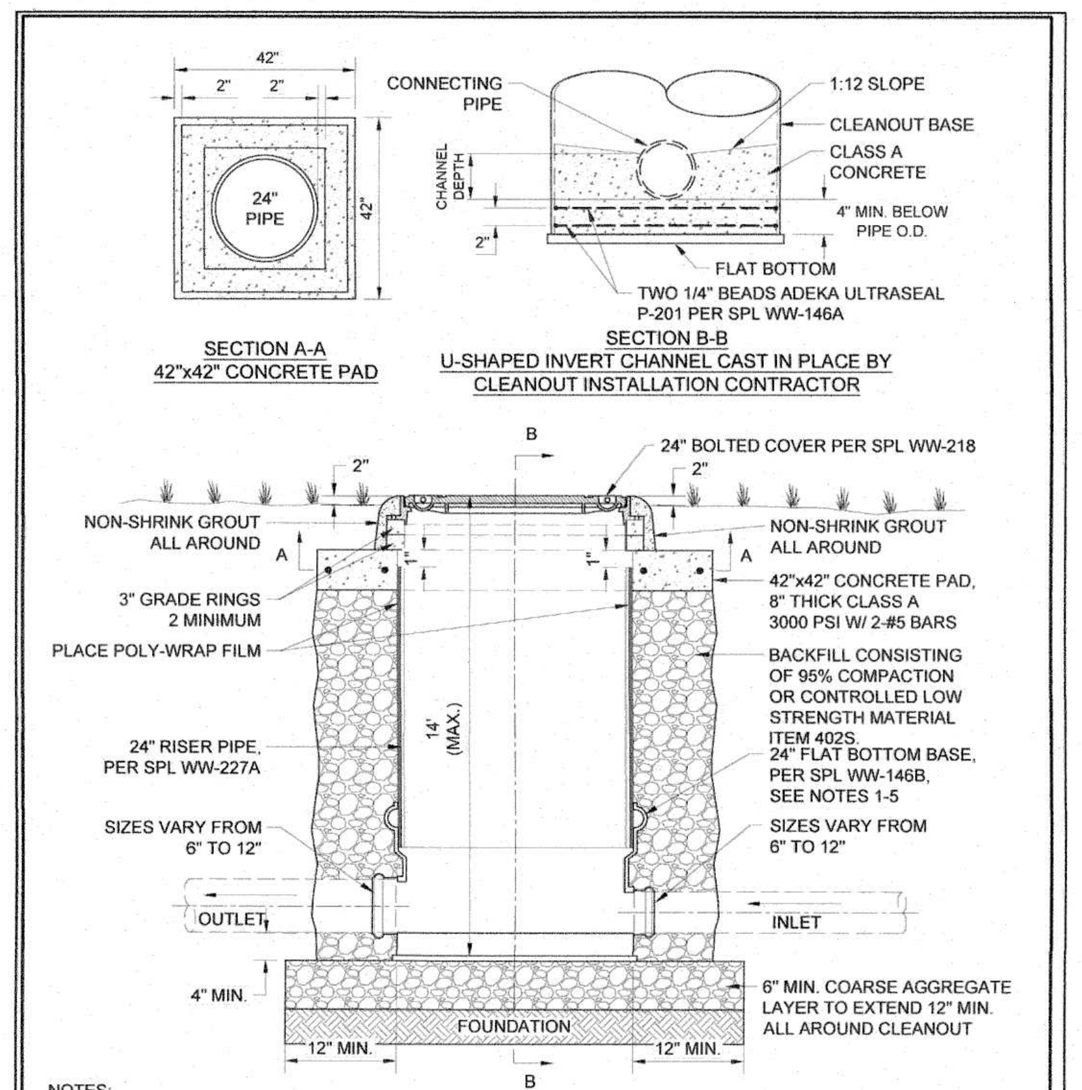
1) THIS DETAIL TO BE USED FOR WATER AND WASTEWATER CROSSING PIPES WITHIN NINE FEET, WHERE THE WASTEWATER COLLECTION SYSTEM PIPE IS BELOW THE WATER SUPPLY PIPE.

2) CEMENT-STABILIZED SAND FOR ENCASING COLLECTION SYSTEM PIPES MUST:

i. INCLUDE AT LEAST 160 POUNDS OF CEMENT FOR EVERY CUBIC YARD OF SAND;

ii. BE INSTALLED BEGINNING ONE-QUARTER PIPE DIAMETER BELOW THE CENTERLINE OF THE COLLECTION SYSTEM PIPE;

iii. BE INSTALLED ENDING ONE FULL PIPE DIAMETER ABOVE THE TOP OF THE COLLECTION SYSTEM PIPE, OR 12 INCHES ABOVE THE TOP OF THE COLLECTION SYSTEM PIPE, WHICHEVER IS GREATER.



NOTES:

1. THE CLEANOUT BASE SECTION SHALL BE SUPPLIED WITH A FLAT BOTTOM WITHOUT A FABRICATOR-INSTALLED INVERT.
2. A U-SHAPED INVERT CHANNEL CONNECTING THE FLOWLINES OF THE INLET AND OUTLET PIPES SHALL BE CAST IN PLACE BY THE CLEANOUT INSTALLATION CONTRACTOR.
3. THE CHANNEL DEPTH SHALL BE 3/4 OF THE DIAMETER OF THE LARGEST PIPE CONNECTING TO THE CLEANOUT.
4. USE CLASS A CONCRETE FOR THE CAST IN PLACE INVERT AND COAT IT WITH AN ORGANIC SPRAY LINER LISTED ON SPL WW-511.
5. THE CLEANOUT FOUNDATION SHALL MEET OR EXCEED STANDARD SPECIFICATION ITEM 506.5B.
6. IN CASES WHERE THE WASTEWATER SERVICE LINE IS LARGER THAN 12" DIAMETER, THE CONTRACTOR MUST INSTALL A MINIMUM 48" DIAMETER MANHOLE IN LIEU OF THE LARGE DIAMETER CLEANOUT. THE ENGINEER MUST PROVIDE AN ACCEPTABLE SAMPLE PORT AND RECEIVE APPROVAL IN WRITING FROM THE INDUSTRIAL WASTE REVIEWER BEFORE INSTALLATION. THE 48" DIA. MANHOLE SHALL CONFORM TO STD. 506S-10 AND INCLUDE A SAMPLE PORT.

CITY OF AUSTIN
AUSTIN WATER

LARGE DIAMETER CLEANOUT

JEFF A. KYLE 08/14/2020 ADOPTED

THE ENGINEER/ARCHITECT ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD. MODIFICATIONS TO THIS STANDARD ARE PROHIBITED.

STANDARD NO. 506-AW-04
1 OF 1

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

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

WOODFIELD PRESERVE
PHASE 3

GENERAL DETAILS

REVISIONS

NO.	DESCRIPTION	BY	DATE

DATE: 3/1/2024
DESIGNED BY: XXX
DRAWN BY: XXX
CHECKED BY: XXX
DRAWING NAME: A245-1002_PH3_DT4.dwg

JUSTIN D. MIDURA
128809
2-26-2024

LJA Engineering, Inc.
2700 La Frontera Blvd
Suite 150
Round Rock, TX 78681
Phone 512.439.4700
Fax 512.439.4716
FRN - F-1386

JOB NUMBER:
A245-1002

DT4

SHEET NO.
109
OF 118 SHEETS

User Name : jpiecuch
Date\Time : Fri, 01 Mar 2024 - 9:00am
Path\Name : G:\A245-1002 Georgetown Village\ACAD_Sheet Files\PHASE 3\A245-1002_PH3_DT4.dwg

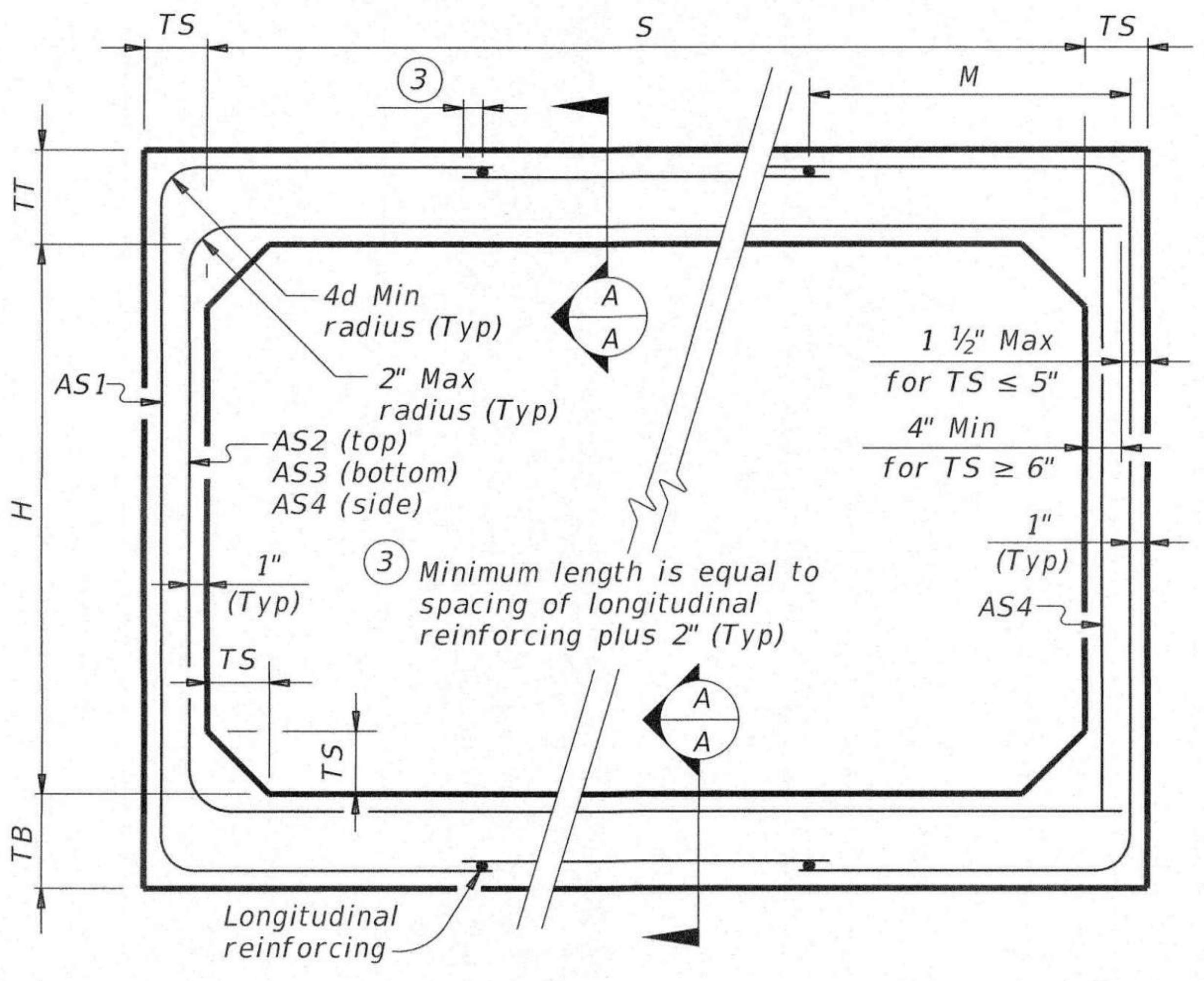
DATE:
FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height	M (Min)	REINFORCING (sq. in. / ft.) ②							① Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
10	4	10	10	10	< 2	-	0.33	0.34	0.27	0.24	0.24	0.24	0.24	16.5
10	4	10	10	10	2 < 3	58	0.38	0.35	0.30	0.24	-	-	-	16.5
10	4	10	10	10	3 - 5	53	0.31	0.28	0.27	0.24	-	-	-	16.5
10	4	10	10	10	10	52	0.36	0.32	0.33	0.24	-	-	-	16.5
10	4	10	10	10	15	52	0.47	0.42	0.43	0.24	-	-	-	16.5
10	4	10	10	10	20	52	0.61	0.54	0.55	0.24	-	-	-	16.5
10	4	10	10	10	25	52	0.75	0.67	0.68	0.24	-	-	-	16.5
10	5	10	10	10	< 2	-	0.30	0.36	0.30	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2 < 3	58	0.35	0.39	0.34	0.24	-	-	-	17.5
10	5	10	10	10	3 - 5	52	0.28	0.31	0.30	0.24	-	-	-	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	-	-	-	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	-	-	-	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	-	-	-	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	-	-	-	17.5
10	6	10	10	10	< 2	-	0.28	0.38	0.33	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2 < 3	58	0.32	0.42	0.37	0.24	-	-	-	18.5
10	6	10	10	10	3 - 5	53	0.26	0.34	0.33	0.24	-	-	-	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	-	-	-	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	-	-	-	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	-	-	-	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	-	-	-	18.5
10	7	10	10	10	< 2	-	0.25	0.40	0.36	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2 < 3	58	0.30	0.45	0.40	0.24	-	-	-	19.5
10	7	10	10	10	3 - 5	58	0.24	0.36	0.35	0.24	-	-	-	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	-	-	-	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	-	-	-	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	-	-	-	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	-	-	-	19.5
10	8	10	10	10	< 2	-	0.24	0.41	0.38	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2 < 3	64	0.27	0.47	0.43	0.24	-	-	-	20.5
10	8	10	10	10	3 - 5	58	0.24	0.38	0.38	0.24	-	-	-	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	-	-	-	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	-	-	-	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	-	-	-	20.5
10	9	10	10	10	< 2	-	0.24	0.42	0.41	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2 < 3	70	0.26	0.50	0.46	0.24	-	-	-	21.5
10	9	10	10	10	3 - 5	64	0.24	0.40	0.40	0.24	-	-	-	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	-	-	-	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	-	-	-	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	-	-	-	21.5
10	10	10	10	10	< 2	-	0.24	0.44	0.44	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2 < 3	79	0.25	0.52	0.48	0.24	-	-	-	22.5
10	10	10	10	10	3 - 5	70	0.24	0.42	0.43	0.24	-	-	-	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	-	-	-	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	-	-	-	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	-	-	-	22.5

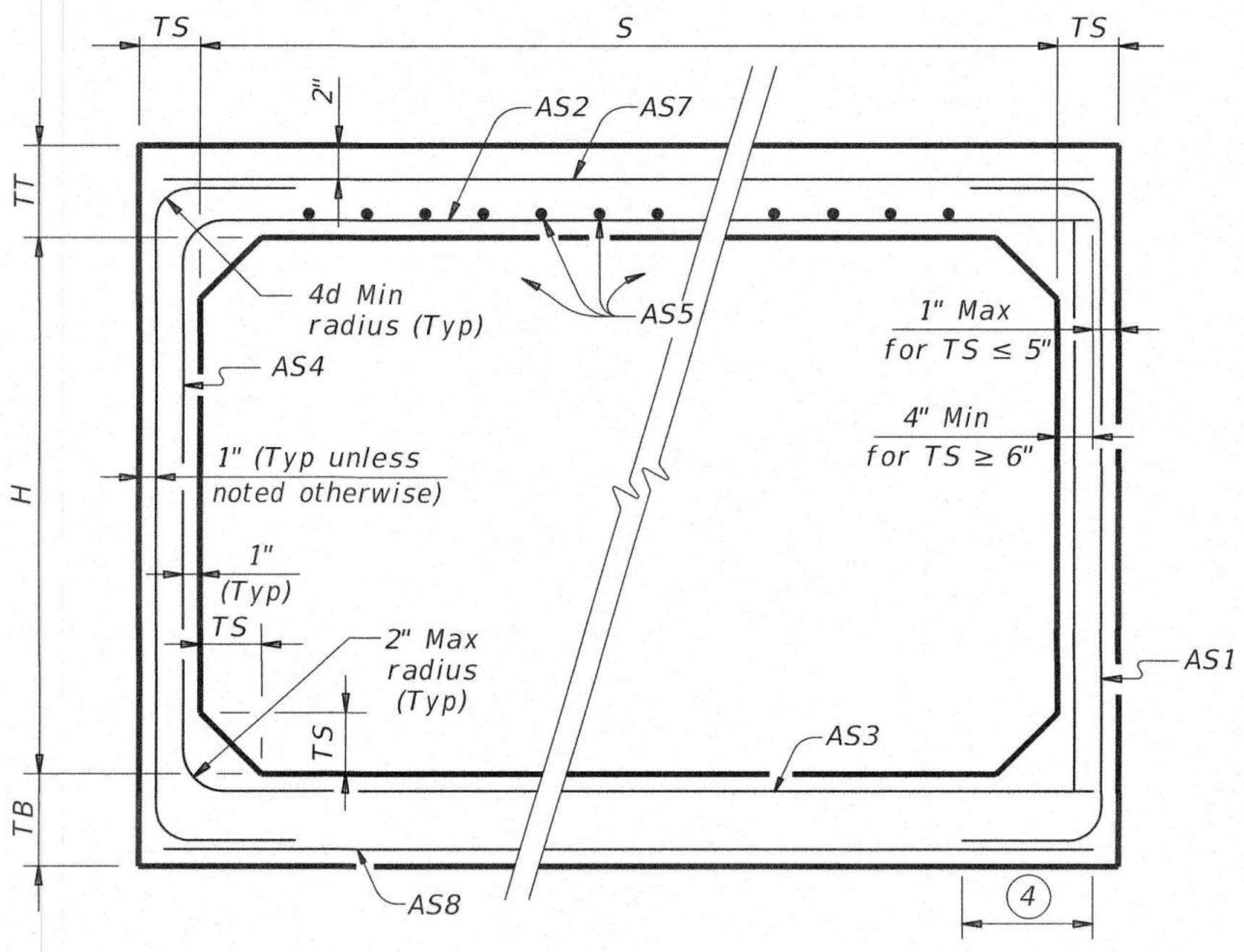
① For box length = 8'-0"

② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



CORNER OPTION "A" CORNER OPTION "B"

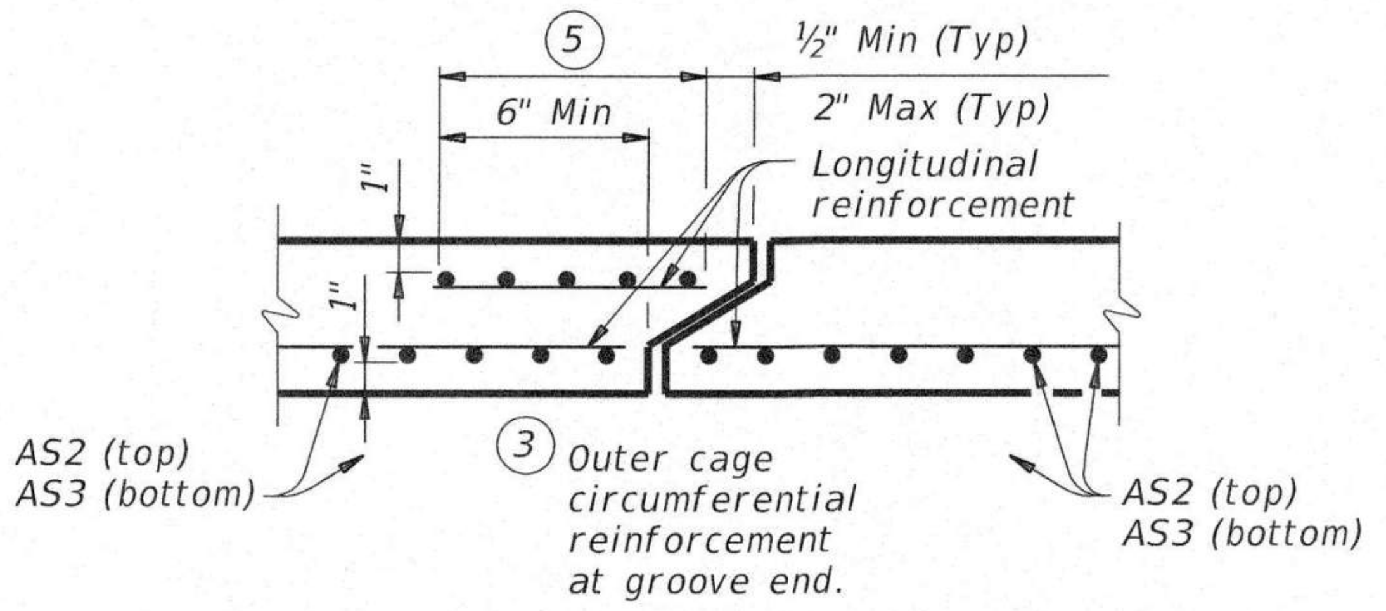
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)."

JUSTIN D. MIDURA
128809
11-30-2023

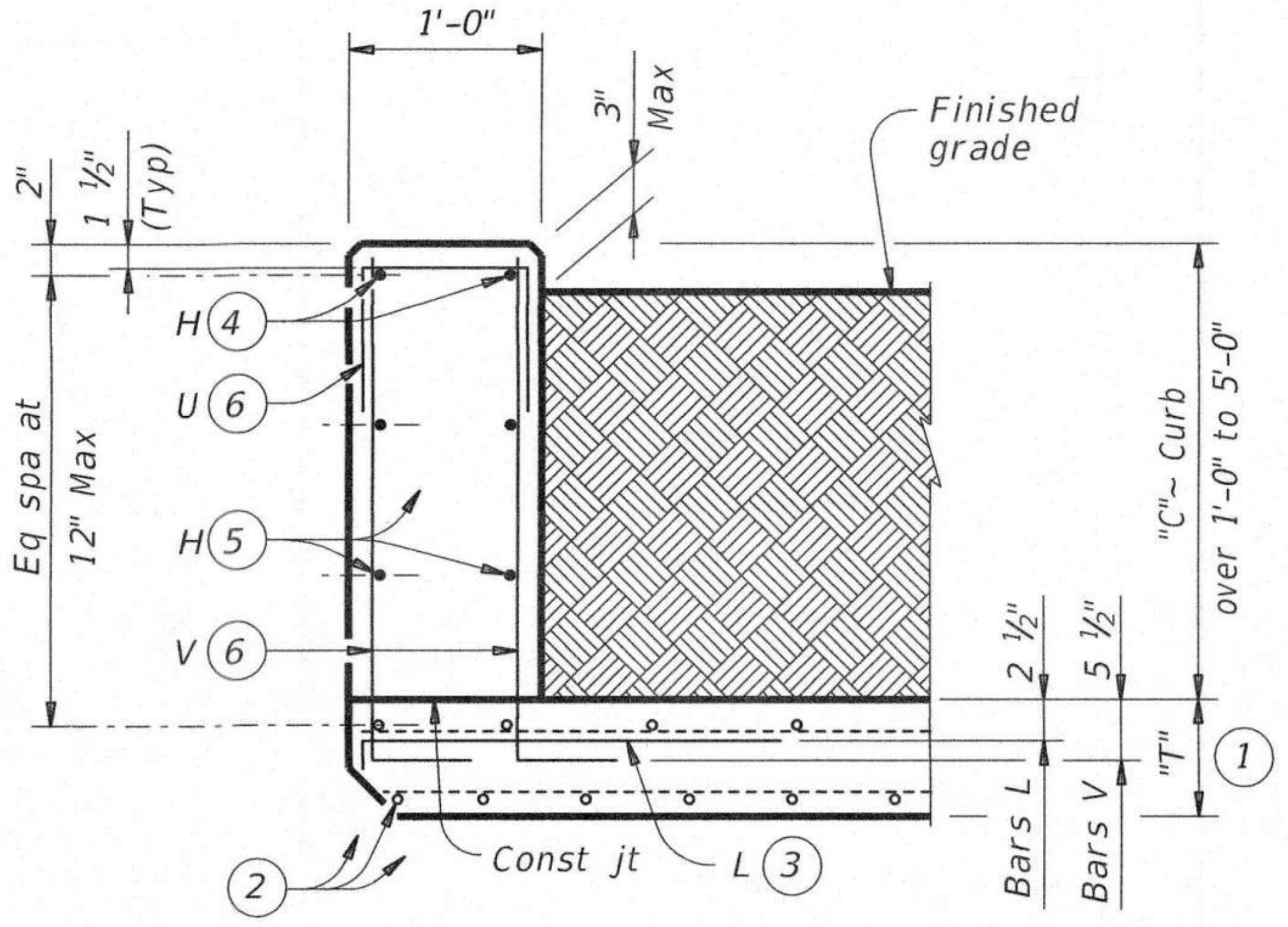
HL93 LOADING

Texas Department of Transportation
Bridge Division Standard

SINGLE BOX CULVERTS PRECAST
10'-0" SPAN

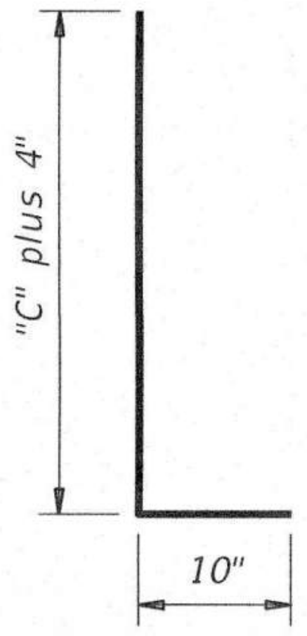
SCP-10

FILE: CD-SCP10-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

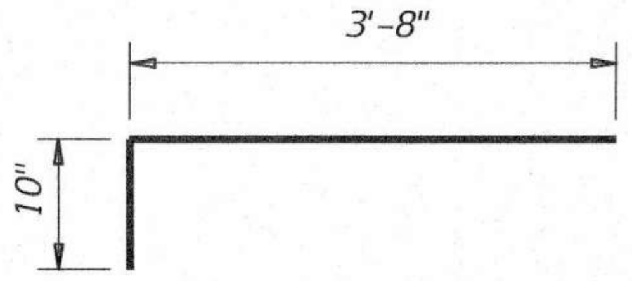


TYPICAL SECTION

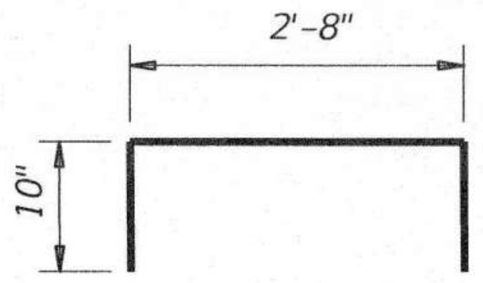
Used for curbs over 1'-0" to 5'-0"



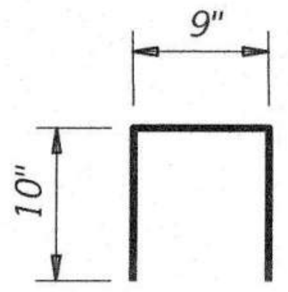
BARS V (#5) ⑥
Spaced at 12" Max



BARS L (#5) ③
Spaced at 12" Max



OPTIONAL
BARS L (#5) ③⑦
Spaced at 12" Max



BARS U (#4) ⑥
Spaced at 12" Max

① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 8" thick, see SCP-MD standard for additional details.

② Adjust normal culvert slab bars as necessary to clear obstructions.

③ Place bars L as shown. Tilt hook as necessary to maintain cover.

④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.

⑤ Additional bars H(#4) as required to maintain 12" Max spacing.

⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.

⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.

⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES ⑧

Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	15.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:

Adjust reinforcing steel as necessary to provide 1 ¼" cover.

For vehicle safety, top of the curb must not project more than 3" above the finished grade.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.

Provide galvanized reinforcing steel if required elsewhere in the plans.

Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.

Provide bar laps, where required, as follows:

- Uncoated or galvanized ~ #4 = 1'-8" Min

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR11, PR22 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.

This Curb is considered as part of the Box Culvert for payment.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

JUSTIN D. MIDURA
128809

11-30-2023

Texas Department of Transportation

Bridge Division Standard

EXTENDED CURB DETAILS

FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

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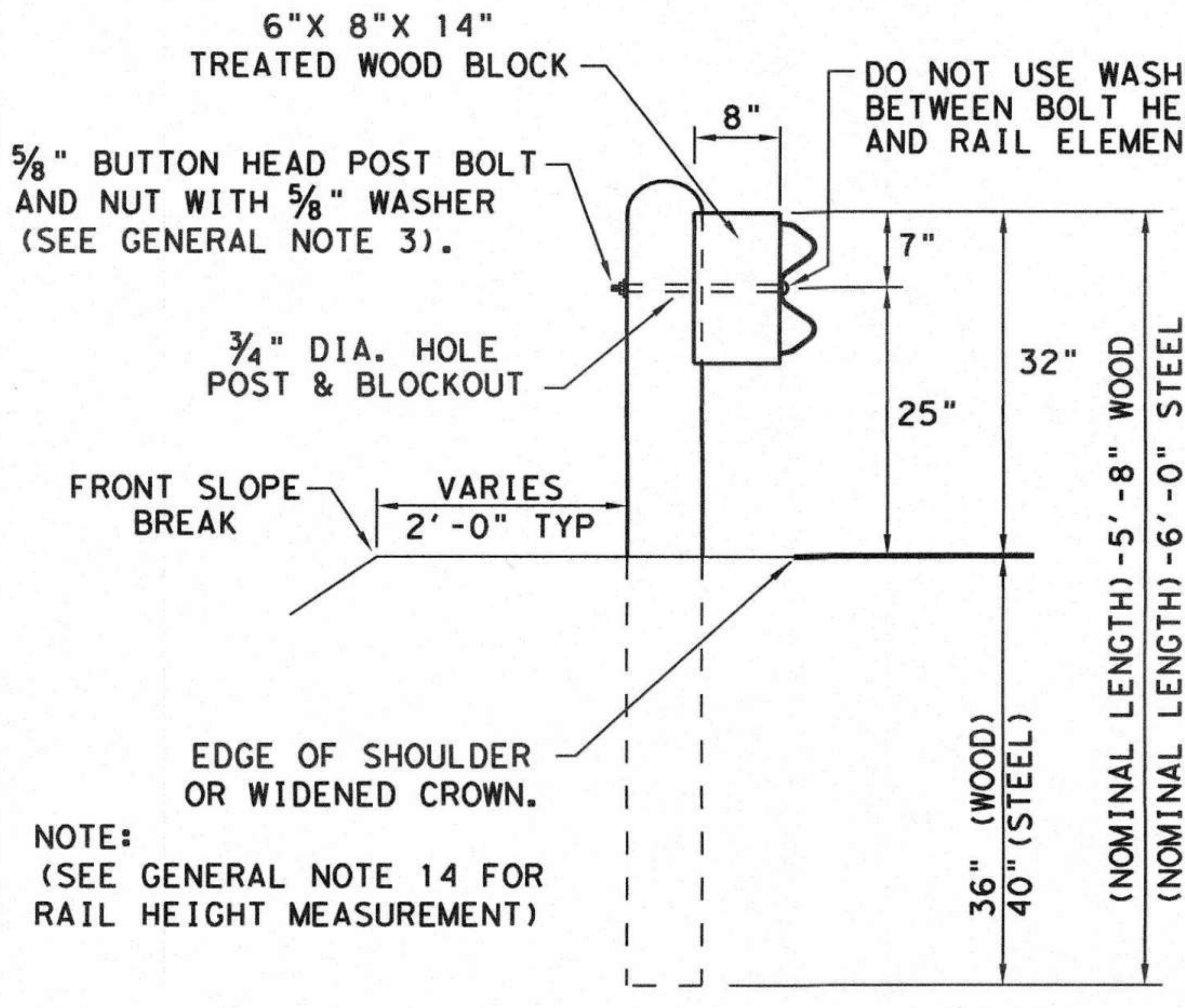
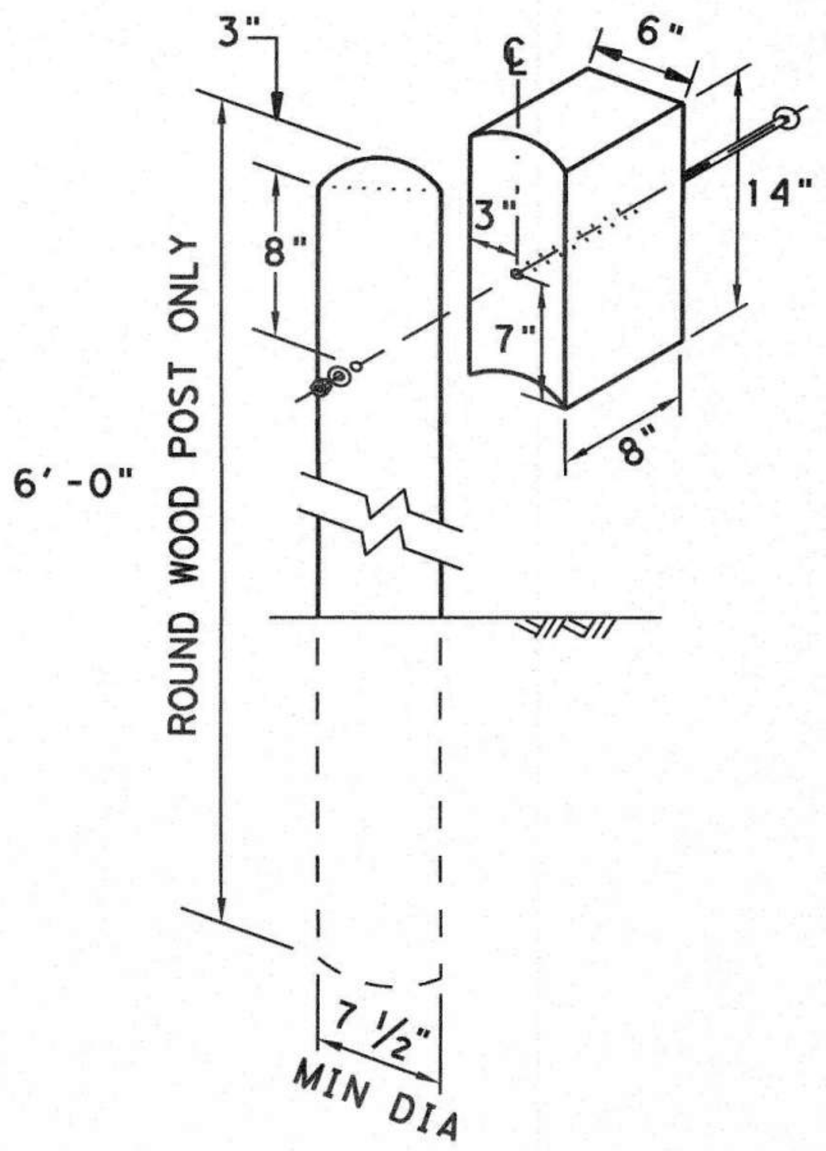
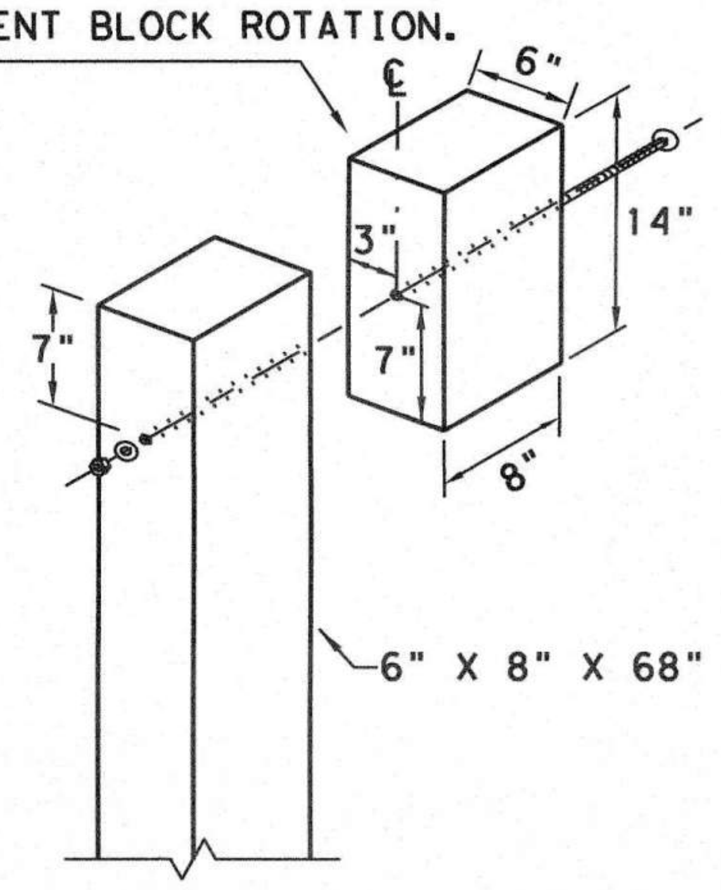


TYPICAL POST PLACEMENT

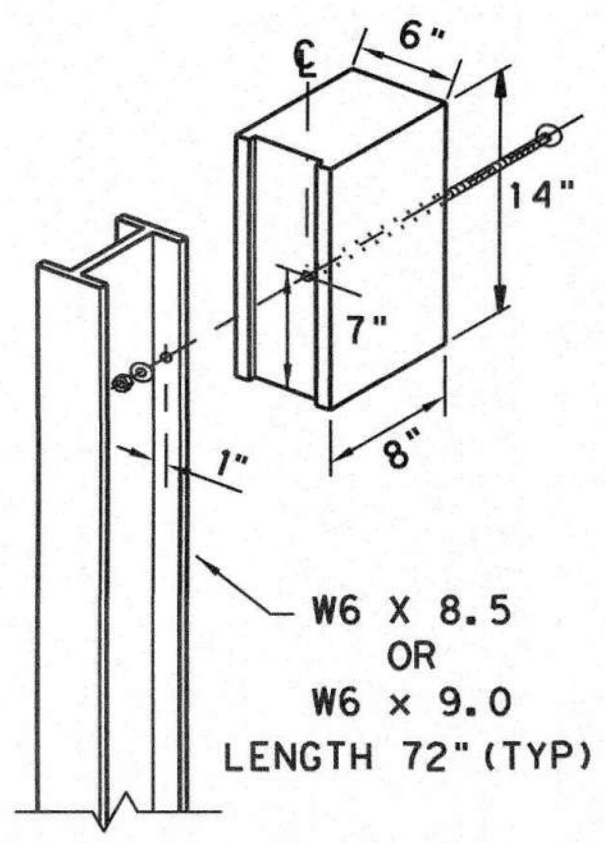
NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.



WOOD BLOCK TO ROUND WOOD POST

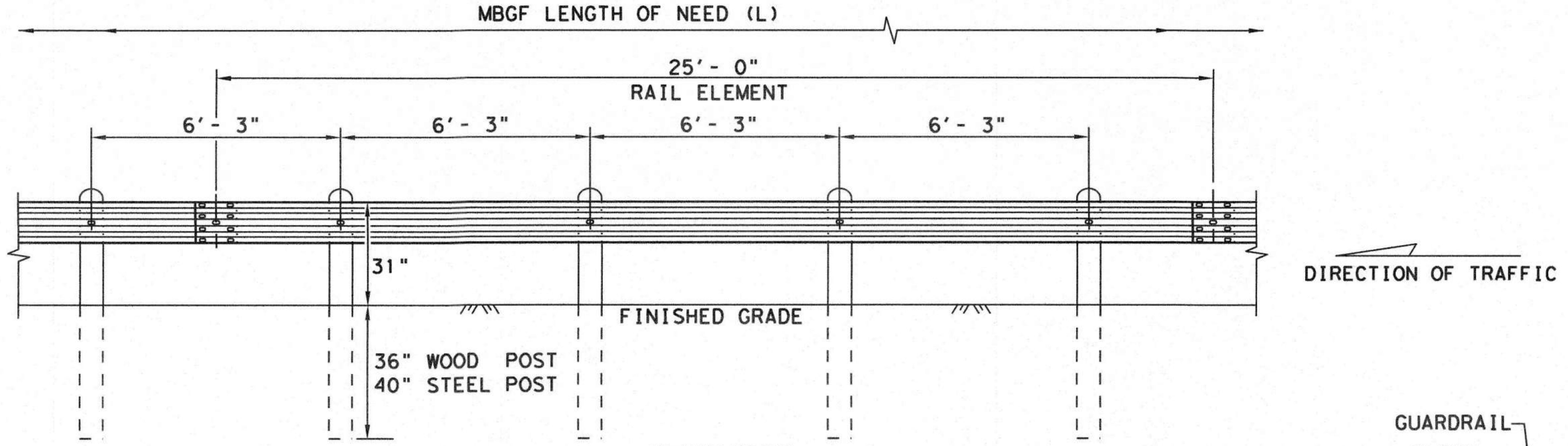


WOOD BLOCK TO RECTANGULAR WOOD POST



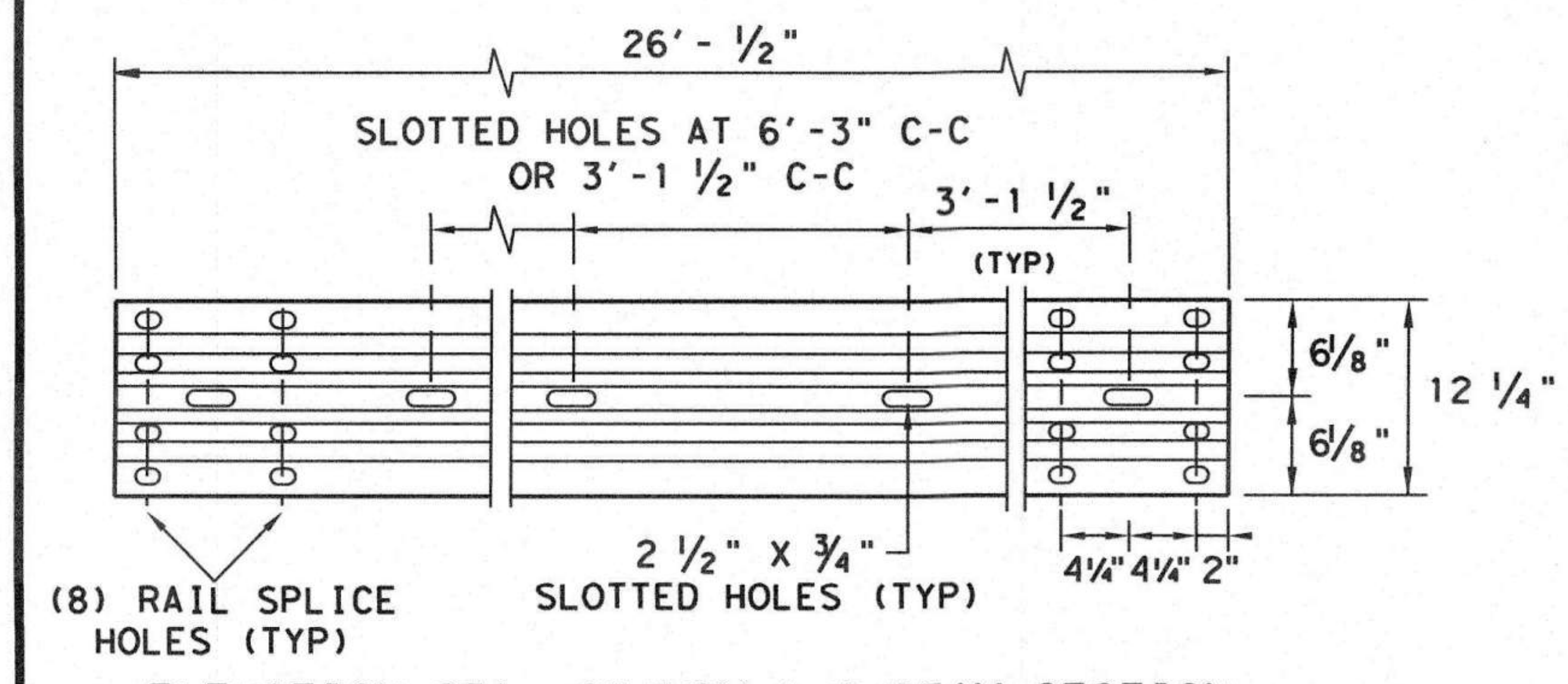
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION
MID-SPAN RAIL SPLICE

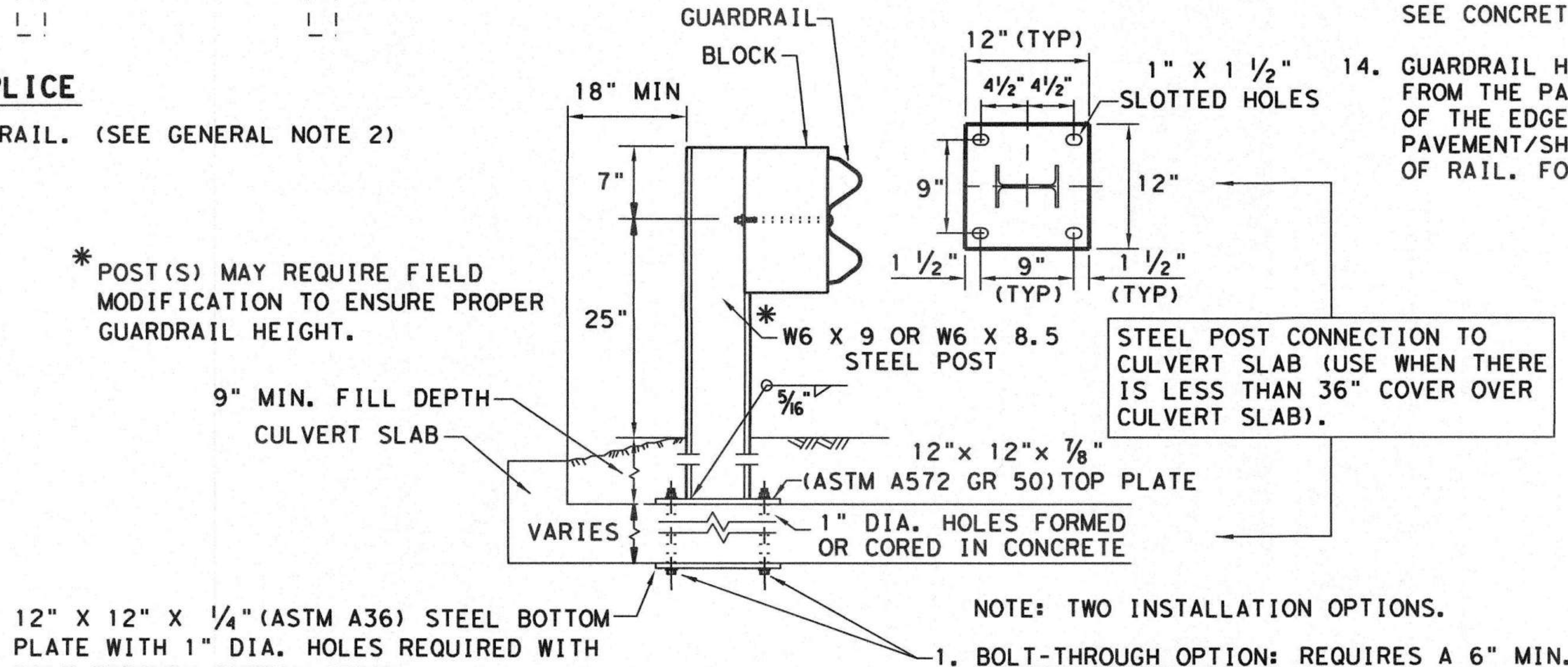
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

*POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



LOW FILL CULVERT POST

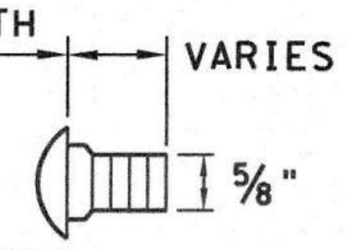
NOTE: TWO INSTALLATION OPTIONS.

1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.

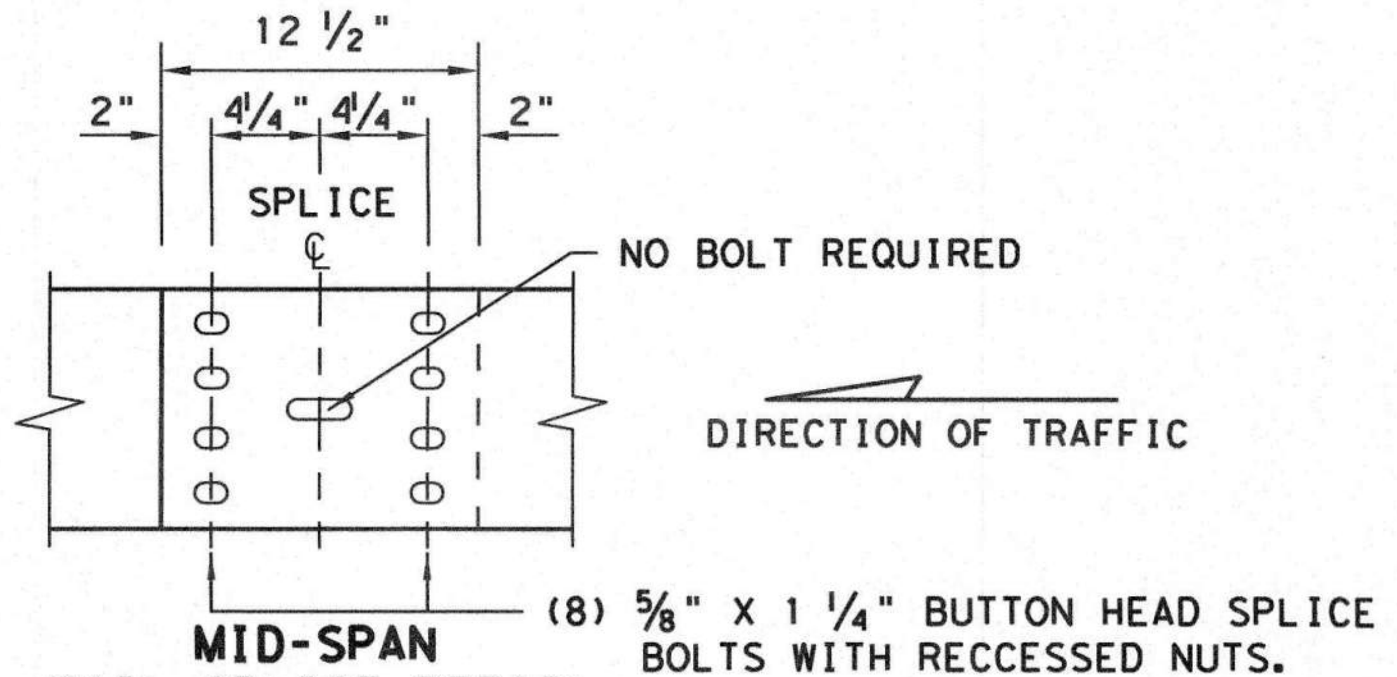
SPLICE BOLT LENGTH
FBB01 = 1 1/4"
FBB02 = 2"



POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

BUTTON HEAD BOLT

NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

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11-30-2023

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Texas Department of Transportation
Design Division Standard

METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT

GF(31)-19

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.

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

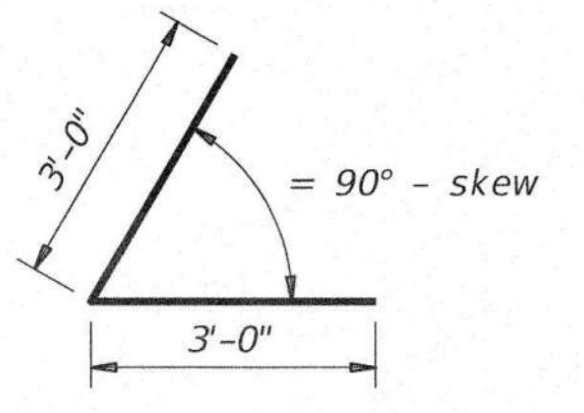
Dimensions					Variable Reinforcing				Estimated Quantities per ft of wing (2~wings) ④		Estimated Quantities per ft of Toewall (1~toewall)	
					Bars J1		Bars J2					
Maximum Wingwall Height Hw	W	X	Y	Z	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING
(2~wings)

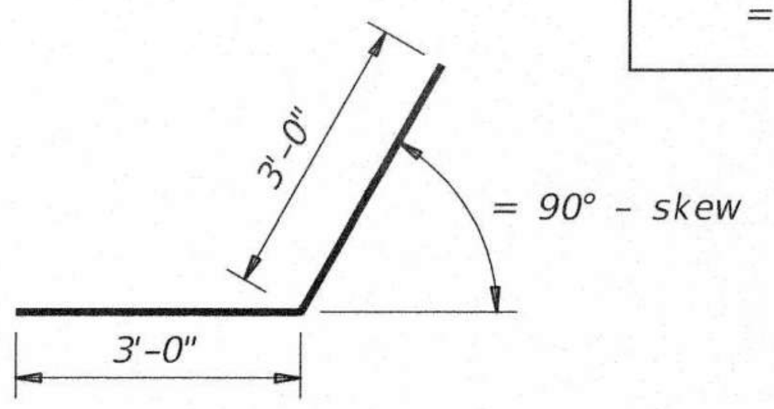
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

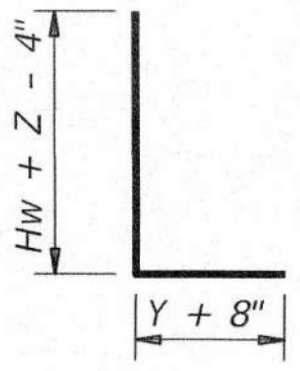
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



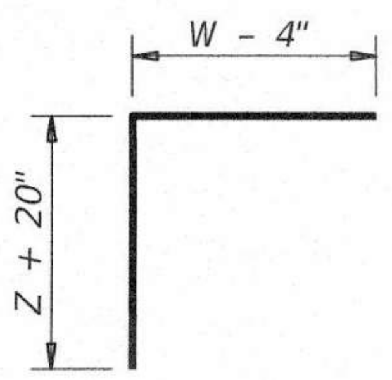
BARS D1



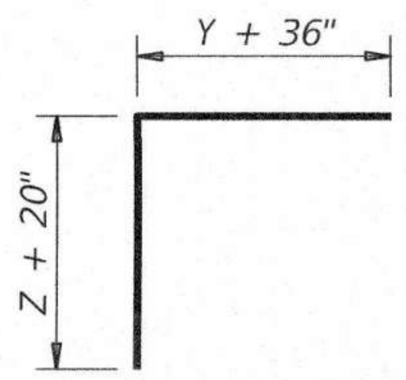
BARS D2



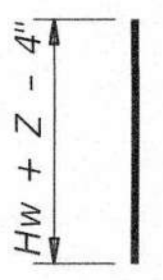
BARS J1



BARS J2



BARS J3



BARS V

WING DIMENSION FORMULAS:

(All values are in feet.)

Hw = H + T + C

Lw = (Hw) (SL) ÷ cosine (θ) for Type PW-1

= (Hw - 1') (SL) ÷ cosine (θ) for Type PW-2 and Hw ≥ 4'

= (Hw - 0.5') (SL) ÷ cosine (θ) for Type PW-2 and Hw < 4'

For cast-in-place culverts:

Ltw = [(N) (S) + (N + 1) (U)] ÷ cosine (θ)

For precast culverts:

Ltw = [(N) (2 U + S) + (N - 1) (0.5')] ÷ cosine (θ)

Total Wingwall Area (two wings ~ SF)

= (2)(Hw)(Lw) for Type PW-1

= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'

= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio. (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

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

① Skew = 0°

② At discharge end, chamfer may be ¾" minimum.

③ For 15° skew ~ 1"
For 30° skew ~ 2"
For 45° skew ~ 3"

④ Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.

⑤ Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.

⑥ Extend Bars E2 1'-6" minimum into the wingwall footing.

⑦ Lap Bars M1 1'-6" minimum with Bars M2.

⑧ Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.

⑨ 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

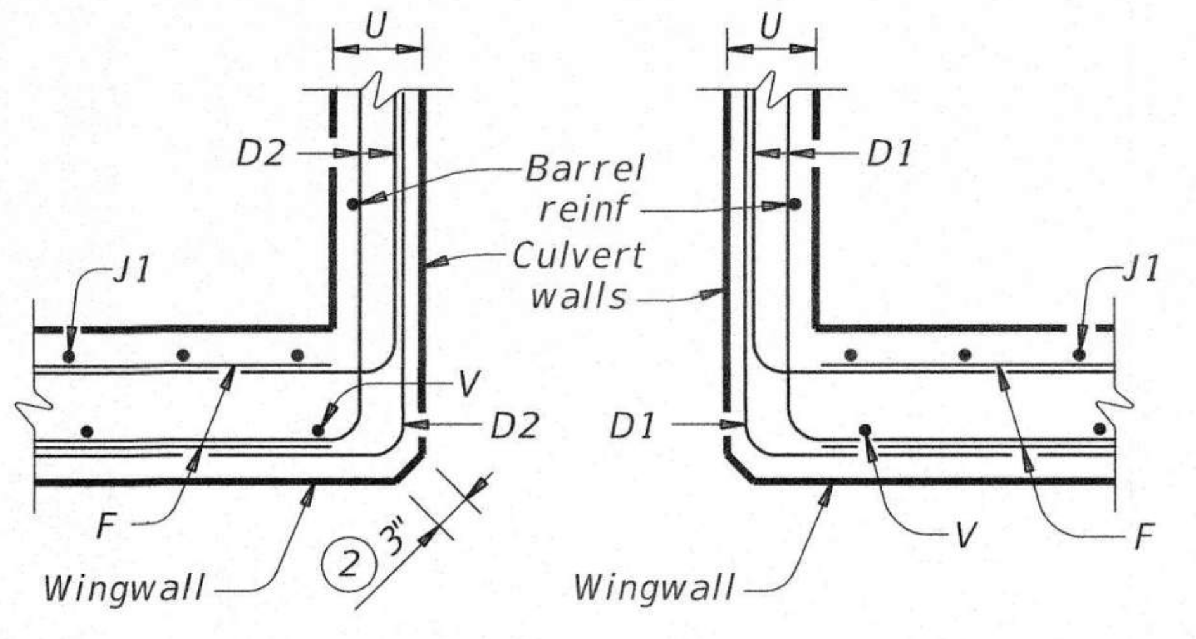
⑩ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

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

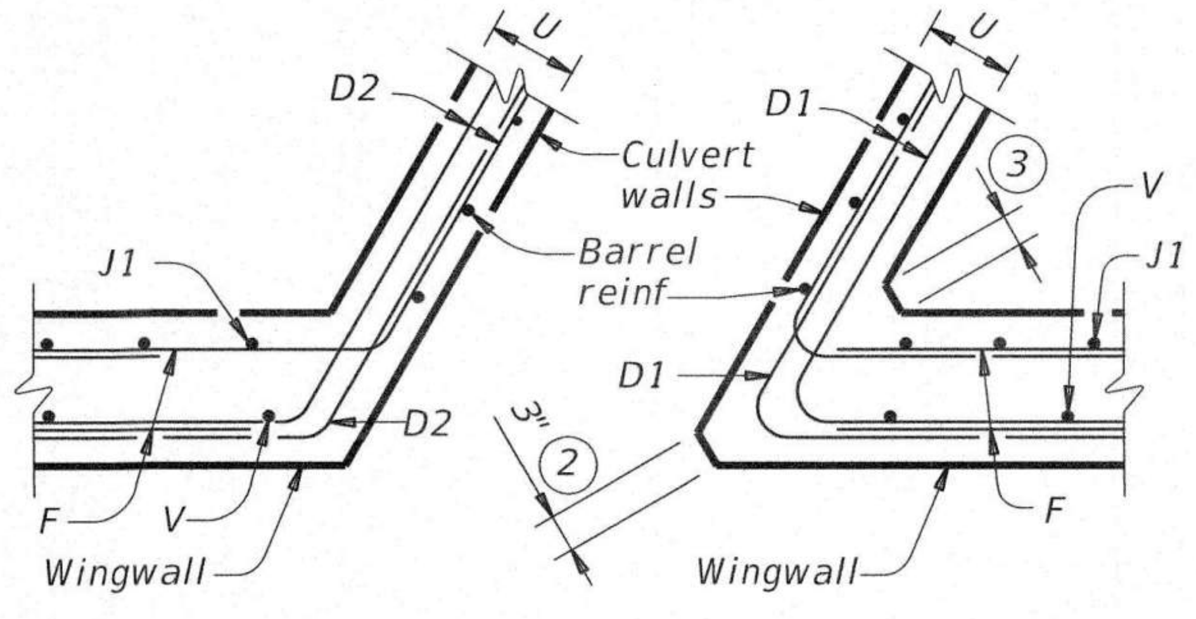
⑪ 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elswhere in the plans.

⑫ 3'-0" for Hw < 4'.

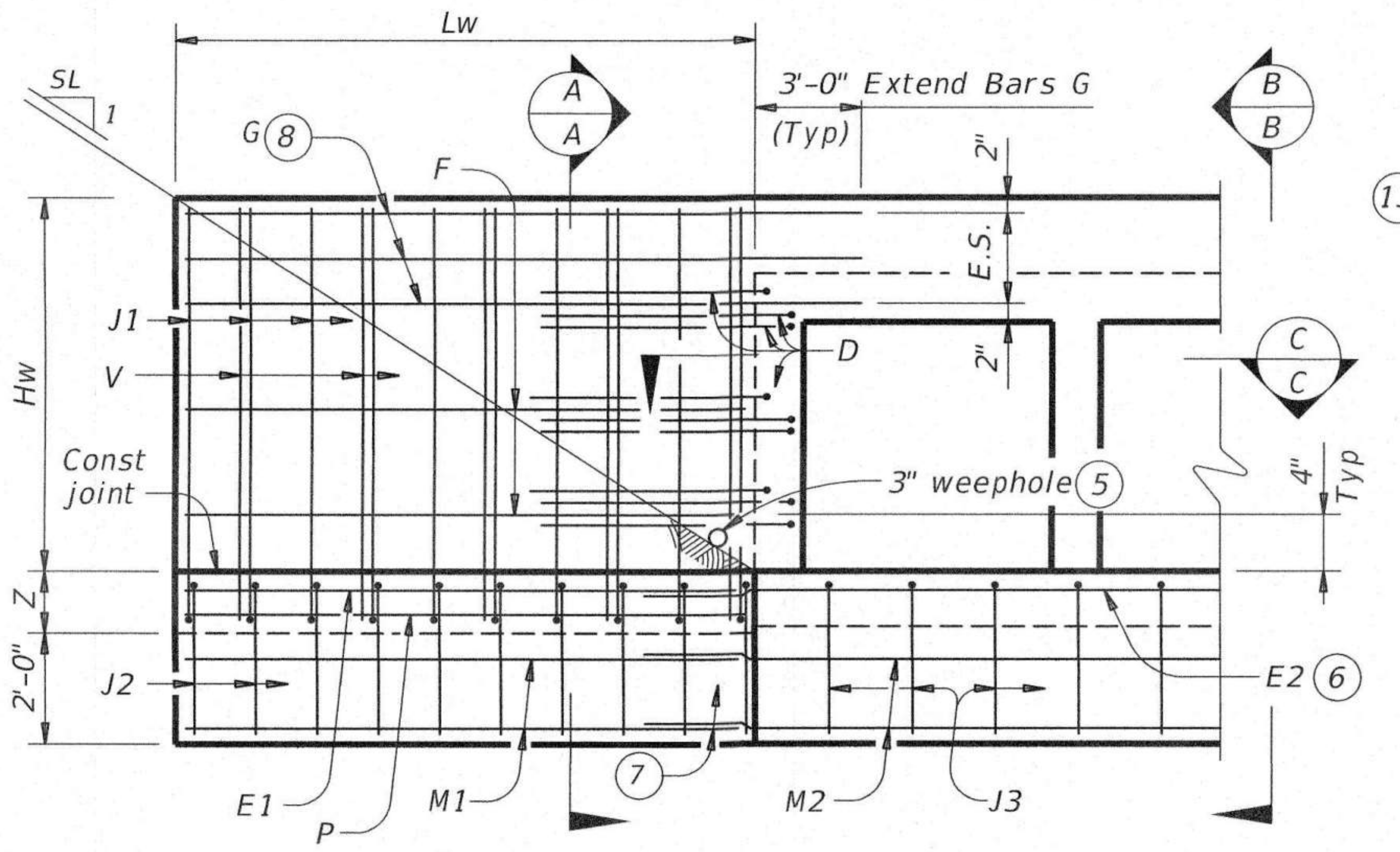
⑬ 6" for Hw < 4'.



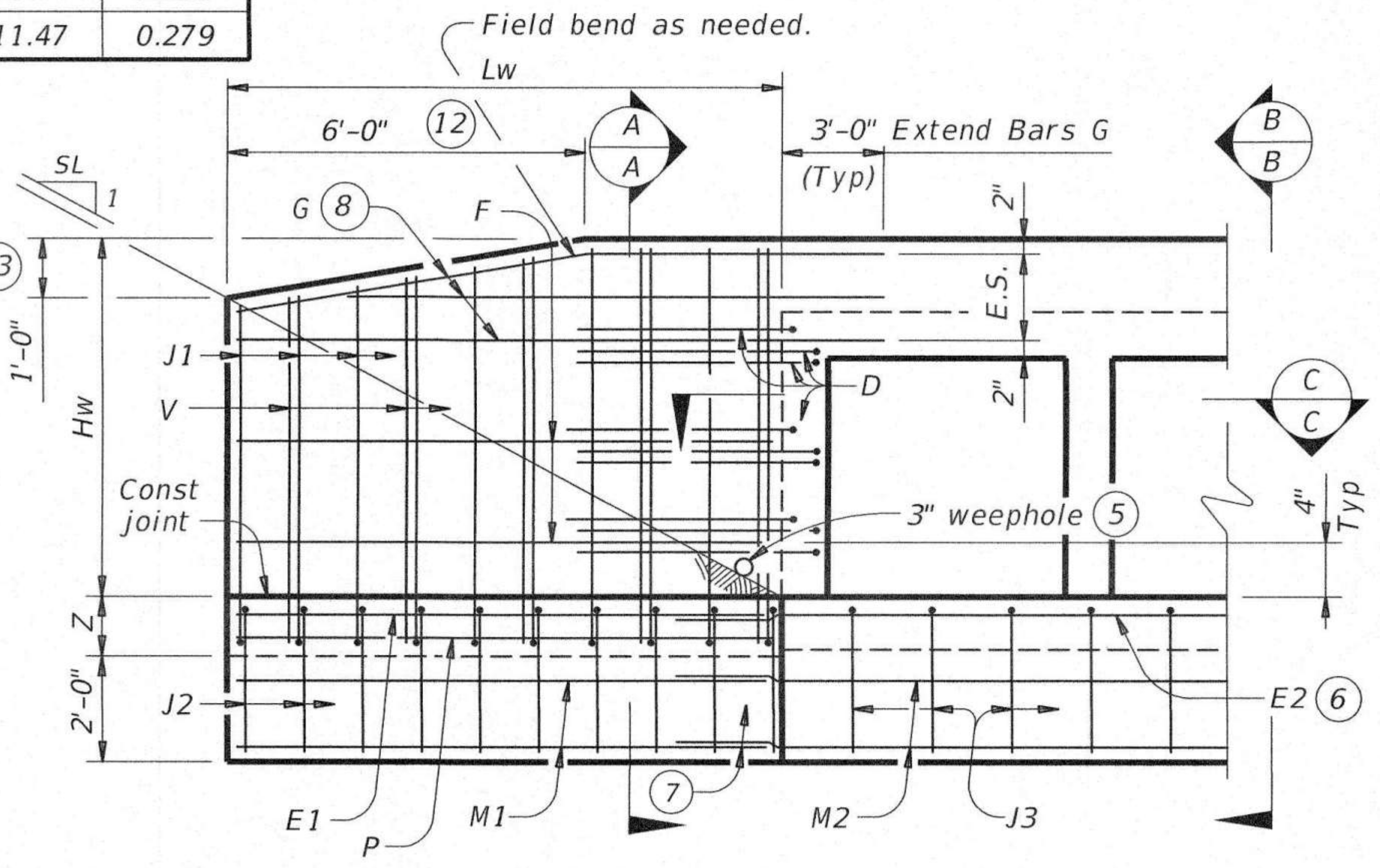
SECTION C-C - PW-1



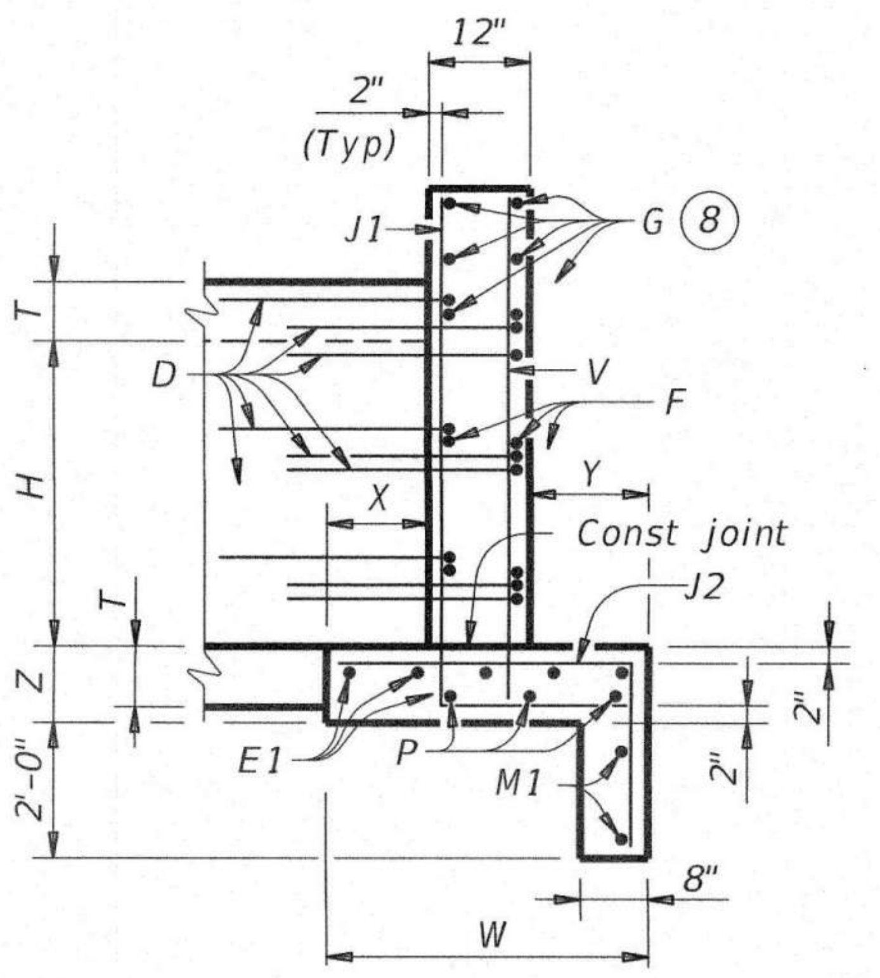
SECTION C-C - PW-2



PARTIAL ELEVATION - PW-1

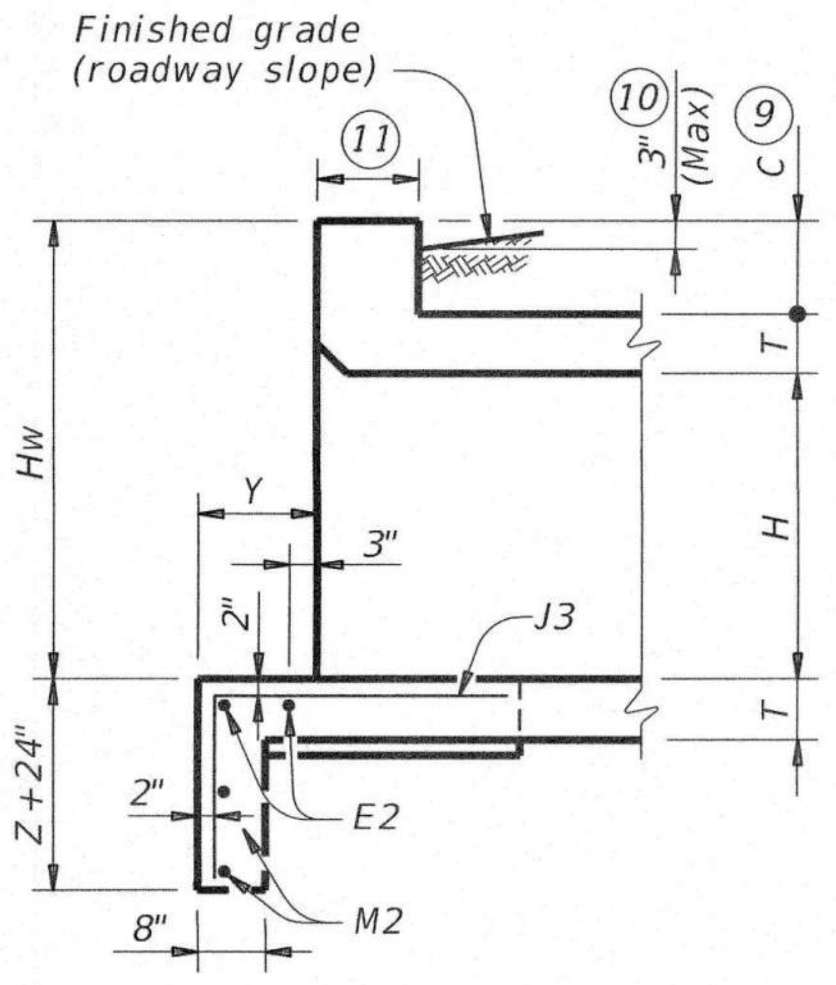


PARTIAL ELEVATION - PW-2



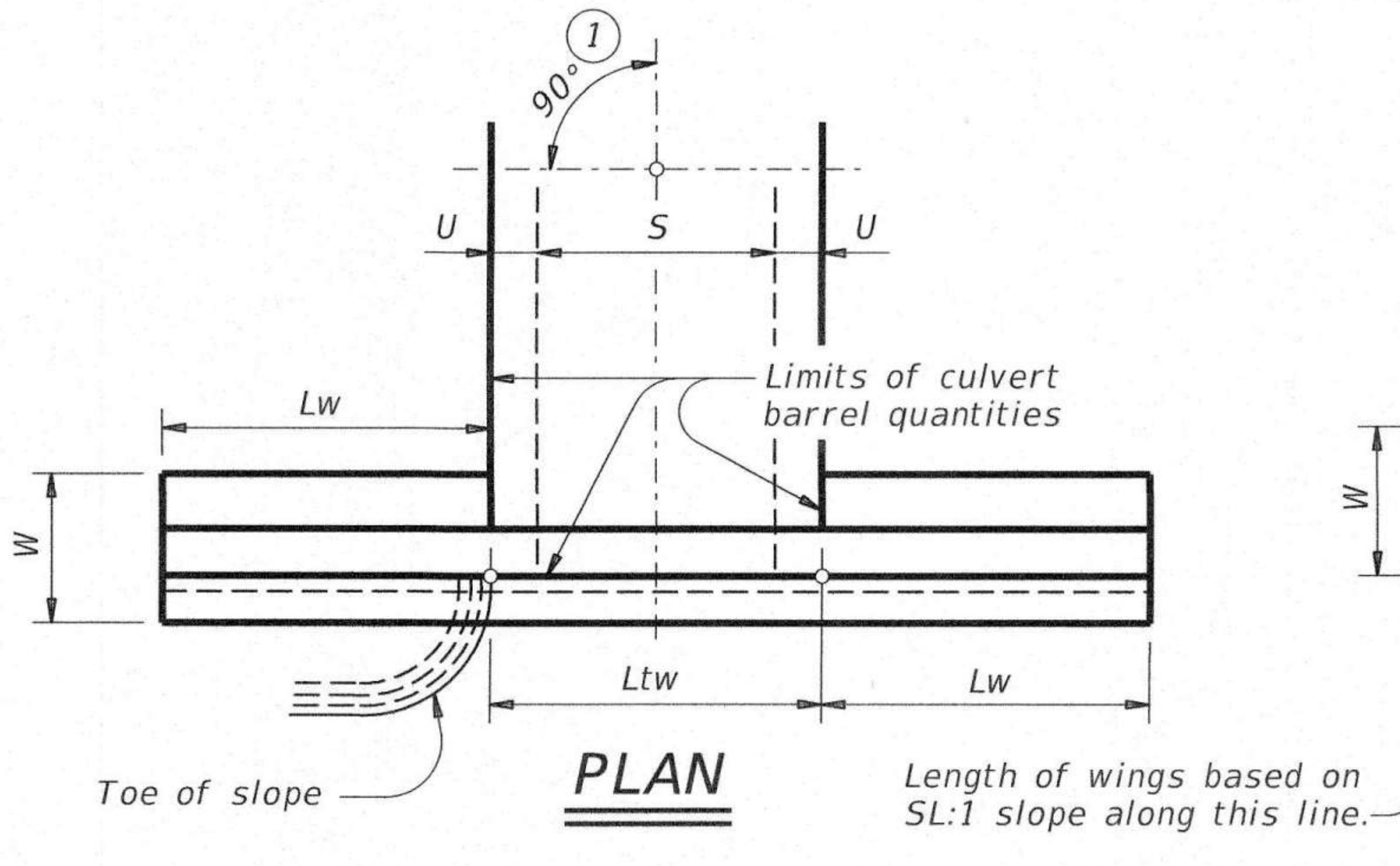
SECTION A-A

(Showing wing reinforcement.)



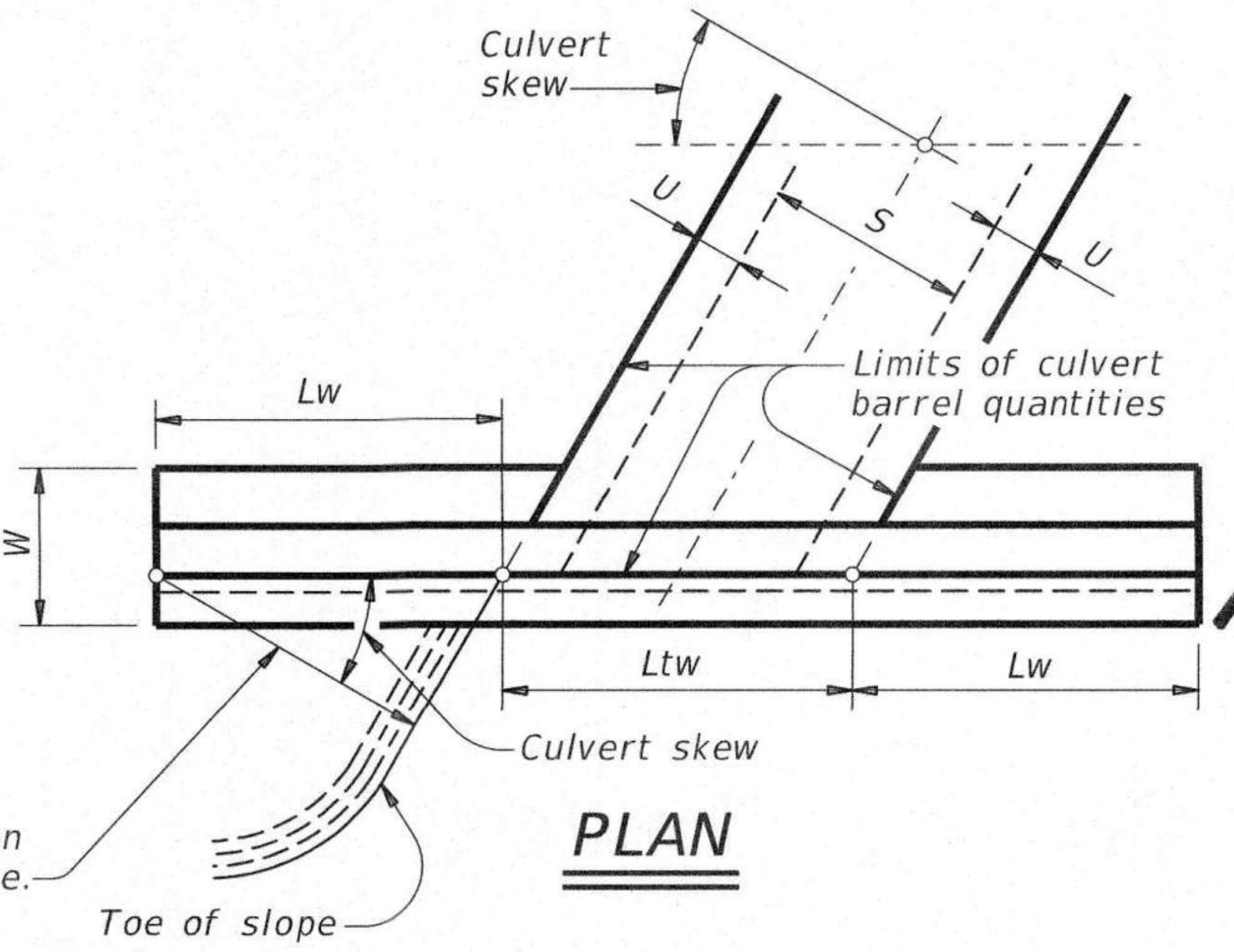
SECTION B-B

(Showing wing reinforcement.)



PLAN

DETAILS FOR NON-SKEWED BOX CULVERTS



PLAN

DETAILS FOR SKEWED BOX CULVERTS

(Showing 30° skew.)

DESIGNER NOTES:

Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.

Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).

Provide Grade 60 reinforcing steel.

Provide galvanized reinforing steel if required elsewhere in the plans.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.

See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.

Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

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

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11-30-2023

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Texas Department of Transportation
Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR BOX CULVERTS
TYPES PW-1 AND PW-2

PW

FILE: pwstde01-20.dgn	DN: GAF		CK: CAT	DW: TxDOT		CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB		HIGHWAY	
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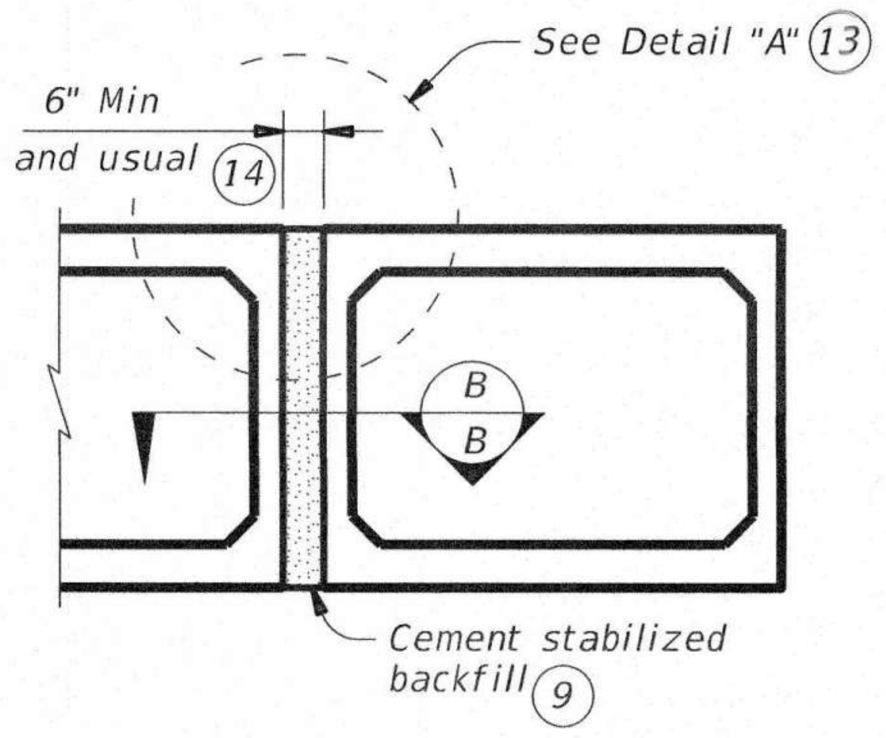
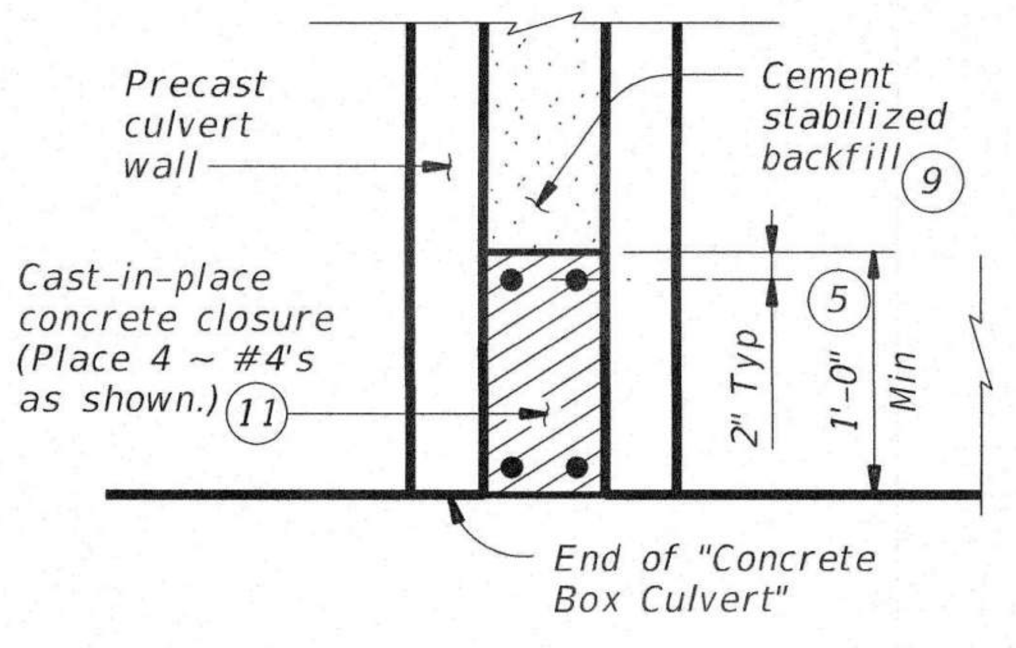
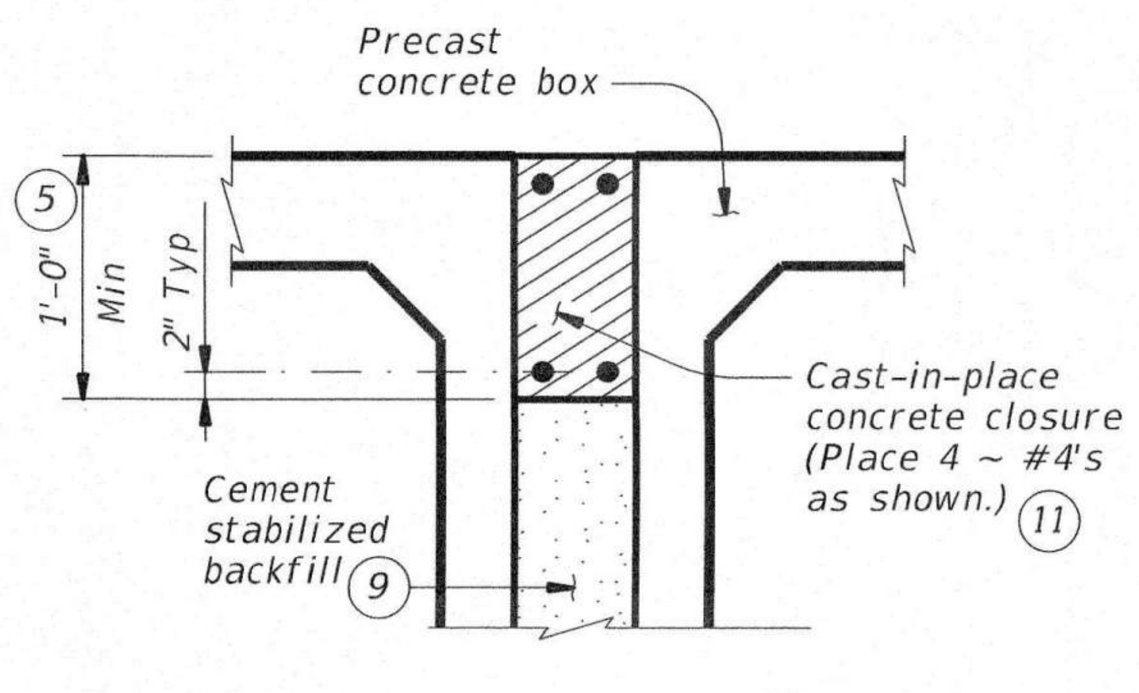


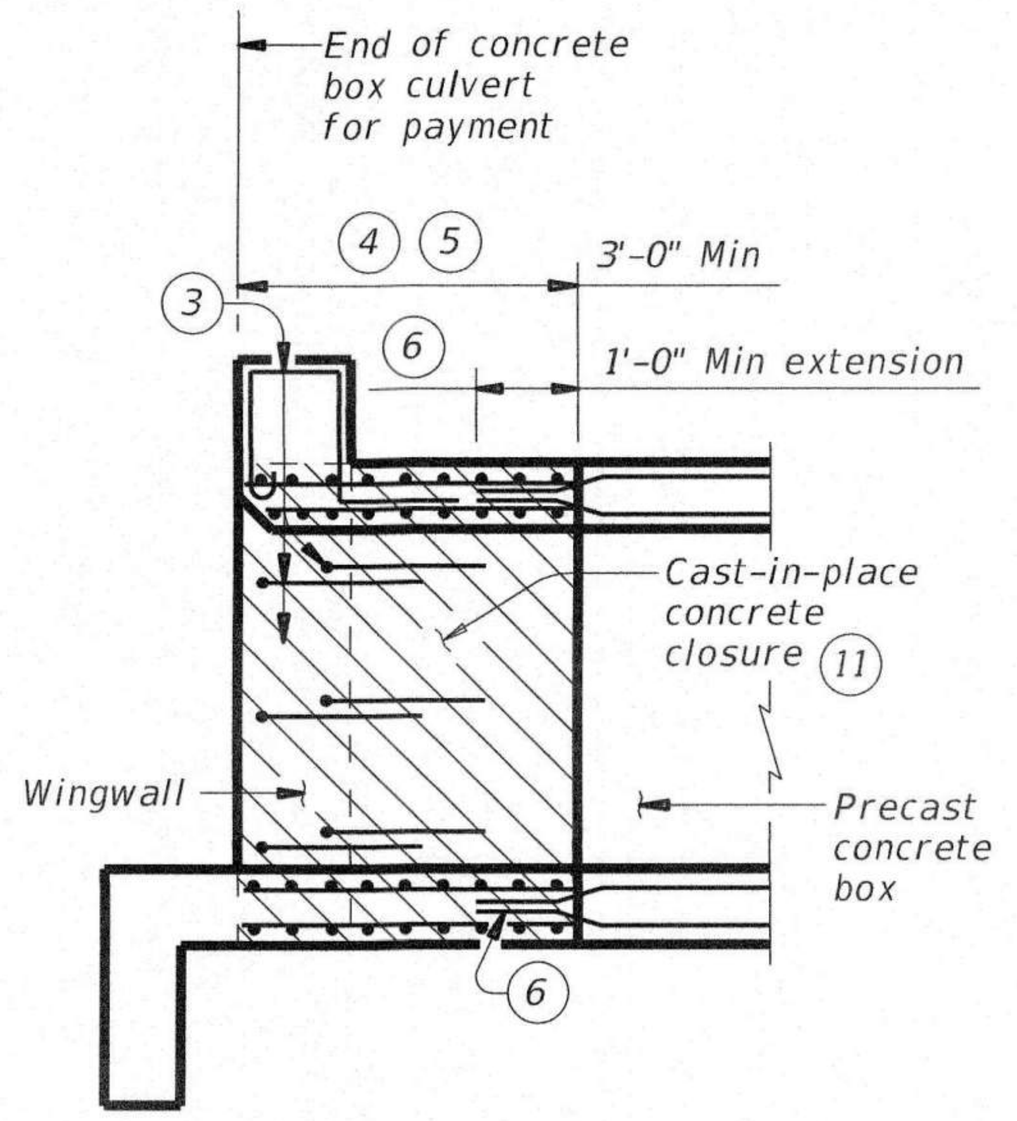
MULTIPLE UNIT PLACEMENT



SECTION B-B

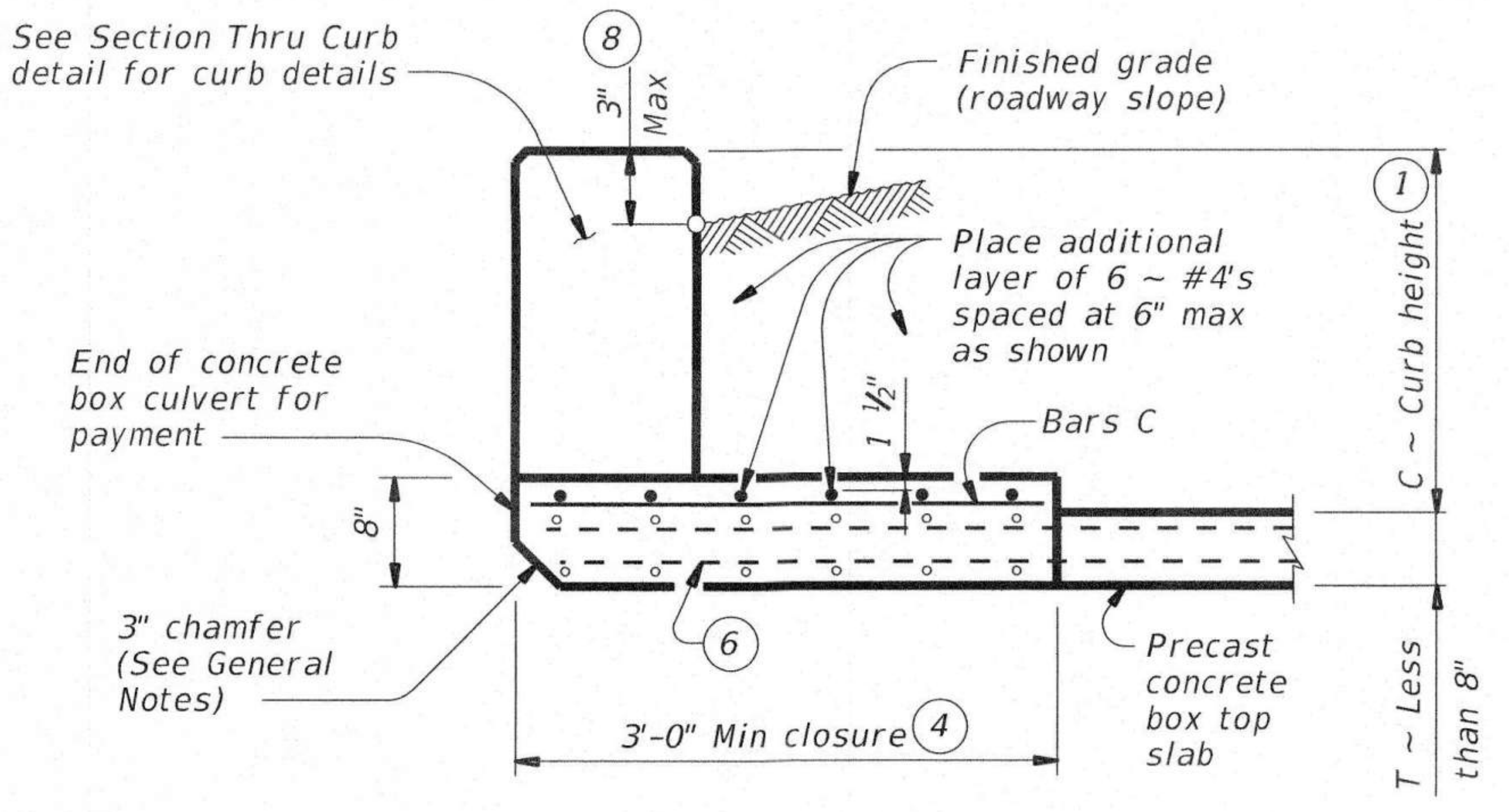


DETAIL "A" ⑬

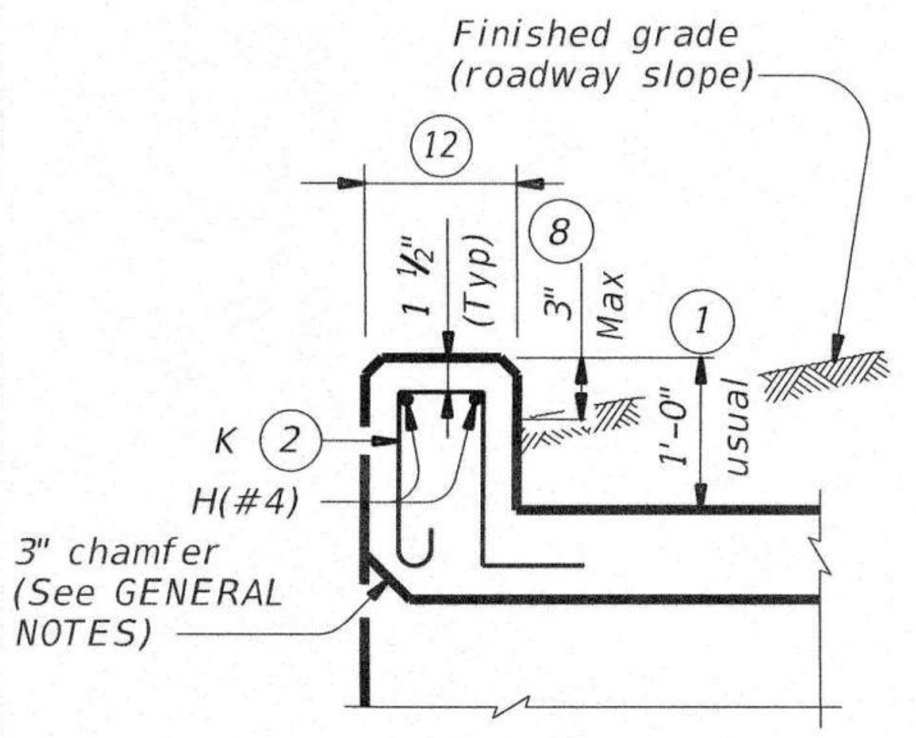


WINGWALL CONNECTION

(Also applies to safety end treatment.)

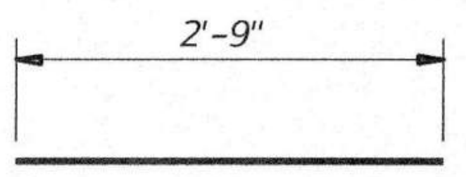


SECTION THRU TOP SLABS LESS THAN 8"

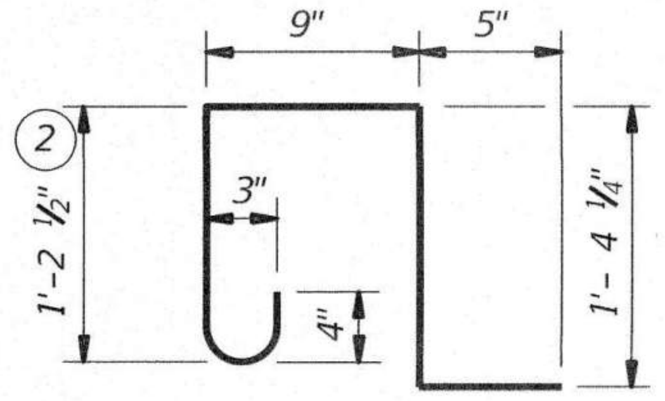


SECTION THRU CURB

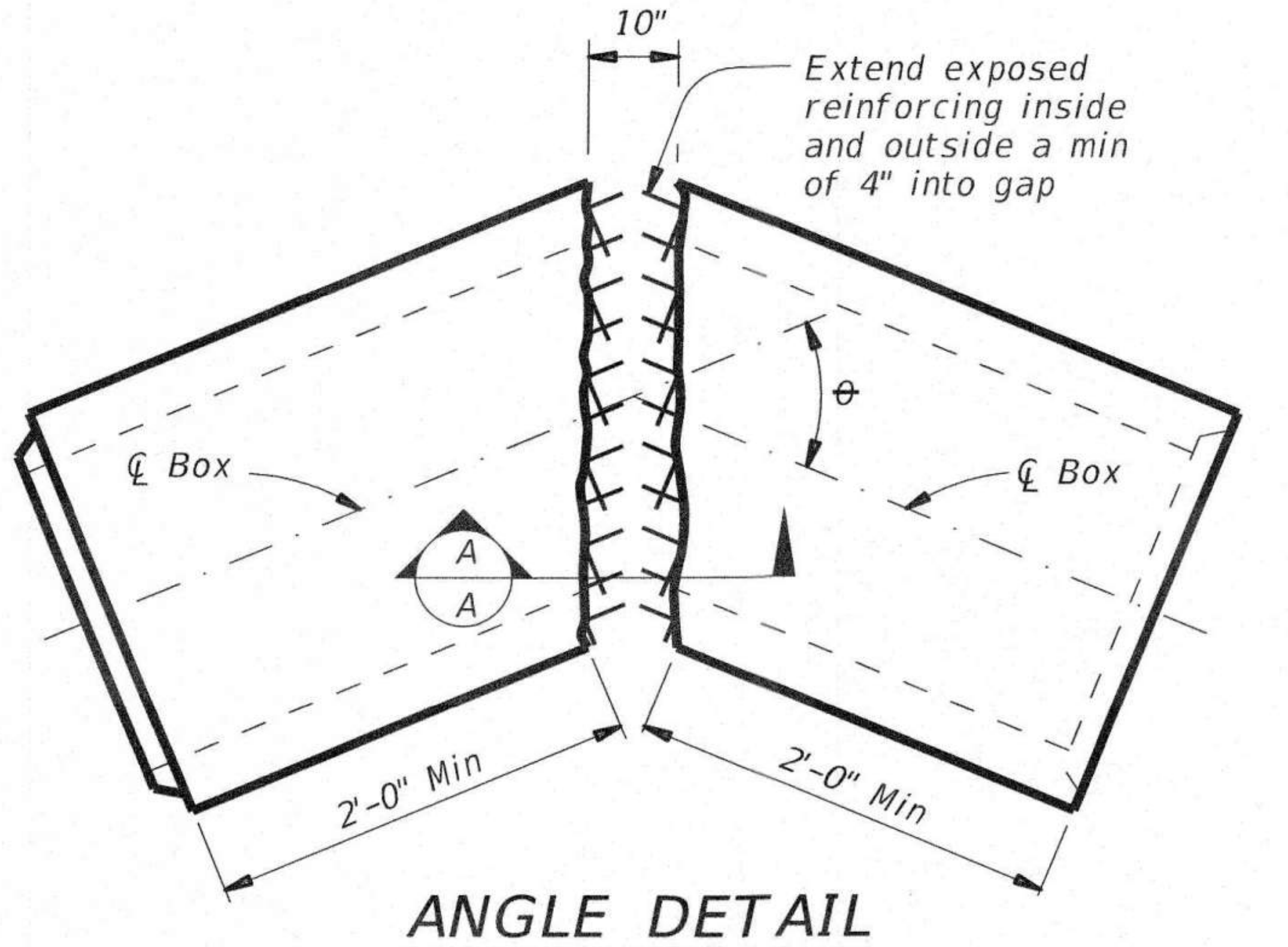
QUANTITIES PER FOOT OF CURB ⑩	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



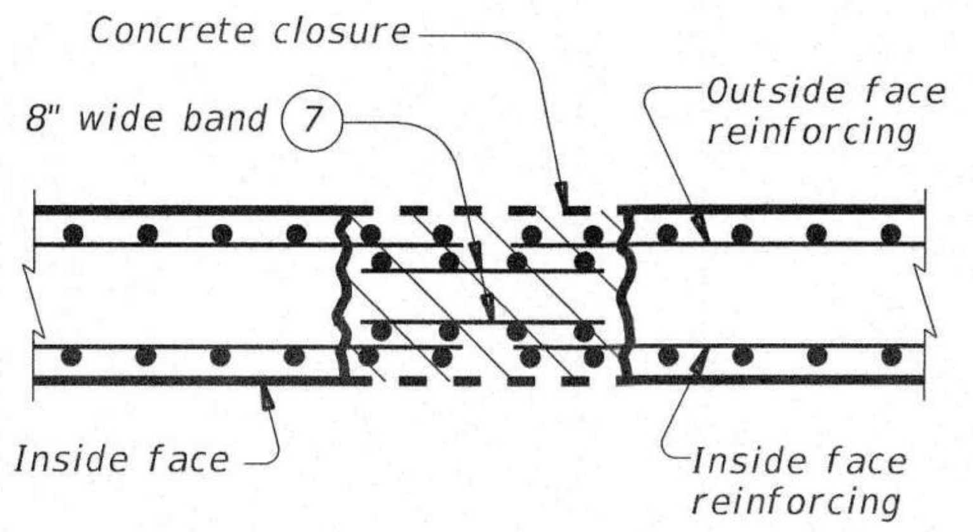
BARS C (#4)
(Spa = 1'-0" Max)



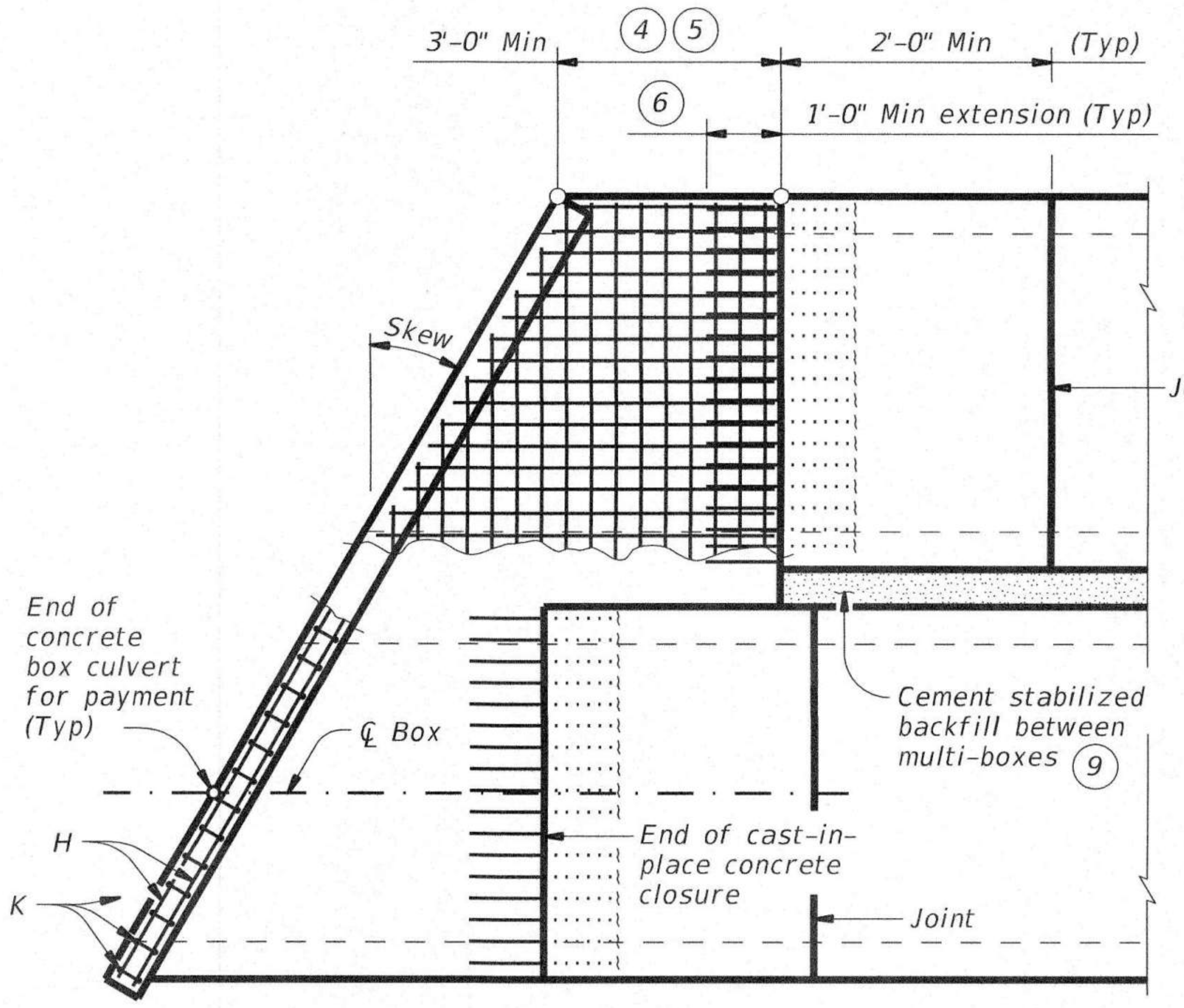
BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

② For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

③ Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.

④ Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.

⑤ For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.

⑥ Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).

⑦ Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.

⑧ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

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

⑨ Cement stabilized backfill between boxes is considered part of the box culvert for payment.

⑩ All curb concrete and reinforcing is considered part of the box culvert for payment.

⑪ Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.

⑫ 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

⑬ For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".

⑭ This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

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

HL93 LOADING

JUSTIN D. MIDURA
128809

11-30-2023

Texas Department of Transportation
Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

DATE:
FILE:

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: Woodfield Preserve Phase 3

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: Larry Colditz
Entity: LSMA Georgeotwn, LLC
Mailing Address: 6310 Capital Dr, Ste 130
City, State: Lakewood Ranch, FL Zip: 34202
Telephone: 303-720-4436 Fax: _____
Email Address: LColditz@starwoodland.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: Justin Midura, P.E.
Texas Licensed Professional Engineer's Number: 128809
Entity: LJA Engineering, Inc.
Mailing Address: 2700 La Frontera Blvd, Ste 200
City, State:Round Rock, TX Zip: 78681
Telephone:512-439-4700 Fax:_____
Email Address:jmidura@lja.com

Project Information

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

   ☒ Residential: Number of single-family lots: 229
   ☐ 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	57,250 gallons/day
_____% Industrial	_____ gallons/day
_____% Commingled	_____ gallons/day

   Total gallons/day: 57,250

6. Existing and anticipated infiltration/inflow is 83,500 gallons/day. This will be addressed by: appropriate sizing.

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 the same day as this SCS application, 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"	11,052	SDR 26	ASTM-3034
12"	887	SDR 26	ASTM-3034

Total Linear Feet: 11,939

(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 Berry Creek (name) Treatment Plant. The treatment facility is:

   ☒ Existing
   ☐ Proposed

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

   ☒ The City of Georgetown 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 Attachment	Of		
	Of		
	Of		
	Of		
	Of		
	Of		
	Of		

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

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

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

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

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

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

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 200'.

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*
WWL U	90 of 118	8+78.46 to 10+15.79
	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***
See Attachment				

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***
See Attachment			

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]**	NA of NA
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) **[Required]**	108 of 118
Alternate method of joining lateral to existing SCS line for potential future connections **[Required]**	NA of NA
Typical trench cross-sections **[Required]**	109 of 118
Bolted manholes **[Required]**	109 of 118
Sewer Service lateral standard details **[Required]**	109 of 118
Clean-out at end of line **[Required, if used]**	109 of 118
Baffles or concrete encasement for shock/erosion protection **[Required, if flow velocity of any section of pipe >10 fps]**	Na of NA
Detail showing Wastewater Line/Water Line Crossing **[Required, if crossings are proposed]**	109 of 118
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) **[Required, if Flexible Pipe is used]**	109 of 118

Standard Details	***Shown on Sheet***
Drop manholes **[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]**	108 of 118

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: Feb 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: Justin Midura, P.E.

Date: 3-4-2024

Place engineer's seal here:

JUSTIN D. MIDURA
128809

Signature of Licensed Professional Engineer:

Appendix A-Flow Velocity Table

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

Table 10 - Slope Velocity

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

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

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

Figure 1 - Manning's Formula

Where:

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

Table 2 - Manholes and Cleanouts

Line	Shown on Sheet	Station	Manhole or Cleanout?
WWL Q	87 Of 118	1+80.77	MH
WWL Q	87 Of 118	2+24.90	MH
WWL Q	87 Of 118	4+60.07	MH
WWL Q	87 Of 118	6+95.56	MH
WWL Q	87 Of 118	8+28.43	MH
WWL Q	87 Of 118	9+23.39	MH
WWL Q	87 Of 118	12+58.88	MH
WWL Q	88 Of 118	13+38.92	MH
WWL Q	88 Of 118	17+68.28	MH
WWL Q	88 Of 118	19+79.33	MH
WWL Q	89 Of 118	22+74.33	MH
WWL Q	89 Of 118	25+58.98	MH
WWL Q	90 Of 118	27+11.38	MH
WWL U	90 Of 118	1+26.78	MH
WWL U	90 Of 118	3+15.54	MH
WWL U	90 Of 118	7+82.49	MH
WWL U	91 Of 118	10+80.83	MH
WWL U	91 Of 118	11+72.40	MH
WWL U	91 Of 118	14+41.64	MH
WWL U	91 Of 118	17+10.87	MH
WWL U	92 Of 118	19+99.93	MH
WWL U	92 Of 118	20+73.73	MH
WWL U	92 Of 118	21+20.45	MH
WWL U	92 Of 118	22+60.84	MH
WWL U	92 Of 118	22+73.34	CO
WWL AA	92 Of 118	2+67.78	CO
WWL BB	93 Of 118	2+45.45	MH
WWL BB	93 Of 118	4+37.56	MH
WWL BB	93 Of 118	5+85.98	MH
WWL BB	93 Of 118	6+49.00	MH
WWL BB	93 Of 118	7+23.93	MH
WWL BB	93 Of 118	8+79.12	MH
WWL BB	93 Of 118	9+53.51	MH
WWL BB	94 Of 118	10+27.01	MH
WWL BB	94 Of 118	11+31.52	MH
WWL BB	94 Of 118	14+27.98	MH
WWL BB	94 Of 118	17+51.53	MH
WWL BB	94 Of 118	18+45.68	MH
WWL BB	94 Of 118	18+92.74	MH
WWL CC	95 Of 118	3+94.21	MH
WWL CC	95 Of 118	8+02.23	MH
WWL DD	96 Of 118	1+54.69	MH
WWL DD	96 Of 118	2+58.50	MH
WWL DD	96 Of 118	4+00.88	MH
WWL DD	96 Of 118	4+57.03	MH

WWL DD	96 Of 118	6+24.44	MH
WWL DD	96 Of 118	6+72.25	MH
WWL DD	97 Of 118	10+51.32	MH
WWL DD	97 Of 118	12+22.26	MH
WWL WW	97 Of 118	2+47.83	MH
WWL WW	97 Of 118	2+55.00	CO
WWL GG	97 Of 118	2+77.95	MH
WWL GG	97 Of 118	4+60.89	MH
WWL EE	98 Of 118	4+77.95	MH
WWL FF	98 Of 118	3+90.76	MH
WWL HH	100 Of 118	12+14.07	MH
WWL JJ	100 Of 118	4+02.65	MH
WWL JJ	100 Of 118	6+05.97	MH
WWL JJ	100 Of 118	7+74.55	CO

Table 5 - Water Line Crossings

Line	Station or Closest Point	Crossing or Parallel	Horizontal Separation Distance	Vertical Separation Distance
WWL Q	7+23.06	Crossing	NA	MIN 2'
WWL Q	10+15.26	Crossing	NA	MIN 2'
WWL Q	14+86.28	Crossing	NA	MIN 2'
WWL Q	17+82.69	Crossing	NA	MIN 2'
WWL Q	25+87.98	Crossing	NA	MIN 2'
WWL U	12+01.40	Crossing	NA	MIN 2'
WWL U	17+39.87	Crossing	NA	MIN 2'
WWL U	20+30.21	Crossing	NA	MIN 2'
WWL U	22+05.89	Crossing	NA	MIN 2'
WWL AA	1+45.28	Crossing	NA	MIN 2'
WWL BB	2+83.88	Crossing	NA	MIN 2'
WWL CC	1+61.90	Crossing	NA	MIN 2'
WWL CC	4+21.09	Crossing	NA	MIN 2'
WWL DD	1+27.32	Crossing	NA	MIN 2'
WWL EE	1+28.86	Crossing	NA	MIN 2'
WWL HH	4+11.76	Crossing	NA	MIN 2'
WWL HH	8+59.59	Crossing	NA	MIN 2'
WWL HH	11+49.59	Crossing	NA	MIN 2'
WWL KK	1+31.00	Crossing	NA	MIN 2'
WWL MM	1+41.92	Crossing	NA	MIN 2'
WWL NN	1+41.50	Crossing	NA	MIN 2'
WWL PP	1+41.50	Crossing	NA	MIN 2'

Table 7 - Drop Manholes

Line	Manhole	Station	Sheet
WWL Q	WWMH LS	1+26.78	87 Of 118
WWL Q	WWMH Q9	9+86.26	87 Of 118
WWL Q	WWMH Q12	14+58.28	88 Of 118
WWL U	WWMH U4	11+37.40	91 Of 118
WWL EE	WWMH EE1	1+19.01	94 Of 118
WWL HH	WWMH HH2	4+62.23	99 Of 118

Woodfield Preserve
Phase 3

SCS ENGINEER DESIGN REPORT AND SPECIFICATIONS

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Exhibits:

- **A.** Proposed Development Site Map
- **B.** Wastewater Calculations
- **C.** Wastewater Collection System Diagram

I. INTRODUCTION

This SCS Engineering Design Report has been prepared to comply with the Texas Commission on Environmental Quality's requirements of Title 30 Texas Administrative Code Chapter 217: Design Criteria for Domestic Wastewater Systems. This includes Subchapter A, Subchapter C, and Subchapter D of 30 TAC Chapter 217 when applicable. Whenever multiple regulations apply, the more stringent regulation shall be used.

The Woodfield Preserve Phase 3 Subdivision is located North of Shell Road between SH 195 and FM 338 in Georgetown, TX, Williamson County. The Phase 3 development is approximately 83.47 acres with 39.09 acres of impervious cover or 46.8%.

The project area is located in the full-purpose City of Georgetown city limits (Woodfield Preserve). The overall project boundaries are surrounded on the west by Woodfield Preserve; on the north by Berry Creek; on the east by undeveloped tracts in the ETJ; and on the south by Shell Road. The site is located entirely in the Berry Creek Watershed.

Wastewater service will consist of 8-inch and 12-inch SDR-26 PVC wastewater gravity mains extended through Woodfield Preserve. Wastewater service to this construction plan area is to be provided by City of Georgetown. A total of 11,939 proposed linear feet of wastewater line will tie into the Woodfield Preserve Lift Station.

Wastewater will be collected into a gravity system and routed to Berry Creek Wastewater Treatment Plant.

Odor control for this wastewater gravity system has been provided by watertight pipe connections at manholes and cleanouts. Manhole lids will be tight.

Flow development was calculated using Georgetown design criteria (250 gallons per LUE, 1,000 gal/acre/day) based on 3.5 people per LUE, 70 gpd/person, for residential use. Flow development calculations are included in the Supporting Engineering Calculations.

II. DESCRIPTION OF PROPOSED SYSTEM

A. Design Criteria

The gravity mains and manholes meet the TCEQ requirements of Chapter 217. All the gravity mains with this project are PVC. The construction plans consist of the following:

	Linear Feet	Pipe Material	National Standard Specification for Pipe Material	National Standard for Pipe Joints
8”	11,052	SDR 26	ASTM-3034	ASTM D3212
12”	887	SDR 26	ASTM-3034	ASTM D3212

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

Pipe Diameter: 8" Min. Slope: 0.35 % Max. Slope: 5.46 %
Pipe Diameter: 12" Min. Slope: 0.35 % Max. Slope: 0.50 %

The plans and specifications, which describe the project identified in this report, are in substantial compliance with all the requirements of Chapter 217.

B. Structural Analysis:

Structural analysis per 30 TAC 217.53 (k) for the proposed wastewater system is below:

Wastewater Collection System Structural Analysis per 30 TAC 217.53 (k)

Proposed Wastewater Pipe Constants

Nominal Diameter	8	inch
Material	PVC, SDR 26	
Description	Gravity Sewer Pipe, Flexible Pipe	
Pipe Standard	ASTM D3034, Type PSM	
Joint Standard	ASTM D3212	
Pipe Stiffness, PS	115	psi
Wall Thickness, t	0.323	inch
Tensile Strength, T	7,000	psi
Modulus of Pipe Elasticity, E	400,000	psi

Proposed Trench Constants

Minimum Trench Width	21	inch
Maximum Trench Width	33	inch
Shallowest Bury Depth of Cover	4	feet
Deepest Bury Depth of Cover	34	feet
Unit Weight of Soil Backfill, w	120	pcf
Water Table Height Above Pipe	0	feet

Notes

1) Trench widths per City of Georgetown Construction Standards and Details - Trench and Embedment Detail WW18 included in the construction plans on the detail sheets.

2) The structural calculations provided bracket the shallowest proposed line depth (rounded to 4 foot depth in calculations to be conservative) and the deepest proposed line depth (rounded to 34 foot depth in calculations to be conservative). As the calculations show, the two opposite ends of the spectrum show the most extreme PVC depth of burial case for the proposed wastewater system which are in conformance with 30 TAC 217.53 (k).

3) Per the Georgetown Village (aka Woodfield Preserve) Geotech Report, the water table elevation was not observed in the test pits or borehole depths drilled during the preliminary excavation and study. For purposes of this structural analysis, groundwater and water table elevations are assumed to be below the proposed depth of bury (i.e. pipe is unsaturated).

Live Load Constants per AASHTO H-25 or HS-25

Depth of Cover (feet)	Live Load on PVC Pipe (psi)
1	15.63
2	6.95
3	5.21
4	3.48
5	2.18
6	1.74
7	1.53
8	0.86
+10	Negligible

Notes

1) Live loads beyond 8 feet are negligible for highway loading.

Proposed In-situ Soil and Bedding Constants

Modulus of Soil Reaction, E' (bed) (Bedding Material)	3,000	psi
Modulus of Soil Reaction, E' (in-situ) (In-Situ Material)	3,100	psi
Ratio of Modulus Bedding Soil to Modulus In-Situ Soil	0.97	unitless
Leonhardt's Zeta Factor, z	1.0	unitless
Modulus of Soil Reaction, E' (composite)	3,000	psi

Notes

1) Values are constant for both the shallowest and deepest burial depth of cover cases.

2) Values for E' (bed) per JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe" Table 5 and City of Georgetown Construction Specifications at minimum 95% compaction.

3) Values for E' (in-situ) based on JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe" Table 5 and Geotech Report showing limestone subgrade strata in test pits and boreholes.

4) 21-inch minimum trench widths assumed per City of Georgetown Construction Specifications.

Leonhardt's Zeta Factor and Modulus of Soil Reaction (Composite) Equations

Ratio = E' (bed) / E' (in-situ)
(when Ratio is less than or equal to 1.25, Leonhardt's Zeta Factor assumed to be 1.0, but if Ratio is greater than 1.25, use Leonhardt's Zeta Factor Equation to get coefficient).

Shallowest Depth of Cover - Prism Load

Shallowest Depth of Cover, H	4	feet
Unit Weight of Soil Backfill, w	120	pcf
Prism Load (i.e. Dead Load), P	3.33	psi

Deepest Depth of Cover - Prism Load

Deepest Depth of Cover, H	34	feet
Unit Weight of Soil Backfill, w	120	pcf
Prism Load (i.e. Dead Load), P	28.33	psi

Prism Load (i.e. Dead Load) Equation

P = (w * H) / 144

P = Prism Load, psi
w = Unit Weight of Soil Backfill, pcf
H = Depth of Cover, ft

Shallowest Depth of Cover - Deflection

Live Load @ Min Depth, W'	3.48	psi
Prism Load, P	3.33	psi
Pipe Stiffness, PS	115	psi
Modulus of Soil Reaction, E'	3,000	psi
% Deflection	0.34	%
Check % Deflection less than 5%	Yes, within tolerance	

Modified Iowa Equation

% Deflection = [0.1 (W' + P) 100] / [0.149 (PS) + 0.061 (E')]

% Deflection = Predicted Diametric Deflection, %
W' = Live Load, psi
P = Prism Load, psi
PS = Pipe Stiffness, psi
E' = Modulus of Soil Reaction, psi

Equation per JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe". Per TCEQ, up to 5% deflection is allowed.

Deepest Depth of Cover - Deflection

Live Load @ Max Depth, W'	0.00	psi
Prism Load, P	28.33	psi
Pipe Stiffness, PS	115	psi
Modulus of Soil Reaction, E'	3,000	psi
% Deflection	1.42	%
Check % Deflection less than 5%	Yes, within tolerance	

Shallowest & Deepest Depth of Cover - Wall Crushing Determination

No part of the proposed wastewater collection system is proposed to be encased in concrete. Therefore, the proposed pipe is not subject to wall crushing determinations for purposes of this review for the proposed conditions. The theoretical wall crushing calculation is shown below for completeness, however is not applicable.

Compressive Stress, Pc	4,000	psi	
Surface Area of Pipe Wall, A	0.323	in^2/in	(equivalent to t, wall thickness)
Specific Weight of Soil, Ys	120	pcf	
Pipe Outside Diameter, Do	8.4	in	
Depth for Wall Crushing, H	369.1	ft	

Wall Crushing Determination

Note: Analysis only applicable for flexible pipe/PVC pipe encased in **concrete**. For purposes of this wall crushing determination, TCEQ does not consider pipes encased in cement-stablized sand to be concrete. If PVC pipe is proposed to be encased in cement-stablized sand or no concrete encasement will be used, this wall crushing determination can be skipped, otherwise the maximum depth of cover at which flexible pipewall crushing happens needs to be calculated.

Maximum Depth of Cover for Wall Crushing

H = [288 (Pc) (A)] / [(Ys) (Do)]

H = Depth of cover at which wall crushing happens, ft
288 = Coefficient (conversion factor)
Pc = Compressive Stress (i.e. Hydrostatic Design Basis), psi (assume 4,000 psi for PVC)
A = Surface Area of Pipe Wall, in^2/ft = t, wall thickness (in)
Ys = Specific Weight of Soil, pcf

Shallowest & Deepest Depth of Cover - Buckling Pressure Determinations

Modulus of Pipe Elasticity, E	400,000	psi
Dimension Ratio, DR	26	unitless
Poisson's Ratio, v	0.38	unitless
Critical Wall Buckling Pressure, Pcr	59.8	psi

Modulus of Soil Reaction, E'	3,000	psi
Reduction Factor, C	0.87	unitless
Critical Wall Buckling Pressure, Pcr (allowable)	423.9	psi

Critical Buckling Pressure Equation

Per JM Eagle Technical Bulletin No. 8, wall buckling is when external pressure on the pipeline causes failure. The threshold point at which the external pressure causes failure in the pipeline is the critical wall buckling pressure. For circular pipes, where Moment of Inertia (I) is defined as $t^3 / 12$, the critical wall buckling pressure can be defined per the following:

$Pcr = [2 (E)] / [(1 - v^2) (DR - 1)^3]$

Pcr = Critical Wall Buckling Pressure, psi
E = Modulus of Tensile Elasticity (i.e. Pipe Elasticity), psi
DR = Dimension Ratio, (Do/t)

Critical Buckling Pressure Equation

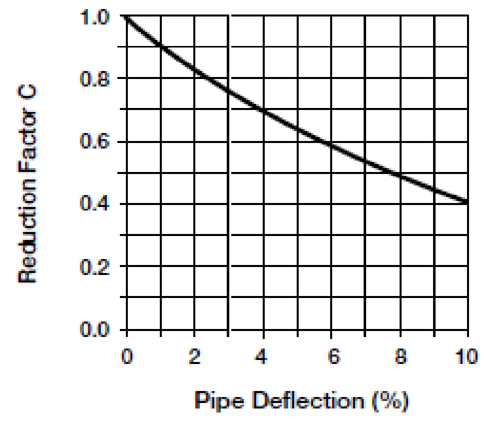
The soil surrounding a buried pipeline increases the pipe's resistance to buckling (i.e. failing). The modified (i.e. allowable) critical wall buckling pressure is defined per the following taking into consideration a reduction factor based on the pipe's anticipated deflection using JM Eagle Technical Bulletin No. 8, Figure 3:

$Pcr\ (allowable) = 1.15\ [((Pcr)\ (E'))^{(1/2)}]\ (C)$

Pcr = Original Critical Wall Buckling Pressure, psi
E' = Modulus of Soil Reaction, psi
C = Reduction Factor per Figure 3 (using 1.25% (i.e. the deepest burial case) to be conservative)

Figure 3

CRITICAL BUCKLING PRESSURE REDUCTION FACTOR C FOR SHAPE



Reference: "Uni-Bell Handbook of PVC Pipe."

Shallowest Depth of Cover - Proposed External Pressure

Specific Weight of Water, Yw	0.0361	pci
Height of Water Above Pipe, hw	0	inch
Depth of Cover, h	48	inch
Water Buoyancy Factor, Rw	1	unitless
Specific Weight of Soil, Ys	120	pcf
Depth of Cover, H	4	feet
Pipe Diameter, D	8	inch
Wall Thickness, t	0.323	inch
Vertical Soil Load on Pipe, Wc	27.7	lb/in
Live Load, W'	3.48	psi
Total External Pressure, Pe	6.9	psi

Proposed external pressure is less than the allowable critical wall buckling pressure, therefore the proposed pipe design works.

Deepest Depth of Cover - Proposed External Pressure

Specific Weight of Water, Yw	0.0361	pci
Height of Water Above Pipe, hw	0	inch
Depth of Cover, h	408	inch
Water Buoyancy Factor, Rw	1	unitless
Specific Weight of Soil, Ys	120	pcf
Depth of Cover, H	34	feet
Pipe Diameter, D	8	inch
Wall Thickness, t	0.323	inch
Vertical Soil Load on Pipe, Wc	235.8	lb/in
Live Load, W'	0.00	psi
Total External Pressure, Pe	29.5	psi

Proposed external pressure is less than the allowable critical wall buckling pressure, therefore the proposed pipe design works.

Applied External Pressure Equation

For proposed conditions, the total summation of external pressure applied on the pipeline is defined per the following:

$Pe = (Yw) (hw) + (Rw) (Wc / D) + W'$

Pe = Total summation of the external pressures on pipe, psi
Yw = Specific Weight (i.e. Unit Weight) of Water, pci (62.4 pcf => 0.0361 pci)
hw = Height of Water above Pipeline, in
Rw = Water Buoyancy Factor = 1 - 0.33 (hw / h), where h = depth of cover, in
Wc = Vertical Soil Load on Pipe, lb/in = (Ys) (H) [(D + t) / 144]
Ys = Specific Weight (i.e. Unit Weight) of Soil Backfill, pcf
H = Depth of Cover, ft
D = Pipe Diameter, in
t = Wall Thickness, in

Shallowest Depth of Cover - Strain Prediction

Total External Pressure, Pe	6.9	psi
Pipe Diameter, D	8	inch
Wall Thickness, t	0.323	inch
Modulus of Pipe Elasticity, E	400,000	psi
Max Strain due to Hoop Stress	0.00022	in/in

% Deflection	0.34	%
Vertical Decrease in Dia, ΔY	0.027	inch
Dimension Ratio, DR	26	unitless
Max Strain due to Ring Deflect.	0.00040	in/in

Max Combined Strain in Pipe W	0.00061	in/in

The calculated values are within normal tolerances, therefore the proposed conditions will not cause strain failure in the proposed pipe design.

Deepest Depth of Cover - Strain Prediction

Total External Pressure, Pe	29.5	psi
Pipe Diameter, D	8	inch
Wall Thickness, t	0.323	inch
Modulus of Pipe Elasticity, E	400,000	psi
Max Strain due to Hoop Stress	0.00091	in/in

% Deflection	1.42	%
Vertical Decrease in Dia, ΔY	0.113	inch
Dimension Ratio, DR	26	unitless
Max Strain due to Ring Deflect.	0.00168	in/in

Max Combined Strain in Pipe W	0.00259	in/in

The calculated values are within normal tolerances, therefore the proposed conditions will not cause strain failure in the proposed pipe design.

Strain Prediction Calculations

Per Uni-Bell Technical Report "Deflection: The Pipe/Soil Mechanism", strain is not a common cause of failure in pipelines and is not a factor that limits a pipeline's design, however strain calculations are included for completeness. The strain prediction calculations are defined by the following:

$\in h = (Pe)\ (D)\ /\ 2\ (t)\ (E)$

$\in h$ = Maximum strain in the pipe wall due to hoop stress, in/in
Pe = Total External Pressure on Pipe, psi
D = Pipe Diameter, in
t = Wall Thickness, in
E = Modulus of Pipe Elasticity, psi

$\in f = (1/DR)\ [3\ (\Delta Y)\ /\ ((D - 2\ (\Delta Y))]$

$\in f$ = Maximum strain in pipe wall due to ring deflection or flexure, in/in
ΔY = Vertical decrease in diameter, in
t = Wall Thickness, in
D = Pipe Diameter, in
DR = Dimension Ratio, unitless

$\in = \in h + \in f$

Table 5

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E' (FOR INITIAL FLEXIBLE PIPE DEFLECTION)					
	PIPE BEDDING MATERIALS	E' FOR DEGREE OF COMPACTION OF PIPE ZONE BACKFILL (PSI)			
SOIL CLASS	SOIL TYPE (Unified Classification System^a)	Loose	Slight < 85% Proctor, < 40% relative density	Moderate 85% - 95% Proctor, 40% - 70% relative density	High > 95% Proctor, > 70% relative density
Class V	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			
Class IV	Fine-grained Soils (LL < 50)Soils with medium to no plasticity CL, ML,ML-CL, with less than 25% coarse-grained particles	50	200	400	1,000
Class III	Fine-grained Soils (LL < 50)Soils with medium to no plasticity CL, ML,ML-CL, with more than 25% coarse-grained particles 1004001,0002,000 Coarse-grained Soils with Fines GM, GC, SM, SCC contains more than 12% fines	100	400	1,000	2,000
Class II	Coarse-grained Soils with Little or No Fines GW, GP, SW, SPC contains less than 12% fines	200	1,000	2,000	3,000
Class I	Crushed Rock	1,000	3,000	3,000	3,000
	Accuracy in Terms of Percentage Deflection	±2	±2	±1	±0.5

[a] ASTM Designation D 2487, USBR Designation E-3
[b] LL = Liquid limit
[c] Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC)
[d] For ± 1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%.

Note: Values applicable only for fills less than 50ft (15m). Table does not include any safety factor. For use in predicting initial deflections only; appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m^3) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1psi = 6.9kN/m^2.

Source: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver Colorado. Reprinted with permission from American Society of Civil Engineers Journal of Geotechnical Engineering Division, January 1977, pp. 33-43.

Wastewater Collection System Structural Analysis per 30 TAC 217.53 (k)

Proposed Wastewater Pipe Constants

Nominal Diameter	12	inch
Material	PVC, SDR 26	
Description	Gravity Sewer Pipe, Flexible Pipe	
Pipe Standard	ASTM D3034, Type PSM	
Joint Standard	ASTM D3212	
Pipe Stiffness, PS	115	psi
Wall Thickness, t	0.490	inch
Tensile Strength, T	7,000	psi
Modulus of Pipe Elasticity, E	400,000	psi

Proposed Trench Constants

Minimum Trench Width	25	inch
Maximum Trench Width	37	inch
Shallowest Bury Depth of Cover	4	feet
Deepest Bury Depth of Cover	18	feet
Unit Weight of Soil Backfill, w	120	pcf
Water Table Height Above Pipe	0	feet

Notes

1) Trench widths per City of Georgetown Construction Standards and Details - Trench and Embedment Detail WW18 included in the construction plans on the detail sheets.
2) The structural calculations provided bracket the shallowest proposed line depth (rounded to 4 foot depth in calculations to be conservative) and the deepest proposed line depth (rounded to 18 foot depth in calculations to be conservative). As the calculations show, the two opposite ends of the spectrum show the most extreme PVC depth of burial case for the proposed wastewater system which are in conformance with 30 TAC 217.53 (k).

3) Per the Georgetown Village (aka Woodfield Preserve) Geotech Report, the water table elevation was not observed in the test pits or borehole depths drilled during the preliminary excavation and study. For purposes of this structural analysis, groundwater and water table elevations are assumed to be below the proposed depth of bury (i.e. pipe is unsaturated).

Live Load Constants per AASHTO H-25 or HS-25

Depth of Cover (feet)	Live Load on PVC Pipe (psi)
1	15.63
2	6.95
3	5.21
4	3.48
5	2.18
6	1.74
7	1.53
8	0.86
+10	Negligible

Notes

1) Live loads beyond 8 feet are negligible for highway loading.

Proposed In-situ Soil and Bedding Constants

Modulus of Soil Reaction, E' (bed) (Bedding Material)	3,000	psi
Modulus of Soil Reaction, E' (in-situ) (In-Situ Material)	3,100	psi
Ratio of Modulus Bedding Soil to Modulus In-Situ Soil	0.97	unitless
Leonhardt's Zeta Factor, z	1.0	unitless
Modulus of Soil Reaction, E' (composite)	3,000	psi

Notes

1) Values are constant for both the shallowest and deepest burial depth of cover cases.
2) Values for E' (bed) per JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe" Table 5 and City of Georgetown Construction Specifications at minimum 95% compaction.
3) Values for E' (in-situ) based on JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe" Table 5 and Geotech Report showing limestone subgrade strata in test pits and boreholes.
4) 21-inch minimum trench widths assumed per City of Georgetown Construction Specifications.

Leonhardt's Zeta Factor and Modulus of Soil Reaction (Composite) Equations

Ratio = E' (bed) / E' (in-situ)
(when Ratio is less than or equal to 1.25, Leonhardt's Zeta Factor assumed to be 1.0, but if Ratio is greater than 1.25, use Leonhardt's Zeta Factor Equation to get coefficient).

Shallowest Depth of Cover - Prism Load

Shallowest Depth of Cover, H	4	feet
Unit Weight of Soil Backfill, w	120	pcf
Prism Load (i.e. Dead Load), P	3.33	psi

Deepest Depth of Cover - Prism Load

Deepest Depth of Cover, H	18	feet
Unit Weight of Soil Backfill, w	120	pcf
Prism Load (i.e. Dead Load), P	15.00	psi

Prism Load (i.e. Dead Load) Equation

$P = (w * H) / 144$

P = Prism Load, psi
w = Unit Weight of Soil Backfill, pcf
H = Depth of Cover, ft

Shallowest Depth of Cover - Deflection

Live Load @ Min Depth, W'	3.48	psi
Prism Load, P	3.33	psi
Pipe Stiffness, PS	115	psi
Modulus of Soil Reaction, E'	3,000	psi
% Deflection	0.34	%
Check % Deflection less than 5%	Yes, within tolerance	

Deepest Depth of Cover - Deflection

Live Load @ Max Depth, W'	0.00	psi
Prism Load, P	15.00	psi
Pipe Stiffness, PS	115	psi
Modulus of Soil Reaction, E'	3,000	psi
% Deflection	0.75	%
Check % Deflection less than 5%	Yes, within tolerance	

Modified Iowa Equation

% Deflection = [0.1 (W' + P) 100] / [0.149 (PS) + 0.061 (E')]

% Deflection = Predicted Diametric Deflection, %
W' = Live Load, psi
P = Prism Load, psi
PS = Pipe Stiffness, psi
E' = Modulus of Soil Reaction, psi

Equation per JM Eagle's Technical Bulletin No. 6 "Depth of Burial for PVC Pipe". Per TCEQ, up to 5% deflection is allowed.

Shallowest & Deepest Depth of Cover - Wall Crushing Determination

No part of the proposed wastewater collection system is proposed to be encased in concrete. Therefore, the proposed pipe is not subject to wall crushing determinations for purposes of this review for the proposed conditions. The theoretical wall crushing calculation is shown below for completeness, however is not applicable.

Compressive Stress, Pc	4,000	psi	
Surface Area of Pipe Wall, A	0.490	in^2/ft	(equivalent to t, wall thickness)
Specific Weight of Soil, Ys	120	pcf	
Pipe Outside Diameter, Do	12.98	in	
Depth for Wall Crushing, H	362.4	ft	

Wall Crushing Determination

Note: Analysis only applicable for flexible pipe/PVC pipe encased in **concrete**. For purposes of this wall crushing determination, TCEQ does not consider pipes encased in cement-stablized sand to be concrete. If PVC pipe is proposed to be encased in cement-stablized sand or no concrete encasement will be used, this wall crushing determination can be skipped, otherwise the maximum depth of cover at which flexible pipewall crushing happens needs to be calculated.

Maximum Depth of Cover for Wall Crushing

H = [288 (Pc) (A)] / [(Ys) (Do)]

H = Depth of cover at which wall crushing happens, ft
288 = Coefficient (conversion factor)
Pc = Compressive Stress (i.e. Hydrostatic Design Basis), psi (assume 4,000 psi for PVC)
A = Surface Area of Pipe Wall, in^2/ft = t, wall thickness (in)
Ys = Specific Weight of Soil, pcf

Shallowest & Deepest Depth of Cover - Buckling Pressure Determinations

Modulus of Pipe Elasticity, E	400,000	psi
Dimension Ratio, DR	26	unitless
Poisson's Ratio, v	0.38	unitless
Critical Wall Buckling Pressure, Pcr	59.8	psi

Modulus of Soil Reaction, E'	3,000	psi
Reduction Factor, C	0.87	unitless
Critical Wall Buckling Pressure, Pcr (allowable)	423.9	psi

Critical Buckling Pressure Equation

Per JM Eagle Technical Bulletin No. 8, wall buckling is when external pressure on the pipeline causes failure. The threshold point at which the external pressure causes failure in the pipeline is the critical wall buckling pressure. For circular pipes, where Moment of Inertia (I) is defined as $t^3 / 12$, the critical wall buckling pressure can be defined per the following:

$$Pcr = [2 (E)] / [(1 - v^2) (DR - 1)^3]$$

Pcr = Critical Wall Buckling Pressure, psi
E = Modulus of Tensile Elasticity (i.e. Pipe Elasticity), psi
DR = Dimension Ratio, (Do/t)

Critical Buckling Pressure Equation

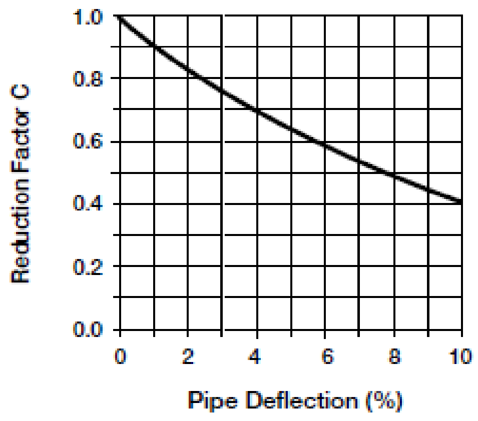
The soil surrounding a buried pipeline increases the pipe's resistance to buckling (i.e. failing). The modified (i.e. allowable) critical wall buckling pressure is defined per the following taking into consideration a reduction factor based on the pipe's anticipated deflection using JM Eagle Technical Bulletin No. 8, Figure 3:

$$Pcr\ (allowable) = 1.15\ [((Pcr)\ (E'))^{(1/2)}]\ (C)$$

Pcr = Original Critical Wall Buckling Pressure, psi
E' = Modulus of Soil Reaction, psi
C = Reduction Factor per Figure 3 (using 1.25% (i.e. the deepest burial case) to be conservative)

Figure 3

CRITICAL BUCKLING PRESSURE REDUCTION FACTOR C FOR SHAPE



Reference: *"Uni-Bell Handbook of PVC Pipe."*

Shallowest Depth of Cover - Proposed External Pressure

Specific Weight of Water, Yw	0.0361	pci
Height of Water Above Pipe, hw	0	inch
Depth of Cover, h	48	inch
Water Buoyancy Factor, Rw	1	unitless
Specific Weight of Soil, Ys	120	pcf
Depth of Cover, H	4	feet
Pipe Diameter, D	12	inch
Wall Thickness, t	0.490	inch
Vertical Soil Load on Pipe, Wc	41.6	lb/in
Live Load, W'	3.48	psi
Total External Pressure, Pe	6.9	psi

Proposed external pressure is less than the allowable critical wall buckling pressure, therefore the proposed pipe design works.

Deepest Depth of Cover - Proposed External Pressure

Specific Weight of Water, Yw	0.0361	pci
Height of Water Above Pipe, hw	0	inch
Depth of Cover, h	216	inch
Water Buoyancy Factor, Rw	1	unitless
Specific Weight of Soil, Ys	120	pcf
Depth of Cover, H	18	feet
Pipe Diameter, D	12	inch
Wall Thickness, t	0.490	inch
Vertical Soil Load on Pipe, Wc	187.4	lb/in
Live Load, W'	0.00	psi
Total External Pressure, Pe	15.6	psi

Proposed external pressure is less than the allowable critical wall buckling pressure, therefore the proposed pipe design works.

Applied External Pressure Equation

For proposed conditions, the total summation of external pressure applied on the pipeline is defined per the following:

$$Pe = (Yw) (hw) + (Rw) (Wc / D) + W'$$

Pe = Total summation of the external pressures on pipe, psi
Yw = Specific Weight (i.e. Unit Weight) of Water, pci (62.4 pcf => 0.0361 pci)
hw = Height of Water above Pipeline, in
Rw = Water Buoyancy Factor = 1 - 0.33 (hw / h), where h = depth of cover, in
Wc = Vertical Soil Load on Pipe, lb/in = (Ys) (H) [(D + t) / 144]
Ys = Specific Weight (i.e. Unit Weight) of Soil Backfill, pcf
H = Depth of Cover, ft
D = Pipe Diameter, in
t = Wall Thickness, in

Shallowest Depth of Cover - Strain Prediction

Total External Pressure, Pe	6.9	psi
Pipe Diameter, D	12	inch
Wall Thickness, t	0.490	inch
Modulus of Pipe Elasticity, E	400,000	psi
Max Strain due to Hoop Stress	0.00021	in/in

% Deflection	0.34	%
Vertical Decrease in Dia, ΔY	0.041	inch
Dimension Ratio, DR	26	unitless
Max Strain due to Ring Deflect.	0.00040	in/in

Max Combined Strain in Pipe W	0.00061	in/in

The calculated values are within normal tolerances, therefore the proposed conditions will not cause strain failure in the proposed pipe design.

Deepest Depth of Cover - Strain Prediction

Total External Pressure, Pe	15.6	psi
Pipe Diameter, D	12	inch
Wall Thickness, t	0.490	inch
Modulus of Pipe Elasticity, E	400,000	psi
Max Strain due to Hoop Stress	0.00048	in/in

% Deflection	0.75	%
Vertical Decrease in Dia, ΔY	0.090	inch
Dimension Ratio, DR	26	unitless
Max Strain due to Ring Deflect.	0.00088	in/in

Max Combined Strain in Pipe W	0.00136	in/in

The calculated values are within normal tolerances, therefore the proposed conditions will not cause strain failure in the proposed pipe design.

Strain Prediction Calculations

Per Uni-Bell Technical Report "Deflection: The Pipe/Soil Mechanism", strain is not a common cause of failure in pipelines and is not a factor that limits a pipeline's design, however strain calculations are included for completeness. The strain prediction calculations are defined by the following:

$\in h = (Pe)\ (D)\ /\ 2\ (t)\ (E)$

$\in h$ = Maximum strain in the pipe wall due to hoop stress, in/in
Pe = Total External Pressure on Pipe, psi
D = Pipe Diameter, in
t = Wall Thickness, in
E = Modulus of Pipe Elasticity, psi

$\in f = (1/DR)\ [3\ (\Delta Y)\ /\ ((D - 2\ (\Delta Y))]$

$\in f$ = Maximum strain in pipe wall due to ring deflection or flexure, in/in
ΔY = Vertical decrease in diameter, in
t = Wall Thickness, in
D = Pipe Diameter, in
DR = Dimension Ratio, unitless

$\in = \in h + \in f$

Table 5

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E' (FOR INITIAL FLEXIBLE PIPE DEFLECTION)

	PIPE BEDDING MATERIALS	E' FOR DEGREE OF COMPACTION OF PIPE ZONE BACKFILL (PSI)			
SOIL CLASS	SOIL TYPE (Unified Classification System[a])	Loose	Slight < 85% Proctor, < 40% relative density	Moderate 85% - 95% Proctor, 40% - 70% relative density	High > 95% Proctor, > 70% relative density
Class V	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			
Class IV	Fine-grained Soils (LL < 50)Soils with medium to no plasticity CL, ML,ML-CL, with less than 25% coarse-grained particles	50	200	400	1,000
Class III	Fine-grained Soils (LL < 50)Soils with medium to no plasticity CL, ML,ML-CL, with more than 25% coarse-grained particles 1004001,0002,000 Coarse-grained Soils with Fines GM, GC, SM, SCC contains more than 12% fines	100	400	1,000	2,000
Class II	Coarse-grained Soils with Little or No Fines GW, GP, SW, SPC contains less than 12% fines	200	1,000	2,000	3,000
Class I	Crushed Rock	1,000	3,000	3,000	3,000
	Accuracy in Terms of Percentage Deflection	±2	±2	±1	±0.5

[a] ASTM Designation D 2487, USBR Designation E-3
[b] LL = Liquid limit
[c] Or any borderline soil beginning with one of these symbols (i.e. GM-GC, GC-SC)
[d] For ± 1% accuracy and predicted deflection of 3%, actual deflection would be between 2% and 4%.

Note: Values applicable only for fills less than 50ft (15m). Table does not include any safety factor. For use in predicting initial deflections only; appropriate Deflection Lag Factor must be applied for long-term deflections. If bedding falls on the borderline between two compaction categories, select lower E' value or average the two values. Percentage Proctor based on laboratory maximum dry density from test standards using about 12,500 ft-lb/cu ft (598,000 J/m^3) (ASTM D 698, AASHTO T-99, USBR Designation E-11). 1psi = 6.9kN/m^2.

Source: "Soil Reaction for Buried Flexible Pipe" by Amster K. Howard, U.S. Bureau of Reclamation, Denver Colorado. Reprinted with permission from American Society of Civil Engineers Journal of Geotechnical Engineering Division, January 1977, pp. 33-43.

C. Safety Considerations:

This project design incorporated numerous safety considerations. Security fences will be used throughout the projects boundary to prevent any passerby from accidentally entering an active construction zone. Any and all trenches that require a depth of larger than 4 feet will follow the trenching and excavation safety guidelines set forth by OSHA. There will be no blasting on the entire construction site. The wastewater manholes are spaced less than the maximum allowed TCEQ spacing and allow appropriate ventilation throughout to prevent odor buildup. All pipe buried is set at a reasonable depth to prevent excessive excavation. There are no anticipated tight workspaces throughout the entire jobsite.

Exhibit A: Proposed Development Site Map

Refer to Attached Construction Documents

Exhibit B: Wastewater Calculations

Phase	LUE	Approx. Drainage Area *(acre)*	*Dry Weather Flow (DWF) per LUE (gpd)*	*DWF (gpd)*	*DWF (MGD)*	*Peaking Factor (PF)*	*Peak Dry Weather Flow (Qpdwf) (MGD)*	*Inflow & Infiltration (gpd/acre)*	*Inflow & Infiltration (MGD)*	*Peak Wet Weather Flow (Qpwwf) (MGD)*
3	229	83.5	250	57,250	0.057	3.5	0.20	1,000	0.084	0.281

Notes

1. One (1) LUE equates to an average wastewater flow of 250 gallons per day (gpd).
2. Inflow & Infiltration (I&I) factored in at 1,000 gallons per day per acre (gpd/acre).

Exhibit C: Wastewater Collection System Diagram

Refer to Attached Construction Documents

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: Justin Midura, P.E.

Date: 3-4-2024

Signature of Customer/Agent:

Regulated Entity Name: Woodfield Preserve Phase 3

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: Berry 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.

Temporary Stormwater Section

ATTACHMENT A

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Spill Response Actions:

1) Contain the spill.
2) Immediately stake off area.
3) Notify Hazardous Material team (if necessary); notify TCEQ:
   (512) 339-2929 or Emergency # 1-800-832-8224
4) Take necessary steps to clean up, i.e. notify remediation contractor if large spill, or small spills will be cleaned by the construction contractor

All Site personnel will be made aware of the manufacturers' recommended methods for spill cleanup and the location of information and cleanup supplies.

Spills will be reported according to the Reportable Quantity, attached on the following page.

Materials and equipment necessary for spill cleanup will be kept onsite in an accessible location known to site personnel.

All spills will be cleaned up immediately upon discovery. Any spill of hydrocarbons or hazardous substances greater than 25 gallons will require notification to the Fire Department Hazardous Materials Team and the TCEQ. As with all spills, an effort shall be made to prevent materials from entering surface streams and storm drains by using rock or earth berms to contain the material.

1.4.16 Spill Prevention and Control

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

The following steps will help reduce the 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 available in 30 TAC 327.4 and 40 CFR 302.4.
(2) Educate employees and subcontractors on potential dangers to humans and the environment from spills and leaks.
(3) Hold regular meetings to discuss and reinforce appropriate disposal procedures (incorporate into regular safety meetings).
(4) Establish a continuing education program to indoctrinate new employees.
(5) Have contractor's superintendent or representative oversee and enforce proper spill prevention and control measures.

General Measures

(1) To the extent that the work can be accomplished safely, spills of oil, petroleum products, 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 runon during rainfall to the extent that it doesn't compromise clean up activities.
(7) Do not bury or wash spills with water.
(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used on the project site in an open, conspicuous, and accessible location.
(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

(1) Clean up leaks and spills immediately.

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

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
(2) Use absorbent materials on small spills rather than hosing down or burying the spill.
(3) Absorbent materials should be promptly removed and disposed of properly.
(4) Follow the practice below for a minor spill:
(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:
(1) Contain spread of the spill.
(2) Notify the project foreman immediately.
(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills

For significant or hazardous spills that are in reportable quantities:
(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone numbers at the construction site.
(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
(3) Notification should first be made by telephone and followed up with a written report.
(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
(5) Other agencies which may need to be consulted includ e, 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:
https://www.tceq.texas.gov/response/spills/spill_rq.html

Vehicle and Equipment Maintenance

(1) If maintenance must occur onsite, use a designated area and a secondary containment, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
(2) Regularly inspect onsite vehicles and equipment for leaks and repair immediately
(3) Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
(4) Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
(5) Place drip pans or absorbent materials under paving equipment when not in use.
(6) Use absorbent materials on small spills rather than hosing down or burying the spill. Remove the absorbent materials promptly and dispose of properly.
(7) Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
(8) Oil filters disposed of in trashcans or dumpsters can leak oil and pollute stormwater. Place the oil filter in a funnel over a waste oil-recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask the oil supplier or recycler about recycling oil filters.
(9) Store cracked batteries in a non- leaking secondary container. Do this with all cracked batteries even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

(1) If fueling must occur on site, use designated areas, located away from drainage courses, to prevent the runon of stormwater and the runoff of spills.
(2) Discourage "topping off" of fuel tanks.
(3) Always use secondary containment, such as a drain pan, when fueling to catch spills/ leaks.

Temporary Stormwater Section

ATTACHMENT B

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Potential Sources of Contamination:

Gasoline, Diesel, and Hydraulic Fluid from Construction Equipment,
Asphalt Products,
Construction Materials,
Trash and Debris,
Paint,
Concrete,
Gypsum from Sheet Rock
Sediment

All materials shall be hauled in a manner consistent with the manufacturer's recommendations. Disposal of waste material shall be in conformance with All State and Local Laws.

Kind of spill	**Where discharged**	**Reportable quantity**
Hazardous substance	onto land	"Final RQ" in Table 302.4 in 40 CFR 302.4 (PDF)
	into water	"Final RQ" or 100 lbs, whichever is **less**
Any oil	coastal waters	as required by the Texas General Land Office
Crude oil, oil that is neither a petroleum product nor used oil	onto land	210 gallons (five barrels)
	directly into water	enough to create a sheen
Petroleum product, used oil	onto land, from an exempt PST facility	210 gallons (five barrels)
	onto land, or onto land from a non-exempt PST facility	25 gallons
	directly into water	enough to create a sheen
Associated with the exploration, development and production of oil, gas, or geothermal resources	under the jurisdiction of the Railroad Commission of Texas	as required by the Railroad Commission of Texas
Industrial solid waste or other substances	into water	100 lbs
From petroleum storage tanks, underground or aboveground	into water	enough to create a sheen on water
From petroleum storage tanks, underground or aboveground	onto land	25 gallons or equal to the RQ under 40 CFR 302
Other substances that may be useful or valuable and are not ordinarily considered to be waste, but will cause pollution if discharged into water in the state	into water	100 lbs

Temporary Stormwater Section

ATTACHMENT C

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

SEQUENCE of MAJOR ACTIVITIES:

1) Install temporary erosion control measures, stabilized construction entrance, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc. Notify Construction Inspection Division, when installed. Estimate of disturbed area = 83 acres.

2) Prior to beginning construction, the owner or his authorized representative shall convene a Pre-Construction Conference between the TCEQ, Williamson County, consulting engineer, contractor, and any other affected parties. Notify TCEQ at least 48 hours prior to the time of the conference and 48 hours prior to the beginning of construction. Provide 72-hour notification of EV Inspection (at 512-974-2278) to pre-construction conference.

3) Hold pre-construction conference with Contractor, TCEQ, EV Inspector, Engineer, and Owner.

4) Begin installation of wastewater lines. Upon completion, restore as much disturbed areas as possible, particularly channels and large open areas. Estimate of disturbed area = 83 acres.

5) Complete permanent erosion control and restoration of site vegetation. Estimate of disturbed area = 83 acres.

6) Project Engineer to provide a written concurrence letter, and scheduling final inspection with EV Inspector, prior to the removal of erosion controls.

7) Remove and dispose of temporary erosion/sedimentation control measures.

8) Conduct a final inspection and complete all punch list items.

Clearing and grubbing under a development permit, solely for the purpose of surveying and soil exploration, shall be a hand cutting or blade-up operation

Temporary Stormwater Section

ATTACHMENT D

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Temporary Best Management Practices and Measures:

Install temporary erosion control measures, silt fence, stabilized construction entrance, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc.

All geologic features for this site are to be included in the geological assessment.

Temporary Stormwater Section

ATTACHMENT F

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Structural Practices:

BMPs utilizing silt fences, diversion berms, and inlet protection devices will be used during construction to control sediment runoff.

Stormwater runoff from the site will drain into catch basins and into the permanent detention and water quality system before discharging downstream at a controlled rate. All stormwater from the site will be collected via a series of storm pipes and passed through the Water Quality and Detention ponds 7, 8, and 9. Ponds 7, 8, and 9 will be rough cut prior to construction for temporary sediment runoff.

Temporary Stormwater Section

ATTACHMENT G

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Drainage Area Map:

An overall drainage area map is included with this application.

Temporary Stormwater Section
ATTACHMENT H

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Temporary Sediment Pond Plans and Calculations:

The ponds will be graded to full capacity at the beginning of the project. All mid-construction discharge will be routed to the ponds for the duration of construction.

Temporary Stormwater Section

ATTACHMENT I

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Inspection and Maintenance for Best Management Practices:

Best Management Practices installed during construction will be maintained in accordance with the requirements of the EPA's NPDES/TPDES stormwater pollution prevention program. The following maintenance procedures shall be followed until permanent stabilization occurs.

Silt Fence

a. Inspect weekly or after each rainfall event and repair or replacement shall be made promptly as needed.
b. Silt fence shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.
c. Accumulated silt shall be removed when it reaches a depth of 6 inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.

Rock Berm

a. Inspect weekly or after each rain and the stone and/or fabric core-woven sheathing shall be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc. event and repair or replacement shall be made promptly as needed.
b. When silt reaches a depth equal to one-third the height of the berm or 6", whichever is less, the silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
c. Accumulated silt shall be removed when it reaches a depth of 6 inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
d. Severe service rock berms shall be inspected daily. Silt shall be removed when it reaches a depth of 6"
e. Rock berms shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.

Stabilized Construction Entrance

a. 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 devices used to trap sediment.
b. Entrance must be properly graded to incorporate a drain swale or a similar measure to prevent runoff from leaving the construction site.

Inlet Protection

a. Inspection shall be made weekly or after each rainfall event and replacement or repair shall be made promptly as needed.
b. Accumulated silt shall be removed when it reaches a depth of 6 inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
c. The dyke shall be removed when the site is completely stabilized so as to not block or impede storm flow or drainage.

Concrete Washout

a. Inspection shall be made daily or after each rainfall event to check to leaks, identify any plastic linings and sidewalls have been damaged by construction activities.
b. When the washout container is filled over 75 percent of its capacity, the washwater should be vacuumed off or allowed to evaporate to avoid overflows. When the remaining cementitious solids have hardened, they should be removed and recycled.
c. Damages to the container should be repaired promptly.
d. Before heavy rains, the washout container's liquid level should be lowered, or the container should be covered to avoid an overflow during the rain storm.
e.

The owner shall hire an E&S compliance company to inspect E&S measures and keep reports of onsite inspections with deficiencies and solutions.

Temporary Stormwater Section

ATTACHMENT J

TCEQ SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Schedule of Interim and Permanent Soil Stabilization Practices:

Soil Stabilization for all disturbed areas shall be accomplished by hydraulic planting. Following is an outline to accomplish the required stabilization.

1. Preparing Seed Bed. After the designated areas have been rough graded to the lines, grades and typical sections indicated in the Drawings or as provided for in other items of this contract and for any other soil area disturbed by the construction, a suitable seedbed shall be prepared. The seedbed shall consist of a minimum of either 4 inches (100 millimeters) of approved topsoil or 4 inches (100 millimeters) of approved salvaged topsoil, cultivated and rolled sufficiently to enhance the soil to a state of good health, when the soil particles on the surface are small enough and lie closely enough together to prevent the seed from being covered too deeply for optimum germination. The optimum depth for seeding shall be 1/4 inch (6 millimeters). Water shall be gently applied as required to prepare the seedbed prior to the planting operation either by broadcast seeding or hydraulic planting. Bare soils should be seeded or otherwise stabilized within 14 calendar days after final grading or where construction activity has temporarily ceased for more than 21 days. Seeding shall be performed in accordance with the requirements hereinafter described.

2. Watering. All watering shall comply with Chisholm Trail Subdivision Rules and Regulations. Broadcast seeded areas shall immediately be watered with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed and in the manner and quantity as directed by the Engineer or designated representative. Hydraulic seeded areas and native grass seeded areas shall be watered commencing after the tackifier has dried with a minimum of 5 gallons of water per square yard (22.5 liters of water per square meter) or as needed to keep the seedbed in a wet condition favorable for the growth of grass.

Watering applications shall constantly maintain the seedbed in a wet condition favorable for the growth of grass. Watering shall continue until the grass is uniformly 1 1/2 inches (40 mm) in height and accepted by the Engineer or designated representative. Watering can be postponed immediately after a 1/2 inch (12.5 mm) or greater rainfall on the site but shall be resumed before the soil dries out.

3. Hydraulic Planting. The seedbed shall be prepared as specified above and hydraulic planting equipment, which is capable of placing all materials in a single operation, shall be used.

March 1 to September 15

Hydraulic planting mixture and minimum rate of application pounds per 1000 square feet (kilograms per 100 square meters):

Planting Mixture			
Hulled Bermuda Seed (PLS=0.83)	Fiber Mulch		Soil Tackifier
	Cellulose	Wood	
1 Lbs/1000 ft2 (0.5 kgs/100 m2))	45.9 Lbs/1000 ft2 (22.5 kgs/100 m2))		1.4 Lbs/1000 ft2 (0.7 kgs/100 m2))
		57.4 Lbs/1000 ft2 (28.01 kgs/100 m2))	1.5 Lbs/1000 ft2 (0.75 kgs/100 m2))

September 15 to March 1

Add 1.5 pounds per 1000 square feet (0.75 kilograms per 100 square meters) of cool season cover crop (see Table 1) to above mixture. The fertilizer shall conform to City of Austin Standard Specification Item No. 606S, "Fertilizer".

Table 1: Cool Season Cover Crop

Common Name	Botanical Name	Application rates	
		Lbs/1000 feet ^{2}	kg/ 100 meter^2
Wheat	Triticum aestivum	0.5	0.25
Oats	Avena sativa	0.5	0.25
Cereal Rye Grain	Secale cereale	0.5	0.25
Total Cool Season Cover Crop Seeding Rate		1.5	0.75
Total Cool Season Seeding Rate (Grass, Wildflowers, & Cover Crop)		4.5	2.25

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: Justin Midura, P.E.

Date: 3-4-2024

Signature of Customer/Agent

Regulated Entity Name: Woodfield Preserve Phase 3

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

Permanent Stormwater Section

ATTACHMENT B

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Best Management Practices for Upgradient Stormwater:

The Woodfield Preserve Phase 3 developments does not accept off-site drainage from the upgradient.

Developed conditions propose five drainage basins. Two drainage basins to be treated by vegetative filter strips and three drainage basins to be treated by means of onsite ponding per Ponds 7, 8, and 9.

All extended batch detention ponds were analyzed by using HEC-HMS to model detention and outlet structures for the 24-hour duration, 2-, 10-, 25-, and 100-year frequency rainfall events with WQ volume using the TCEQ Technical Guidance Manual. Stormwater is conveyed to the proposed BMP via curb and gutter flow to curb and grate inlets located in the ROW and driveways. At these points the water drains into the ponds via storm pipe and released to the designated watershed by means of a safety end treatment (SET) outlet structure.

Permanent Stormwater Section

ATTACHMENT C

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Best Management Practices for On-site Stormwater:

Since this project site is located within the Edwards Aquifer Recharge Zone, water quality has been provided by proposed three extended batch detention water quality ponds and two vegetated filter strips (VFS). This development proposes a total impervious cover of 39.09 acres. The proposed BMP was designed to follow TCEQ's guidelines and will remove a minimum of 80% of the increased TSS from the proposed construction. Maintenance of the ponds and VFS will be performed by the Shell Road MUD.

Permanent Stormwater Section

ATTACHMENT D

TCEQ WPAP & SCS APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Best Management Practices for Surface Streams Stormwater:

No BMPs are proposed to specifically affect surface streams. The function of proposed onsite BMPs is to retain natural flow patterns and volumetric flowrates as in existing conditions. Therefore, the BMPs proposed for reducing pollutant loads in surface streams are described in the previous section; "Attachment 5C, BMPs for On-Site Stormwater." A discussion on how the detention and water quality ponds will manage stormwater runoff entering nearby surface streams is within "Attachment I – Measures for Minimizing Surface Stream Contamination."

Permanent Stormwater Section

ATTACHMENT F

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Construction Plans:

Construction plans for the erosion/sedimentation control measures proposed with this development are included at the end of this report.

Permanent Stormwater Section

ATTACHMENT G

TCEQ WPAP & APPLICATION

Woodfield Preserve Phase 3

Williamson County, Texas

Inspection, Maintenance, Repair and Retrofit Plan

Temporary BMP's:

Best Management Practices (BMP's) installed during construction will be maintained in accordance with the requirements of the EPA's NPDES stormwater pollution prevention program. The construction superintendent will inspect temporary erosion controls on a regular basis and adjust the controls and/or remove any sediment buildup in accordance with the erosion/sedimentation control notes and as otherwise directed by the owner or his designated representative. Temporary erosion controls should be inspected, maintained, and repaired, at a minimum, every seven (7) days and within 24 hours of a storm of 0.5 inches or more rainfall depth. Sediment shall be removed from controls when 50% of the design height is exceeded. Following inspection of the BMP's, deficiencies shall be noted and corrected by the contractor.

Permanent BMP's:

Extended Batch Detention

Inspections. Basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the pond is meeting the target detention times. In particular, the extended detention control device should be regularly inspected for evidence of clogging, or conversely, for too rapid a release. If the design drawdown times are exceeded by more than 24 hours, then repairs should be scheduled immediately. The upper stage pilot channel, if any, and its flow path to the lower stage should be checked for erosion problems. During each inspection, erosion areas inside and downstream of the BMP should be identified and repaired or revegetated immediately.

Mowing. The upper stage, side slopes, embankment, and emergency spillway of an extended detention basin must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around basins should be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing of grass is performed, a mulching mower should be used, or grass clippings should be caught and removed.

Debris and Litter Removal Debris and litter will accumulate near the extended detention control device and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the control device or riser.

Erosion control. The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems. Similarly, the channel connecting an upper stage with a lower stage may periodically need to be replaced or repaired.

Structural Repairs and Replacement. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. These repairs should include patching of cracked concrete, sealing of voids, and removal of vegetation from cracks and joints. The various inlet/outlet and riser works in a basin will eventually deteriorate and must be replaced. Public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, whereas reinforced concrete barrels and risers may last from 50 to 75 yr.

Nuisance Control. Standing water (not desired in a extended detention basin) or soggy conditions within the lower stage of the basin can create nuisance conditions for nearby residents. Odors, mosquitoes, weeds, and litter are all occasionally perceived to be problems. Most of these problems are generally a sign that regular inspections and maintenance are not being performed (e.g., mowing, debris removal, clearing the outlet control device).

Sediment Removal. When properly designed, dry extended detention basins will accumulate quantities of sediment over time. Sediment accumulation is a serious maintenance concern in extended detention dry ponds for several reasons. First, the sediment gradually reduces available stormwater management storage capacity within the basin. Second, unlike wet extended detention basins (which have a permanent pool to conceal deposited sediments), sediment accumulation can make dry extended detention basins very unsightly. Third, and perhaps most importantly, sediment tends to accumulate around the control device. Sediment deposition increases the risk that the orifice will become clogged, and gradually reduces storage capacity reserved for pollutant removal. Sediment can also be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams. For these reasons, accumulated sediment needs to be removed from the lower stage when sediment buildup fills 20% of the volume of the basin or at least every 10 years.

Ultimately, these facilities will be owned, operated and maintained by Shell Road MUD.

Acknowledged by:

Larry Colditz
Authorized Signatory
LSMA Georgetown, LLC

Permanent Stormwater Section

ATTACHMENT I

TCEQ WPAP APPLICATION

Woodfield Preserve Phase 3
Williamson County, Texas

Measures for Minimizing Surface Stream Contamination:

The development minimizes surface stream contamination by maintaining the natural sheet, and shallow concentrated flows across the lots to storm inlets. Drainage from this development will be directed to the proposed extended batch detention ponds and vegetative filter strips.

Since the proposed design of stormwater management features reduces developed flow rates to below existing conditions for the 2, 10, 25, 100-yr design storm, there is no increase to the volumetric rate or change to the flow path at which stormwater will enter Berry Creek watershed.

Agent Authorization Form

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

I **Lawrence Colditz**,
Print Name

Authorized Agent,
Title - Owner/President/Other

of LSMA Georgetown, LLC,
Corporation/Partnership/Entity Name

have authorized Justin Midura, P.E.
Print Name of Agent/Engineer

of LJA Engineering, Inc.
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

12-5-2023
Date

THE STATE OF Florida §
County of Manatee §

BEFORE ME, the undersigned authority, on this day personally appeared Lawrence Colditz 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 December, 2023.

Karen Wynn
NOTARY PUBLIC

Karen M. Wynn
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: July 15, 2025

KAREN M. WYNN
MY COMMISSION # HH 154479
EXPIRES: July 15, 2025
Bonded Thru Notary Public Underwriters

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Woodfield Preserve Phase 3
Regulated Entity Location: North of Shell Road between SH 195 and FM 338
Name of Customer: Larry Colditz
Contact Person: Justin Midura, P.E. Phone: 512-439-4700
Customer Reference Number (if issued):CN CN606070779
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	83.47 Acres	$ 6,500
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	11,939 L.F.	$ 5,970
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Total $12,470.00

Signature: ____________ Date: 3-4-2024

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	$1,500
	5 < 10	$3,000
	10 < 40	$4,000
	40 < 100	$6,500
	100 < 500	$8,000
	≥ 500	$10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1	$3,000
	1 < 5	$4,000
	5 < 10	$5,000
	10 < 40	$6,500
	40 < 100	$8,000
	≥ 100	$10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.)*

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	**3. Regulated Entity Reference Number** *(if issued)*
CN606070779		**RN**

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)* *If new Customer, enter previous Customer below:*

LSMA Georgetown, LLC

7. TX SOS/CPA Filing Number	**8. TX State Tax ID** (11 digits)	**9. Federal Tax ID** (9 digits) 87-2466381	**10. DUNS Number** *(if applicable)*

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ Local ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☒ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☒ Owner ☐ Operator ☐ Owner & Operator ☐ Other:
☐ Occupational Licensee ☐ Responsible Party ☐ VCP/BSA Applicant

15. Mailing Address:	8344 Enterprise Circle							
	Ste 100							
	City	Lakewood Ranch	**State**	FL	**ZIP**	34202	**ZIP + 4**	

16. Country Mailing Information *(if outside USA)*	**17. E-Mail Address** *(if applicable)*

18. Telephone Number	**19. Extension or Code**	**20. Fax Number** *(if applicable)*

(941) 388-0707		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected, a new permit application is also required.)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated, in order to meet TCEQ Core Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

Woodfield Preserve Phase 3

23. Street Address of the Regulated Entity: ***(No PO Boxes)***							
	City		**State**		**ZIP**		**ZIP + 4**
24. County							

If no Street Address is provided, fields 25-28 are required.

25. Description to Physical Location:	North of Shell Rd between SH 195 and Williams Drive

26. Nearest City	**State**	**Nearest ZIP Code**
Georgetown	TX	78628

Latitude/Longitude are required and may be added/updated to meet TCEQ Core Data Standards. (Geocoding of the Physical Address may be used to supply coordinates where none have been provided or to gain accuracy).

27. Latitude (N) In Decimal:	30.705547		**28. Longitude (W) In Decimal:**	97.698228	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	42	19.97	97	41	53.62

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)
6552		237210	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Residential- Subdivision

34. Mailing Address:	**6310 Capital Dr., Ste 130**						
	City	**Lakewood Ranch**	**State**	**FL**	**ZIP**	**34202**	**ZIP + 4**

35. E-Mail Address: **Lcolditz@starwoodland.com**

36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(303) 720-4436		( ) -

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Wastewater	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Justin Midura, P.E.	**41. Title:**	Project Manager
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 439-4700		( ) -	Jmidura@lja.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	LJA Engineering, Inc.	**Job Title:**	Project Manager
Name *(In Print)*:	Justin Midura, P.E.	**Phone:**	(512) 439- 4700
Signature:		**Date:**	3-4-2024