

# **WATER POLLUTION ABATEMENT PLAN & ORGANIZED SEWAGE COLLECTION SYSTEM PLAN**

**BERRY CREEK HIGHLANDS PHASE 3  
2451 STATE HIGHWAY 195  
GEORGETOWN, WILLIAMSON COUNTY, TEXAS**

*Prepared For:*

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(512) 610-7000

*Prepared By:*

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Firm No. 928  
KHA Project No. 067782805

October 5, 2023

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# **SECTION 1: EDWARDS AQUIFER APPLICATION COVER PAGE**

# Texas Commission on Environmental Quality

## Edwards Aquifer Application Cover Page

### *Our Review of Your Application*

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

### *Administrative Review*

1. [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.

<b>1. Regulated Entity Name:</b> Berry Creek Highlands Phase 3					<b>2. Regulated Entity No.:</b>				
<b>3. Customer Name:</b> FR Berry Hills, LLC					<b>4. Customer No.:</b>				
<b>5. Project Type:</b> (Please circle/check one)	<input checked="" type="radio"/> New	Modification			Extension		Exception		
<b>6. Plan Type:</b> (Please circle/check one)	<input checked="" type="radio"/> WPAP	<input checked="" type="radio"/> CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
<b>7. Land Use:</b> (Please circle/check one)	<input checked="" type="radio"/> Residential		Non-residential			<b>8. Site (acres):</b>		16.885	
<b>9. Application Fee:</b>	\$5,183.50		<b>10. Permanent BMP(s):</b>			Detention Pond			
<b>11. SCS (Linear Ft.):</b>	2,367 LF		<b>12. AST/UST (No. Tanks):</b>			N/A			
<b>13. County:</b>	Williamson		<b>14. Watershed:</b>			Lower 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](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.)	—	—	<u>X</u>
Region (1 req.)	—	—	<u>X</u>
County(ies)	—	—	<u>X</u>
Groundwater Conservation District(s)	<u>—</u> Edwards Aquifer Authority <u>—</u> Barton Springs/ Edwards Aquifer <u>—</u> Hays Trinity <u>—</u> Plum Creek	<u>—</u> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<u>—</u> Austin <u>—</u> Buda <u>—</u> Dripping Springs <u>—</u> Kyle <u>—</u> Mountain City <u>—</u> San Marcos <u>—</u> Wimberley <u>—</u> Woodcreek	<u>—</u> Austin <u>—</u> Bee Cave <u>—</u> Pflugerville <u>—</u> Rollingwood <u>—</u> Round Rock <u>—</u> Sunset Valley <u>—</u> West Lake Hills	<u>—</u> Austin <u>—</u> Cedar Park <u>—</u> Florence <u>X</u> Georgetown <u>—</u> Jerrell <u>—</u> Leander <u>—</u> Liberty Hill <u>—</u> Pflugerville <u>—</u> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	—	—	—	—	—
Region (1 req.)	—	—	—	—	—
County(ies)	—	—	—	—	—
Groundwater Conservation District(s)	<u>—</u> Edwards Aquifer Authority <u>—</u> Trinity-Glen Rose	<u>—</u> Edwards Aquifer Authority	<u>—</u> Kinney	<u>—</u> EAA <u>—</u> Medina	<u>—</u> EAA <u>—</u> Uvalde
City(ies) Jurisdiction	<u>—</u> Castle Hills <u>—</u> Fair Oaks Ranch <u>—</u> Helotes <u>—</u> Hill Country Village <u>—</u> Hollywood Park <u>—</u> San Antonio (SAWS) <u>—</u> Shavano Park	<u>—</u> Bulverde <u>—</u> Fair Oaks Ranch <u>—</u> Garden Ridge <u>—</u> New Braunfels <u>—</u> Schertz	NA	<u>—</u> 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.

**Jacob Kondo, P.E.**

Print Name of Customer/Authorized Agent

*Jacob Kondo*

09/14/2023

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):

# SECTION 2: GENERAL INFORMATION

# 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: Jacob Kondo

Date: 09/14/2023

Signature of Customer/Agent:



## Project Information

1. Regulated Entity Name: Berry Creek Highlands Phase 3

2. County: Williamson

3. Stream Basin: San Gabriel River

4. Groundwater Conservation District (If applicable): N/A

5. Edwards Aquifer Zone:

☒ Recharge Zone

☐ Transition Zone

6. Plan Type:

☒ WPAP

☒ SCS

☐ Modification

☐ AST

☐ UST

☐ Exception Request

7. Customer (Applicant):

Contact Person: Brandon Jenkins

Entity: FR Berry Hills, LLC

Mailing Address: 11 Dupont Circle NW, Suite 900

City, State: Washington, DC

Zip: 20036

Telephone: 512-450-4916

Fax: N/A

Email Address: frank.delcastillo@ashtonwoods.com

8. Agent/Representative (If any):

Contact Person: Jacob Kondo

Entity: Kimley-Horn

Mailing Address: 10814 Jollyville Road; Bldg. IV, Suite 200

City, State: Austin, Texas

Zip: 78759

Telephone: 512-418-1771

Fax: N/A

Email Address: Jacob.Kondo@kimley-horn.com

9. Project Location:

- ☒ The project site is located inside the city limits of Georgetown.  
☐ The project site is located outside the city limits but inside the ETJ (extra-territorial jurisdiction) of Williamson County.  
☐ 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.

2451 State Highway 195, Georgetown, TX 78633

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" = 1000') of the Edwards Recharge Zone is attached. The map(s) clearly show:
- ☒ Project site boundaries.
  - ☒ USGS Quadrangle Name(s).
  - ☒ Boundaries of the Recharge Zone (and Transition Zone, if applicable).
  - ☒ Drainage path from the project site to the boundary of the Recharge Zone.
13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☐ Survey staking will be completed by this date: \_\_\_\_\_



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

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

15. Existing project site conditions are noted below:

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

### ***Prohibited Activities***

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

- (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
- (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
- (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
- (4) The use of sewage holding tanks as parts of organized collection systems; and
- (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).
- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

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

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

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

### ***Administrative Information***

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

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

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

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

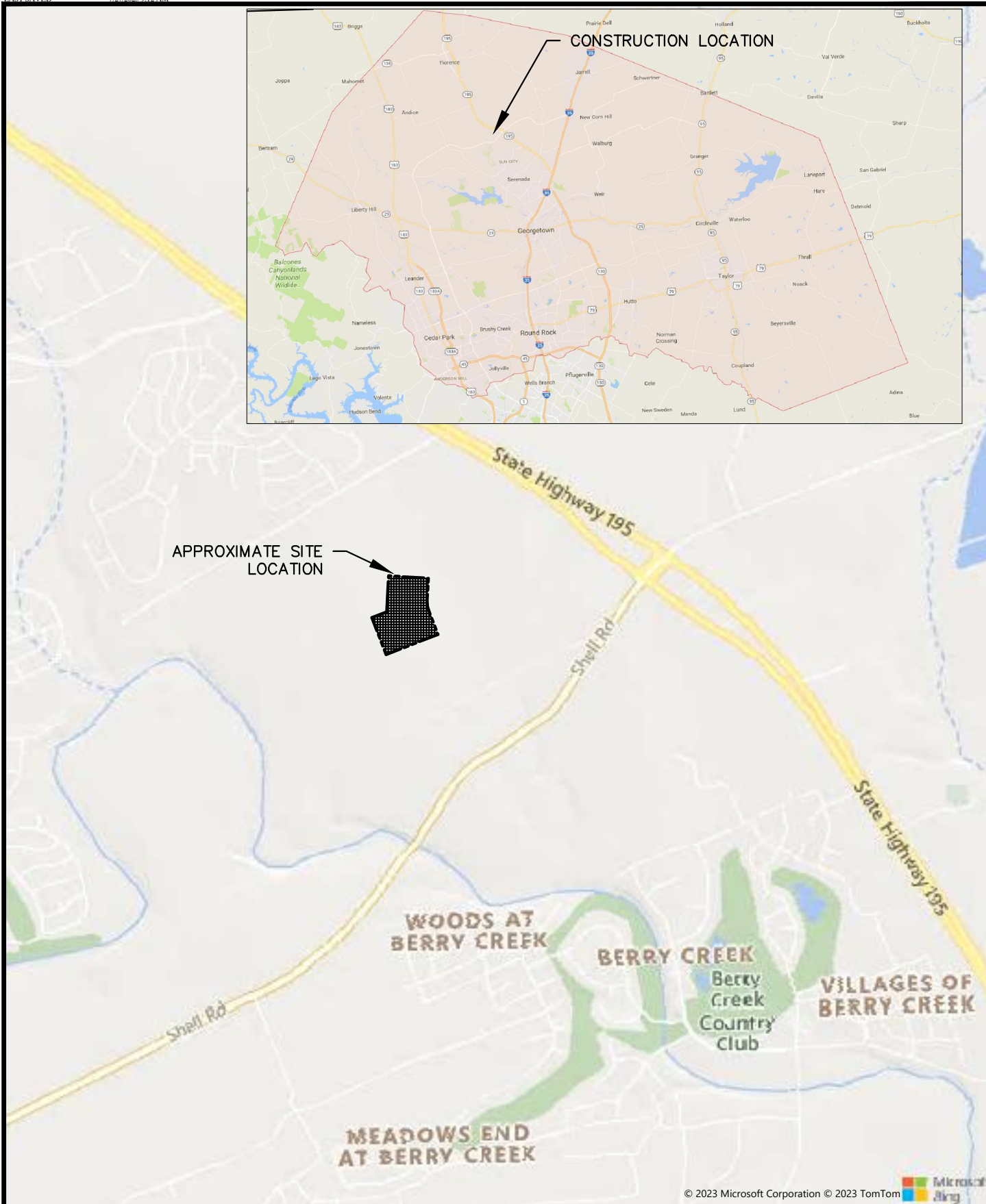
20. ☒ Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies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



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



***Attachment A***

***Road Map***



SHEET 1	Scale:	N.T.S.	ROAD MAP	Berry Creek Highlands Phase 3 Georgetown, Williamson County, Texas		
	Designed by:	ANR				
	Drawn by:	ANR				
	Checked by:	JRK				
	Date:	July 2023				
OF 1 SHEETS	Project No.	067782805	This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.			

***Attachment B***

***USGS/Edwards Recharge Zone Map***





U.S. DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY



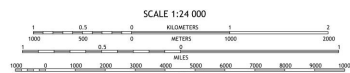
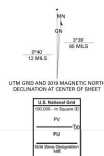
GEORGETOWN QUADRANGLE  
TEXAS - WILLIAMSON COUNTY  
7.5-MINUTE SERIES



Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)  
World Geodetic System of 1984 (WGS84) Projection and  
1:250,000 scale horizontal datum. State Plane  
This map is not a legal document. Boundaries may be  
generalized for this map scale. Private land with government  
interests may not be shown. Obtain permission before  
entering private lands.

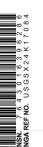
Imagery: U.S. NADP, August 2016 - November 2016  
Roads: U.S. Census, 2013  
Hydrography: USGS, 2003, 2004  
Contours: National Hydrography Dataset, 2002  
Boundaries: Multiple sources; see metadata file 2016 - 2017  
Wetlands: FWS National Wetlands Inventory 1982



1	2	3	Fluvial
4	5	6	Coastal
7	8	9	Landward
10	11	12	Landward

ROAD CLASSIFICATION	
Expressway	Local Connector
Interstate Route	State Route
Ramp	Wetland

GEORGETOWN, TX  
2019

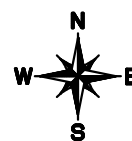


SHEET  
1

Scale: 1:2000  
Designed by: ANR  
Drawn by: ANR  
Checked by: JRK  
Date: July 2023  
Project No. 067782805

USGS Quadrangle

Berry Creek Highlands  
Phase 3  
Georgetown, Williamson County,  
Texas



**Kimley»Horn**

This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.

OF 1 SHEETS

## **Attachment C**

### **Introduction**

The proposed Berry Creek Phase 3 development is located on the west side of Highway 195, Northwest of the intersection of Highway 195 and Shell Road, in Georgetown, Texas. The proposed development is approximately 16.885 acres of 90 single-family residences. The site is currently undeveloped.

The proposed improvements include water, wastewater, storm sewer, sidewalks, and other associated site improvements with the project.

No portion of this site is located in the Federal Emergency Management Agency's 100-year floodplain per the Flood Insurance Rate Map 48491C0285F, dated December 20, 2019, for Williamson County, Texas. No floodplain modifications are proposed. The site is located within the North Edwards Aquifer Recharge Zone according to the City of Georgetown and Edward's Aquifer GIS databases. There are no critical water quality zones or critical environmental features located on-site.

### **Legal Description**

The legal description of the property is as follows:

BEING a 16.885-acre (735,512 square feet) tract of land situated in the Burrell Eaves Survey, Abstract No. 216, City of Georgetown, Williamson County, Texas; and being all of that certain 16.885 acre tract described in Special Warranty Deed to FR BERRY HILLS, LLC., recorded in Document No. 2022090595, of the Official Public Records of Williamson County.

### **Land Use**

The site is undeveloped and resides within the Full Purpose city limits of the City of Georgetown.

### **Existing Drainage Conditions**

The subject site is composed of 3 existing drainage areas, 2 of which are located off site. These drainage areas belong to the Lower Berry Creek watershed. The existing, on-site drainage area is sized at 162.63 acres, and the off-site drainage areas are sized at 23.10 acres and 19.70 acres.

### **Proposed Development**

The proposed development includes the construction of public roads, sidewalks, landscaping, stormwater management infrastructure, water, and sanitary sewer. The subdivision will consist of 94 total lots; more specifically 90 single-family lots, 3 landscape lots, and 1 drainage lot. This development will gain access from Cowboy Canyon Drive (constructed with the Phase 1 improvements for the Berry Creek Highlands subdivision).



## **Drainage and Water Quality Analysis**

### **Watershed Classification**

This project is located within the Berry Creek Watershed of the Brazos River Basin.

### **Floodplain Information**

No portion of the site is located within FEMA floodplain per Flood Insurance Rate Map #48491C0285F dated December 20, 2019, for Williamson County, Texas.

### **On-Site Drainage**

This portion of the site to be improved is mostly undeveloped and is in good condition with pasture, grassland, or range with over 50% grass cover at an average of one to two percent slopes. All proposed runoff is designed to be collected in the on-site storm drain for Berry Creek Highlands. The storm drain will collect and discharge into an existing full sedimentation-filtration pond with stacked detention located at the east of the site. This pond has already been completed and accepted by the City of Georgetown in Phase 1 of the Berry Creek Highlands development. (EAPP AI No. 11001800)

### **Off-Site Drainage**

There is no off-site drainage within this phase of the project.

### **Detention and Water Quality**

The subject site has no existing detention or water quality ponds onsite. This subject site (Phase 3) will utilize an existing full sedimentation-filtration and detention pond within the phase 1 area. This pond has already been completed in Phase 1 of the Berry Creek Highlands development (EAPP AI No. 11001800). The detention pond is sized per current City of Georgetown design standards. Drainage area maps, calculations, and detention analysis that incorporate Atlas-14 rainfall data are included in the approved TCEQ application from phase 1 (EAPP AI No. 11001800) plan set for reference.

Based on the overall development drainage area maps and the topographic survey, the offsite flow incoming from the northwestern side of the property will be accepted by a channel along the northwestern side of the property. This channel will terminate at a proposed 36" headwall, which connects to the Berry Creek Highlands Phase 1 storm system. This headwall will connect into a 36" storm stub out that was installed in Phase 1.

### **Erosion and Sedimentation Controls**

Temporary erosion and sedimentation controls during construction are proposed on the Erosion Control Plan and include: silt fences, inlet protection, construction staging area, concrete washout, and a stabilized construction entrance designed to City of Georgetown criteria. Where the City of Georgetown does not specify criteria, the City of Austin criteria is used. The land disturbed during construction, including the staging and stockpile areas, will drain via overland flow and into the detention and water quality pond located on-site. Permanent erosion control will include vegetation using perennial grasses and the water quality wet pond.



# SECTION 3: GEOLOGIC ASSESSMENT

March 31, 2016 (Revised July 30, 2020)

**KIMLEY-HORN**

10814 Jollyville Road, Avallon IV, Suite 300  
Austin, Texas 78759

Attn: Mr. Brian Parker, P.E., Senior Associate  
Via email: [brian.parker@kimley-horn.com](mailto:brian.parker@kimley-horn.com)

Re: Geologic Assessment  
314-Acre Johnson/Schneider Tracts  
Highway 195 & Bonnet Lane  
Georgetown, Texas  
PSI Project No.: 435-2660

Dear Mr. Parker:

Professional Service Industries, Inc. (PSI) has completed a geologic recharge assessment for the above referenced project in compliance with the Texas Commission on Environmental Quality (TCEQ) requirements for regulated developments located on the Edwards Aquifer Recharge Zone (EARZ). The purpose of this report is to describe surficial geologic units and identify the locations and extent of significant recharge features present in the development area.

**AUTHORIZATION**

Authorization to perform this assessment was given by a signed copy of PSI Proposal No. 171837 between Kimley-Horn and PSI dated March 2, 2016.

**PROJECT DESCRIPTION**

The subject site is an irregular shaped tract of land, approximately 314-acres in size, located on the west side of Highway 195, at the southwest corner of Bonnet Lane and Hwy 195 in Georgetown, Williamson County, Texas. The site is covered with grassy vegetation, and varying thicknesses of soil, with rock outcrops scattered throughout. The online Edwards Aquifer Map provided by the TCEQ was reviewed for this assessment. According to the contour lines on the maps, the elevation of the property ranges from approximately 825 feet above mean sea level (MSL) in the northern portion of the tract, to approximately 735 feet MSL on the southwest corner of the tract, by Berry Creek. The contour lines in the area of the property indicate variable slopes; but generally to the south-southwest towards the Berry Creek drainage; while some middle portions slope to the southeast, towards a tributary drainage of Berry Creek.

## **REGIONAL GEOLOGY**

### **Physiography**

From west to east, the two physiographic provinces in Williamson County are: the Edwards Plateau and the Blackland Prairie. The Edwards Plateau terrain is rugged and hilly, with elevations ranging from 800 feet to 1,400 feet above sea level.

This area is underlain by beds of limestone that dip gently to the southeast. Southeast of the Edwards Plateau is the Balcones Fault Zone, which is also the northernmost limit of the Blackland Prairie. The Balcones Fault Zone extends north-south across Williamson County and is composed of fault blocks of limestone, chalk, shale and marl. The undulating, hilly topography of the Blackland Prairie ranges in elevation from about 400 feet to 800 feet above sea level. The faults are predominantly normal, down thrown-to-the Gulf Coast, with near vertical throws.

The subject property lies on the Edwards Plateau. According to the 1974 Austin Sheet of the Geologic Atlas of Texas, published by the Bureau of Economic Geology in cooperation with the University of Texas at Austin, no faults are mapped in proximity to the subject site.

### **Stratigraphy and Structure**

The site is predominantly clay covered, with few rock outcrops of note. According to the Austin Sheet of the Geologic Atlas of Texas, the underlying rocks at the site are mapped as the Edwards Limestone, undivided, which includes the overlying Georgetown Formation (Ked); is fine to coarse-grained, with abundant chert, medium gray to grayish brown; fossils in the formation are rudistids as reefs and individuals, miliolid (microfossils), and shell fragments; solution zones and collapse breccia common; thickness 300-500 feet.

No features scoring more than 40 points on the F-0585 form were observed on the subject tract. Feature S-1 is a small solution cavity on the western portion of the site, and Features S-2 to S-5 were small closed depressions on hillsides that appeared to have limited subsurface interconnection. Features S-6 and S-12 were water wells, and Feature S-7 was a linear outcrop feature in a drainage on the southeast portion of the site. Features S-8, 10 and 11 were small closed depressions on the western portion of the site, and S-11 may have been excavated as an attempt to make a stock tank/pond. Feature S-9 is a small solution cavity on the northwest portion of the site that had a lateral extent of about 4 feet in the subsurface.

## **SITE INVESTIGATION**

The site investigation was performed by systematically traversing the subject tract, and mapping fractured or vuggy rock outcrops, closed depressions, sinkholes, caves, or indications of fault/fracture zones. The purpose of the site investigation was to delineate features with recharge potential that may warrant special protection or consideration. The results of the site investigation are included in the attached TCEQ report format.

## SUMMARY

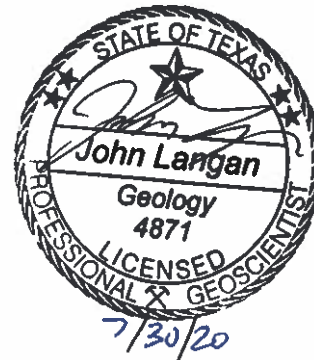
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We appreciate this opportunity to be of service to you. If you have any questions, please do not hesitate to contact our office.

Respectfully submitted,  
**PROFESSIONAL SERVICE INDUSTRIES, INC.**



John Langan, P.G.  
Environmental Services



## **WARRANTY**

The field observations and research reported herein are considered sufficient in detail and scope to form a reasonable basis for a general geological recharge assessment of this site. PSI warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted geologic methods, only for the site described in this report. These methods have been developed to provide the client with information regarding apparent indications of existing or potential conditions relating to the subject site and are necessarily limited to the conditions observed at the time of the site visit and research. This report is also limited to the information available at the time it was prepared. In the event additional information is provided to PSI following the report, it will be forwarded to the client in the form received for evaluation by the client. There is a possibility that conditions may exist which could not be identified within the scope of the assessment or which were not apparent during the site visit. PSI believes that the information obtained from others during the review of public information is reliable; however, PSI cannot warrant or guarantee that the information provided by others is complete or accurate.

This report has been prepared for the exclusive use of Kimley-Horn for the site discussed herein. Reproductions of this report cannot be made without the expressed approval Kimley-Horn. The general terms and conditions under which this assessment was prepared apply solely to Kimley-Horn. No other warranties are implied or expressed.

## STRATIGRAPHIC COLUMN

**314-Ac. Johnson/Schneider Tracts  
Highway 195  
Georgetown, Texas**

FORMATION	THICKNESS	LITHOLOGIC DESCRIPTION
Del Rio Clay	40-70	Calcareous and gypsiferous, with pyrite common, with a blocky structure that weathers to light gray or yellowish gray. The characteristic marine mega fossil, <i>Ilmatogyra arietina</i> (formerly <i>exogyra arietina</i> ) is widespread throughout the formation.
Georgetown Formation	2-20'	Light tan limestone identified by proximity to Del Rio clay and diagnostic marker fossil: <i>waconella wacoensis</i> brachiopod; low porosity and permeability development.
Edwards Limestone	60-350'	Limestones and dolomites, extensive porosity development in "honeycomb sections, interbedded with massive recrystallized limestones with more limited permeabilities

## **SOILS NARRATIVE**

According to the Soil Survey of Williamson County, published by the United States Department of Agriculture, Soil Conservation Service, in cooperation with the Texas Agricultural Extension Service, issued in 1983, indicated the soils at the subject property include Eckrant cobbly clay, 1 to 8 percent slopes, (EaD), Eckrant extremely stony clay 0-3% slopes (EeB), Eckrant-Rock outcrop complex, rolling (ErE), Georgetown stony clay loam, 1-3% slopes (GsB) and Oakalla soils, channeled (Oc).

Eckrant soils are nearly level to gently sloping soils on broad ridges and shallow valleys in uplands that develop over limestone. Due to the large amount of rock fragments and shallowness, these soils are not suited to crops or pasturelands, but are used as rangeland. The soil is well drained, with moderately slow permeability, very low water capacity and rapid surface runoff. The shallow depth to limestone is suitable for home sites, as the rock offers stable footings for foundations, but considerable cutting and blasting is required for underground utility lines.

Georgetown stony clay loam occurs mostly on higher parts of uplands, and has an approximate 7" thick surface layer of slightly acid, brown stony clay loam which overlies a reddish-brown clay subsoil to a depth of approximately 35". The parent material is an indurated, fractured limestone. The soil is well drained, with slow permeability, medium surface runoff and low available water capacity. The soil is used as rangeland, and is suitable for home sites.

Oakalla soils occur on bottom lands in narrow stream valleys. The surface layer is a dark brown loam approximately 7" thick, which overlies a dark brown clay loam roughly 16" thick, which in turn overlies a dark brown sandy clay loam to a depth of 66". These soils are generally used as rangeland, as the channeled topography is not suited for farm equipment.

## **SITE GEOLOGIC NARRATIVE**

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## **SUMMARY**

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# 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: John Langan

Telephone: 210/342-9377

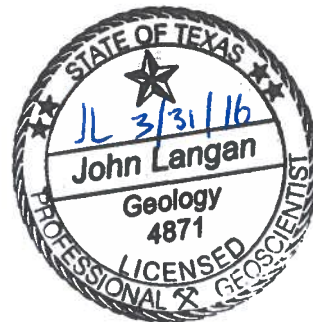
Date: March 31, 2016

Fax: 210/342-9401

Representing: PSI TBPG No. 50128 (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:

  
Regulated Entity Name: 314-Ac Johnson/Schneider Tracts



## Project Information

1. Date(s) Geologic Assessment was performed: 3/24-28/16

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)
Eckrant cobbly clay ,1-8% slopes	B	0-2'
Eckrant Extremely stony clay 0-3% slopes	B	0-2'
Eckrant Rock outcrop complex, rolling	B	0-1'
Georgetown stony clay loam 1-3% slopes	B	0-2

Soil Name	Group*	Thickness(feet)
Oakalla soils 0-1% slopes, channeled, freq flooded	C	1-3

*\* 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" = 400'

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

☐ The wells are not in use and have been properly abandoned.

☐ The wells are not in use and will be properly abandoned.

☒ The wells are in use and comply with 16 TAC Chapter 76.

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

### ***Administrative Information***

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

## **STRATIGRAPHIC COLUMN**

### **314-Ac. Johnson/Schneider Tracts Highway 195 Georgetown, Texas**

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# **GEOLOGIC ASSESSMENT**

For

**314-AC JOHNSON/SCHNEIDER TRACTS  
HIGHWAY 195  
GEORGETOWN, WILLIAMSON COUNTY,  
TEXAS**

Prepared for

**KIMLEY-HORN  
10814 JOLLYVILLE RD, AVALLON IV, STE 300  
AUSTIN, TEXAS 78759**

Prepared by

**Professional Service Industries, Inc.  
Three Burwood Lane  
San Antonio, Texas 78216  
Telephone (210) 342-9377**

**PSI PROJECT NO.: 0435-2660**

**March 31, 2016**



March 31, 2016

**KIMLEY-HORN**

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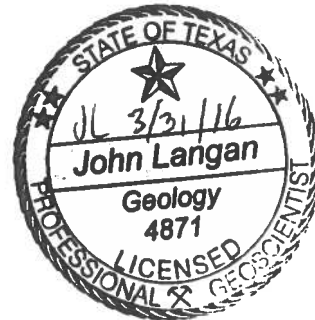
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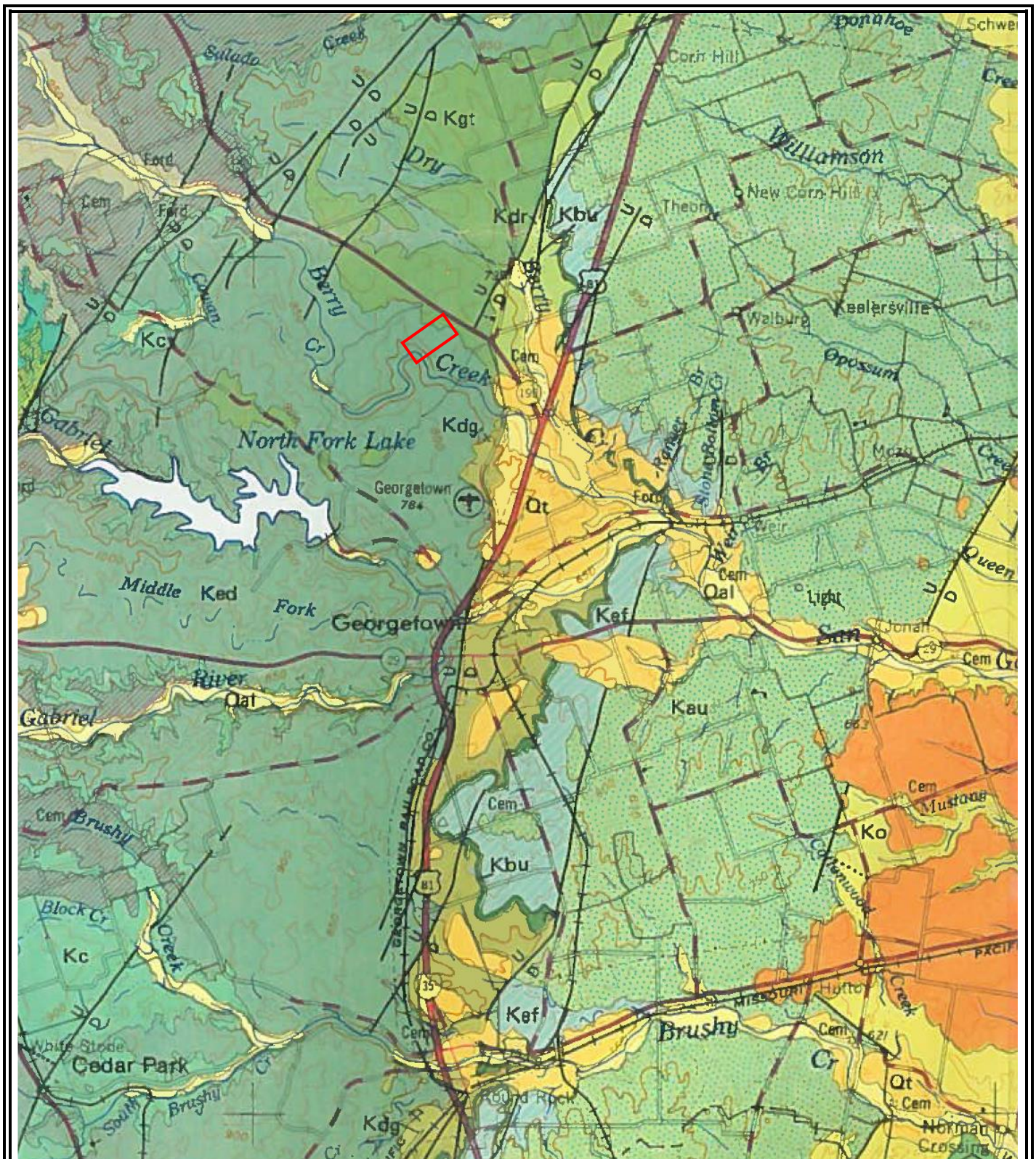
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**psi** Information  
To Build On

Engineering • Consulting • Testing

PSI, Inc.

3 Burwood Lane

San Antonio, Texas 78216

**PROJECT NAME:**

314-Ac Johnson/Schneider  
Tracts

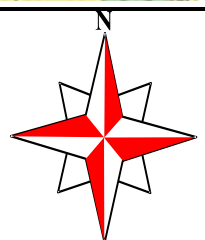
Highway 195

Georgetown, Texas

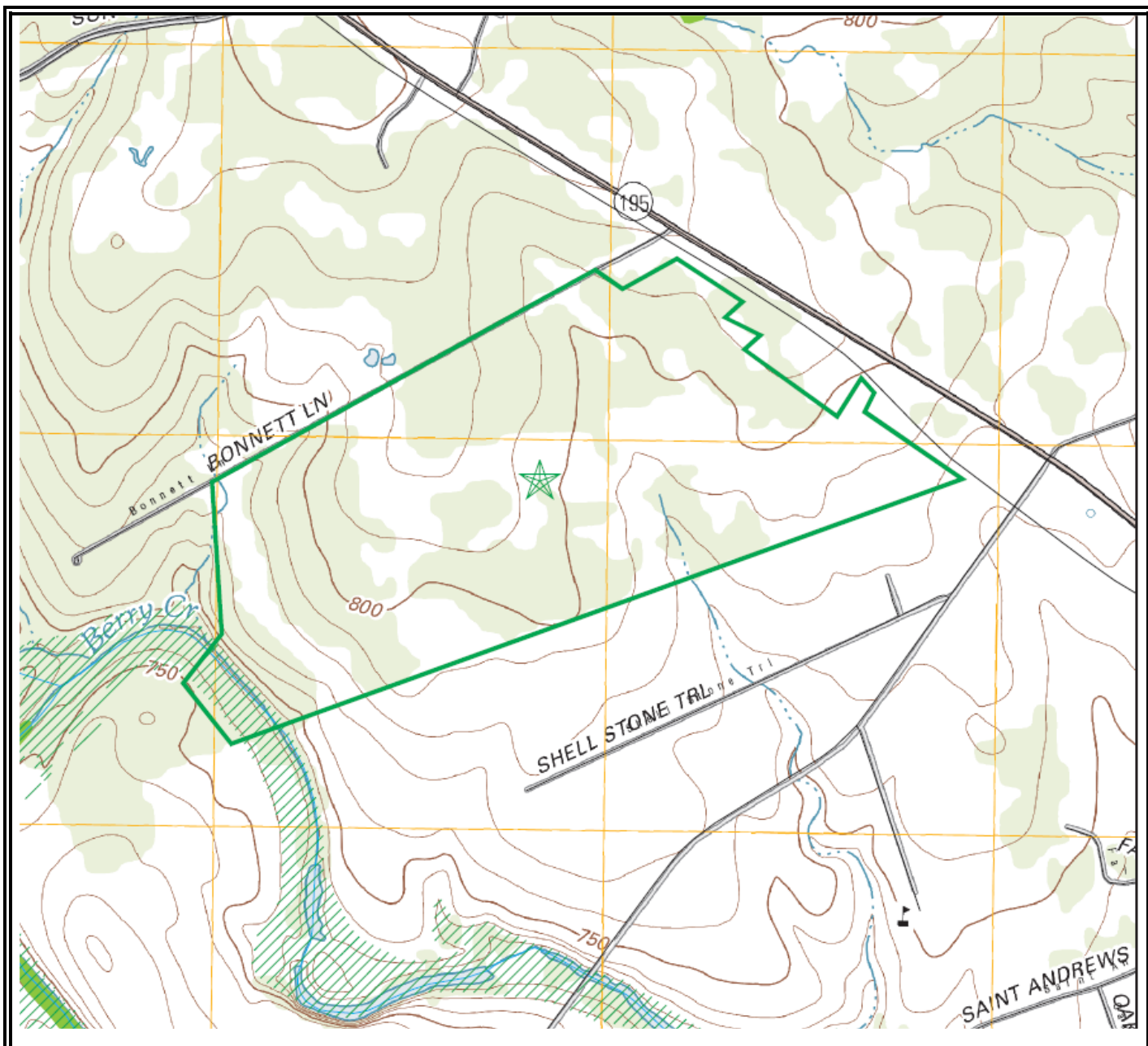
PROJECT NO.:435-2660

**Geologic Atlas of  
Texas, Austin Sheet**

(Bureau of Economic  
Geology, UT-Austin1981)





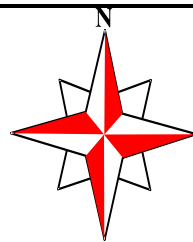


**psi** Information  
To Build On  
Engineering • Consulting • Testing

PSI, Inc.  
3 Burwood Lane  
San Antonio, Texas 78216

**PROJECT NAME:**  
314-Ac Johnson/Schneider  
Tracts  
Highway 195  
Georgetown, Texas  
  
PROJECT NO.: 435-2660

**Topographic Map**  
USGS "Georgetown,  
Texas"  
2013



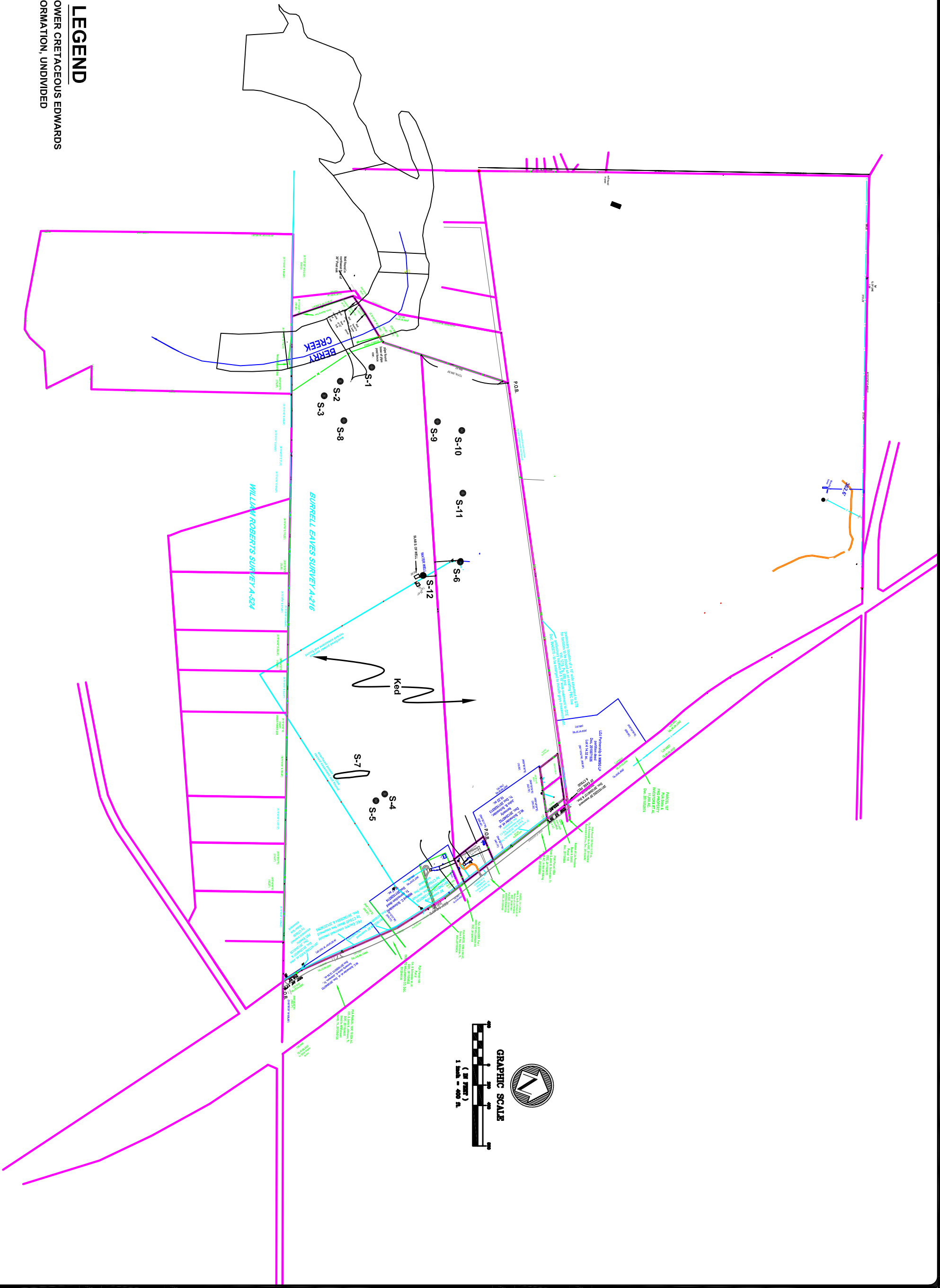
GEOLOGIC ASSESSMENT  
for  
314 ACRE JOHNSON/SCHNEIDER TRACTS  
HIGHWAY 195  
GEORGETOWN, TEXAS



**psi** Information  
To Build On  
Engineering • Consulting • Testing  
THREE BURWOOD LANE  
SAN ANTONIO, TEXAS 78216

REVISIONS:

JOB NO. 04352640  
FILE: 04352640.LTI  
DATE: 04/01/2016  
DESIGN: -  
DRAWN: J.TEAL  
CHECKED: -  
SHEET 1 OF 1



**LEGEND**  
Kep - Lower Cretaceous Edwards  
Formation, Undivided



GEOLOGIC ASSESSMENT TABLE						PROJECT NAME: 314-Ac. Johnson/Schneider Tracts														
LOCATION			FEATURE CHARACTERISTICS											EVALUATION					PHYSICAL SETTING	
1A	1B *	1C *	2A	2B	3	DIMENSIONS (FEET)			4	5	5A	6	7	8A	8B	9	10	11	12	
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION					TREND (DEGREES)	D <sub>OM</sub>	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	CATCHMENT AREA (ACRES)	TOPOGRAPHY	
						X	Y	Z			10						<40	≥40	<1.6	≥1.6
S-1	30-43-17.6	97-41-37.2	SC	20	Ked	0.4	0.4	0.5							10	30	X		X	hillside
S-2	30-43-15.6	97-41-34.9	CD	5	Ked	4	4	0.5							8	13	X		X	hillside
S-3	30-43-15.3	97-41-34.1	CD	5	Ked	4	3	0.05							8	13	X		X	hillside
S-4	30-43-31.9	97-40-54	CD	5	Ked	6	6	0.5							8	13	X		X	hillside
S-5	30-43-31.4	97-40-53.9	CD	5	Ked	7	6	0.5							8	13	X		X	hillside
S-6	30-43-33	97-41-19.2	MB	30	Ked	0.6	0.6	>100							4	34	X		X	hillside
S-7	30-43-28.7	97-40-57.3	O	5	Ked	275	35	7							22	27	X		X	hillside
S-8	30-43-19.9	97-41-27.4	CD	5	Ked	1.5	1.5	1							8	13	X		X	hillside
S-9	30-43-27	97-41-32.8	SC	20	Ked	3	3	4							18	38	X		X	hillside
S-10	30-43-29.1	97-41-33.5	CD	5	Ked	5	5	1							8	13	X		X	hillside
S-11	30-43-27.6	97-41-26.9	CD	5	Ked	25	20	3							8	13	X		X	hillside
S-12	30-43-29.9	97-41-16.2	MB	30	Ked	0.6	0.6	>100							4	34	X		X	hillside
DATUM:																				

\* 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	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

#### 8A INFILLING

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

#### 12 TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understand, 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.

*John Langan*

Date: March 31, 2016

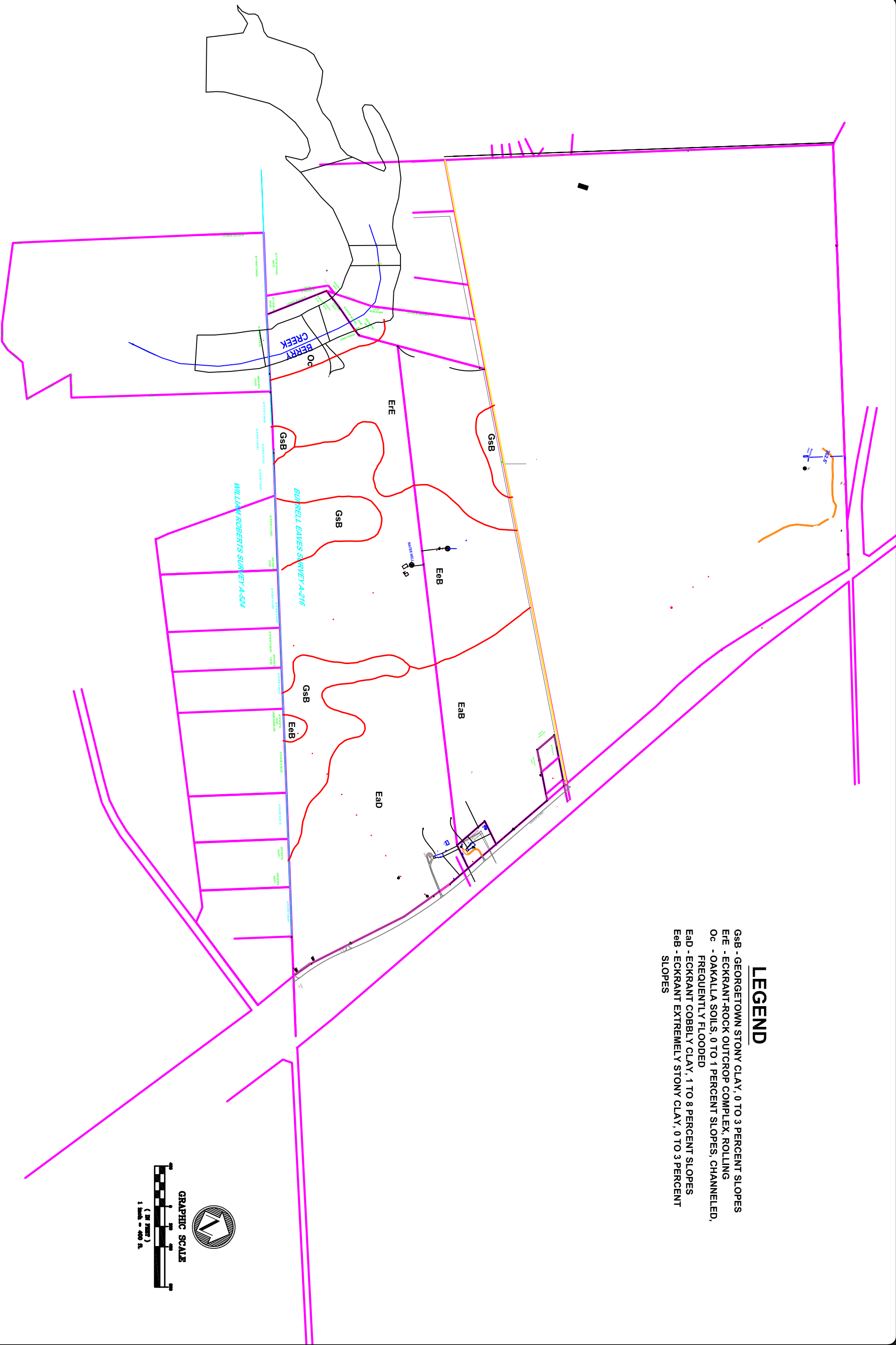
Sheet 1 of 1

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



**LEGEND**

GsB - GEORGETOWN STONY CLAY, 0 TO 3 PERCENT SLOPES  
Eie - ECKKRANT-ROCK OUTCROP COMPLEX, ROLLING  
Oc - OAKALLA SOILS, 0 TO 1 PERCENT SLOPES, CHanneLED,  
FREQUENTLY FLOODED  
Ead - ECKKRANT COBBLY CLAY, 1 TO 8 PERCENT SLOPES  
Eeb - ECKKRANT EXTREMELY STONY CLAY, 0 TO 3 PERCENT  
SLOPES



**GEOLOGIC ASSESSMENT**  
for  
**314 ACRE JOHNSON/SCHNEIDER TRACTS**  
**HIGHWAY 195**  
**GEORGETOWN, TEXAS**



**Information To Build On**  
Engineering • Consulting • Testing  
**THREE BURWOOD LANE**  
**SAN ANTONIO, TEXAS 78216**

REVISIONS:

JOB NO. 04352600  
FILE: 04352600.LRT  
DATE: 04/01/2016  
DESIGN: J.TEAL  
DRAWN: J.TEAL  
CHECKED: J.TEAL  
SHEET 1 OF 1





1. View northwest of Berry Creek on the western property line of the 314-Ac. Johnson/Schneider Tract on Highway 195 in Georgetown, Texas.



2. View of cut bank cliff outcrop of Edwards limestone along Berry Creek, showing thick vegetation masking visibility significantly.





3. View of closed depression feature S-2 located on the southwest portion of the 314-Ac. Johnson/Schneider Tract on Highway 195 in Georgetown, Texas.



4. View of closed depression feature S-3 located on the southwest portion of the site, southeast of S-2.





5. View of closed depression feature S-4 located on the eastern portion of the 314-Ac. Johnson/Schneider Tract on Highway 195 in Georgetown, Texas.



6. View of closed depression feature S-5, located south of feature S-4.





7. View of outcrop feature S-7, located in a drainage on the southeast portion of the site.



8. View of water well feature S-6, on the north-central portion of the site.





9. Close-up view of well feature S-6.



10. View of solution cavity feature S-9 located on the western portion of the site, at 30-43-27; 97-41-32.8.





11. View of water well feature S-12, in the central portion of the site at 30-43-29.9; 97-41-16.2.



12. View of closed depression feature S-11, which appeared to possibly have been excavated for an attempted stock tank, on the west central portion of the site at 30-43-27.6; 97-41-26.9.



# **SECTION 4: WATER POLLUTION ABATEMENT PLAN**

# 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: Jacob Kondo

Date: 09/14/2023

Signature of Customer/Agent:



Regulated Entity Name: Berry Creek Highlands Phase 3

## Regulated Entity Information

1. The type of project is:

- ☒ Residential: Number of Lots: 90
- ☐ Residential: Number of Living Unit Equivalents:
- ☐ Commercial
- ☐ Industrial
- ☐ Other: \_\_\_\_\_

2. Total site acreage (size of property): 16.885

3. Estimated projected population: 315

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	270,000.00	÷ 43,560 =	6.20
Parking	N/A	÷ 43,560 =	N/A
Other paved surfaces	119,107.49	÷ 43,560 =	2.73
Total Impervious Cover	389,107.49	÷ 43,560 =	8.93

**Total Impervious Cover 8.93 ÷ Total Acreage 16.885 X 100 = 52.88% Impervious Cover**

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

### ***For Road Projects Only***

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

7. Type of project:

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

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

- ☐ Concrete
- ☐ Asphaltic concrete pavement
- ☐ Other: \_\_\_\_\_

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

Width of R.O.W.: \_\_\_\_\_ feet.

L x W = \_\_\_\_\_ Ft<sup>2</sup> ÷ 43,560 Ft<sup>2</sup>/Acre = \_\_\_\_\_ acres.

10. Length of pavement area: \_\_\_\_\_ feet.

Width of pavement area: \_\_\_\_\_ feet.

L x W = \_\_\_\_\_ Ft<sup>2</sup> ÷ 43,560 Ft<sup>2</sup>/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:

<u>100</u> % Domestic	<u>0.10</u> million gallons/day
<u>      </u> % Industrial	<u>      </u> Gallons/day
<u>      </u> % Commingled	<u>      </u> Gallons/day
TOTAL gallons/day <u>0.10 MGD</u>	

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 San Gabriel Wastewater 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" = 60'.

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): \_\_\_\_\_

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

☐ The wells are not in use and have been properly abandoned.

☐ The wells are not in use and will be properly abandoned.

☐ The wells are in use and comply with 16 TAC §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.

## ***Attachment A***

### ***Factors Affecting Water Quality***

Materials that are anticipated to be used on site that could be a potential source of contamination include the following:

During Construction:

1. Concrete and Masonry Materials
2. Wood, plastic, and metal Materials
3. Tar and hydrocarbons from paving operations
4. Oil, Grease, fuel, and hydraulic fluid from construction equipment and vehicle drippings
5. Fertilizers, Herbicides, and Pesticides
6. Cleaning solutions and detergents
7. Miscellaneous construction trash and debris
8. Soil erosion and sedimentation due to construction activity

Ultimate Use:

1. Pollutants generated from vehicles utilizing the site
2. Fertilizers, Herbicides, and pesticides used to maintain landscaping
3. Miscellaneous trash and debris generated from the public

(This is not intended to be an all-inclusive list)

All practical management practices will be used to reduce the risk of spills and other exposure of any contaminant to surface or groundwater.

## ***Attachment B***

### ***Volume and Character of Storm Water***

The content of this report is based on 16.885-acre tract of land portioned from the 314.54-acre Berry Creek property. The property in acquisition is located on the west side of Highway 195, Northwest of the intersection of Highway 195 and Shell Road, in Georgetown, Texas. The client is proposing 90 single-family lots in phase 3 of the master-planned project. There are 90 proposed single family lots in Phase 3.

No portion of this site is located in the Federal Emergency Management Agency's 100-year floodplain per the Flood Insurance Rate Map 48491C0285F, dated December 20, 2019, for Williamson County, Texas. No floodplain modifications are proposed. The Suburban Watershed Requirements allow Residential Single-family (RS) developments to have up to 60% impervious cover per PUD Ord. 2018-36.

The Lot is located in the Lower Berry Creek Watershed, regulated as a Suburban watershed. No portion of the site is located within FEMA floodplain per Flood Insurance Rate Map #48491C0285F dated December 20, 2019, for Williamson County, Texas.

The subject site has no existing detention or water quality ponds. One detention pond is already constructed to the east side of the site. This detention and water quality pond was installed and accepted by the city of Georgetown in the Phase 1 construction plans. The as-built plans for the detention pond are attached in section 7 of this report. The Detention Pond is sized per current City of Georgetown design standards. Drainage area maps and calculations that incorporate Atlas-14 rainfall data are included in the plan set for reference. Detention analysis is provided with the construction plans.

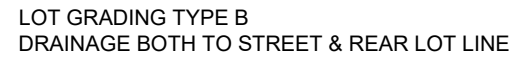
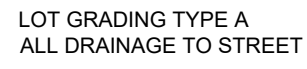
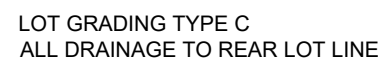
Based on the overall development drainage area maps and the topographic survey it appears that all offsite drainage is conveyed via sheet flow onto the southeastern boundary of the site.

Both an existing and proposed drainage area map are provided at the end of this report.



## ***Site Plan***





TBM# 101 "X" SET IN HEADWALL OF CULVERT  
LOCATED IN THE MEDIAN OF STATE HIGHWAY AND  
BONNET LANE.  
ELEVATION = 821.82 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOC  
3.70' FROM THE EASTERLY CORNER OF THAT CERT  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED  
3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)



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

- NOTE:
1. CONTRACTOR TO PROVIDE STRUCTURAL WALL DESIGN FOR ALL WALLS.
  2. BW = BOTTOM OF GRADE  
TW = TOP OF GRADE  
SEE STRUCTURAL FOR TOP OF FOOTING AND TOP OF BLOCK.
  3. ANY REVISIONS TO RETAINING WALLS WILL REQUIRE CITY APPROVAL

NOTE:

1. CONTRACTOR TO PROVIDE STRUCTURAL WALL DESIGN FOR ALL WALLS.
2. BW = BOTTOM OF GRADE  
TW = TOP OF GRADE  
SEE STRUCTURAL FOR TOP OF FOOTING AND TOP OF BLOCK.
3. ANY REVISIONS TO RETAINING WALLS WILL REQUIRE CITY APPROVAL

# Kimley»»Horn



KHA PROJECT 069291006
DATE SEPTEMBER 2023
SCALE: AS SHOWN
DESIGNED BY: MDM
DRAWN BY: MDM
CHECKED BY: JRK

# GRADING PLAN

# BERRY CREEK HIGHLANDS PHASE 3

SHEET NUMBER  
**C-09**  
OF C-37

2023-XX-CON



# **SECTION 5: ORGANIZED SEWAGE COLLECTION SYSTEM PLAN**

# Organized Sewage Collection System Application

## Texas Commission on Environmental Quality

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

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

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

**Regulated Entity Name:** Berry Creek Highlands Phase 3

31. ☒ **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

32. 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: Brandon Jenkins

Entity: FR Berry Hills, LLC

Mailing Address: 11 Dupont Circle NW, Suite 900

City, State: Washington, DC

Zip: 20036

Telephone: 512-450-4916

Fax: N/A

Email Address: frank.delcastillo@ashtonwoods.com

***The appropriate regional office must be informed of any changes in this information within 30 days of the change.***

33. The engineer responsible for the design of this sewage collection system is:

Contact Person: Jacob Kondo

Texas Licensed Professional Engineer's Number: 115813

Entity: Kimley-Horn

Mailing Address: 10814 Jollyville Road; Bldg. IV, Suite 200

City, State: Austin, Texas

Zip: 78759

Telephone: 512-418-1771

Fax: N/A

Email Address: [Jacob.Kondo@kimley-horn.com](mailto:Jacob.Kondo@kimley-horn.com)

## Project Information

34. 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: 90  
☐ Multi-family: Number of residential units:  
☐ Commercial  
☐ Industrial  
☐ Off-site system (not associated with any development)  
☐ Other: \_\_\_\_\_

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

100 % Domestic .10 million gallons/day  
\_\_\_\_ % Industrial \_\_\_\_\_ gallons/day  
\_\_\_\_ % Commingled \_\_\_\_\_ gallons/day

Total gallons/day: 0.10 MGD

36. Existing and anticipated infiltration/inflow is 11.73 gallons/day. This will be addressed by: n/a.

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

- ☐ The WPAP application for this development was approved by letter dated \_\_\_\_\_. A copy of the approval letter is attached.  
☒ The WPAP application for this development was submitted to the TCEQ on 10/5/23 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.

38. Pipe description:

**Table 2 - Pipe Description**

Pipe Diameter (Inches)	Linear Feet (1)	Pipe Material (2)	Specifications (3)
8" (WWL-A)	783 LF	SDR-26	ASTM D3034
8" (WWL-B)	402 LF	SDR-26	ASTM D3034
8" (WWL-C)	483 LF	SDR-26	ASTM D3034
8" (WWL-D)	699 LF	SDR-26	ASTM D3034

**Total Linear Feet: 2367 LF**

(1) Linear feet - Include stub-outs and double service connections. Do not include private service laterals.

(1) Pipe Material - If PVC, state SDR value.

(2) Specifications - ASTM / ANSI / AWWA specification and class numbers should be included.

39. The sewage collection system will convey the wastewater to the San Gabriel Wastewater Treatment Plant.

The treatment facility is:

- ☒ Existing  
☐ Proposed

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

- ☒ The City of Georgetown standard specifications.  
☐ Other. Specifications are attached.

41. ☒ 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***

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

43. ☒ 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***

44. ☒ 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 3 - Manholes and Cleanouts**

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
WWL-A	26 of 35	1+00.00	Manhole
WWL-A	26 of 35	4+59.57	Manhole
WWL-A	26 of 35	5+63.49	Manhole
WWL-A & WWL-B	26 & 27 of 35	6+82.86 & 1+00.00	Manhole
WWL-A	26 of 35	8+82.36	Manhole

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
WWL-C	28 of 35	1+00.00	Manhole
WWL-C	28 of 35	3+38.54	Manhole
WWL-C	28 of 35	4+09.01	Manhole
WWL-C	28 of 35	5+02.43	Manhole
WWL-C	28 of 35	5+98.80	Manhole
WWL-C & WWL-D	28 & 29 of 35	8+52.18 & 1+00.00	Manhole
WWL-D	29 of 35	3+92.11	Manhole

45. ☐ Manholes are installed at all Points of Curvature and Points of Termination of a sewer line.

46. ☒ 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.

47. ☐ 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.***

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

Site Plan Scale: 1" = 60'.

49. ☒ 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.

50. 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.

51. 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.

52. 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 4 - 100-Year Floodplain**

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a
n/a	n/a	n/a

53. 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 5 - 5-Year Floodplain**

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
n/a	n/a	n/a
n/a	n/a	n/a



<i>Line</i>	<i>Sheet</i>	<i>Station</i>
n/a	n/a	n/a
n/a	n/a	n/a

54. ☒ Legal boundaries of the site are shown.
55. ☒ 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.

56. ☒ 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 6 - Water Line Crossings**

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>
WWL-B	1+29.03	Crossing	n/a	1.50 FT
WWL-D	1+26.52	Crossing	n/a	0.70 FT
WWL-D	4+23.50	Crossing	n/a	1.60 FT

57. 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 7 - Vented Manholes**

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
n/a	n/a	n/a	n/a

58. 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 8 - Drop Manholes**

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a

59. 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.

60. 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.

61. 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.

62. 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 9 - Flows Greater Than 10 Feet per Second**

<i>Line</i>	<i>Profile Sheet</i>	<i>Station to Station</i>	<i>FPS</i>	<i>% Slope</i>	<i>Erosion/Shock Protection</i>
n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a
n/a	n/a	n/a	n/a	n/a	n/a

63. Assuming pipes are flowing full, where flows are  $\geq 10$  feet per second, the provisions noted below have been made to protect against pipe displacement by erosion and/or shock under 30 TAC §217.53(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**

64. ☒ 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.
65. ☒ 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 10 - Standard Details**

<b>Standard Details</b>	<b>Shown on Sheet</b>
Lateral stub-out marking <b>[Required]</b>	n/a
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) <b>[Required]</b>	33-35 of 35
Alternate method of joining lateral to existing SCS line for potential future connections <b>[Required]</b>	n/a
Typical trench cross-sections <b>[Required]</b>	33-35 of 35
Bolted manholes <b>[Required]</b>	n/a
Sewer Service lateral standard details <b>[Required]</b>	33-35 of 35
Clean-out at end of line <b>[Required, if used]</b>	33-35 of 35
Baffles or concrete encasement for shock/erosion protection <b>[Required, if flow velocity of any section of pipe &gt;10 fps]</b>	n/a
Detail showing Wastewater Line/Water Line Crossing <b>[Required, if crossings are proposed]</b>	33-35 of 35
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) <b>[Required, if Flexible Pipe is used]</b>	n/a
Drop manholes <b>[Required, if a pipe entering a manhole is more than 24 inches above manhole invert]</b>	33-35 of 35

66. ☒ All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
67. ☒ 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: \_\_\_\_\_

68. ☒ 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.
69. ☒ 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: Jacob Kondo

Date: 09/14/2023

Place engineer's seal here:



Signature of Licensed Professional Engineer:



## Appendix A-Flow Velocity Table

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

**Table 11 - Slope Velocity**

<i>Pipe Diameter(Inches)</i>	<i>% Slope required for minimum flow velocity of 2.0 fps</i>	<i>% Slope which produces flow velocity of 10.0 fps</i>
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)

$R_h$  = hydraulic radius (ft)

$S$  = slope (ft/ft)

## ***Attachment A – SCS Engineering Design Report***

This Engineering Design Report has been prepared to comply with the Texas Commission on Environmental Quality Design Criteria for Domestic Wastewater Systems, 30 TAC Chapter 217, including 217.10 of Subchapter A, §§217.51 – 217.70 of Subchapter C, and Subchapter D as applicable. Please note that throughout this application, the more stringent of AWU or TCEQ regulations shall apply.

## **Project Description**

### ***Introduction***

The content of this report is based on 16.885-acre tract of land portioned from the 314.54-acre Berry Creek property. The property in acquisition is located on the west side of Highway 195, Northwest of the intersection of Highway 195 and Shell Road, in Georgetown, Texas. The client is proposing 90 single-family lots within one phase (Phase 3) of the master-planned project.

No portion of this site is located in the Federal Emergency Management Agency's 100-year floodplain per the Flood Insurance Rate Map 48491C0285F, dated December 20, 2019, for Williamson County, Texas. No floodplain modifications are proposed.

The entire 314.54 tract is located within the Edwards Aquifer Recharge Zone.

On-site infrastructure is comprised of private domestic fire hydrants, water, gas, electric, wastewater, and storm sewer lines. The wastewater service outlined in this report will consist of four alignments: WWL-A, WWL-B, WWL-C, and WWL-D. These lines will tie into existing infrastructure on Cowboy Canyon Dr and will consist of laterals to each building that is proposed per this development. All proposed wastewater lines will be installed within the Edwards Aquifer Recharge Zone (EARZ).

The proposed system will connect to the existing Phase 1 Wastewater (EAP ID 11001827) system for conveyance to the San Gabriel Wastewater Treatment Plant for treatment and disposal. Based on the TCEQ approval of the existing Phase 1 Wastewater (EAP ID 11001827) system, the San Gabriel Treatment Plan currently has sufficient capacity to adequately treat the proposed peak flow.

## **Pipe Design**

### ***Flow Design Basis***

Service for the future build-out of the 16.885-acre single-family site located at 2451 State Highway will be served by the existing wastewater stub-outs on Cowboy Canyon Dr.

### ***Gravity Pipe and Joint Materials***

The proposed pipe to be used for the 8-inch wastewater line will be ASTM D3034 SDR-26 PVC pipe (cell class 12454). The joints for this pipe shall meet the requirements of ASTM D3212. The pipe joints shall have an integral bell and rubber gasket seal with the locked-in type gasket.

### ***Separation Distances for Water and Wastewater***

A nine-foot minimum horizontal separation is maintained between all proposed wastewater infrastructure and existing public water supply lines. Where water and wastewater lines cross with less than 9 ft of vertical separation, 20 LF of steel encasement of the wastewater line is centered on the crossing.

### ***Building Laterals and Taps***

Each of the proposed buildings will have a lateral connection to the nearest wastewater line in the main drive aisle of the property. Lateral detail is shown on the construction plans.

### ***Boring and Tunneling of Crossings***

No boring or tunneling of crossings are proposed for this project.

### ***Corrosion Potential***

PVC pipe will be utilized for or all proposed wastewater lines. No deterioration of the proposed pipe or its associated components is anticipated in this application.

### ***Odor Control***

All flows contributing to the proposed wastewater lines are from multi-family developments generating domestic sewage. There are no significant generators of sulfide or other odorous compounds (such as lift stations) upstream of the proposed wastewater lines. Therefore, no odor control measures are proposed for this project.

### ***Active Geologic Faults***

Per the Geologic Assessment, no active geologic faults were located within the area of the project.

### ***Capacity Analysis***

The capacity of each proposed wastewater segment is calculated below based on Manning's Equation. The calculation for each segment is based on the minimum proposed slope.

$$Q = \frac{1.49}{n} * A * R^{0.67} * S^{0.5}$$

Where:

Q<sub>full</sub> = flow rate of fluid in pipe at full flow (ft<sup>3</sup>/s) (cfs)

Q<sub>90%</sub> = flow rate of fluid in pipe at 90% full flow (ft<sup>3</sup>/s) (cfs)

$$A = \text{area of pipe (ft}^2\text{)} = \frac{\pi * d^2}{4}$$

d = internal pipe diameter (ft) = D<sub>o</sub> – 2t

D<sub>o</sub> = outside diameter (in)

t = pipe wall thickness (in)

n = Manning's Roughness coefficient = 0.013

R<sub>full</sub> = hydraulic radius of pipe (full flow) = A/P = D/4 (ft)

R<sub>90%</sub> = hydraulic radius of pipe (90% full flow) = 0.9\*A/P = 0.9\*D/4 (ft)

P = wetted perimeter of pipe =  $\pi$  \* D (ft)

S = slope of energy line

	Pipe Size	Pipe Name	Upstream Slope (%)	Upstr. Length (ft)	# of LUEs Added	# of People	Total # of people	AREA SF	# of acres	I / I (GPM)	ADWF (GPM)	PDWF (GPM)	PDWF (CFS)	V PDWF (FPS)	PWWF (GPM)	V PWWF (FPS)	PWWF (CFS)	V FULL (FPS)	Q <sub>full</sub> (gpm)	PDWF Capacity (%)	PWWF Capacity (%)
WWL-A	8	PIPE-05	0.50%	359.569'	16.00	56.00	56.00	117451.00	2.6963	1.4043	3	12	0.026	N/A	13	N/A	0.029	2.4	384	3.05%	3.42%
	8	PIPE-06	0.50%	119.522'	3.00	10.50	66.50	28960.00	0.6442	0.3355	3	14	0.031	1.16	16	1.31	0.035	2.4	384	3.61%	4.06%
	8	PIPE-07	0.50%	119.570'	2.00	7.00	73.50	12957.00	0.2975	0.1549	4	15	0.034	1.19	17	1.35	0.038	2.4	384	3.98%	4.47%
	8	PIPE-08	0.50%	199.500'	4.00	14.00	136.50	25914.00	0.5949	0.3098	7	28	0.062	1.43	30	1.65	0.067	2.4	384	7.26%	7.83%
WWL-B	8	PIPE-09	0.50%	401.303'	14.00	49.00	49.00	111566.00	2.5612	1.3340	2	10	0.023	1.06	14	1.25	0.031	2.4	384	2.68%	3.60%
WWL-C	8	PIPE-10	1.43%	238.537'	10.00	35.00	35.00	75097.00	1.7240	0.8979	2	7	0.016	1.38	12	1.64	0.026	4.1	650	1.14%	1.82%
	8	PIPE 10 (1)	0.33%	70.469'	3.00	10.50	45.50	22918.00	0.5261	0.2740	2	10	0.021	0.90	14	1.12	0.032	2.0	312	3.06%	4.57%
	8	PIPE-11	0.33%	93.425'	2.00	7.00	52.50	14099.00	0.3237	0.1686	3	11	0.025	0.93	16	1.16	0.035	2.0	312	3.52%	5.09%
	8	PIPE-12	0.33%	96.366'	4.00	14.00	66.50	33476.00	0.7685	0.4003	3	14	0.031	1.00	19	1.23	0.043	2.0	312	4.44%	6.13%
	8	PIPE-13	0.33%	263.384'	10.00	35.00	101.50	66740.00	1.5321	0.7980	5	21	0.047	1.13	27	1.39	0.060	2.0	312	6.71%	8.65%
	8	PIPE-14	0.33%	90.441'	2.00	7.00	178.50	13340.00	0.3062	0.1595	9	36	0.081	1.33	42	1.62	0.094	2.0	312	11.68%	13.58%
WWL-D	8	PIPE-15	0.79%	292.105'	6.00	21.00	21.00	40020.00	0.9187	0.4785	1	4	0.010	0.97	11	1.34	0.025	3.1	483	0.93%	2.32%
	8	PIPE-16	0.50%	406.322'	14.00	49.00	70.00	93390.00	2.1437	1.1165	3	15	0.032	1.18	22	1.48	0.050	2.4	384	3.79%	5.83%

The proposed wastewater line installed at the slope specified provides capacity in excess of the calculated peak wet weather design flows at full flow and 90% full flow conditions. The minimum grade for 8-inch pipes is 0.33% - this information can be found in Appendix A, Table 10 of Form TCEQ-0582. The maximum grade can also be found in this table and is 8.40%. The proposed wastewater system fits within these criteria, as the minimum slope is 0.33% and maximum slope is 1.43%.

## Lift Station Capacity

WASTEWATER FLOWS												
Sewershed Name	Land Use	Total Area (Acres)	Units	LUE/Unit or SF	LUEs	Wastewater Flows						
						Avg. Dry Weather (GPM)	Avg. Dry Weather (MGD)	Peaking Factor	Peak Dry Weather (GPM)	I & I (GPM)	Peak Wet Weather (GPM)	Peak Wet Weather (MGD)
A-4	Single-Family	28.09	191	1.00	191	33.16	0.05	3.50	116.00	19.50	135.51	0.20
OS-5	Multi-Family	26.30	308	0.80	246	42.78	0.06	3.43	146.89	18.26	165.15	0.24
<b>Total Site</b>		<b>54.39</b>	<b>499</b>	<b>1.80</b>	<b>437</b>	<b>75.94</b>	<b>0.11</b>	<b>3.29</b>	<b>250.02</b>	<b>37.77</b>	<b>287.79</b>	<b>0.41</b>

The proposed phase will bring wastewater flows from 191 single family lots, and 308 multifamily units online that will be served by the Berry Creek Highlands Lift Station. During the design of the lift station, 188 single family units and 360 multi-family units were assumed when calculating the required wastewater flow capacity for the lift station. The proposed development results in an ultimate build out wastewater flow of 784 gpm to be conveyed to the lift station. The lift station is designed to a capacity of 809 gpm, showing it has the necessary capacity to serve the proposed development.

The lift station capacity is shown above. This has already been approved by the TCEQ and accounts for flows from Phase 3.

## Structural Analysis

Flexible pipe is proposed on this project. Structural calculations are provided for the flexible pipe to be installed. The proposed collection system piping is designed to have a minimum structural life of 50 years. As previously mentioned, all proposed PVC pipe shall be cell class 12454 with a tensile strength of 7,000 psi.

*Live Load Calculations* – no significant live loads are anticipated on any segment of this project.

*Buckling Pressure* - the following equations utilized for the calculation of buckling pressure are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$P_{cr} = \frac{2 * E}{(1 - \nu^2) * (DR - 1)^3} \quad (\text{Equation 7.14})$$



$$P_b = 1.15 * \sqrt{P_{cr} * E'} \quad (\text{Equation 7.18})$$

$$H = (P_b * 144) / w \quad (\text{Equation 6.7})$$

Where:

$P_{cr}$  = critical buckling pressure (psi)

$E$  = modulus of elasticity (psi) = 400,000 psi for PVC

$\nu$  = Poisson's Ratio = 0.38 for PVC

DR = dimension ratio

$P_b$  = buckling pressure in soil (psi)

$E'$  = modulus of soil reaction (psi) = 2,000 psi for crushed rock compacted to greater than 95% relative density

$H$  = maximum allowable cover height of soil (ft)

$w$  = weight of soil (lbs/ft<sup>3</sup>) = 120 lbs/ft<sup>3</sup>

### **8" ASTM D3034 SDR-26**

$$P_{cr} = \frac{2 * 400,000}{(1 - 0.38^2) * (26 - 1)^3}$$

$$P_{cr} = 59.84 \text{ psi}$$

$$P_b = 1.15 * \sqrt{59.84 * 2,000}$$

$$P_b = 397.84 \text{ psi}$$

$$H = (397.84 * 144) / 120$$

**H = 477.41 ft height of soil to cause pipe buckling**

*Prism Load Calculations* - the following equations utilized for the calculation of prism loads are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$P = H * w \quad (\text{Equation 6.7})$$

Where:

$P$  = prism load pressure due to soil weight (lbs/ft<sup>2</sup>)

$H$  = depth of pipe (ft)

$w$  = soil density (lbs/ft<sup>3</sup>) = 120 lbs/ft<sup>3</sup>

### **8" ASTM D3034 SDR-26**

$$P = 12 * 120$$

$$P = 1,440 \text{ lbs/ft}^2 \text{ or } 10.00 \text{ psi}$$

*Long Term Deflection Calculations* - the following equations utilized for the calculation of long term deflection are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$\Delta Y/D = \frac{DL * K * P + K * W_1}{[2E / (3(DR - 1)^3)] + 0.061 * E'} * 100 \quad (\text{Equation 7.10})$$

Where:

$\Delta Y/D$  = long term deflection (%)

DL = Deflection Lag Factor = 1.0 for prism load calculation

K = bedding constant = 0.096 for 90°

P = prism load pressure due to soil weight (lbs/ft<sup>2</sup>)

W<sub>1</sub> = live load (psi) = 0 psi

E = modulus of elasticity (psi) = 400,000 psi for PVC

DR = dimension ratio

E' = modulus of soil reaction (psi) = 2,000 psi for crushed rock bedding compacted to greater than 95% relative density

Note: Leonhardt's Zeta factor is assumed to equal 1, and thus is not required in the calculation. This is a conservative assumption that results in a more conservatively calculated value for long term deflection.

### **8" ASTM D3034 SDR-26**

$$\Delta Y/D = \frac{1.0 * 0.096 * 10.00 + 0.096 * 0}{[2(400,000) / (3(26 - 1)^3)] + 0.061 * 2,000} * 100$$

$$\Delta Y/D = 0.69\%$$

*Wall Crushing Calculations* - the following equations utilized for the calculation of wall crushing are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$P_y = \frac{\Theta_c * 2 * A}{D} \quad (\text{Equation 7.20})$$

$$H = P_y / w \quad (\text{Equation 6.7})$$

Where:

P<sub>y</sub> = pressure due to soil weight (psi)

Θ<sub>c</sub> = compressive stress (psi) = 4,000 psi for PVC pipe

A = surface area of the pipe wall (in<sup>2</sup>/in)

D = mean pipe diameter (in) = D<sub>o</sub> – t

t = pipe wall thickness (in)

H = maximum allowable height of cover (ft)  
w = soil density (lbs/ft<sup>3</sup>) = 120 lbs/ft<sup>3</sup>

### **8" ASTM D3034 SDR-26**

Do = 8.40 – 0.323 = 8.077 in, A = 3.88 in<sup>2</sup>/ft (0.323 in \* 12 in/ft)

$$P_y = \frac{4,000 * 2 * (3.88 / 12)}{8.077}$$

P<sub>y</sub> = 320.25 psi

H = (320.25\*144) / 120

**H = 384.30 ft height of soil to cause wall crushing**

*Strain Calculations* - the following equations utilized for the calculation of strain are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$\epsilon_h = \frac{P * D}{2 * t * E} \quad (\text{Equation 7.22})$$

$$\epsilon_f = \frac{t}{D} * \frac{[3 * \Delta Y / D]}{[1 - 2 * \Delta Y / D]} \quad (\text{Equation 7.24})$$

$$\epsilon = \epsilon_h + \epsilon_f \quad (\text{Equation 7.25})$$

Where:

$\epsilon_h$  = maximum strain in the pipe wall due to hoop stress (in/in)  
P = prism load pressure due to soil weight (psi)  
D = mean pipe diameter (in) = Do – t  
t = pipe wall thickness (in)  
E = modulus of elasticity (psi) = 400,000 psi for PVC  
 $\epsilon_f$  = maximum strain in the pipe due to ring deflection or flexure (in/in)  
 $\Delta Y/D$  = long term deflection  
 $\epsilon$  = maximum combined strain in pipe wall (in/in)

### **8" ASTM D3034 SDR-26**

$$\epsilon_h = \frac{10.00 * 8.077}{2 * 0.323 * 400,000}$$

$\epsilon_h$  = 0.00031 in/in

$$\epsilon_f = \frac{0.323}{8.077} * \frac{[3 * 0.0069]}{[1 - 2 * 0.0069]}$$

$\epsilon_f$  = 0.00084 in/in

$\epsilon$  = 0.00031 + 0.00084

$$\epsilon = 0.00115 \text{ in/in}$$

Per the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001), deflection test samples have experienced a pipe wall strain of up to 0.025 in/in and have not "showed any failures or cracks". The calculated strains for this project are significantly below this level, so no failure due to strain is anticipated.

*Pipe Stiffness Calculation* - the following equations utilized for the calculation of pipe stiffness are taken from the *Handbook of PVC Pipe: Design and Construction* (Uni-Bell PVC Pipe Association, 2001).

$$P_s = 4.47 * \frac{E}{(DR - 1)^3} \quad (\text{Equation 7.3})$$

Where:

- Ps = pipe stiffness (psi)
- DR = Dimensional Ratio = Do / t
- Do = Outside diameter (in)
- t = pipe wall thickness (in)
- E = modulus of elasticity (psi) = 400,000 psi for PVC

#### **8" ASTM D3034 SDR-26**

$$DR = 26$$

$$P_s = 4.47 * \frac{400,000}{(26 - 1)^3}$$

$$P_s = 115 \text{ psi}$$

## **Criteria for Laying Pipe**

### ***Pipe Embedment***

Bedding and initial backfill material selection and installation will be carried out in accordance with applicable governing procedures contained within the *City of Georgetown Construction Specifications and Standards, TCEQ Chapter 217.54(a)*, and in accordance with the City of Georgetown detail WW-16 through WW-18. Bedding material shall be in accordance with *City of Georgetown Technical Specifications Section G4 – Pipe Excavation, Trenching, Embedment, Encasement, and Backfilling*. Compacted backfill, from a point one (1) foot above the pipe to the finished surface, will be comprised of suitable material removed during excavation, as described in Section G4.05. Brush, debris, and junk shall not be utilized as a backfilling material.

### ***Compaction***

Trench compaction will be carried out in accordance with the *City of Georgetown Technical Specifications Section G4 – Pipe Excavation, Trenching, Embedment, Encasement, and Backfilling* and *TCEQ Chapter 217.54(b)*. Proper placement of the backfill and compaction per City of Georgetown requirements will not negatively impact the structural integrity of the pipe.

## ***Envelope Size***

Envelope size will be in accordance with *City of Georgetown Technical Specifications Section G4 – Pipe Excavation, Trenching, Embedment, Encasement, and Backfilling* and *TCEQ Chapter 217.54(c)*. Per the City of Georgetown Detail WW-16, a minimum of 6-inch and maximum of 12-inch space shall be allowed between the outside diameter of the pipe and the trench wall and floor. In addition, a minimum of 6-inch and maximum of 12-inch space shall be allowed between the outside diameter of the pipe bell and the trench wall. The embedment and initial backfill must be installed to a minimum depth of 12 inches above the crown of the pipe.

## ***Trench Width***

Trench width will be in accordance with the City of Georgetown Detail WW-16 and *TCEQ Chapter 217.54(d)*. Per the City of Georgetown Detail WW-16, a minimum of 6-inch and maximum of 12-inch space shall be allowed between the outside diameter of the pipe and the trench wall and floor. In addition, a minimum of 6-inch and maximum of 12-inch space shall be allowed between the outside diameter of the pipe bell and the trench wall. These limits shall be maintained to protect the structural integrity of the pipe and will be sufficient for the placement of materials and use of compaction equipment in the pipe zone.

## **Manholes and Related Structures**

### ***Manhole and Appurtenance Placement***

Each manhole is placed according to the construction plans. There are 23 – 4' manholes to be constructed.

### ***Manhole Stub Outs***

No stub outs are included on this project.

### ***Cleanouts***

Cleanouts are proposed for the service line connections in the locations specified on the construction plans.

### ***Manhole Material***

Monolithic or precast manholes are acceptable for the contractor to utilize and are included in the City of Georgetown Wastewater Specifications - Section WW-1. The use of bricks is not acceptable for the manhole or for cover adjustments.

### ***Manhole Spacing***

Manhole spacing meets the requirements of Table C.2 in *TCEQ Chapter 217.55*.

### ***Manholes within Waterways***

No manholes will be located within flow paths of waterways or in areas where water ponding is probable.

### ***Manhole Covers, Inlets, and Bases***

Per the City of Georgetown detail WW-02, the manhole covers shall have a 30-inch diameter clear opening. Manhole covers shall be constructed of cast iron and have no openings for water to infiltrate. No proposed manholes are located within the 100-year flood plain. All manholes shall be watertight, with watertight rings and covers, as shown per the City of Georgetown detail WW-02.

As shown in the project details, the bottom of the manhole shall have a U-shaped channel to provide smooth continuation between the inlet and outlet pipes. For the proposed pipe, the manhole channel depth shall be equal to at least half the largest pipe diameter. Manholes with different pipe sizes shall have the tops

of the pipes at the same elevation and flow channels in the invert sloped evenly from pipe to pipe. A bench will be provided above each manhole channel to slope at a minimum of 0.5 inches per foot.

### ***Manhole Steps***

No steps shall be allowed in any proposed manholes.

### ***Manhole Connections***

Manhole-pipe connections shall be watertight per City of Georgetown pipe to manhole connector SPL WW-146D. See detail WW-2 for more information.

### ***Manhole Venting***

The proposed manholes are spaced at less than 1,500-foot intervals and none are located within the 100-year flood plain. Therefore, no vented manholes are proposed on this project.

## **Trenchless Pipe Installation**

There will be no trenchless pipe installation.

## **Testing Requirements for Gravity Pipes**

### ***Infiltration/Exfiltration and Low Pressure Air Test***

All testing will be in compliance with Texas Administrative Code title 30 Part 1 Chapter 217 Subchapter C 217.57 and 217.58. See TCEQ note on Sheet 2 of 8.

Infiltration and exfiltration or low pressure air testing in accordance with ASTM C828, C924 or F1417 are required for all proposed gravity wastewater pipe as specified in the project notes, sheet 2 of 8. The requirements specified are in accordance with *TCEQ Chapter 217.57*.

### ***Deflection Testing***

For the proposed 8-inch wastewater line, deflection shall be measured with a rigid mandrel per the project detail on sheet 2 of 8. The requirements specified are in accordance with *TCEQ Chapter 217.57*.

### ***Owner Inspection***

The Owner shall have an inspector onsite during construction of the project. A professional engineer registered in the state of Texas (Jacob Kondo, P.E.) shall be present to witness the testing of the wastewater lines.

## **Testing Requirements for Manholes**

Manhole testing in accordance with *TCEQ Chapter 217.58* is specified in the project notes, sheet 2 of 8.

Manholes will be tested after assembly and backfilling for leakage by either a hydrostatic test and/or a vacuum test.

For the vacuum test, all lift holes and exterior joints shall be plugged with an approved non-shrink grout and no grout shall be placed in horizontal joints before testing. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole. Stub-outs, manhole boots and pipe plugs shall be secured to prevent movement while the vacuum is drawn. A minimum 60-inch/lb torque wrench shall be used to tighten the external clamps that secure the test cover to the top of the manhole. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches of

mercury. The manhole shall pass if the time is greater than 2 minutes. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. If the manhole fails a second time, repairs should again be made, and the manhole shall be tested by means of a hydrostatic test. If any manhole fails the hydrostatic test, after failing the vacuum test twice, the contractor should consider replacing that manhole. If the contractor chooses to attempt to repair that manhole, the manhole must be retested by means of the hydrostatic test until it passes.

Inspection will be provided during critical phases of construction by a qualified inspector under the direction of a P.E. (Jacob Kondo, P.E.). Critical phases of construction are deemed at a minimum to include testing of pipe and manholes for leakage and testing of flexible pipe for installed deflection.

TCEQ approval letters for plans and specifications review contain the requirement that once the project is completed, a P.E. registered in the state of Texas (Jacob Kondo, P.E.) must certify that the construction was performed substantially in accordance with the approved plans and specifications.

## Notification and Inspection

*TCEQ Chapter 213* requires that the applicant must provide written notification to the Austin regional office at least 48 hours prior to commencing construction on the regulated activity. If any sensitive feature is discovered during construction then the work shall be suspended immediately, and the Austin regional office shall be notified to then determine the appropriate course of action. All other notification and inspection requirements identified in *TCEQ Chapter 213.5(c)* shall be met.

## Wastewater Calculations

Wastewater Design Criteria		
Avg. Daily Flow (gpd):	250	gpd/LUE
Residential Peak Factor:	PF=2.8*AvgDWF <sup>-0.0732</sup>	
I&I Contribution:	1,000	gpd/acre
Average Dry Weather:	16.15	gpm
Peaking Factor:	3.69	

Total Area: 16.885 AC

Units: 90 Single-Family

LUE/unit: 1.00

$$\text{Infiltration \& Inflow: } \frac{16.885 \text{ AC} \times 1,000 \frac{\text{gpd}}{\text{acre}}}{1440 \text{ minutes}} = 11.73 \text{ gpm}$$

$$\text{Average Dry Weather: } \frac{90 \text{ LUES} \times 250 \frac{\text{gpd}}{\text{LUE}}}{1440 \text{ minutes}} = 15.63 \text{ gpm}$$

$$\text{Peak Dry Weather: } 15.63 \text{ gpm} \times 3.69 = 57.66 \text{ gpm}$$

$$\text{Peak Wet Weather: } 57.66 \text{ gpm} + 11.73 \text{ gpm} = 69.39 \text{ gpm}$$

***Attachment B - Justification and Calculations for Deviation  
in Straight Alignment without Manholes***

NOT APPLICABLE



## ***Attachment C - Justification for Variance from Manhole Spacing***

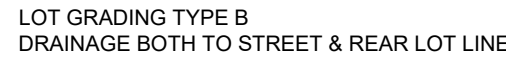
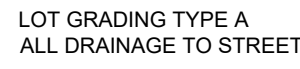
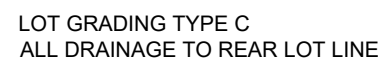
NOT APPLICABLE

***Attachment D - Explanation of Slopes for Flows Greater Than 10.0 FPS***

NOT APPLICABLE

## ***Site Plan***





TBM# 101 "X" SET IN HEADWALL OF CULVERT  
LOCATED IN THE MEDIAN OF STATE HIGHWAY AND  
BONNET LANE.  
ELEVATION = 821.82 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOC  
3.70' FROM THE EASTERLY CORNER OF THAT CERT  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED  
3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)



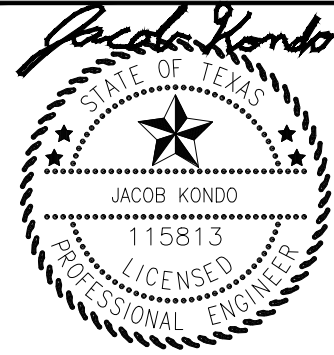
Know what's below.  
**Call** before you dig.

WARNING: CONTRACTOR IS TO  
VERIFY PRESENCE AND EXACT  
LOCATION OF ALL UTILITIES  
PRIOR TO CONSTRUCTION.

1. CONTRACTOR SHALL CUT 3' BEHIND BACK OF CURB TO SUBGRADE ELEVATION.
2. ALL PERIMETER SLOPES TO NATURAL GROUND ARE TO BE 4:1 MAX, UNLESS OTHERWISE NOTED.
3. ALL SIDEWALKS SHALL NOT EXCEED A MAXIMUM 2% CROSS SLOPE & A 5% LONGITUDINAL SLOPE.
7. CONTRACTOR TO MATCH EXISTING GRADES AT ALL PHASE BOUNDARIES
8. GRADES PROVIDED ARE A TOP TO PAVEMENT AND/OR TOP OF GROUND. CONTRACTOR TO MASS GRADE TO TOP OF PAVEMENT SUBGRADE FOR FUTURE ROADWAYS, AND TO TOP OF FINISHED PAD, AND TO TOP OF GROUND FOR LOT/LANDSCAPE AREAS.
9. REFER TO GEOTECH REPORT FOR M&A REPORT NO. 22101103.001.
10. ALL PROPOSED ELEVATIONS (SPOT GRADES AND CONTOURS) ARE TO FUTURE TOP OF GROUND AND PAVEMENT. CONTRACTOR TO CONSTRUCT ROADWAYS AND R.O.W. TO FINAL TOP OF PAVEMENT, CURB, AND GROUND ELEVATIONS PER THESE PLANS. CONTRACTOR TO VERIFY EXISTING TOP OF SUBGRADE ELEVATIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER IMMEDIATELY IF ANY DISCREPANCIES.
11. INDIVIDUAL LOT OWNERS/BUILDERS ARE REQUIRED TO SUBMIT A DETAIL LOT GRADING PLAN THAT CONFORMS TO THE DRAINAGE PATTERNS SHOWN ON SHEET C-09 IN THE APPROVED CHILLY CONSTRUCTION PLANS FOR THE DEVELOPMENT, THAT IS SIGNED AND SEALED BY A TEXAS REGISTERED P.E., TO THE CITY ALONG WITH THEIR BUILDING PERMIT APPLICATION.
12. ALL REQUIRED RETAINING WALLS TO BE DESIGNED & CONSTRUCTED BY THE HOMEOWNER.
13. HOMEOWNER MUST MAINTAIN LOT GRADING CRITERIA AS FOLLOWS:
  - FRONT YARD: 1:1% - 6% (MAX DRAINAGE SLOPE OF 10%)
  - MINIMUM LOT SLOPE: 1:1% FOR A & C LOTS, 1.5% FOR B & LOTS
  - MAX BACKYARD SLOPE: 10% - 15%

1. CONTRACTOR TO PROVIDE STRUCTURAL WALL DESIGN FOR ALL WALLS.
2. BW = BOTTOM OF GRADE  
TW = TOP OF GRADE  
SEE STRUCTURAL FOR TOP OF FOOTING AND TOP OF BLOCK.
3. ANY REVISIONS TO RETAINING WALLS WILL REQUIRE CITY APPROVAL

# Kimley»»Horn



KHA PROJECT 069291006	DATE SEPTEMBER 2023
SCALE: AS SHOWN	DESIGNED BY: MDM
	DRAWN BY: MDM
	CHECKED BY: JRK

# GRADING PLAN

**BERRY CREEK  
HIGHLANDS  
PHASE 3**  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-09**  
OF C-37

2023-XX-CON

REVISIONS	DATE	BY
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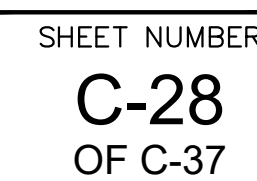
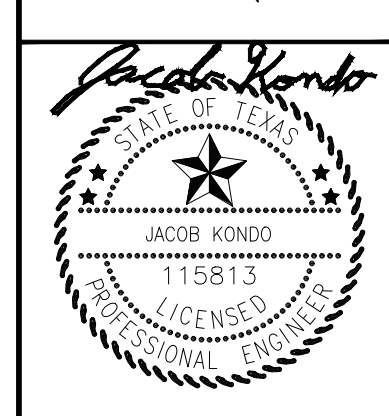
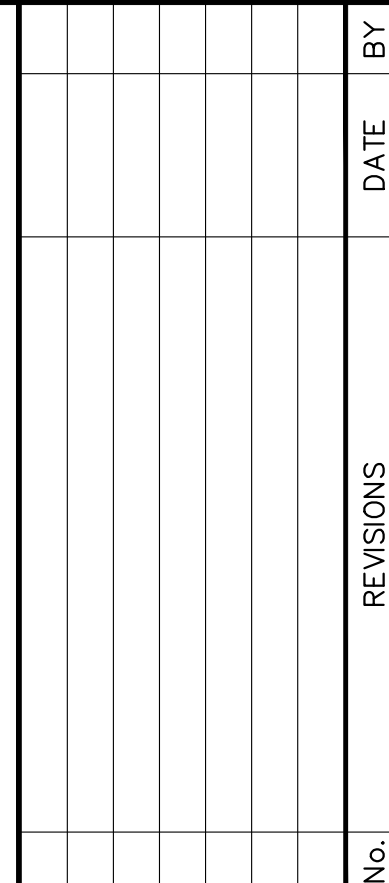
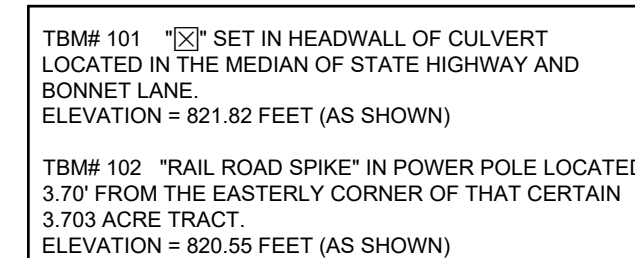
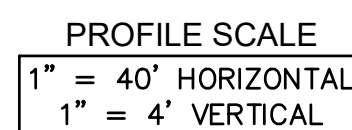
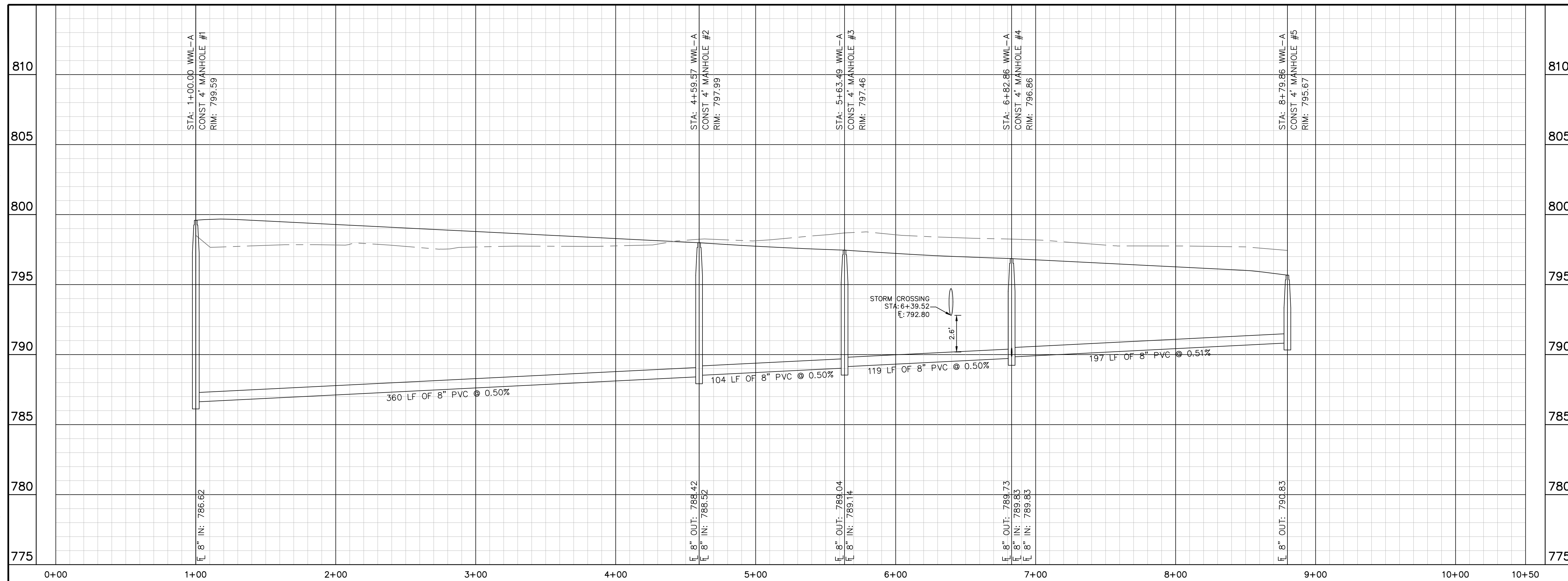
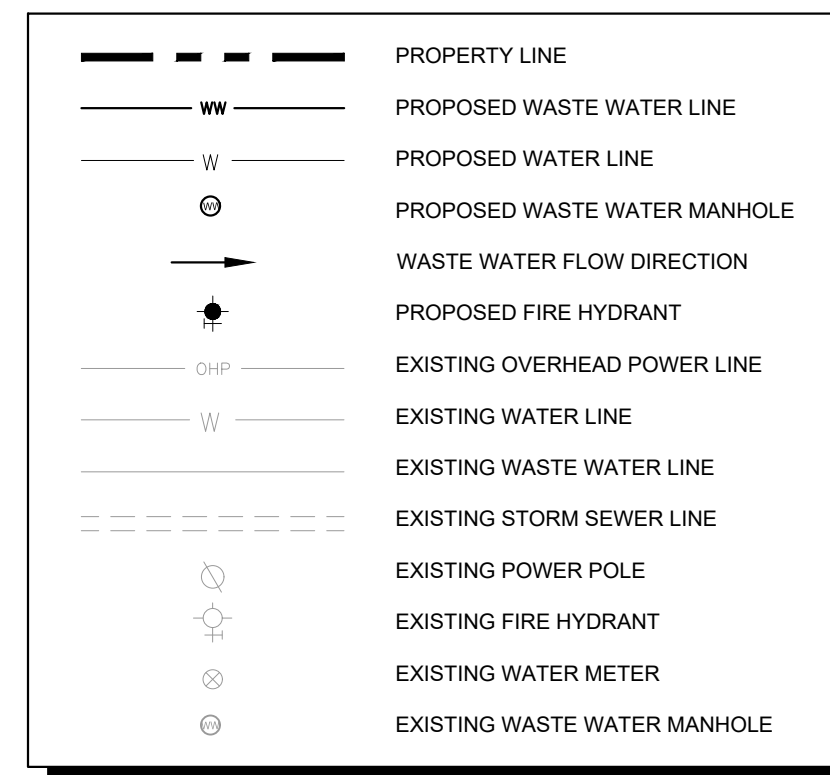
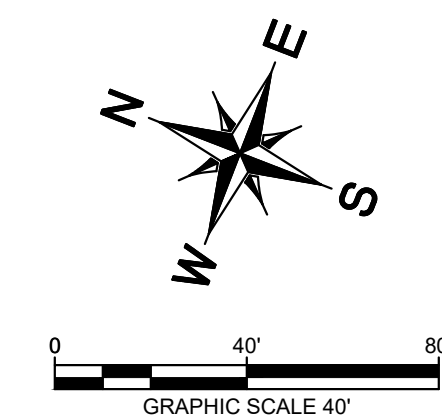
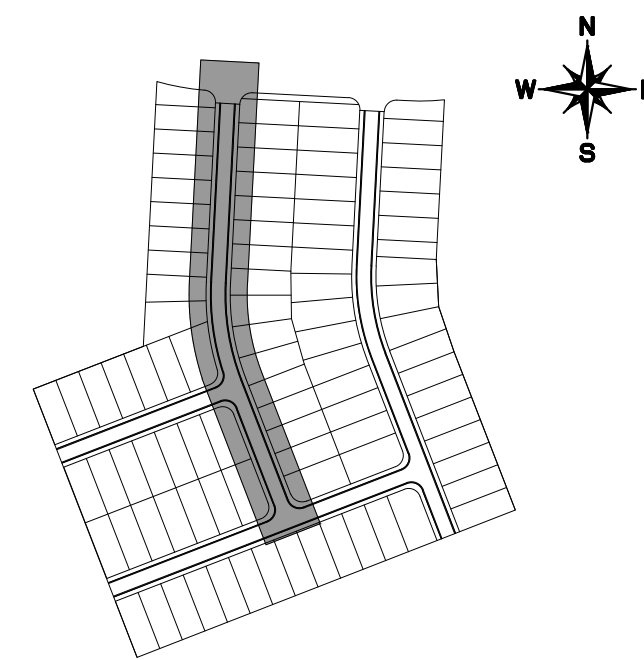
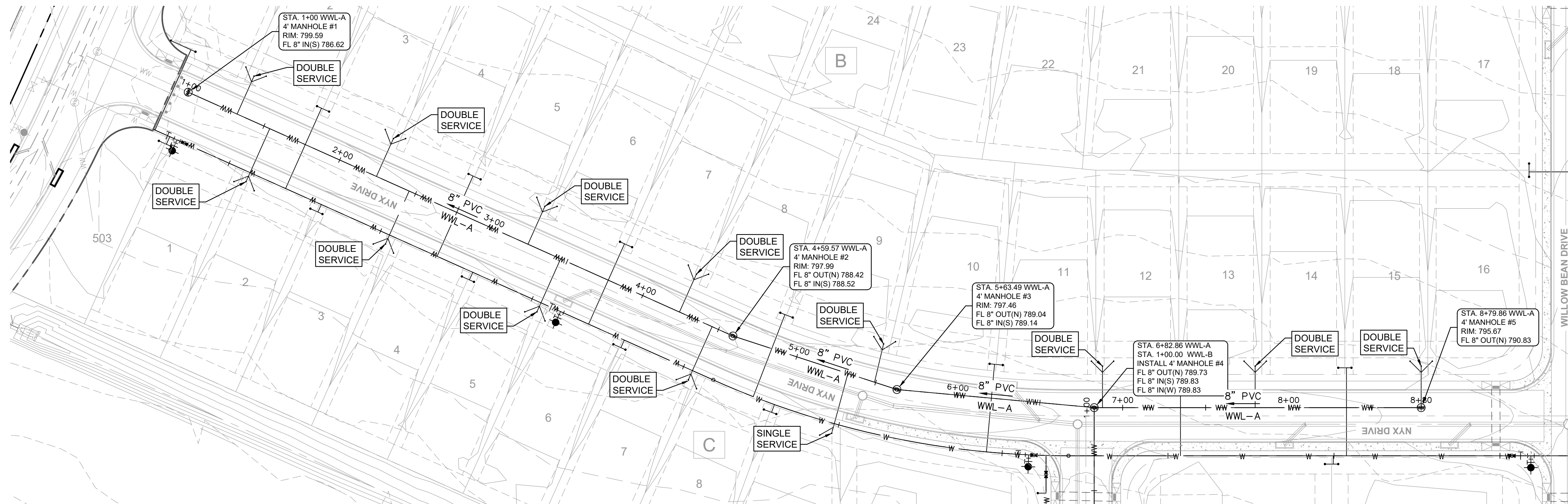
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***Final Plan and Profile Sheets***



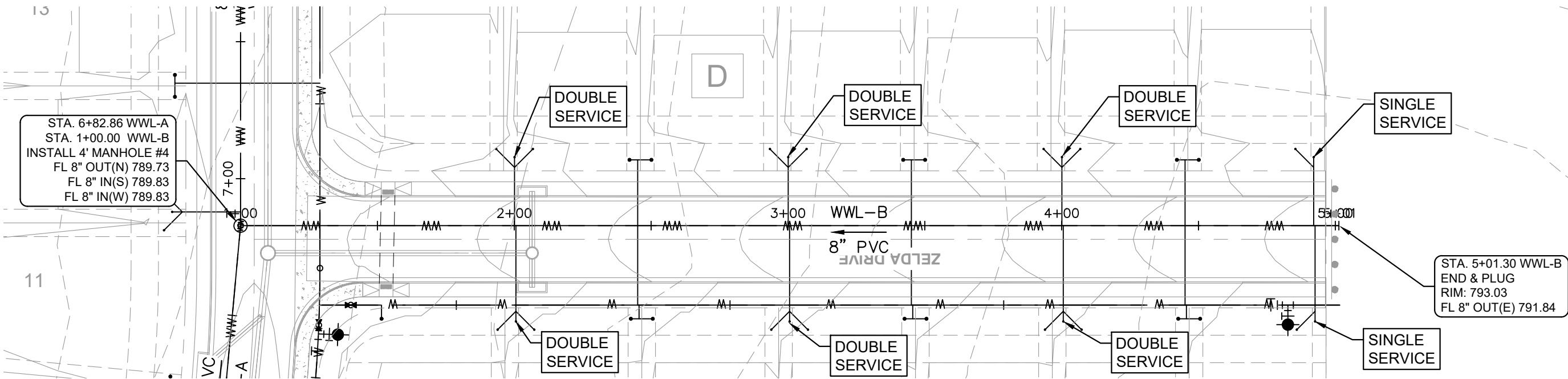
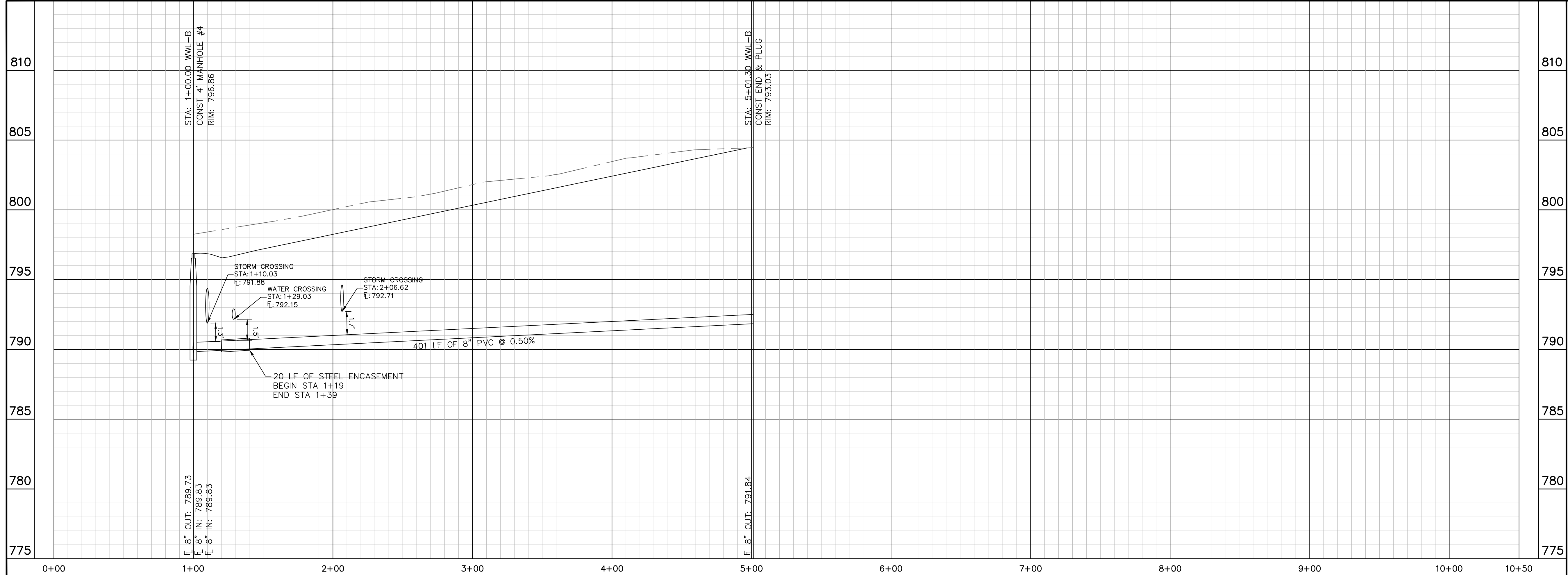


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**UTILITY LEGEND**

---	PROPERTY LINE
—WW—	PROPOSED WASTE WATER LINE
—W—	PROPOSED WATER LINE
⊙	PROPOSED WASTE WATER MANHOLE
→	WASTE WATER FLOW DIRECTION
•	PROPOSED FIRE HYDRANT
—OHP—	EXISTING OVERHEAD POWER LINE
—W—	EXISTING WATER LINE
---	EXISTING WASTE WATER LINE
---	EXISTING STORM SEWER LINE
⊙	EXISTING POWER POLE
⊙	EXISTING FIRE HYDRANT
⊙	EXISTING WATER METER
⊙	EXISTING WASTE WATER MANHOLE

**KEY MAP**  
N.T.S.

**PROFILE SCALE**  
1" = 40' HORIZONTAL  
1" = 4' VERTICAL

**BENCHMARKS**

TBM# 101 "SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BONNET LANE. ELEVATION = 821.82 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED 3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN 3.703 ACRE TRACT. ELEVATION = 820.55 FEET (AS SHOWN)

**BERRY CREEK HIGHLANDS PHASE 3**  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

**WASTEWATER PLAN & PROFILE - WWL-B**

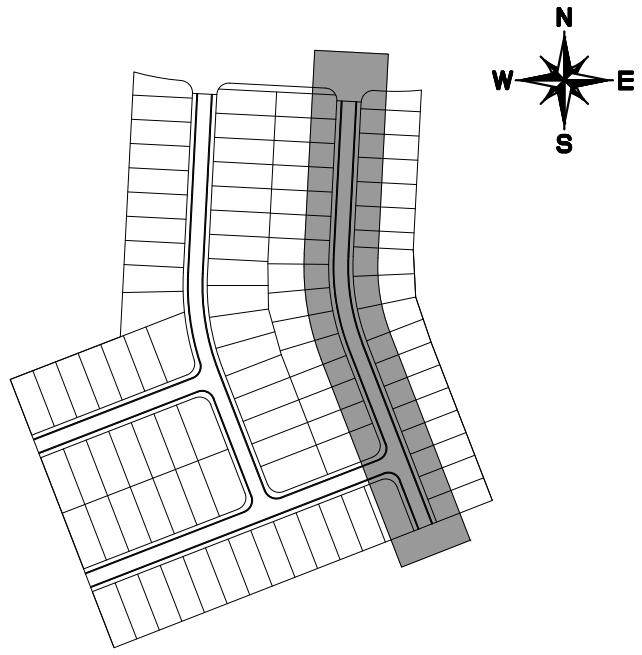
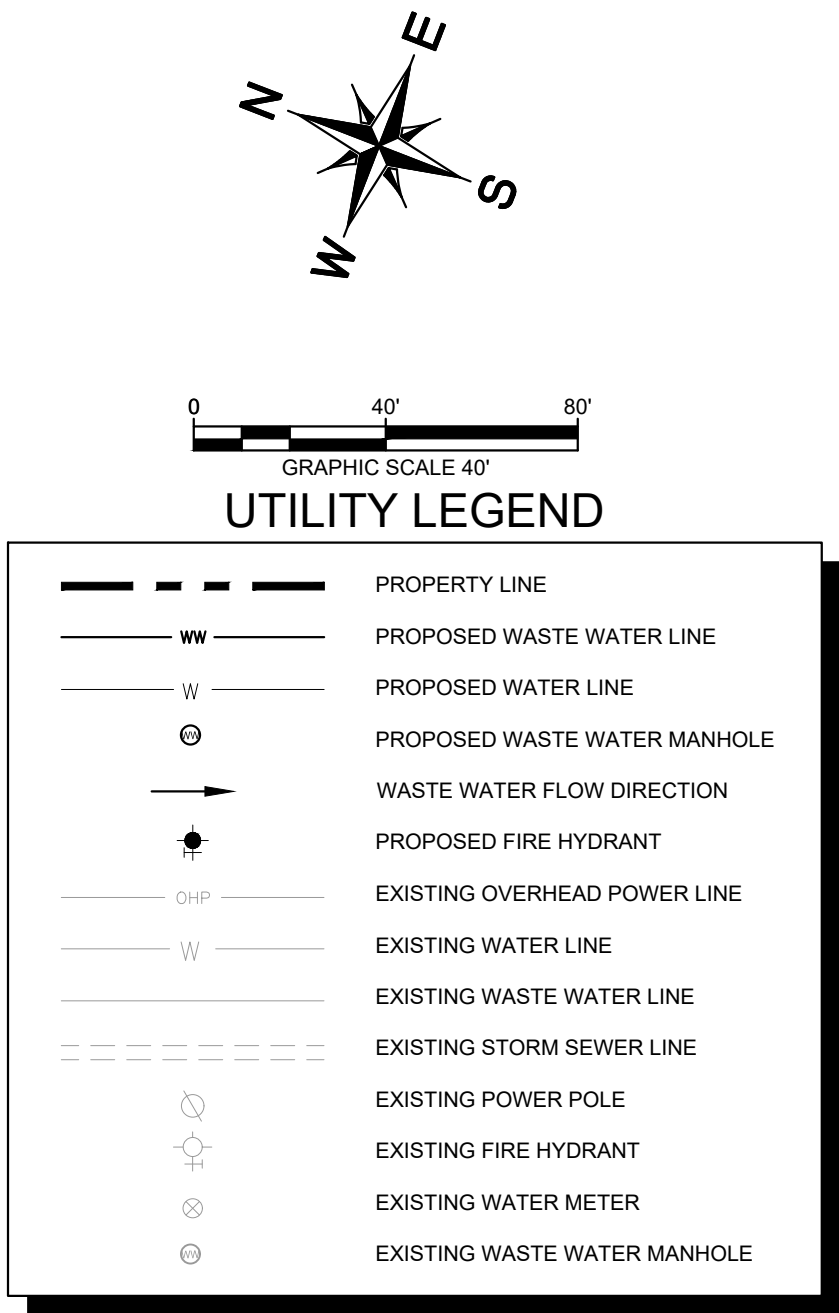
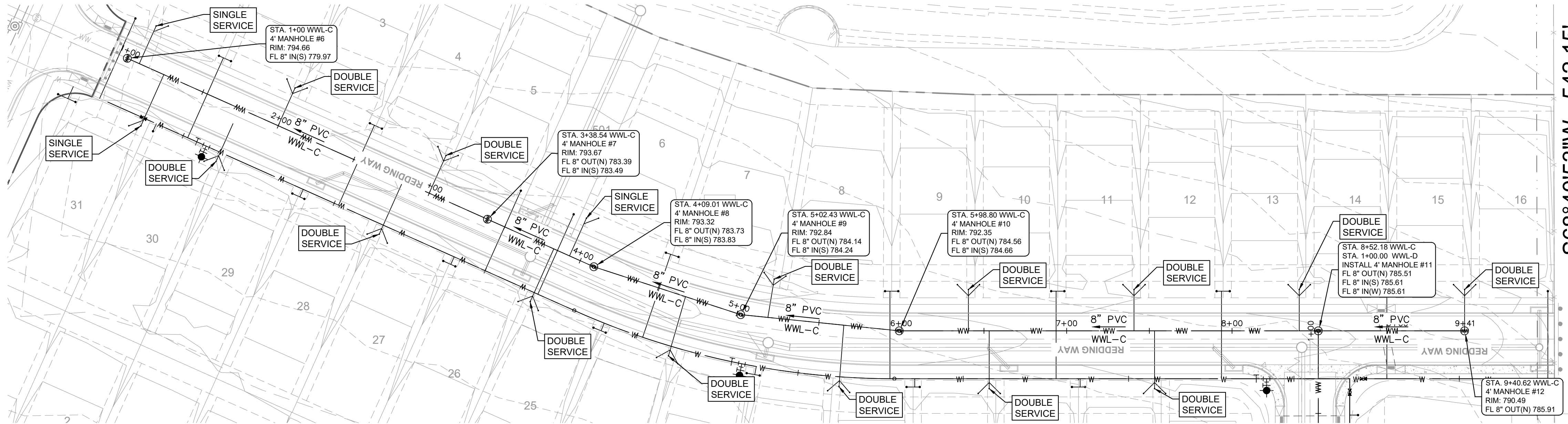
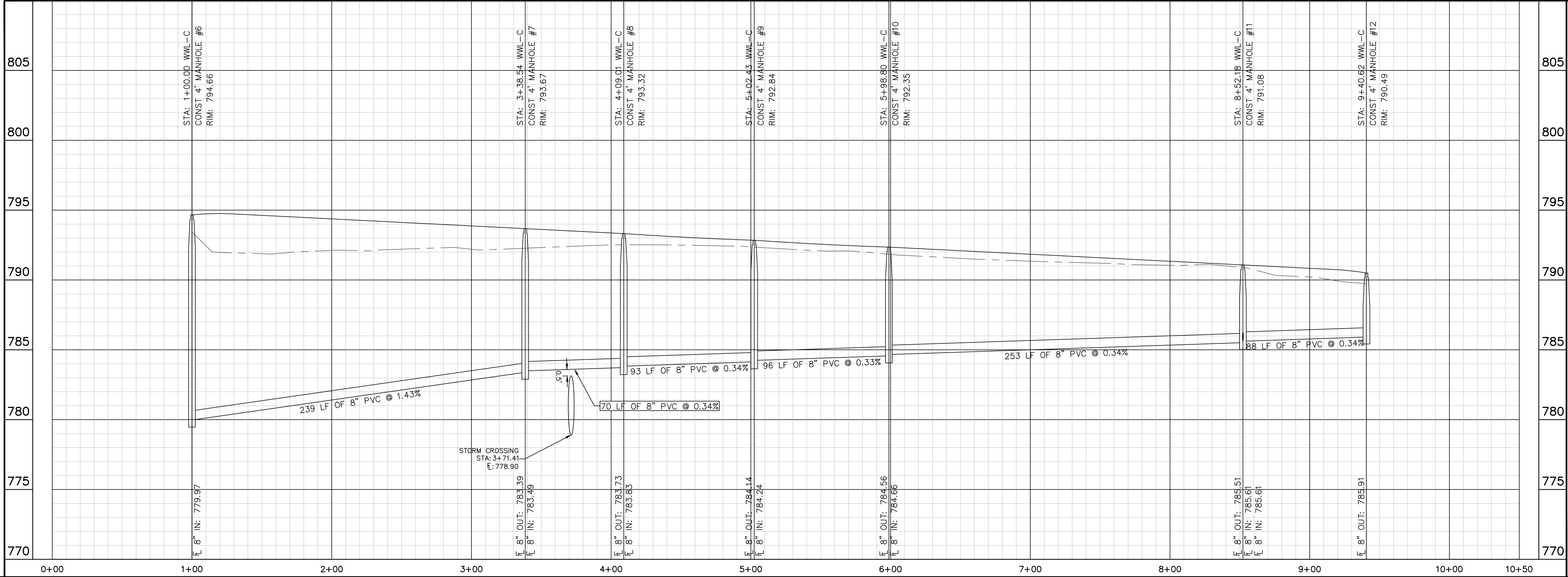
SHEET NUMBER  
**C-29**  
OF C-37

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TEXAS REGISTERED ENGINEERING FIRM F-928

No.	REVISIONS	DATE	BY



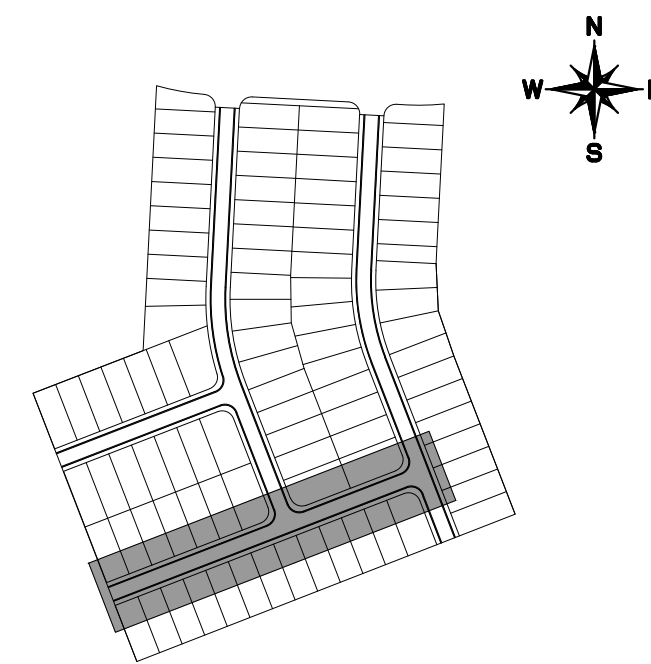
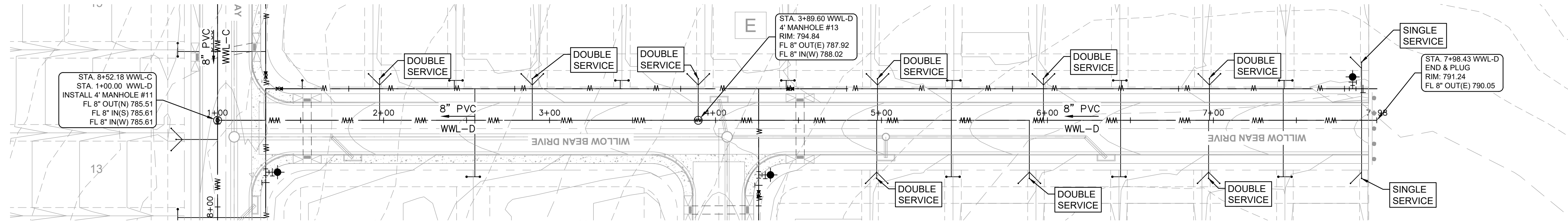
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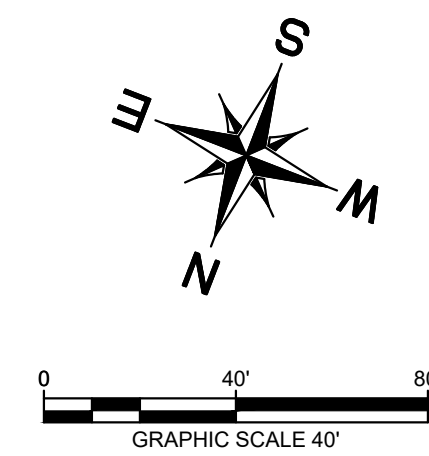
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<b>BERRY CREEK HIGHLANDS PHASE 3</b> CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS											
SHEET NUMBER <b>C-30</b> OF C-37											
2023-XX-CON											
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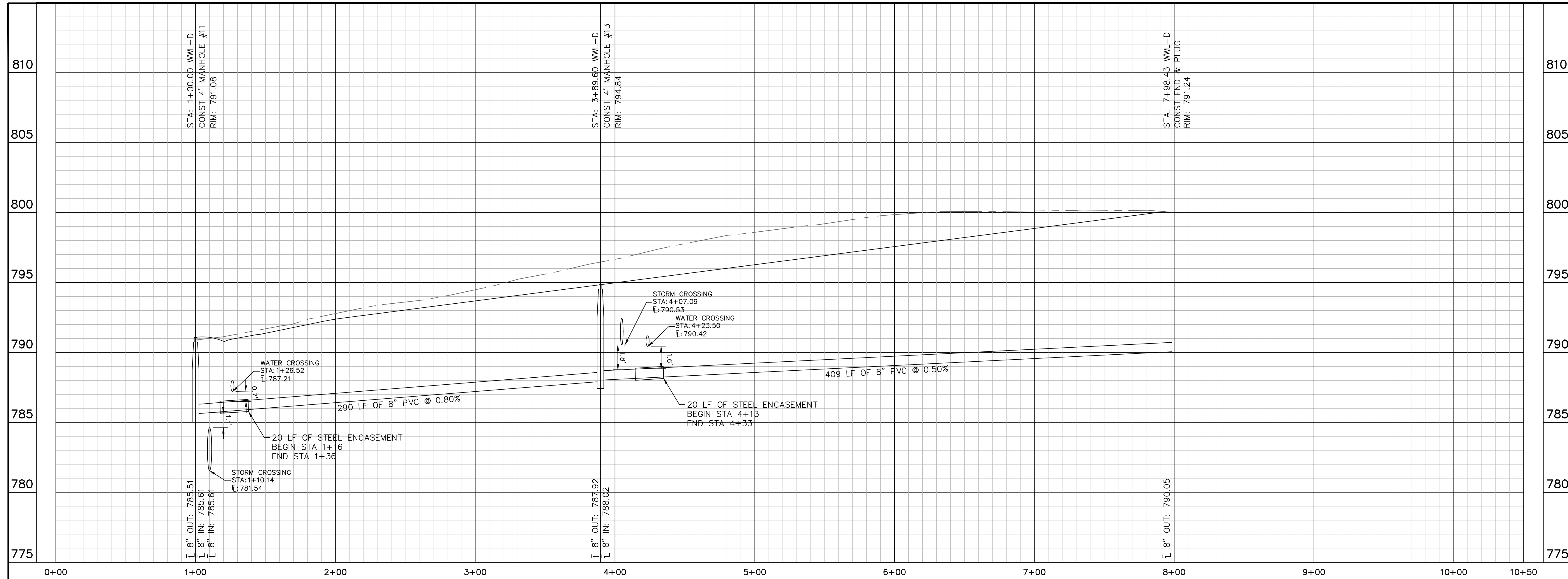
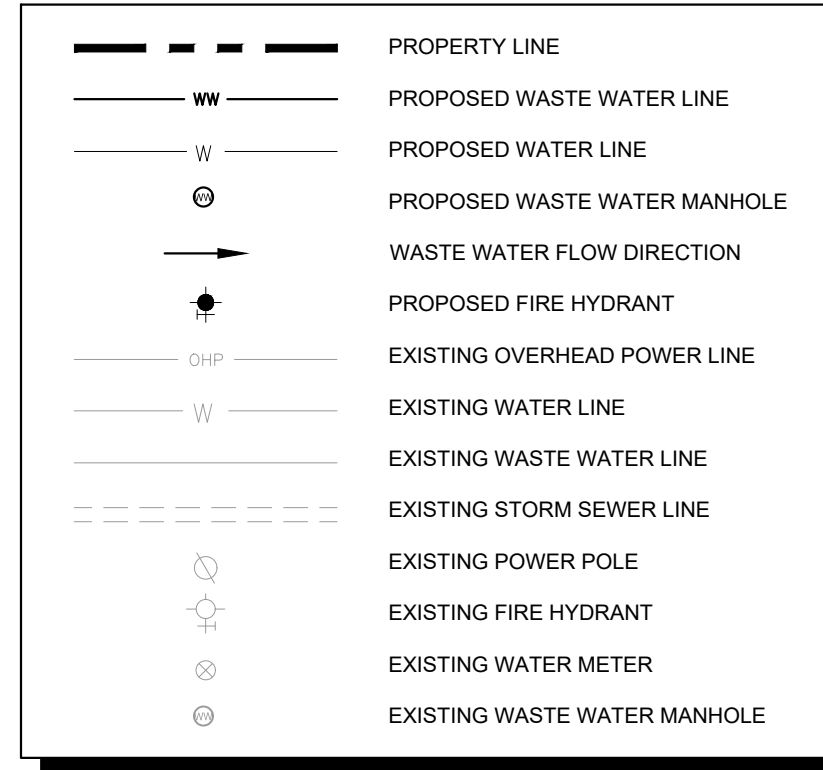
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**KEY MAP**  
N.T.S.



## UTILITY LEGEND



PROFILE SCALE  
1" = 40' HORIZONTAL  
1" = 4' VERTICAL

## BENCHMARKS

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3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED 3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN 3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

[illegible]

**Kimley»»Horn**  
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TEXAS REGISTERED ENGINEERING FIRM F-928

The seal is circular with a five-pointed star in the center. The text "STATE OF TEXAS" is at the top, "JACOB KONDO" is below the star, "115813" is below the name, and "LICENSED PROFESSIONAL ENGINEER" is at the bottom. The entire seal is surrounded by a decorative border.

KHA PROJECT 069291006	DATE SEPTEMBER 2023	DESIGNED BY: MDM
	SCALE: AS SHOWN	DRAWN BY: MDM
		CHECKED BY: JRK

# WASTEWATER PLAN & PROFILE - WWL-D

**BERRY CREEK  
HIGHLANDS  
PHASE 3**  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-31**  
OF C-37

2023-XX-CON

# **SECTION 6: TEMPORARY STORMWATER SECTION**



# Temporary Stormwater Section

## Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(A), (B), (D)(I) and (G); Effective June 1, 1999

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

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

## Signature

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

Print Name of Customer/Agent: Jacob Kondo

Date: 09/14/2023

Signature of Customer/Agent:



Regulated Entity Name: Berry Creek Highlands 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: Lower Berry Creek (1428B).

### ***Temporary Best Management Practices (TBMPs)***

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

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

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

- ☒ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. Erosion and sediment controls other than sediment basins or sediment traps within each disturbed drainage area will be used.
11. ☐ **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
- ☒ N/A
12. ☒ **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. ☒ All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. ☒ If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. ☒ Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. ☒ Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

## ***Soil Stabilization Practices***

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

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

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

### ***Administrative Information***

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

# Attachment A

## Spill Response Actions

If there is an accidental spill on site, the contractor shall respond with appropriate action. The contractor will be required to contact the owner and in turn the owner will contact the TCEQ in the event of a spill on site. In addition to the following guidance, reference the latest version of TCEQ's Technical Guidance Manual (TGM) RG-348 Section 1.4.16.

### Cleanup

- Clean up leaks and spills immediately.
- 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.
- 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.
- Onsite personnel will be trained to perform and be knowledgeable of the spill response actions.

### Minor Spills

- 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.
- Use absorbent materials on small spills rather than hosing down or burying the spill.
- Absorbent materials should be promptly removed and disposed of properly.
- Follow the practice below for a minor spill:
  - Contain the spread of the spill.
  - Recover spilled materials.
  - 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:

- Contain spread of the spill.
- Notify the project foreman immediately.
- 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.
- If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
- 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:



- 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.
- For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
- Notification should first be made by telephone and followed up with a written report.
- The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
- Other agencies which may need to be consulted include, but not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

## Attachment B

# Potential Sources of Contamination

Potential Source: Oil, grease, fuel, and hydraulic fluid contamination from construction equipment and vehicle dripping.

Preventative Measures: Vehicle maintenance will be performed within the construction staging area or a local maintenance shop.

Potential Source: Miscellaneous trash and litter from construction workers and material wrappings.

Preventative Measures: Trash containers will be placed throughout the site to encourage proper disposal of trash.

Potential Source: Silt leaving the site.

Preventative Measures: Contractor will install all temporary best management practices prior to start of construction including the stabilized construction entrance to prevent tracking onto adjoining streets.

Potential Source: Construction Debris.

Preventative Measures: Construction debris will be monitored daily by contractor. Debris will be collected weekly and placed in disposal bins. Situations requiring immediate attention will be addressed on a case-by-case basis.

Potential Source: Soil and Mud from Construction Vehicle tires as they leave the site.

Preventative Measures: A stabilized construction exit shall be utilized as vehicles leave the site. Any soil, mud, etc. carried from the project onto public roads shall be cleaned up within 24 hours.

Potential Source: Sediment from soil, sand, gravel and excavated materials stockpiled on site.

Preventative Measures: Silt fence shall be installed on the down gradient side of the stockpiled materials. Reinforced rock berms shall be installed at all downstream discharge locations.

Potential Source: Portable toilet spill.

Preventative Measures: Toilets on the site will be emptied on a regular basis by the contracted toilet company.

# Attachment C

## Sequence of Major Activities

The installation of erosion and sedimentation controls shall occur prior to any excavation of materials or major disturbances on the site. The sequence of major construction activities will be as follows. Approximate acreage to be disturbed is listed in parentheses next to each activity.

### Intended Schedule or Sequence of Major Activities:

1. Construct Access (0.05 Acres)
2. Installation of Temporary BMPs (9.00 Acres)
3. Initiate Grubbing and Topsoil Stripping of Site (9.00 Acres)
4. Rough Subgrade Preparation (earthwork, grading, street and drainage excavation and embankment) (9.00 Acres)
5. Wet and Dry Utility Construction (9.00 Acres)
6. Final Subgrade Preparation (9.00 Acres)
7. Installation of Base Materials (9.00 Acres)
8. Concrete (foundations, curbs, flatwork) (9.00 Acres)
9. Building Construction (9.00 Acres)
10. Paving Activities (9.00 Acres)
11. Topsoil, Irrigation, Landscaping, and Permanent Soil Stabilization (9.00 Acres)
12. Site cleanup and Removal of Temporary BMPs (9.00 Acres)

Maximum total construction time is not expected to exceed 36 months.

NOTE: The total area to be disturbed is 16.885 acres, however, only 9 acres will be disturbed at a time.

## Attachment D

# Temporary Best Management Practices and Measures

- A. There is no storm water that originates up gradient from the site that will flow across the site.
- B. Temporary BMPs will be installed prior to soil disturbing construction activity. Silt fencing will be placed along the down-gradient sides of the property to prevent silt from escaping the construction area. A temporary construction entrance will be placed on site to reduce vehicle “tracking” onto adjoining streets. A concrete washout pit will be used to collect all excess concrete during construction.

BMPs for this project will protect surface water or groundwater from turbid water, phosphorus, sediment, oil, and other contaminants, which may mobilize in storm water flows by slowing the flow of runoff to allow sediment and suspended solids to settle out of the runoff.

Practices may also be implemented on site for interim and permanent stabilization. Stabilization practices may include but are not limited to: establishment of temporary vegetation, establishment of permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of existing trees and vegetation, and other similar measures.

- C. There are no sensitive features or surface streams within the boundaries of the project. The temporary onsite BMPs will be used to treat stormwater runoff before it leaves the project and prevent pollutants from entering into surface streams or any sensitive features down-gradient of the site.
- D. There were no sensitive features identified during the geologic assessment. However, the BMPs for this project are designed to allow water to pass through after sedimentation has occurred. Existing flow patterns will be maintained to any naturally occurring sensitive features that are discovered during construction.

## **Attachment E**

# **Request to Temporarily Seal a Feature**

Naturally occurring features will not be sealed on the site.



# Attachment F

## Structural Practices

Structural BMPs will be used to limit runoff discharge of pollutants from exposed areas of the site. BMPs will be installed prior to soil disturbing construction activity. Silt fencing will be placed along the down-gradient sides of the property to prevent silt from escaping the construction area. A temporary construction entrance will be placed at the site entry/exit point to reduce tracking onto adjoining streets. A construction staging area will be used onsite to perform all vehicle maintenance and for equipment and material storage. A concrete truck washout pit will be placed on site to provide containment and easier cleanup of waste from concrete operations. The location of all structural temporary BMP's are shown on the erosion control plan sheet and details and specifications are provided on the erosion control details sheet which can be found at the end of this report under Section 7.

### Description of Temporary BMPs

#### Temporary Construction Entrance/Exit

The purpose of a temporary gravel construction entrance is to provide a stable entrance/exit condition from the construction site and keep mud and sediment off public roads. A stabilized construction entrance is a stabilized pad of crushed stone located at any point traffic will be entering or leaving the construction site from a public right-of-way, street, alley, sidewalk or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking or flowing of sediment onto public rights-of-way. This practice should be used at all points of construction ingress and egress.

Excessive amounts of mud can also present a safety hazard to roadway users. To minimize the amount of sediment loss to nearby roads, access to the construction site should be limited to as few points as possible and vegetation around the perimeter should be protected where access is not necessary. A rock stabilized construction entrance should be used at all designated access points.

#### Silt Fence

The purpose of a silt fence is to intercept and detain water-borne sediment from unprotected areas of a limited extent. Silt fence is used during the period of construction near the perimeter of a disturbed area to intercept sediment while allowing water to percolate through. This fence should remain in place until the disturbed area is permanently stabilized. Silt fence should not be used where there is a concentration of water in a channel or drainage way. If concentrated flow occurs after installation, corrective action must be taken such as placing a rock berm in the areas of concentrated flow.

Silt fencing within the site may be temporarily moved during the day to allow construction activity provided it is replaced and properly anchored to the ground at the end of the day. Silt fences on the perimeter of the site or around drainage ways should not be moved at any time.

#### Concrete Washout Area

The purpose of concrete washout areas is to prevent or reduce the discharge of pollutants to stormwater from concrete waste by conducting washout offsite, performing onsite washout in a designated area, and training employees and subcontractors.

The following steps will help reduce stormwater pollution from concrete wastes:

- Incorporate requirements for concrete waste management into material supplier and subcontractor agreements.
- Avoid mixing excess amounts of fresh concrete.
- Perform washout of concrete trucks in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.

- Do not allow excess concrete to be dumped onsite, except in designated areas.
- For onsite washout:
- Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste.
- Wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed properly.

Below grade concrete washout facilities are typical. These consist of a lined excavation sufficiently large to hold expected volume of washout material. Above grade facilities are used if excavation is not practical. Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this section, with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. Plastic lining material should be a minimum of 10 mil in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.

When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of. Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of. Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

## Rock Berm

The purpose of a rock berm is to serve as a check dam in areas of concentrated flow, to intercept sediment-laden runoff, detain the sediment and release the water in sheet flow. The rock berm should be used when the contributing drainage area is less than 5 acres. Rock berms are used in areas where the volume of runoff is too great for a silt fence to contain. They are less effective for sediment removal than silt fences, particularly for fine particles, but are able to withstand higher flows than a silt fence. As such, rock berms are often used in areas of channel flows (ditches, gullies, etc.). Rock berms are most effective at reducing bed load in channels and should not be substituted for other erosion and sediment control measures further up the watershed.

## Triangular Filter Dike

The purpose of a triangular sediment filter dike is to intercept and detain water-borne sediment from unprotected areas of limited extent. The triangular sediment filter dike is used where there is no concentration of water in a channel or other drainage way above the barrier and the contributing drainage area is less than one acre. If the uphill slope above the dike exceeds 10%, the length of the slope above the dike should be less than 50 feet. If concentrated flow occurs after installation, corrective action should be taken such as placing rock berm in the areas of concentrated flow. This measure is effective on paved areas where installation of silt fence is not possible or where vehicle access must be maintained. The advantage of these controls is the ease with which they can be moved to allow vehicle traffic and then reinstalled to maintain sediment.

## Inlet Protection

In developments for which drainage is to be conveyed by underground storm sewers (i.e., streets with curbs and gutters), all inlets that may receive storm runoff from disturbed areas should be protected. Temporary inlet protection is a series of different measures that provide protection against silt transport or accumulation in storm sewer systems. This clogging can greatly reduce or completely stop the flow in the pipes. The different measures are used for different site conditions and inlet type.

## Attachment G

# Drainage Area Map

Berry Creek Highlands Phase 3 will produce an area greater than 10 acres within a common drainage area that will be disturbed at one time. An existing and proposed drainage area map is provided at the end of this report in Section 7 to support the requirement.

# **Attachment H**

## **Temporary Sediment Pond(s) Plans and Calculations**

Temporary sediment ponds are not proposed.

# Attachment I

## Inspection and Maintenance for BMPs

### Personnel Responsible for Inspections

The agent that performs the inspections should be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWPPP for the site. The contractor is to provide an inspector with a CPESC, CESSWI, or CISEC certification. Documentation of the inspector's qualifications is to be included in the attached Inspector Qualifications Log.

### Inspection Schedule

The primary operator is required to choose one of the two inspections listed below.

- ☐ **Option 1:** Once every seven calendar days. If this alternative schedule is developed, then the inspection must occur regardless of whether or not there has been a rainfall event since the previous inspection.
- ☐ **Option 2:** Once every 14 calendar days and within 24 hours of the end of a storm event of two inches or greater.

The inspections may occur on either schedule provided that documentation reflects the current schedule and that any changes to the schedule are conducted in accordance with the following provisions: the schedule may be changed a maximum of one time each month, the schedule change must be implemented at the beginning of a calendar month, and the reason for the schedule change must be documented (e.g., end of “dry” season and beginning of “wet” season).

If option 2 is the chosen frequency of inspections a rain gauge must be properly maintained on site or the storm event information from a weather station that is representative of the site location. For any day of rainfall during normal business hours that measures 0.25 inches or greater, proper documentation of the total rainfall measured for that day must be recorded.

Personnel provided by the permittee must inspect:

- disturbed areas of the construction site that have not been finally stabilized;
- areas used for storage of materials that are exposed to precipitation;
- structural controls (for evidence of, or the potential for, pollutants entering the drainage system);
- sediment and erosion control measures identified in the SWP3 (to ensure they are operating correctly); and
- locations where vehicles enter or exit the site (for evidence of off-site sediment tracking).

### Reductions in Inspection Frequency

Where sites have been finally or temporarily stabilized or where runoff is unlikely due to winter conditions (e.g. site is covered with snow, ice, or frozen ground exists), inspections must be conducted at least once every month. In arid, semi-arid, or drought-stricken areas, inspections must be conducted at least once every month and within 24 hours after the end of a storm event of 0.5 inches or greater. A record of the total rainfall measured, as well as the approximate beginning and ending dates of winter or drought conditions resulting in monthly frequency of inspections in the attached Rain Gauge Log.

In the event of flooding or other uncontrollable situations which prohibit access to the inspection sites, inspections must be conducted as soon as access is practicable.

### Inspection Report Forms

Use the Inspection Report Forms given as a checklist to ensure that all required areas of the construction site are addressed. There is space to document the inspector's name as well as when the inspections regularly take place. The tables will document that the required area was inspected. (If there were any areas



of concern, briefly describe them in this space with a more detailed description in the narrative section. Use the last table to document any discharges found during the inspections).

Describe how effective the installed BMPs are performing. Describe any BMP failures that were noted during the investigation and describe any maintenance required due to the failure. If new BMPs are needed as the construction site changes, the inspector can use the space at the bottom of the section to list BMPs to be implemented before the next inspection.

Describe the inspector's qualifications, how the inspection was conducted, and describe any areas of non-compliance in detail. If an inspection report does not identify any incidents of non-compliance, then it must contain a certifying signature stating that the facility or site is in compliance. The report must be signed by a person and in a manner required by 30 TAC 305.128. There is space at the end of the form to allow for this certifying signature.

Whenever an inspection shows that BMP modifications are needed to better control pollutants in runoff, the changes must be completed within seven calendar days following the inspection. If existing BMPs are modified or if additional BMPs are needed, you must describe your implementation schedule, and wherever possible, make the required BMP changes before the next storm event.

The Inspection Report Form functions as the required report and must be signed in accordance with TCEQ rules at 30 TAC 305.128.

## ***Corrective Action***

### **Personnel Responsible for Corrective Actions**

Both Primary and Secondary Operators are responsible for maintaining all necessary Corrective Actions. If an individual is specifically identified as the responsible party for modifying the contact information for that individual should be documented in the attached Inspector Qualifications Log.

### **Corrective Action Forms**

The Temporary BMPs must be modified based on the results of inspections, as necessary, to better control pollutants in runoff. Revisions must be completed within seven (7) calendar days following the inspection. If existing BMPs are modified or if additional BMPs are necessary, an implementation schedule must be described in the attached forms and wherever possible those changes implemented before the next storm event. If implementation before the next anticipated storm event is impracticable, these changes must be implemented as soon as practicable. Actions taken as a result of inspections must be properly documented by completing the corrective action forms given.

## **Attachment J**

### **Schedule of Interim and Permanent Soil Stabilization**

Construction practices shall disturb the minimal amount of existing ground cover as required for land clearing, grading, and construction activity for the shortest amount of time possible to minimize the potential of erosion and sedimentation from the site. Existing vegetation shall be maintained and left in place until it is necessary to disturb for construction activity. For this project the following stabilization practices will be implemented:

1. Hydraulic Mulch and Seeding: Disturbed areas subject to erosion shall be stabilized with hydraulic mulch and/or seeded and watered to provide interim stabilization. For areas that are not to be sodded as per the project landscaping plan, a minimum of 85% vegetative cover will be established to provide permanent stabilization.
2. Sodding and Wood Mulch: As per the project landscaping plan, Sodding and wood mulch will be applied to landscaped areas to provide permanent stabilization prior to project completion.

Records of the following shall be maintained:

- a) The dates when major grading activities occur;
- b) The dates when construction activities temporarily or permanently cease on a portion of the site; and
- c) The dates when stabilization measures are initiated.

Stabilization measures must be initiated as soon as practical in portions of the site where construction activities have temporarily or permanently ceased, and except as provided in the following, must be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased:

Where the initiation of stabilization measures by the 14<sup>th</sup> day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures must be initiated as soon as practical.

Where construction activity on a portion of the site is temporarily ceased and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of the site.

In arid areas (areas with an average rainfall of 0-10 inches), semiarid areas (areas with an average annual rainfall of 10 to 20 inches), and areas experiencing droughts where the initiation of stabilization measures by the 14<sup>th</sup> day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practical.

### **Maintenance**

Below are some maintenance practices to be used to maintain erosion and sediment controls:

- All measures will be maintained in good working order. The operator should correct any damage or deficiencies as soon as practicable after the inspection, but in no case later than seven (7) calendar days after the inspection.
- BMP Maintenance (as applicable)
- Sediment must be removed from sediment traps and sedimentation ponds no later than the time that design capacity has been reduced by 50%. For perimeter controls such as silt fences, berms, etc., the trapped sediment must be removed before it reaches 50% of the above-ground height.
- Silt fence will be inspected for depth of sediment, tears, to see if the fabric is securely attached to the fence posts, and to see that the fence posts are firmly in the ground.
- Drainage swale will be inspected and repaired as necessary.

- Inlet control will be inspected and repaired as necessary.
- Check dam will be inspected and repaired as necessary.
- Straw bale dike will be inspected and repaired as necessary.
- Diversion dike will be inspected and any breaches promptly repaired.
- Temporary and permanent seeding and planting will be inspected for bare spots, washouts, and healthy growth.
- If sediment escapes the site, accumulations must be removed at a frequency that minimizes off-site impacts, and prior to the next rain event, if feasible. If the permittee does not own or operate the off-site conveyance, then the permittee must work with the owner or operator of the property to remove the sediment.
- Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

To maintain the above practices, the following will be performed:

- Maintenance and repairs will be conducted before the next anticipated storm event or as necessary to maintain the continued effectiveness of storm water controls. Following an inspection, deficiencies should be corrected no later than seven (7) calendar days after the inspection.

**Inspector Qualifications Log\***

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

Inspector Name: \_\_\_\_\_  
Qualifications (Check as appropriate and provide description):  
☐ Training Course \_\_\_\_\_  
☐ Supervised Experience \_\_\_\_\_  
☐ Other \_\_\_\_\_

*\* The agent that performs the inspections should be knowledgeable of this general permit, familiar with the construction site, and knowledgeable of the SWPPP for the site. The contractor is to provide an inspector with a CPESC, CESSWI, or CISEC certification.*

## Amendment Log

[illegible]



Construction Activity Sequence Log

Name of Operator	Projected dates Month/year	Activity Disturbing Soil clearing, excavation, etc.	Location on-site where activity will be conducted	Acreage being disturbed

\*Construction activity sequences for linear projects may be conducted on a rolling basis. As a result, construction activities may be at different stages at different locations in the project area. The Contractor is required to complete and update the schedule and adjust as necessary.

## Stormwater Control Installation and Removal Log

[illegible]

## Stabilization Activities Log

[illegible]

Stabilization and erosion control practices may include, but are not limited to: establishing temporary or permanent vegetation, mulching, geotextiles, sod stabilization, vegetative buffer strips, and protecting existing trees and vegetation. List practices used where they are located, when they will be implemented, and whether they are temporary (interim) or permanent.

## Inspection Frequency Log

[illegible]

## ***Rain Gauge Log***

[illegible]



General Information					
Name of Project		Tracking No.		Inspection Date	
Inspector Name, Title & Contact Information					
Present Phase of Construction					
Inspection Location (if multiple inspections are required, specify location where this inspection is being conducted)					
<b>Inspection Frequency</b> <b>Standard Frequency:</b> <input type="checkbox"/> Weekly <input type="checkbox"/> Every 14 days and within 24 hours of a 0.25” rain <b>Increased Frequency:</b> <input type="checkbox"/> Every 7 days and within 24 hours of a 0.25” rain <b>Reduced Frequency:</b> - <input type="checkbox"/> Once per month (for stabilized areas) - <input type="checkbox"/> Once per month and within 24 hours of a 0.25” rain (for arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought) - <input type="checkbox"/> Once per month (for frozen conditions where earth-disturbing activities are being conducted)					
<b>Was this inspection triggered by a 0.25” storm event?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If yes, how did you determined whether a 0.25” storm event has occurred?</b> <input type="checkbox"/> Rain gauge on site <input type="checkbox"/> Weather station representative of site. Specify weather station source:  <b>Total rainfall amount that triggered the inspection</b> (in inches):					
<b>Unsafe Conditions for Inspection</b> <b>Did you determine that any portion of your site was unsafe for inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If “yes”, complete the following:</b> -     Describe the conditions that prevented you from conducting the inspection in this location:    -     Location(s) where conditions were found:					

Condition and Effectiveness of Erosion and Sediment (E&S) Controls				
Type/Location of E&S Control	Repairs or Other Maintenance Needed?	Corrective Action Required?	Date on Which Maintenance or Corrective Action First Identified?	Notes
1.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Condition and Effectiveness of Pollution Prevention (P2) Practices				
Type/Location of P2 Practices	Repairs or Other Maintenance Needed?	Corrective Action Required?	Identification Date	Notes
1.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
2.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
3.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
4.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
5.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
6.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
7.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
8.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
9.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		
10.	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No		

Stabilization of Exposed Soil			
Stabilization Area	Stabilization Method	Have You Initiated Stabilization?	Notes
1.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
2.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
3.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
4.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
5.		<input type="checkbox"/> YES <input type="checkbox"/> NO If yes, provide date:	
Description of Discharges			
<b>Was a stormwater discharge or other discharge occurring from any part of your site at the time of the inspection?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>If “yes”, provide the following information for each point of discharge:</b>			
Discharge Location	Observations		
1.	Describe the discharge:  At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:		
2.	Describe the discharge:  At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:		
3.	Describe the discharge:  At points of discharge and the channels and banks of surface waters in the immediate vicinity, are there any visible signs of erosion and/or sediment accumulation that can be attributed to your discharge? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe what you see, specify the location(s) where these conditions were found, and indicate whether modification, maintenance, or corrective action is needed to resolve the issue:		

## Contractor or Subcontractor Certification and Signature

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Contractor or Subcontractor:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_

## Certification and Signature by Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Permittee or  
"Duly Authorized Representative":** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_



Section A – Initial Report				
(Complete this section <u>within 24 hours</u> of discovering the condition that triggered corrective action)				
Name of Project		Tracking No.		Today's Date
Date Problem First Discovered			Time Problem First Discovered	
Name and Contact Information of Individual Completing this Form				
<p>What site conditions triggered the requirement to conduct corrective action:</p> <p><input type="checkbox"/> A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Part 2 and/or 3</p> <p><input type="checkbox"/> The stormwater controls that have been installed and maintained are not effective enough for the discharge to meet applicable water quality standards</p> <p><input type="checkbox"/> A prohibited discharge has occurred or is occurring</p> <p>Provide a description of the problem:</p> <p>Deadline for completing corrective action (<i>Enter date that is either: (1) no more than 7 calendar days after the date you discovered the problem, or (2) if it is infeasible to complete work within the first 7 days, enter the date that is as soon as practicable following the 7th day</i>):</p> <p>If your estimated date of completion falls after the 7-day deadline, explain (1) why you believe it is infeasible to complete work within 7 days, and (2) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe:</p>				
Section B – Corrective Action Progress				
(Complete this section <u>no later than 7 calendar days</u> after discovering the condition that triggered corrective action)				
Section B.1 – Why the Problem Occurred				
Cause(s) of Problem (Add an additional sheet if necessary)			How This Was Determined and the Date You Determined the Cause	
1.			1.	
2.			2.	
3.			3.	
Section B.2 – Stormwater Control Modifications to be Implemented to Correct the Problem				
List of Stormwater Control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	Completion Date	SWPPP Update Necessary?	Notes	
1.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		
3.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		

Section A – Initial Report				
(Complete this section <u>within 24 hours</u> of discovering the condition that triggered corrective action)				
Name of Project		Tracking No.		Today's Date
Date Problem First Discovered			Time Problem First Discovered	
Name and Contact Information of Individual Completing this Form				
<p>What site conditions triggered the requirement to conduct corrective action:</p> <p><input type="checkbox"/> A required stormwater control was never installed, was installed incorrectly, or not in accordance with the requirements in Part 2 and/or 3</p> <p><input type="checkbox"/> The stormwater controls that have been installed and maintained are not effective enough for the discharge to meet applicable water quality standards</p> <p><input type="checkbox"/> A prohibited discharge has occurred or is occurring</p> <p>Provide a description of the problem:</p> <p>Deadline for completing corrective action (<i>Enter date that is either: (1) no more than 7 calendar days after the date you discovered the problem, or (2) if it is infeasible to complete work within the first 7 days, enter the date that is as soon as practicable following the 7th day</i>):</p> <p>If your estimated date of completion falls after the 7-day deadline, explain (1) why you believe it is infeasible to complete work within 7 days, and (2) why the date you have established for making the new or modified stormwater control operational is the soonest practicable timeframe:</p>				
Section B – Corrective Action Progress				
(Complete this section <u>no later than 7 calendar days</u> after discovering the condition that triggered corrective action)				
Section B.1 – Why the Problem Occurred				
Cause(s) of Problem (Add an additional sheet if necessary)			How This Was Determined and the Date You Determined the Cause	
1.			1.	
2.			2.	
3.			3.	
Section B.2 – Stormwater Control Modifications to be Implemented to Correct the Problem				
List of Stormwater Control Modification(s) Needed to Correct Problem (Add an additional sheet if necessary)	Completion Date	SWPPP Update Necessary?	Notes	
1.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		
2.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		
3.		<input type="checkbox"/> Yes <input type="checkbox"/> No Date:		

## Contractor or Subcontractor Certification and Signature

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Contractor or Subcontractor:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_

## Certification and Signature by Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

**Signature of Permittee or  
"Duly Authorized Representative":** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Printed Name and Affiliation:** \_\_\_\_\_

# SECTION 7: PERMANENT STORMWATER

# 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: Jacob Kondo

Date: 09/14/2023

Signature of Customer/Agent



Regulated Entity Name: Berry Creek Highlands 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 ensure 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 ensure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.
- ☐ N/A
4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- ☐ The site will be used for low density single-family residential development and has 20% or less impervious cover.
- ☒ The site will be used for low density single-family residential development but has more than 20% impervious cover.
- ☐ The site will not be used for low density single-family residential development.
5. The executive director may waive the requirement for other permanent BMPs for multi-family residential developments, schools, or small business sites where 20% or less impervious cover is used at the site. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.
- ☐ **Attachment A - 20% or Less Impervious Cover Waiver.** The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.
- ☐ The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.
- ☒ The site will not be used for multi-family residential developments, schools, or small business sites.
6. ☒ **Attachment B - BMPs for Upgradient Stormwater.**



- ☐ A description of the BMPs and measures that will be used to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site is attached.
- ☒ No surface water, groundwater or stormwater originates upgradient from the site and flows across the site, and an explanation is attached.
- ☐ Permanent BMPs or measures are not required to prevent pollution of surface water, groundwater, or stormwater that originates upgradient from the site and flows across the site, and an explanation is attached.
7. ☒ **Attachment C - BMPs for On-site Stormwater.**
- ☒ A description of the BMPs and measures that will be used to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff from the site is attached.
- ☐ Permanent BMPs or measures are not required to prevent pollution of surface water or groundwater that originates on-site or flows off the site, including pollution caused by contaminated stormwater runoff, and an explanation is attached.
8. ☐ **Attachment D - BMPs for Surface Streams.** A description of the BMPs and measures that prevent pollutants from entering surface streams, sensitive features, or the aquifer is attached. Each feature identified in the Geologic Assessment as sensitive has been addressed.
- ☒ N/A
9. ☒ The applicant understands that to the extent practicable, BMPs and measures must maintain flow to naturally occurring sensitive features identified in either the geologic assessment, executive director review, or during excavation, blasting, or construction.
- ☒ The permanent sealing of or diversion of flow from a naturally-occurring sensitive feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed.
- ☐ **Attachment E - Request to Seal Features.** A request to seal a naturally-occurring sensitive feature, that includes, for each feature, a justification as to why no reasonable and practicable alternative exists, is attached.
10. ☒ **Attachment F - Construction Plans.** All construction plans and design calculations for the proposed permanent BMP(s) and measures have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer, and are signed, sealed, and dated. The plans are attached and, if applicable include:
- ☒ Design calculations (TSS removal calculations)
- ☒ TCEQ construction notes
- ☒ All geologic features
- ☒ All proposed structural BMP(s) plans and specifications
- ☐ N/A

11. ☒ **Attachment G - Inspection, Maintenance, Repair and Retrofit Plan.** A plan for the inspection, maintenance, repairs, and, if necessary, retrofit of the permanent BMPs and measures is attached. The plan includes all of the following:
- ☒ Prepared and certified by the engineer designing the permanent BMPs and measures
  - ☒ Signed by the owner or responsible party
  - ☒ Procedures for documenting inspections, maintenance, repairs, and, if necessary retrofit
  - ☒ A discussion of record keeping procedures
- ☐ N/A
12. ☐ **Attachment H - Pilot-Scale Field Testing Plan.** Pilot studies for BMPs that are not recognized by the Executive Director require prior approval from the TCEQ. A plan for pilot-scale field testing is attached.
- ☒ N/A
13. ☒ **Attachment I - Measures for Minimizing Surface Stream Contamination.** A description of the measures that will be used to avoid or minimize surface stream contamination and changes in the way in which water enters a stream as a result of the construction and development is attached. The measures address increased stream flashing, the creation of stronger flows and in-stream velocities, and other in-stream effects caused by the regulated activity, which increase erosion that results in water quality degradation.
- ☒ N/A

### ***Responsibility for Maintenance of Permanent BMP(s)***

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

14. ☒ The applicant is responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. Such entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred.
- ☐ N/A
15. ☒ A copy of the transfer of responsibility must be filed with the executive director at the appropriate regional office within 30 days of the transfer if the site is for use as a multiple single-family residential development, a multi-family residential development, or a non-residential development such as commercial, industrial, institutional, schools, and other sites where regulated activities occur.
- ☐ N/A

***Attachment A***

***20% or Less Impervious Cover Waiver***

A waiver will not be submitted for this project.

## ***Attachment B***

### ***BMPs for UP-GRADIENT STORMWATER***

Up-gradient storm water does not exist based on current topography maps and field observations. Please refer to the Proposed Drainage Area Map that is provided at the end of this report in Section 7.

## ***Attachment C***

### ***BMPs for On-Site Stormwater***

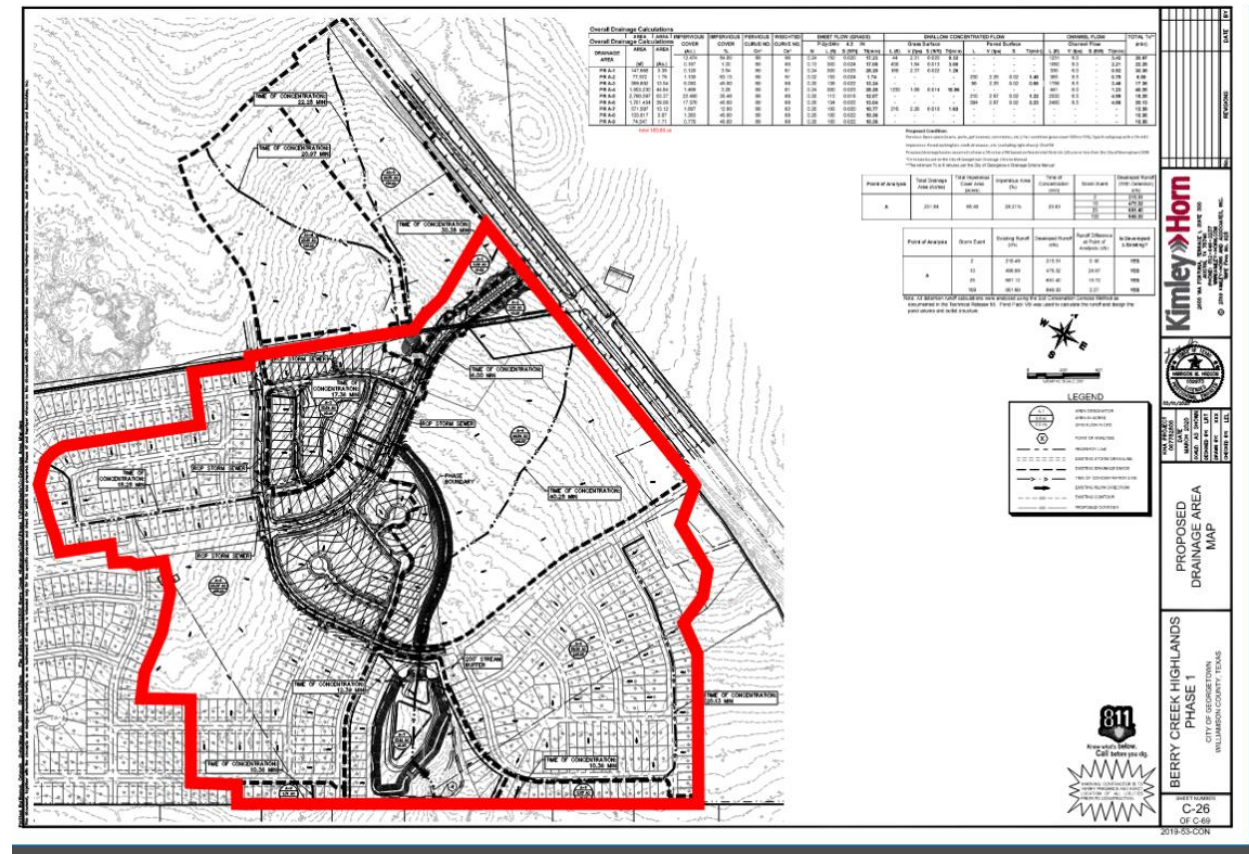
A detention pond will be utilized as the permanent best management practices on this site. All stormwater runoff from impervious areas will be collected and conveyed to the pond via storm drainage pipe network and routed through the sand filter basin to provide the required overall removal of 80% of the increase in Total Suspended Solids.

Construction plans, calculations and specifications are provided in Section 7 which is located at the end of this report.

A water quality pond will be utilized as a permanent best management practice on this site. The proposed, permanent water quality pond is a wet pond with a TSS reduction efficiency of 93%. The proposed water quality wet pond was designed to treat the additional impervious cover within the TxDOT right-of-way. The right-of-way area was incorporated into the TSS spreadsheet and calculations. The total area is designated as post-development impervious cover. This includes 5.67 acres of existing impervious cover in the right-of-way and 0.71 acres of proposed impervious cover in the right-of-way. The following table summarizes the breakdown of on-site area versus TxDOT right-of-way area.

	ON-SITE	TXDOT ROW	TOTAL
PROJECT AREA INCLUDED IN PLAN (ACRES)	179.11	15.4	194.51
PREDEVELOPMENT IMPERVIOUS AREA WITHIN THE LIMITS OF THE PLAN (ACRES)	0	5.67	5.67
PROPOSED IMPERVIOUS AREA WITHIN THE LIMITS OF THE PLAN (ACRES)	50.46	0.71	51.17
TOTAL POST-DEVELOPMENT IMPERVIOUS AREA WITHIN THE LIMITS OF THE PLAN (ACRES)	50.46	6.38	56.84

The water quality pond was proposed and constructed within Berry Creek Highlands Phase 1. The pond received TCEQ approval on February 27, 2020 per EAPP ID No. 11001800. This water quality pond will serve all the sections outlined below in red.



The pond was designed to over-detain (194.51 AC), whereas only 183.89 AC will be draining to it. (see overall drainage calculations below). By over-detaining, it is ensured that the southern lot of Phase 3 will be accounted for.

### Overall Drainage Calculations

DRAINAGE AREA	AREA (sf)	AREA (Ac.)
PR A-1	147,668	3.39
PR A-2	77,972	1.79
PR A-3	589,802	13.54
PR A-4	1,953,230	44.84
PR A-5	2,760,397	63.37
PR A-6	1,701,454	39.06
PR A-7	571,507	13.12
PR A-8	133,917	3.07
PR A-9	74,547	1.71

total 183.89 ac



## ***Attachment D***

### ***BMPs for Surface Streams***

There are no existing surface streams or sensitive features on site. All permanent BMP's have been designed to remove 80% of the increase in Total Suspended Solids as per current TCEQ requirements.

## ***Attachment E***

### ***Request To Seal a Feature***

The permanent sealing of or diversion of flow from a naturally-occurring “sensitive” or “possibly sensitive” feature that accepts recharge to the Edwards Aquifer as a permanent pollution abatement measure has not been proposed for any naturally-occurring “sensitive” or “possibly sensitive” features on this site.

## ***Attachment F***

### ***Construction Plans***

Calculations for the load removal requirements for the project and the load removal provided by the permanent BMP's are provided as an exhibit in section 7 which have been signed and sealed by a professional engineer licensed in the state of Texas. The load removal requirements are derived from the equations from the technical guidance manual based upon project area and increase in impervious cover. All stormwater runoff from impervious areas will be treated by the proposed permanent BMP's to provide the overall required removal of 80% of the increase in Total Suspended Solids. Provided within the calculations is a summary of the amount of pollutant load required to be removed from the drainage areas and the amount of removal provided by the permanent BMP's.

Construction plans, details, specifications, calculations, and construction notes are provided in section 7 which is attached at the end of this report.

**BERRY CREEK (GEORGETOWN)  
WATER POLLUTION ABATEMENT PLAN**

***Inspection, Maintenance, Repair and Retrofit Plan***

The inspection and maintenance plan outlines the procedures necessary to maintain the performance of the Permanent Best Management Practices for this project. It should be noted that the plan provides guidelines that may have to be adjusted dependent on site specific and weather related conditions.

It is the responsibility of the owner to provide the inspections and maintenance as outlined in the plan for the duration of the project. The owner will maintain this responsibility until it is assumed or transferred to another entity in writing. If the property is leased or sold, the responsibility for the maintenance will be required to be transferred through the lease agreement, binding covenants, closing documents, or other binding legal instrument.

Disposal of accumulated silt shall be accomplished following Texas Commission on Environmental Quality guidelines and specifications.

Maintenance records shall be kept on the installation, maintenance, or removal of items necessary for the proper operation of the facilities. All inspections shall be documented.

An amended copy of this document will be provided to the Texas Commission on Environmental Quality within thirty (30) days of any changes in the following information.

Responsible Party: Berry Creek (Georgetown) ASLI IX LLC  
Mailing Address: 923 N. Pennsylvania Avenue  
City, State: Winter Park, Florida Zip: 32789  
Telephone: (407) 628-8488 Fax: N/A

I, the owner, have read and understand the requirements of the attached Inspection and Maintenance Plan for the proposed Permanent Best Management Practices for my project. I acknowledge that I will maintain responsibility for the implementation and execution of the plan until the responsibility is transferred to or assumed by another party in writing through a binding legal instrument.

Signature of Responsible Party See attached sheets. Date \_\_\_\_\_

This Maintenance Plan is based on TCEQ Maintenance Guidelines.

By:  \_\_\_\_\_ Date 03/02/2020  
Harrison M. Hudson, P.E.

## Water Quality Ponds

### Routine Maintenance

Mowing: The side-slopes, embankment, and emergency spillway of the basin should be mowed at least twice a year to prevent woody growth and to control weeds.

Inspections. Water Quality Ponds 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 basin is functioning properly. There are many functions and characteristics of these BMPs that should be inspected. The embankment should be checked for subsidence, erosion, leakage, cracking, and tree growth. The condition of the emergency spillway should be checked. The inlet, barrel, and outlet should be inspected for clogging. Stability of the side slopes should be checked. Modifications to the basin structure and contributing watershed should be evaluated. During semi-annual inspections, replace any dead or displaced vegetation. Replanting of various species of wetland vegetation may be required at first, until a viable mix of species is established. Cracks, voids and undermining should be patched/filled to prevent additional structural damage. Trees and root systems should be removed to prevent growth in cracks and joints that can cause structural damage. The inspections should be carried out with As-built pond plans in hand.

Debris and Litter Removal: As part of periodic mowing operations and inspections, debris and litter should be removed from the surface of the basin. Attention should be paid to floatable debris, and the outlet should be checked for possible clogging.

Sediment Removal: Inspection of the forebay should be completed every three months for the first two years after construction completion, and during the three-month inspection cycle, if more than 15% of the forebay volume is lost, the sediment build-up should be removed. After the two-year period, the sediment forebay should be inspected every three years, and the sediment should be cleaned out if more than one-third of the forebay volume is lost. Every six years, the sediment build-up in the main pool should be inspected and sediment should be removed if twenty percent of the main pool volume is lost.

Erosion Control: The basin side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion. Corrective measures such as re-grading and re-vegetation may be necessary.

Nuisance Control: Most public agencies surveyed indicate that control of insects, weeds, odors, and algae may be needed in some ponds. Nuisance control is probably the most frequent maintenance item demanded by local residents. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.). Biological control of algae and mosquitoes using fish such as fathead minnows is preferable to chemical applications.

### Non-Routine Maintenance

Structural Repairs and Replacement: The structural integrity of the embankment, outlet structure and retaining walls should be inspected during the required routine inspections. Leakage or seepage of water through the embankment must be avoided and any structural damage should be repaired immediately.

Harvesting: If vegetation is present on the fringes or in the pond, it can be periodically harvested and the clippings removed to provide export of nutrients and to prevent the basin from filling with decaying organic matter.

**BERRY CREEK (GEORGETOWN)  
WATER POLLUTION ABATEMENT PLAN**

An amended copy of this document will be provided to the Texas Commission on Environmental Quality within thirty (30) days of any changes in the following information.

Responsible Party: Berry Creek (Georgetown) ASLI IX LLC  
Mailing Address: 923 N Pennsylvania Avenue  
City, State: Winter Park, Florida Zip: 32789  
Telephone: (407) 628-8488 Fax: N/A

I, the owner, have read and understand the requirements of the attached Inspection and Maintenance Plan for the proposed Permanent Best Management Practices for my project. I acknowledge that I will maintain responsibility for the implementation and execution of the plan until the responsibility is transferred to or assumed by another party in writing through a binding legal instrument.

Signature of Responsible Party SEE SIGNATURE BELOW Date \_\_\_\_\_

**BERRY CREEK (GEORGETOWN) ASLI IX, LLC**

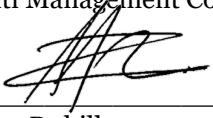

By: Avanti Strategic Land Investors IX, L.L.L.P.

By: APG ASLI IX GP, LLC

By: Avanti Properties Group III, L.L.L.P.

By: APG III GP, LLC

By: Avanti Management Corporation

By:  \_\_\_\_\_ 

Name: Andrew Dubill

Title: Executive Vice President

Date: 11/5/19



## **Background**

Sand Filter Basins (SFBs) are a common type of Stormwater Management facility utilized within the Edwards Aquifer Recharge Zone. A SFB consists of a sedimentation chamber, a flat surfaced area of sand, a filtration chamber, and a flat sand filter bed with an underdrain system. A surcharge zone exists within the sedimentation and filtration chambers for temporary storage of the Water Quality Capture Volume (WQCV). During a storm, runoff enters the sedimentation chamber, where the majority of sediments are deposited. The runoff then enters the filtration chamber where it ponds above the sand bed and gradually infiltrates into the underlying sand filter, filling the void spaces of the sand. The underdrain gradually dewateres the sand bed and discharges the runoff to a nearby channel, swale, or storm sewer. SFBs provide for filtering and absorption of pollutants in the stormwater. The popularity of SFBs has grown because they allow the WQCV to be provided on a site that has little open area available for stormwater management. However, there are limitations on their use due to potential clogging from large amounts of sediment.

## **Inspecting Sand Filter Basins**

### **Access and Easements**

Inspection and maintenance personnel may utilize the stormwater facility map located in Appendix G containing the locations of the access points and maintenance easements of the SFBs within this development.

### **Stormwater Management Facilities Locations**

Inspection and maintenance personnel may utilize the stormwater facility map located in Appendix G containing the locations of the SFBs within this development.

### **Sand Filter Extended Detention Basin (SFB) Features**

SFBs have a number of features that are designed to serve a particular function. Many times the proper function of one feature depends on another. It is important for maintenance personnel to understand the function of each of these features to prevent damage to any feature during maintenance operations. Below is a list and description of the most common features within a SFB and the corresponding maintenance inspection items that can be anticipated:

**TABLE SFB-1  
Typical Inspection & Maintenance Requirements Matrix**

	<b>Sediment Removal</b>	<b>Mowing Weed control</b>	<b>Trash/ Debris Removal</b>	<b>Erosion</b>	<b>Overgrown Vegetation Removal</b>	<b>Removal/ Replacement</b>	<b>Structure Repair</b>
<b>Inflow Points/Splitter Box</b>	X		X				X
<b>Sedimentation Chamber</b>	X	X	X	X	X		
<b>Filter Media</b>	X	X	X	X	X	X	
<b>Underdrain System</b>						X	
<b>Overflow Outlet Works</b>	X		X				X
<b>Embankment</b>		X	X	X	X		

### **Inflow Points/Splitter Box**

Inflow points or outfalls into SFBs are the point of stormwater discharge into the facility. An inflow point is commonly a curb cut with a concrete or riprap rundown or a storm sewer pipe outfall with a flared end section.

SFBs are designed to treat only the WQCV. The WQCV is a volume of water that runs off a site during an 80th percentile event. Any amount over the WQCV is allowed to go to a detention facility without water

## **BERRY CREEK HIGHLANDS WATER POLLUTION ABATEMENT PLAN**

quality treatment. The splitter box is generally constructed of reinforced concrete. The splitter box typically has a lower wall that has a height that will trap the required WQCV. Volumes over the WQCV are allowed to spill over the wall and enter a storm sewer system that conveys the runoff to a detention facility. Proper inspection and maintenance of the splitter box is essential in ensuring the long-term operation of the SFB.

An energy dissipater is typically immediately downstream of the splitter box, at the discharge point into the SFB, to protect the sedimentation and filtration chambers from erosion. In some cases, the splitter box outfall can have a toe-wall or cut-off wall immediately below the structure to prevent undercutting of the outfall from erosion.

*The typical maintenance activities that are required at inflow points are as follows:*

- a. Riprap Displaced – Many times, because of the repeated impact/force of water, the riprap can shift and settle. If any portion of the riprap apron appears to have settled, soil is present between the riprap, or the riprap has shifted, maintenance may be required to ensure future erosion is prevented.
- b. Sediment Accumulation – Because of the turbulence in the water created by the energy dissipater, sediment often deposits immediately downstream of the inflow point. To prevent a loss in performance of the upstream infrastructure, sediment that accumulates in this area must be removed on a timely basis.
- c. Structural Damage – Structural damage can occur at anytime during the life of the facility. Typically for an inflow, the structural damage occurs to the pipe flared end section (concrete or steel). Structural damage can lead to additional operating problems with the facility, including loss of hydraulic performance.

### **Sedimentation Chamber**

The sedimentation chamber is located adjacent to the splitter box and generally consists of a flat irrigated turf grass area followed by a water trapping device that allows water to be briefly held in the sedimentation chamber before being released into the filtration chamber. This slowing of the runoff allows sediments to be deposited in the sedimentation chamber and not the filtration chamber where they can cause clogging of the filter media.

*The typical maintenance activities that are required within the sedimentation chamber are as follows:*

- a. Mowing/woody growth control/weeds present - Routine mowing of the turf grass within the sediment chamber is necessary to improve the overall appearance and to ensure proper function of the SFB. Turf grass should be mowed to a height of 2 to 4- inches and shall be bagged to prevent potential contamination of the filter media. If undesirable vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate, resulting in blockage of the filter media. Also, shrub, grass and weed roots can cause damage to the filter media and underdrain system. Routine management is essential to prevent more extensive and costly future maintenance.

### **Filter Media**

The filter media is the main pollutant removal component of the SFB. The filter media consists of 18-inches of washed sand. The filter media removes pollutants through several different processes, including sedimentation, filtration, infiltration and microbial uptake.

Sedimentation is accomplished by the slow release of stormwater runoff through the filter media. This slow release allows for sediment particles that were not deposited in the sedimentation chamber to be deposited on the top layer of the filter media where they are easily removed through routine maintenance. Other pollutants are also removed through this process because they are attached to sediment.

Filtration is the main pollutant removal mechanism of SFBs. When the stormwater runoff migrates down through the filter media, many of the particulate pollutants are physically strained out as they pass through the filter bed of sand and are trapped on the surface or among the pores of the filter media.

SFBs that are not lined with an impervious liner allow for infiltration into the native soils. This process also allows for additional pollutant removal.

## **INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN**

## **BERRY CREEK HIGHLANDS WATER POLLUTION ABATEMENT PLAN**

Microbes that naturally occur in the filter media can assist with pollutant removal by breaking down organic pollutants.

*The typical maintenance activities that are required within the filter media areas are as follows:*

a. Mowing/woody growth control/weeds present - Noxious weeds and other unwanted vegetation must be treated as needed throughout the SFB. This activity can be performed either through mechanical means (mowing/pulling) or with herbicide. Consultation with a local Weed Inspector is highly recommended prior to the use of herbicide. Herbicides should be utilized sparingly and as a last resort. All herbicide applications should be in accordance with the manufacturer's recommendations.

b. Sediment/Pollutant Removal – Although SFBs should not be utilized in areas where large concentrations of sediment and other pollutants will enter the SFB, it is inevitable that some sediment and other pollutants will enter the SFB. Most sediment will be deposited in the sedimentation chamber, however finer suspended particles will migrate to the filter media. These sediments need to be removed to ensure proper infiltration rates of the stormwater runoff.

c. Filter Replacement - The top layers of the filter media are the most susceptible to pollutant loading and therefore may need to be removed and disposed of properly on a semi-regular basis when infiltration rates slow.

d. Infiltration Rate Test - An infiltration test may be necessary to ensure proper functioning of the filter media. The infiltration test can be conducted by filling the sand filter with water to the elevation of the overflow wall in the splitter box. The sand filter needs to drain completely within 24-hours of the filling. If the drain time for the basin is longer than 24-hours, the filter is in need of maintenance.

### **Underdrain System**

The underdrain system consists of a layer of geotextile fabric, gravel storage area and perforated PVC pipes. The geotextile fabric is utilized to prevent the filter media from entering the underdrain system. The gravel storage area allows for storage of treated stormwater runoff prior to the discharge of the runoff through the perforated PVC pipe.

*The typical maintenance activities that are required for the underdrain system are as follows:*

With proper maintenance of the filter media and sediment chamber, there should be a minimum amount of maintenance required on the underdrain system. Generally, the only maintenance performed on the underdrain system is jet-vac cleaning.

### **Overflow Outlet Works**

Some SFBs include an overflow outlet works in place of the splitter box. The overflow outlet works allows runoff amounts that exceed the WQCV to exit the SFB to the detention facility. The outlet works is typically constructed of reinforced concrete into the embankment of the SFB. The concrete structure typically has steel orifice plates anchored/embedded into it to control stormwater release rates. The larger openings (flood control) on the outlet structure typically have trash racks over them to prevent clogging. Proper inspection and maintenance of the outlet works is essential in ensuring the long-term operation of the SFB.

*The typical maintenance activities that are required for the overflow outlet works are as follows:*

a. Structural Damage - The overflow outlet structure is primarily constructed of concrete, which can crack, spall, and settle. The steel grate on the overflow outlet structure is also susceptible to damage.

b. Mowing/woody growth control/weeds present – The presence of plant material not part of the original landscaping, such as wetland plants or other woody growth, can clog the overflow outlet works during a larger storm event, causing flooding damage to adjacent areas. This plant material may indicate a clogging of the filter media and may require additional investigation.

## **INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN**

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## **Embankments**

Some SFBs utilize irrigated turf grass embankments to store the WQCV.

*The typical maintenance activities that are required for the embankment areas are as follows:*

- a. Vegetation Sparse – The embankments are one of the most visible parts of the SFB and, therefore, aesthetics is important. Adequate and properly maintained vegetation can greatly increase the overall appearance of the SFB. Also, vegetation can reduce the potential for erosion and subsequent sediment transport to the filter media, thereby reducing the need for more costly maintenance.
- b. Erosion – Inadequate vegetative cover may result in erosion of the embankments. Erosion that occurs on the embankments can cause clogging of the filter media.
- c. Trash/Debris – Trash and debris can accumulate in the upper area after large events, or from illegal dumping. Over time, this material can clog the SFB filter media and outlet works.
- d. Mowing/woody growth control/weeds present – The presence of plant material not part of the original landscaping, such as wetland plants or other woody growth, can result in difficulty in performing maintenance activities. These trees and shrubs may also damage the underdrain system of the SFB. This plant material may indicate a clogging of the filter media and may require additional investigation.

## **Emergency Overflow**

An emergency spillway is typical of all SFBs and designed to serve as the overflow in the event the volume of the pond is exceeded. The emergency spillway is typically armored with riprap (or other hard armor), and is sometimes buried with soil or may be a concrete wall or other structure. The emergency spillway is typically a weir (notch) in the basin embankment. Proper function of the emergency spillway is essential to ensure flooding does not affect adjacent properties.

*The typical maintenance activities that are required for the emergency overflow areas are as follows:*

- a. Riprap Displaced – As mentioned before, the emergency spillway is typically armored with riprap to provide erosion protection. Over the life of an SFB, the riprap may shift or become dislodged due to flow.
- b. Erosion Present – Although the spillway is typically armored, stormwater flowing through the spillway can cause erosion damage. Erosion must be repaired to ensure the integrity of the basin embankment, and proper function of the spillway.
- c. Mowing/weed/woody growth control – Management of woody vegetation is essential in the proper long-term function of the spillway. Larger trees or dense shrubs can capture larger debris entering the SFB and reduce the capacity of the spillway. These trees and shrubs may also damage the underdrain system of the SFB.
- d. Obstruction/Debris – The spillway must be cleared of any obstruction (man made or natural) to ensure the proper design capacity.

## **Miscellaneous**

There are a variety of inspection/maintenance issues that may not be attributed to a single feature within the SFB. This category on the inspection form is for maintenance items that are commonly found in the SFB, but may not be attributed to an individual feature.

- a. Encroachment in Easement Area – Private lots/property can sometimes be located very close to the SFBs, even though they are required to be located in tracts with drainage easements. Property owners may place landscaping, trash, fencing, or other items within the easement area that may affect maintenance or the operation of the facility.

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b. Graffiti/Vandalism – Vandals can cause damage to the SFB infrastructure. If criminal mischief is evident, the inspector should forward this information to the local Sheriff's Office

c. Public Hazards – Public hazards include items such as vertical drops of greater than 4-feet, containers of unknown/suspicious substances, and exposed metal/jagged concrete on structures. **If any hazard is found within the facility area that poses an immediate threat to public safety, contact the local Sheriff's Office at 911 immediately.**

d. Other – Any miscellaneous inspection/maintenance items not contained on the form should be entered here.

### **Inspection Forms**

SFB Inspection forms are located in Appendix D. Inspection forms shall be completed by the person(s) conducting the inspection activities. Each form shall be reviewed and submitted by the property owner or property manager to Arapahoe County per the requirements of the Operations and Maintenance Manual. These inspection forms shall be kept indefinitely and made available to Arapahoe County upon request.

## **Maintaining Sand Filter Basins (SFBs)**

### **Maintenance Personnel**

Maintenance personnel must be qualified to properly maintain SFBs. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

### **Equipment**

It is imperative that the appropriate equipment and tools are taken to the field with the operations crew. The types of equipment/tools will vary depending on the task at hand. Below is a list of tools, equipment, and material(s) that may be necessary to perform maintenance on a SFB:

- 1.) Mowing Tractors
- 2.) Trimmers (extra string)
- 3.) Shovels
- 4.) Rakes
- 5.) All Surface Vehicle (ASVs)
- 6.) Skid Steer
- 7.) Back Hoe
- 8.) Track Hoe/Long Reach Excavator
- 9.) Dump Truck
- 10.) Jet-Vac Machine
- 11.) Engineers Level (laser)
- 12.) Riprap (Minimum - Type M)
- 13.) Geotextile Fabric
- 14.) Erosion Control Blanket(s)
- 15.) Sod
- 16.) Illicit Discharge Cleanup Kits
- 17.) Trash Bags
- 18.) Tools (wrenches, screw drivers, hammers, etc)
- 19.) Confined Space Entry Equipment
- 20.) Approved Stormwater Facility Operation and Maintenance Manual
- 21.) ASTM C-33 Sand

Some of the items identified above may not be needed for every maintenance operation. However, this equipment should be available to the maintenance operations crews should the need arise.

### **Safety**

Vertical drops may be encountered in areas located within and around the SFB. Avoid walking on top of retaining walls or other structures that have a significant vertical drop. If a vertical drop is identified within

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the pond that is greater than 48-inches in height, make the appropriate note/comment on the maintenance inspection form.

## **SFB Maintenance Forms**

The SFB Maintenance Form provides a record of each maintenance operation performed by maintenance contractors. The SFB Maintenance Form shall be filled out in the field after the completion of the maintenance operation. Each form shall be reviewed and submitted by the property owner or property manager to Arapahoe County per the requirements of the Operations and Maintenance Manual. The SFB Maintenance form is located in Appendix E.

## **SFB Maintenance Categories and Activities**

A typical SFB Maintenance Program will consist of three broad categories of work: Routine, Minor and Major. Within each category of work, a variety of maintenance activities can be performed on a SFB. A maintenance activity can be specific to each feature within the SFB, or general to the overall facility. This section of the SOP explains each of the categories and briefly describes the typical maintenance activities for a SFB.

A variety of maintenance activities are typical of SFBs. The maintenance activities range in magnitude from routine trash pickup to the reconstruction of the SFB filter media or underdrain system. Below is a description of each maintenance activity, the objectives, and frequency of actions:

## **Routine Maintenance Activities**

The majority of this work consists of scheduled mowings, trash and debris pickups for the SFB during the growing season. It also includes activities such as weed control. These activities normally will be performed numerous times during the year. These items typically do not require any prior correspondence with Arapahoe County, however, completed inspection and maintenance forms shall be submitted to Arapahoe County for each inspection and maintenance.

The Routine Maintenance Activities are summarized below, and further described in the following sections.

**TABLE SFB-2**  
**Summary of Routine Maintenance Activities**

<b>Maintenance Activity</b>	<b>Minimum Frequency</b>	<b>Look for:</b>	<b>Maintenance Action</b>
<b>Mowing</b>	Twice annually	Excessive grass height/aesthetics	2"-4" grass height
<b>Trash/Debris Removal</b>	Twice annually	Trash/debris in SFB	Remove and dispose of trash and debris
<b>Splitter Box/Overflow Outlet Works Cleaning</b>	As needed - after significant rain events – twice annually minimum	Clogged outlet structure; ponding water	Remove and dispose of debris/trash/sediment to allow outlet to function properly
<b>Woody growth control /Weed removal</b>	Minimum twice annually	Noxious weeds; Unwanted vegetation	Treat w/herbicide or hand pull; consult a local Weed Inspector

## **Mowing**

Routine mowing of the turf grass embankments and turf grass located in the sedimentation chamber is necessary to improve the overall appearance of the SFB and ensure proper performance of the sediment chamber. Turf grass should be mowed to a height of 2 to 4-inches and shall be bagged to prevent potential contamination of the filter media.

*Frequency* – Routine - Minimum of twice annually or depending on aesthetics.



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## **Trash/Debris Removal**

Trash and debris must be removed from the entire SFB area to minimize outlet clogging and to improve aesthetics. This activity must be performed prior to mowing operations.

*Frequency* – Routine – Prior to mowing operations and minimum of twice annually.

## **Splitter Box/Overflow Outlet Works Cleaning**

Debris and other materials can clog the splitter box/overflow outlet work's grate. This activity must be performed anytime other maintenance activities are conducted to ensure proper operation.

*Frequency* - Routine – After significant rainfall event or concurrently with other maintenance activities.

## **Woody Growth Control/Weed Removal**

Noxious weeds and other unwanted vegetation must be treated as needed throughout the SFB. This activity can be performed either through mechanical means (mowing/pulling) or with herbicide. Consultation with a local County Weed Inspector is highly recommended prior to the use of herbicide. Herbicides should be utilized sparingly and as a last resort. All herbicide applications should be in accordance with the manufacturer's recommendations.

*Frequency* – Routine – As needed based on inspections.

## **Minor Maintenance Activities**

This work consists of a variety of isolated or small-scale maintenance/operational problems. Most of this work can be completed by a small crew, hand tools, and small equipment. These items require prior approval from Arapahoe County. Completed inspection and maintenance forms shall be submitted to Arapahoe County for each inspection and maintenance period. In the event that the SFB needs to be dewatered, care should be given to ensure sediment, filter material and other pollutants are not discharged. All dewatering activities shall be coordinated with Arapahoe County.

**TABLE SFB-3  
Summary of Minor Maintenance Activities**

<b>Maintenance Activity</b>	<b>Minimum Frequency</b>	<b>Look for:</b>	<b>Maintenance Action</b>
<b>Sediment/Pollutant Removal</b>	As needed; typically every 1 –2 years	Sediment build-up in sedimentation chamber and filter media; decrease in infiltration rate	Remove and dispose of sediment
<b>Erosion Repair</b>	As needed, based upon inspection	Rills/gullies on embankments or sedimentation in the forebay	Repair eroded areas & revegetate; address cause
<b>Jet-Vac/Cleaning Underdrains</b>	As needed, based upon inspection	Sediment build-up /non-draining system	Clean drains; Jet-Vac if needed

## **Sediment Removal/Pollutant Removal**

Sediment removal is necessary to ensure proper function of the filter media. The infiltration rate of the SFB needs to be checked in order to ensure proper functioning of the SFB. Generally, a SFB should drain completely within 12-hours of a storm event. If drain times exceed the 12-hour drain time than maintenance of the filter media shall be required.

## **BERRY CREEK HIGHLANDS WATER POLLUTION ABATEMENT PLAN**

At a minimum, the top 3-inches of filter media should be removed at each removal period. Additional amounts of filter media may need to be removed if deeper sections of the filter media are contaminated. New filter media will need to be placed back into the SFB when the total amount of sand removed reaches 9-inches. This may take multiple maintenance events to accomplish. It is critical that only sand that meets the American Society for Testing and Materials (ASTM) C-33 standard be utilized in the replacement of the filter media.

### **ASTM C-33 Sand Standard**

<b>US Standard Sieve Size (Number)</b>	<b>Total Percent Passing (%)</b>
9.5mm (3/8 inch)	100
4.75 mm (No. 4)	95-100
2.36 mm (No. 8)	80-100
1.18 mm (No. 16)	50-85
600 µm (No. 30)	25-60
300 µm (No. 50)	10-30
150 µm (No. 100)	2-10

Other types of sand and soil material may lead to clogging of the SFB. The minor sediment removal activities can typically be addressed with shovels, rakes and smaller equipment. Major sediment removal activities will require larger and more specialized equipment. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur. The major sediment removal activities will also require surveying with an engineer's level, and consultation with Arapahoe County Engineering Staff to ensure design volumes/grades are achieved.

Stormwater sediments removed from SFBs do not meet the regulatory definition of "hazardous waste". However, these sediments can be contaminated with a wide array of organic and inorganic pollutants and handling must be done with care to ensure proper removal and disposal. Sediments should be transported by motor vehicle only after they are dewatered. All sediments must be taken to a licensed landfill for proper disposal. Should a spill occur during transportation, prompt and thorough cleanup and disposal is imperative.

*Frequency* – Non-routine – As necessary, based upon inspections. Sediment removal in the sedimentation chamber may be necessary as frequently as every 1-2 years.

## **Erosion Repair**

The repair of eroded areas is necessary to ensure the proper functioning of the SFB, to minimize sediment transport, and to reduce potential impacts to other features. Erosion can vary in magnitude from minor repairs to filter media and embankments, to rills, and gullies in the embankments and inflow points. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap, concrete, and sod. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur. Major erosion repair to the pond embankments, spillways, and adjacent to structures will require consultation with Arapahoe County Engineering Staff.

*Frequency* – Non-routine – As necessary, based upon inspections.

## **Jet-Vac/Clearing Drains**

A SFB contains an underdrain system that allows treated stormwater runoff to exit the facility. These underdrain systems can develop blockages that can result in a decrease of hydraulic capacity and also create standing water. Many times the blockage to this infrastructure can be difficult to access and/or clean. Specialized equipment (jet-vac machines) may be necessary to clear debris from these difficult areas.

*Frequency* – Non-routine – As necessary, based upon inspections.

## **INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN**

## **Major Maintenance Activities**

This work consists of larger maintenance/operational problems and failures within the stormwater management facilities. All of this work requires approval from Arapahoe County Engineering to ensure the proper maintenance is performed. This work requires that Engineering Staff review the original design and construction drawings to assess the situation and assign the necessary maintenance activities. This work may also require more specialized maintenance equipment, design/details, surveying, or assistance through private contractors and consultants. In the event that the basin needs to be dewatered, care should be given to ensure sediment, filter material and other pollutants are not discharged. Consultation with Arapahoe County is required prior to any dewatering activity.

**TABLE SFB-4  
Summary of Major Maintenance Activities**

<b>Maintenance Activity</b>	<b>Minimum Frequency</b>	<b>Look for:</b>	<b>Maintenance Action</b>
<b>Major Sediment/Pollutant Removal</b>	As needed - based upon scheduled inspections	Large quantities of sediment in the sedimentation chamber and/or filter media; reduced infiltration rate /capacity	Remove and dispose of sediment. Repair vegetation as needed
<b>Major Erosion Repair</b>	As needed – based upon scheduled inspections	Severe erosion including gullies, excessive soil displacement, areas of settlement, holes	Repair erosion – find cause of problem and address to avoid future erosion
<b>Structural Repair</b>	As needed – based upon scheduled inspections	Deterioration and/or damage to structural components – broken concrete, damaged pipes & outlet works	Structural repair to restore the structure to its original design
<b>SFB Rebuild</b>	As needed – due to complete failure of SFB	Removal of filter media and underdrain system	Contact Arapahoe County Engineering

## **Major Sediment/Pollutant Removal**

In very rare cases the filter media of the SFB may be contaminated so badly that the entire 18-inches of the filter media may need to be removed.

Major sediment/pollutant removal consists of removal of large quantities of sediment/filter media. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur. The sediment/filter media needs to be carefully removed, transported and properly disposed. Vegetated areas need special care to ensure design volumes and grades are preserved or may need to be replaced due to the removal activities. Stormwater sediments removed from SFBs do not meet the regulatory definition of “hazardous waste”. However, these sediments can be contaminated with a wide array of organic and inorganic pollutants and handling must be done with care to insure proper removal and disposal. Sediments should be transported by motor vehicle only after they are dewatered. All sediments must be taken to a licensed landfill for proper disposal. Should a spill occur during transportation, prompt and thorough cleanup and disposal is imperative.

*Frequency* – Non-routine – Repair as needed, based upon inspections.

**BERRY CREEK HIGHLANDS  
WATER POLLUTION ABATEMENT PLAN**

**Major Erosion Repair**

Major erosion repair consists of filling and revegetating areas of severe erosion. Determining the cause of the erosion as well as correcting the condition that caused the erosion should also be part of the erosion repair. Care should be given to ensure design grades and volumes are preserved. Extreme care should be taken when utilizing motorized or heavy equipment to ensure damage to the underdrain system does not occur.

*Frequency* – Non-routine – Repair as needed, based upon inspections.

**Structural Repair**

A SFB generally includes a splitter box or concrete overflow outlet structure that can deteriorate or be damaged during the service life of the facility. These structures are constructed of steel and concrete that can degrade or be damaged and may need to be repaired or re-constructed from time to time. Major repairs to structures may require input from a structural engineer and specialized contractors. Consultation with Arapahoe County Engineering Staff shall take place prior to all structural repairs.

*Frequency* – Non-routine – Repair as needed, based upon inspections.

**SFB Rebuild**

In very rare cases a SFB may need to be rebuilt. Generally, the need for a complete rebuild is a result of improper construction, improper maintenance resulting in structural damage to the underdrain system, or extensive contamination of the SFB. Consultation with Arapahoe County Engineering Staff shall take place prior to any rebuild project.

*Frequency* – Non-routine – As needed, based upon inspections.

## ***Attachment H***

### ***Pilot-Scale Field Testing Plan***

The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site; therefore pilot-scale field testing is not required.

## ***Attachment I***

### ***Measures for Minimizing Surface Stream Contamination***

There are no sensitive features or surface streams within the boundaries of the project, however, Berry Creek is one mile away from the project location. Therefore, the temporary onsite BMPs will be used to treat stormwater runoff before it leaves the project area and will prevent pollutants from entering surface streams or any sensitive features down-gradient of the site.



# SECTION 8: ADDITIONAL FORMS

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

I Brandon Jenkins  
Print Name

Authorized Signatory  
Title - Owner/President/Other

of FR Berry Hills, LLC  
Corporation/Partnership/Entity Name

have authorized Jacob Kondo  
Print Name of Agent/Engineer

of Kimley-Horn  
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.

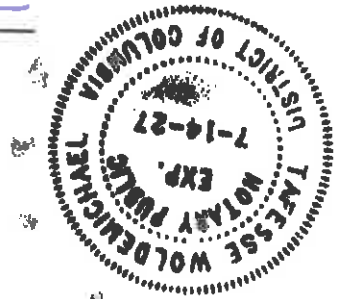
I also understand that:

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:

*Brandon Jenkins*  
Applicant's Signature

7/22/22  
Date



THE STATE OF Washington Dc  
County of District of Columbia

BEFORE ME, the undersigned authority, on this day personally appeared ☒ Brandon Jenkins 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 21<sup>st</sup> day of JULY, 2022

*Tatesse Woldemichael*  
NOTARY PUBLIC

Tatesse Woldemichael  
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 7-14-2027

# Application Fee Form

## Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Berry Creek Highlands Phase 3

Regulated Entity Location: 2451 State Highway 195, Georgetown, TX 78633

Name of Customer: FR Berry Hills, LLC

Contact Person: Jacob Kondo

Phone: 512-418-1771

Customer Reference Number (if issued): CN N/A

Regulated Entity Reference Number (if issued): RN N/A

### 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

☐ San Antonio Regional Office

☐ Mailed to: TCEQ - Cashier

☐ Overnight Delivery to: TCEQ - Cashier

Revenues Section

Mail Code 214

P.O. Box 13088

Austin, TX 78711-3088

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

<i>Type of Plan</i>	<i>Size</i>	<i>Fee Due</i>
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	16.885 Acres	\$ 4,000
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	\$
Sewage Collection System	2,367 L.F.	\$ 1,183.50
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: 

Date: 09/14/2023

## ***Application Fee Schedule***

Texas Commission on Environmental Quality

Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

### **Water Pollution Abatement Plans and Modifications**

#### **Contributing Zone Plans and Modifications**

<i>Project</i>	<i>Project Area in Acres</i>	<i>Fee</i>
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**

<i>Project</i>	<i>Cost per Linear Foot</i>	<i>Minimum Fee- Maximum Fee</i>
Sewage Collection Systems	\$0.50	\$650 - \$6,500

#### **Underground and Aboveground Storage Tank System Facility Plans and Modifications**

<i>Project</i>	<i>Cost per Tank or Piping System</i>	<i>Minimum Fee- Maximum Fee</i>
Underground and Aboveground Storage Tank Facility	\$650	\$650 - \$6,500

#### **Exception Requests**

<i>Project</i>	<i>Fee</i>
Exception Request	\$500

#### **Extension of Time Requests**

<i>Project</i>	<i>Fee</i>
Extension of Time Request	\$150



***Check Payable to the "Texas Commission on Environmental Quality"***





***Core Data Form***



TCEQ Use Only

# TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

## SECTION I: General Information

<b>1. Reason for Submission</b> (If other is checked please describe in space provided.)	
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)	
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other
<b>2. Customer Reference Number (if issued)</b>	<b>3. Regulated Entity Reference Number (if issued)</b>
CN	RN

[Follow this link to search for CN or RN numbers in Central Registry\\*\\*](#)

## SECTION II: Customer Information

<b>4. General Customer Information</b>		<b>5. Effective Date for Customer Information Updates</b> (mm/dd/yyyy)		9/19/2023	
<input checked="" type="checkbox"/> New Customer		<input type="checkbox"/> Update to Customer Information		<input type="checkbox"/> Change in Regulated Entity Ownership	
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)					
<b>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).</b>					
<b>6. Customer Legal Name</b> (If an individual, print last name first: eg: Doe, John)				<i>If new Customer, enter previous Customer below:</i>	
FR Berry Hills, LLC					
<b>7. TX SOS/CPA Filing Number</b>		<b>8. TX State Tax ID</b> (11 digits)		<b>9. Federal Tax ID</b> (9 digits)	
0804658531		32085556457			
<b>11. Type of Customer:</b>		<input checked="" type="checkbox"/> Corporation		<input type="checkbox"/> Individual	
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other		<input type="checkbox"/> Sole Proprietorship		Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited	
<b>12. Number of Employees</b>		<input type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input checked="" type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<b>13. Independently Owned and Operated?</b>	
				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<b>14. Customer Role</b> (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following					
<input type="checkbox"/> Owner		<input type="checkbox"/> Operator		<input checked="" type="checkbox"/> Owner & Operator	
<input type="checkbox"/> Occupational Licensee		<input type="checkbox"/> Responsible Party		<input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:	
<b>15. Mailing Address:</b>	11 Dupont Circle NW, Suite 900				
	City	Washington	State	DC	ZIP
<b>16. Country Mailing Information</b> (if outside USA)		<b>17. E-Mail Address</b> (if applicable)			
		frank.delcastillo@ashtonwoods.com			
<b>18. Telephone Number</b>		<b>19. Extension or Code</b>		<b>20. Fax Number</b> (if applicable)	
( 512 ) 450-4916				( ) -	

## SECTION III: Regulated Entity Information

<b>21. General Regulated Entity Information</b> (If 'New Regulated Entity' is selected below this form should be accompanied by a permit application)	
<input checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information	
<b>The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).</b>	
<b>22. Regulated Entity Name</b> (Enter name of the site where the regulated action is taking place.)	
Berry Creek Highlands Phase 3	

23. Street Address of the Regulated Entity: (No PO Boxes)	Highway 195							
	City	Georgetown	State	TX	ZIP	78626	ZIP + 4	
24. County								

**Enter Physical Location Description if no street address is provided.**

25. Description to Physical Location:	State HWY 195 and Bonnet Lane								
26. Nearest City	Georgetown				State	TX		Nearest ZIP Code	78626
27. Latitude (N) In Decimal:	30.723943			28. Longitude (W) In Decimal:	-97.684738				
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
30	43	26.1948	97	41	5.0604				
29. Primary SIC Code (4 digits)	30. Secondary SIC Code (4 digits)		31. Primary NAICS Code (5 or 6 digits)		32. Secondary NAICS Code (5 or 6 digits)				
1521	1522		236115						
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)									
Single-Family Residential Homes									
34. Mailing Address:	11 Dupont Circle NW, Suite 900								
	City	Washington	State	DC	ZIP	20036	ZIP + 4		
35. E-Mail Address:	frank.delcastillo@ashtonwoods.com								
36. Telephone Number	37. Extension or Code		38. Fax Number (if applicable)						
( 512 ) 450-4916			( ) -						

**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.

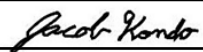
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

#### **SECTION IV: Preparer Information**

40. Name:	Jacob Kondo, P.E.	41. Title:	Project Manager
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
( 737 ) 471-0326		( ) -	jacob.kondo@kimley-horn.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:	Kimley-Horn	Job Title:	Project Manager
Name (In Print):	Jacob Kondo, P.E.	Phone:	( 737 ) 471- 0326
Signature:		Date:	09/19/2023

# SECTION 9: EXHIBITS















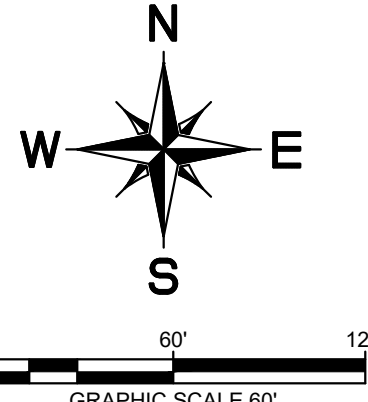
Plotted By:Massey, Mason Date:September 25, 2023 04:54:47pm File Path:K:\You\_civil\067782805\_berry\_creek\_highlands\Coat-Phase 3\plannotes\GC-General Notes.dwg  
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and consent of Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

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## LEGEND

	PHASE LINE
	LIMITS OF CONSTRUCTION
	PROPOSED WALL
	CW CONCRETE WASHOUT
	SS STAGING AND SPOILS AREA
	IP INLET PROTECTION
	SF SILT FENCE
	TP TREE PROTECTION SEE SHEET C-07
	TP TREE PROTECTION SEE SHEET C-07
	CE STABILIZED CONSTRUCTION ENTRANCE
	TREE TO BE REMOVED
	TREE TO BE RETAIN
	HERITAGE TREE
	RB ROCK BERM
	FLOW ARROW

NOTE

1. FOR TREE PROTECTION SEE SHEET C-07
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION/SEDIMENTATION CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
3. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATA FOR EACH EMPLOYED (WHETHER CALLED OUT ON ORIGINAL PERMIT OR NOT) DIRECTLY ON THE SITE MAP.
4. THE ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON SITE TO KEEP PROJECT IN COMPLIANCE WITH THE EROSION CONTROL ACT, RULES AND REGULATIONS.
5. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURE DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING AS PER THE CITY OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
6. PERMITS FOR PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AT THE EARLIEST POSSIBLE TIME DURING THE CONSTRUCTION SEQUENCE AS AN EXAMPLE, PERMETER SILT FENCE SHALL BE INSTALLED BEFORE THE IMPLEMENTATION OF ANY OTHER STABILIZATION PRACTICES. WHEN INSTALLED SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDINGS AND FURNISHING.
7. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER. FOR EXAMPLE, SILT FENCES LOCATED AT TOE OF SLOPE AND INLET DITCHES ARE NOT FOR INLET DITCHES OR CONCENTRATED FLOW AREAS.
8. ADDITIONAL EROSION AND SEDIMENTATION CONTROLS MAY BE REQUIRED BY THE CITY DURING CONSTRUCTION.
9. REFERENCE EROSION CONTROL DETAILS SHEET C-33.
10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TARP OR REVEGETATION MATTING (CLASS 1 A & B.3, SECTION 5.1). THE CONTRACTOR WILL CLEAN UP SPOILS AND DEBRIS ON SITE FOR INLET DITCHES AND CONCENTRATED FLOW AREAS.
11. USE J-COOKS WHERE SILT FENCE CANNOT BE INSTALLED PARALLEL TO THE EXISTING CONTOURS.
12. CONTRACTOR TO MAINTAIN AND UPDATE AS NECESSARY PER TCQO REQUIREMENTS.
13. CONTRACTOR TO INSTALL, MAINTAIN AND UPDATE PROPOSED SILT FENCE AS NECESSARY PER TCQO REQUIREMENTS.
14. ALL SILT FENCE IS REQUIRED TO BE FABRIC PRODUCT AND NOT WOVEN MATERIAL.

## EROSION CONTROL MEASURES SEQUENCING

BEFORE ANY SITE GRADING ACTIVITIES

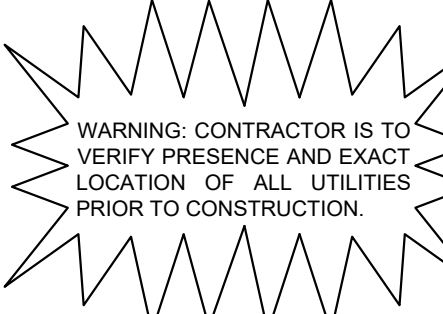
2. INSTALL STORM DRAIN INLET PROTECTION
3. CONSTRUCTION STABILIZED CONSTRUCTION ENTRANCE
4. CONSTRUCT SEDIMENT BASINS

## SITE GRADING

2. BEGIN OVERALL SITE GRADING
3. ESTABLISH TOP SOIL STOCKPILE
4. INSTALL SILT FENCE AROUND STOCKPILES
5. DISTURBED AREAS WHERE CONSTRUCTION WILL CEASE FOR MORE THAN 14 DAYS SHALL BE STABILIZED WITH EROSION CONTROL S



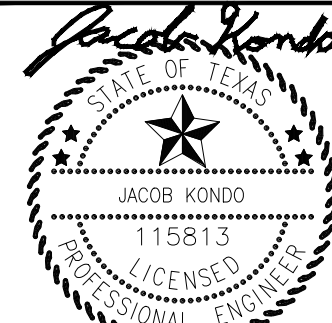
Know what's below.  
**Call** before you dig.



WARNING: CONTRACTOR MUST  
VERIFY PRESENCE AND EXACT  
LOCATION OF ALL UTILITIES  
PRIOR TO CONSTRUCTION


# Kimley» Horn

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0814 JOLLYMILLE ROAD, AVALLON IV, SUITE 300, AUSTIN, TX 78759  
PHONE: 512-418-1771 FAX: 512-418-1791  
[WWW.KIMLEY-HORN.COM](http://WWW.KIMLEY-HORN.COM)



KHA PROJECT 069291006	DATE SEPTEMBER 2023	SCALE: AS SHOWN	DESIGNED BY: MDM	DRAWN BY: MDM
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## ESPOSIZIONI CONTRO I PIÙ ANI

# BERRY CREEK

# GHI ANDS

CITY OF GEORGETOWN

SHEET NUMBER  
**C-06**  
OF C-37

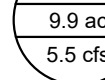








2023-XX-CO



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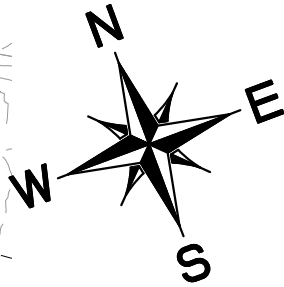
**Existing Condition:**  
Open Space; Type D soil group with a CN OF 77.

Existing Drainage Basin SC-M and SC-O conform to previously approved drainage analysis within the Sun City Neighborhood development.

	AREA DESIGNATOR AREA IN ACRES Q100 FLOW IN CFS
	PROPERTY LINE
	EXISTING STORM SEWER LINE
	EXISTING DRAINAGE DIVIDE
	EXISTING STORM SEWER INLET
	EXISTING STORM SEWER MANHOLE
	EXISTING STORM SEWER HEADWALL
	EXISTING FLOW DIRECTION
	EXISTING CONTOUR

**TBM# 101** ☒ SET IN HEADWALL OF CULVERT  
LOCATED IN THE MEDIAN OF STATE HIGHWAY AND  
BONNET LANE.  
ELEVATION = 821.82 FEET (AS SHOWN)

**TBM# 102** "RAIL ROAD SPIKE" IN POWER POLE LOCATED  
3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)



0 200' 400'

GRAPHIC SCALE 200'

2023-XX-COM



Plotted By:Massey, Mason. Date:September 25, 2023 04:57:19pm. File Path:K:\you\_civil\067782806\berry\_creek\_highlands\cod\Phase 3\plan\sheet\c--Drainage Area Map-Existing.dwg  
This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Overall Drainage Calculations

DRAINAGE AREA	AREA	AREA	IMPERVIOUS COVER	IMPERVIOUS COVER	PERVIOUS CURVE NO.	WEIGHTED CURVE NO.	SHEET FLOW (GRASS)				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW				TOTAL Tc** (min)				
							P-2yr24hr		4.2	IN	Grass Surface		Paved Surface		Channel Flow		Channel Flow						
							N	L (ft)			F (ft)	Tt(min)	L (ft)	V (fps)	S (ft/ft)	Tt(min)	L	V (fps)		S	Tt(min)	L (ft)	V (fps)
PR SC-M	1,006,236	23.10	12.474	54.00	80	90	0.24	150	0.020	17.23	44	2.31	0.020	0.32	-	-	-	1231	6.0	-	3.42	20.97	
PR SC-O	858,132	19.70	0.197	1.00	80	80	0.13	300	0.024	17.08	430	1.84	0.013	3.00	-	-	-	1060	8.0	-	2.21	22.28	
PR A-1	147,668	3.39	0.120	3.54	80	81	0.24	300	0.023	28.20	180	2.37	0.022	1.26	-	-	-	330	6.0	-	0.92	30.38	
PR A-2	77,972	1.79	1.130	63.13	80	91	0.02	150	0.024	1.74	-	-	-	-	200	2.28	0.02	1.46	385	8.5	-	0.75	6.00
PR A-3	589,802	13.54	6.093	45.00	80	88	0.20	136	0.022	13.24	-	-	-	-	90	2.28	0.02	0.66	1769	8.5	-	3.46	17.36
PR A-4	1,953,230	44.84	1.469	3.28	80	81	0.24	300	0.023	28.20	1233	1.89	0.014	10.86	-	-	-	441	6.0	-	1.23	40.28	
PR A-5	2,760,397	63.37	22.490	35.49	80	86	0.20	110	0.018	12.07	-	-	-	-	210	2.87	0.02	1.22	2550	8.5	-	4.99	18.28
PR A-6	1,701,454	39.06	17.578	45.00	80	88	0.20	134	0.022	13.04	-	-	-	-	384	2.87	0.02	2.23	2480	8.5	-	4.86	20.13
PR A-7	571,507	13.12	1.697	12.93	80	82	0.20	100	0.020	10.77	215	2.20	0.019	1.63	-	-	-	-	-	-	-	-	12.39
PR A-8	133,917	3.07	1.383	45.00	80	88	0.20	100	0.022	10.36	-	-	-	-	-	-	-	-	-	-	-	-	10.36
PR A-9	74,547	1.71	0.770	45.00	80	88	0.20	100	0.022	10.36	-	-	-	-	-	-	-	-	-	-	-	-	10.36

Proposed Condition:

Pervious: Open space (lawns, parks, golf courses, cemeteries, etc.): Fair condition (grass cover 50% to 75%), Type D soil group with a Cn of 80.

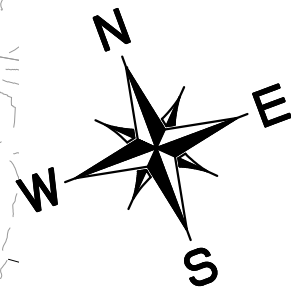
Impervious: Paved parking lots, roofs, driveways, etc. (excluding right of way): Cn of 98

Proposed drainage basins assumed to have a Cn value of 90 based on Residential Districts 1/8 acre or less from the City of Georgetown DCM.

\*Cn Values based on the City of Georgetown Drainage Criteria Manual

\*\*The minimum Tc is 6 minutes per the City of Georgetown Drainage Criteria Manual

Point of Analysis	Total Drainage Area (Acres)	Total Impervious Cover Area (acres)	Impervious Area (%)	Time of Concentration (min)	Storm Event	Developed Runoff (With Detention) (cfs)
A	231.84	65.40	28.21%	23.43	2	215.31
					10	475.32
					25	651.40
					100	949.33



LEGEND

	AREA DESIGNATOR AREA IN ACRES Q100 FLOW IN CFS
	INLET NUMBER
	PROPERTY LINE
	PROPOSED STORM SEWER LINE
	EXISTING STORM SEWER LINE
	PROPOSED DRAINAGE DIVIDE
	PROPOSED STORM SEWER INLET
	PROPOSED STORM SEWER MANHOLE
	PROPOSED STORM SEWER HEADWALL
	PROPOSED FLOW DIRECTION
	PROPOSED CONTOUR
	EXISTING CONTOUR

DRAINAGE AREA A-5

PHASE	IMPERVIOUS COVER (AC.)
PHASE 3	9.7900

BENCHMARKS

TBM# 101 "SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BONNET LANE.  
ELEVATION = 821.82 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED 3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN 3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

**Kimley»Horn**

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PHONE: 512-418-1771 FAX: 512-418-791  
WWW.KIMLEY-HORN.COM  
TEXAS REGISTERED ENGINEERING FIRM F-928



KHA PROJECT	069291006
DATE	SEPTEMBER 2023
SCALE	AS SHOWN
DESIGNED BY:	MDM
DRAWN BY:	MDM
CHECKED BY:	JRK

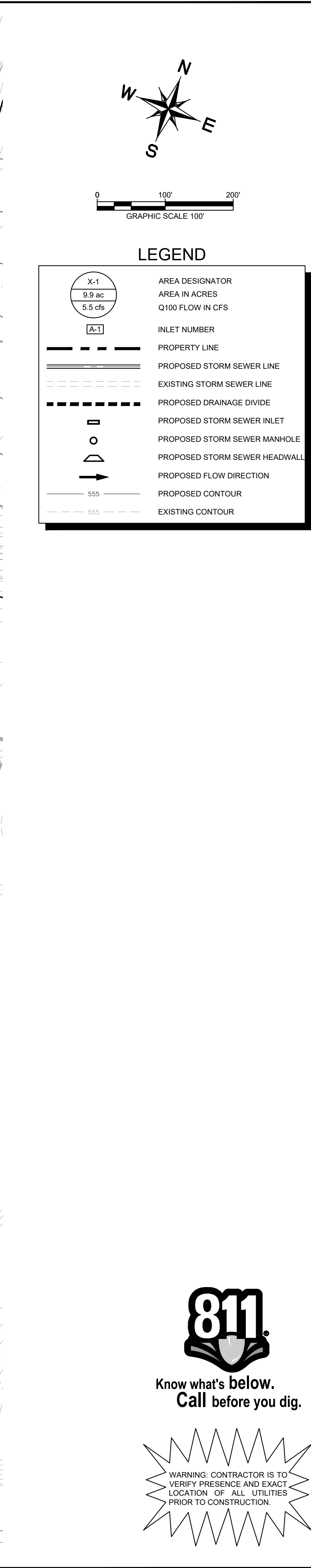
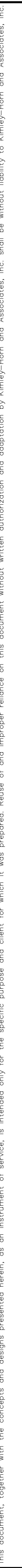
PROPOSED DRAINAGE  
AREA MAP

BERRY CREEK  
HIGHLANDS  
PHASE 3  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-15**  
OF C-37

2023-XX-CON





WARNING: CONTRACTOR IS TO  
VERIFY PRESENCE AND EXACT  
LOCATION OF ALL UTILITIES  
PRIOR TO CONSTRUCTION.

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Peak Flow Calculation - Rational Method						RUNOFF COEFFICIENT ( C )															RAINFALL INTENSITY (I)					
INLET DRAINAGE AREA	Area (Acres)	Street Length (FT)	Lot Coverage (FT²)	Impervious Cover (Acres)	% I.C.	C				SHEET FLOW (GRASS) N-2yr24hr				SHALLOW CONCENTRATED FLOW				TC (MIN)	I				Q			
						2-Year	10-Year	25-Year	100-Year	P	L (ft)	S (ft/ft)	Tt(min)	L (ft)	V (fps)	S (ft/ft)	Tt(min)		2-Year	10-Year	25-Year	100-Year	2-Year	10-Year	25-Year	100-Year
LAT SD-A1	0.150	270	0	0.13	86.8%	0.88	0.89	0.89	0.90	0.30	10	0.02	2.36	270	1.44	0.005	3.13	5.49	6.35	8.48	9.67	11.69	0.84	1.13	1.30	1.58
LAT SD-A2	0.800	135	31103	0.39	48.3%	0.63	0.66	0.68	0.71	0.30	250	0.02	30.98	135	1.44	0.005	1.57	32.56	3.09	4.43	5.24	6.50	1.57	2.34	2.83	3.70
LAT SD-A3	1.310	150	52987	0.62	47.3%	0.63	0.65	0.67	0.71	0.30	260	0.02	31.98	150	1.44	0.005	1.74	33.72	3.02	4.34	5.15	6.38	2.48	3.72	4.51	5.91
LAT SD-A4	0.970	150	36570	0.45	46.4%	0.62	0.65	0.66	0.70	0.30	260	0.02	31.98	150	1.44	0.005	1.74	33.72	3.02	4.34	5.15	6.38	1.82	2.73	3.32	4.35
LAT SD-A5	0.810	120	30783	0.38	46.4%	0.62	0.65	0.66	0.70	0.30	260	0.02	31.98	120	1.44	0.005	1.39	33.37	3.04	4.37	5.17	6.42	1.53	2.29	2.78	3.65
LAT SD-A6	0.630	284	8746	0.23	36.1%	0.55	0.59	0.61	0.65	0.30	50	0.02	8.55	284	2.34	0.032	2.03	10.58	5.27	7.16	8.26	10.06	1.84	2.64	3.15	4.12
LAT SD-A7	0.220	380	0	0.18	83.3%	0.86	0.87	0.87	0.89	0.30	10	0.02	2.36	380	2.34	0.032	2.71	5.07	6.46	8.62	9.81	11.85	1.22	1.65	1.89	2.31
LAT SD-A8	0.930	140	37070	0.45	48.4%	0.63	0.66	0.68	0.71	0.30	260	0.02	31.98	140	2.34	0.032	1.20	32.98	3.06	4.40	5.21	6.46	1.81	2.70	3.27	4.28
SD-A	0.790	150	30702	0.39	49.3%	0.64	0.67	0.68	0.72	0.30	260	0.02	31.98	150	2.34	0.032	1.07	33.05	3.06	4.39	5.20	6.45	1.55	2.31	2.80	3.65
SD-B	0.930	140	37317	0.45	48.7%	0.64	0.66	0.68	0.71	0.30	260	0.02	31.98	140	1.44	0.005	1.62	33.60	3.03	4.35	5.16	6.40	1.79	2.68	3.25	4.24
LAT SD-C1	0.490	100	18568	0.24	49.0%	0.64	0.66	0.68	0.71	0.30	150	0.02	20.60	100	1.44	0.005	1.16	21.76	3.86	5.41	6.34	7.81	1.21	1.76	2.11	2.74
LAT SD-C2	0.660	165	18754	0.27	41.4%	0.59	0.62	0.64	0.68	0.30	120	0.02	17.23	165	1.44	0.005	1.91	19.14	4.12	5.73	6.70	8.23	1.60	2.34	2.81	3.68
LAT SD-C3	0.300	528	0	0.25	84.8%	0.87	0.88	0.88	0.89	0.30	10	0.02	2.36	528	1.44	0.005	6.12	8.48	5.66	7.64	8.78	10.66	1.48	2.02	2.33	2.86
LAT SD-C4	0.740	180	27920	0.38	50.7%	0.65	0.67	0.69	0.72	0.30	120	0.02	17.23	180	1.44	0.005	2.09	19.32	4.10	5.71	6.67	8.20	1.97	2.85	3.40	4.39
SD-C	0.960	260	35870	0.50	51.7%	0.66	0.68	0.69	0.73	0.30	120	0.02	17.23	260	1.44	0.005	3.01	20.24	4.01	5.59	6.54	8.04	2.52	3.65	4.36	5.62
LAT SD-D1	0.190	290	0	0.14	73.6%	0.80	0.81	0.82	0.84	0.30	10	0.02	2.36	290	2.81	0.0191	1.72	5.00	6.48	8.64	9.84	11.88	0.98	1.33	1.53	1.89
SD-D	0.780	290	26971	0.42	53.6%	0.67	0.69	0.71	0.74	0.30	100	0.02	14.89	290	2.81	0.0191	1.72	16.61	4.40	6.08	7.08	8.68	2.29	3.28	3.90	5.00
LAT SD-E1	0.360	611	0	0.29	81.8%	0.85	0.86	0.87	0.88	0.30	50	0.02	8.55	611	1.44	0.005	7.08	15.64	4.52	6.23	7.25	8.88	1.39	1.93	2.26	2.81
SD-E	0.350	393	1585	0.21	58.8%	0.70	0.72	0.74	0.76	0.30	10	0.02	2.36	393	1.44	0.005	4.56	6.92	6.00	8.06	9.22	11.17	1.48	2.04	2.37	2.99
OS-1	0.160	0	0	0.00	0.0%	0.32	0.37	0.40	0.47	0.30	820	0.02	80.16	700	2.03	0.01	5.74	85.90	1.59	2.45	2.97	3.75	5.16	9.22	12.05	17.89

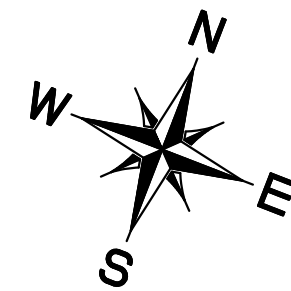
INLET FLOW CALCULATION TABLE (25-Yr Flows) PHASE 3																						
Parabolic Crown																						
Inlet No.	Inlet Type	Drainage Area No.	Street Width (FOC - FOC)	K0	K1	K2	Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Slope (%)	a (in.)	yo (ft.)	Ponded Width (ft)	R.F. (%)	Qa/La	La (ft)	Length (ft)	L/La	a/yo	Q/Qa	Q (cfs)	Q Pass (cfs)
1	Sump	LAT SD-A1	31'	2.85	0.50	3.03	1.3	0.0	1.3	0.50%	5.0	0.300	5.57	0	0.75	1.72	10	5.80	1.39	1.00	1.3	0.0
2	Grade	LAT SD-A2	31'	2.85	0.50	3.03	2.8	0.0	2.8	0.50%	5.0	0.387	7.94	0	0.85	3.35	10	2.99	1.08	1.00	2.8	0.0
3	Sump	LAT SD-A3	31'	2.85	0.50	3.03	4.5	0.0	4.5	0.50%	5.0	0.452	10.34	0	0.93	4.52	10	2.03	0.92	1.00	4.5	0.0
4	Grade	LAT SD-A4	31'	2.85	0.50	3.03	3.3	0.0	3.3	0.50%	5.0	0.408	8.62	0	0.87	3.82	10	2.62	1.02	1.00	3.3	0.0
5	Grade	LAT SD-A5	31'	2.85	0.50	3.03	2.8	0.0	2.8	0.50%	5.0	0.385	7.88	0	0.84	3.30	10	3.03	1.08	1.00	2.8	0.0
6	Grade	LAT SD-A6	31'	2.85	0.50	3.03	3.2	0.0	3.2	1.32%	5.0	0.342	6.63	0	0.80	3.96	10	2.53	1.22	1.00	3.2	0.0
7	Grade	LAT SD-A7	31'	2.85	0.50	3.03	1.9	0.0	1.9	1.32%	5.0	0.289	5.32	0	0.74	2.55	10	3.93	1.44	1.00	1.9	0.0
8	Grade	LAT SD-A8	31'	2.85	0.50	3.03	3.3	0.0	3.3	1.32%	5.0	0.346	6.75	0	0.80	4.08	10	2.45	1.20	1.00	3.3	0.0
9	Grade	SD-A	31'	2.85	0.50	3.03	2.8	0.0	5.2	1.32%	5.0	0.404	8.46	0	0.86	6.03	10	1.66	1.03	1.00	5.2	0.0
10	Grade	SD-B	31'	2.85	0.50	3.03	3.2	0.0	3.2	0.50%	5.0	0.406	8.53	0	0.86	3.76	10	2.66	1.03	1.00	3.2	0.0
11	Grade	LAT SD-C1	31'	2.85	0.50	3.03	2.1	0.0	2.1	0.50%	5.0	0.352	6.90	0	0.81	2.62	10	3.82	1.18	1.00	2.1	0.0
12	Grade	LAT SD-C2	31'	2.85	0.50	3.03	2.8	0.0	2.8	0.50%	5.0	0.387	7.91	0	0.84	3.33	10	3.00	1.08	1.00	2.8	0.0
13	Grade	LAT SD-C3	31'	2.85	0.50	3.03	2.3	0.0	2.3	0.50%	5.0	0.363	7.22	0	0.82	2.84	10	3.52	1.15	1.00	2.3	0.0
14	Grade	LAT SD-C4	31'	2.85	0.50	3.03	3.4	0.0	3.4	0.50%	5.0	0.412	8.74	0	0.87	3.90	10	2.56	1.11	1.00	3.4	0.0
15	Grade	SD-C	31'	2.85	0.50	3.03	4.4	0.0	4.4	0.50%	5.0	0.447	10.11	0	0.91	4.79	10	2.09	0.93	1.00	4.4	0.0
16	Grade	LAT SD-D1	31'	2.85	0.50	3.03	1.5	0.0	1.5	1.91%	5.0	0.254	4.53	0	0.71	2.17	10	4.61	1.64	1.00	1.5	0.0
17	Grade	SD-D	31'	2.85	0.50	3.03	3.9	0.0	3.9	1.91%	5.0	0.345	6.72	0	0.80	4.87	10	2.05	1.21	1.00	3.9	0.0
18	Grade	LAT SD-E1	31'	2.85	0.50	3.03	2.3	0.0	2.3	0.50%	5.0	0.360	7.12	0	0.82	2.77	10	3.61	1.16	1.00	2.3	0.0
19	Grade	SD-E	31'	2.85	0.50	3.03	2.4	0.0	2.4	0.50%	5.0	0.366	7.29	0	0.82	2.89	10	3.46	1.14	1.00	2.4	0.0

INLET FLOW CALCULATION TABLE (100-Yr Flows) PHASE 3																						
Parabolic Crown																						
Inlet No.	Inlet Type	Drainage Area No.	Street Width (FOC - FOC)	K0	K1	K2	Q (cfs)	Q Pass (cfs)	Q Total (Qa) (cfs)	Slope (%)	a (in.)	yo (ft.)	Ponded Width (ft)	Rf. (%)	Qa/La	La (ft)	Length (ft)	L/La	a/yo	Q/Qa	Q (cfs)	Q Pass (cfs)
1	Sump	LAT SD-A1	31'	2.85	0.50	3.03	1.6	0.0	1.6	0.50%	5.0	0.320	6.06	0	0.77	2.05	10	4.88	1.30	1.00	1.6	0.0
2	Grade	LAT SD-A2	31'	2.85	0.50	3.03	3.7	0.0	3.7	0.50%	5.0	0.423	9.16	0	0.88	4.18	10	2.39	0.98	1.00	3.7	0.0
3	Sump	LAT SD-A3	31'	2.85	0.50	3.03	5.9	0.0	5.9	0.50%	5.0	0.494	12.90	0	0.96	6.14	10	1.63	0.84	1.00	5.9	0.0
4	Grade	LAT SD-A4	31'	2.85	0.50	3.03	4.3	0.0	4.3	0.50%	5.0	0.466	10.09	0	0.91	4.78	10	2.09	0.93	1.00	4.3	0.0
5	Grade	LAT SD-A5	31'	2.85	0.50	3.03	3.6	0.0	3.6	0.50%	5.0	0.421	9.09	0	0.88	4.14	10	2.42	0.99	1.00	3.6	0.0
6	Grade	LAT SD-A6	31'	2.85	0.50	3.03	4.1	0.0	4.1	1.32%	5.0	0.374	7.52	0	0.83	4.96	10	2.02	1.12	1.00	4.1	0.0
7	Grade	LAT SD-A7	31'	2.85	0.50	3.03	2.3	0.0	2.3	1.32%	5.0	0.309	5.79	0	0.76	3.03	10	3.30	1.35	1.00	2.3	0.0
8	Grade	LAT SD-A8	31'	2.85	0.50	3.03	4.3	0.0	4.3	1.32%	5.0	0.378	7.66	0	0.84	5.12	10	1.95	1.10	1.00	4.3	0.0
9	Grade	SD-A	31'	2.85	0.50	3.03	3.6	0.0	5.2	1.32%	5.0	0.404	8.46	0	0.86	6.03	10	1.66	1.03	1.00	5.2	0.0
10	Grade	SD-B	31'	2.85	0.50	3.03	4.2	0.0	4.2	0.50%	5.0	0.443	9.94	0	0.91	4.69	10	2.13	0.94	1.00	4.2	0.0
11	Grade	LAT SD-C1	31'	2.85	0.50	3.03	2.7	0.0	2.7	0.50%	5.0	0.383	7.81	0	0.84	3.25	10	3.07	1.09	1.00	2.7	0.0
12	Grade	LAT SD-C2	31'	2.85	0.50	3.03	3.7	0.0	3.7	0.50%	5.0	0.422	9.13	0	0.88	4.16	10	2.40	0.99	1.00	3.7	0.0
13	Grade	LAT SD-C3	31'	2.85	0.50	3.03	2.9	0.0	2.9	0.50%	5.0	0.366	7.58	0	0.85	3.38	10	2.96	1.07	1.00	2.9	0.0
14	Grade	LAT SD-C4	31'	2.85	0.50	3.03	4.4	0.0	4.4	0.50%	5.0	0.448	10.15	0	0.91	5.02	10	2.08	0.93	1.00	4.4	0.0
15	Grade	SD-C	31'	2.85	0.50	3.03	5.6	0.0	5.6	0.50%	5.0	0.486	12.25	0	0.95	5.90	10	1.70	0.86	1.00	5.6	0.0
16	Grade	LAT SD-D1	31'	2.85	0.50	3.03	1.9	0.0	1.9	1.91%	5.0	0.272	4.93	0	0.72	2.61	10	3.83	1.53	1.00	1.9	0.0
17	Grade	SD-D	31'	2.85	0.50	3.03	5.0	0.0	5.0	1.91%	5.0	0.375	7.55	0	0.83	6.01	10	1.66	1.11	1.00	5.0	0.0
18	Grade	LAT SD-E1	31'	2.85	0.50	3.03	2.8	0.0	2.8	0.50%	5.0	0.386	7.91	0	0.84	3.33	10	3.01	1.08	1.00	2.8	0.0
19	Grade	SD-E	31'	2.85	0.50	3.03	3.0	0.0	3.0	0.50%	5.0	0.394	8.16	0	0.85	3.50	10	2.85	1.06	1.00	3.0	0.0

Texas Commission on Environmental Quality		Project Name: <b>Berry Creek Highlands Phase 3</b> Date Prepared: <b>9/19/2023</b>	
<b>TSS Removal Calculations 04-20-2009</b>			
Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell. Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348. Characters shown in red are data entry fields. Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.			
<b>1. The Required Load Reduction for the total project:</b>		Calculations from RG-348	Pages 3-27 to 3-30
Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$			
where:	$L_M$ TOTAL PROJECT = Required TSS removal resulting from the proposed development = 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 = <b>Williamson</b> Total project area included in plan = <b>16.89</b> acres Predevelopment impervious area within the limits of the plan = <b>0.00</b> acres Total post-development impervious area within the limits of the plan = <b>8.93</b> acres Total post-development impervious cover fraction = <b>0.53</b> $P$ = <b>32</b> inches		
	$L_M$ TOTAL PROJECT = <b>8258</b> lbs.		
* The values entered in these fields should be for the total project area.			
	Number of drainage basins / outfalls areas leaving the plan area = <b>1</b>		
<b>2. Drainage Basin Parameters (This information should be provided for each basin):</b>			
	Drainage Basin/Outfall Area No. = <b>1</b> Total drainage basin/outfall area = <b>222.91</b> acres Predevelopment impervious area within drainage basin/outfall area = <b>12.79</b> acres Post-development impervious area within drainage basin/outfall area = <b>63.25</b> acres Post-development impervious fraction within drainage basin/outfall area = <b>0.28</b> $L_M$ THIS BASIN = <b>46661</b> lbs.		
<b>3. Indicate the proposed BMP Code for this basin.</b>			
	Proposed BMP = <b>Wet Basin</b> Removal efficiency = <b>93</b> percent		Aqualogic Cartridge Filter Bioretention Contech StormFilter Constructed Wetland Extended Detention Grassy Swale Retention / Irrigation Sand Filter Stormceptor Vegetated Filter Strips Vortechs Wet Basin Wet Vault
<b>4. Calculate Maximum TSS Load Removed (<math>L_R</math>) for this Drainage Basin by the selected BMP Type.</b>			
	RG-348 Page 3-33 Equation 3.7: $L_R = (BMP \text{ efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$		
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		
	$A_C$ = <b>179.11</b> acres $A_i$ = <b>50.46</b> acres $A_p$ = <b>128.65</b> acres $L_R$ = <b>54026</b> lbs.		
<b>5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area</b>			
	Desired $L_M$ THIS BASIN = <b>47317</b> lbs. $F$ = <b>0.88</b>		
<b>6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area.</b>		Calculations from RG-348	Pages 3-34 to 3-36
	Rainfall Depth = <b>1.50</b> inches Post Development Runoff Coefficient = <b>0.25</b> On-site Water Quality Volume = <b>242473</b> cubic feet		
	Calculations from RG-348	Pages 3-36 to 3-37	
	Off-site area draining to BMP = <b>43.80</b> acres Off-site Impervious cover draining to BMP = <b>0.00</b> acres Impervious fraction of off-site area = <b>0.00</b> Off-site Runoff Coefficient = <b>0.02</b> Off-site Water Quality Volume = <b>4770</b> cubic feet		
	Storage for Sediment = <b>49448</b> Total Capture Volume (required water quality volume(s) x 1.20) = <b>296691</b> 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.			
<b>11. Wet Basins</b>		Designed as Required in RG-348	Pages 3-66 to 3-71
	Required capacity of Permanent Pool = <b>296691</b> cubic feet Required capacity at WQV Elevation = <b>539164</b> cubic feet	Permanent Pool Capacity is 1.20 times the WQV Total Capacity should be the Permanent Pool Capacity plus a second WQV.	

BERRY CREEK HIGHLANDS PHASE 3 CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS	DRAINAGE CALCULATIONS	KHA PROJECT 069291006  DATE SEPTEMBER 2023  SCALE: AS SHOWN DESIGNED BY: MDM DRAWN BY: MDM CHECKED BY: JRK		 <p>© 2017 KIMLEY-HORN AND ASSOCIATES, INC. 10814 JOLLYVILLE ROAD, AVALON IV, SUITE 300, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM TEXAS REGISTERED ENGINEERING FIRM F-928</p>	No.	REVISIONS	DATE	BY





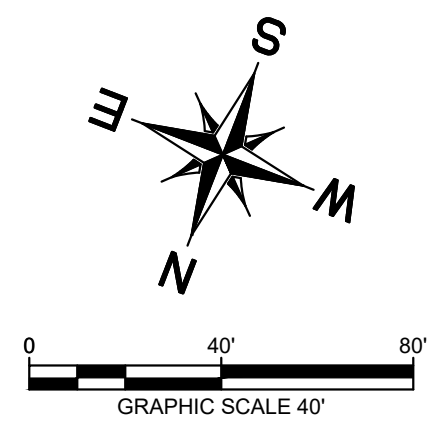
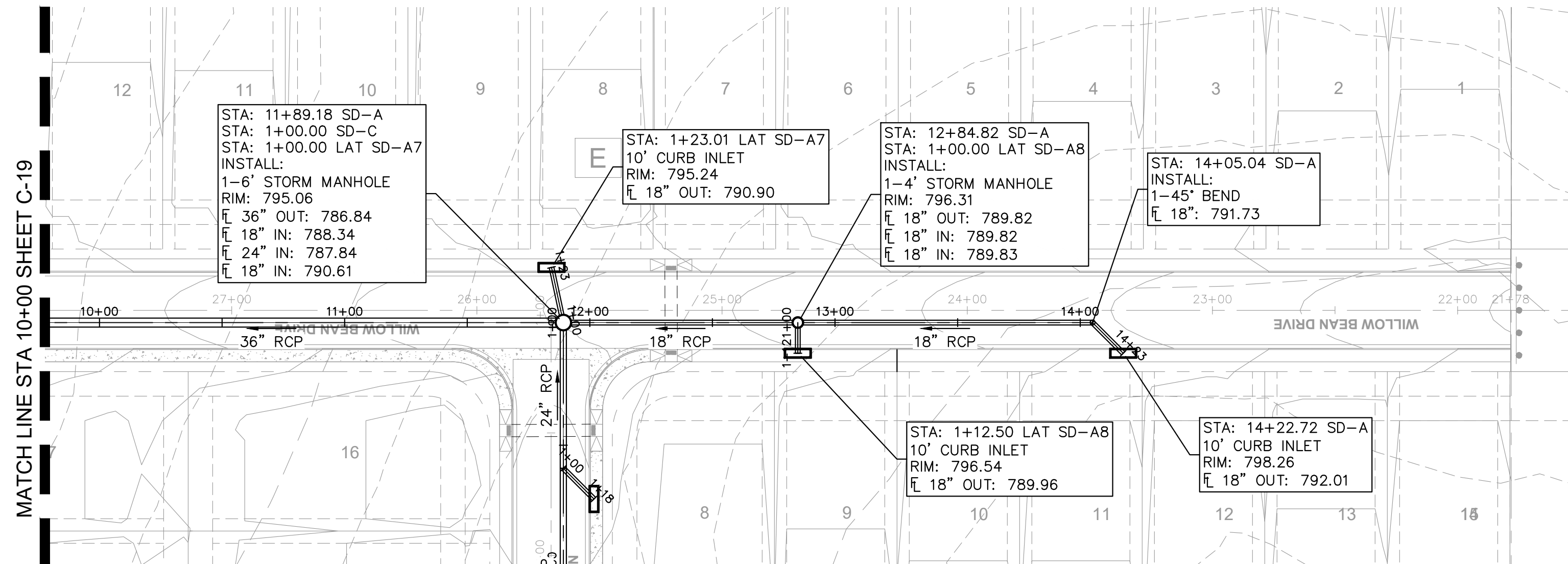
## LEGEND








































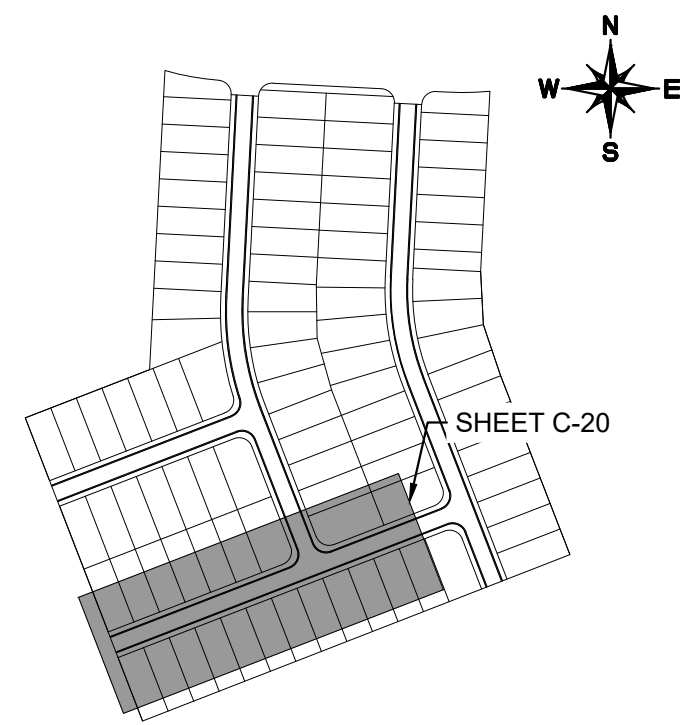






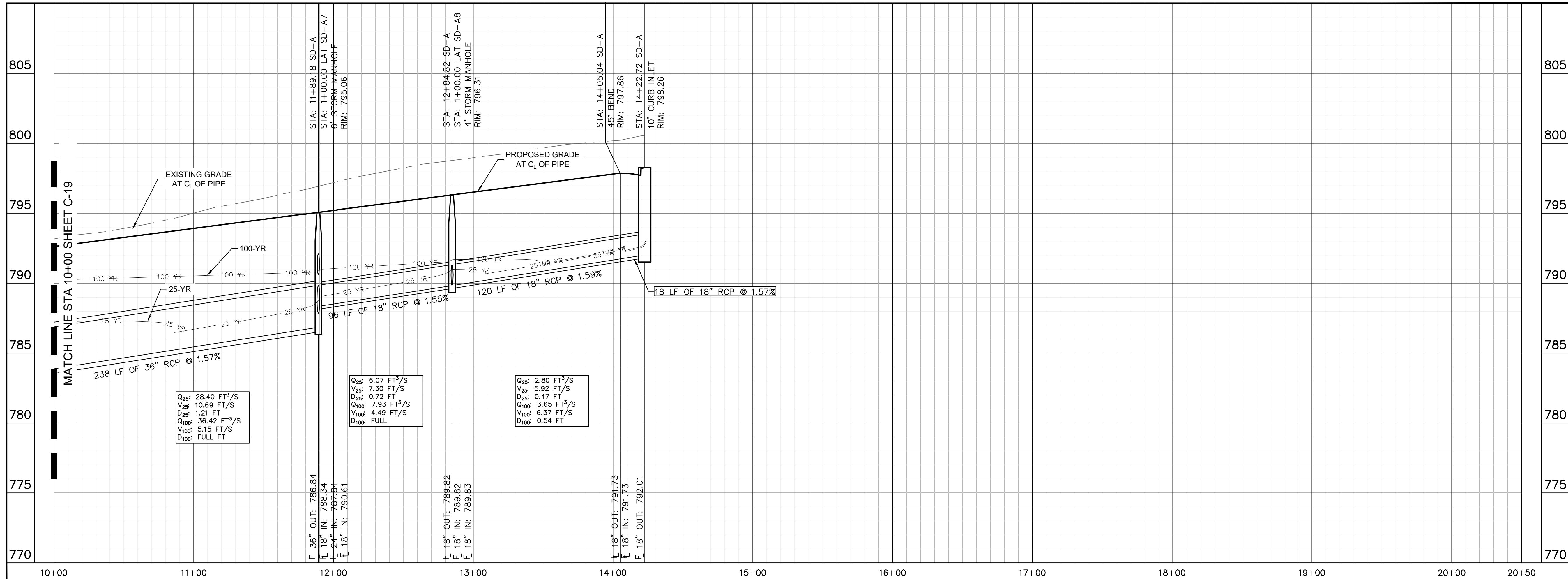
## LEGEND

	W	EXISTING WATER LINE
	UFO	EXISTING UNDERGROUND FIBER OPTIC LINE
	UGT	EXISTING UNDERGROUND TELEPHONE LINE
	GAS	EXISTING GAS LINE
	OHE	EXISTING OVERHEAD ELECTRIC LINE
		PROPOSED FIRE HYDRANT
	W	PROPOSED WATER LINE
	WW	PROPOSED SANITARY SEWER LINE
		PROPOSED STORM SEWER LINE
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		
		



**KEY MAP**  
N.T.S.

SD-A



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



## BENCHMARKS

TBM# 101 "X" SET IN HEADWALL OF CULVERT  
LOCATED IN THE MEDIAN OF STATE HIGHWAY AND  
BONNET LANE.  
ELEVATION = 821.82 FEET (AS SHOWN)

TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOC  
3.70' FROM THE EASTERLY CORNER OF THAT CERT  
3.703 ACRE TRACT.  
ELEVATION = 820.55 FEET (AS SHOWN)

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KHA PROJECT 069291006	DATE SEPTEMBER 2023	SCALE: AS SHOWN	DESIGNED BY: MDM	DRAWN BY: MDM	CHECKED BY: .IRK
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STORM PLAN & PROFILE -  
SD-A (SHEET 2 OF 2)

**BERRY CREEK  
HIGHLANDS  
PHASE 3**  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-20**  
OF C-37

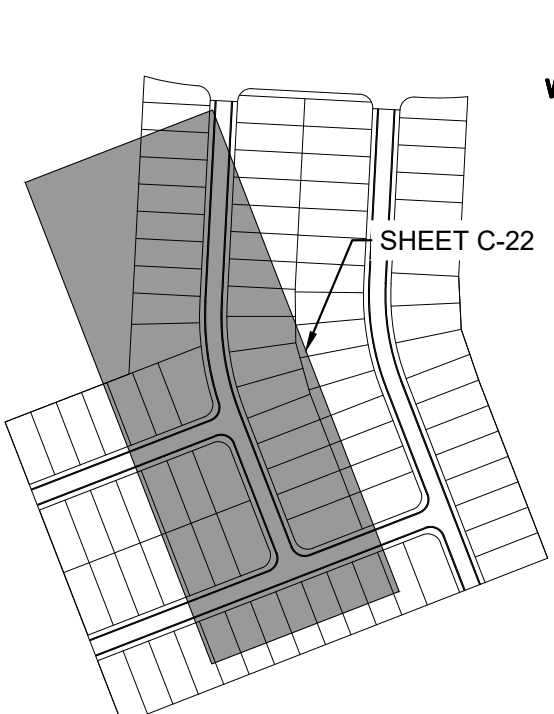
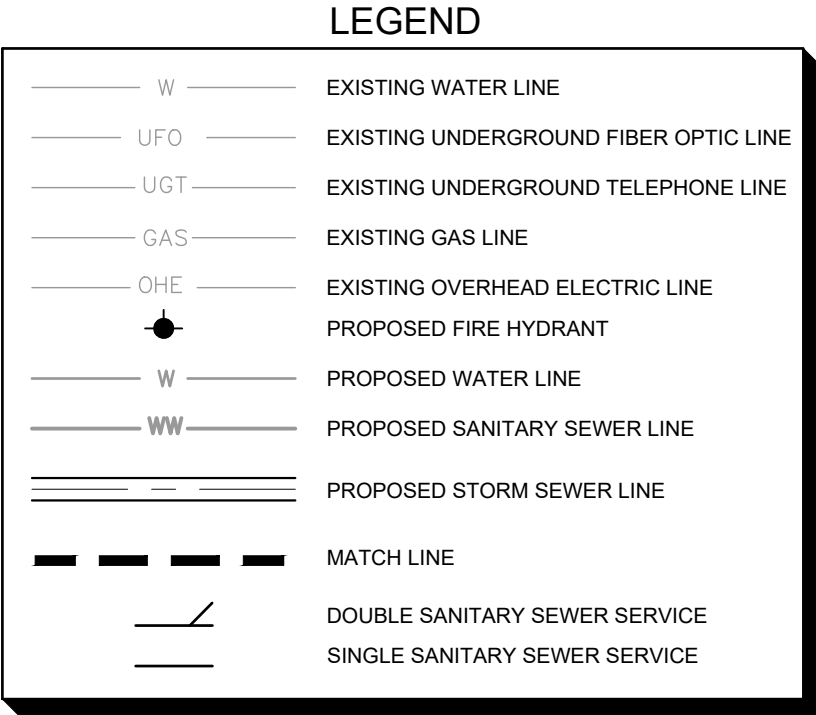
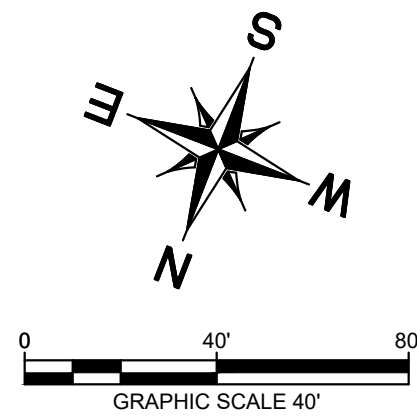
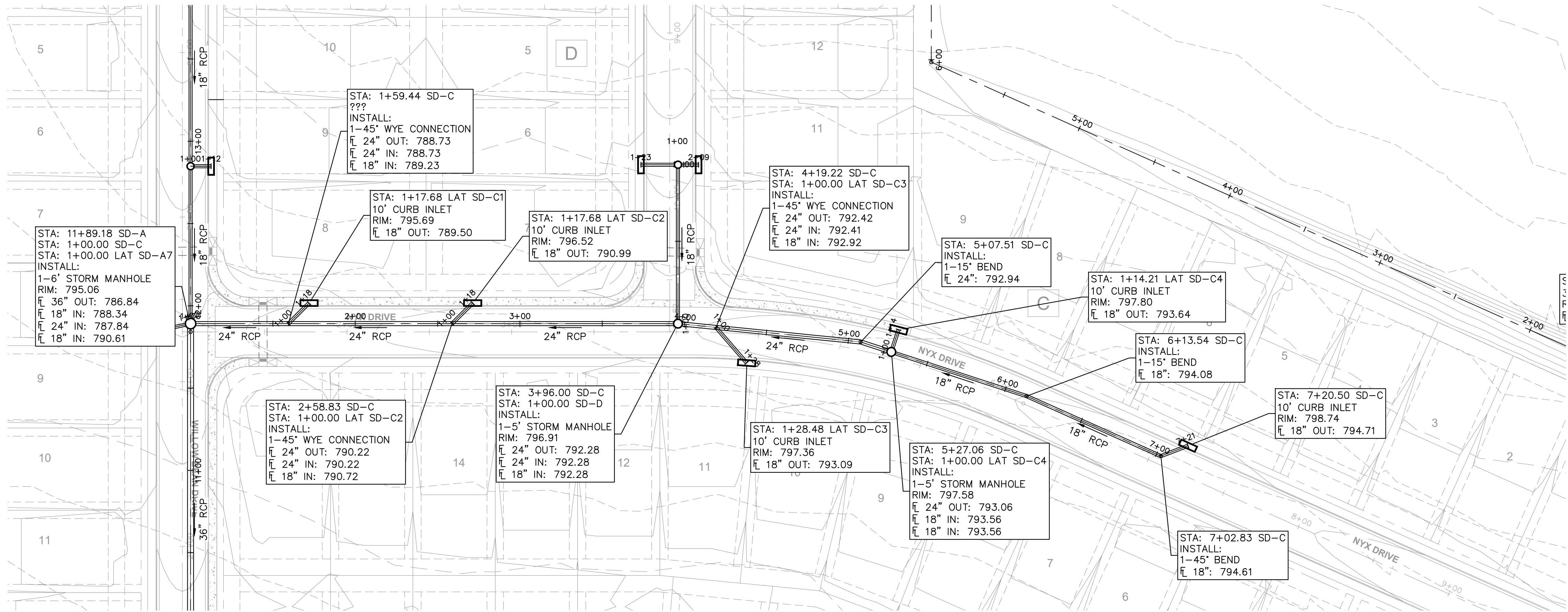
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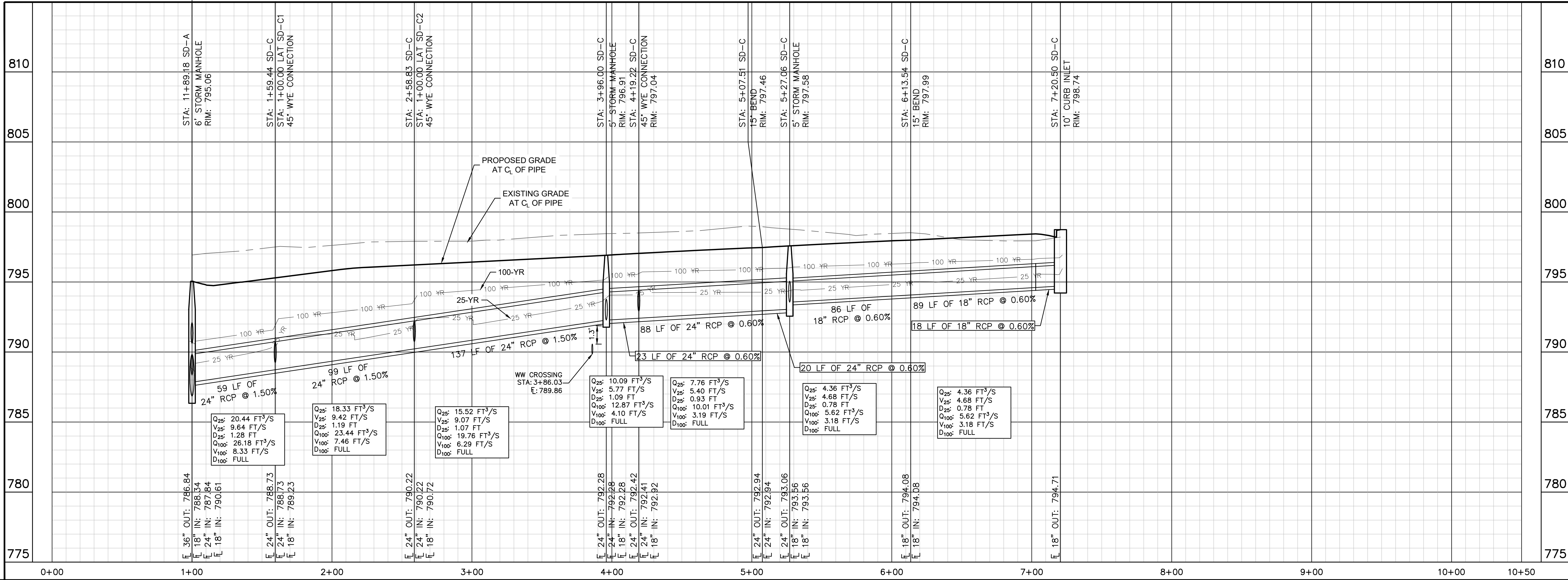




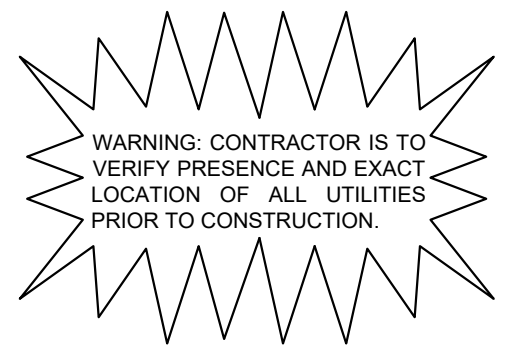
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SD-C



PROFILE SCALE  
1" = 40' HORIZONTAL  
1" = 4' VERTICAL

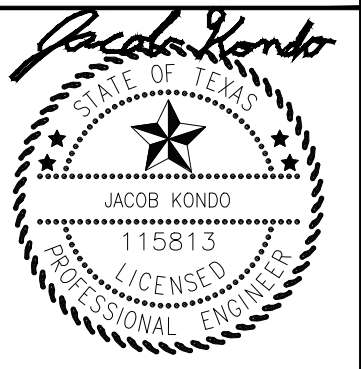


BENCHMARKS

TBM# 101 "X" SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BONNET LANE. ELEVATION = 821.82 FEET (AS SHOWN)  
TBM# 102 "RAIL ROAD SPIKE" IN POWER POLE LOCATED 3.70' FROM THE EASTERLY CORNER OF THAT CERTAIN 3.703 ACRE TRACT. ELEVATION = 820.55 FEET (AS SHOWN)

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KHA PROJECT	069291006
DATE	SEPTEMBER 2023
SCALE	AS SHOWN
DESIGNED BY:	MDM
DRAWN BY:	MDM
CHECKED BY:	JRK

STORM PLAN & PROFILE -  
SD-C

BERRY CREEK  
HIGHLANDS  
PHASE 3  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-22**  
OF C-37

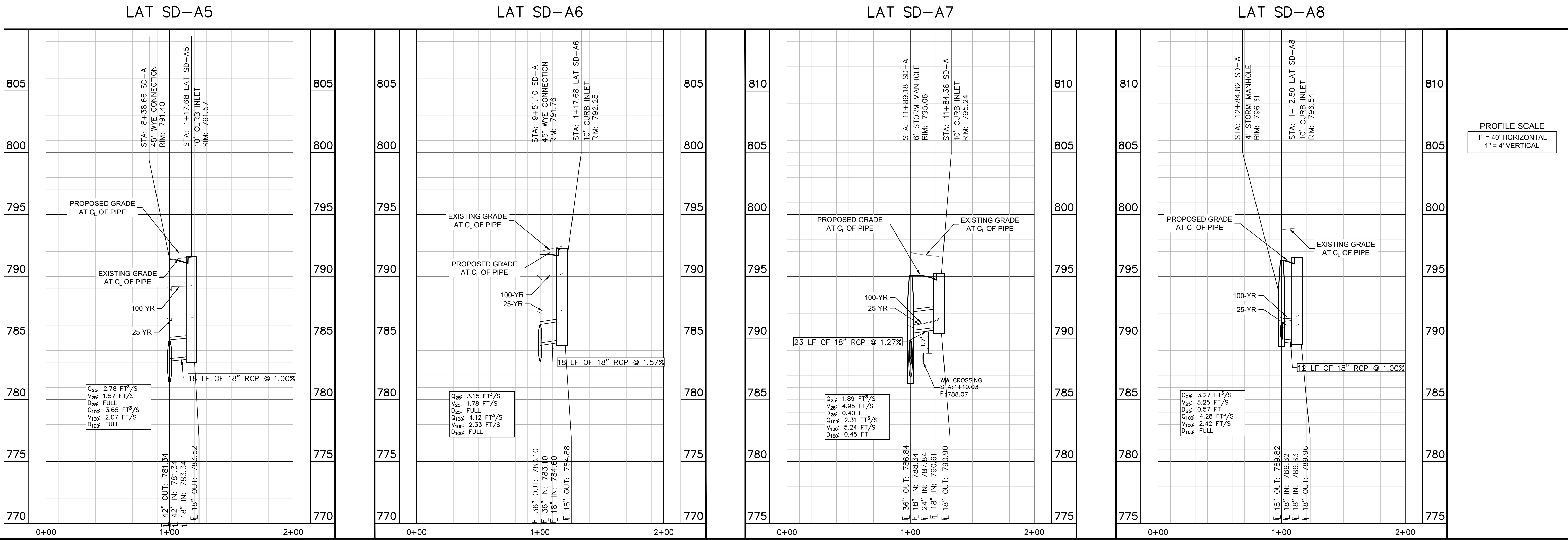
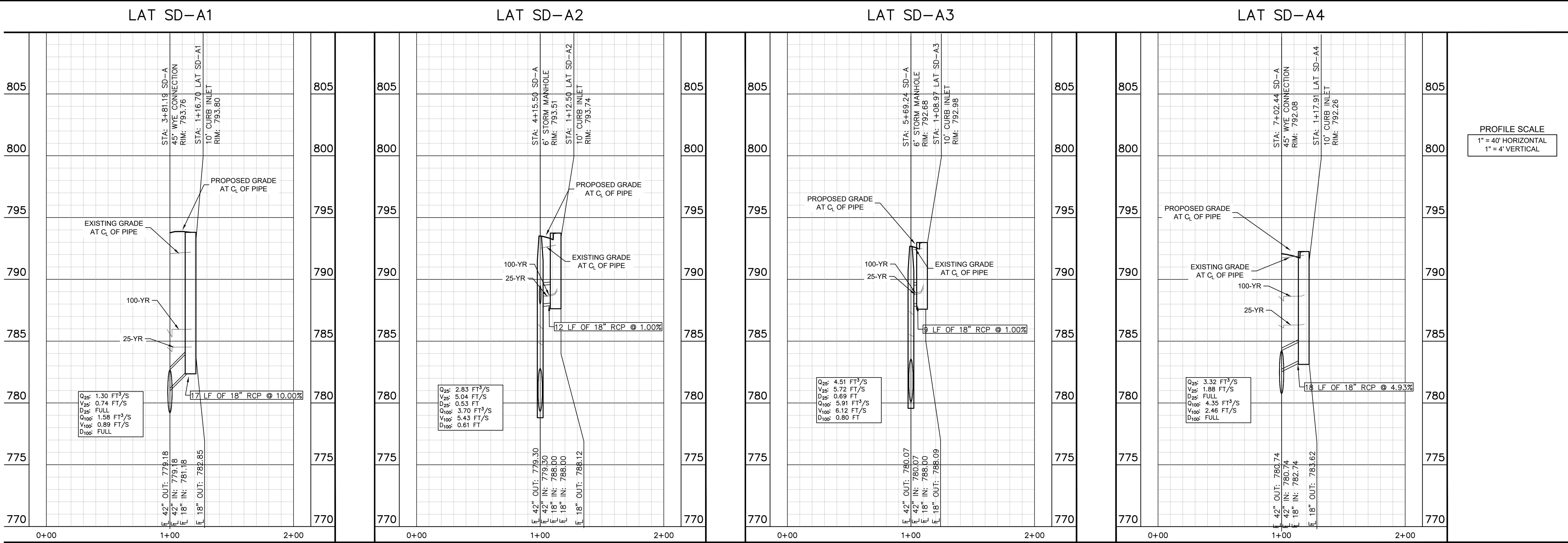
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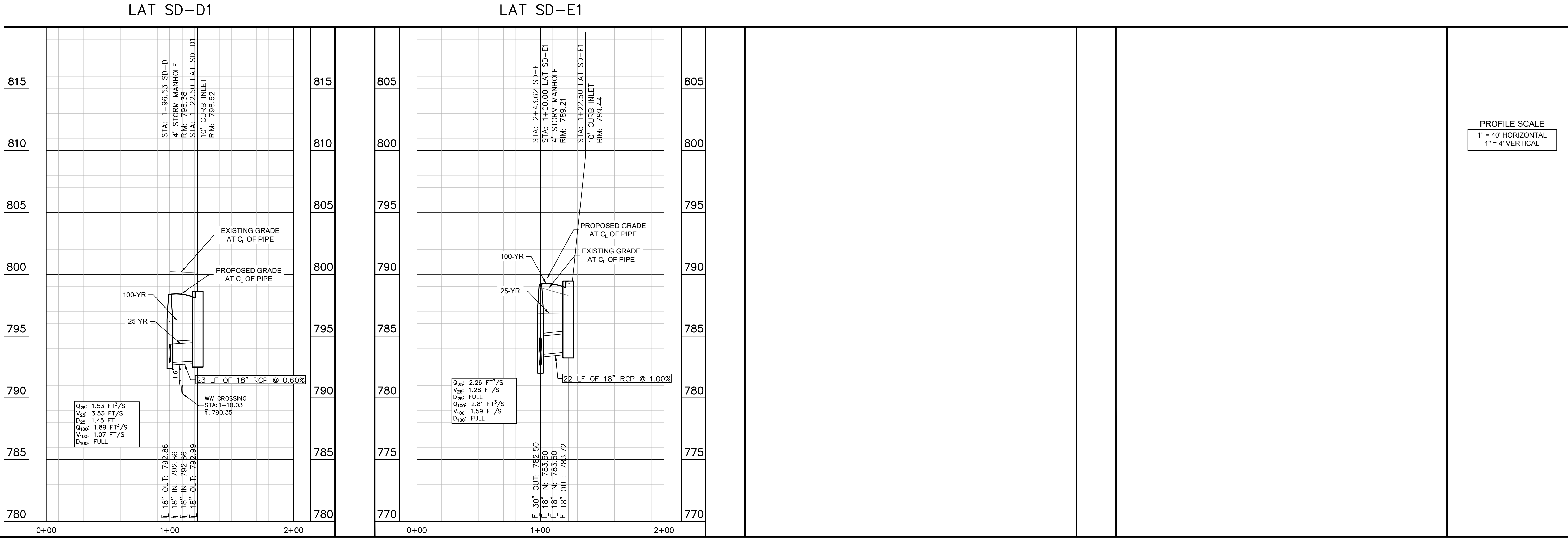
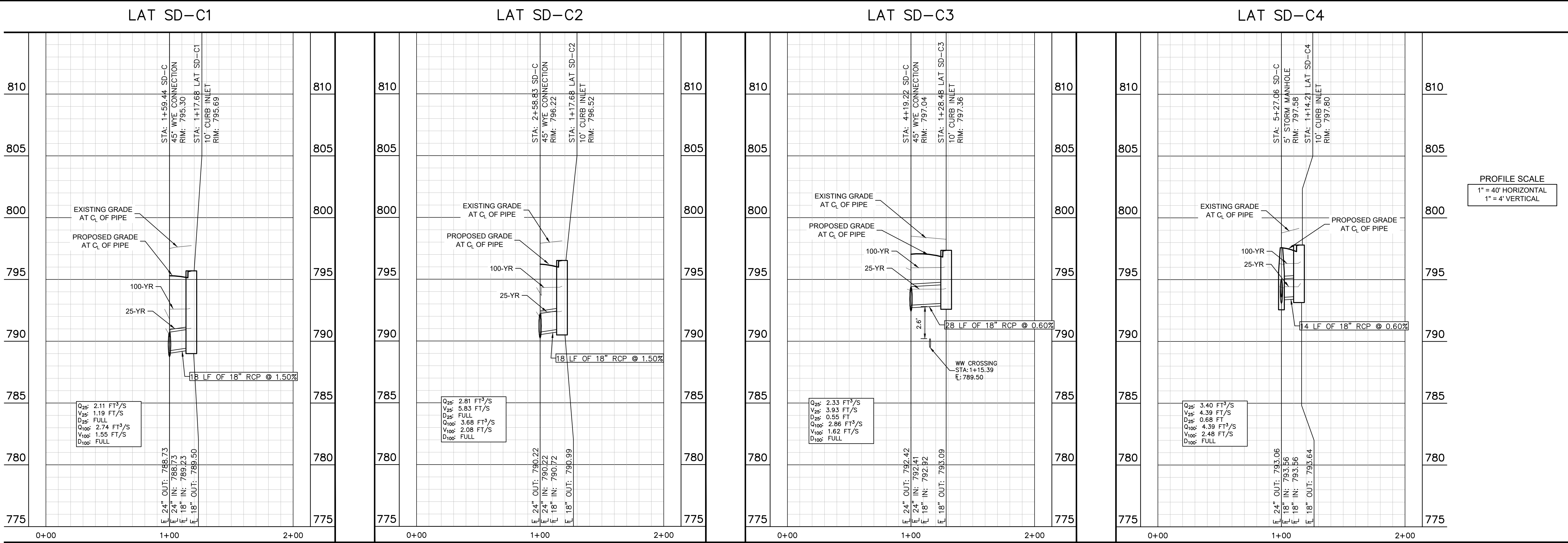
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BERRY CREEK HIGHLANDS PHASE 3 CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS						
SHEET NUMBER C-24 OF C-37						
STORM LATERAL PROFILES (SHEET 1 OF 2)						
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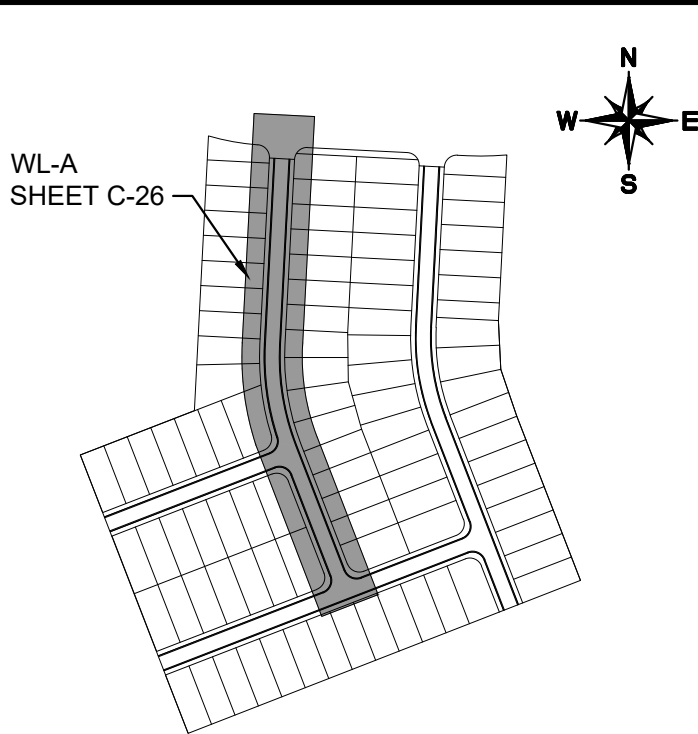
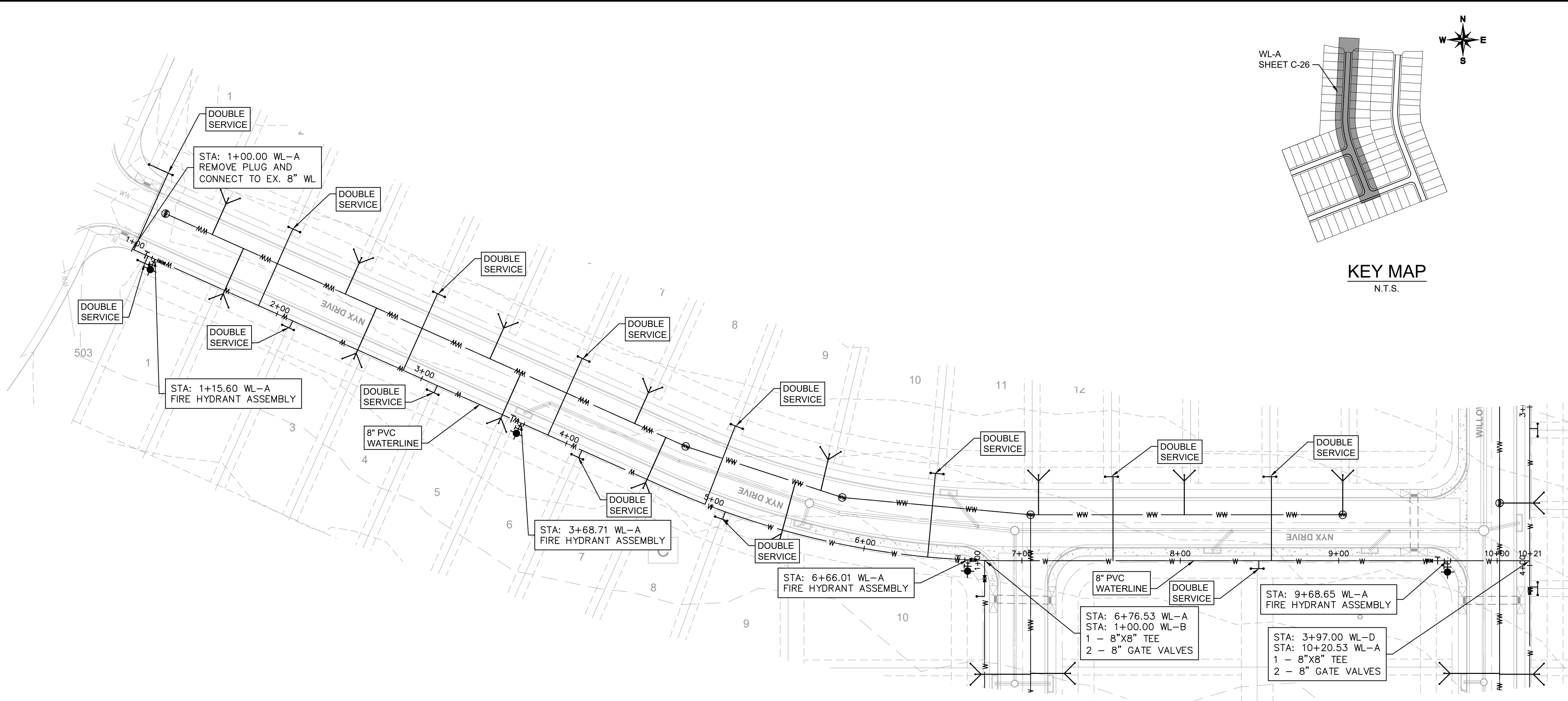


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BERRY CREEK HIGHLANDS PHASE 3 CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS						STORM LATERAL PROFILES (SHEET 2 OF 2)					
SHEET NUMBER C-25 OF C-37						2023-XX-CON					
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JACOB KIMLEY 115813 LICENSED PROFESSIONAL ENGINEER						No. _____					
REVISIONS						DATE					
BY						BY					

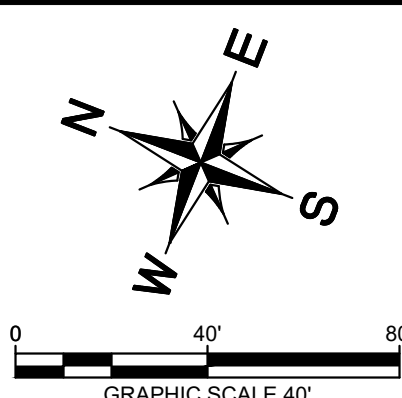


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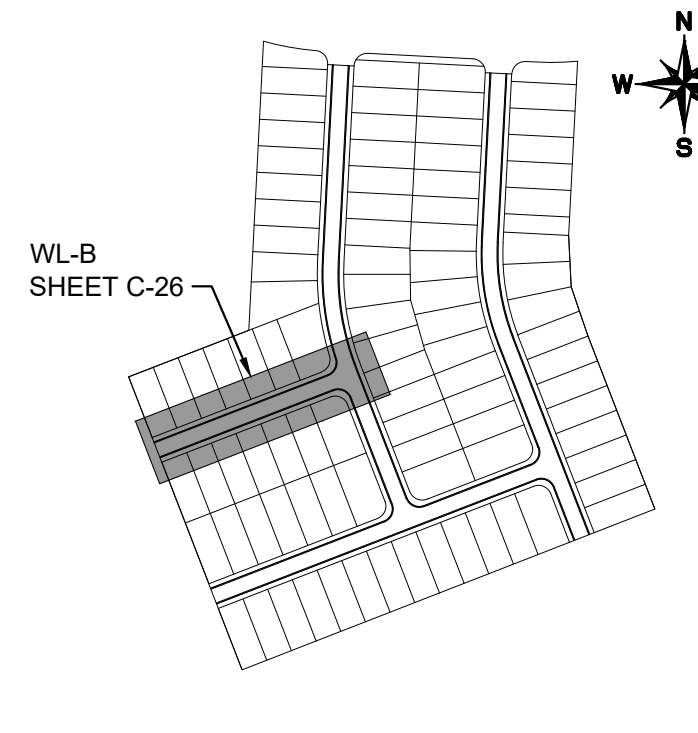
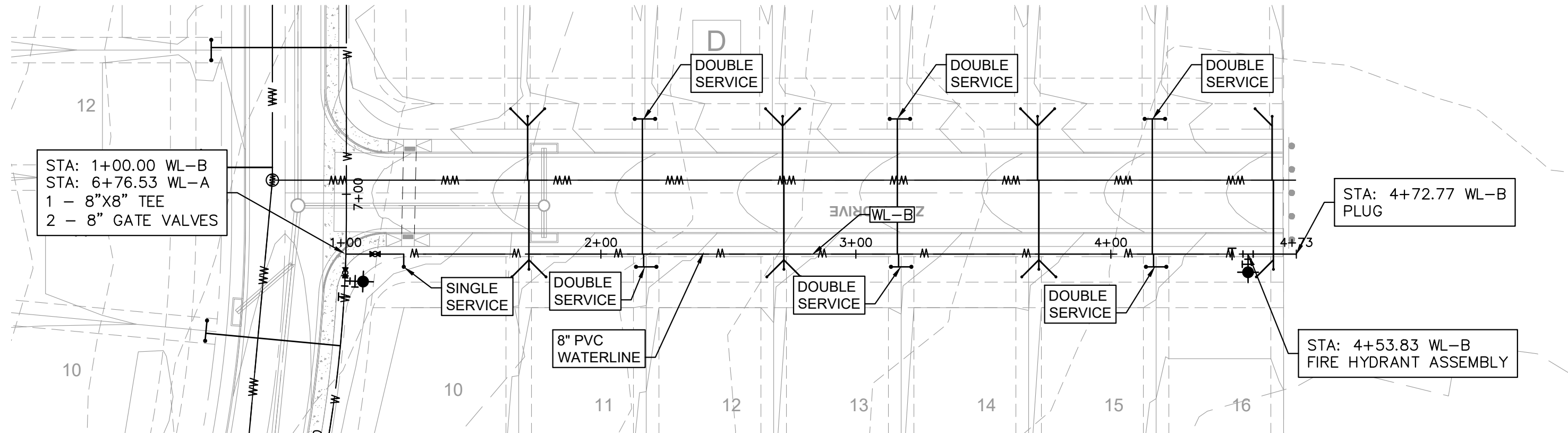
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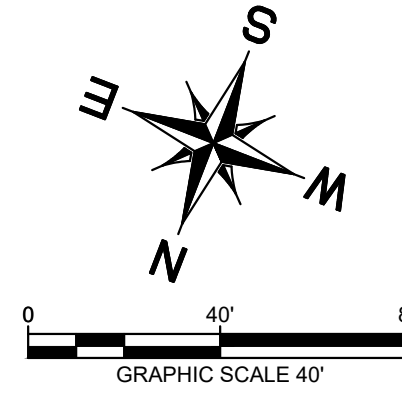
KEY MAP  
N.T.S.



UTILITY LEGEND	
	PROPERTY LINE
	PROPOSED WASTE WATER LINE
	PROPOSED WATER LINE
	PROPOSED WASTE WATER MANHOLE
	WASTE WATER FLOW DIRECTION
	PROPOSED FIRE HYDRANT
	EXISTING OVERHEAD POWER LINE
	EXISTING WATER LINE
	EXISTING WASTE WATER LINE
	EXISTING STORM SEWER LINE
	EXISTING POWER POLE
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WASTE WATER MANHOLE



KEY MAP  
N.T.S.



Know what's below.  
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BENCHMARKS

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REVISIONS		DATE	BY
No.			

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KHA PROJECT	069291006
DATE	SEPTEMBER 2023
SCALE	AS SHOWN
DESIGNED BY:	MDM
DRAWN BY:	MDM
CHECKED BY:	JRK

OVERALL WATER PLAN  
(SHEET 1 OF 2)

**BERRY CREEK  
HIGHLANDS  
PHASE 3**  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
**C-26**  
OF C-37

2023-XX-CON








GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS			
TYPE OF STRUCTURE	REACH LENGTH	MAXIMUM DRAINAGE AREA	SLOPE
SILT FENCE	N/A	2 ACRES	0 – 10%
	200 FEET	2 ACRES	10 – 20%
	100 FEET	1 ACRE	20 – 30%
TRIANGLE FILTER DIKE	50 FEET	1/2 ACRE	> 30%
	100 FEET	1/2 ACRE	< 30% SLOPE
ROCK BERM **,	50 FEET	1/4 ACRE	> 30% SLOPE
	500 FEET	< 5 ACRES	0 – 10%

\* FOR ROCK BERM DESIGN WHERE PARAMETERS ARE OTHER THAN STATED, DRAINAGE AREA CALCULATIONS AND ROCK BERM DESIGN MUST BE SUBMITTED FOR REVIEW.

\*\* HIGH SERVICE ROCK BERMS MAY BE REQUIRED IN AREAS OF ENVIRONMENTAL SIGNIFICANCE AS DETERMINED BY THE CITY OF GEORGETOWN.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES	ADOPTED 6/21/2006
		EC01

**The Architect/Engineer assumes  
responsibility for appropriate  
use of this standard.**

**CROSS SECTION**

**3" to 5" OPEN GRADED ROCK**

**WOVEN WIRE SHEATHING**

**SILT FENCE**

**FLOW**

#### **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 TO COMPLETELY ENCLOSE THE FINISHED SIZE OF THE BERM.
- INSTALL THE SILT FENCE ALONG THE CENTER OF THE PROPOSED BERM PLACEMENT. INSTALLATION SHOULD BE AS DESCRIBED IN DRAWING NO. EC-02 "SILT FENCE DETAIL".
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE AND ON BOTH SIDES OF THE SILT FENCE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE REMAINS ITS SHAPE.
- SECURE WITH THE WIRE.
- 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 CONTRACTOR. FOR THE INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE ON ROCK BERMS.
- 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.

ADOPTED 6/21/2006

ISSUED DATE

EC04

DATE

NTS

DATE

12/2003

DATE

NTS

DATE

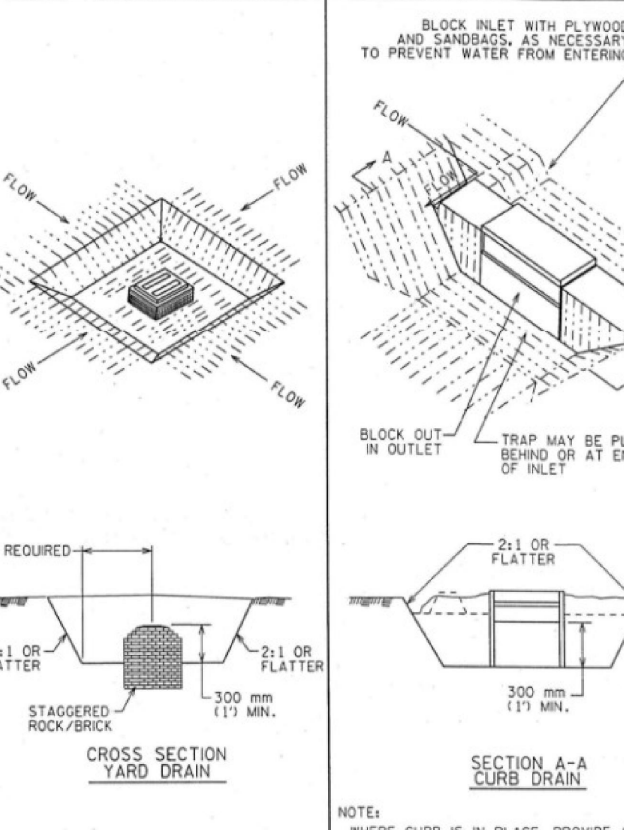
12/2003

DATE

NTS

DATE

12/2003

	
<b>NOTE:</b> WHERE CURB IS IN PLACE, PROVIDE A 300 mm (12 in.) WIDE OPENING IN THE CURB OR USE A SANDBOX TO DIVERT WATER OVER THE CURB TO THE TRAP.	
<b>CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT</b>	
<b>STORM INLET SEDIMENT TRAP</b>	
STANDARD NO. 632S-1	

NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WAP) OR STORM WATER POLLUTION PREVENTION PLANS (SWPP) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.

1. THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREES/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 EDWARDS AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TREC 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. VARIATIONS 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 SPECIALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FERTILIZER (NUTRIENT 51) AT A RATE OF 1000/ACRE. GRASS SHALL BE COMMON BERMUDA GRASS, MAILED, MINIMUM 80% HYBRID SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEEDS, GRASS, OR NOXIOUS CROPS. RESILIENT AND TOLERANT WITH APPROPRIATE FERTILIZER. AT TIME OF MOWING, 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 BROADCAST OR SPRIKLED IN A MANNER THAT WILL NOT EXPOSE 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 UNTIL WIND.

7. RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 90% 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 SOO (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 WITH TREE EMPHASE.

11. TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIFTLINE 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 (BRANCHES, ETC.) ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE "NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHAVE 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 SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPILL 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 GRASS CHANGE, WHEREVER PLANNING SURVEYS, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'-4') BEYOND 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 CONVENTIONS, 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 OWNER'S EXPENSE.

20. INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL, RESULTING FROM ACCIDENTAL SPILL, IS 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

Scale: 1"=200'  
DATE: 6/21/06  
BY: [Signature]

**The Architect/Engineer assumes  
responsibility for appropriate  
use of this standard.**

**CROSS SECTION**

**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.

GEOTEXTILE

T-POST  
6" X 6" MAX.

WOVEN WIRE SUPPORT  
2' X 4' WIRE MESH

FLOW

FILL

**INSTALLATION:**

- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES) FURTHER THAN 2' TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FENCE FOR 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 1 1/2 GAUGE GALVANIZED TURNED CLIPS. THE TOP OF THE WIRE TO BE 2" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH 10# GALV. WIRE.
- THE SILT FENCE TO BE INSTALLED WITH A SHORT 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 6".
- 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  
EC02

DATE: 1/2003  
BY: TMS

CITY OF GEORGETOWN  
CONSTRUCTION STANDARDS AND DETAILS  
SILT FENCE DETAIL

**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 (DRIFLINE), 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 DRIFTLINES 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
BY	
DATE	
EC09	

DATE	1/23/2003
BY	
DATE	

CITY OF GEORGETOWN  
CONSTRUCTION STANDARDS AND DETAILS

TREE PROTECTION –  
CHAIN LINK FENCE

PLAN VIEW

SECTION A-A

SECTION B-B

#### INSTALLATION:

- LOCATE THE SEDIMENT TRAP SO AS TO DISTURB AS FEW TREES AS POSSIBLE.
- CLEAR AND GRUB THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MATS.
- LAYOUT THE WIRE MESH AND THEN THE GEOTEXTILE FABRIC.
- CONSTRUCT THE GEOTEXTILE CORE AND CORRESPONDING ROCK EMBANKMENT TO THE DESIGNATED HEIGHT AND CONFIGURATION.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE REMAINS ITS SHAPE. SECURE WITH THE WIRE.
- PLACE THE EMBANKMENT MATERIAL IN 8 TO 12 INCH LIFTS AND MACHINE COMPACT.

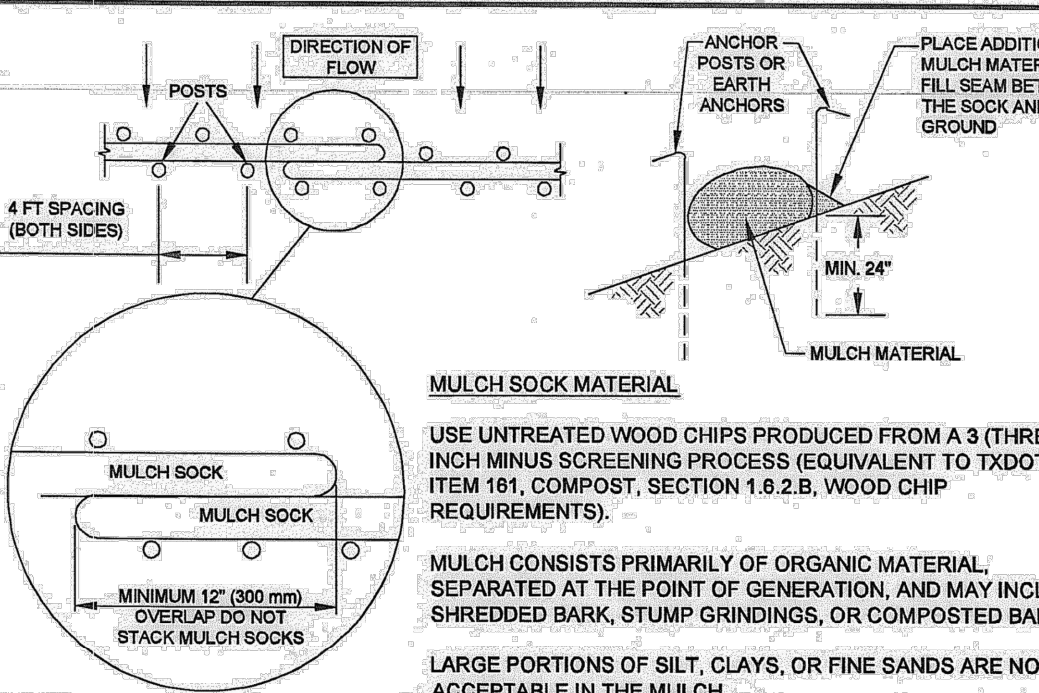
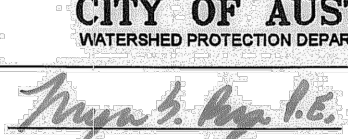
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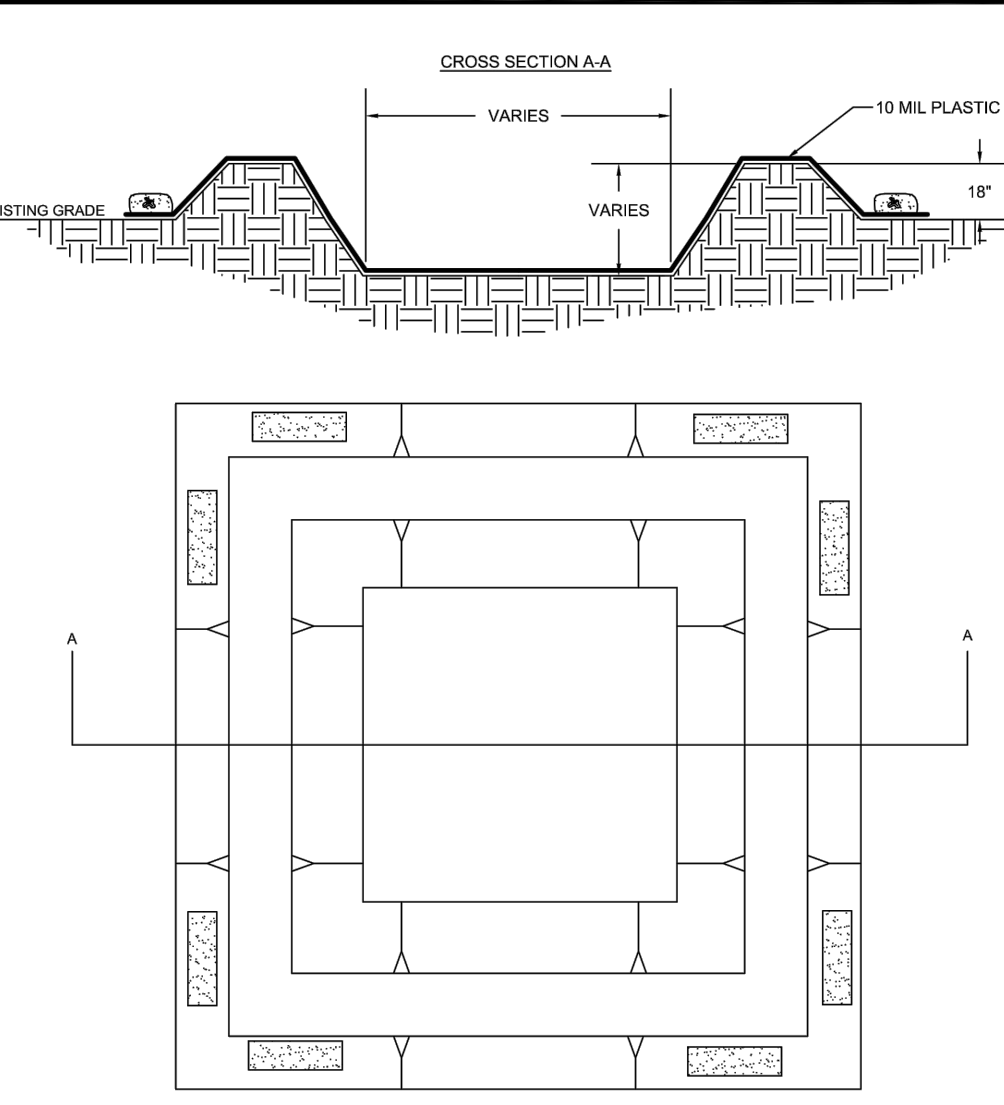
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE AND INSPECT THE EMBANKMENT FOR PILING AND SETTLEMENT. REPAIR SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
- TRASH AND OTHER DEBRIS SHOULD BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO HALF OF THE DESIGN DEPTH OF THE TRAP.
- SEDIMENT REMOVED FROM THE TRAP SHOULD BE DEPOSITED IN AN APPROVED SPILLS AREA AND IN SUCH A MANNER THAT IT WILL NOT CAUSE ADDITIONAL SEDIMENT.

*The Architect/Engineer assumes  
responsibility for appropriate  
use of this standard.*

ADOPTED 6/21/2006	
DESIGN NAME	EC07
DATE	1/7/2003
BY	PROJECT BY
CHECKED BY	

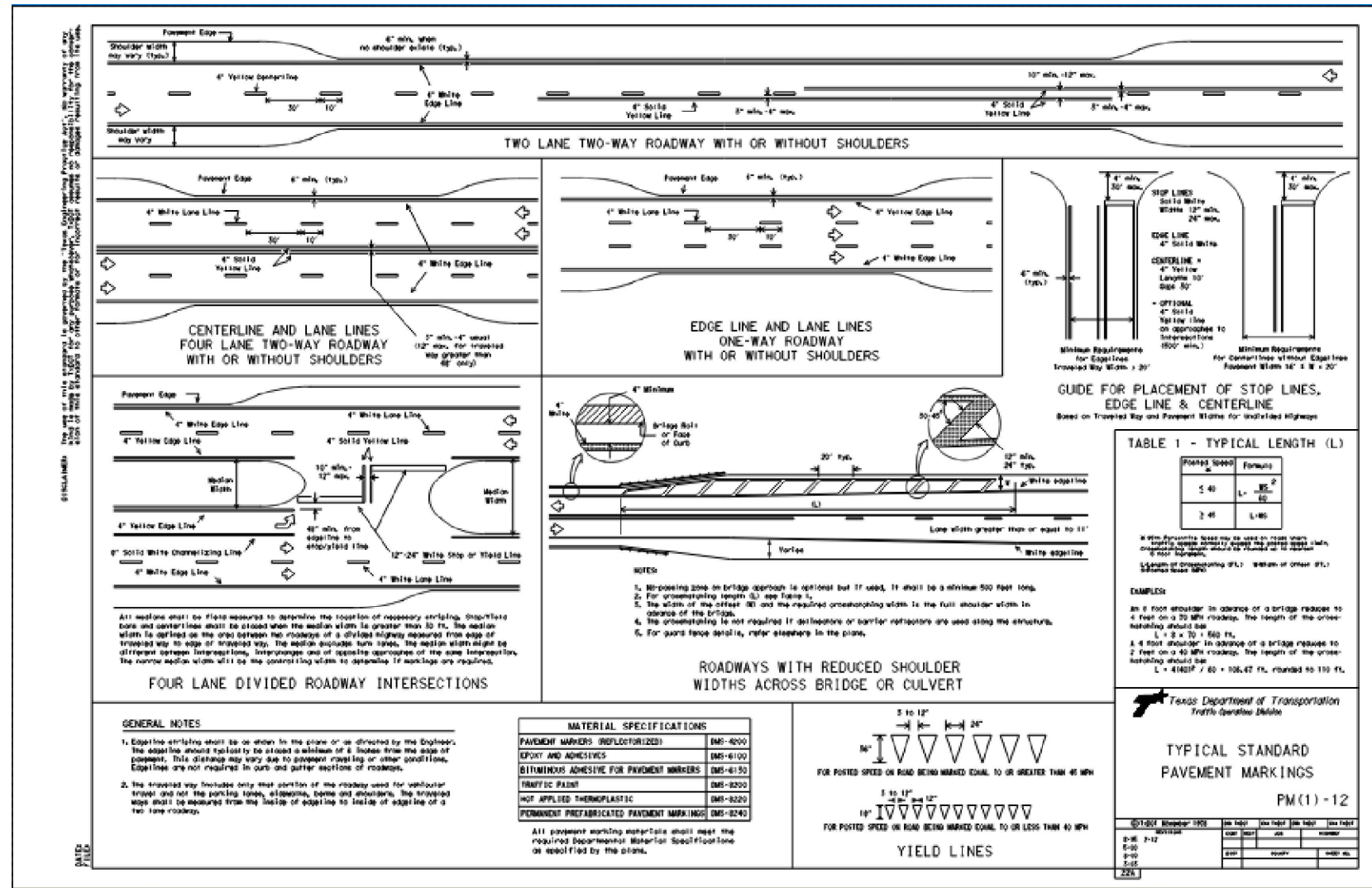
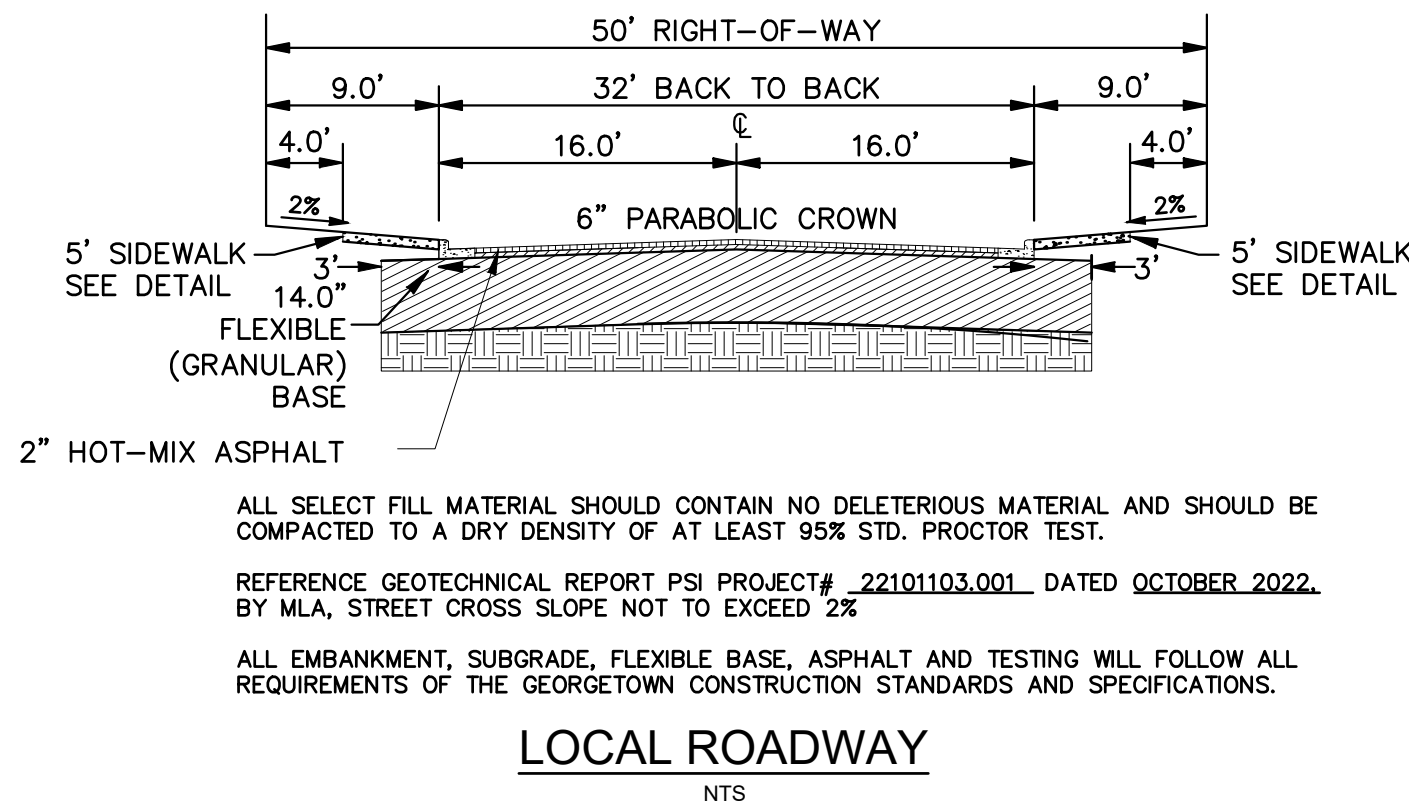
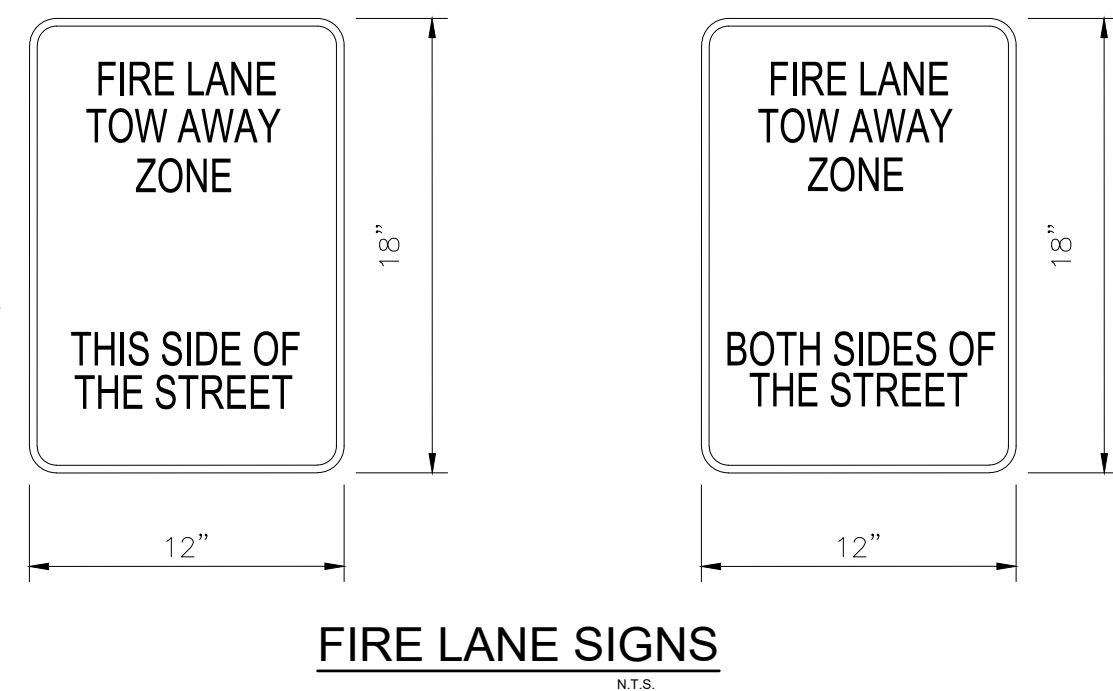
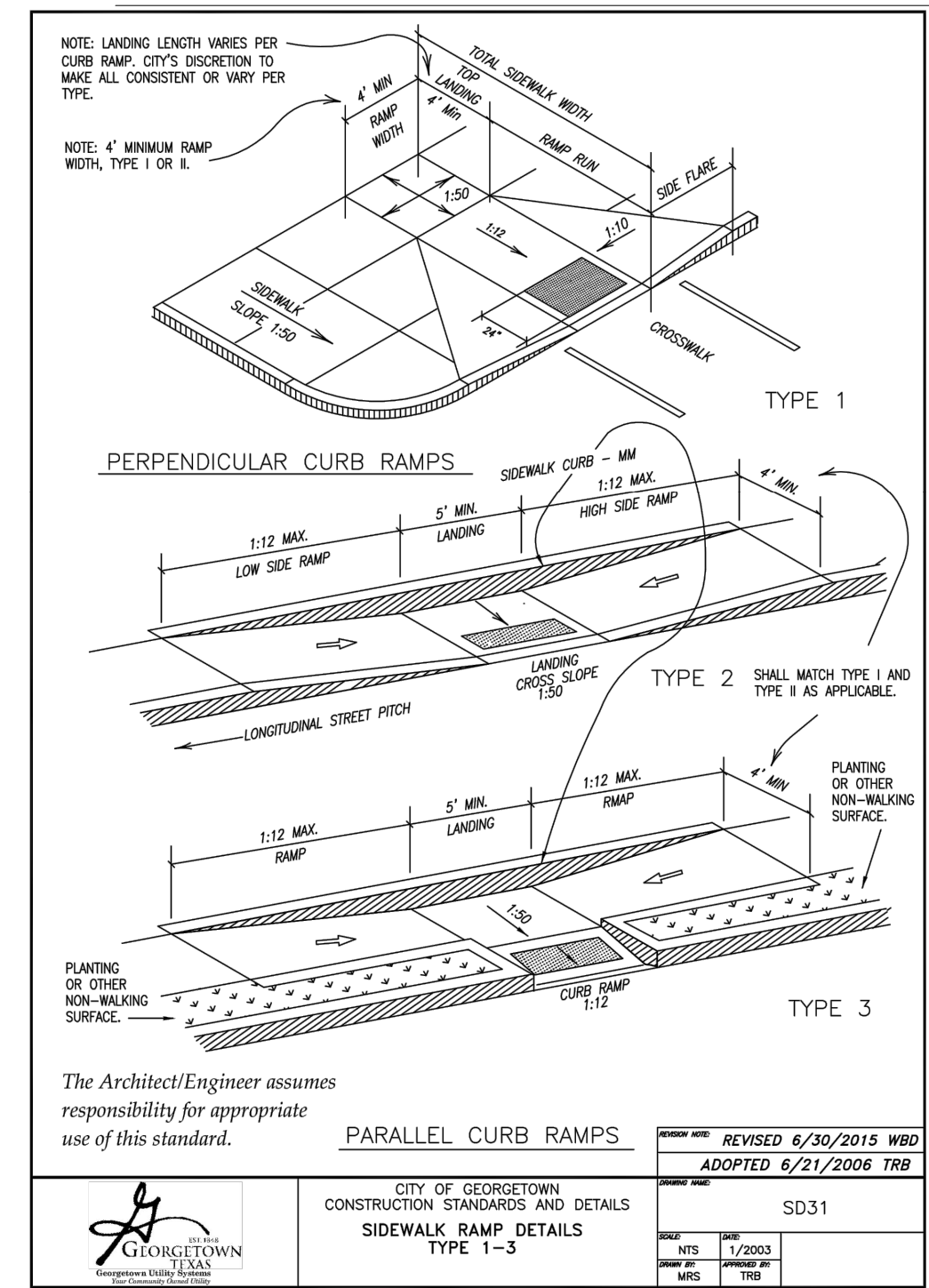
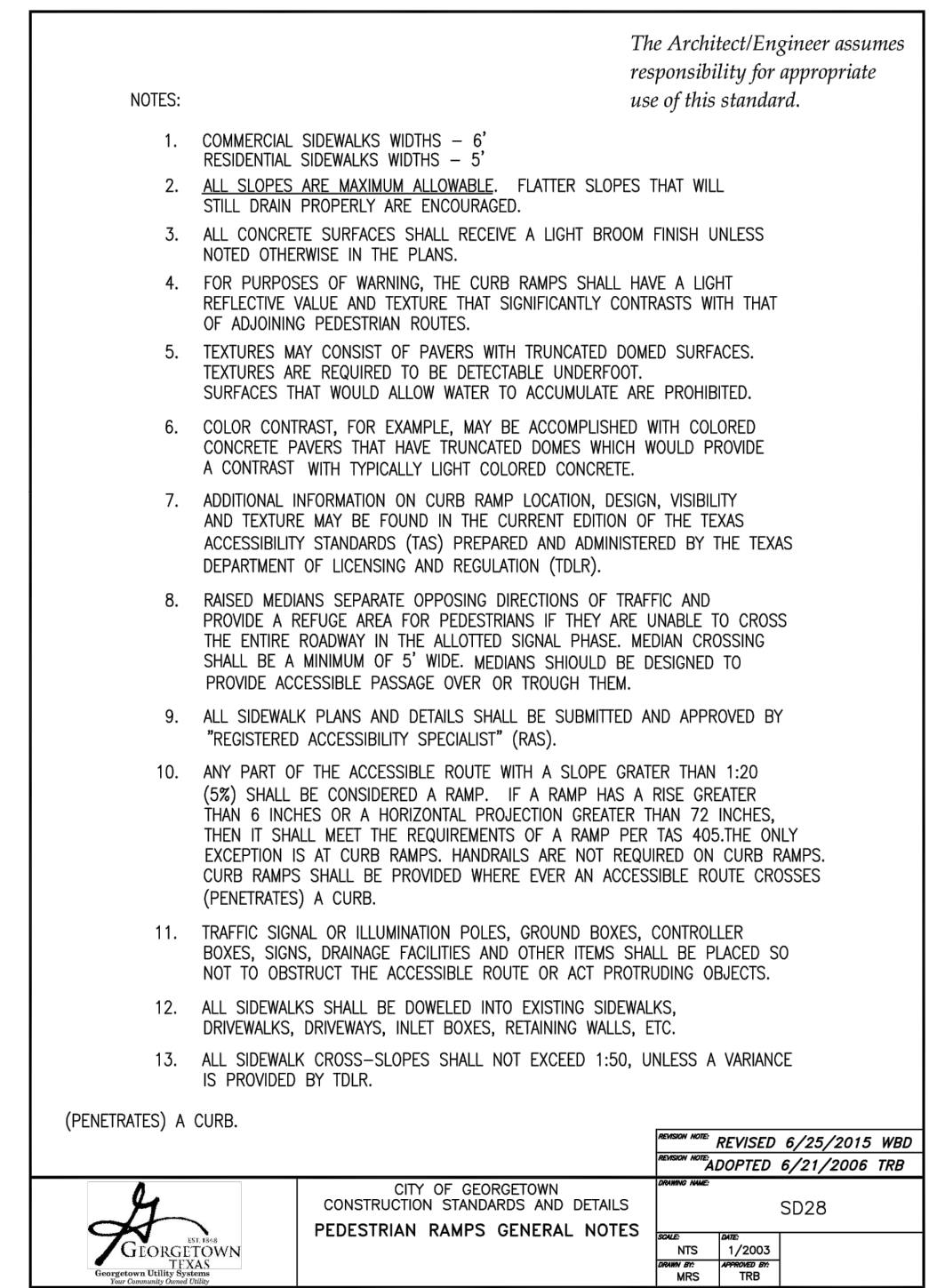
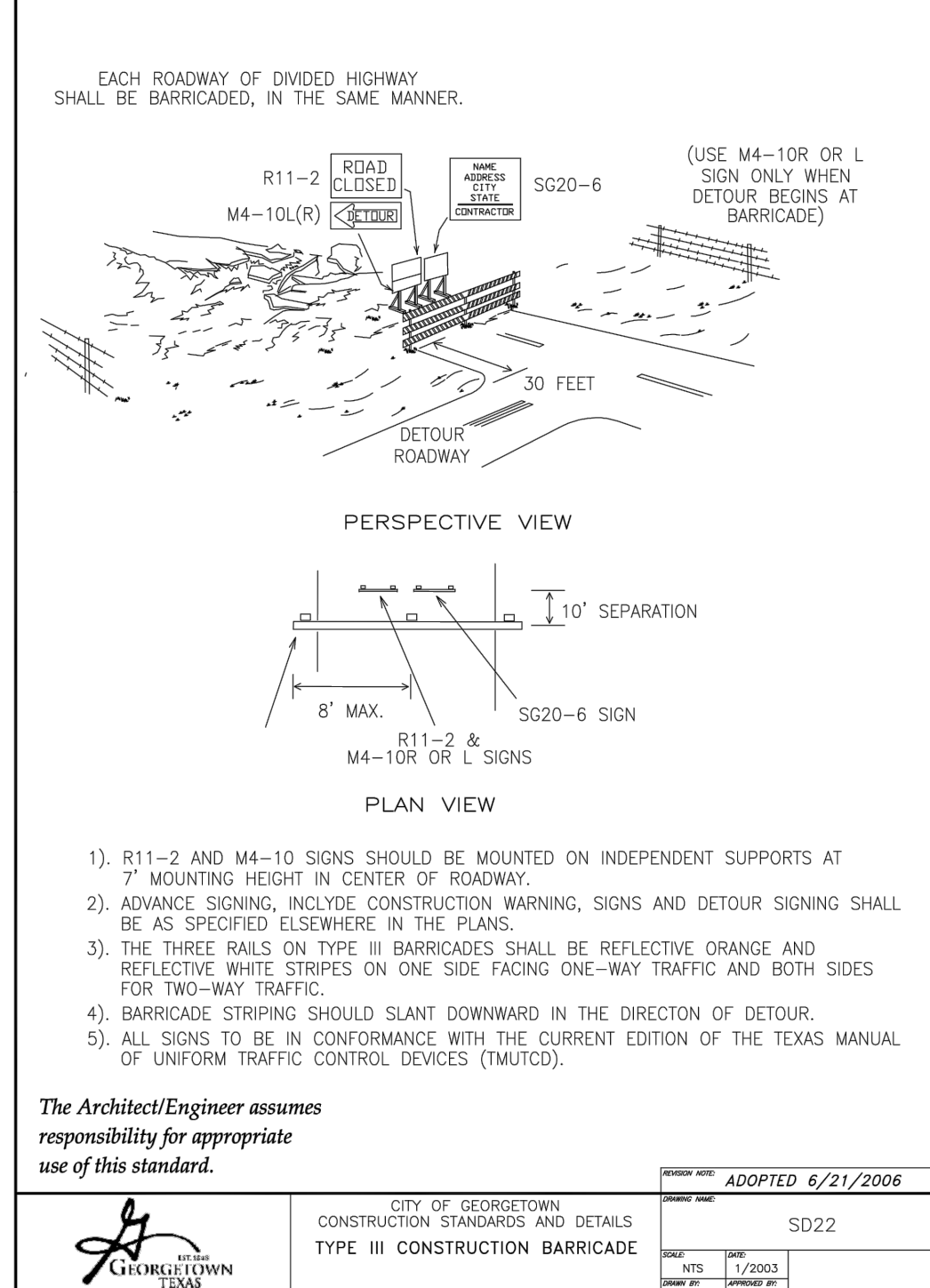
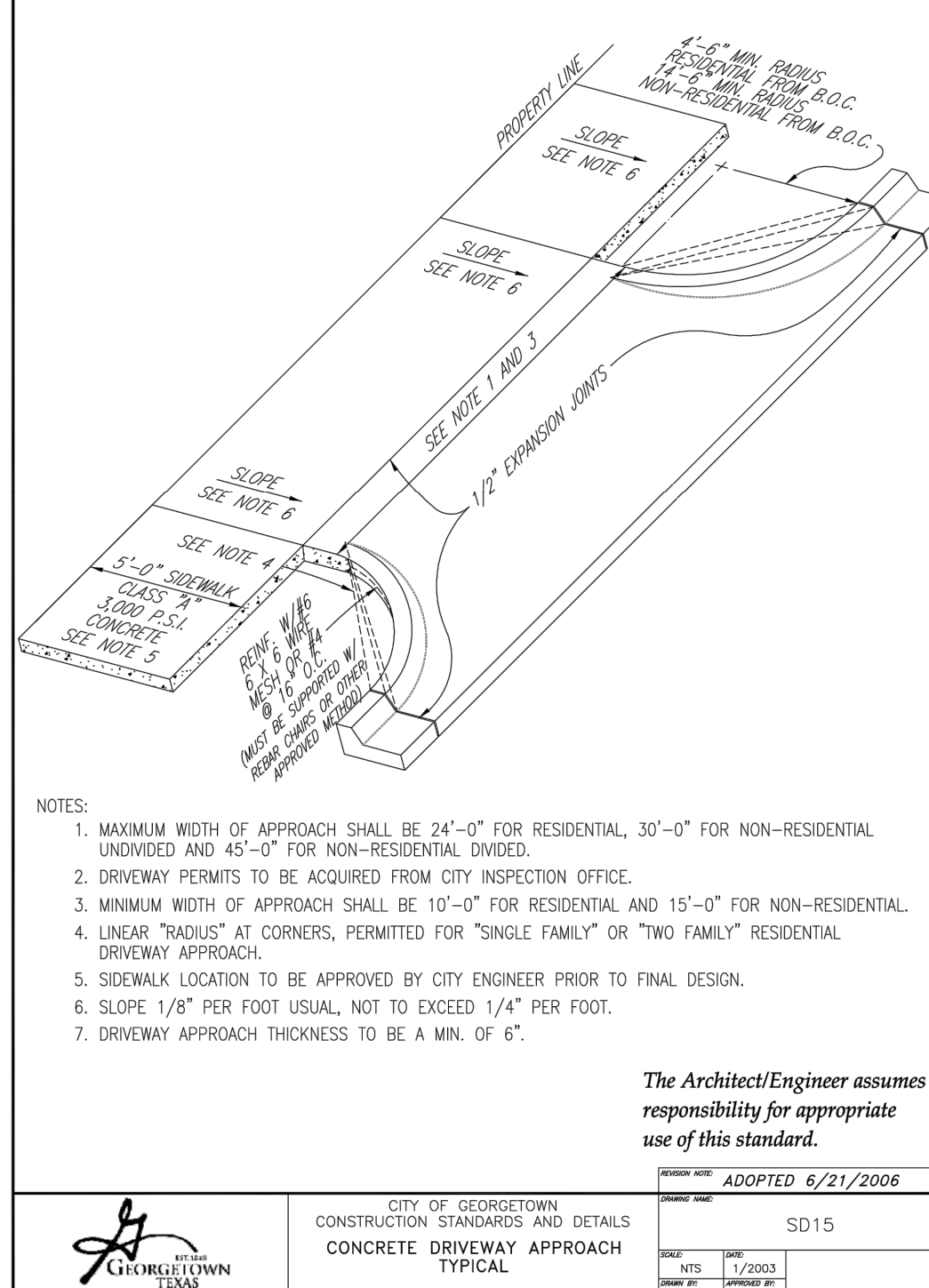
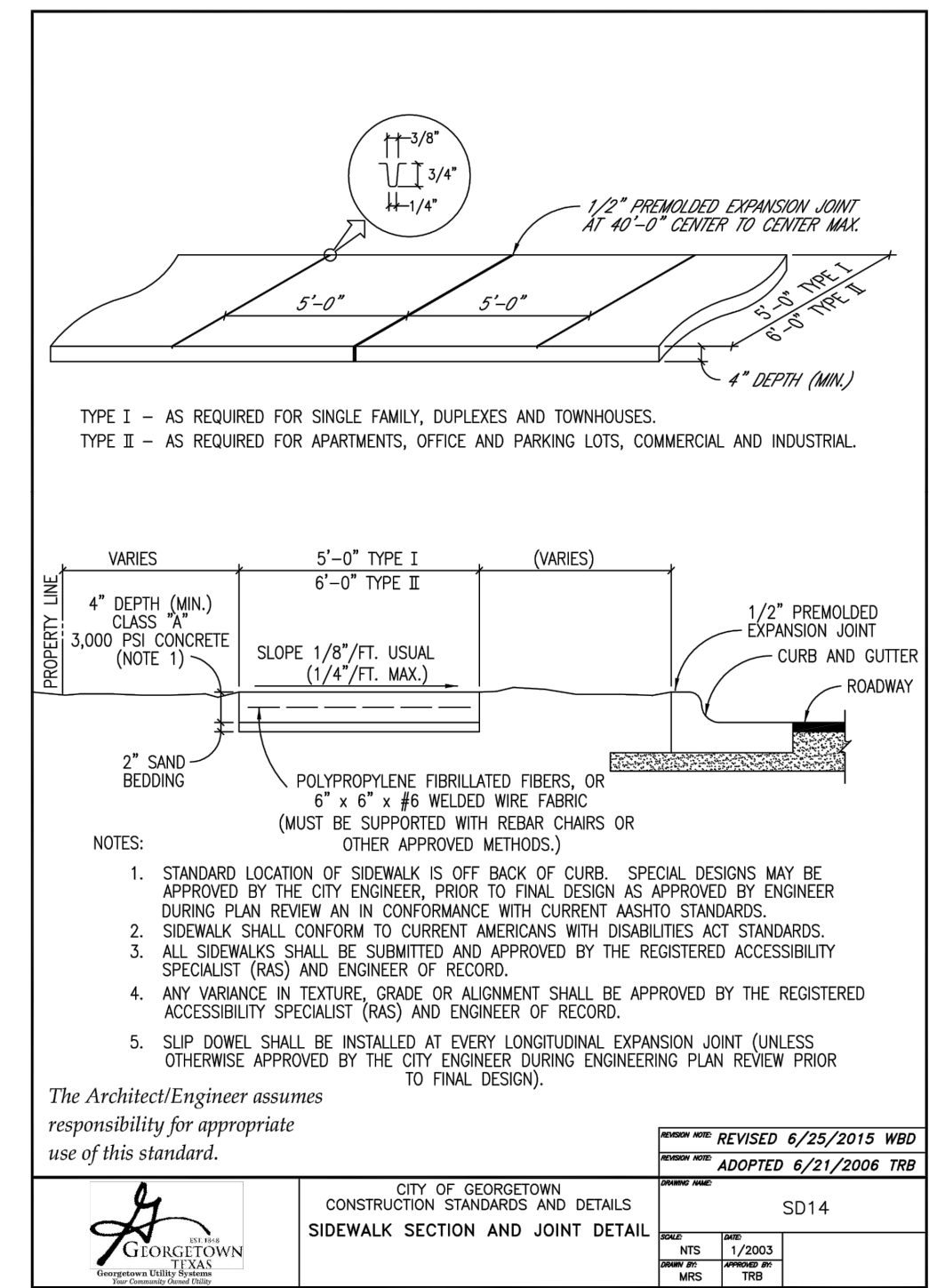
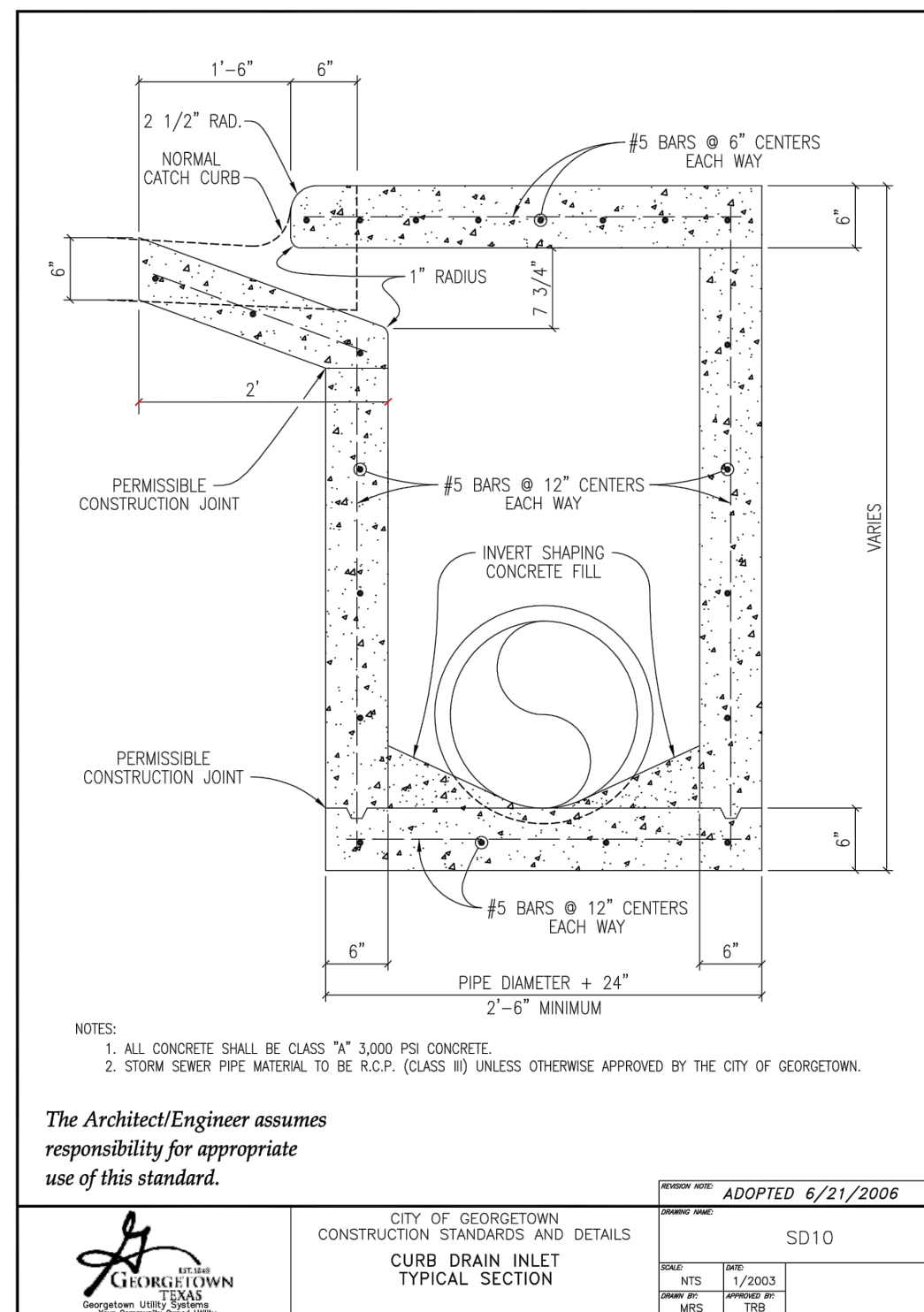
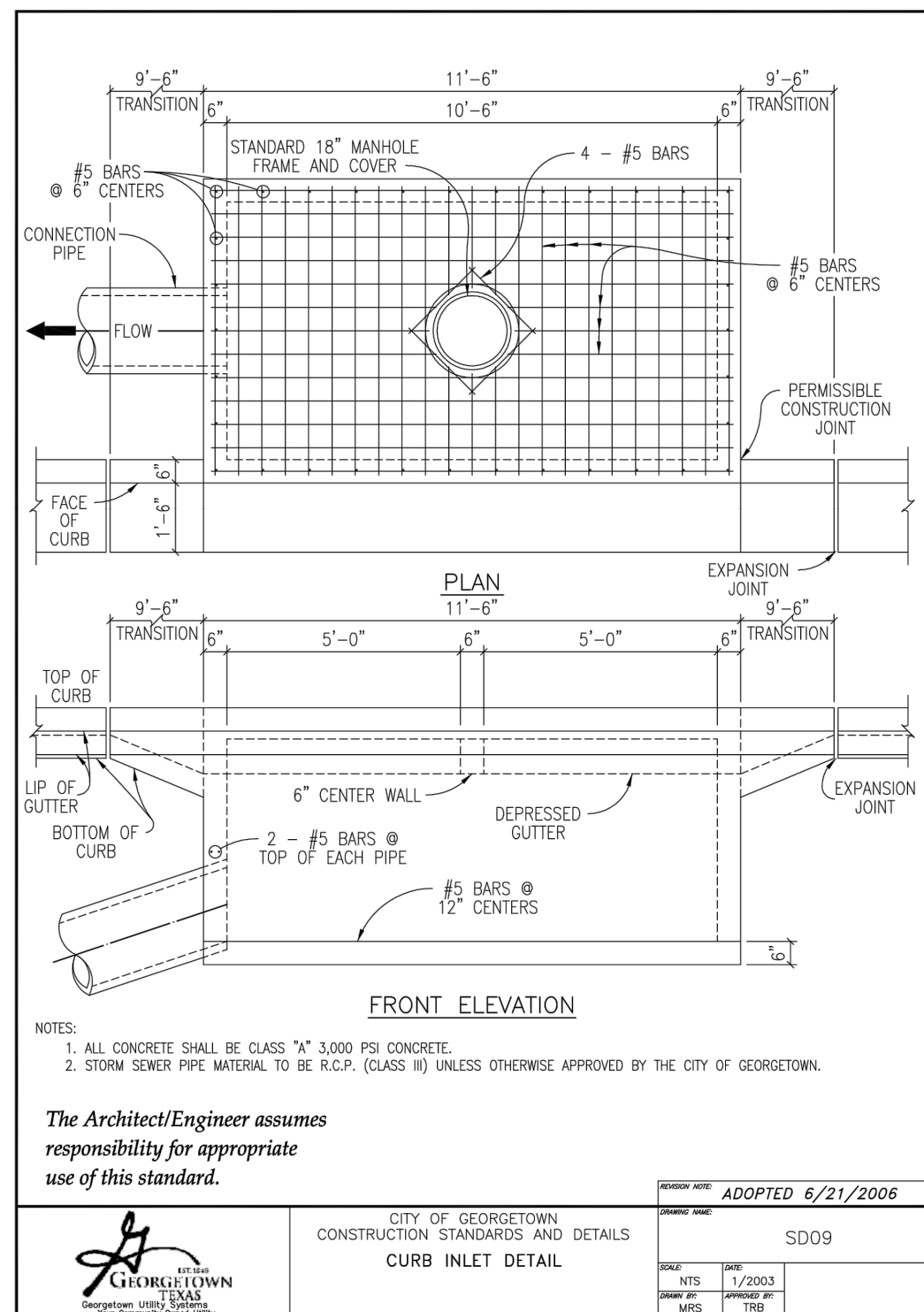
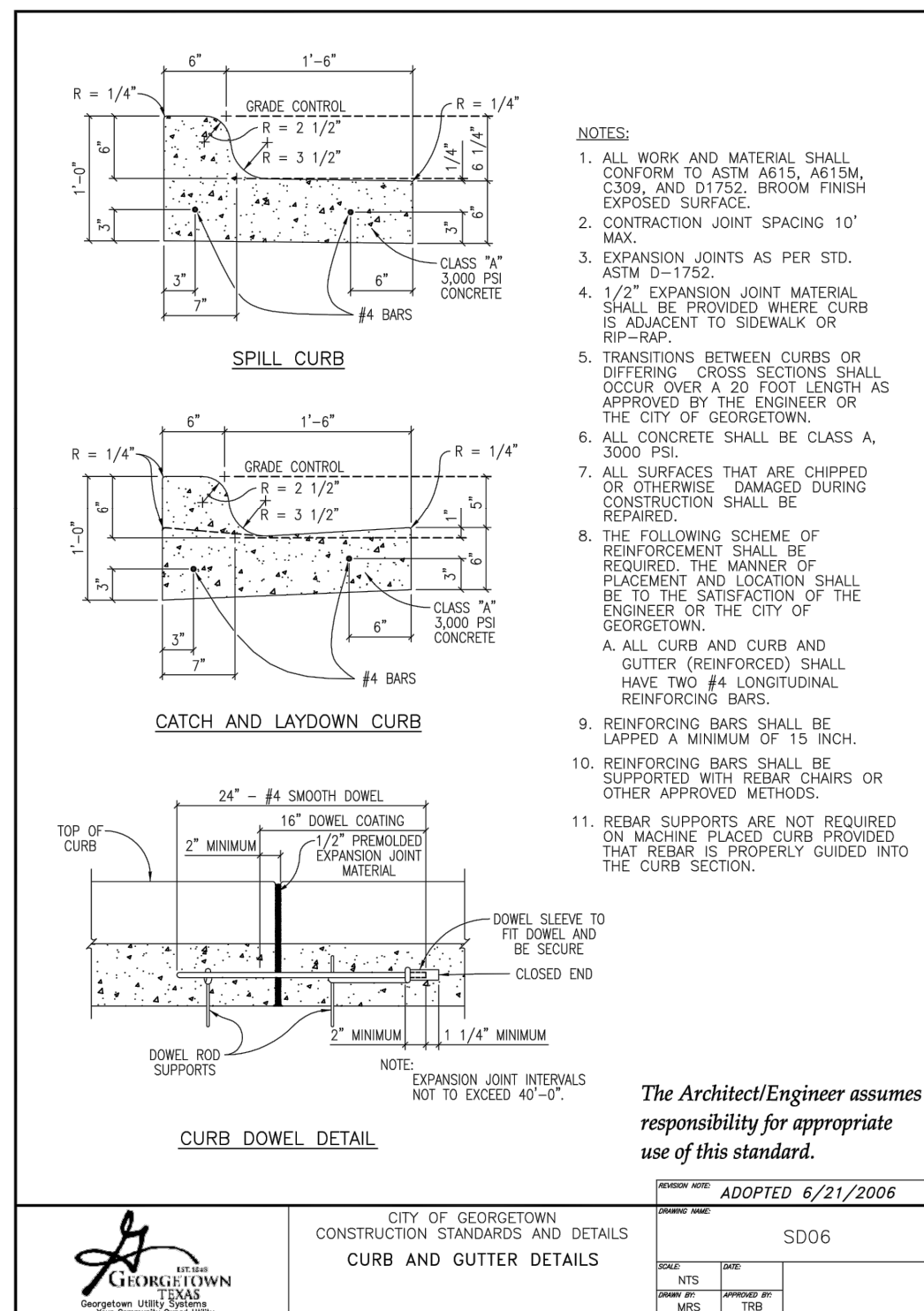
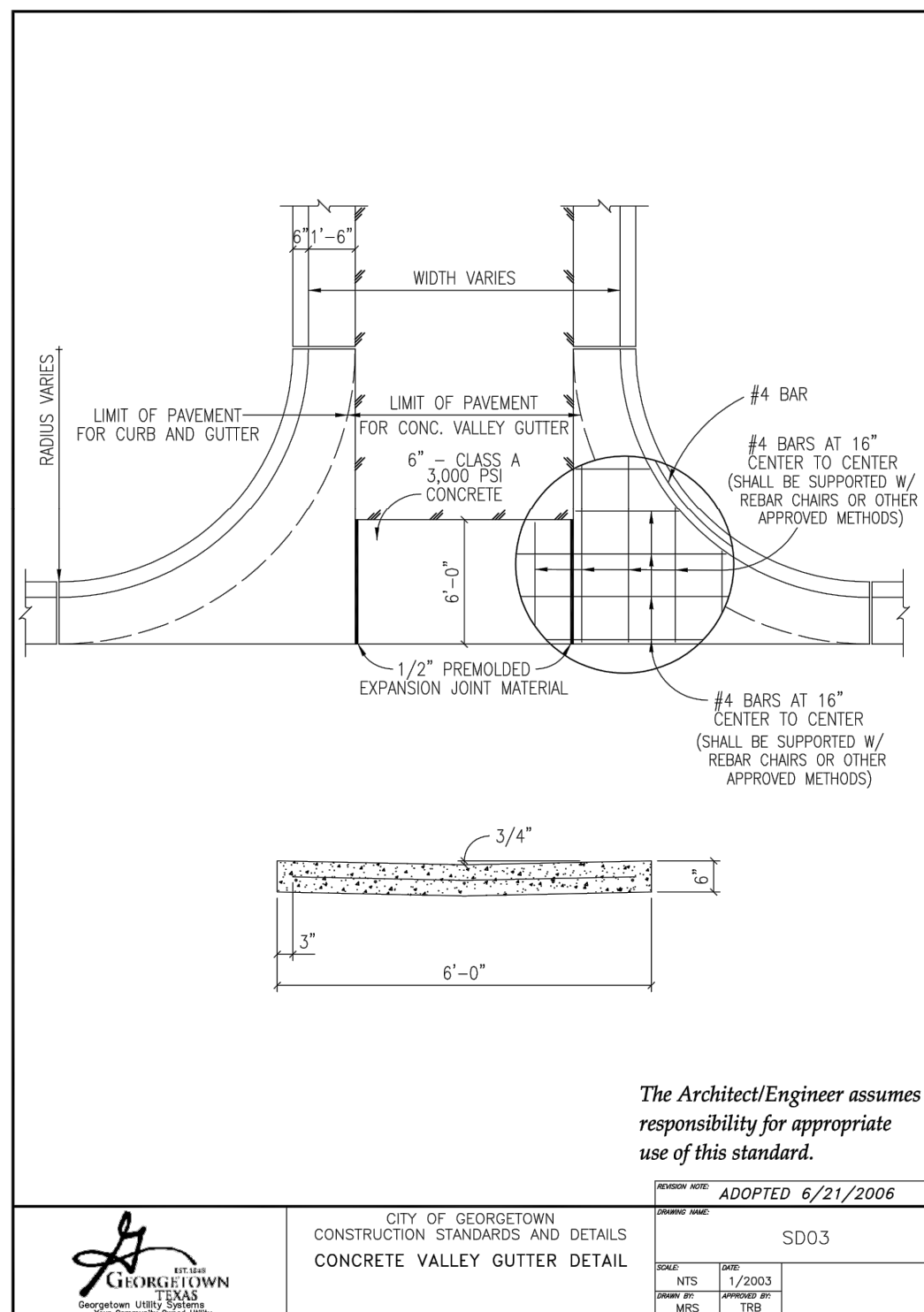
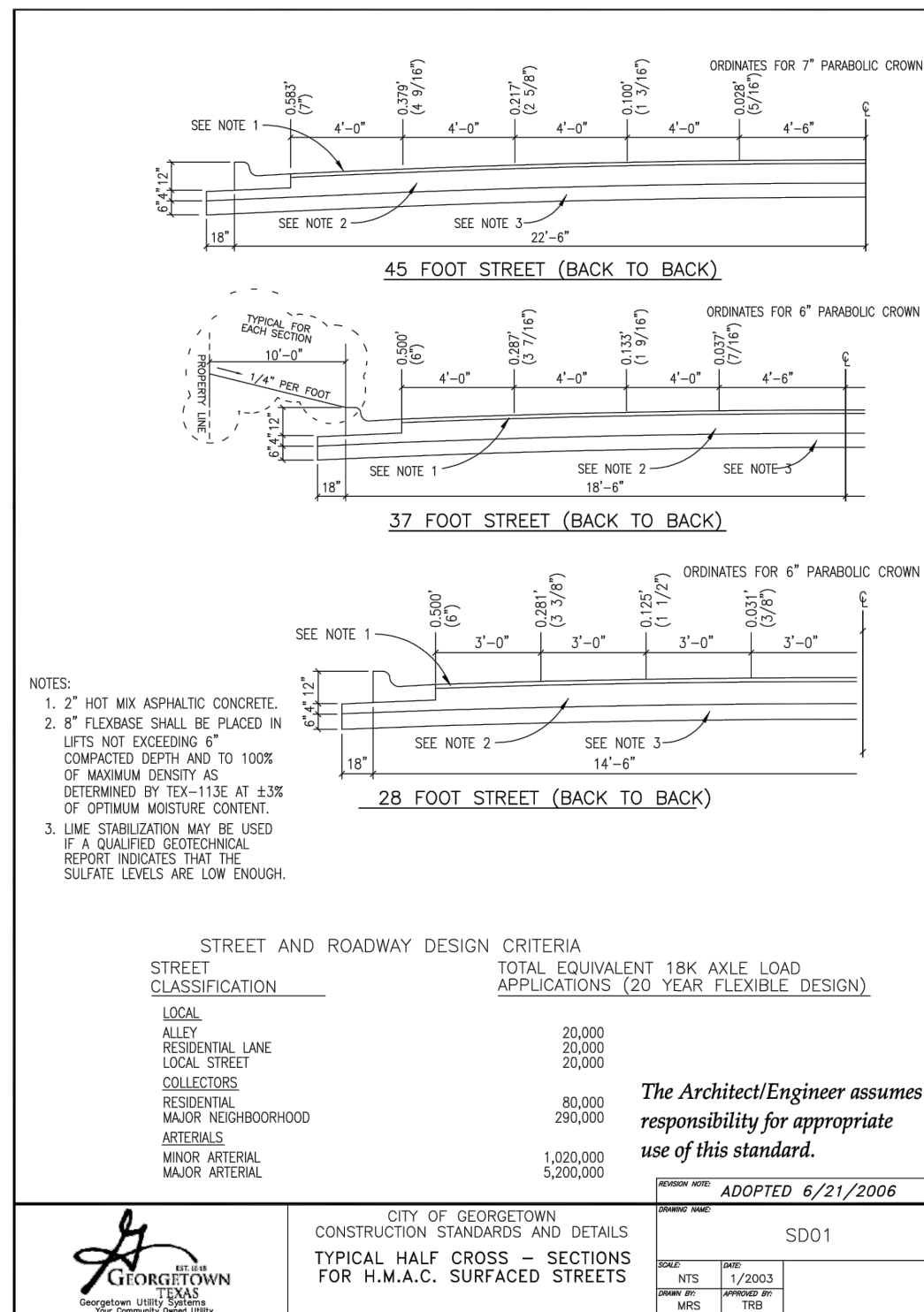
CITY OF GEORGETOWN  
CONSTRUCTION STANDARDS AND DETAILS  
SEDIMENT TRAP DETAIL

		
<b>MULCH SOCK MATERIAL</b> USE UNTREATED WOOD CHIPS PRODUCED FROM A 3 (THREE) INCH MINUS SCREENING PROCESS (EQUIVALENT TO TXDOT ITEM 181, COMPOST, SECTION 1.6.2.B, WOOD CHIP REQUIREMENTS).		
<b>MULCH CONSISTS PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, OR COMPOSTED BARK.</b>		
<b>LARGE PORTIONS OF SILT, CLAYS, OR FINE SANDS ARE NOT ACCEPTABLE IN THE MULCH.</b>		
<b>NOTES:</b> <ol style="list-style-type: none"><li>STEEL OR WOOD POSTS WHICH SUPPORT THE MULCH SOCK SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 600mm (24 inches). IF WOOD POSTS CANNOT ACHIEVE 600mm (24 inches) DEPTH, USE STEEL POSTS. EARTH ANCHORS ARE ALSO ACCEPTABLE.</li><li>THE TOE OF THE MULCH SOCK SHALL BE PLACED SO THAT THE MULCH SOCK IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. IN ORDER TO PREVENT WATER FROM FLOWING BETWEEN THE JOINTS OF ADJACENT ENDS OF MULCH SOCKS, LAP THE ENDS OF ADJACENT MULCH SOCKS A MINIMUM OF 300mm (12 inches).</li><li>MULCH MATERIAL MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH; IT IS NOT ACCEPTABLE FOR THE MULCH MATERIAL TO CONTAIN GROUND CONSTRUCTION DEBRIS, BIOSOLIDS, OR MANURE.</li><li>SOCK MATERIAL WILL BE 100% BIODEGRADABLE, PHOTODEGRADABLE, OR RECYCLABLE SUCH AS BURLAP, TWINE, UV PHOTOBIODEGRADABLE PLASTIC, POLYESTER, OR ANY OTHER ACCEPTABLE MATERIAL.</li><li>MULCH SOCKS SHOULD BE USED AT THE BASE OF SLOPES NO STEEPER THAN 2:1 AND SHOULD NOT EXCEED THE MAXIMUM SPACING CRITERIA PROVIDED IN CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL TABLE 1.4.5.1 FOR A GIVEN SLOPE CATEGORY.</li><li>ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 150mm (6 inches). THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.</li></ol>		
	CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT	MULCH SOCK
THE CONTRACTOR/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.		
STANDARD NO. 648S-1		

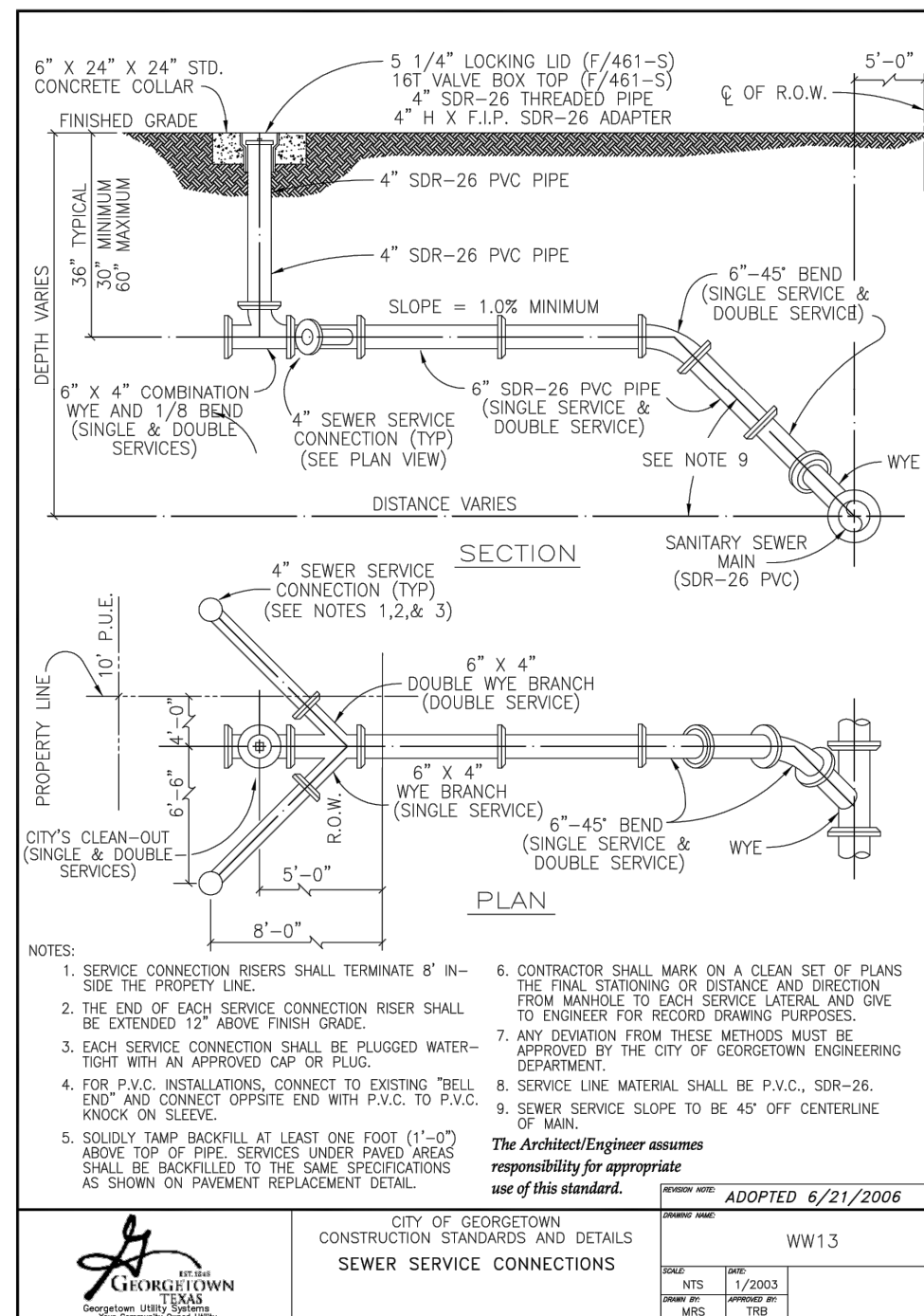
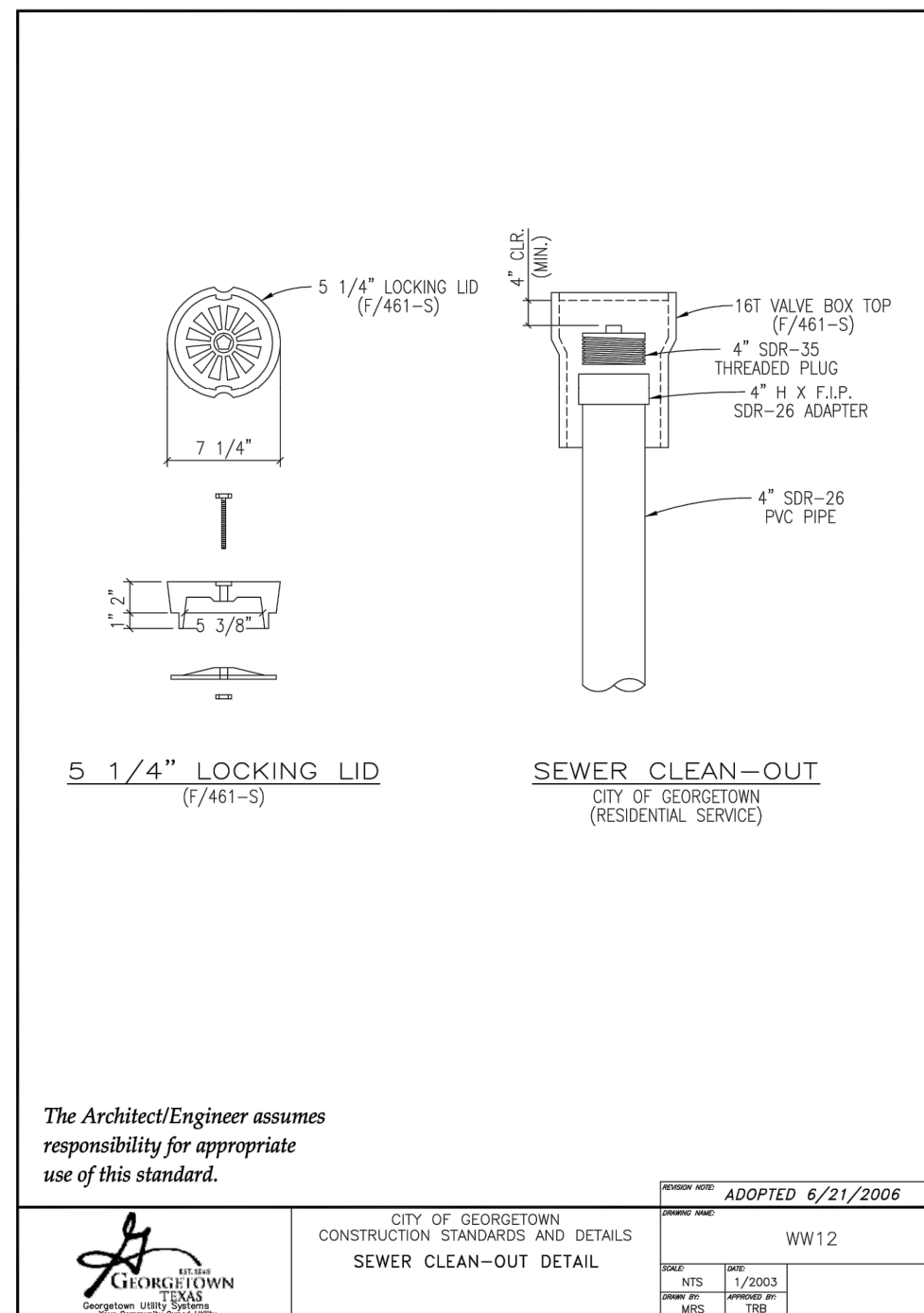
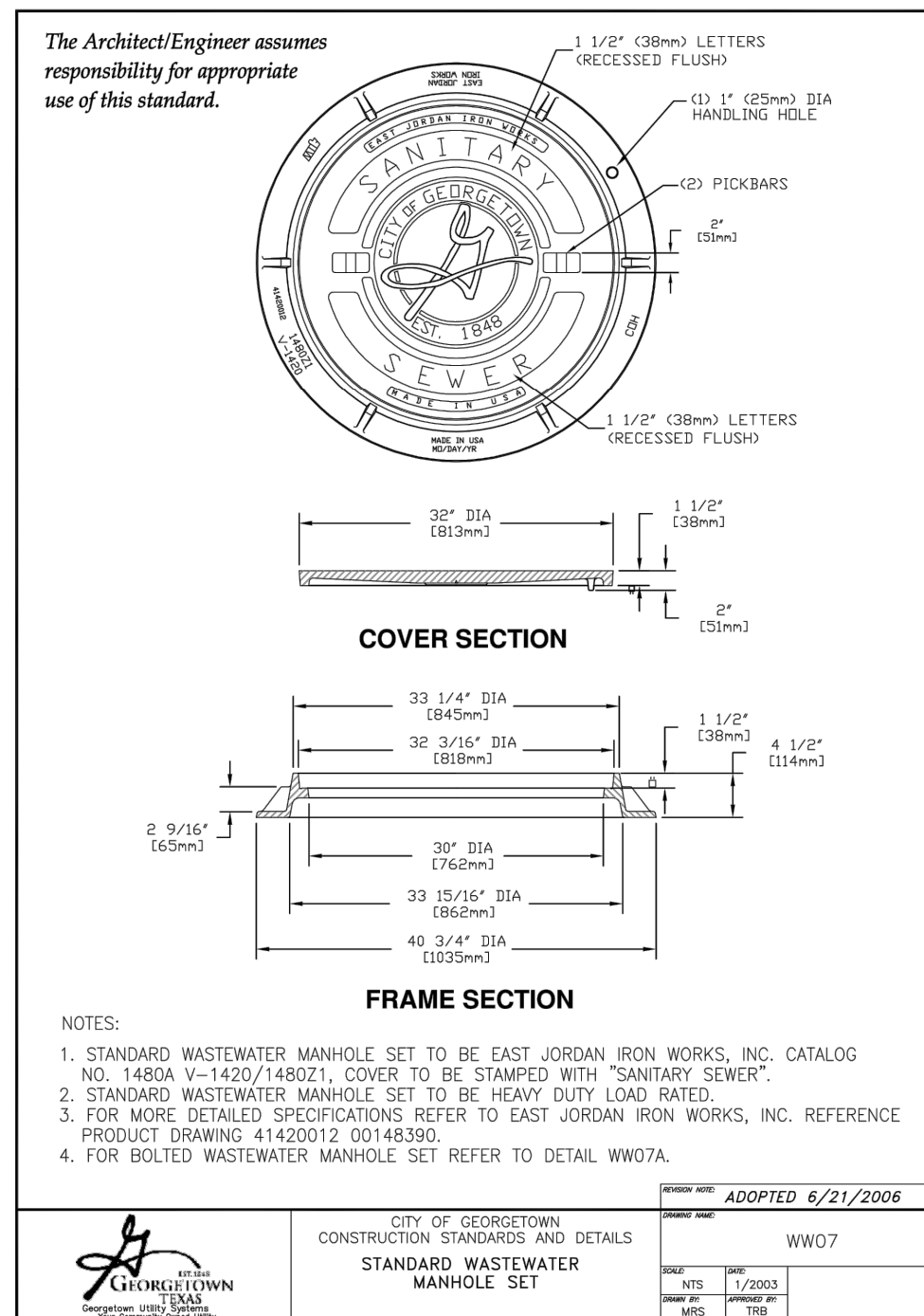
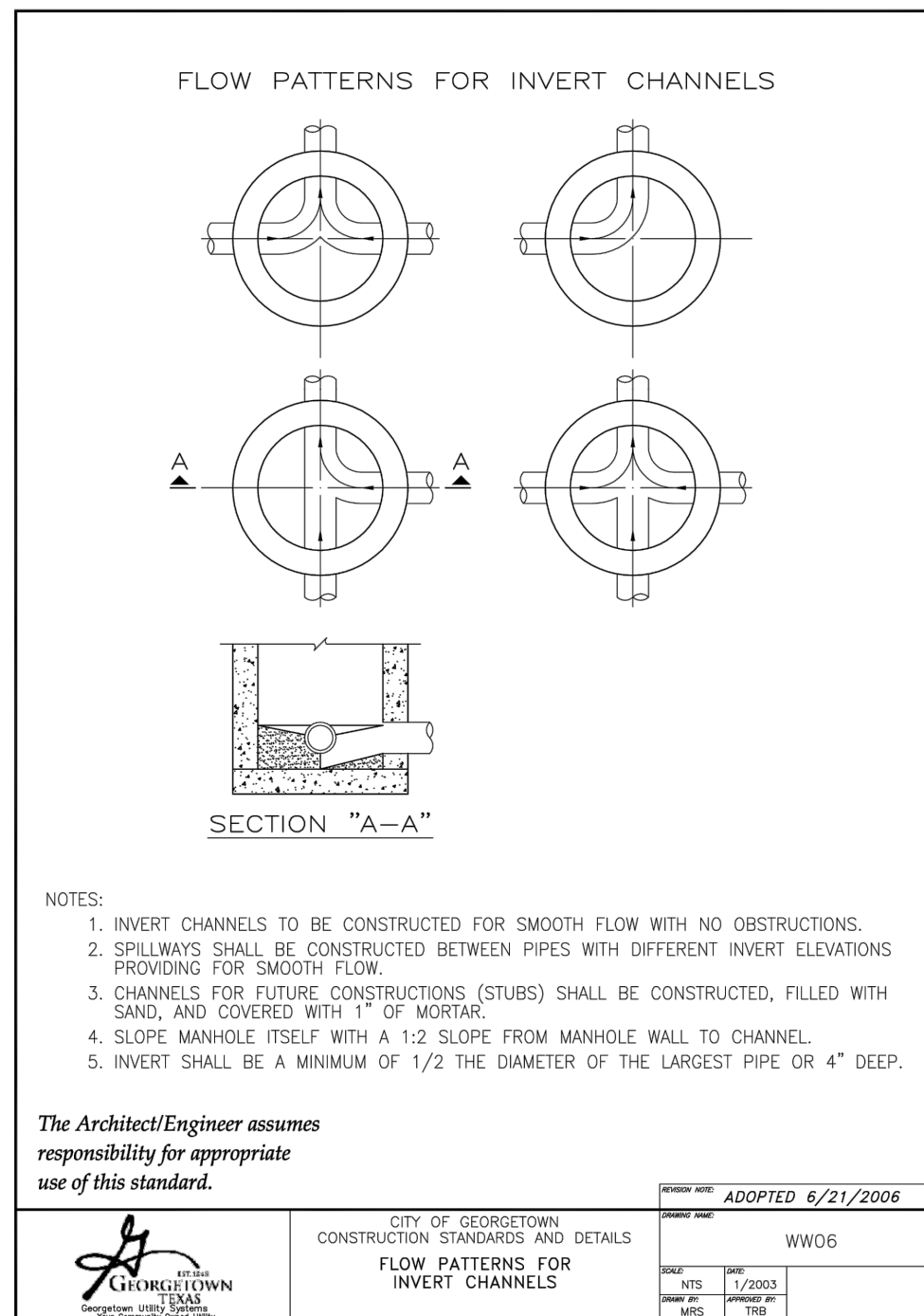
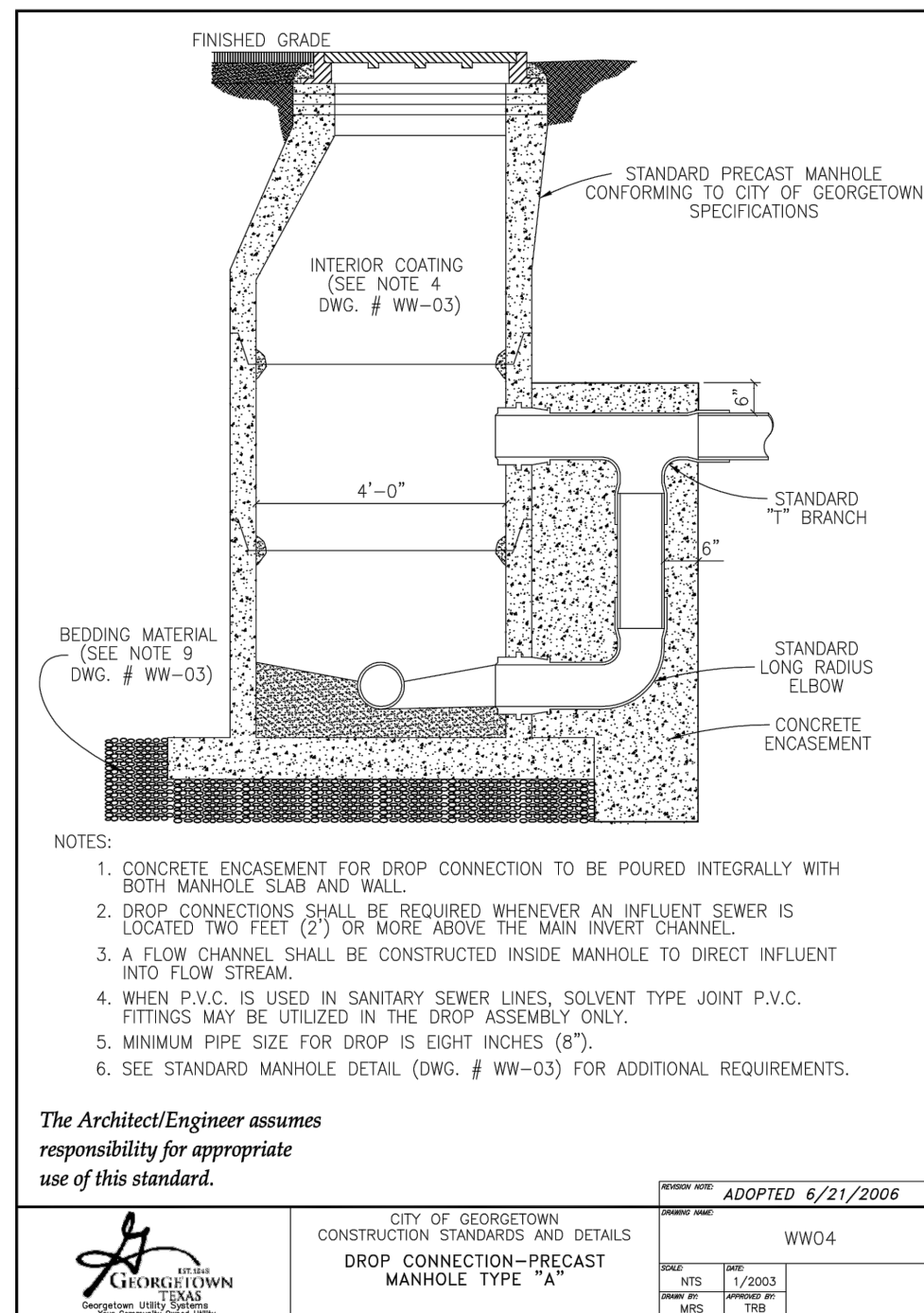
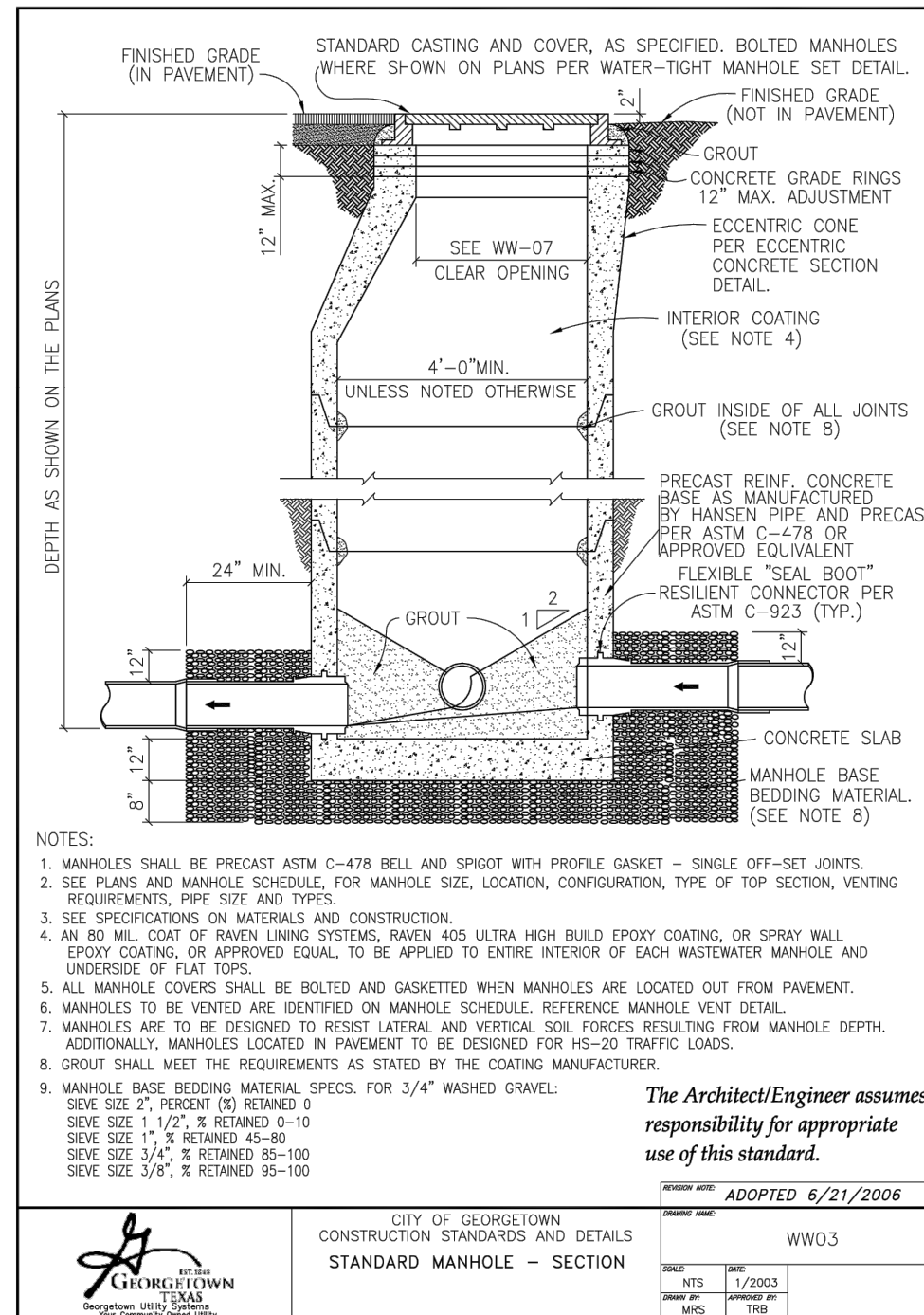
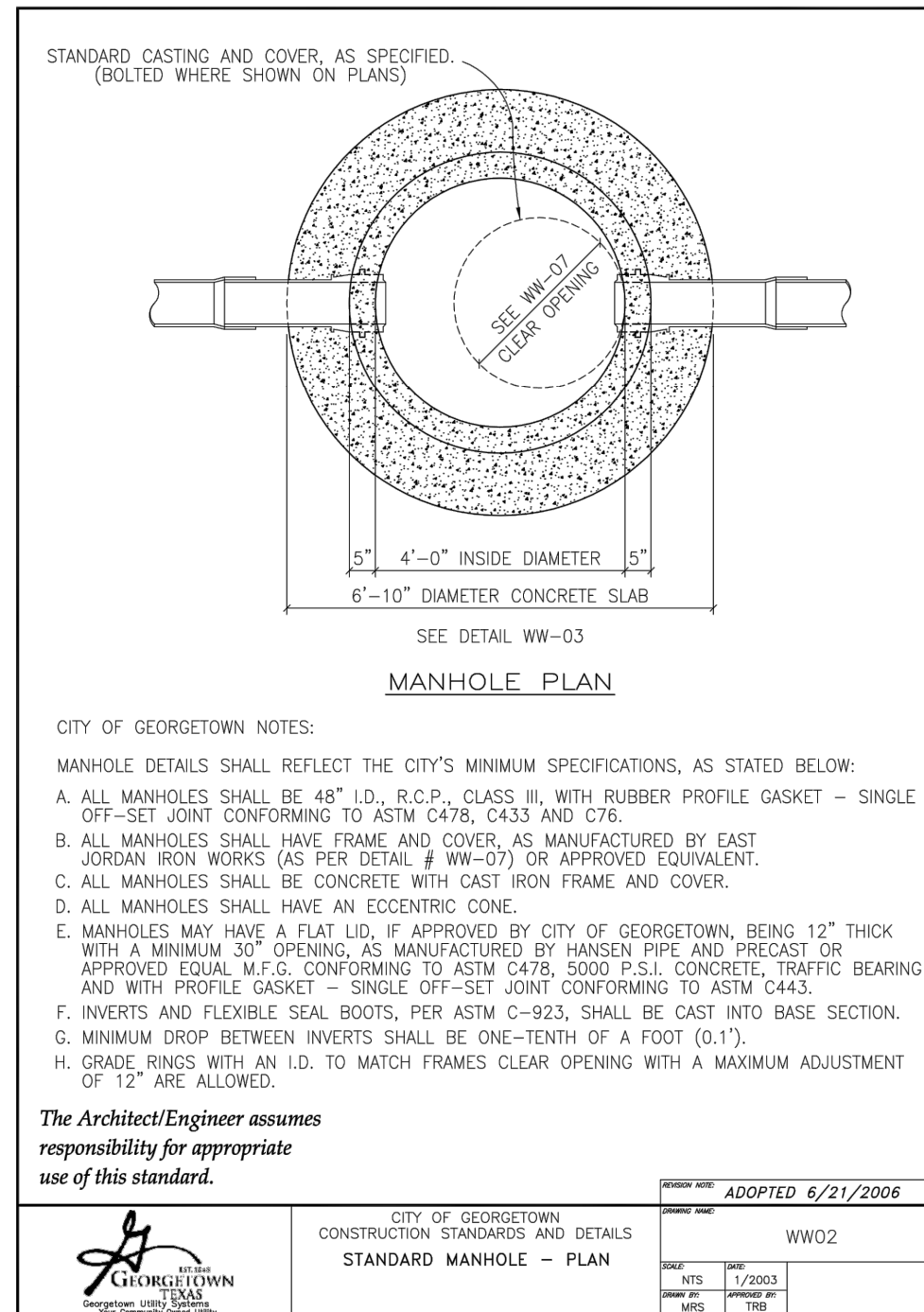
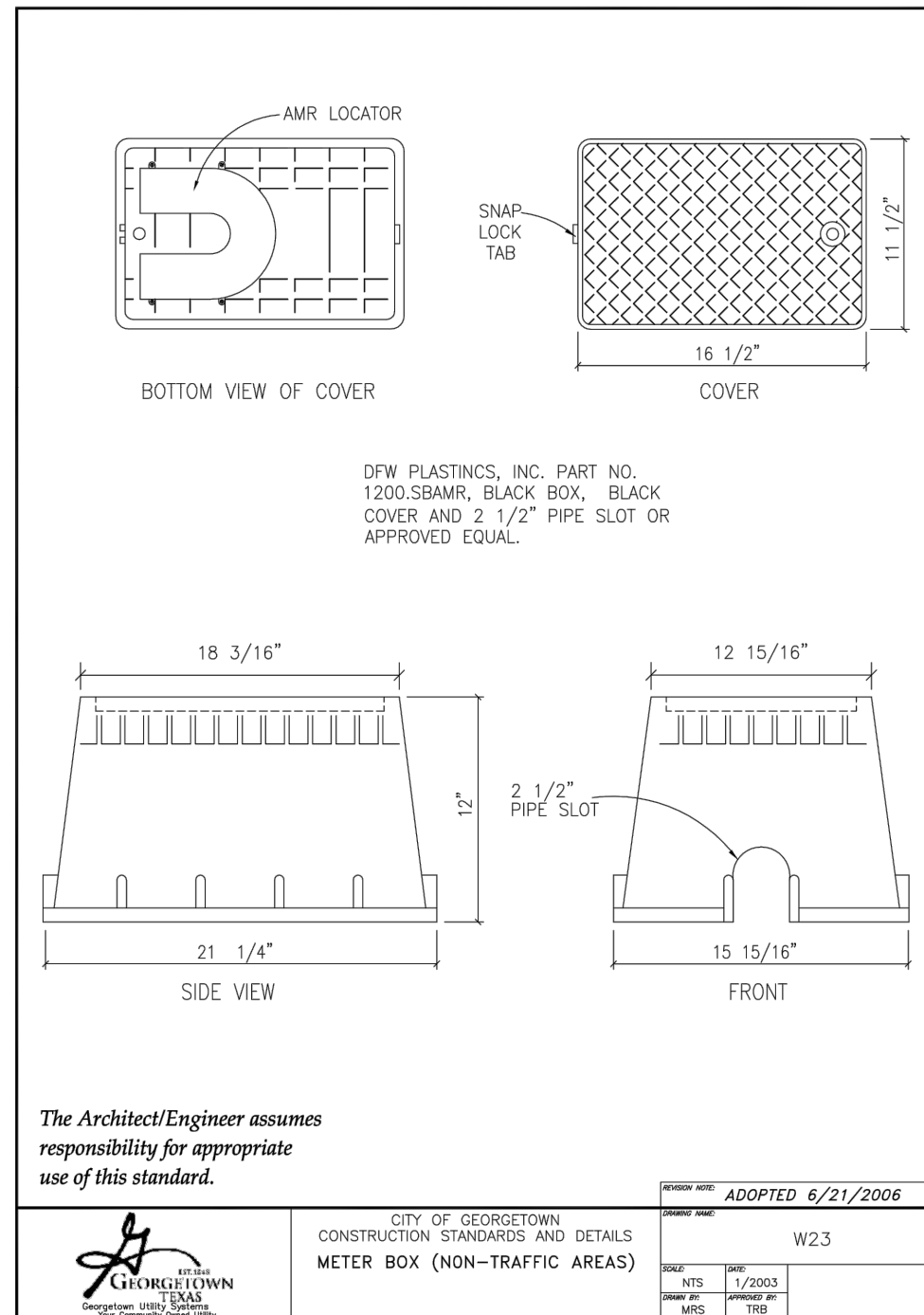
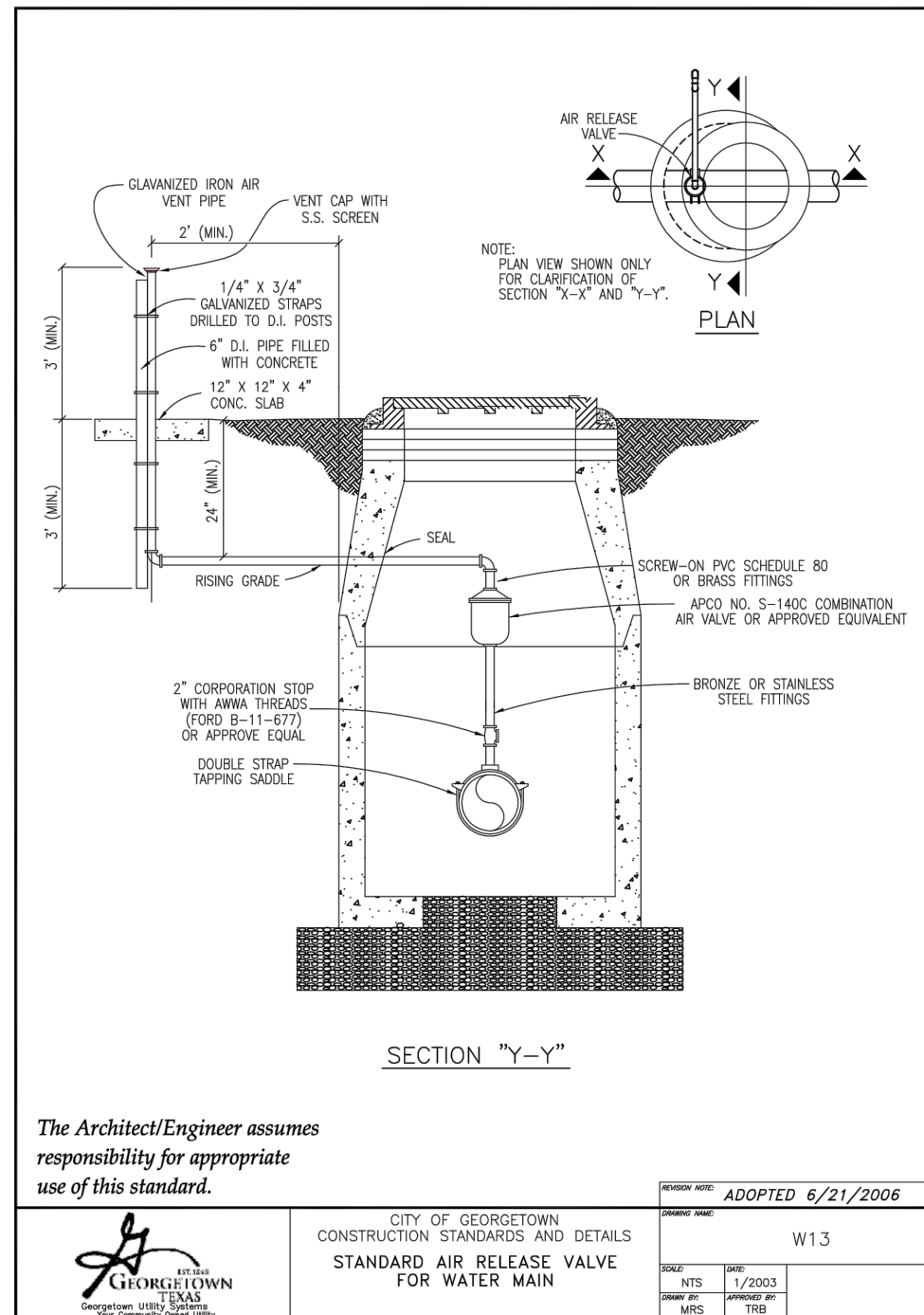
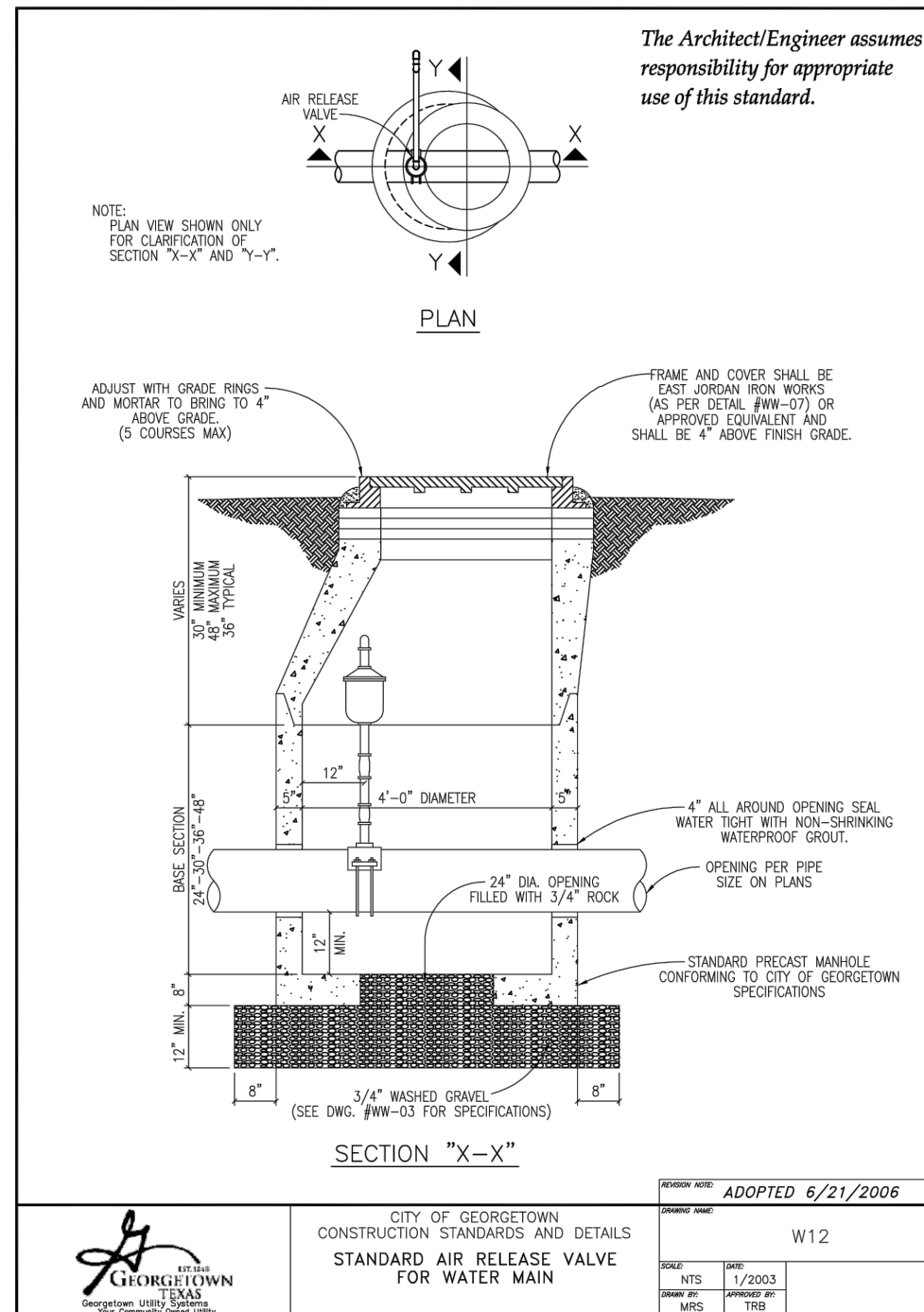
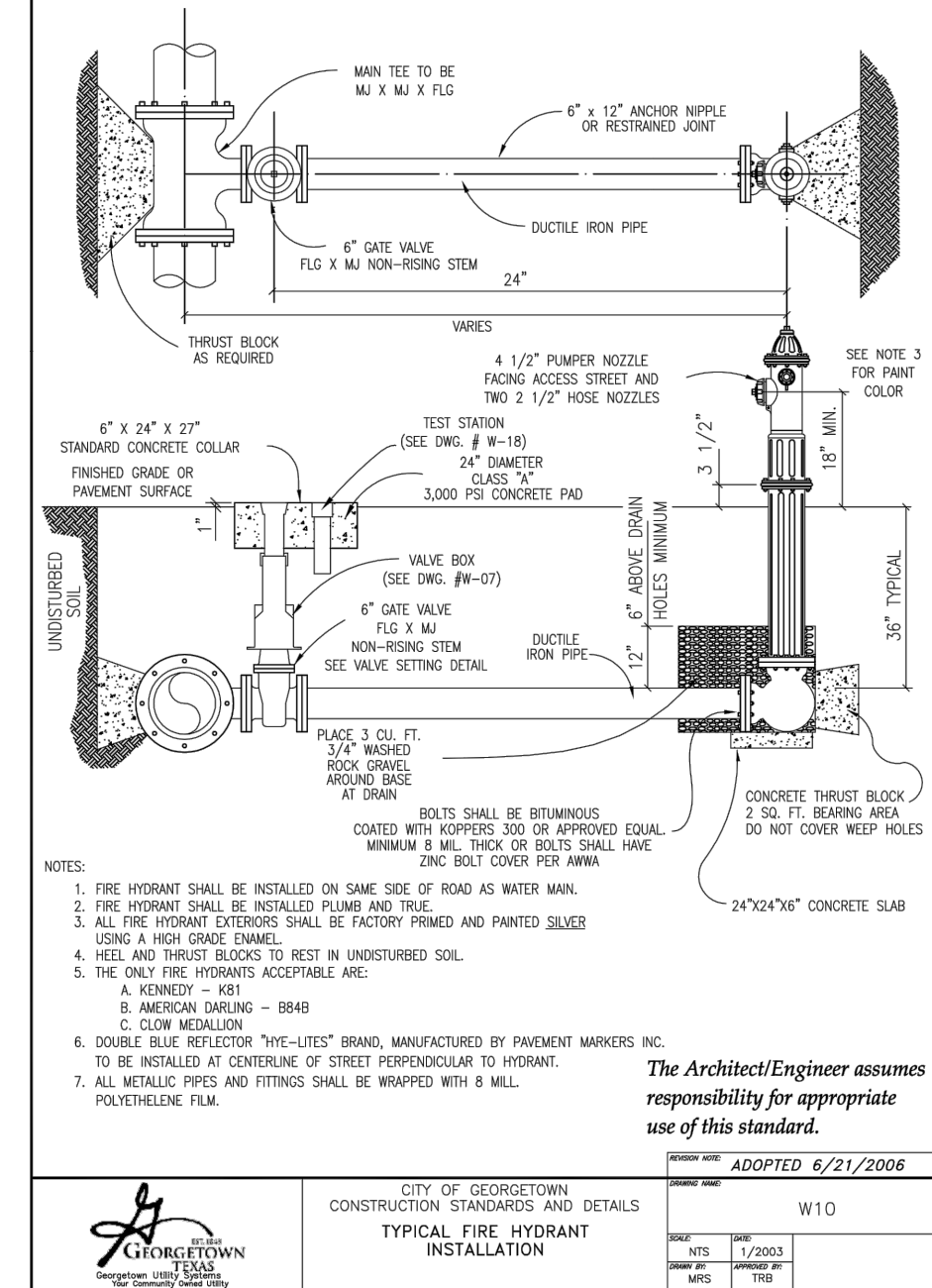
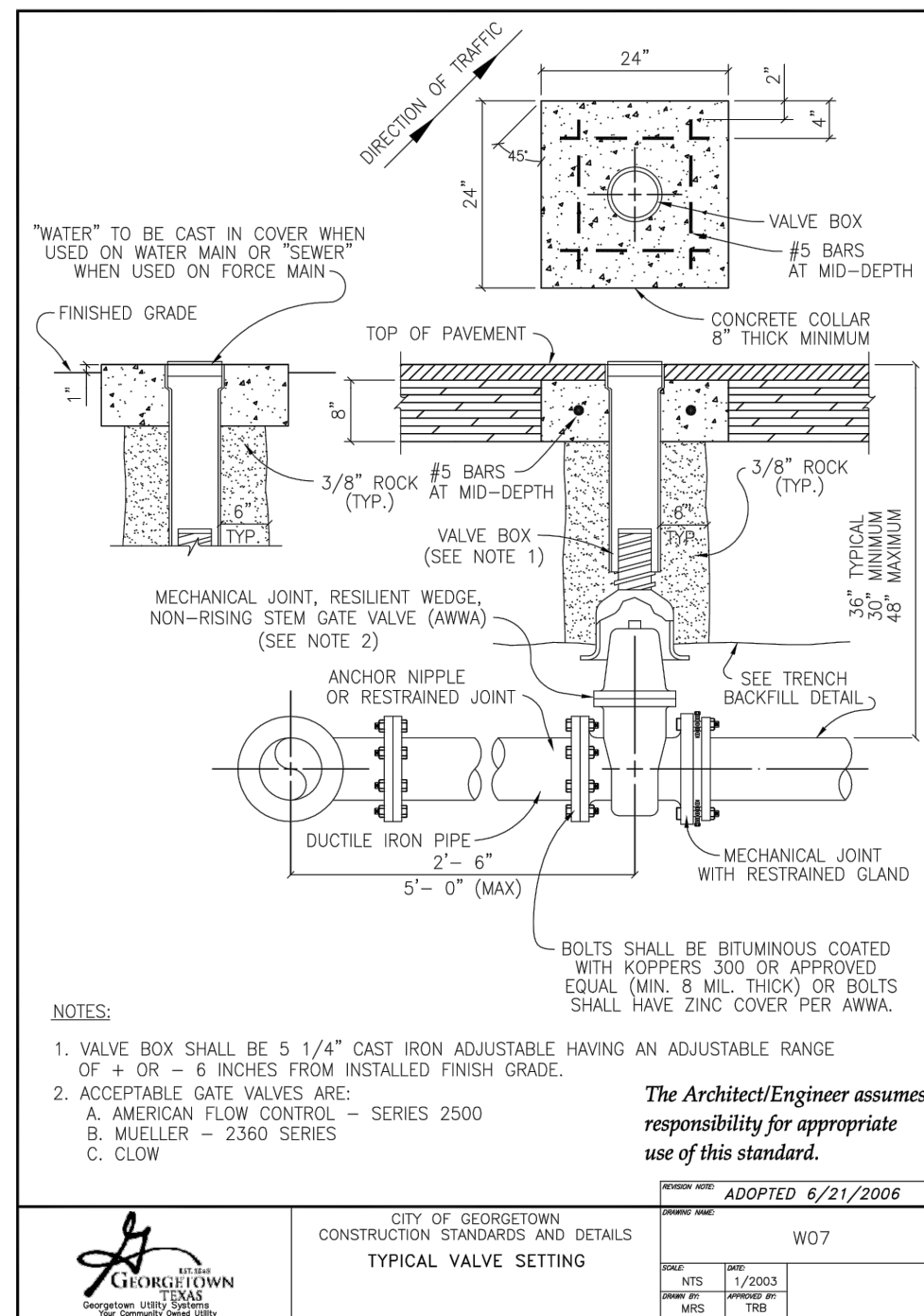
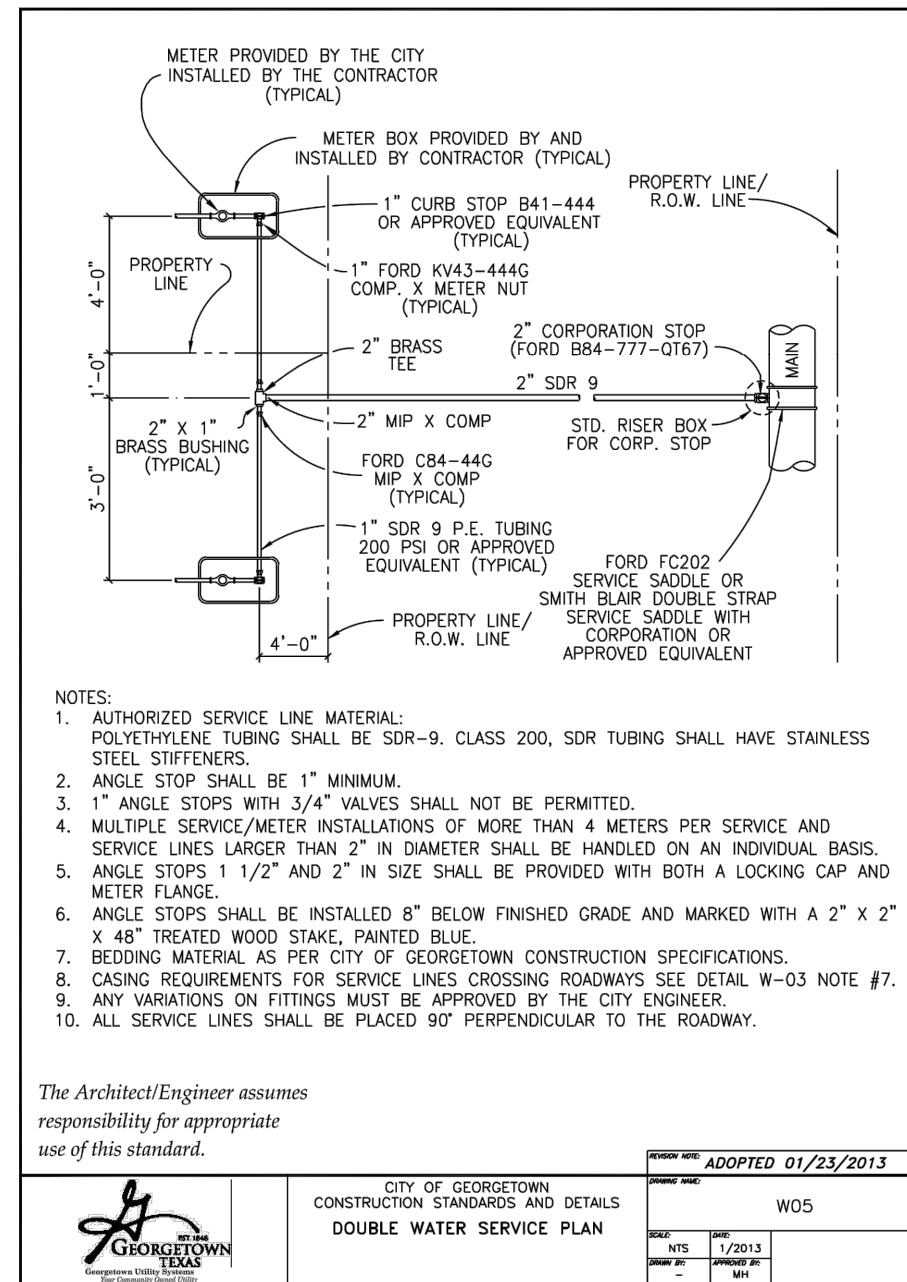
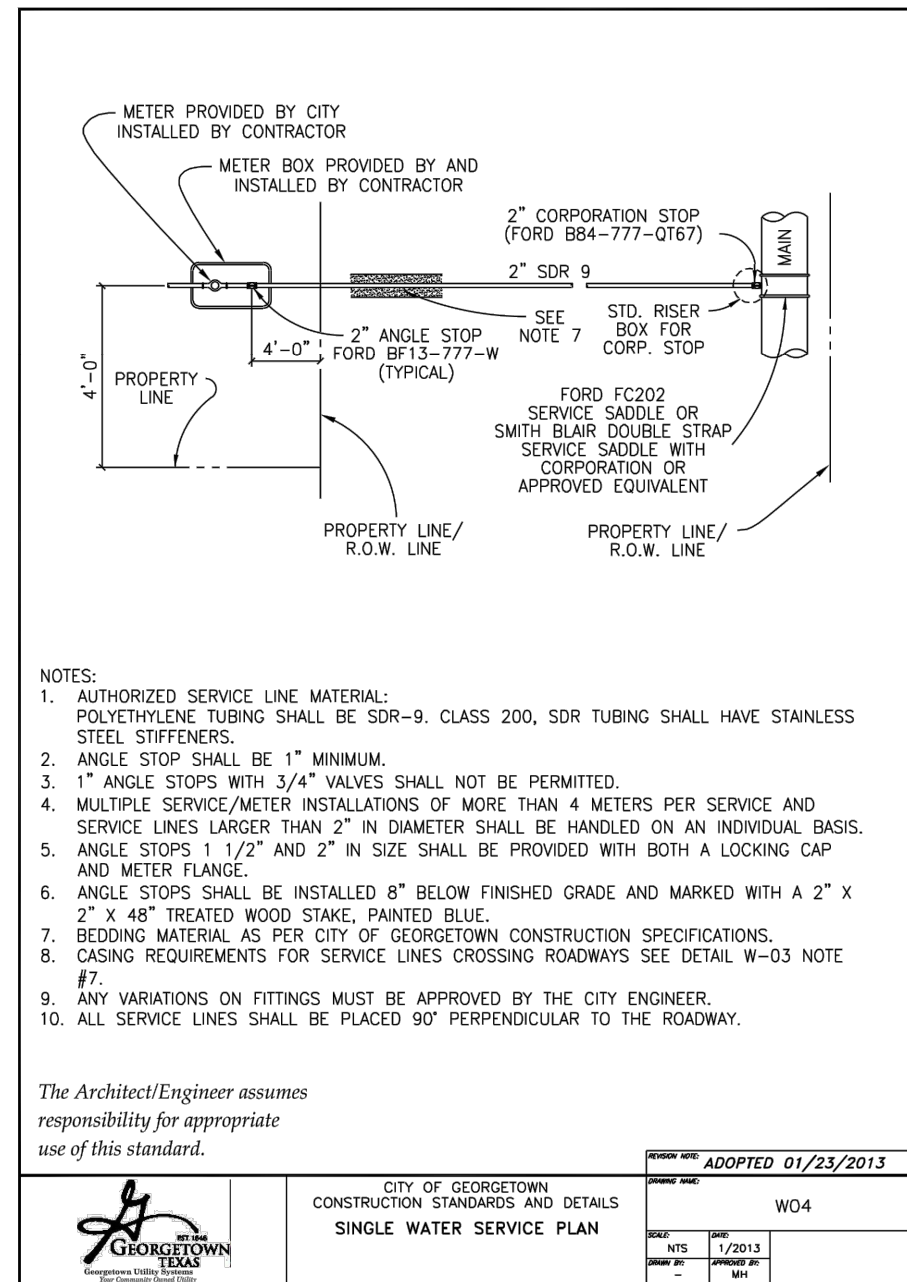
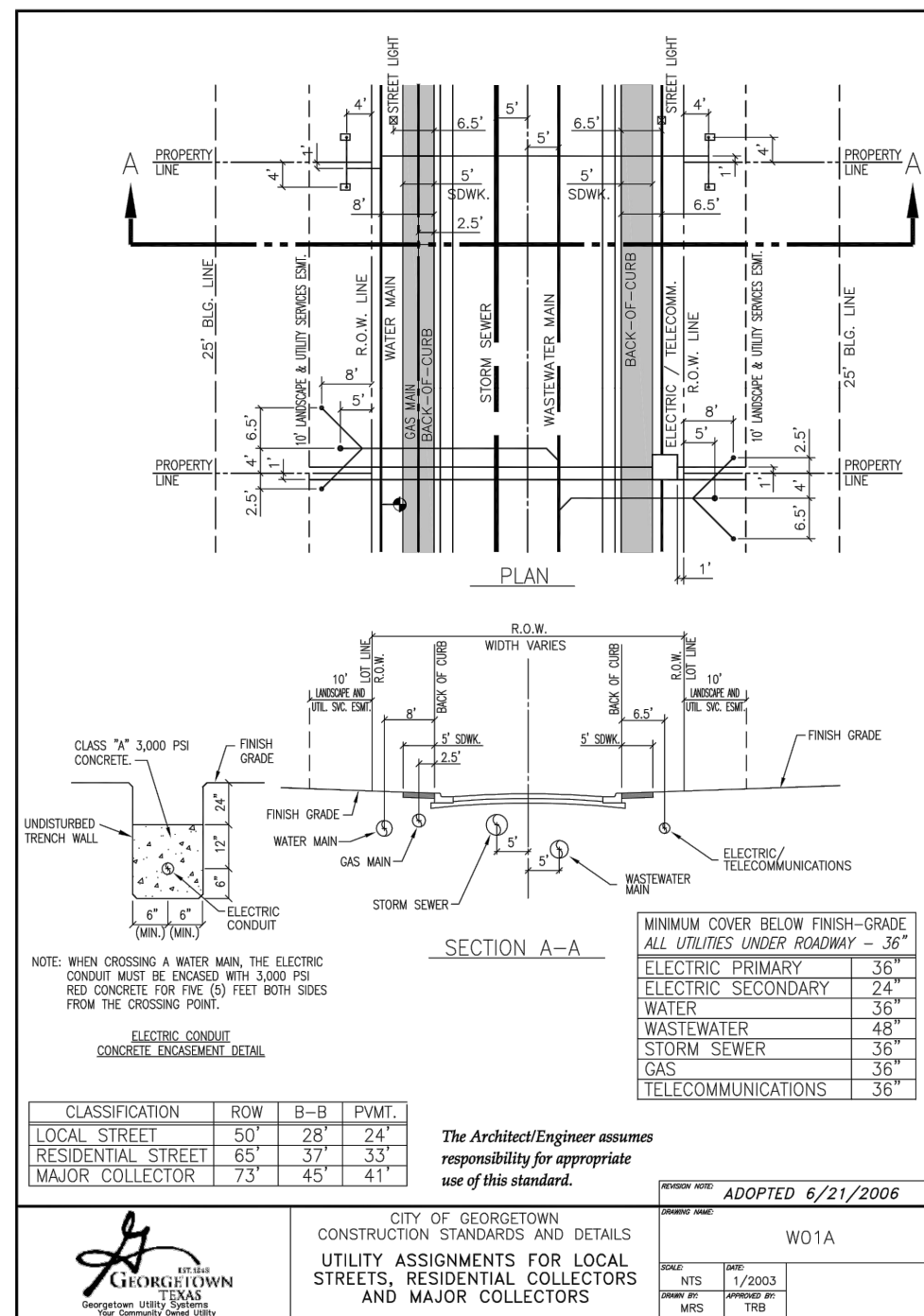
	
<b>NOTES:</b> <ol style="list-style-type: none"><li>SET LENGTH AND WIDTH AS NECESSARY TO PROVIDE ADEQUATE SPACE FOR WASHOUT ACTIVITIES.</li><li>IF RESTRICTED BY DEPTH DUE TO BELOW GRADE APPURTENANCES, PLACE EARTHEN BERMS AT GRADE.</li><li>USE EXCAVATED MATERIAL TO CREATE EARTHEN BERMS SURROUNDING THE AREA TO BE DESIGNATED AS A CONCRETE WASHOUT.</li><li>PLACE 10MIL OR GREATER PLASTIC SHEETING.</li><li>SECURE SHEETING ON OUTSIDE OF BERM AREA USING SAND BAGS OR ROCK EQUIVALENT.</li></ol>	
<b>CONCRETE WASHOUT</b>	
<b>THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.</b>	
STANDARD NO. 648S-1	

KHA PROJECT 069291006		DATE SEPTEMBER 2023	SCALE AS SHOWN	DESIGNED BY MDM	DRAWN BY MDM	CHECKED BY JRK
BERRY CREEK HIGHLANDS PHASE 3		EROSION CONTROL DETAILS				
CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS		SHEET NUMBER C-33 OF C-37				
2023-XX-CON		2023-XX-CON				



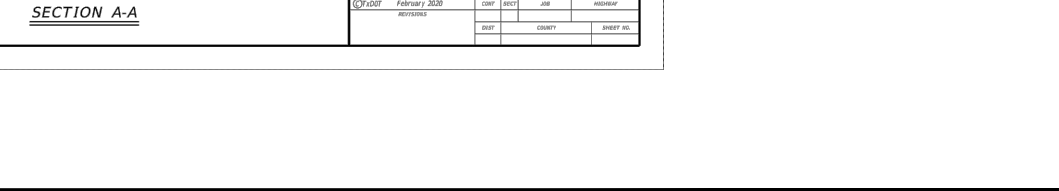
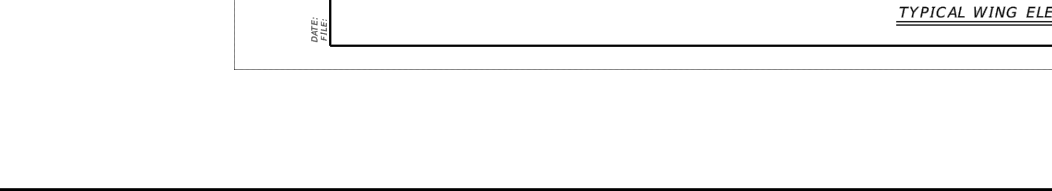
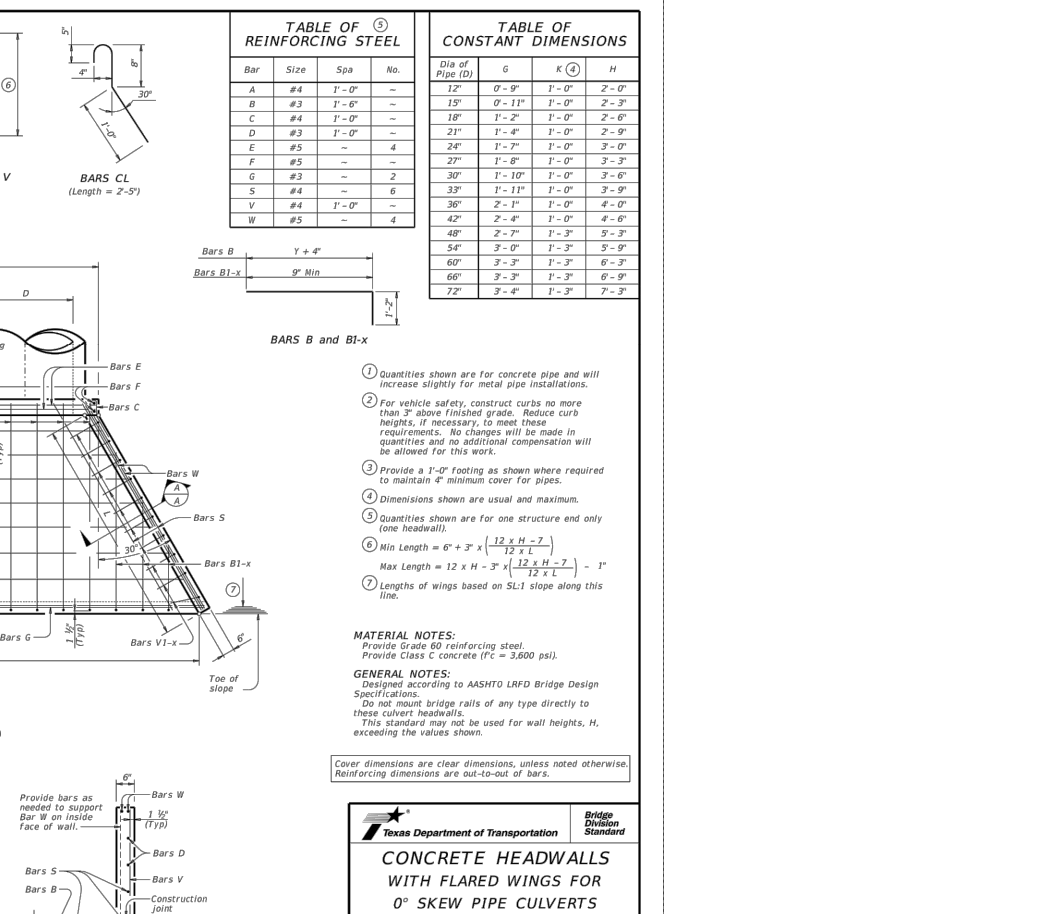
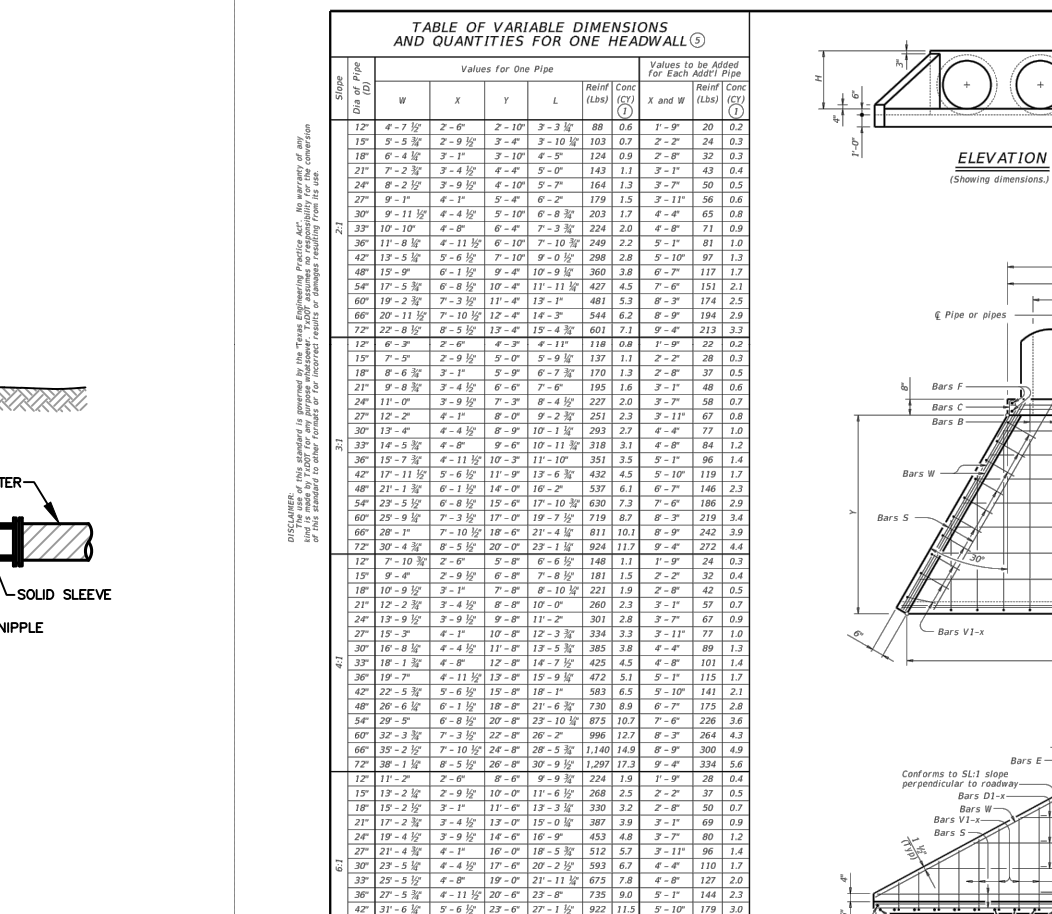
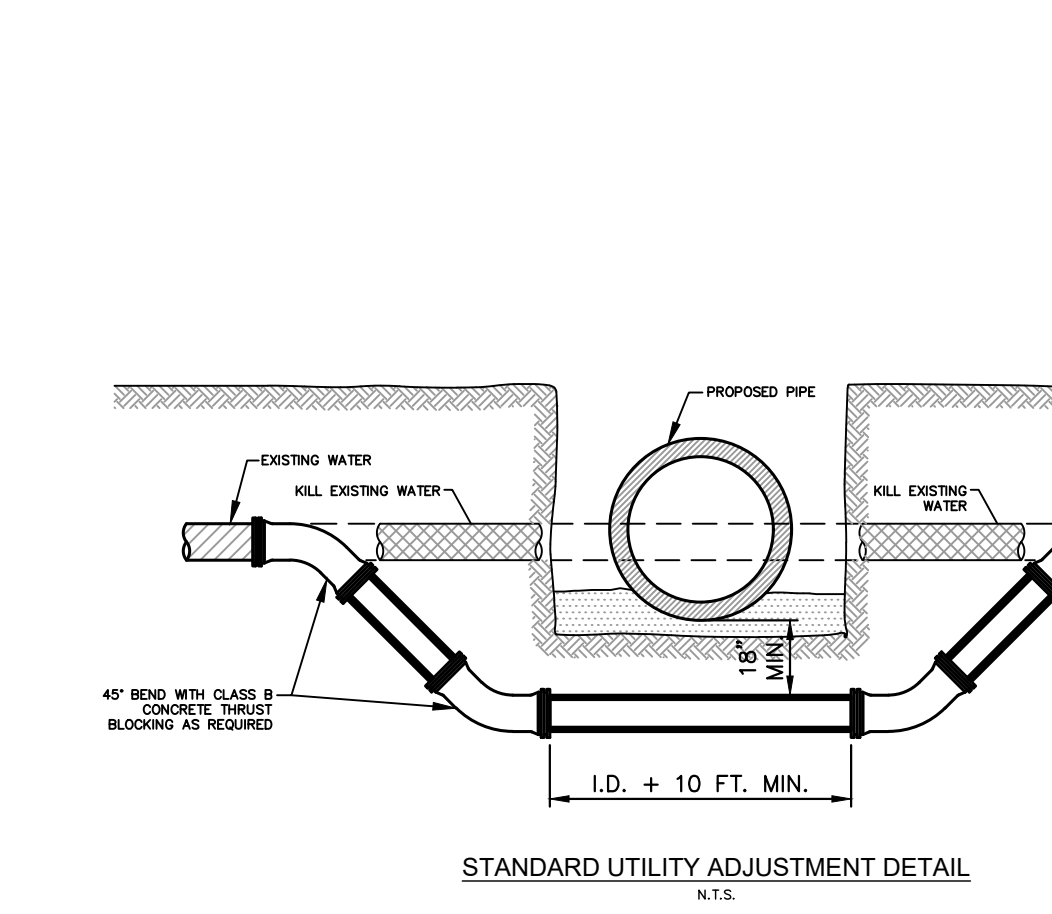
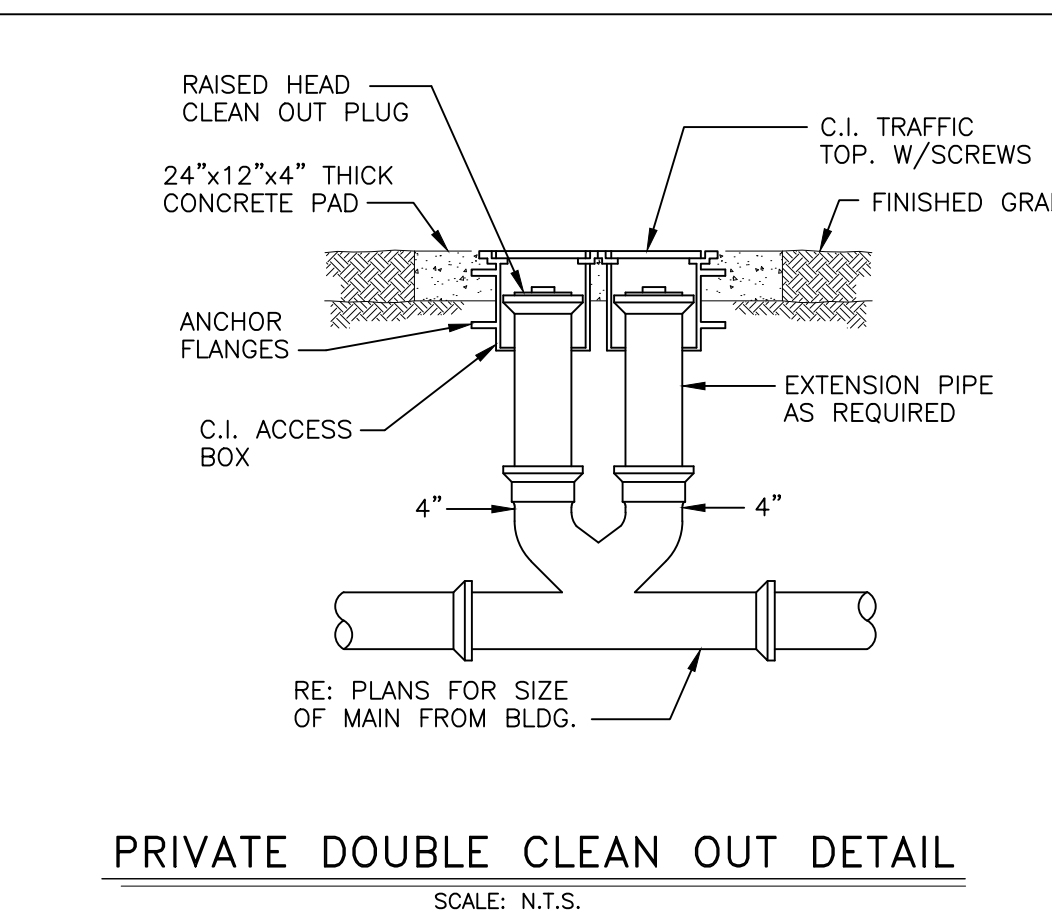
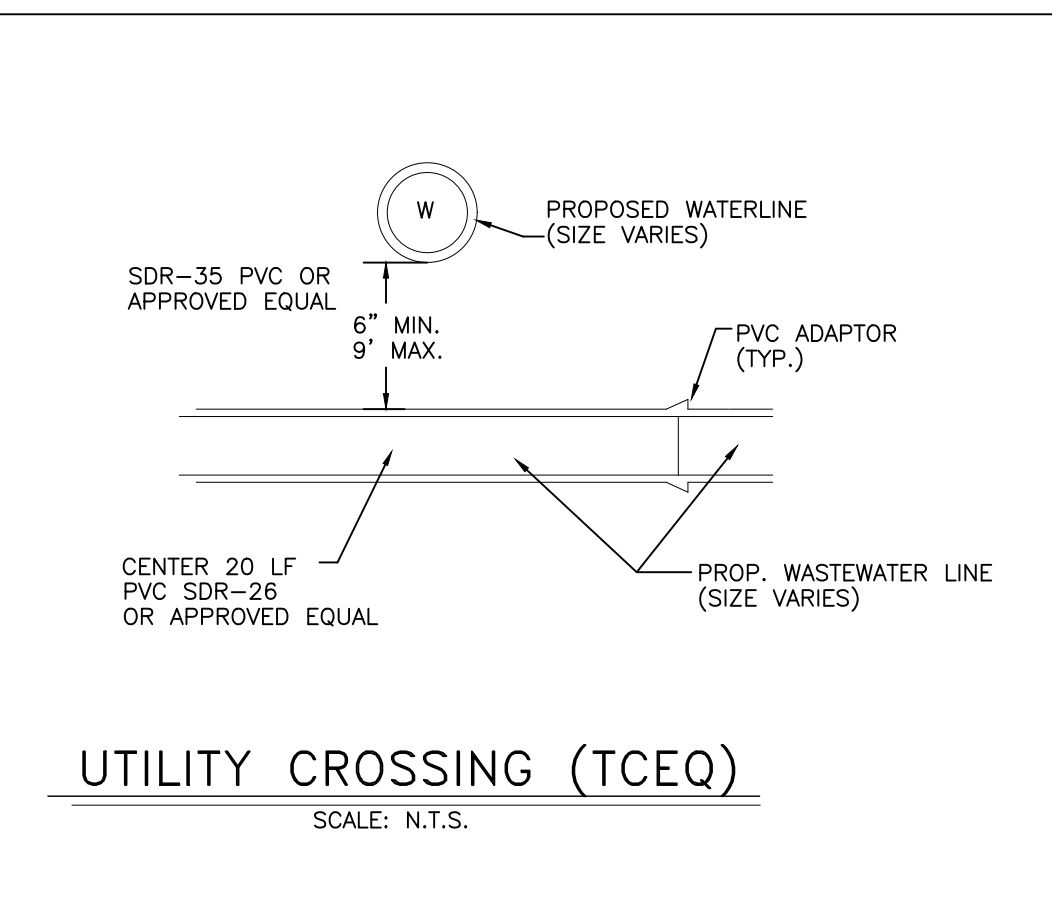
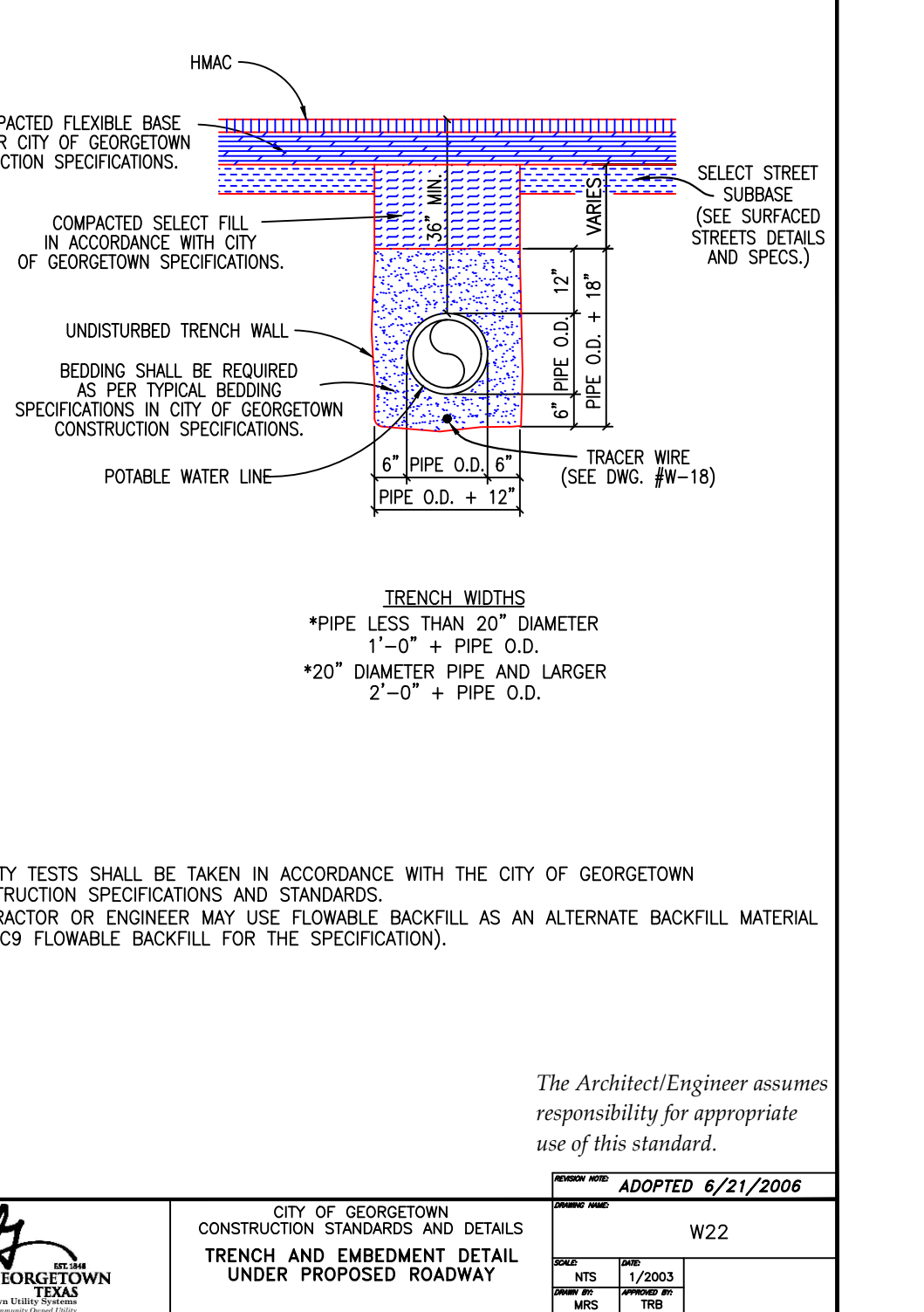
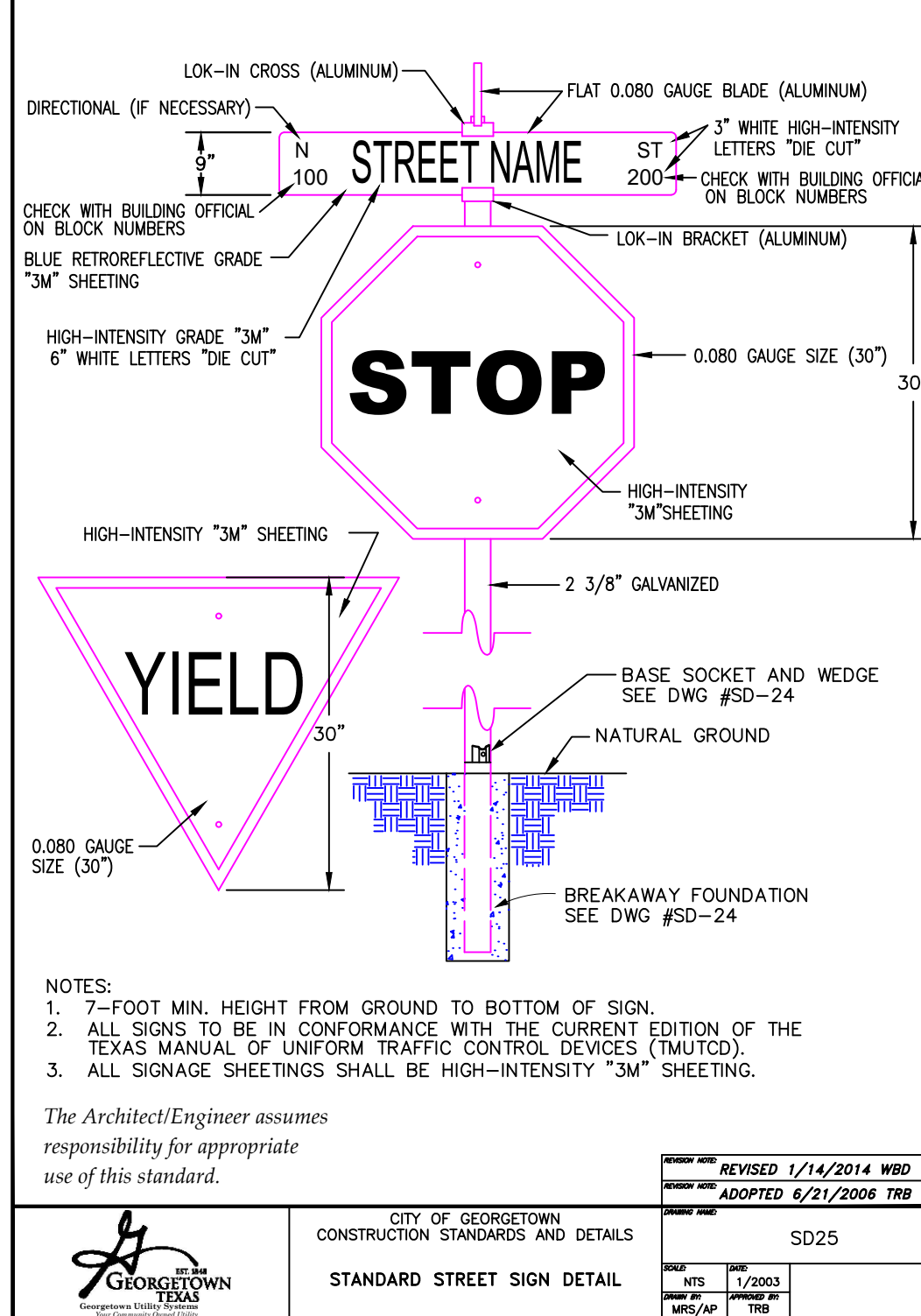
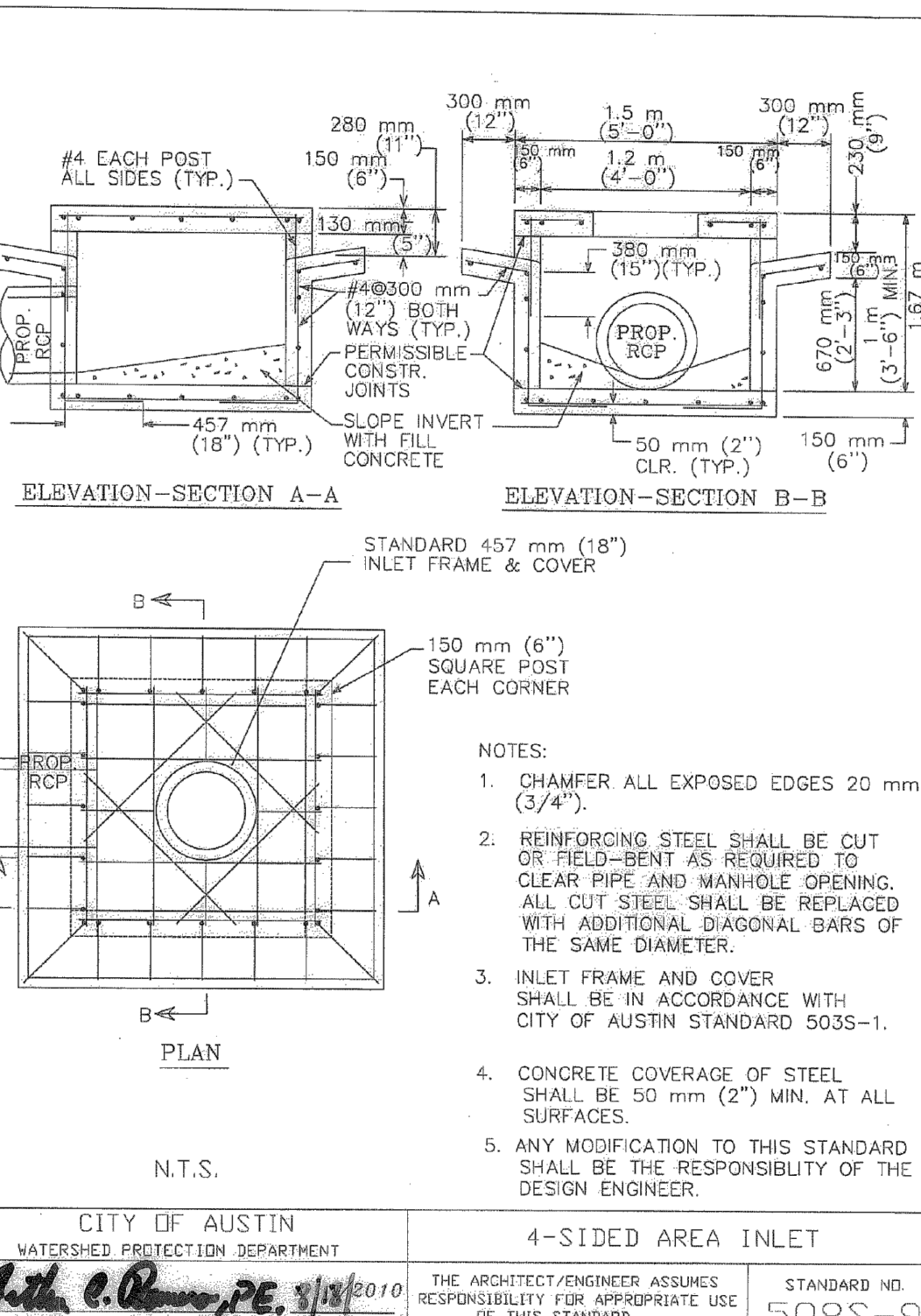
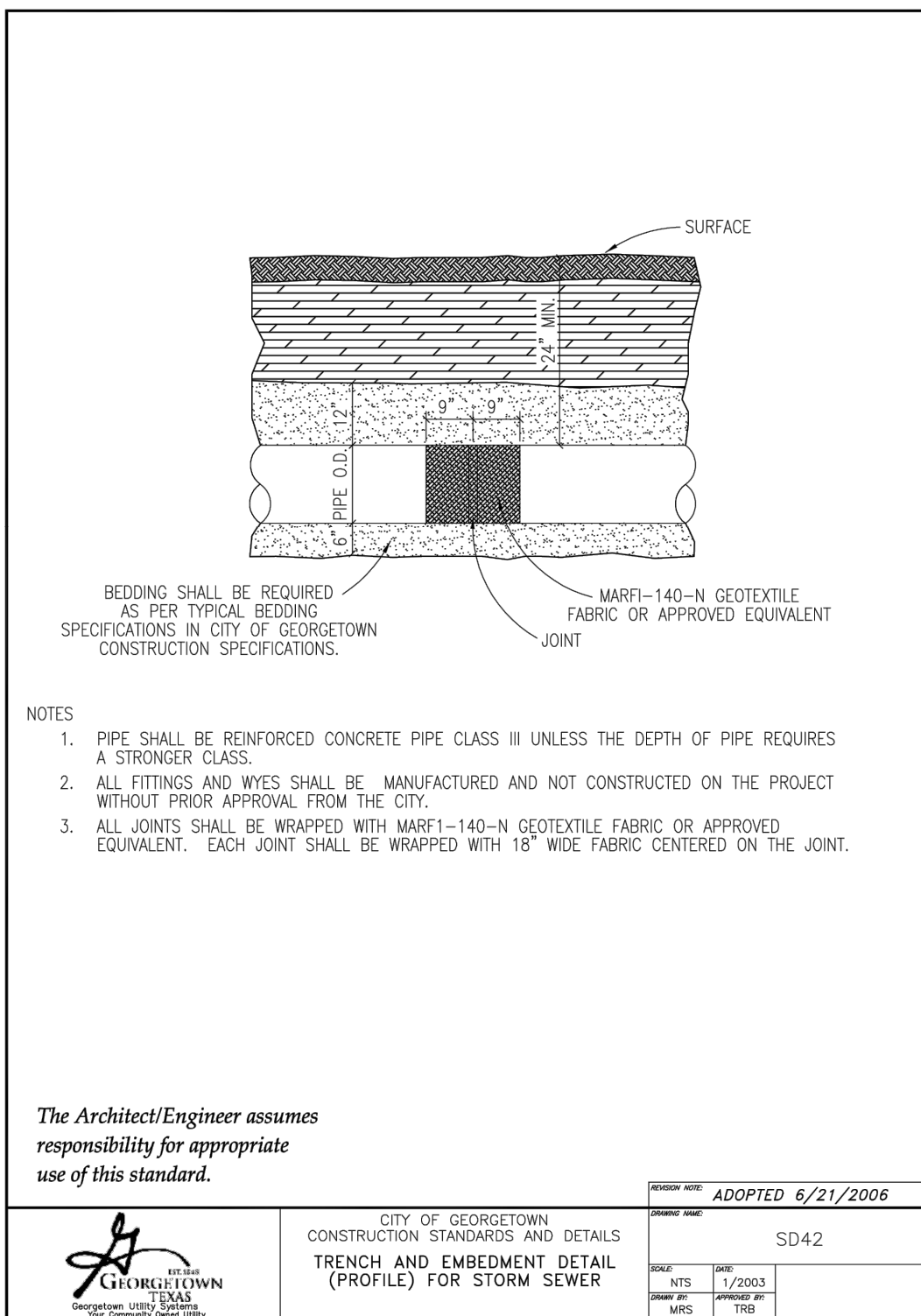
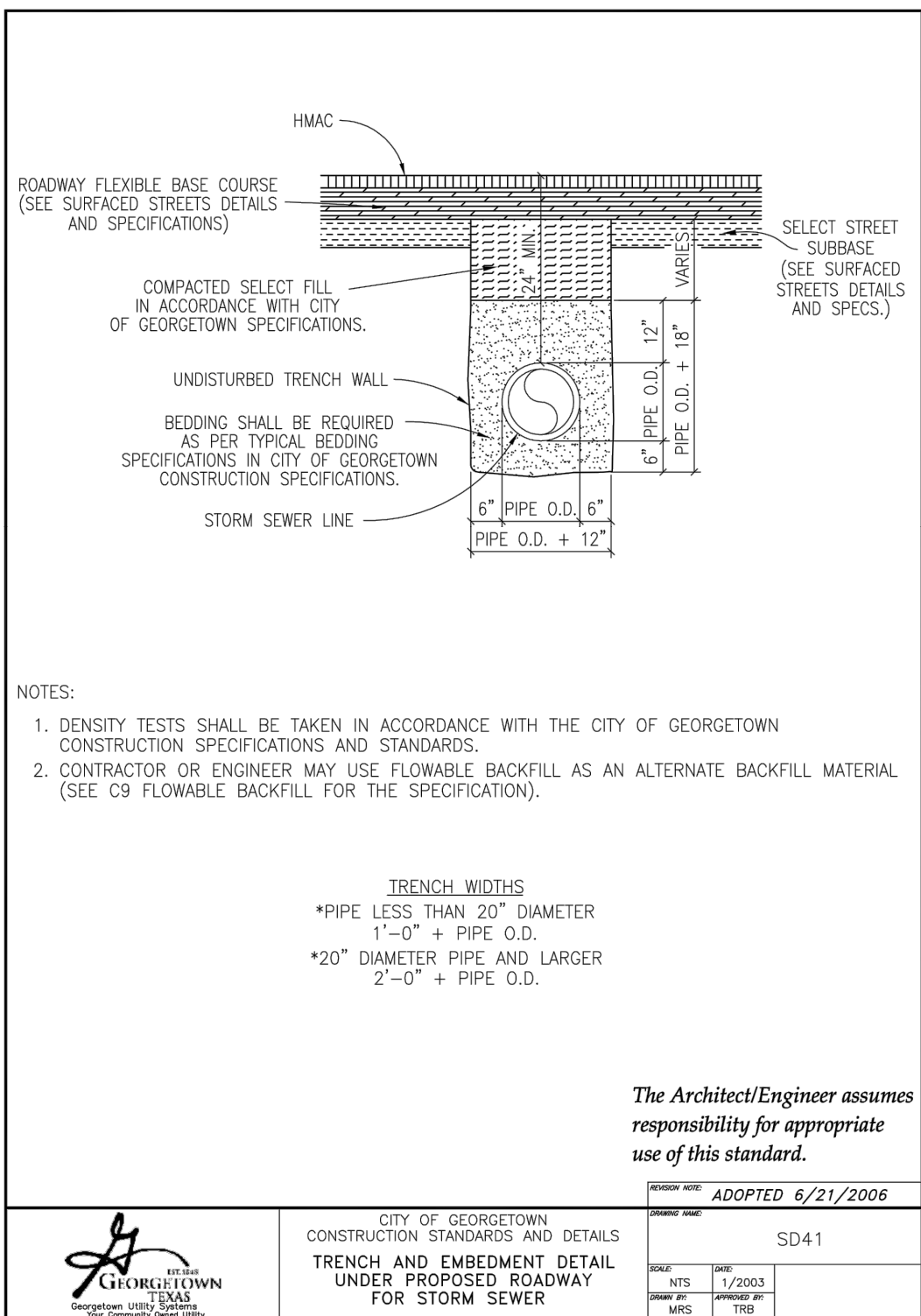
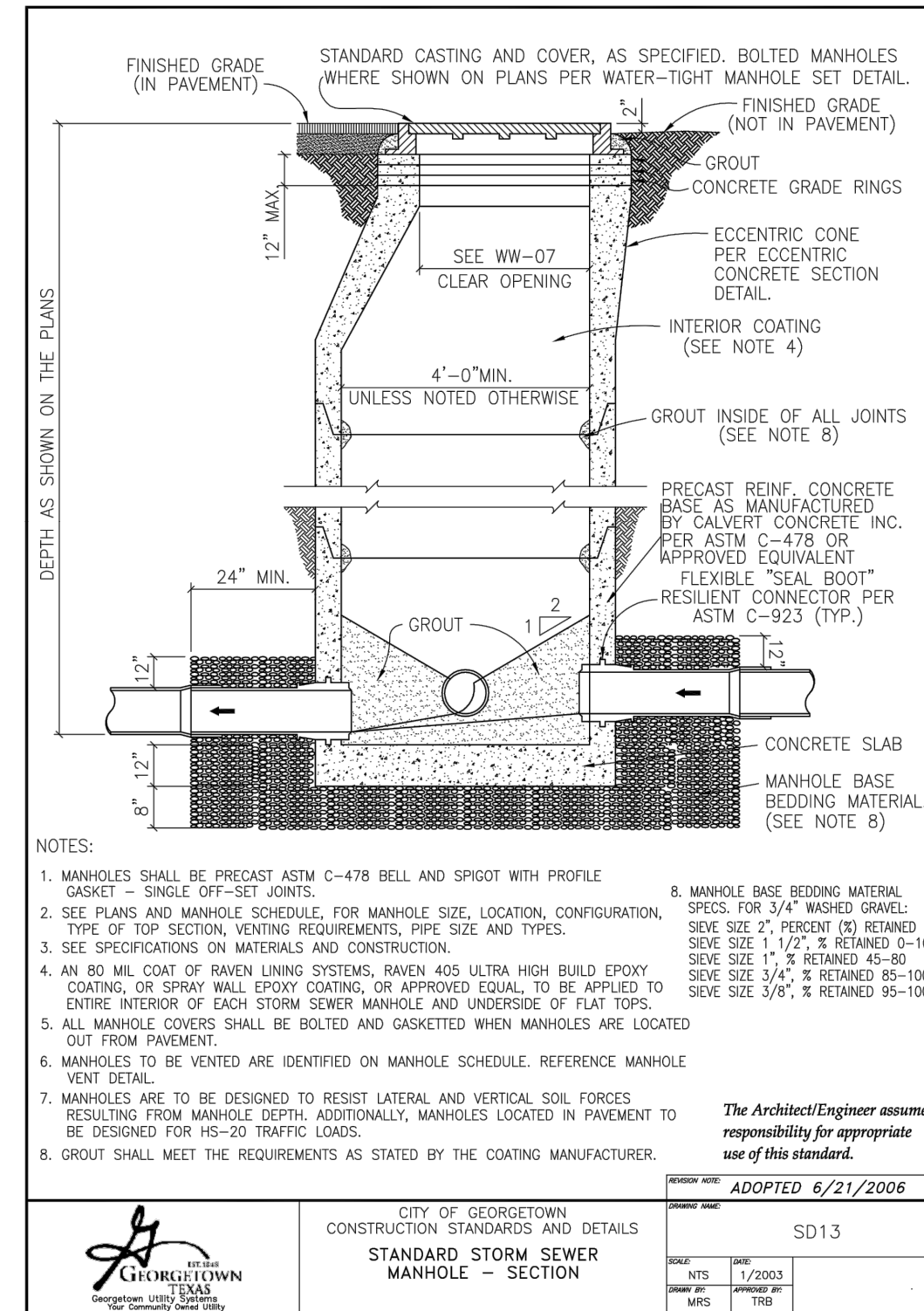
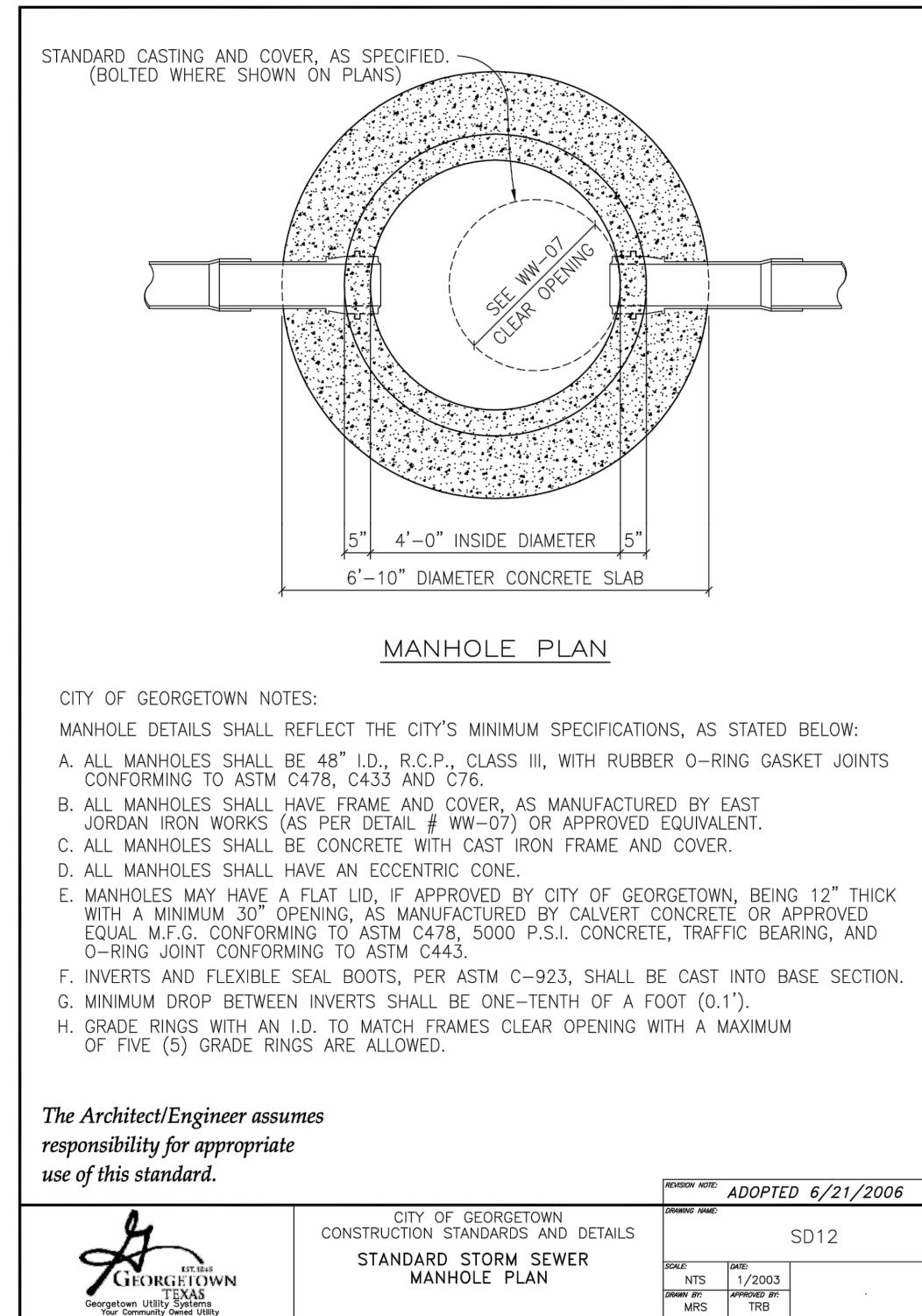
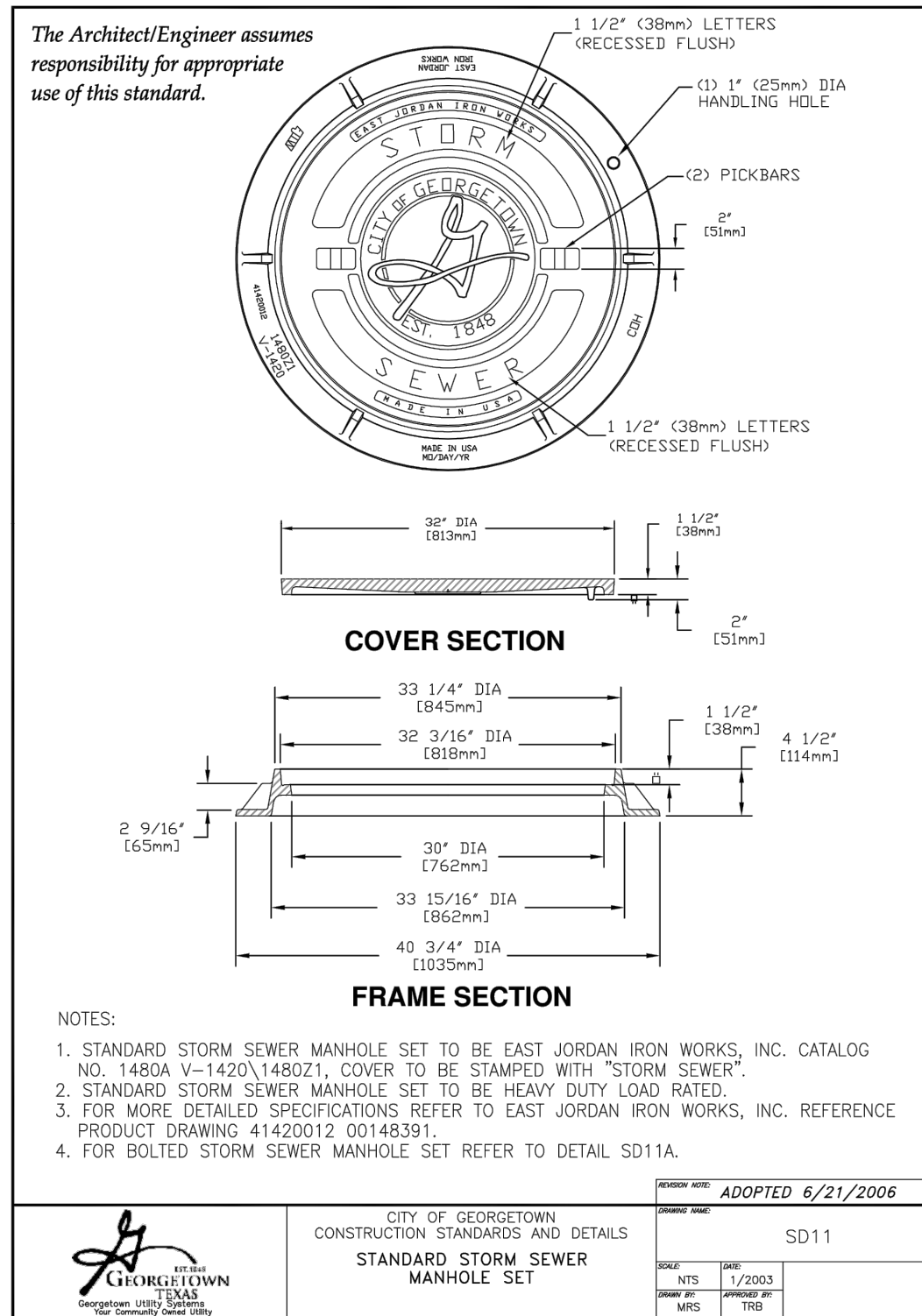
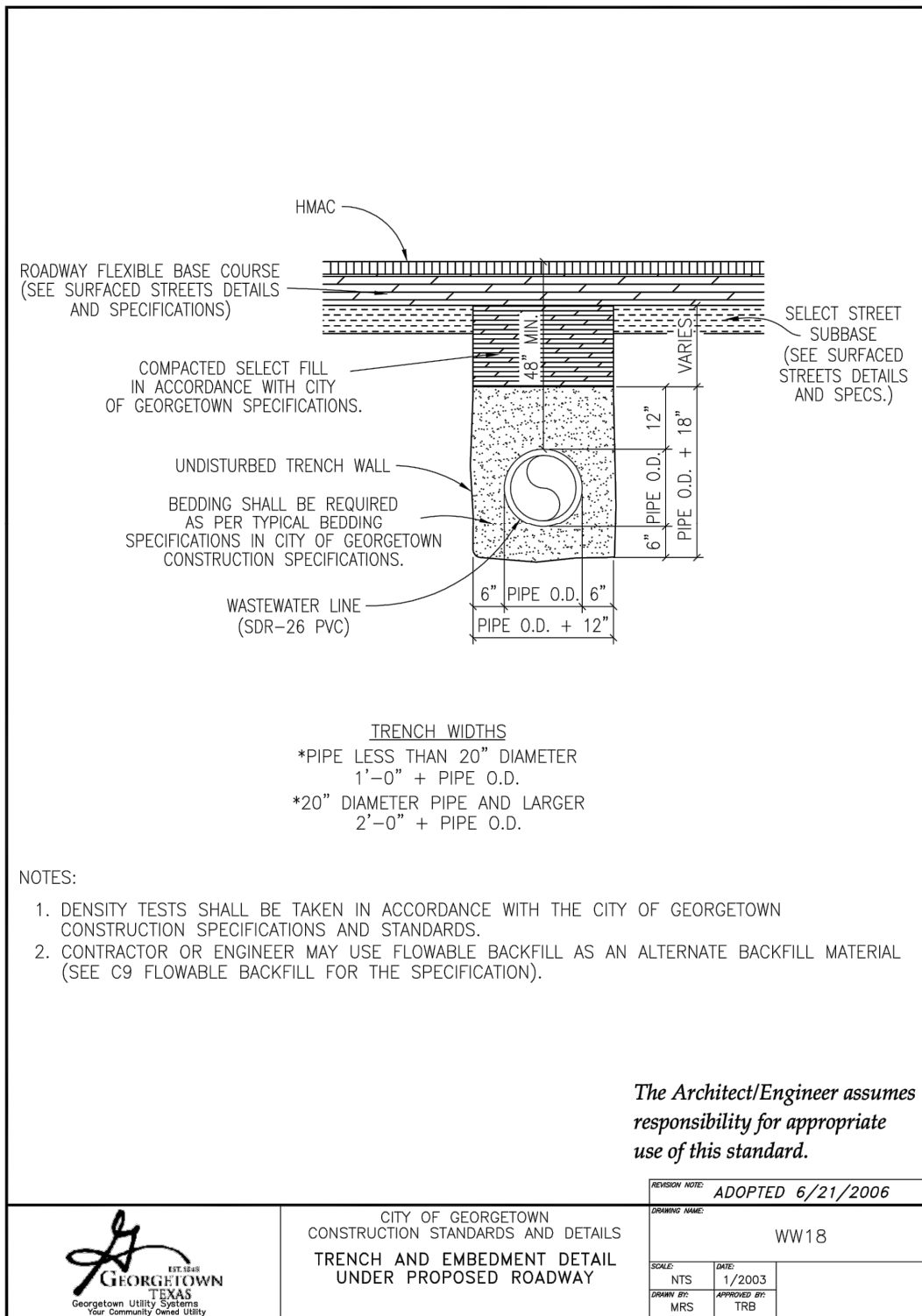
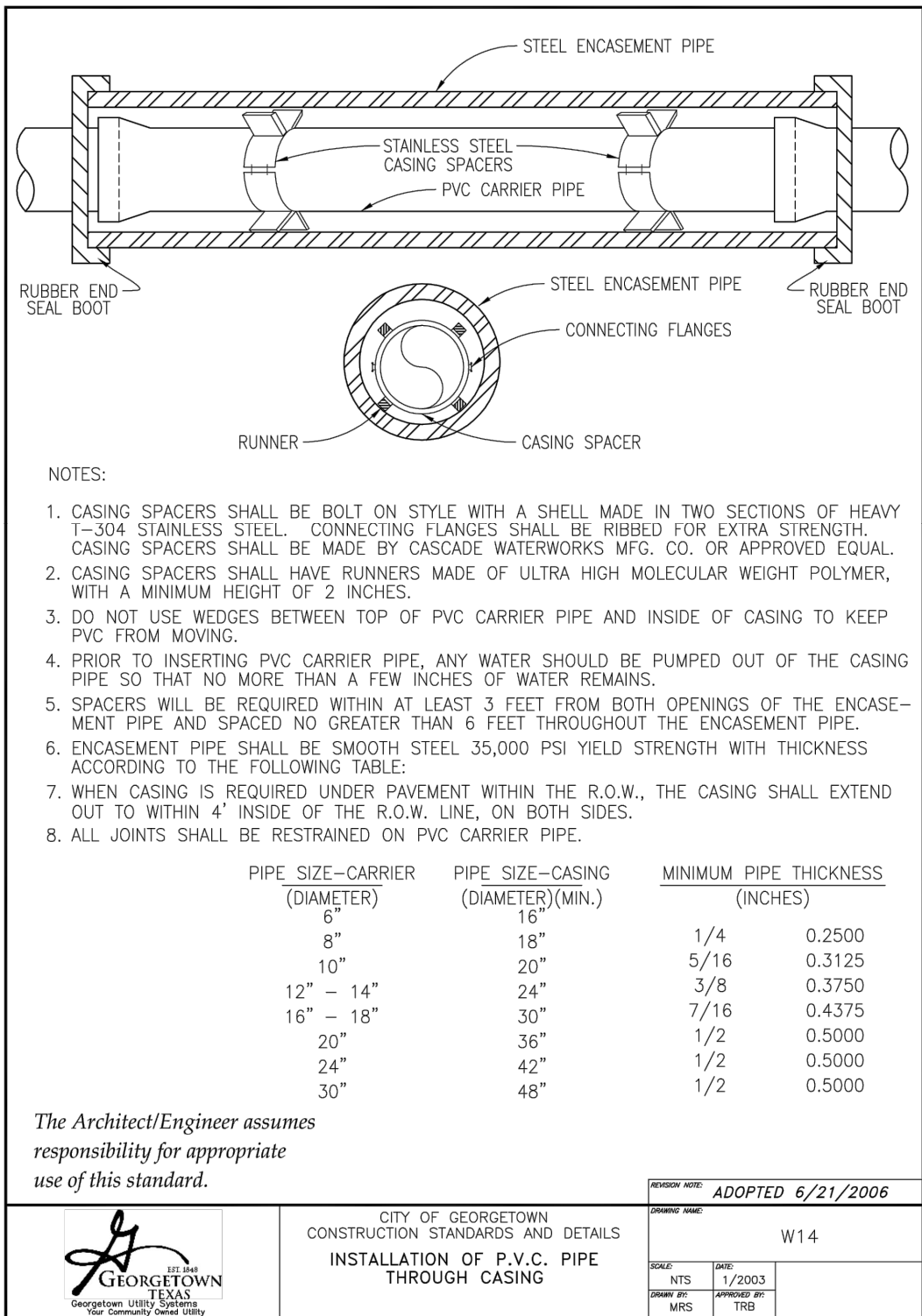








Plotted By: Messey, Mason Date: September 25, 2023 05:03:34pm File Path: K:\you\_civil\06782805 berry creek highlands Coad Phase 3\plan sheets\0-Utility Details.dwg  
This document, together with the concepts and designs presented herein, is an instrument of service. It is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



UTILITY DETAILS (SHEET 2 OF 3)

BERRY CREEK HIGHLANDS PHASE 3

CITY OF GEORGETOWN WILLIAMSON COUNTY, TEXAS

DATE: SEPTEMBER 2023

SCALE: AS SHOWN

DRAWN BY: MDM

CHECKED BY: JRK

PROJECT: KHA PROJECT 069291006

DATE: SEPTEMBER 2023

SCALE: AS SHOWN

DRAWN BY: MDM

CHECKED BY: JRK

REVISIONS

DATE

BY

SHEET NUMBER

C-36

OF C-37

2023-XX-CON

Kimley»Horn

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10814 JOLLYVILLE ROAD, AVALON IV, SUITE 300, AUSTIN, TX 78759  
PHONE: 512-418-1771 FAX: 512-418-791  
WWW.KIMLEY-HORN.COM  
TEXAS REGISTERED ENGINEERING FIRM F-928

Jacob Kondo

STATE OF TEXAS

PROFESSIONAL ENGINEER

JACOB KONDO

115813

LICENSE

KHA PROJECT 069291006

DATE: SEPTEMBER 2023

SCALE: AS SHOWN

DRAWN BY: MDM

CHECKED BY: JRK









RE: Texas Commission on Environmental Quality  
Engineer's Certificate of Completion of Water District Project for:  
**Berry Creek Highlands Phase 1B Construction Plans (City Project No. 2021-7-CON)**

Name of District: **Berry Creek Highlands Municipal Utility District**

Owner of Property if other than District: **Berry Creek (Georgetown) ASLI IX, LLC**

Kind of project, contract identification: **Drainage, Water, Wastewater and Paving Infrastructure Plans**

Name of Contractor: **CC Carlton Industries**

Name of Consulting Engineer: **Kimley-Horn and Associates, Inc.**

Address of Consulting Engineer: **5301 Southwest Parkway, Building 3, Suite 100, Austin, TX 78735**

I certify that this project was 100% complete on 4/26/2022; that the project was under continual observation; that all observation of the work performed by or under the supervision of Harrison M. Hudson, Registered Professional Engineer; that to the best of my knowledge the project was in accordance with and includes all the items and specifications approved by all authorities having jurisdictions; and "record drawings" will be furnished to the district.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

Harrison M. Hudson, P.E.  
Project Manager  
TBPE F-928









**Existing Condition:**  
Open Space; Type D soil group with a CN OF 77.

Existing Drainage Basin SC-M and SC-O conform to previously approved drainage analysis within the Sun City Neighborhood development

**LEGEND**

	AREA DESIGNATOR
	AREA IN ACRES
	Q100 FLOW IN CFS
	POINT OF ANALYSIS
	PROPERTY LINE
	EXISTING STORM DRAIN LINE
	EXISTING DRAINAGE DIVIDE
	TIME OF CONCENTRATION LINE
	EXISTING FLOW DIRECTION
	EXISTING CONTOUR
	PROPOSED CONTOUR

0 200' 400'

GRAPHIC SCALE 200'

03/11/2020

# EXISTING DRAINAGE AREA MAP

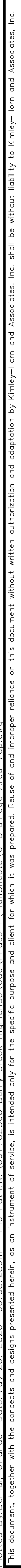


**Know what's below.  
Call before you dig.**

**WARNING: CONTRACTOR IS TO  
VERIFY PRESENCE AND EXACT  
LOCATION OF ALL UTILITIES  
PRIOR TO CONSTRUCTION.**

SHEET NUMBER  
**C-25**  
OF C-69

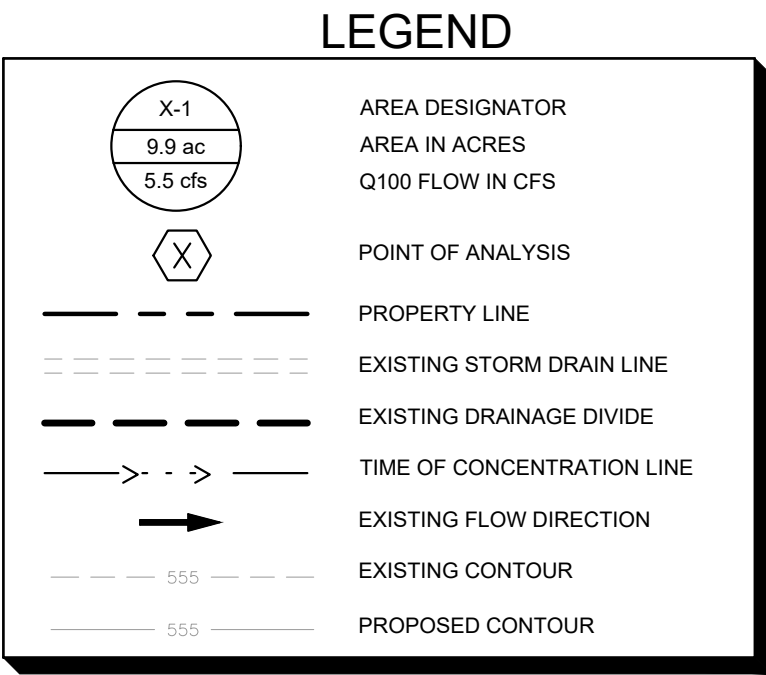




**Proposed Condition:**  
 Pervious: Open space (lawns, parks, golf courses, cemeteries, etc.): Fair condition (grass cover 50% to 75%), Type D soil group with a CN of 83.  
 Impervious: Paved parking lots, roofs driveways, etc. (excluding right of way): CN of 98  
 Proposed drainage basins assumed to have a CN value of 90 based on Residential Districts 1/8 acre or less from the City of Georgetown DCM.  
 \*CN Values based on the City of Georgetown Drainage Criteria Manual  
 \*\*The minimum Tc is 6 minutes per the City of Georgetown Drainage Criteria Manual

Point of Analysis	Storm Event	Existing Runoff (cfs)	Developed Runoff (cfs)	Runoff Difference at Point of Analysis (cfs)	Is Developed $\leq$ Existing?
A	2	215.49	215.31	0.18	YES
	10	499.99	475.32	24.67	YES
	25	667.12	651.40	15.72	YES
	100	951.60	949.33	2.27	YES

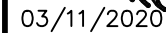
Note: All detention runoff calculations were analyzed using the Soil Conservation Services Method as documented in the Technical Release 55. Pond Pack V8i was used to calculate the runoff and design the pond volume and outlet structure.



WARNING: CONTRACTOR IS TO  
VERIFY PRESENCE AND EXACT  
LOCATION OF ALL UTILITIES  
PRIOR TO CONSTRUCTION.

**BY:** Harrison Hudson, P.E. **DATE:** 4/21/2022

2600 VIA FORTUNA, TERRACE I, SUITE 300  
AUSTIN, TX 78746  
PHONE: 512-646-2237  
WWW.KIMLEY-HORN.COM  
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TRPF Firm No. 928



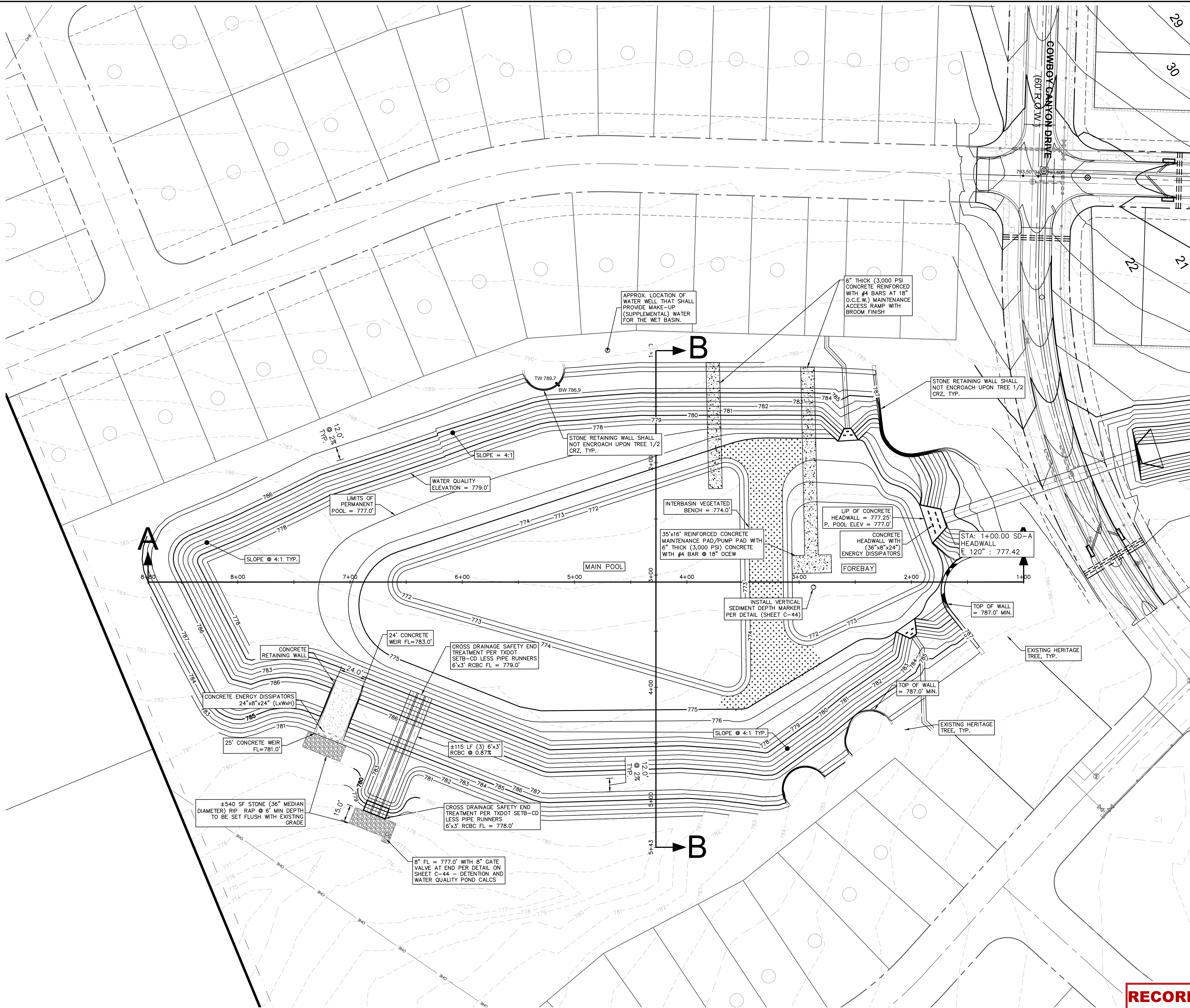
# PROPOSED DRAINAGE AREA MAP

CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

2019-53-CON



Plotted By: Bernal, Orlando Date: May 20, 2020 06:34:14pm File Path: K:\067782805 Berry Creek Highlands\Coord Phase 1\PlanSheets\C-Pond Plan.dwg  
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**LEGEND**

	PROPERTY LINE
	PROPOSED WASTEWATER LINE
	PROPOSED WATER LINE
	PROPOSED WASTEWATER MANHOLE
	PROPOSED WASTEWATER CLEANOUT
	WASTEWATER FLOW DIRECTION
	PROPOSED FIRE HYDRANT
	PROPOSED GATE VALVE
	PROPOSED STORM DRAIN LINE
	PROPOSED STORM DRAIN INLET
	EXISTING OVERHEAD POWER LINE
	EXISTING WATER LINE
	EXISTING WASTEWATER LINE
	EXISTING STORM SEWER LINE
	EXISTING POWER POLE
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WASTEWATER MANHOLE

**NOTES**

- ALL DIMENSIONS ARE TO CENTERLINE OF PIPE UNLESS NOTED OTHERWISE.
- CONTRACTOR TO FIELD VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF FIELD CONDITIONS VARY.
- CONTRACTOR TO PROVIDE CL IV RCP AT ALL LOCATIONS WITH LESS THAN 2.0' OF COVERAGE.

Know what's below.  
Call before you dig.

WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

**RECORD DRAWINGS**  
BY: Harrison Hudson, P.E. DATE: 4/21/2022

**Kimley»Horn**

2600 VIA FORTUNA, TERRACE 1, SUITE 300  
AUSTIN, TX 78746  
PHONE: 512-846-2237  
FAX: 512-846-2237  
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TBPE Firm No. 928

03/11/2020

KHA PROJECT	067782805
DATE	MARCH 2020
SCALE	AS SHOWN
DESIGNED BY:	LRT
DRAWN BY:	JHG
CHECKED BY:	LEL

**BERRY CREEK HIGHLANDS  
PHASE 1**

CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

**POND PLAN**

SHEET NUMBER  
**C-42**  
OF C-69

2019-53-CON







TCEQ SPREADSHEET

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Berry Creek Highlands Phase 1  
Date Prepared: 2/6/2020

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

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

where:  $L_M \text{ TOTAL PROJECT} = \text{Required TSS removal resulting from the proposed development} = 85\% \text{ of increased load}$   
 $A_N = \text{Net increase in impervious area for the project}$   
 $P = \text{Average annual precipitation, inches}$

Site Data: Determine Required Load Removal Based on the Entire Project  
County = **Williamson**  
Total project area included in plan = **194.51** acres  
Predevelopment impervious area within the limits of the plan = **18.46** acres  
Total post-development impervious area within the limits of the plan = **69.63** acres  
Total post-development impervious cover fraction = **0.36**  
 $P = 32$  inches

$L_M \text{ TOTAL PROJECT} = 47317$  lbs. \*NOTE: CALCULATION HAS BEEN REVISED TO REQUIRE 85% REMOVAL

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

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

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

Drainage Basin/Outfall Area No. = **1**

Total drainage basin/outfall area = **222.91** acres  
Predevelopment impervious area within drainage basin/outfall area = **12.79** acres  
Post-development impervious area within drainage basin/outfall area = **63.25** acres  
Post-development impervious fraction within drainage basin/outfall area = **0.28**  
 $L_M \text{ THIS BASIN} = 46661$  lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Wet Basin**  
Removal efficiency = **93** percent

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

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

Stage (ft msl)	Area (sf)	Volume (cf)	Storage (cf)
772	9,789	0	0
773	11,428	10,598	
774	13,168	22,886	
775	20,716	39,686	
776	24,508	62,271	
777	27,831	88,423	
778	33,354	118,974	
779	35,356	153,324	

Stage (ft msl)	Area (sf)	Volume (cf)	Storage (cf)
772	33,919	0	0
773	37,319	35,605	46,204
774	40,820	74,662	97,548
775	63,303	126,314	166,000
776	71,380	193,615	255,886
777	84,216	271,324	359,748
778	103,460	364,997	483,972
779	107,826	470,633	623,957

Water Surface Elevation (ft)	Storage Volume (cf)	Flow (ft <sup>3</sup> /s)
779.00	0	0
779.50	72,968	17.2
780.00	145,935	48.8
780.50	221,929	89.6
781.00	297,923	137.8
781.50	376,972	192.6
781.67	403,068	213.0
782.00	456,021	252.9
782.50	538,153	318.7
783.00	620,285	361.7
783.50	705,530	433.4
783.71	740,753	472.0
784.00	790,775	525.2
784.50	879,161	626.5
784.60	896,687	649.1
785.00	967,547	735.8
785.50	1,059,105	852.1
785.89	1,130,181	947.9
786.00	1,150,663	974.9
786.50	1,249,682	1,103.7
787.00	1,348,700	1,238.3

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

Desired  $L_M \text{ THIS BASIN} = 47317$  lbs.  
 $F = 0.88$

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

Rainfall Depth = **1.50** inches  
Post Development Runoff Coefficient = **0.25**  
On-site Water Quality Volume = **242473** cubic feet

Storage for Sediment = **49448**  
Total Capture Volume (required water quality volume(s) x 1.20) = **296691** cubic feet

11. Wet Basins Designed as Required in RG-348 Pages 3-66 to 3-71

Required capacity of Permanent Pool = **296691** cubic feet  
Required capacity at WQV Elevation = **539164** cubic feet

\*NOTE: REF. STAGE STORAGE TABLE FOR PROVIDED CAPACITY

Permanent Pool Capacity is 1.20 times the WQV  
Total Capacity should be the Permanent Pool Capacity

STAGE STORAGE TABLES

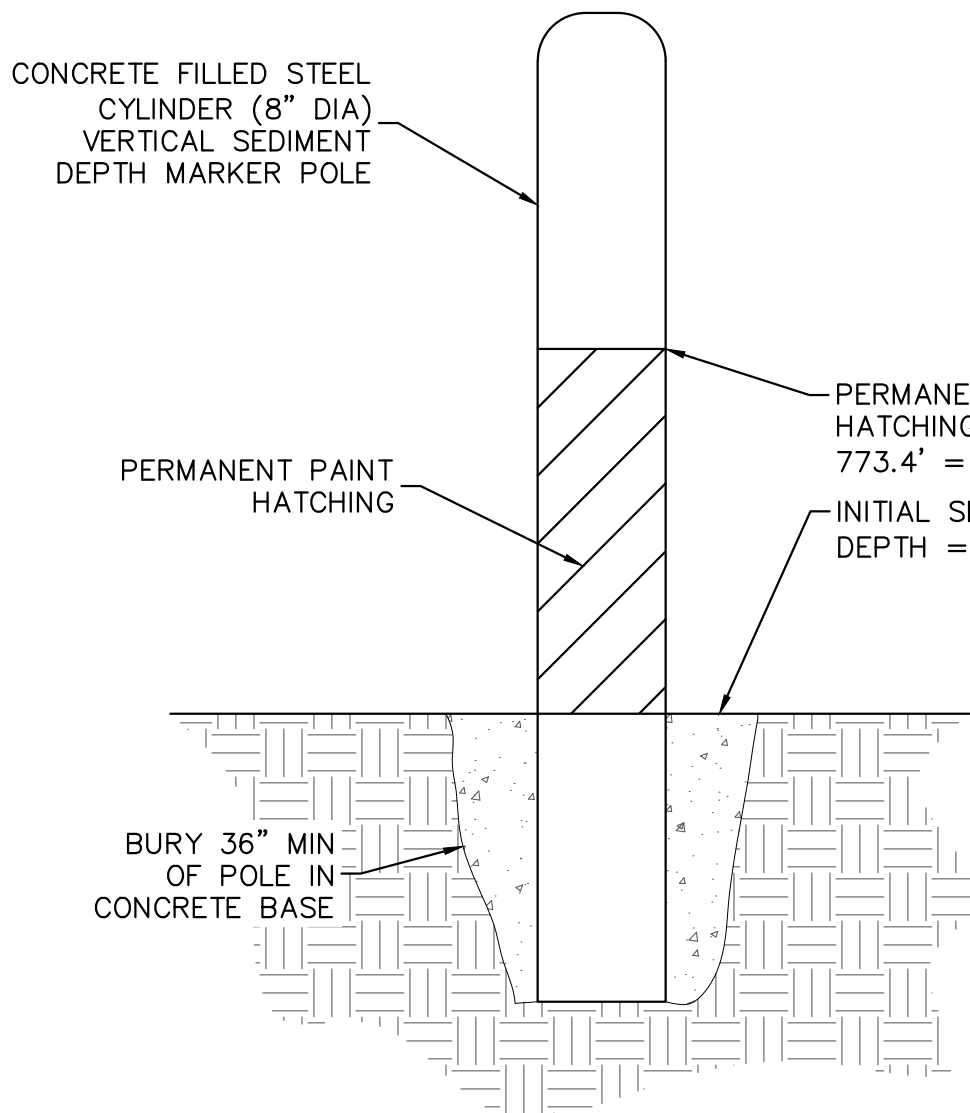
Forebay	Area	Storage
Stage (ft msl)	(sf)	Volume (cf)
772	9,789	0
773	11,428	10,598
774	13,168	22,886
775	20,716	39,686
776	24,508	62,271
777	27,831	88,423
778	33,354	118,974
779	35,356	153,324

Main Pool	Area	Storage	Combined Pond
Stage (ft msl)	(sf)	Volume (cf)	Volumes (cf)
772	33,919	0	0
773	37,319	35,605	46,204
774	40,820	74,662	97,548
775	63,303	126,314	166,000
776	71,380	193,615	255,886
777	84,216	271,324	359,748
778	103,460	364,997	483,972
779	107,826	470,633	623,957

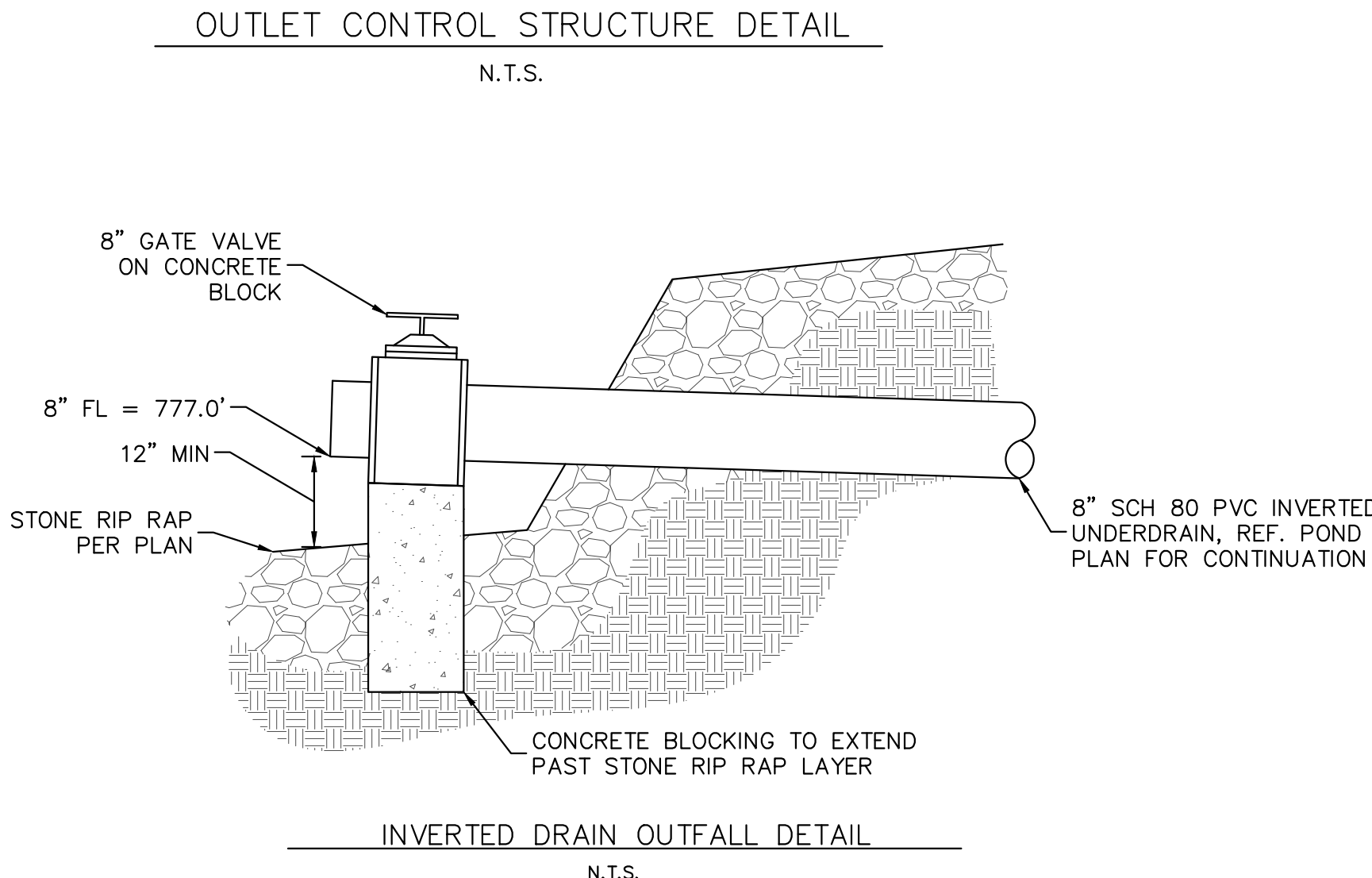
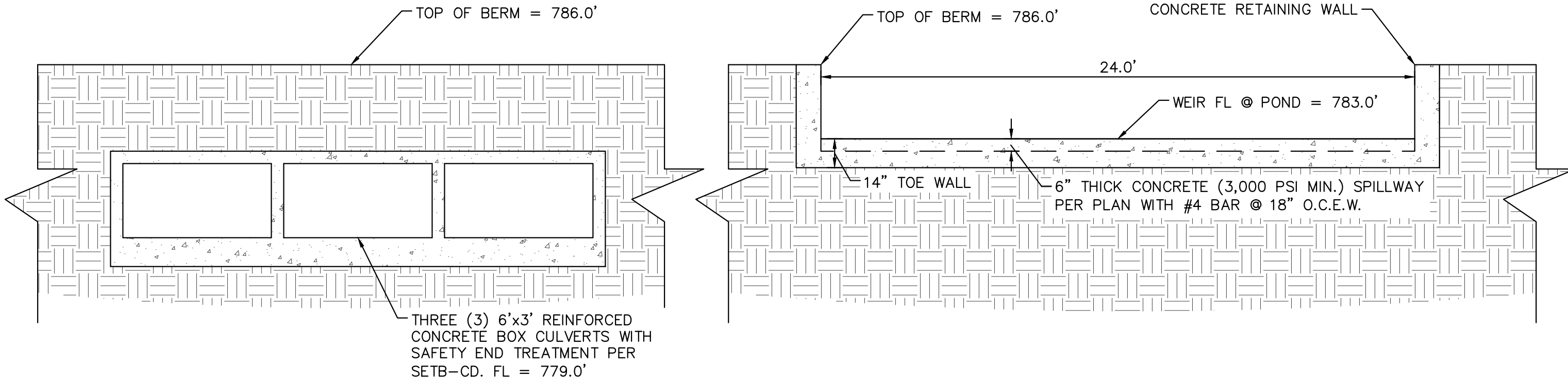
Detention Volume	Area	Volume	Storage
Stage (ft msl)	(sf)	(cf)	Volume (cf)
778	144,654	0	0
779	151,510	148,069	148,069
780	158,175	154,831	302,900
781	164,940	161,546	464,445
782	171,805	168,361	632,806
783	178,770	175,276	808,082
784	185,831	182,289	990,372
785	192,993	189,401	1,179,772

ELEVATION - FLOW TABLE

Water Surface Elevation (ft)	Storage Volume (cf)	Flow (ft <sup>3</sup> /s)
779.00	0	0
779.50	72,968	17.2
780.00	145,935	48.8
780.50	221,929	89.6
781.00	297,923	137.8
781.50	376,972	192.6
781.67	403,068	213.0
782.00	456,021	252.9
782.50	538,153	318.7
783.00	620,285	361.7
783.50	705,530	433.4
783.71	740,753	472.0
784.00	790,775	525.2
784.50	879,161	626.5
784.60	896,687	649.1
785.00	967,547	735.8
785.50	1,059,105	852.1
785.89	1,130,181	947.9
786.00	1,150,663	974.9
786.50	1,249,682	1,103.7
787.00	1,348,700	1,238.3



VERTICAL SEDIMENT DEPTH MARKER DETAIL  
N.T.S.



RECORD DRAWINGS  
BY: Harrison Hudson, P.E. DATE: 4/21/2022

811  
Know what's below.  
Call before you dig.  
WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

Kimley»Horn

2600 VIA FORTUNA, TERRACE 1, SUITE 300  
AUSTIN, TX 78746  
PHONE: 512-442-2237  
FAX: 512-442-2237  
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TBPE Firm No. 928

HARRISON M. HUDSON  
09973  
LICENSED PROFESSIONAL ENGINEER

03/11/2020

KHA PROJECT  
067782805

DATE  
MARCH 2020

SCALE: AS SHOWN

DESIGNED BY: LRT

DRAWN BY: JHG

CHECKED BY: LEL

DETENTION AND WATER  
QUALITY POND CALCS

BERRY CREEK HIGHLANDS  
PHASE 1  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
C-44  
OF C-69

2019-53-CON



February 27, 2020

Mr. Marvin Shapiro  
Berry Creek ASLI IX, LLC  
923 North Pennsylvania Avenue  
Winter Park, Florida 32789

Re: Edwards Aquifer, Williamson County  
Berry Creek Highlands, Phase 1; South of Bonnet Lane at SH 195, Georgetown, Texas  
Request for Approval of a Water Pollution Abatement Plan (WPAP)  
30 Texas Administrative Code (TAC) Chapter 213  
Edwards Aquifer Protection Program ID No. 11001800, RN110889862

Dear Mr. Shapiro:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the Austin Regional Office by Kimley-Horn & Associates on behalf of Berry Creek ASLI IX, LLC on November 7, 2019. Final review of the WPAP submittal was completed after additional material was received on February 4 and 14, 2020. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas licensed professional engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas licensed professional engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this WPAP. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10% of the construction has commenced on the project or an extension of time has been requested.*

#### PROJECT DESCRIPTION

The proposed project will add a new area of 111 single family residential homes to an existing master planned area. The new Phase 1 is contained within the Berry Creek Highlands subdivision within the City of Georgetown to include streets construction, driveways, sidewalks, utilities and other ancillary impervious cover, and which connect to water quality devices via storm sewer. The project site contains approximately 28.5 acres within the Berry Creek watershed as defined by the limits of construction for Phase 1, and to include the connection of Shell Spur Road to SH 195. In addition, SH 195 improvements are planned within an area of 12.8 acres to include a new turn lane and intersection. A large wet basin (WB) is to be constructed to drain future buildouts besides Phase 1. These phases are to be completed as they are planned.

Forebay		
Stage (ft msl)	Area	Storage
(Elevation)	(sf)	Volume (cf)
772	9,789	0
773	11,428	10,598
774	13,168	22,886
775	20,716	39,686
776	24,508	62,271
777	27,831	88,423
778	33,354	118,974
779	35,356	153,324

Main Pool			
Stage (ft msl)	Area	Storage	Combined Pond
(Elevation)	(sf)	Volume (cf)	Volumes (cf)
772	33,919	0	0
773	37,319	35,605	46,204
774	40,820	74,662	<b>97,548</b>
775	63,303	126,314	166,000
776	71,380	193,615	255,886
777	84,216	271,324	<b>359,748</b>
778	103,460	364,997	483,972
779	107,826	470,633	<b>623,957</b>

Veg. Bench

P.P. Elev

W.Q.E.

## Proposed Berry Creek Highlands

56.840

Table 1 - Impervious Cover per Phase

DRAINAGE AREA	AREA (sf)	AREA (Ac.)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER %	TSS Removal Required (lbs)
Phase 1	4,037,576	92.69	17.770	19.17	12163.00
Phase 2	883,397	20.28	7.200	35.50	7362.00
Phase 3	1,254,092	28.79	10.380	36.05	8148.00
Phase 4	1,065,042	24.45	12.240	50.06	9987.00
Phase 5	766,220	17.59	9.250	52.59	9659.00

\* Phase 1 includes portions of Drainage Area A-1 through A-5, A-7; Phase 2 includes portion of Drainage Area A-5; Phase 3 includes portion of Drainage Area A-5 and A-9; Phase 4 includes portion of Drainage Area A-6; Phase 5 includes portion of Drainage Area A-6 and A-8. See sheet C-26 of Proposed Drainage Area Map for Phase 1b

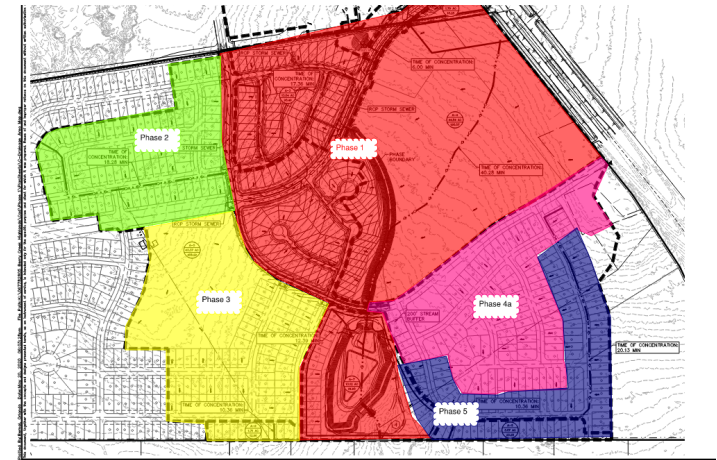
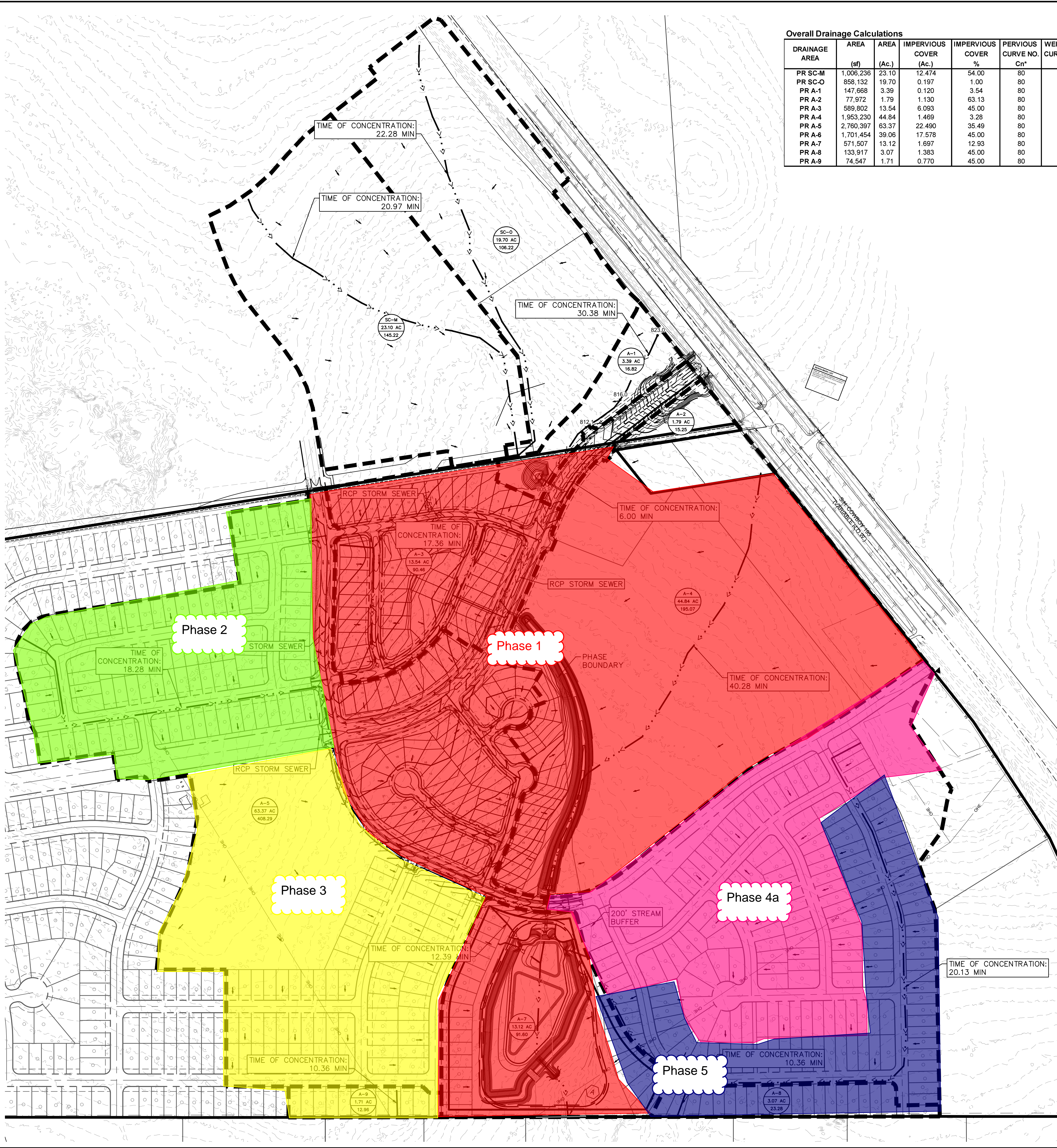


Table 2 - BMP Treatment Requirements

Project Area			Drainage Basin		BMP Treatment Provided			
Total (ac)	Impv Area (ac)	Required TSS Removal (lbs.)	Total (ac)	Impv Area (ac)	Permanent Pool (cf)		Capacity at Water Quality Volume (cf)	
					Required	Provided	Required	Provided
Wet Basin for BCH Ph 1-5								
194.51	56.84	47319	183.80	56.84	296,691	359,748	539,164	623,957



Plotted By: Bernal, Orlando Date: May 20, 2020 06:03:28pm File Path: K:\067782805 Berry Creek Highlands\Code\Phase 1\PlanSheets\C-Drainage Area Map.dwg  
This document, together with the concepts and designs presented herein, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



Overall Drainage Calculations

DRAINAGE AREA	AREA (sf)	AREA (Ac.)	IMPERVIOUS COVER	IMPERVIOUS COVER %	PERVIOUS CURVE NO. Cn*	WEIGHTED CURVE NO. Cn*	SHEET FLOW (GRASS)				SHALLOW CONCENTRATED FLOW								CHANNEL FLOW				TOTAL Tc** (min)
							P-2yr24hr 4.2 IN				Grass Surface				Paved Surface				Channel Flow				
							N	L (ft)	S (ft/ft)	Tt(min)	L (ft)	V (fps)	S (ft/ft)	Tt(min)	L	V (fps)	S	Tt(min)	L (ft)	V (fps)	S (ft/ft)	Tt(min)	
PR SC-M	1,006,236	23.10	12.474	54.00	80	90	0.24	150	0.020	17.23	44	2.31	0.020	0.32	-	-	-	-	1231	6.0	-	3.42	20.97
PR SC-O	858,132	19.70	0.197	1.00	80	80	0.13	300	0.024	17.08	430	1.84	0.013	3.00	-	-	-	-	1060	8.0	-	2.21	22.28
PR A-1	147,668	3.39	0.120	3.54	80	81	0.24	300	0.023	28.20	180	2.37	0.022	1.26	-	-	-	-	330	6.0	-	0.92	30.38
PR A-2	77,972	1.79	1.130	63.13	80	91	0.02	150	0.024	1.74	-	-	-	-	200	2.28	0.02	1.46	385	8.5	-	0.75	6.00
PR A-3	589,802	13.54	6.093	45.00	80	88	0.20	136	0.022	13.24	-	-	-	-	90	2.28	0.02	0.66	1769	8.5	-	3.46	17.36
PR A-4	1,953,230	44.84	1.469	3.28	80	81	0.24	300	0.023	28.20	1233	1.89	0.014	10.86	-	-	-	-	441	6.0	-	1.23	40.28
PR A-5	2,760,397	63.37	22.490	35.49	80	86	0.20	110	0.018	12.07	-	-	-	-	210	2.87	0.02	1.22	2550	8.5	-	4.99	18.28
PR A-6	1,701,454	39.06	17.578	45.00	80	88	0.20	134	0.022	13.04	-	-	-	-	384	2.87	0.02	2.23	2480	8.5	-	4.86	20.13
PR A-7	571,507	13.12	1.697	12.93	80	82	0.20	100	0.020	10.77	215	2.20	0.019	1.63	-	-	-	-	-	-	-	-	12.39
PR A-8	133,917	3.07	1.383	45.00	80	88	0.20	100	0.022	10.36	-	-	-	-	-	-	-	-	-	-	-	-	10.36
PR A-9	74,547	1.71	0.770	45.00	80	88	0.20	100	0.022	10.36	-	-	-	-	-	-	-	-	-	-	-	-	10.36

Proposed Condition:

Pervious: Open space (lawns, parks, golf courses, cemeteries, etc.): Fair condition (grass cover 50% to 75%), Type D soil group with a CN of 83.

Impervious: Paved parking lots, roofs, driveways, etc. (excluding right of way): CN of 98

Proposed drainage basins assumed to have a CN value of 90 based on Residential Districts 1/8 acre or less from the City of Georgetown DCM.

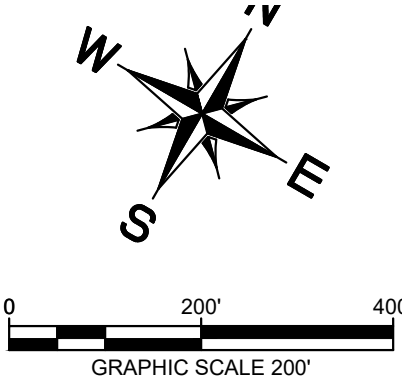
\*Cn Values based on the City of Georgetown Drainage Criteria Manual

\*\*The minimum Tc is 6 minutes per the City of Georgetown Drainage Criteria Manual

Point of Analysis	Total Drainage Area (Acres)	Total Impervious Cover Area (acres)	Impervious Area (%)	Time of Concentration (min)	Storm Event	Developed Runoff (With Detention) (cfs)
A	231.84	65.40	28.21%	23.43	2	215.31
					10	475.32
					25	651.40
					100	949.33

Point of Analysis	Storm Event	Existing Runoff (cfs)	Developed Runoff (cfs)	Runoff Difference at Point of Analysis (cfs)	Is Developed ≤ Existing?
A	2	215.49	215.31	0.18	YES
	10	499.99	475.32	24.67	YES
	25	667.12	651.40	15.72	YES
	100	951.60	949.33	2.27	YES

Note: All detention runoff calculations were analyzed using the Soil Conservation Services Method as documented in the Technical Release 55. Pond Pack V81 was used to calculate the runoff and design the pond volume and outlet structure.



LEGEND

	AREA DESIGNATOR AREA IN ACRES Q100 FLOW IN CFS
	POINT OF ANALYSIS
	PROPERTY LINE
	EXISTING STORM DRAIN LINE
	EXISTING DRAINAGE DIVIDE
	TIME OF CONCENTRATION LINE
	EXISTING FLOW DIRECTION
	EXISTING CONTOUR
	PROPOSED CONTOUR



WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

RECORD DRAWINGS

BY: Harrison Hudson, P.E. DATE: 4/21/2022

**Kimley»Horn**  
2600 VIA FORTUNA, TERRACE 1, SUITE 300  
AUSTIN, TX 78746  
PHONE: 512-846-2237  
FAX: 512-846-2237  
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TBPE Firm No. 928



KHA PROJECT	067782805
DATE	MARCH 2020
SCALE	AS SHOWN
DESIGNED BY:	LRT
DRAWN BY:	XXX
CHECKED BY:	LEL

PROPOSED  
DRAINAGE AREA  
MAP

BERRY CREEK HIGHLANDS  
PHASE 1  
CITY OF GEORGETOWN  
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER  
C-26  
OF C-69



Jon Niermann, *Chairman*  
Emily Lindley, *Commissioner*  
Bobby Janecka, *Commissioner*  
Toby Baker, *Executive Director*



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

*Protecting Texas by Reducing and Preventing Pollution*

March 12, 2020

Mr. Marvin Shapiro  
Berry Creek ASLI IX, LLC  
923 North Pennsylvania Avenue  
Winter Park, Florida 32789

Re: Edwards Aquifer, Williamson County  
Berry Creek Highlands, Phase 1; South of Bonnet Lane at SH 195, Georgetown, Texas  
Request for Approval of an Organized Sewage Collection System (SCS)  
30 Texas Administrative Code (TAC) Chapter 213 and Chapter 217 Edwards Aquifer  
Edwards Aquifer Protection Program ID No. 11001827, RN110889862

Dear Mr. Shapiro:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the SCS Application for the above-referenced project submitted to the Austin Regional Office by Kimley-Horn & Associates on behalf of Berry Creek ASLI IX, LLC on December 3, 2019. Final review of the SCS submittal was completed after additional material was received on February 25, and March 12, 2020. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas licensed professional engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas licensed professional engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

### PROJECT DESCRIPTION

This project is associated with Water Pollution Abatement Plan EAPP ID 11001800.

The proposed wastewater system serves Phase 1 contained within the Berry Creek Highlands residential subdivision. The proposed sewage collection system consists of 12,145 feet of line, comprised of SDR 26 PVC pipe with ASTM D-3212 fittings, a 10-inch force main, and pipe for lateral stub outs, double service laterals, manholes, and appropriate appurtenances.

The lift station will consist of a new 8-foot diameter wet well with an approximate depth of 29.5 feet, two submersible wastewater pumps, and will be provided with an existing emergency power generator. Each pump will have a pumping capacity of 802 gallons per minute (gpm) at a total dynamic head (TDH) of 62 feet with two pumps in operation. Additional equipment will include a control panel, an audio-visual alarm, auto-dial telemetry, hoisting equipment, level pump controllers, pump supports and discharge piping with valves, and a security fence with controlled access.

The system will be connected to an existing Sun City Neighborhood 84 (EAPP ID 11000166) wastewater line for conveyance to the San Gabriel WWTP for treatment and disposal. The project is located within the City of Georgetown and will conform to all applicable codes, ordinances, and requirements of the City of Georgetown.

Separate submittals will occur and require executive director approval for any future SCS phases.

#### GEOLOGY

According to the geologic assessment included with the application, the site is entirely underlain by Edwards Limestone Group (Ked) upgradient to Berry Creek. The site is covered in vegetation and trees as a former pasture. No sensitive features were identified on that portion of the site to be constructed. An Austin Regional Office site assessment of January 8 and 23, 2020 concurs the site is generally as described by the geologic assessment and slopes primarily to the northeast to the creek.

#### SPECIAL CONDITIONS

- I. It is emphasized that where wastewater lines must bridge faults, caverns, sinkholes, or solution features the lines shall be constructed in a manner that will maintain the structural integrity of the pipe. When such sensitive features are encountered, 30 TAC §213.5(f)(2) requires that all regulated activities near the feature must be immediately suspended and the owner/developer shall immediately notify the Austin Regional Office. Additionally, when such geologic features are encountered which are bridged by construction, the location and extent of those features must be assessed by a geologist and must be reported to the Austin Regional Office in writing within two working days of discovery as required by 30 TAC §213.5(c)(3)(K). Construction may not resume in the area of the feature until the executive director has reviewed and approved the methods proposed to protect the aquifer from any potential adverse impacts.
- II. Upon completion of any lift station excavation, a geologist shall certify that the excavation has been inspected for the presence of sensitive features. Certification that the excavation has been inspected must be submitted to the Austin Regional Office.

#### STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.

#### Prior to Commencement of Construction:

2. All contractors conducting regulated activities at the project location shall be provided a copy of this notice of approval. At least one complete copy of the approved SCS plan and this notice of approval shall be maintained at the project location until all regulated activities are completed.

3. Modification to the activities described in the referenced SCS application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
4. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the Austin Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
5. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved application, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established, and the construction area is stabilized. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

During Construction:

6. During the course of regulated activities related to this project, the applicant or his agent shall comply with all applicable provisions of 30 TAC Chapter 213 and Chapter 217. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity, upon which that person or entity shall assume responsibility for all provisions and conditions of this approval.
7. If sediment escapes the construction site, the 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). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
8. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Austin Regional Office of the discovery of the feature.
9. The following records shall be maintained by the applicant and made available to the executive director upon request: the dates trenching 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 and completed.
10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14<sup>th</sup> day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.



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

Independence Title/GF# ~~2223422~~ COM/GMH **SPECIAL WARRANTY DEED**

THE STATE OF TEXAS

§

§

COUNTY OF WILLIAMSON

§

**ASHTON AUSTIN RESIDENTIAL L.L.C.**, a Texas limited liability company ("**Grantor**"), for and in consideration of the sum of Ten Dollars (\$10.00) and other good and valuable consideration to Grantor, in hand paid **FR BERRY HILLS, LLC**, a Delaware limited liability company ("**Grantee**"), whose mailing address is 11 Dupont Circle NW, Suite 900, Washington, DC 20036, the receipt and sufficiency of which are hereby acknowledged by Grantor, has GRANTED, SOLD, AND CONVEYED and, by these presents, does GRANT, SELL, AND CONVEY unto Grantee, subject to the exceptions and other matters stated or referred to herein, the real property described on **Exhibit A-1** and **Exhibit A-2** attached hereto and made part hereof for all purposes, together with all improvements thereon, if any, and all appurtenances pertaining thereto, including but not limited to, all right, title, and interest of Grantor in and to adjacent streets, easements, and rights-of-way; strips and gores; rights of ingress and egress thereto; all permits, approvals, privileges and entitlements appurtenant thereto; and utility capacities, including prepaid impact fees, associated therewith (collectively, the "**Property**").

**TO HAVE AND TO HOLD** the Property, together with all and singular the rights and appurtenances thereto in anywise belonging unto Grantee, and Grantee's successors or assigns, forever; and, subject to all of the matters set forth or referred to herein, Grantor does hereby bind itself and its successors to WARRANT AND FOREVER DEFEND all and singular the Property unto Grantee, Grantee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same, or any part thereof, by, through, or under Grantor, but not otherwise; provided, however, that this conveyance is made by Grantor and accepted by Grantee subject to (a) the validly existing and enforceable rights, interests, and estates of third parties in connection with the items described in **Exhibit B** attached hereto and made part hereof for all purposes; and (b) all liens securing the payment of taxes or assessments for the current and all subsequent years, except for any taxes or other assessments based on change in use or ownership, including, without limitation, rollback taxes, which remain the obligation of Grantor.

Ad valorem taxes with respect to the Property for the current year have been prorated as of the date hereof.

[Signature page follows]

**EXECUTED AND DELIVERED** effective this \_\_\_\_ day of July, 2022.

**GRANTOR:**

ASHTON AUSTIN RESIDENTIAL L.L.C.,  
a Texas limited liability company

By: *Michael G. Ringel*  
Name: Michael G. Ringel  
Title: VP of Finance

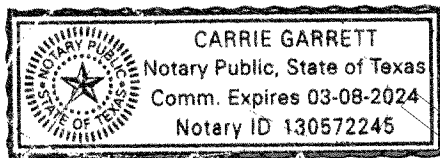
STATE OF TEXAS

§  
§  
§

COUNTY OF TRAVIS

This instrument was acknowledged before me on the 28<sup>th</sup> day of July, 2022, by Michael G. Ringel, VP of Finance of ASHTON AUSTIN RESIDENTIAL L.L.C., a Texas limited liability company, on behalf of said entity.

(seal)



*[Signature]*  
Notary Public, State of Texas

**EXHIBIT A-1****DESCRIPTION OF TRACT 1**

Kimley-Horn and Associates, Inc.  
 TBPLS Firm No. 10193973  
 601 NW Loop 410, Suite 350  
 San Antonio, Texas 78216

**A METES AND BOUNDS  
 DESCRIPTION OF A  
 16.885 ACRE TRACT OF LAND**

**BEING** a 16.885 acre (735,512 square feet) tract of land situated in the Burrell Eaves Survey, Abstract No. 216, City of Georgetown, Williamson County, Texas; and containing a portion of that certain 208.33 acre tract as described in Special Warranty Deed to BERRY CREEK (GEORGETOWN), ASLI IX, LLC, as recorded in Document No. 2018106292, a portion of that certain 314.54 acre tract as described in Quitclaim Deed to BERRY CREEK (GEORGETOWN), ASLI IX, LLC, as recorded in Document No. 2018106293, and a portion of that certain 1.02 acre tract (Director Lot) Termination of Notes Document described in instrument to BERRY CREEK (GEORGETOWN), ASLI IX, LLC, as recorded in Document No. 2022027439, all recorded in the Official Public Records of Williamson County; and being more particularly described as follows:

**COMMENCING** at a 1/2 inch iron rod (with cap) found on the southwestern right-of-way line of S.H. 195 (variable width right-of-way), marking the southeast corner of that certain 16.737 acre tract described in instrument to Alta Berry Creek LP, recorded in Document No. 2021187536 of the Official Public Records of Williamson County, and of said 208.33 acre tract, also the north corner of that certain 5.116 acres described in instrument to Shell Storage LLC, recorded in Document No. 2018081331 of the Official Public Records of Williamson County;

**THENCE**, along the southeasterly boundary of the said 208.33 acre tract, the following twelve (12) courses and distances:

1. South 68°47'58" West, 72.66 feet to a 1/2-inch iron rod found for corner;
2. South 68°51'02" West, 808.80 feet to a 1/2-inch iron rod with a cap found; marking the northwestern corner of that certain 15.114 acres described in instrument to Round Rock 732 Building LLC & Shell GT OS LLC, recorded in Document No. 2020116166 of the Official Public Records of Williamson County, and the northeastern corner of that certain 10.0016 acres described in instrument to Feliberto Garza, III ET UX, recorded in Document No. 2000014422 of the Official Public Records of Williamson County;
3. South 68°58'18" West, 106.51 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the south corner of said 16.737 acre tract;
4. South 68°58'18" West, 57.15 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
5. South 68°35'51" West, 314.42 feet to a 1/2-inch iron rod found marking the northwest corner of said 10.0016 acre tract, and the northeast corner of that certain 10.0 acres described in instrument to Ekram Sharif Mezayek ET UX, recorded in Document No. 2004040065 of the Official Public Records of Williamson County;
6. South 68°49'58" West, 457.10 feet to a 1/2-inch iron rod found marking the northwest corner of said 10.0 acre tract, and the northeast corner of that certain 19.317 acre tract described in instrument to Jupiter Rentals LLC, recorded in Document No. 2019020852 of the Official Public Records of Williamson County;
7. South 68°47'03" West, 790.08 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
8. South 68°45'16" West, 43.72 feet to a 1/2-inch iron rod found marking the northwest corner of said 19.317 acre tract, and the northeast corner of that certain 10.00 acre tract described in instrument to Bryan Threlkeld ET UX, recorded in Document No. 2014039677 of the Official Public Records of Williamson County;
9. South 68°42'04" West, at 143.78 feet passing a 1/2-inch iron rod with a plastic cap stamped "FOREST" found marking the southeast corner of said 1.02 acre tract (Director Lot), for a total distance of 214.93 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the **POINT OF BEGINNING** of herein described tract;

BERRY CREEK HIGHLANDS PHASE 3  
 Job No. 067782813 – January 21, 2022 – Page 1 of 3

Kimley-Horn and Associates, Inc.  
 TBPLS Firm No. 10193973  
 601 NW Loop 410, Suite 350  
 San Antonio, Texas 78216

10. South 68°42'04" West, at 281.56 feet passing a 1/2-inch iron rod with a plastic cap stamped "FOREST" found marking the southwest corner of said Tract 2, 1.102 acre tract, for a total distance of 327.32 feet to a 1/2-inch iron rod found on the northwest line of that certain 10.00 acre tract described in instrument to Paul W. Landreth, recorded in Document No. 2013082663 of the Official Public Records of Williamson County;
11. South 68°42'39" West, 261.92 feet to a 1/2-inch iron rod found marking the northwest corner of said 10.00 acre tract, and the northeast corner of that certain 14.998 acre tract described in instrument to Chas Witt ET AL, recorded in Document No. 2012022314 of the Official Public Records of Williamson County;
12. South 68°46'14" West, 247.37 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the southwest corner of herein described tract;

THENCE, crossing the said 208.33acre tract the following twenty-two (22) courses and distances:

1. North 21°09'52" West, 123.98 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
2. North 20°35'09" West, 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
3. North 21°09'52" West, 246.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
4. North 21°44'36" West, 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
5. North 21°09'52" West, 123.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
6. North 68°50'08" East, 243.22 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
7. North 02°56'16" East, 546.77 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the northwest corner of herein described tract;
8. In a southeasterly direction, along a non-tangent curve to the left, a central angle of 11°25'34", a radius of 500.00 feet, a chord bearing and distance of South 79°41'20" East, 99.55 feet, and a total arc length of 99.71 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set on a point of reverse curve;
9. In a southeasterly direction, along a reverse curve to the right, a central angle of 88°20'22", a radius of 25.00 feet, a chord bearing and distance of South 41°13'56" East, 34.84 feet, and a total arc length of 38.55 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
10. South 86° 48' 35" East 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
11. In a northeasterly direction, along a non-tangent curve to the right, a central angle of 90°00'00", a radius of 25.00 feet, a chord bearing and distance of North 47°56'16" East, 35.36 feet, and a total arc length of 39.27 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set to a point of tangency;
12. South 87°03'44" East, 198.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for a point of curvature;
13. In a southeasterly direction, along a tangent curve to the right, a central angle of 90°00'00", a radius of 25.00 feet, a chord bearing and distance of South 42°03'44" East, 35.36 feet, and a total arc length of 39.27 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
14. South 87°03'44" East, 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
15. In a northeasterly direction, along a non-tangent curve to the right, a central angle of 90°00'00", a radius of 25.00 feet, a chord bearing and distance of North 47°56'16" East, 35.36 feet, and a total arc length of 39.27 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for a point of tangency;

BERRY CREEK HIGHLANDS PHASE 3

Job No. 067782813 – January 21, 2022 – Page 2 of 3



Kimley-Horn and Associates, Inc.  
TBPLS Firm No. 10193973  
601 NW Loop 410, Suite 350  
San Antonio, Texas 78216

16. South  $87^{\circ}03'44''$  East, 20.58 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for a point of curvature;
17. In a northeasterly direction, along a tangent curve to the left, a central angle of  $09^{\circ}00'06''$ , a radius of 530.00 feet, a chord bearing and distance of North  $88^{\circ}26'12''$  East, 83.18 feet, and a total arc length of 83.27 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the northeast corner of herein described tract;
18. South  $13^{\circ}11'05''$  West, 30.94 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
19. South  $02^{\circ}56'16''$  West, 300.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
20. South  $02^{\circ}51'59''$  East, 97.17 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
21. South  $18^{\circ}49'01''$  East, 98.27 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
22. South  $21^{\circ}09'52''$  East, 349.93 feet to the **POINT OF BEGINNING** and containing 16.885 acres of land in Williamson County, Texas, as shown in the document saved in the office of Kimley-Horn and Associates, Inc. in San Antonio, Texas. The basis of bearing for this description is the Texas State Plane Coordinate System Grid, Central Zone (FIPS 4203) (NAD'83). All distances are on the Grid and shown in U.S. Survey Feet. This document was prepared in the office of Kimley-Horn and Associates, Inc. in San Antonio, Texas.

**EXHIBIT A-2****DESCRIPTION OF TRACT 2**

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**A METES AND BOUNDS  
 DESCRIPTION OF A  
 17.606 ACRE TRACT OF LAND**

**BEING** a 17.606 acre (766,929 square feet) tract of land situated in the Burrell Eaves Survey, Abstract No. 216, City of Georgetown, Williamson County, Texas; and being a portion of that certain 208.33 acre tract as described in Special Warranty Deed to BERRY CREEK (GEORGETOWN), ASLI IX, LLC, as recorded in Document No. 2018106292, also being a portion of that certain 314.54 acre tract as described in Quitclaim Deed to BERRY CREEK (GEORGETOWN), ASLI IX, LLC, as recorded in Document No. 2018106293 both of the Official Public Records of Williamson County; and being more particularly described as follows:

**COMMENCING** at a 1/2 inch iron rod (with cap) found on the southwestern right-of-way line of S.H. 195 (variable width right-of-way), marking the southeast corner of that certain 16.737 acre tract described in instrument to Alta Berry Creek LP, recorded in Document No. 2021187536 of the Official Public Records of Williamson County, and of said 208.33 acre tract, also the north corner of that certain 5.116 acres described in instrument to Shell Storage LLC, recorded in Document No. 2018081331 of the Official Public Records of Williamson County;

**THENCE**, along the southeasterly boundary of the said 208.33 acre tract the following seven (7) courses and distances:

1. South 68°47'58" West, 72.66 feet to a 1/2-inch iron rod found for corner;
2. South 68°51'02" West, 808.80 feet to a 1/2-inch iron rod with a cap found; marking the northwestern corner of that certain 15.114 acres described in instrument to Round Rock 732 Building LLC & Shell GT OS LLC, recorded in Document No. 2020116166 of the Official Public Records of Williamson County, and the northeastern corner of that certain 10.0016 acres described in instrument to Feliberto Garza, III ET UX, recorded in Document No. 2000014422 of the Official Public Records of Williamson County;
3. South 68°58'18" West, 106.51 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for the **POINT OF BEGINNING** of herein described tract;
4. South 68°58'18" West, 57.15 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
5. South 68°35'51" West, 314.42 feet to a 1/2-inch iron rod found marking the northwest corner of said 10.0016 acre tract, and the northeast corner of that certain 10.0 acres described in instrument to Ekram Sharif Mezayek ET UX, recorded in Document No. 2004040065 of the Official Public Records of Williamson County;
6. South 68°49'58" West, 457.10 feet to a 1/2-inch iron rod found marking the northwest corner of said 10.0 acre tract, and the northeast corner of that certain 19.317 acre tract described in instrument to Jupiter Rentals LLC, recorded in Document No. 2019020852 of the Official Public Records of Williamson County;
7. South 68°47'03" West, 395.04 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set marking the southwest corner of herein described tract;

**THENCE**, crossing the said 208.33 acre tract the following thirty-two (32) courses and distances:

1. North 44°59'49" West, 190.24 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
2. North 38°46'24" West, 133.11 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
3. North 26°21'06" West, 140.39 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;

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4. North 37°39'18" West, 32.04 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
5. North 50°46'38" East, 144.30 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
6. in a southeasterly direction, along a non-tangent curve to the right, a central angle of 01°57'25", a radius of 275.00 feet, a chord bearing and distance of South 38°14'40" East, 9.39 feet, and a total arc length of 9.39 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
7. North 52°44'03" East, 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
8. North 52°44'03" East, 124.71 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
9. South 32°15'45" East, 144.11 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
10. South 50°25'08" East, 121.25 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
11. North 76°29'15" East, 84.05 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
12. North 67°42'23" East, 135.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
13. North 16°03'10" East, 24.18 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
14. North 67°42'23" East, 450.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
15. North 22°17'37" West, 191.96 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
16. South 67°42'23" West, 19.49 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
17. North 22°17'37" West, 201.51 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
18. North 23°29'59" West, 45.38 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
19. North 40°29'28" West, 326.23 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
20. North 46°51'59" West, 89.74 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
21. North 52°56'59" West, 48.14 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
22. North 39°18'53" East, 124.90 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
23. North 39°18'53" East, 50.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
24. North 50°41'07" West, 20.89 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
25. North 39°18'53" East, 123.00 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
26. South 50°41'07" East, 12.38 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
27. South 50°41'07" East, 123.84 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
28. South 49°19'37" East, 23.94 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
29. South 44°33'50" East, 34.56 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;

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30. South 40°29'28" East, 378.78 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
31. South 25°54'11" East, 55.89 feet to a 1/2-inch iron rod with a plastic cap stamped "KHA" set for corner;
32. South 22°17'42" East, 775.08 feet to the **POINT OF BEGINNING** and containing 17.606 acres of land in Williamson County, Texas, as shown in the document saved in the office of Kimley-Horn and Associates, Inc. in San Antonio, Texas. The basis of bearing for this description is the Texas State Plane Coordinate System Grid, Central Zone (FIPS 4203) (NAD'83). All distances are on the Grid and shown in U.S. Survey Feet. This document was prepared in the office of Kimley-Horn and Associates, Inc. in San Antonio, Texas.

**EXHIBIT B****PERMITTED EXCEPTIONS**

1. The following restrictive covenants of record itemized below: Document No. 2012080146, Document No. 2022026998, Document No. 2022026699, Document No. 2022030966 (Notice of Applicability for Phase 3), Document No. 2022030968 (Notice of Applicability for Phase 5), Document No. 2022027280, Document No. 2022027281, Document No. 2022027282, and Document No. 2022026999, Official Public Records, Williamson County, Texas.
2. Covenants, conditions and restrictions and other instruments recorded in Document No. 2022026999, Official Public Records, Williamson County, Texas and purporting to impose a community enhancement fee or conveyance fee payable upon the conveyance of an interest in real property or payable for the right to make or accept such a transfer, and any and all fees, liens or charges, whether recorded or unrecorded, if any, currently due payable or that will become due or payable, and any other rights deriving therefrom, that are assessed pursuant thereto.
3. Adoption of Working Capital Assessment:  
Recorded: Document No. 2022027282, Official Public Records, Williamson County, Texas.
4. Building setback lines as set forth in the Master Design Guidelines recorded in Document No. 2022027280, Official Public Records, Williamson County, Texas.
5. Maintenance charges and/or assessments secured by a lien as set out in instrument(s) recorded in Document No. 2022026699, Official Public Records, Williamson County, Texas and as amended, supplemented, re-filed or re-stated. Said lien for charges and assessments is subordinate to a recorded first mortgage or first lien deed of trust as set out therein.
6. Easements for installation, maintenance, repair and replacement of utilities, drainage, encroachments and protrusions, together with rights and remedies of Declarant, including but not limited to terms, conditions, covenants, options, provisions and other matters contained in Master Covenant recorded in Document No. 2022026699, Official Public Records, Williamson County, Texas.
7. Easement:  
Recorded: Volume 964, Page 539, as affected by Volume 2168, Page 44, Deed Records, Williamson County, Texas.  
To: Chisholm Trail Water Supply Corporation  
Purpose: Potable water pipeline (blanket-type)

## 8. Easement:

Recorded: Volume 988, Page 310, as affected by Volume 2168, Page 44, Deed Records, Williamson County, Texas.

To: Chisholm Trail Water Supply Corporation

Purpose: Potable water pipeline (blanket-type)

## 9. Easement:

Recorded: Volume 1006, Page 661, Deed Records, Williamson County, Texas.

To: Pedernales Electric Cooperative, Inc.

Purpose: Electric and telephone line(s) (blanket-type)

## 10. Easement:

Recorded: Volume 1218, Page 658, Deed Records, Williamson County, Texas.

To: General Telephone Company of the Southwest

Purpose: Communication lines (blanket-type)

## 11. Easement:

Recorded: Document No. 9643570, Official Records, Williamson County, Texas.

To: GTE Southwest Incorporated

Purpose: Communication lines (blanket-type)

## 12. Terms, Conditions, and Stipulations in the Consent Agreement:

Recorded: Document Numbers 2019034428, 2019034429, 2019101325, 2019101326, Official Public Records, Williamson County, Texas. Further affected by that certain Amended and Restated Consent Agreement in Document No. 2019040583 as affected by Document No. 2019101328, Official Public Records, Williamson County, Texas.

## 13. Terms, Conditions, and Stipulations in the Easement and Developmental Matters Agreement:

Recorded: Document No. 2018106301, Official Public Records, Williamson County, Texas.

## 14. Terms, Conditions, and Stipulations in the Waiver of Special Appraisal for the benefit of Berry Creek Highland MUD:

Recorded: Document No. 2020099751, Official Public Records, Williamson County, Texas.

## 15. Terms, Conditions, and Stipulations in the Deed Recordation Affidavit re: Edwards Aquifer Protection Plan:

Recorded: Document No. 2020111396, Official Public Records, Williamson County, Texas.

## 16. Terms, Conditions, and Stipulations in the Memorandum of Post Closing Agreement:

Recorded: Document No. 2021187537, Official Public Records, Williamson County, Texas.



## 17. Tract 2: Easement:

Recorded: Document No. 2022010762, Official Public Records, Williamson County, Texas, and as shown on survey dated 1/28/2022 and last revised 3/7/2022, prepared by John G. Mosier, RPLS No. 6330.

Purpose: Wastewater Easement

## 18. Terms, Conditions, and Stipulations in the Memorandum of Post-Closing Development Agreement:

Recorded: Document No. 2022031156, Official Public Records, Williamson County, Texas.

## 19. Tract 2: Easement rights, if any, related to the overhead electric lines and power poles over and across subject property, as shown on survey dated 1/28/2022 and last revised 3/7/2022, prepared by John G. Mosier, RPLS No. 6330.

**ELECTRONICALLY RECORDED  
OFFICIAL PUBLIC RECORDS**

**2022090595**

Pages: 12 Fee: \$66.00  
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*Nancy E. Rister*

Nancy E. Rister, County Clerk  
Williamson County, Texas