

■ **SCS & WPAP**

**Berry Creek Highlands
Phase 6A
Georgetown, Williamson County, Texas**

August 2023

Prepared For:

BERRY CREEK ASLI IX, LLC
923 N. PENNSYLVANIA AVENUE
WINTER PARK, FL 32789



Prepared By:

AC Steadman
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Building IV, Suite 200
Austin, TX 78759
TEXAS REGISTRATION #928

8/21/23

Kimley»»Horn

Organized Sewage Collection System Plan Checklist

- **Edwards Aquifer Application Cover Page (TCEQ-20705)**
- **General Information Form (TCEQ-0587)**
 - Attachment A - Road Map
 - Attachment B - USGS / Edwards Recharge Zone Map
 - Attachment C - Project Description
- **Geologic Assessment Form (TCEQ-0585)**
 - Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
 - Comments to the Geologic Assessment Table
 - Attachment B - Soil Profile and Narrative of Soil Units
 - Attachment C - Stratigraphic Column
 - Attachment D - Narrative of Site Specific Geology
 - Site Geologic Map(s)
 - Table or list for the position of features' latitude/longitude (if mapped using GPS)
- **Organized Sewage Collection System Plan (TCEQ-0582)**
 - Attachment A - Engineering Design Report
 - Attachment B - Justification and Calculations for Deviation in Straight Alignment Without Manholes
 - Attachment C - Justification for Variance from Manhole Spacing
 - Attachment D - Explanation of Slopes for Flows Greater Than 10.0 Feet Per Second
 - Site Plan
 - Final Plan and Profile Sheets
- **Lift Station / Force Main System Application (TCEQ-0624) if applicable**
 - Attachment A - Engineering Design Report
 - Site Plan
 - Final Plan and Profile Sheets
- **Temporary Stormwater Section (TCEQ-0602)**
 - Attachment A - Spill Response Actions
 - Attachment B - Potential Sources of Contamination
 - Attachment C - Sequence of Major Activities
 - Attachment D - Temporary Best Management Practices and Measures
 - Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
 - Attachment F - Structural Practices
 - Attachment G - Drainage Area Map
 - Attachment H - Temporary Sediment Pond(s) Plans and Calculations
 - Attachment I - Inspection and Maintenance for BMPs

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

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

Water Pollution Abatement Plan Checklist

- **Edwards Aquifer Application Cover Page (TCEQ-20705)**
- **General Information Form (TCEQ-0587)**
 - Attachment A - Road Map
 - Attachment B - USGS / Edwards Recharge Zone Map
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 - Site Geologic Map(s)
 - Table or list for the position of features' latitude/longitude (if mapped using GPS)
- **Water Pollution Abatement Plan Application Form (TCEQ-0584)**
 - Attachment A - Factors Affecting Water Quality
 - Attachment B - Volume and Character of Stormwater
 - Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
 - Attachment D - Exception to the Required Geologic Assessment (if requesting an exception)
 - Site Plan
- **Temporary Stormwater Section (TCEQ-0602)**
 - Attachment A - Spill Response Actions
 - Attachment B - Potential Sources of Contamination
 - Attachment C - Sequence of Major Activities
 - Attachment D - Temporary Best Management Practices and Measures
 - Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
 - Attachment F - Structural Practices
 - Attachment G - Drainage Area Map
 - Attachment H - Temporary Sediment Pond(s) Plans and Calculations
 - Attachment I - Inspection and Maintenance for BMPs
 - Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices
- **Permanent Stormwater Section (TCEQ-0600)**
 - Attachment A - 20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed for the site
 - Attachment B - BMPs for Upgradient Stormwater

Attachment C - BMPs for On-site Stormwater

Attachment D - BMPs for Surface Streams

Attachment E - Request to Seal Features (if sealing a feature)

Attachment F - Construction Plans

Attachment G - Inspection, Maintenance, Repair and Retrofit Plan

Attachment H - Pilot-Scale Field Testing Plan, if BMPs not based on Complying with the Edwards Aquifer Rules: Technical Guidance for BMPs

Attachment I - Measures for Minimizing Surface Stream Contamination

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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

2. This Edwards Aquifer Application Cover Page form (certified by the applicant or agent) must be included in the application and brought to the administrative review meeting.
3. Administrative reviews are scheduled with program staff who will conduct the review. Applicants or their authorized agent should call the appropriate regional office, according to the county in which the project is located, to schedule a review. The average meeting time is one hour.
4. In the meeting, the application is examined for administrative completeness. Deficiencies will be noted by staff and emailed or faxed to the applicant and authorized agent at the end of the meeting, or shortly after. Administrative deficiencies will cause the application to be deemed incomplete and returned.

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

5. If an application is received by mail, courier service, or otherwise submitted without a review meeting, the administrative review will be conducted within 30 days. The applicant and agent will be contacted with the results of the administrative review. If the application is found to be administratively incomplete, it can be retrieved from the regional office or returned by regular mail. If returned by mail, the regional office may require arrangements for return shipping.
6. If the geologic assessment was completed before October 1, 2004 and the site contains “possibly sensitive” features, the assessment must be updated in accordance with the *Instructions to Geologists* (TCEQ-0585 Instructions).

Technical Review

1. When an application is deemed administratively complete, the technical review period begins. The regional office will distribute copies of the application to the identified affected city, county, and groundwater conservation district whose jurisdiction includes the subject site. These entities and the public have 30 days to provide comments on the application to the regional office. All comments received are reviewed by TCEQ.
2. A site assessment is usually conducted as part of the technical review, to evaluate the geologic assessment and observe existing site conditions. The site must be accessible to our staff. The site boundaries should be

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

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

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: Berry Creek Highlands Phase 6A					2. Regulated Entity No.:				
3. Customer Name: BERRY CREEK ASLI IX, LLC					4. Customer No.:				
5. Project Type: (Please circle/check one)	New <input checked="" type="checkbox"/>		Modification			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP <input checked="" type="checkbox"/>	CZP	SCS <input checked="" type="checkbox"/>	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential <input checked="" type="checkbox"/>		Non-residential			8. Site (acres):		24.91	
9. Application Fee:	\$7,518.00		10. Permanent BMP(s):			1 batch detention pond			
11. SCS (Linear Ft.):	2035.76		12. AST/UST (No. Tanks):			N/A			
13. County:	WILLIAMSON		14. Watershed:			Berry Creek			

Application Distribution


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

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

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

Austin Region			
County:	Hays	Travis	Williamson
Original (1 req.)	—	—	<u>1</u>
Region (1 req.)	—	—	<u>1</u>
County(ies)	—	—	<u>1</u>
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input checked="" type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	—	—	—	—	—
Region (1 req.)	—	—	—	—	—
County(ies)	—	—	—	—	—
Groundwater Conservation District(s)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Trinity-Glen Rose	<input type="checkbox"/> Edwards Aquifer Authority	<input type="checkbox"/> Kinney	<input type="checkbox"/> EAA <input type="checkbox"/> Medina	<input type="checkbox"/> EAA <input type="checkbox"/> Uvalde
City(ies) Jurisdiction	<input type="checkbox"/> Castle Hills <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Helotes <input type="checkbox"/> Hill Country Village <input type="checkbox"/> Hollywood Park <input type="checkbox"/> San Antonio (SAWS) <input type="checkbox"/> Shavano Park	<input type="checkbox"/> Bulverde <input type="checkbox"/> Fair Oaks Ranch <input type="checkbox"/> Garden Ridge <input type="checkbox"/> New Braunfels <input type="checkbox"/> Schertz	NA	<input type="checkbox"/> 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.	
AC Steadman - Kimley-Horn	
Print Name of Customer/Authorized Agent	
Signature of Customer/Authorized Agent	Date 8/4/2023

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: AC Steadman

Date: 08/04/2023

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Berry Creek Phase 6A
2. County: Williamson
3. Stream Basin: Brazos 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: Marvin Shapiro
Entity: BERRY CREEK ASLI IX, LLC
Mailing Address: 923 N. Pennsylvania Avenue IX, LLC
City, State: Winter Park, Florida Zip: 32789
Telephone: (407)- 628-8488 FAX: _____
Email Address: mshapiro@avantiprop.com

8. Agent/Representative (If any):

Contact Person: AC Steadman
Entity: Kimley-Horn & Associates, Inc.
Mailing Address: 10814 Jollyville Road, Building IV, Suite 200
City, State: Austin, Texas Zip: 78759
Telephone: 512-720-5466 FAX: _____
Email Address: AC.Steadman@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 _____.
 The project site is not located within any city's limits or ETJ.

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

The project site is located on the West side of State Highway Cowboy 195 at the intersection with Shell Road.

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

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

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

13. **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate

the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

Survey staking will be completed by this date: 09/15/2022

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:

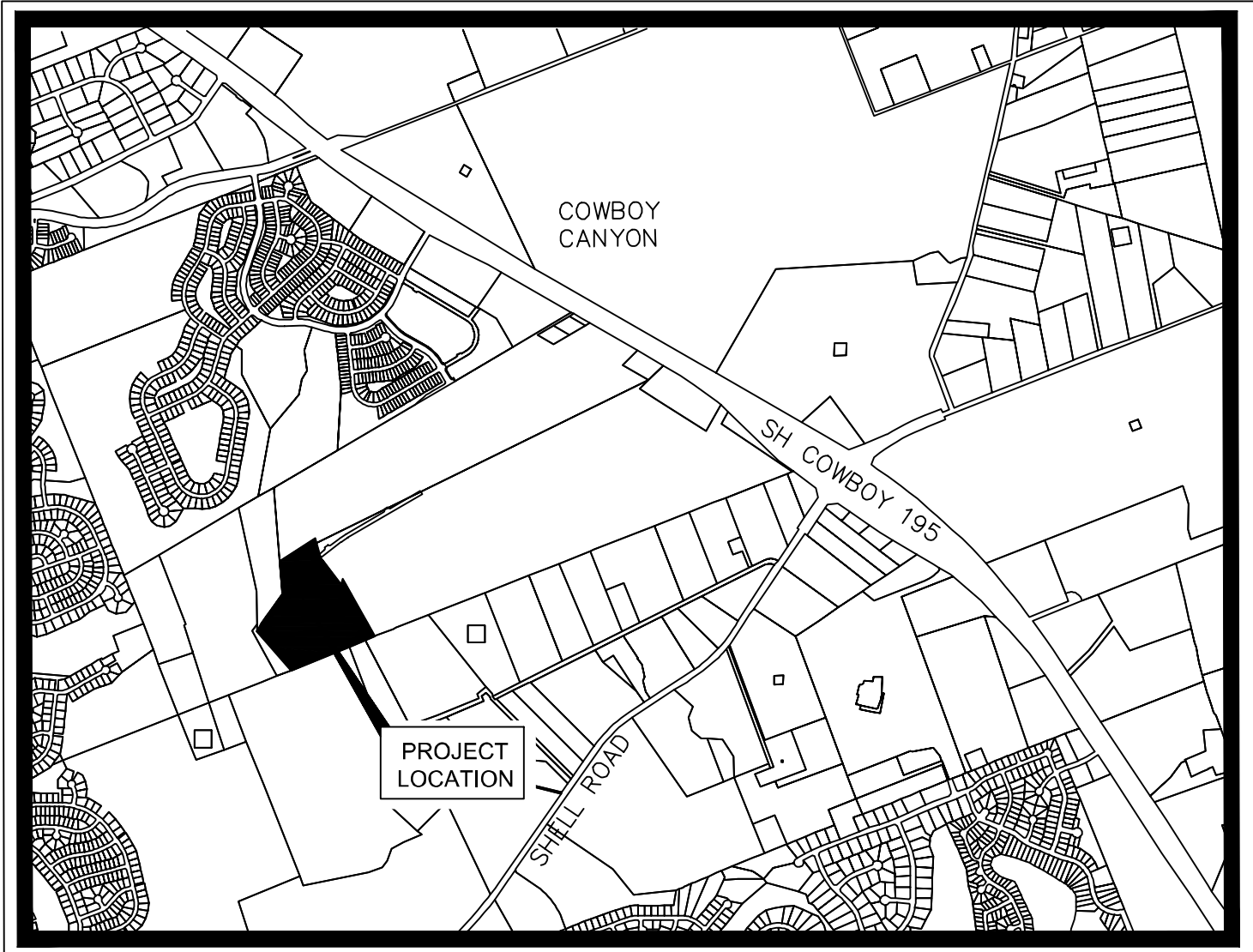
- TCEQ cashier
- Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
- San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)

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

C:\CUNNINGHAM_RYAN_6/19/2023_7:04 PM
K:\AUS_CIVIL\08782815-BERRY_CREEK\SUBMITTALS\PHASE 6A\CONSTRUCTION PLANS\COG\2023-06-20 (INITIAL SUBMITTAL)\01-APPLICATION INFORMATION\LOCATION MAP.DWG
6/19/2023 6:54 PM



VICINITY MAP

SCALE: 1" = 2,000'

PLOTTED BY
DWC NAME
LAST SAVED

Berry Creek Highlands Phase 6A

Georgetown, Texas
June 2023

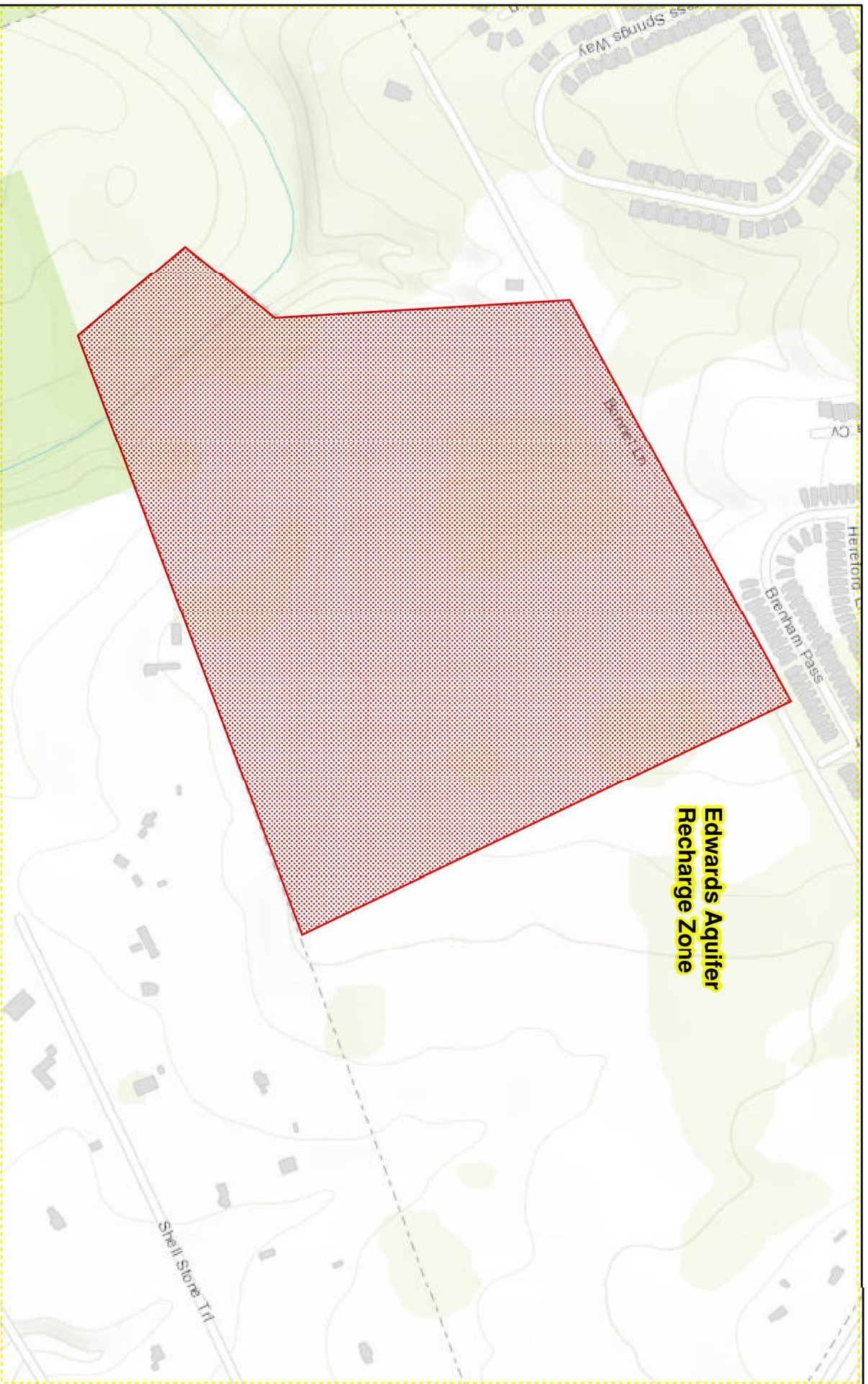
Kimley»Horn

10814 Jollyville Road
Campus IV, Suite 200
Austin, TX 78759
512-418-1771
State of Texas Registration No. F-928

NOTE: THIS PLAN IS CONCEPTUAL IN NATURE AND HAS BEEN PRODUCED IN TRUST FOR THE BENEFIT OF A SURVEY. TOPOGRAPHY, UTILITIES, CONTACT WITH THE CITY, ETC.

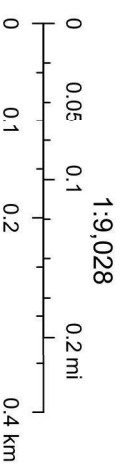
ATTACHMENT B—USGS QUADRANGLE MAP

Edwards Aquifer Viewer Custom Print



**Edwards Aquifer
Recharge Zone**

June 21, 2023



ATTACHMENT C—PROJECT DESCRIPTION

The development is located on the west side of State Highway Cowboy 195 at the intersection with Shell Road in Georgetown Texas, Williamson County. This Water Pollution Abatement Plan (WPAP) application and Organized Sewage Collection System (SCS) application covers Berry Creek Phase 6A, a 25-acre single family subdivision development section out of the Berry Creek Master Plan.

This section includes the development of 1 lot used for parkland and is located in the Edwards Aquifer Recharge Zone. The project includes the construction of ±318 linear feet of public roadway, ±1,308 linear feet of 18" to 48" storm sewer, ±323 linear feet of 8" water line, and ±2,035 linear feet of 8" gravity wastewater within the Phase 6A boundary. The limits of construction for this phase is 25 acres. This section is a part of the proposed larger Berry Creek Master Planned Community.

The SCS covers the wastewater for Berry Creek Highlands Phase 6A that will gravity flow will connect to an existing 30" wastewater interceptor located in the floodplain on the southwestern portion of the site. The existing 30" wastewater interceptor is located within a wastewater easement, and ultimately is treated at the City of Georgetown San Gabriel Wastewater Treatment Plant.

This WPAP covers the storm water generated by Berry Creek Highlands Phase 6A. The storm water from this Phase will be treated in only one location. A portion of the site will be treated by a batch detention water quality pond that is proposed with Berry Creek Highlands Phase 6A. The proposed batch detention water quality pond is designed to accommodate the respective impervious cover and serve as the Permanent Best Management Practice (BMP) for the remainder of the site.

A SWPPP will also be filed with TCEQ per the requirements of the TPDES program for Berry Creek Highlands Phase 6A.

This site may possibly utilize imported fill material. That material shall consist of crushed limestone, select fill, and topsoil. The fill material will be used to facilitate drainage, roadway construction, and re-vegetation of the property and to elevate the building foundations.

All sensitive features and buffers are shown and labeled on the construction plans as per the Geological Assessment.

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 (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

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

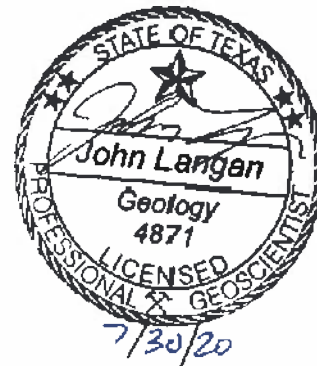
No sensitive recharge features were noted on the subject site. While not observed, septic systems may have been used in the past on the site. If encountered during development activities, septic systems should be properly removed or decommissioned in accordance with state and local regulations. If future use of the on-site water wells is not planned, they should be properly plugged and abandoned in accordance with state and local regulations. No streams or springs exist on Phase 3, 4 or 5 of the subject tract. It is possible that clearing/construction activities will reveal the presence of features currently hidden by thick vegetation and/or soil cover. If caves, sinkholes, or solution cavities are encountered during future clearing/construction activities, please contact our office for additional assistance.

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.

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

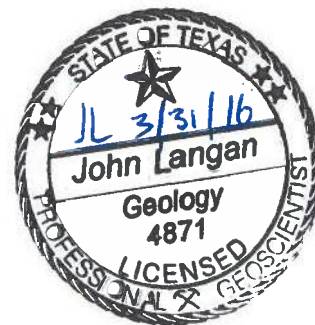
Fax: 210/342-9401

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

AST

SCS

UST

3. Location of Project:

Recharge Zone

Transition Zone

Contributing Zone within the Transition Zone

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

Table 1 - Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group*	Thickness(feet)
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**

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

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.

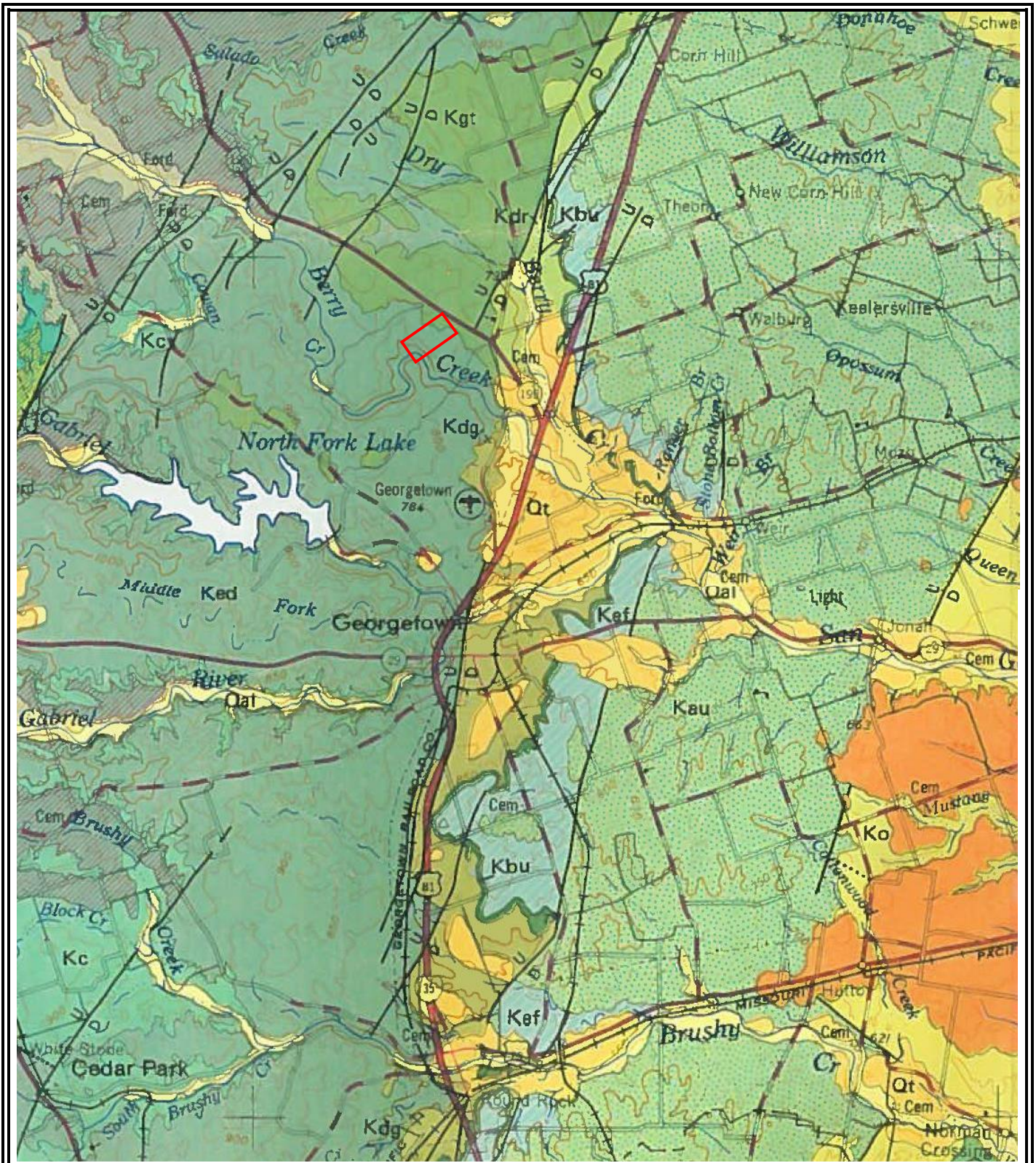
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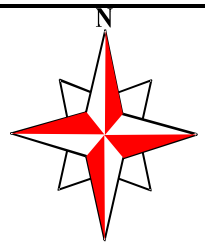
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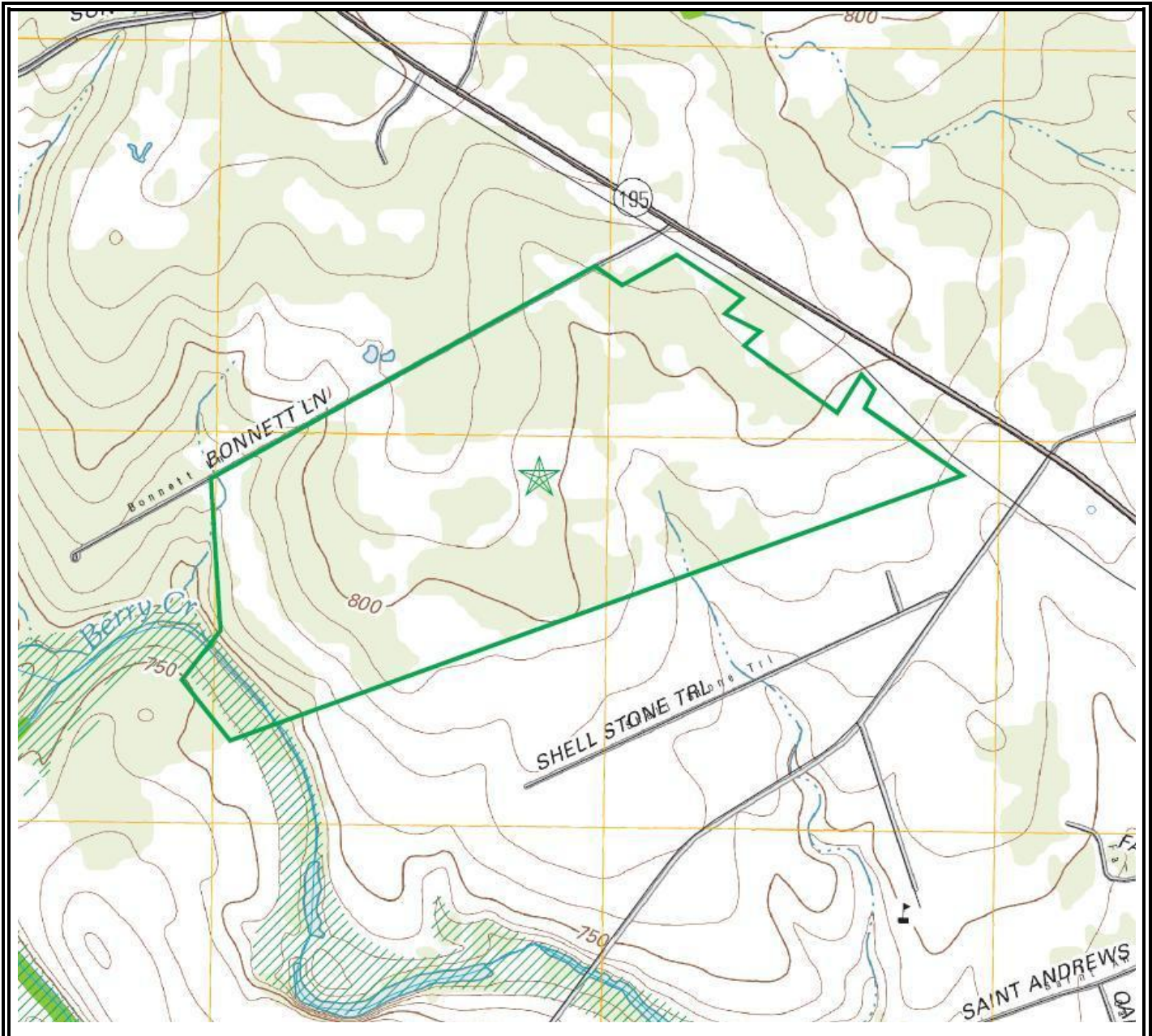


psi Information
 To Build On
 Engineering • Consulting • Testing
 PSI, Inc.
 3 Burwood Lane
 San Antonio, Texas 78216

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)

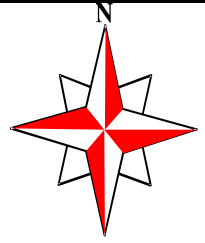




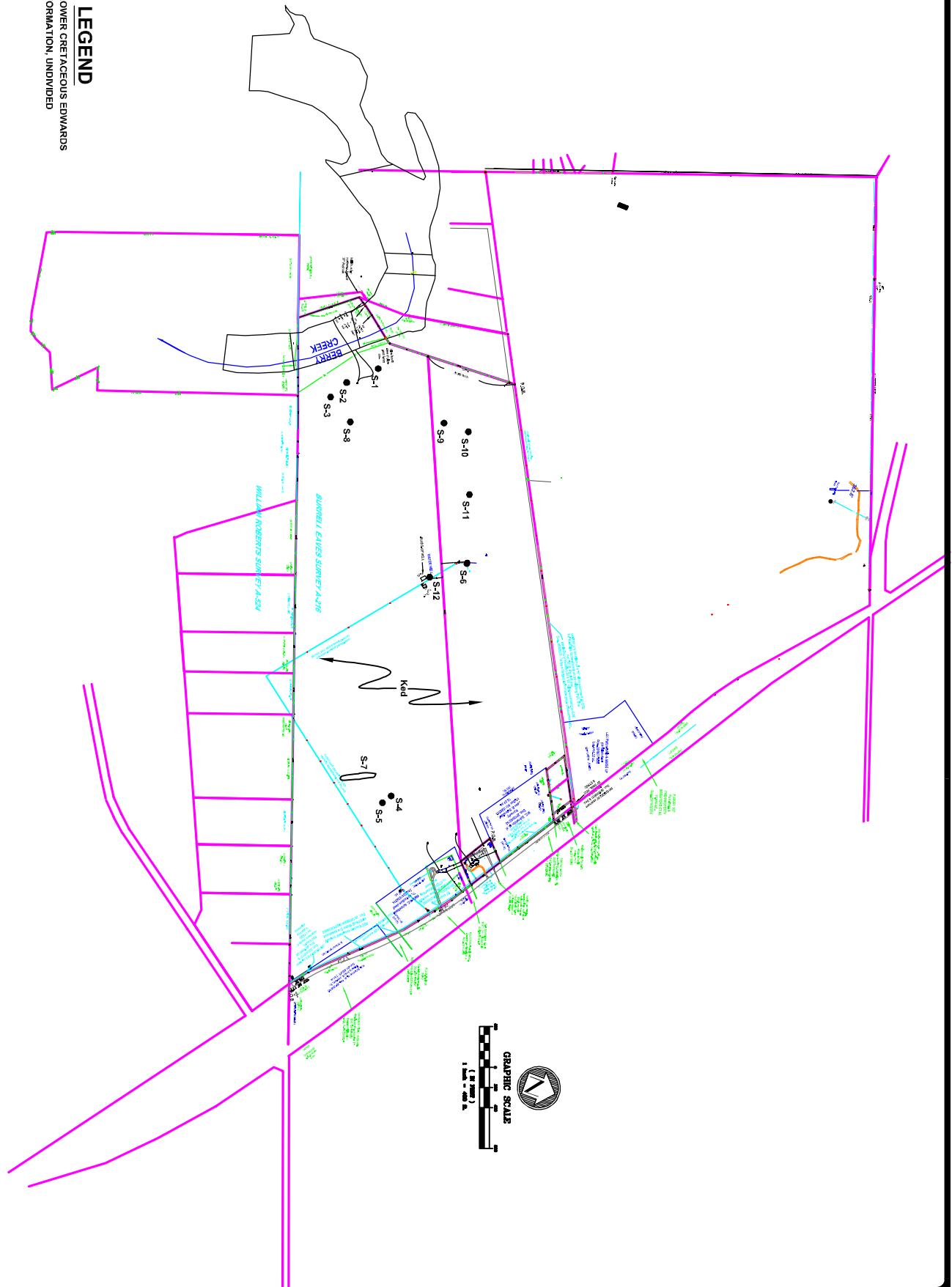
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 3 Burwood Lane
 San Antonio, Texas 78216

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

Topographic Map
 USGS "Georgetown,
 Texas"
 2013



LEGEND
 Kcp - LOWER CRETACEOUS EDWARDS
 FORMATION, UNDIVIDED



DATE	11/11/11
DRAWN BY	JL/STW
CHECKED BY	JL/STW
SCALE	AS SHOWN
TITLE	GEOLOGIC ASSESSMENT
FILE NO.	20110111
PROJECT NO.	20110111

Information To Build On
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 THREE BURWOOD LANE
 SAN ANTONIO, TEXAS 78216



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

GEOLOGIC ASSESSMENT TABLE										PROJECT NAME: 314-Ac. Johnson/Schneider Tracts									
LOCATION					FEATURE CHARACTERISTICS					EVALUATION					PHYSICAL SETTING				
1A	1B*	1C*	2A	2B	3	4			5	5A	6	7	8A	BB	9	10	11	12	
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DENSITY (NOFT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	CATCHMENT AREA (ACRES)	TOPOGRAPHY		
						X	Y	Z							<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						13	X	X		hillside	
S-3	30-43-15.3	97-41-34.1	CD	5	Ked	4	3	0.05						13	X	X		hillside	
S-4	30-43.31.9	97-40-54	CD	5	Ked	6	6	0.5						13	X	X		hillside	
S-5	30-43.31.4	97-40-53.9	CD	5	Ked	7	6	0.5						13	X	X		hillside	
S-6	30-43.33	97-41-19.2	MB	30	Ked	0.6	0.6	>100						34	X	X		hillside	
S-7	30-43-28.7	97-40-57.3	O	5	Ked	275	35	7						27	X	X		hillside	
S-8	30-43-19.9	97-41-27.4	CD	5	Ked	1.5	1.5	1						13	X	X		hillside	
S-9	30-43-27	97-41-32.8	SC	20	Ked	3	3	4						38	X	X		hillside	
S-10	30-43-29.1	97-41-33.5	CD	5	Ked	5	5	1						13	X	X		hillside	
S-11	30-43-27.6	97-41-26.9	CD	5	Ked	25	20	3						13	X	X		hillside	
S-12	30-43-29.9	97-41-16.2	MB	30	Ked	0.6	0.6	>100						34	X	X		hillside	

* DATUM:

2A TYP	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	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.

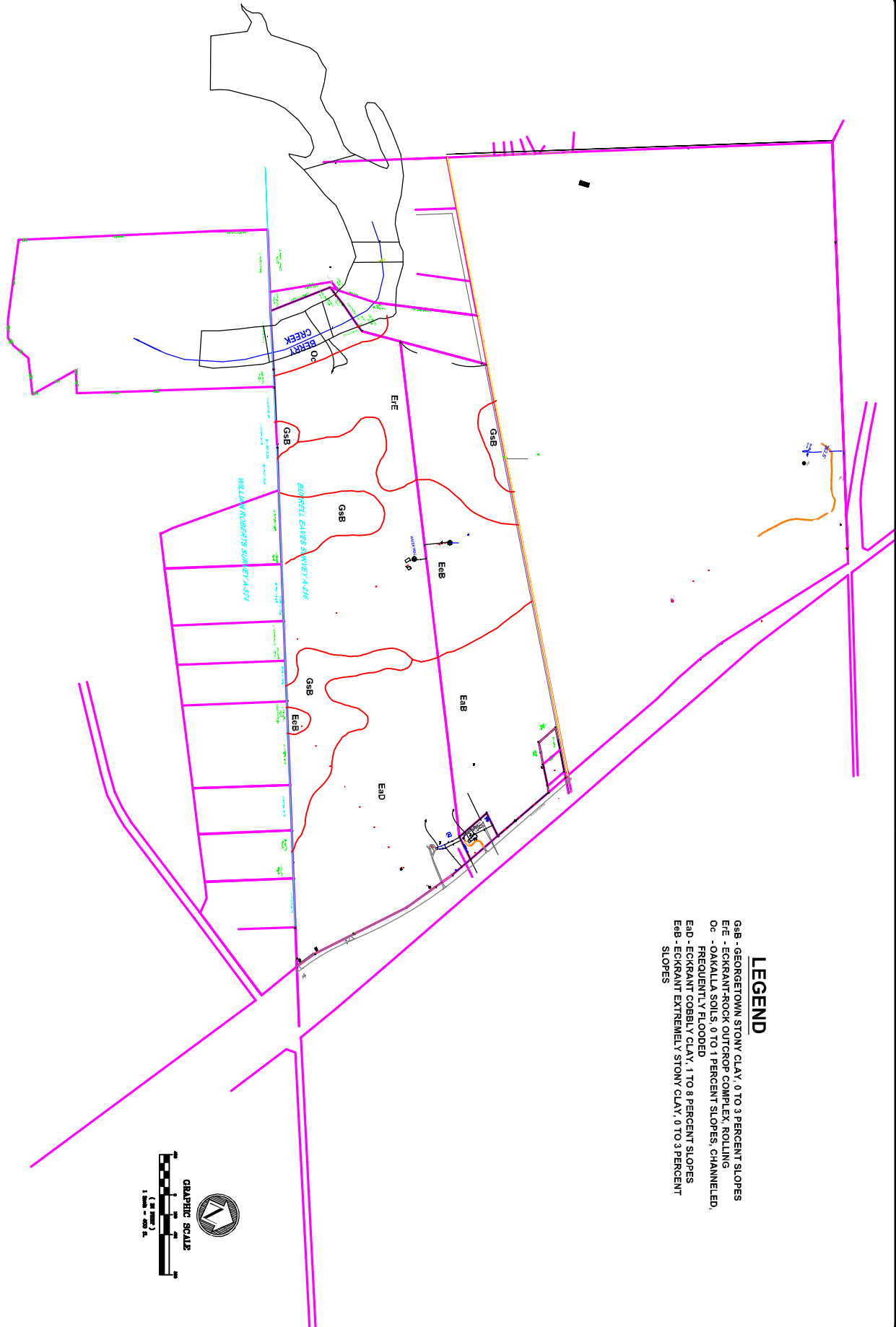
My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.



Date: March 31, 2016

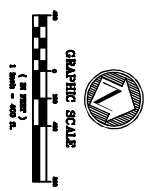
Sheet 1 of 1





LEGEND

G&B - GEORGETOWN STONY CLAY, 0 TO 3 PERCENT SLOPES
 E&E - ECKRANT-ROCK OUTCROP COMPLEX, ROLLING
 Oc - OAKALLA SOILS, 0 TO 1 PERCENT SLOPES, CHANNELLED,
 FREQUENTLY FLOODED
 E&D - ECKRANT COBBLY CLAY, 1 TO 8 PERCENT SLOPES
 E&B - ECKRANT EXTREMELY STONY CLAY, 0 TO 3 PERCENT
 SLOPES



DATE: _____ OF _____
 PROJECT: _____
 DRAWING: _____
 DESIGNER: _____
 CHECKED: _____
 TITLE: _____
 FILE NO.: _____
 PROJECT NO.: _____

psi Information To Build On
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 SAN ANTONIO, TEXAS 78216



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



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.



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.



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.



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.

 **ORGANIZED SEWAGE COLLECTION
SYSTEM REPORT**

**Berry Creek Highlands Phase 6A
Georgetown, Williamson County, Texas**



Prepared By:

AC Steadman
Kimley-Horn and Associates, Inc.
10814 Jollyville Road
Building IV, Suite 200
Austin, TX 78759
TEXAS REGISTRATION #928

August 2023

Kimley»»Horn

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 6A

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

Customer Information

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

Contact Person: Marvin Shapiro

Entity: Berry Creek ASLI IX, LLC

Mailing Address: 923 N. Pennsylvania Ave.

City, State: Winter Park, FL

Zip: 32789

Telephone: (407)-628-8488

Fax: _____

Email Address: mshapiro@avantiprop.com

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

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

Contact Person: AC Steadman

Texas Licensed Professional Engineer's Number: 138792

Entity: Kimley-Horn & Associates, Inc.

Mailing Address: 10814 Jollyville Road, Building IV, Suite 200

City, State: Austin, Texas

Zip: 78759

Telephone: 512-720-5466

Fax: _____

Email Address: ac.steadman@kimley-horn.com

Project Information

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

- Residential: Number of single-family lots: 374
- Multi-family: Number of residential units: _____
- Commercial
- Industrial
- Off-site system (not associated with any development)
- Other: _____

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

100 % Domestic 350,761 gallons/day
 _____ % Industrial _____ gallons/day
 _____ % Commingled
 _____ gallons/day
 Total gallons/day: _____

6. Existing and anticipated infiltration/inflow is _____ gallons/day. This will be addressed by: including infiltration/in flow with peak wet weather flow.

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

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

8. Pipe description:

Table 1 - Pipe Description

<i>Pipe Diameter(Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>
8" (gravity)	+/- 2035.76	SDR-26-PVC	ASTM D 3034
8" (water crossings)	+/- 323	150 PSI SDR-26-PVC	ASTM D 2241

<i>Pipe Diameter(Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>

Total Linear Feet: +/- 2358.76

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

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

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

9. The sewage collection system will convey the wastewater to the San Gabriel Wastewater Treatment Plant (City of Georgetown) (name) Treatment Plant. The treatment facility is:

- Existing
 Proposed

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

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

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

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

Alignment

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

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

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

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

Manholes and Cleanouts

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

Table 2 - Manholes and Cleanouts

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
SEE ATTACHED WWMH SUMMARY	Of		
	Of		
	Of		
	Of		
	Of		
	Of		
	Of		
	Of		
	Of		
	Of		

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

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

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

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

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

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

Site Plan Requirements

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

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

BERRY CREEK PHASE 6A WW MANHOLE SUMMARY

LINE	SHOWN ON SHEET	STATION	MANHOLE OR CLEANOUT?
A	30 & 31 OF 40	1+00.00	4' DOGHOUSE MANHOLE A1
A	30 & 31 OF 40	1+31.18	5' MANHOLE A2
A	30 & 31 OF 40	2+64.90	4' MANHOLE A3
A	30 & 31 OF 40	3+32.88	4' MANHOLE A4
A	30 & 31 OF 40	4+63.66	5' MANHOLE A5
A	30 & 31 OF 40	7+34.56	4' MANHOLE A6
A	30 & 32-33 OF 40	11+44.85	5' MANHOLE A7
A	30 & 32 OF 40	12+10.60	5' MANHOLE A8
A	30 & 32 OF 40	12+79.88	4' MANHOLE A9
A	30 & 32 OF 40	13+82.12	4' MANHOLE A10
A	29 & 32 OF 40	14+73.02	5' MANHOLE A11
A	29 & 32 OF 40	15+80.49	5' MANHOLE A12
A	29 & 32 OF 40	18+89.90	4' MANHOLE A13
A	29 & 32 OF 40	19+11.94	4' MANHOLE A14
A	29 & 32 OF 40	20+01.61	5' MANHOLE A15

Site Plan Scale: 1" = 100', 60', 50', 40'.

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

20. Lateral stub-outs:

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

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

Table 3 - 100-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
SD A	24 - 25 OF 40	1+00 to 4+37.40
LAT A2	24 - 25 OF 40	1+00 to 1+90.07
FUTR LAT A3	24 & 26 OF 40	1+00 to 2+27.96
	of	to

23. 5-year floodplain:

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

Table 4 - 5-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
N/A	of	to
	of	to
	of	to
	of	to

- 24. Legal boundaries of the site are shown.
- 25. The **final plans and technical specifications** are submitted for the TCEQ’s review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

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

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

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

Table 5 - Water Line Crossings

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>
A	19+50.00	Crossing	0.00	10.4'

- 27. Vented Manholes:
 - No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.
 - A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.

- A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.
- A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located within. No vented manholes will be used.

Table 6 - Vented Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
N/A			

28. Drop manholes:

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

Table 7 - Drop Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
A	A-4	3+32.88	30 & 31 OF 40

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

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

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

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

31. Minimum flow velocity (From Appendix A)

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

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

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

Table 8 - Flows Greater Than 10 Feet per Second

<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					

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

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

Administrative Information

- 34. The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.
- 35. Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Table 9 - Standard Details

<i>Standard Details</i>	<i>Shown on Sheet</i>
Lateral stub-out marking [Required]	N/A
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) [Required]	36 of 38
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	36 of 38
Typical trench cross-sections [Required]	37 of 38
Bolted manholes [Required]	36 of 38

Standard Details	Shown on Sheet
Sewer Service lateral standard details [Required]	of
Clean-out at end of line [Required, if used]	of
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	of
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	of
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) [Required, if Flexible Pipe is used]	of
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	of

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

Signature

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

Print Name of Licensed Professional Engineer: AC Steadman, P.E.

Date: 07/21/2023

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 10 - Slope Velocity

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

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

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

Figure 1 - Manning's Formula

Where:

v = velocity (ft/sec)

n = Manning's roughness coefficient
(0.013)

R_h = hydraulic radius (ft)

S = slope (ft/ft)

 **ORGANIZED SEWAGE COLLECTION
SYSTEM REPORT**

**Berry Creek Highlands Phase 6A
Georgetown, Williamson County, Texas**



Prepared By:

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TEXAS REGISTRATION #928

August 2023

Kimley»»Horn

Engineering Design Report

For

Berry Creek Highlands Phase 6A Organized Sewage Collection System

AUGUST 2023

Prepared By:
Kimley-Horn & Associates, Inc.
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Austin, Texas 78759
TBPE Registration Number F928

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PVC PIPE STANDARDS

The American Society for Testing and Materials (ASTM) also known as ASTM International (Reference: www.astm.org) governs the manufacturing specifications for Polyvinyl Chloride (PVC) pipes, including the dimension ratio and water pressure allowable for use of each pipe, through its D-3034 standard. ASTM D-3034 lists its pipe dimensions and pipe classes using the “SDR” mark up, such as SDR-13.5, SDR-21, SDR-26 and SDR-41. The SDR refers to the standard dimension ratio (SDR) of the outside pipe diameter and the wall thickness. This project specifies the use of SDR-26 PVC pipe, which are to meet the ASTM pressure rating of 160 psi and fall in the size category listed below. ASTM D-3034 standards must be meticulously adhered to by all PVC pipe manufacturers and is recognized as the standard during PVC pressure pipe testing and quality checks. Other in-depth information can be found published in Thermoplastic Pressure Pipe Design and Selection UNI-TR-7, by the Uni-Bell PVC Pipe Association.

SDR 26 Pipe Size Matrix (Per ASTM D-3034)			
Size (in)	O.D. (in)	Avg I.D. (in)	Thickness (in)
4	4.215	3.891	0.162
6	6.275	5.793	0.241
8	8.4	7.754	0.323
10	10.5	9.692	0.404
12	12.5	11.538	0.481
15	15.3	14.124	0.588

PROPOSED TYPE OF PIPE (8")
(8")

Type I, Grade I, Polyvinyl Chloride (PVC) Specifications:
Size of Pipe: 8.00 in.

SDR 26 Properties

Pipe Compliance:	ASTM D-3034
Joint Compliance:	ASTM D-3139
Cell Classification:	12454
Minimum Tensile Strength (psi):	7,000
Minimum Modulus of Elasticity (psi):	400,000
Average Inner Diameter (inch):	7.754
Average Outer Diameter (inch):	8.4
Wall Thickness (inch):	0.323
Approximate Trenching Width (feet):	2.70

Minimum Pipe Depth (Cover) used (feet): 6.00
Maximum Pipe Depth (Cover) used (feet): 24.00

FLOW/CAPACITY ANALYSIS

For the Proposed Project:

Proposed Waste Water Usage: **350,761 GPD** (max)

Q_{max} (As determined in Attachment A) = 0.543 CFS

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

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

$Q_{full} = 0.832$ CFS

0.543 < 0.832
Design meets TCEQ Guidelines

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

(8")

Minimum and Maximum Pipe Slopes		
Size of Pipe	Minimum Slope (%)	Maximum Slope (%)
6	0.5	12.35
8	0.33	8.4
10	0.25	6.23
12	0.2	4.88
15	0.15	3.62
18	0.11	2.83
21	0.09	2.3
24	0.08	1.93
27	0.06	1.65
30	0.055	1.43
33	0.05	1.26
36	0.045	1.12
39	0.04	1.01
>39	*	*

* For pipes larger than 39 inches in diameter, the slope is determined by Manning's formula to maintain a velocity greater than **2.0 feet per second** and less than **10.0 feet per second** when flowing full.

MINIMUM AND MAXIMUM VELOCITY FOR THE PROPOSED SYSTEM:

(8")

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

So, using 8.00 inch PVC Pipe:
 V = velocity (ft/sec) = (solve)
 n = Manning's coefficient = 0.013
 R_h = hydraulic radius = 0.165
 S = slope (ft/ft)

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

Maximum Slope Used (%): **7.00**

V_{min} = **2.44** ft/sec

V_{max} = **9.12** ft/sec

2.44 > **2.00** ft/sec

9.12 < **10.00** ft/sec

Design meets TCEQ Guidelines

Design meets TCEQ Guidelines

AVERAGE VALUES OF MODULUS OF SOIL REACTION, E'

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

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

Modulus of Soil Reaction for the in-situ soil is determined to be = 1000 psi

PIPE BEDDING CLASS

Taken from the American Society for Testing and Material (ASTM) D 2321 and American Association of State Highway and Transportation Officials (AASHTO) M43, and as published on Table 7, in Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association, Pg 24.

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

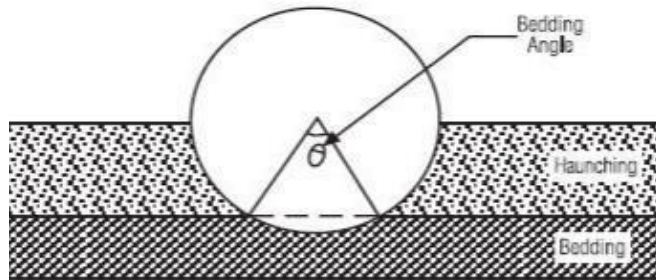
NOTE:

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

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

PIPE BEDDING ANGLE

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



Bedding Constant Values

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

LIVE LOAD DETERMINATION

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

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

¹ Simulates 20 ton truck + impact

² Simulates 80,000 lb/ft railway load + impact

³ 180,000 lbs. dual tandem gear assembly. 26 inch spacing between tires and 66 inch center-to-center spacing between fore and aft tires under a rigid pavement 12 inches thick + impact.

* Negligible live load influence

PRISM LOAD DETERMINATION

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

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

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

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

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

BUCKLING PRESSURE (ALLOWABLE)

(8")

- Where: q_a = Allowable buckling pressure (psi)
 h = Height of soil surface above top of pipe (in)
 H = Depth of burial, feet, from ground surface to top of pipe
 B' = Empirical coefficient of elastic support
 E_b = Modulus of soil reaction for the bedding material (psi)
 E = Modulus of elasticity of the pipe material (psi)
 I = Moment of inertia of the pipe, per linear inch of pipe (in³)
 t = Pipe wall thickness (in)
 D = Mean pipe diameter, outer (in) $D = 8.4$

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

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

$$B' = \frac{3110.4}{4771.4} = 0.652$$

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

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

$$q_a = \frac{1}{2.5} \sqrt{\left[32 \left[\left[1 \left[\left[0.652 \left[\left[1000 \left[\left[400000 \frac{0.003}{592.70} \right] \right] \right] \right] \right] \right] \right] \right]}$$

$q_a = 79.53 \text{ psi}$

BUCKLING PRESSURE (INSTALLED CONDITION)

(8")

Where: q_p	=	Pressure applied to pipe under installed conditions (psi)
γ_w	=	Specific Weight of Water = 0.0361 (pci)
γ_s	=	Specific Weight of Soil (pcf)
W_c	=	Vertical Soil Load on the pipe per unit length (lb/in)
L_L	=	Live load as determined from chart

Standard industry vertical soil load (W_c) calculation (lb/in) developed from empirical data:

$$W_c = \gamma_s * H * \left(\frac{D + t}{144} \right)$$

Where: $\gamma_s = 120$ $D = 8.4$ $t = 0.323$

$$W_c = \left[120 \left[\left[24.00 \left[\frac{8.4 + 0.323}{144} \right] \right] \right] \right]$$

$$W_c = 174.46 \quad \text{lb/in}$$

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

$$q_p = \gamma_w h_w + R_w \left(\frac{W_c + L_L}{D} \right)$$

$$q_p = 62.4 \times 0 + 1 \times \left[\frac{191.96}{8.4} \right]$$

$$q_p = 43.62 \quad \text{psi}$$

Note: The Buckling pressure under installed conditions is less than the Allowable Buckling Pressure of the specified pipe, (i.e.. $q_a > q_p$) therefore the design is acceptable for installation.

WALL CRUSHING CALCULATION

(8")

Where: D_o	=	outside pipe diameter, in.	=	8.4 in
P_c	=	Compressive stress or hydrostatic design basis (HDB). For typical PVC pipe assume 4,000 psi. For any other pipe material the HDB must be supplied by the pipe manufacturer		
A	=	surface area of the pipe wall, in. ² /ft	=	0.323 in. ² /ft
γ_s	=	specific weight of soil, pcf,	=	120 pcf
H	=	Depth of burial (ft) from ground surface to crown of pipe		

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

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

Substituting the Thrust equation into the Wall Crushing equation:

$$P_c = \frac{\frac{P_y D}{2}}{A} = \frac{P_y D}{2A}$$

From the Marston Equation determining the Prism Load Calculation (See previous section on Prism Load), substitute the equation for P_y :

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

$$\text{And simplifies to: } 288AP_c = \gamma_s HD$$

Note that the Surface Area of the Pipe Wall, A , is per unit length in inches² per foot, a conversion factor (from feet to inches) of 12 must be applied, therefore,

$$24AP_c = \gamma_s HD$$

Solving for H , the equation becomes:

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

(Continued on next page)

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

$$H = \frac{24 \left[\frac{4000}{120} \times 8.4 \right] \left[0.323 \times 12 \right]}{1} = 369.14$$

$$H = 369.14 \text{ feet}$$

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

DEFLECTION ANALYSIS: LEONHARDT'S ZETA FACTOR

(8")

The Leonhardt's Zeta Factor Equation can be calculated using Equation 9 of Buczala and Cassady in Buried Plastic Pipe Technology, Pgs 196-197

- Where: D = Pipe Outer Diameter, in = 8.4
 B = Trench Width, in, = 2.7' = 32.4
 E_b = Modulus of soil reaction for the bedding material (psi)
 E_n = Modulus of soil reaction for the in-situ soil (psi)

$$zeta = \frac{1.662 + 0.639 \left(\frac{B}{D-1} \right)}{\frac{B}{D-1} + \left[1.662 + 0.361 \left(\frac{B}{D} \right) - 1 \right] \left[\frac{E_b}{E_n} \right]}$$

The Leonhardt Zeta factor is then determined as:

$$zeta = \frac{1.662 + 0.639 \times \left[\frac{32.4}{7.4} \right]}{\frac{32.4}{7.4} \left[1.662 + 0.361 \times \left[\frac{32.4}{8.4} \right] - 1 \right] \left[\frac{1000}{1000} \right]}$$

Leonhardt's zeta factor = 0.693

PIPE STIFFNESS (Figure: 30 TAC §217.53(k)(3))

(8")

Using Equation B.1, as directed in 30 TAC §217.53(k)(3), to Calculate the Pipe Stiffness:

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

Where: PS = Pipe Stiffness in pounds per square inch (psi)
C = Conversion factor = 0.8
RSC = Ring Stiffness Constant
D = Mean Pipe Diameter, Outer = 8.400 in

The RSC can be supplied by the manufacturer or otherwise calculated using Equation 4 of Resistance to Ring Bending – Pipe Stiffness (PS), Ring Stiffness Constant (RSC) and Flexibility Factor (FF) for Buried Gravity Flow Pipes TN-19/2005, Pg 6 published by the Plastics Pipe Institute:

$$RSC = 6.44 \times \frac{EI}{D^2}$$

And E = 400,000 psi

Solving for the Moment of Inertia:

$$I = \left(\frac{t^3}{12} \right) * \left(\frac{\text{inches}^3}{\text{in}_{linear}} \right) = 0.003$$

$$RSC = 6.44 \times \frac{1123.276}{70.560} = 102.52$$

$$PS = 0.8 \times 102.521 \times \frac{8.337}{8.400}$$

PS = 81.40 psi

PIPE STIFFNESS TO SOIL STIFFNESS FACTOR

(8")

Where: PS = Pipe Stiffness (psi) = 81.40 psi
E_b = Modulus of soil reaction for the bedding material (psi)
zeta = Leonhardt's Zeta factor = 0.693
SSF = Soil stiffness factor (0.061×zeta×E_b)

The Soil Stiffness Factor is calculated using Equation 10 referenced by Buczala and Cassady, Buried Plastic Pipe Technology, Pg 198, where:

$$SSF = 0.6 * zeta * E_b$$

Therefore,

$$\frac{PS}{SSF} = \frac{PS}{0.6 * zeta * E_b}$$

$$\frac{PS}{SSF} = \frac{81.40}{415.97} = 0.20$$

PREDICTED PIPE DEFLECTION

(8")

Using the Modified Iowa Equation, referenced and published by the Uni-Bell PVC Pipe association and found at <http://www.uni-bell.org/faq.html>, and Equation 14 of Deflection: The Pipe/Soil Mechanism UNI-TR-1-97, Uni-Bell PVC Pipe Association Pgs 17, the predicted pipe deflection can be calculated.

Where: % $\Delta Y/D$	=	Predicted % vertical deflection under load
P	=	Prism Load, psi
K	=	Bedding angle constant, Assumed to = 0.110
W'	=	Live Load, psi, = 0
DR	=	Dimension Ratio= 26
E	=	Modulus of tensile elasticity of the pipe material, psi
E'	=	Modulus of Soil Reaction, psi
D _L	=	Deflection Lag Factor = 1.5

And using the Modified Iowa Equation:

$$(\%) \frac{\Delta Y}{D} = \frac{(D_L K P + K W') \times 100}{[2E / (3(DR - 1)^3)] + 0.061 E'}$$

$$\text{Where, Prism Load, } P = \frac{\gamma_s * H}{144}$$

and/or from previous chart, prism load = 17.50 psi

The Predicted Deflection is determined as:

$$(\%) \frac{\Delta Y}{D} = \frac{\left[\left[1.5 \times 1.925 \left[+ 0 \left[\times 100 \right. \right. \right. \right.}{\left[\frac{800000}{46875} \right] + \left[0.061 \times 1000 \left[\right. \right. \right.}{\left. \right. \right.} = 3.70\%$$

NOTE: 3.70% < 5%, therefore pipe design is acceptable

PIPE STRAIN

(8")

Pipe strain is also known as the elongation of the pipe over the original length of the pipe. Under normal loading conditions of the PVC pipe, the variable that affects the elongation or straining of the pipe stems from the either the flexure or deflection (i.e., bending) of the pipe within the bedding material (i.e. increased or excessive pipe deflection causing the pipe to elongate) or hoop stress within the pipe wall. Please note that pipe strain is not generally known to be the limiting performance factor during pipe failure. For this system, pipe deflection is limited to 5% for a SDR 26 pipe. This 5% deflection value is the industry accepted value placing the pipe within its straining limits. Therefore, as the calculated deflection above is shown to be less than 5%, the pipe and bedding class used in this system is within the acceptable straining limits for this pipe.

However, total Pipe strain is calculated as the combination of the before mentioned hoop stress and the maximum strain due to deflection. Both items are calculated below using Equations 15 and 16 found in Deflection: the Pipe/Soil Mechanism, UNI-TR-1-97, Published by the Uni-Bell PVC Pipe Association (Pgs 28-30):

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

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

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

$$\epsilon_h = \frac{[0.00 + 17.50] \times 8.4}{2 \times 0.323 \times 400,000} = 5.689E-04 \frac{\text{in}}{\text{in}}$$

(Continued on following page)

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

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

$$\epsilon_f = 0.038 \times \frac{8.663}{8.4 - 5.775} = 0.1269 \frac{\text{in}}{\text{in}}$$

$$\epsilon_{total} = 1.2749\text{E-}01 \frac{\text{in}}{\text{in}}$$

TCEQ PIPE BEDDING AND TRENCHING REQUIREMENTS (30 TAC 217.54)

These notes are provided in the Construction Documents on [General Notes Sheet](#)

a. Pipe Embedment

1. initial backfill to support the anticipated load. The bedding classes that are allowed are A, B, or C, as described in American Society for Testing and Materials (ASTM) C 12, American National Standards Institute (ANSI) A 106.2, Water Environment Federation Manual of Practice No. 9 or American Society of Civil Engineers (ASCE) MOP 37.
2. A flexible pipe must be laid with the adequate bedding, haunching, and initial backfill to support the anticipated load. The bedding classes that are allowed are IA, IB, II, or III, as described in ASTM D-2321 or ANSI K65.171.
3. Debris, large clods, or stones that are greater than six inches in diameter, organic matter, or other unstable materials are prohibited as bedding, haunching, or initial backfill.
4. Backfill must not disturb the alignment of a collection system pipe.
5. If trenching encounters significant fracture, fault zones, caves, or solutional modification to the rock strata, an owner must halt construction until an engineer prepares a written report detailing how construction will accommodate these site conditions.

b. Compaction.

1. manufacturer's recommendations for the collection system pipe used in a project.
2. Compaction of an embedment envelope must provide the modulus of soil reaction for the bedding material necessary to ensure a wastewater collection system pipe's structural integrity as required by §217.53 of this title (relating to Pipe Design).
3. The placement of the backfill above a pipe must not affect the structural integrity of a pipe.

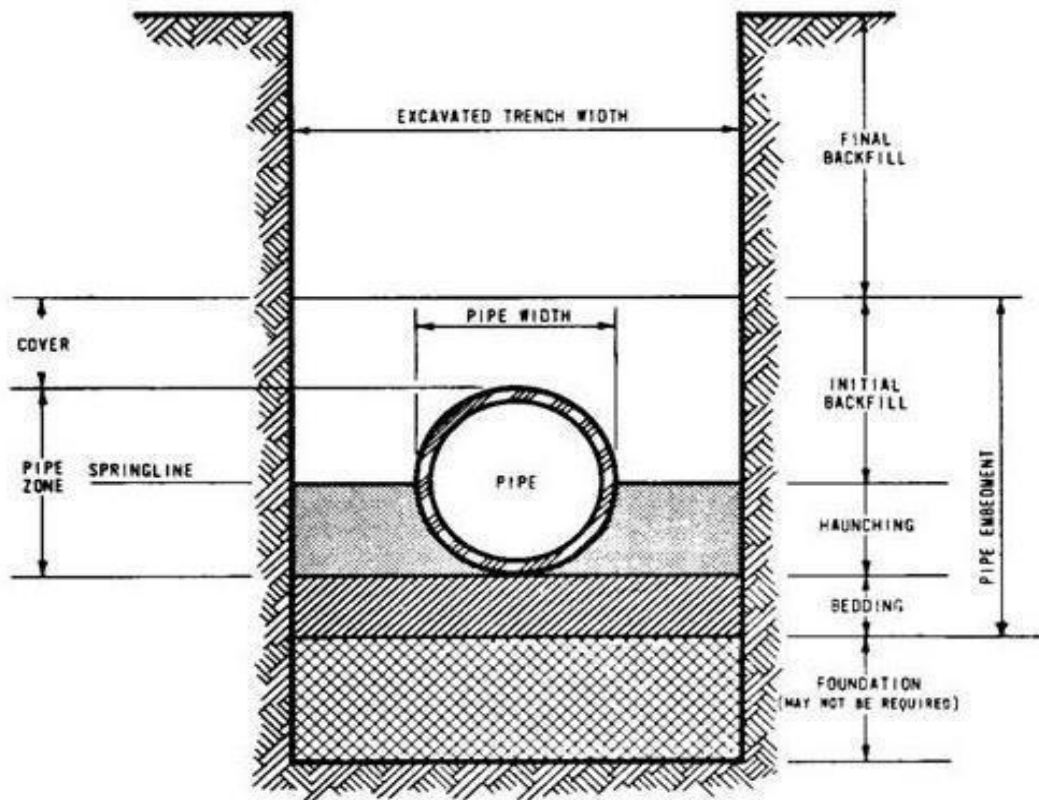
c. Envelope Size.

1. A minimum clearance of 6.0 inches below and on each side of the bell of all pipes to the trench walls and floor is required.
2. The embedment material used for haunching and initial backfill must be installed to a minimum depth of 12 inches above the crown of a pipe.

d. Trench Width.

1. properly and must allow the backfill to be placed and compacted as needed.
2. The maximum and minimum trench width needed for safety and a pipe's structural integrity must be included in the report.
3. The width of a trench must be sufficient to properly and safely place and compact haunching materials.
4. The space between a pipe and a trench wall must be wider than the compaction equipment used in the pipe zone.

TRENCH CROSS-SECTION (30 TAC 217.54)



NOTE:

Trenching Details along with 30 TAC 217.54 are annotated in the Construction Documents/Plan Sheets on [Wastewater Details Sheet](#).

MANHOLE SPECIFICATIONS

30 TAC 217.55 Requirements with design comments:

- a. An owner must include manholes in a wastewater collection system at:
 - 1. All points of change in alignment, grade, or size;
 - 2. At the intersection of all pipes; and
 - 3. At the end of all pipes that may be extended at a future date.
- b. Manholes placed at the end of a wastewater collection system pipe that may be extended in the future must include pipe stub outs with plugs. (pipe stub-outs with plugs are proposed at the end of each line that will be extended with Phase 2 of Section 19.)
- c. A clean-out with watertight plugs may be installed in lieu of a manhole at the end of a wastewater collection system pipe if no extensions are anticipated. **(Self explanatory, clean outs not used in-lieu of manholes)**
- d. Cleanout installations must pass all applicable testing requirements outlined for gravity collection pipes in §217.57 of this title (relating to Testing Requirements for Installation of Gravity Collection System Pipes). **(Self explanatory, see Item c above)**
- e. A manhole must be made of monolithic, cast-in-place concrete, fiberglass, pre-cast concrete, high-density polyethylene, or equivalent material that provides adequate structural integrity. **See the Pre-Cast Manhole Details following these construction notes)**
- f. The use of bricks to adjust a manhole cover to grade or construct a manhole is prohibited. **(Self explanatory, See Details following these notes)**
- g. Manholes may be spaced no further apart than the distances specified in the following table for a wastewater collection system with straight alignment and uniform grades, unless a variance based on the availability of cleaning equipment that is capable of servicing greater distances is granted by the executive director. **(Self explanatory and maintained throughout the design of the SCS)**

Table C.2. - Maximum Manhole Spacing	
Pipe Diameter	Maximum Manhole
6-15	500
18-30	800
36-48	1000
54 or larger	2000

- h. Tunnels are exempt from manhole spacing requirements because of construction constraints. **(Self explanatory and not applicable)**

- i. An intersection of three or more collection pipes must have a manhole. **(Self explanatory and maintained throughout the design of the SCS)**
- j. A manhole must not be located in the flow path of a watercourse, or in an area where ponding of surface water is probable. **(Self explanatory and maintained throughout the design of the SCS)**
- k. The inside diameter of a manhole must be no less than 48 inches. A manhole diameter must be sufficient to allow personnel and equipment to enter, exit, and work in the manhole and to allow proper joining of the collection system pipes in the manhole wall. **(See Manhole Details following these notes)**
- l. Manholes must meet the following requirements for covers, inlets, and bases.

- 1. Manhole Covers

- A.

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

- B. A manhole located within a 100-year flood plain must have a means of preventing inflow. **(Self explanatory and maintained throughout the design of the SCS)**

- C. A manhole cover construction must be constructed of impervious material. **(Self explanatory, See Manhole Details following these construction notes)**

- D. A manhole cover that is located in a roadway must meet or exceed the American Association of State Highways and Transportation Officials standard M-306 for load bearing. **(Self explanatory, See Manhole Details)**

- 2. Manhole Inverts

- A. The bottom of a manhole must contain a U-shaped channel that is a smooth continuation of the inlet and outlet pipes. **(Self explanatory, see Manhole Details)**

- B. A manhole connected to a pipe less than 15 inches in diameter must have a channel depth equal to at least half the largest pipe's diameter **(Self explanatory, see Manhole Details)**

- C. A manhole connected to a pipe at least 15 inches in diameter but not more than 24 inches in diameter must have a channel depth equal to at least three-fourths of the largest pipe's diameter **(Self explanatory, but not applicable for this project)**

- D. A manhole connected to a pipe greater than 24 inches in diameter must have a channel depth equal to at least the largest pipe's diameter **(Self explanatory, but not applicable for this project).**

- E. A manhole with pipes of different sizes must have the tops of the pipes at the same elevation and flow channels in the invert sloped on an even slope from pipe to pipe. **(Self explanatory and maintained throughout the design of the SCS)**
- F. A bench provided above a channel must slope at a minimum of 0.5 inch per foot. **(Self Explanatory)**
- G. An invert must be filleted to prevent solids from being deposited if a wastewater collection system pipe enters a manhole higher than 24 inches above a manhole invert. **(Self Explanatory, see manhole details. Not applicable for this site.)**
- H. A wastewater collection system pipe entering a manhole more than 24 inches above an invert must have a drop pipe. **(Self Explanatory, see Manhole Details)**
- m. The inclusion of steps in a manhole is prohibited. **(Self Explanatory, see Manhole Details)**
- n. Connections. A manhole-pipe connection must use watertight, size-on-size resilient connectors that allow for differential settlement and must conform to American Society for Testing and Materials C-923. **(Self Explanatory, see Manhole Details)**
- o. Venting. An owner must use an alternate means of venting if manholes are at more than 1,500 foot intervals and gasketed manhole covers are required for more than three manholes in sequence. Vents must meet the following requirements: **(Self Explanatory, but not applicable for this project)**
 - 1. Vent design must minimize inflow;
 - 2. Vents must be located above a 100-year flood event elevation; and
 - 3. Tunnels must be vented in compliance with this subsection.
- p. Cleanouts. The size of a cleanout must be equal to the size of the wastewater collection system main. **(Self Explanatory)**

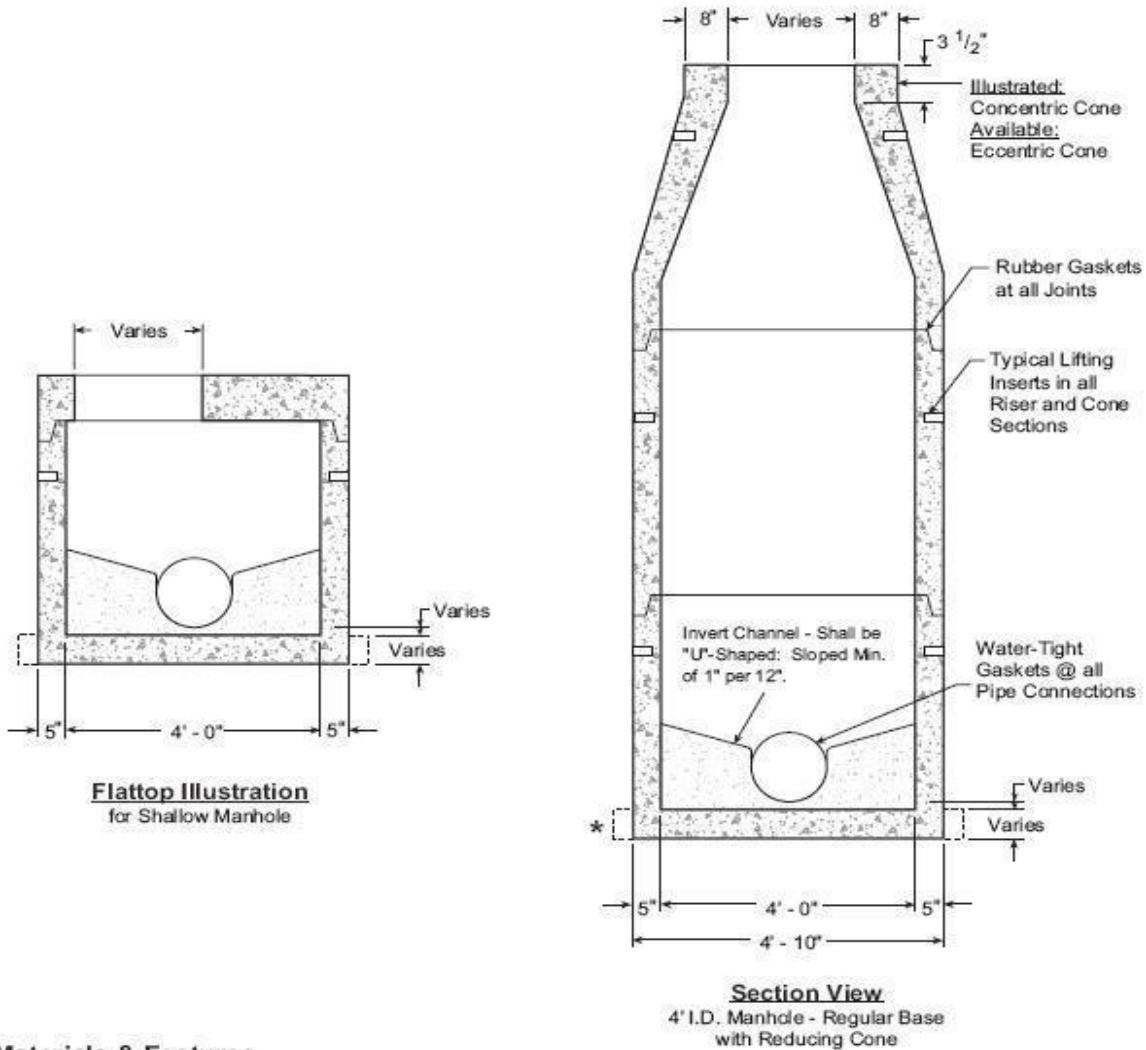
Precast Manhole Information:

Hanson Pipe and Precast

Hanson Building Products West
300 E John Carpenter Freeway
11th floor
Irving, TX 75062
972.653.5500

San Antonio Metro Area Contact:
210.661.2351
866.426.7661

Precast Manholes



Materials & Features


HOLES AS SPECIFIED: Max diameter = 32"
 CONCRETE: 5,000 PSI, 28 day strength.
 REINFORCING: Meets or exceeds ASTM C478 requirements.
 Average weight of 24" depth base w/8" invert = 4,500 lbs.
 Estimated weight of riser and cone sections = 870 lbs. / vt. ft.

* - Extended base is available to meet local requirements.

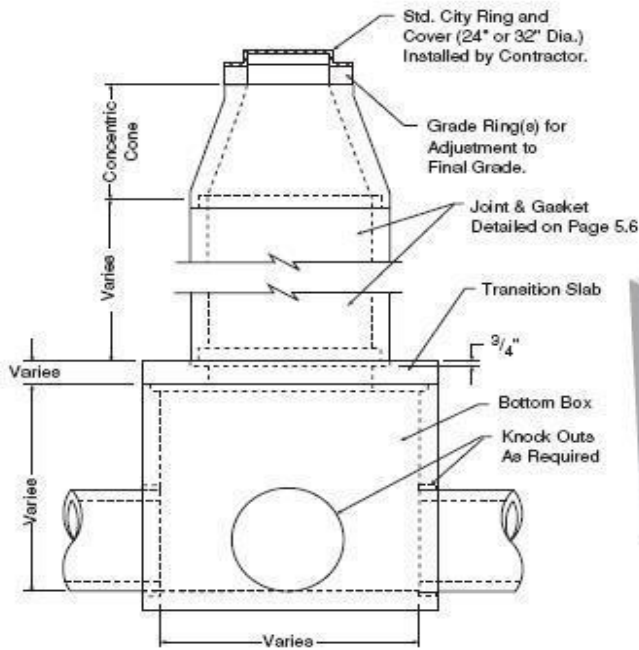
In the event a boot is loose contact your Hanson representative to resolve.

"Manufactured to your specifications."

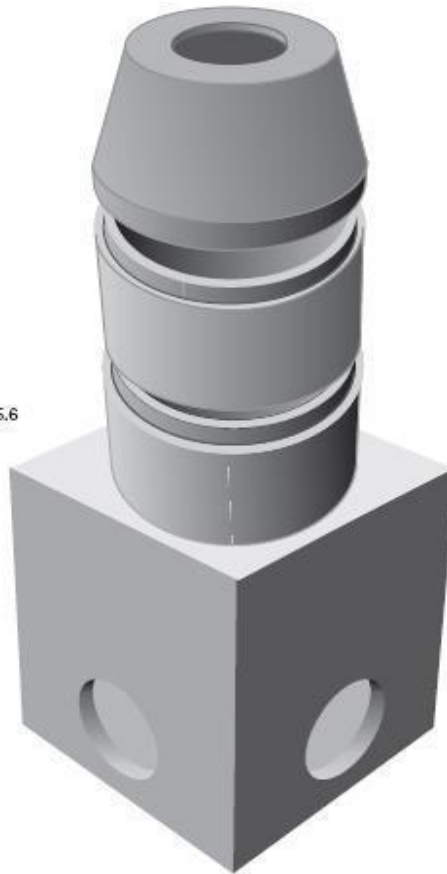
-No Scale-
 All dimensions subject to allowable
 specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE	
4' I.D. Manhole Regular Base w/ Reducing Cone	All Plants	TX	5.5	07-01-06	

Precast Manholes



Side View



Isometric View

Materials & Features

CONCRETE: 5,000 PSI in 28 days.

REINFORCING STEEL: per ASTM A-615 / A-185


REINFORCING to meet AASHTO HS 20-44 Loading.

BASE DESIGN EQUAL TO OR EXCEEDS ASTM C-357

RISER DESIGN EQUAL TO OR EXCEEDS ASTM C-478

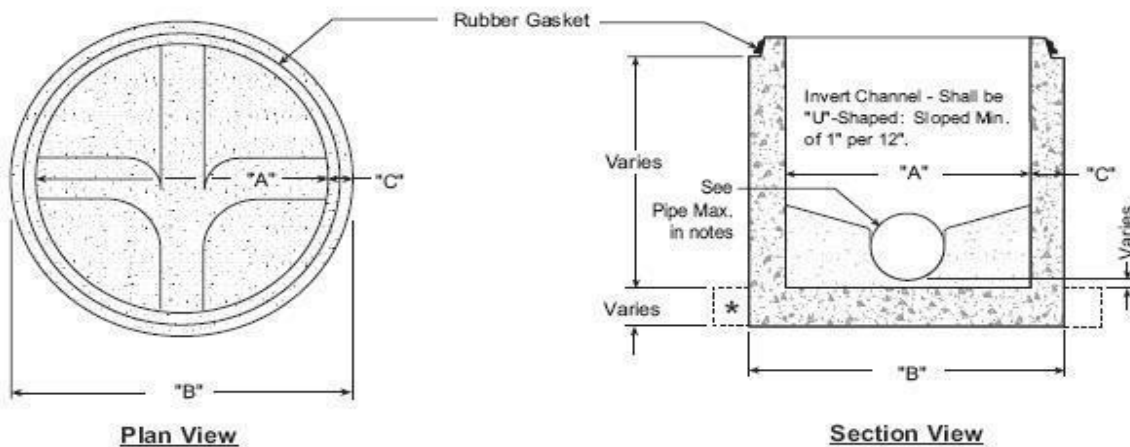
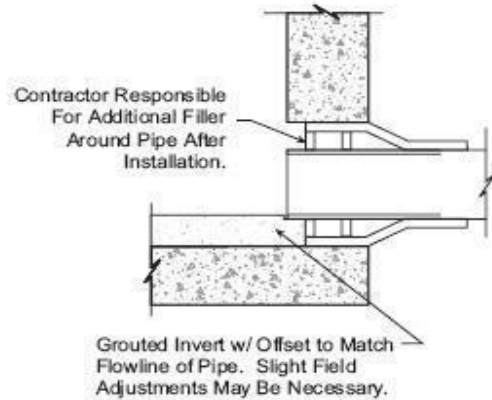
In the event a boot is loose contact your Hanson representative to resolve.

-No Scale-
All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION,PAGE	DATE	
Type "C" Manhole	Houston San Antonio	TX	5.11	07-01-06	

Precast Manholes

For Pipe Entering the Manhole at Excessive Depths Above the Flow Line Out, the Contractor May be Responsible for Grout Work Necessary to Bring Channel up to Flow Line on Inlet Pipe.



Materials & Features

HOLES AS SPECIFIED:

For 4' I.D. max. diameter = 32"

For 5' I.D. max. diameter = 40"

For 6' I.D. max. diameter = 54"

CONCRETE: 5,000 PSI, 28 day strength.

REINFORCING: Meets or exceeds ASTM C478 requirements.

Average weight of 24" depth base w/8" invert = 4,500 lbs.

Water-tight gaskets at all pipe connections.


* - Regular base shown: Extended base also available.

In the event a boot is loose contact your Hanson representative to resolve.

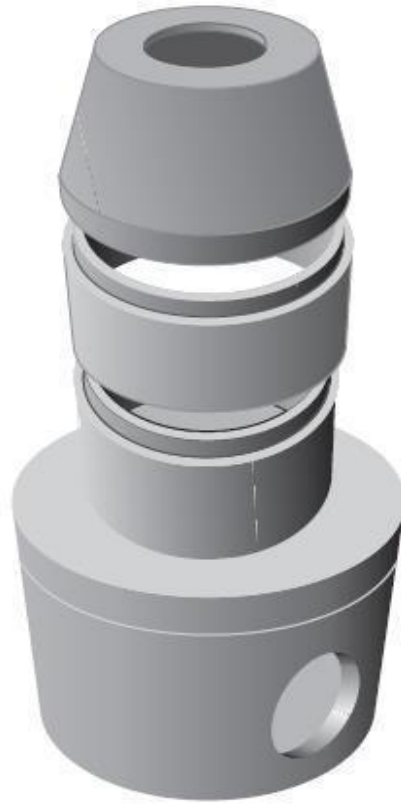
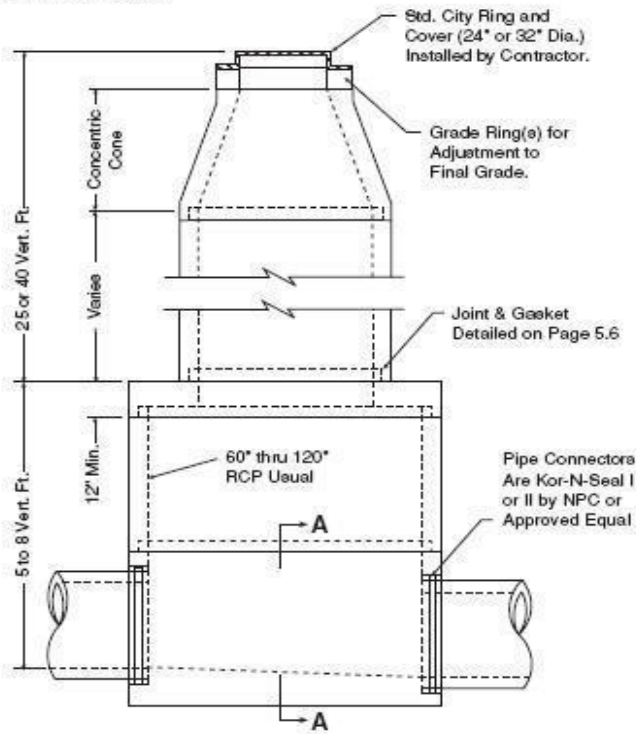
Pipe Size	I.D. "A"	O.D. "B"	Wall Thk. "C"
4'	4' - 0"	4' - 10"	5"
5'	5' - 0"	6' - 0"	6"
6'	6' - 0"	7' - 2"	7"

-No Scale-

All dimensions subject to allowable specification tolerances.

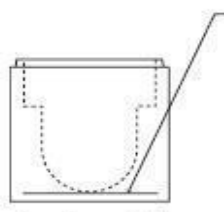
TITLE	PLANT	STATE	SECTION/PAGE	DATE	
Details: 4', 5' & 6' I.D. Precast Regular Manhole Base	All Plants	TX	5.7	07-01-06	

Precast Manholes



Isometric View

w/ Precast Base



Section A-A

Base Slab Reinforcing

30' Deep Structure

- 60"ø - 6" Thick Slab min. - #5 @ 8" ea.way
- 72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
- 84"ø - 8" Thick Slab min. - #5 @ 6" ea.way
- 96"ø - 10" Thick Slab min. - #5 @ 6" ea.way

45' Deep Structure

- 60"ø - 8" Thick Slab min. - #5 @ 8" ea.way
- 72"ø - 8" Thick Slab min. - #5 @ 8" ea.way
- 84"ø - 10" Thick Slab min. - #5 @ 6" ea.way
- 96"ø - 12" Thick Slab min. - #5 @ 6" ea.way

All Reinforcing has 1 1/2" cover from top of slab.


Materials & Features

CONCRETE: 5,000 PSI in 28 days.
 REINFORCING STEEL: per ASTM A-615, Grade 60.
 REINFORCING to meet AASHTO HS 20-44 Loading.
 DESIGN EQUAL TO OR EXCEEDS ASTM C-478
 In the event a boot is loose contact your Hanson representative to resolve.

Note:

- Inverts shall be specifically sized for connecting pipes; and shall be U-Shaped with the min. depth 3/4 of the largest pipe diameter.

-No Scale-
 All dimensions subject to allowable specification tolerances.

TITLE	PLANT	STATE	SECTION/PAGE	DATE	
30 & 45 Ft. Depth 60" thru 96" Large Base Manhole	Houston San Antonio	TX	5.10	07-01-06	

ATTACHMENT A
WASTEWATER / SEWAGE CALCULATIONS

ATTACHMENT B
WASTEWATER UTILITY SERVICE AGREEMENT

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: AC Steadman, P.E. -Kimley-Horn

Date: 08/04/2022

Signature of Customer/Agent:



Regulated Entity Name: Berry Creek Highlands Phase 6A

Regulated Entity Information

1. The type of project is:

- Residential: Number of Lots:
- Residential: Number of Living Unit Equivalents: 0
- Commercial
- Industrial
- Other:

2. Total site acreage (size of property): 25

3. Estimated projected population: 945

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	0	÷ 43,560 =	0
Parking	0	÷ 43,560 =	0
Other paved surfaces	13,192	÷ 43,560 =	0.3
Total Impervious Cover	13,192	÷ 43,560 =	0.3

Total Impervious Cover 0.3 ÷ Total Acreage 25 X 100 = 1.2% Impervious Cover

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

For Road Projects Only

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

7. Type of project:

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

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

- Concrete
- Asphaltic concrete pavement
- Other: _____

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

Width of R.O.W.: _____ feet.

L x W = _____ Ft² ÷ 43,560 Ft²/Acre = _____ acres.

10. Length of pavement area: _____ feet.

Width of pavement area: _____ feet.

L x W = _____ Ft² ÷ 43,560 Ft²/Acre = _____ acres.

Pavement area _____ acres ÷ R.O.W. area _____ acres x 100 = _____ % impervious cover.

11. A rest stop will be included in this project.
- A rest stop will not be included in this project.

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

<u>100</u> % Domestic	<u>350,761</u> Gallons/day
<u> </u> % Industrial	<u> </u> Gallons/day
<u> </u> % Commingled	
<u> </u> Gallons/day	
TOTAL gallons/day <u> </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-City of Georgetown (name) Treatment Plant. The treatment facility is:

- Existing.
 Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 100', 60', 50', and 40'.

18. 100-year floodplain boundaries:

Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.

No part of the project site is located within the 100-year floodplain.

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): FEMA FIRM 48491C0290E dated 9/26/08

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

Possible factors that could affect surface water and ground water quality are:

- Petroleum drippings from vehicle movement
- Integrated Pest Management
- Landscape Maintenance
- Asphalt and/or Concrete Products
- Soil/Stock Pile
- Paint
- Oils
- Sediment and soil from disturbed areas

ATTACHMENT B -- VOLUME AND CHARACTER OF STORMWATER

EXISTING DRAINAGE CONDITIONS

The natural topography of the site is defined by gently rolling hills. The entire site drains south to a drainage channel that ultimately discharges in the San Gabriel River.

STORM WATER DETENTION AND WATER QUALITY

Detention for this site is not required so only water quality aspects were analyzed.

Water Quality for the site is provided in a batch detention water quality pond located in Berry Creek Highlands Phase 6A. The batch detention water quality pond located in Berry Creek Highlands, Phase 6A (under construction) was designed and being constructed to treat the projected impervious cover for the portion of Berry Creek Highlands Phase 6A, Phase 6B and Phase 8b that is draining to the pond. Onsite batch detention water quality pond 1 was designed to treat the impervious cover generated onsite.

Water Quality Pond 1, the proposed top and bottom elevations of the detention are 762.0 and 775.0, respectively. The proposed top and bottom elevations of the water quality are 762.0 and 771.0, respectively. The following table is a detention routing summary for conveyance of the 2 through 100-year storms.

WQ POND 1				
ROUTING TABLE				
DESIGN SCENARIO	PEAK INFLOW (FT³/S)	COMPUTED PEAK OUTFLOW (FT³/S)	MAXIMUM WATER SURFACE ELEVATION (FT)	MAXIMUM STORAGE (FT³)
2 YR	137.56	109.33	768.30	81968.00
10 YR	221.82	185.81	768.86	118965.00
25 YR	277.95	229.47	769.23	144132.00
100 YR	371.00	287.27	769.98	195728.00

Table 2 is the Water Quality Pond A water quality volume summary.

WQ POND 1					
STAGE STORAGE TABLE					
STAGE (FT MSL)	AREA (SF)	STORAGE (CF)	CUMULATIVE STORAGE (CF)	DISCHARGE (CFS)	CONTRIBUTING STRUCTURES
762.00	200.00	N/A	0.00	0.00	NONE
763.00	14710.00	7455.00	7455.00	0.00	NONE
764.00	39966.00	27338.00	34793.00	0.00	NONE
765.00	55089.00	47527.50	82320.50	0.00	NONE
766.00	58049.00	56569.00	138889.50	0.00	NONE
767.00	61067.00	59558.00	198447.50	0.00	WEIR
768.00	64141.00	62604.00	261051.50	72.80	WEIR
769.00	67271.00	65706.00	326757.50	205.90	WEIR
770.00	70458.00	68864.50	395622.00	288.58	WEIR
771.00	73701.00	72079.50	467701.50	334.55	WEIR

WQV

Required water quality volume for Pond A is 190,992 CF and the provided water quality volume provided is 198,447.50 CF.

ATTACHMENT C – SUITABILITY LETTER FROM AUTHORIZED AGENT

Attachment C is not applicable for this project. An on-site sewage facility will not be implemented for this development. Proposed private service laterals will be connected to a sewage collection system.

ATTACHMENT D - EXEMPTION TO THE REQUIRED GEOLOGIC ASSESSMENT

Attachment D is not applicable for this project. A geological assessment exemption will not be requested. A copy of the site Geological Assessment performed by Horizon Environmental Services, Inc. has been provided, see Geologic Assessment Form and Attachments.

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

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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: AC Steadman, P.E. -Kimley-Horn

Date: 08/04/2023

Signature of Customer/Agent:



Regulated Entity Name: Berry Creek Highlands Phase 6A

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: South Fork San Gabriel River

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

Good Housekeeping and Material Management Practices shall include, but are not limited to the following:

- Neat and orderly storage of any chemicals, pesticides, fertilizers, fuels, etc., that are being stored on site. All storage tanks will be above ground, have a maximum storage capacity of 250 gallons and be stored on site for less than one (1) year. Aboveground Storage Tanks (ASTs) shall comply with Title 30 Texas Administrative Code, Chapter 334, Subchapter F and will be located within the respective phase's Stockpiling Area as illustrated on the Erosion and Sedimentation Control Plans included with this submittal.
- Regular garbage, rubbish, construction waste and sanitary waste disposal.
- Prompt cleanup of any spills that have occurred of liquid or dry materials.
- Cleanup of sediments that have been tracked by vehicles or have been transported by wind or storm water about the site or onto nearby roadways.

In addition to the Good Housekeeping and Material Management Practices, discussed in the previous sections of this plan, the following practices will be followed for spill prevention and clean up.

- Manufacturer's recommended methods of spill cleanup will be clearly posted and site personnel will be made aware of the procedures and the location of the information and the clean up supplies.
- Materials and equipment necessary for spill cleanup will be kept in the materials storage area onsite. Equipment and materials will include but are not limited to brooms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, plastic and metal trash containers specifically for this purpose.
- All spills will be cleaned up immediately after discovery.
- The spill area will be kept well ventilated and personnel will wear appropriate clothing to prevent injury from contact with a hazardous substance.
- Spills of toxic or hazardous material will be reported to the appropriate State, or Local Government Agency, regardless of the size.
- The spill prevention plan will be adjusted to include measures to prevent this type of spill from recurring and how to cleanup the spill if there is another one. A description of the spill, what caused it, and the cleanup measures will also be included.
- The site superintendent responsible for the day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three (3) other

site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage area and in the office trailer onsite.

- Reportable quantities of hydrocarbon or hazardous material spills should be reported to the Texas Commissions on Environmental Quality (TCEQ) at the following 24-hour toll free number 1-800-832-8224. The reportable quantity depends on the substance released and where released. Reference the "Spill Reporting" section on the external TCEQ website for a table to use to determine whether the spill should be reported and under what rule.

The Contractor shall notify the agency as soon as possible whenever necessary to provide information that would trigger a change in the response to the spill or discharge. If the discharge or spill creates an imminent health threat, the Contractor shall immediately notify and cooperate with local emergency authorities.

The Contractor will cooperate with the local emergency authority in providing support to implement appropriate notification and response actions. The local emergency authority, as necessary, will implement its emergency management plan, which may include notifying and evacuating affected personnel. In the absence of a local emergency authority, the Contractor shall take reasonable measure to notify potentially affected persons of the imminent health threat.

As soon as possible, but no later than two (2) weeks after discovery of the spill or discharge, the Contractor shall reasonably attempt to notify the Owner (if identifiable) or Occupant of the property upon which the discharge or spill occurred as well as the occupants of any property that the Contractor believes is adversely affected.

ATTACHMENT B -- POTENTIAL SOURCES OF CONTAMINATION

Asphalt products will be used on this project. After placement of asphalt, emulsion, or coatings, the applicant will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt curing time, the applicant should maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur.

Sediment and soil from disturbed areas are another potential source of contamination. During activities causing soil disturbance, temporary best management practices outlined in ***Attachment D***, shall be followed to prevent discharge of sediment to South Fork San Gabriel River.

Other potential sources of contamination include hydraulic fluid and diesel fuel from mechanical equipment, as well as paints and chemicals used on site. Any spills shall be handled according to the Spill Response Actions in ***Attachment A***.

ATTACHMENT C – SEQUENCE OF MAJOR ACTIVITIES

Berry Creek Highlands Phase 6A limits of construction includes a total of approximately 25 acres of disturbed area in the Recharge Zone. The location of the temporary erosion control measures is shown on the Erosion Control Sheets.

1. Install temporary erosion control measures, stabilized construction entrance, and tree protection according to the plans and specifications prior to any clearing and grubbing, grading, excavating, etc. Notify Construction Inspection Division, when installed. (±1.72 acres)
2. Prior to beginning construction, the Owner or his authorized representative shall convene a Pre-Construction Conference between the Texas Commission on Environmental Quality (TCEQ), City of Georgetown, Williamson County, Consulting Engineer, Contractor, and any other affected parties. Notify the TCEQ at least 48 hours prior to the time of the conference and 48 hours prior to the beginning of construction. On-site Pre-Construction meeting should be held with Contractor, TCEQ, Engineer, and Owner.
3. Set up all erosion control devices and temporary Best Management Practices measures. (±7.3 acres)
4. Clear and Grub for the streets, utilities, and lot grading. (±7.3 acres)
5. Rough Cut Roadway and perform lot grading. (±7.3 acres)
6. Begin construction including water, wastewater, paving, dry utilities, drainage, and other related site improvements. Install all utilities to be located under proposed pavement. (±7.3 acres)
7. Upon completion, restore as much disturbed areas as possible, particularly large open area. (±7 acres)
8. Clean site and re-vegetate all disturbed areas according to the plans and specifications. Disturbed areas of the construction site that will not be re-disturbed for 21 days or more must be stabilized by the 14th day after the last disturbance. Stabilization measures should include seeding and/or mulching. (±7.3 acres)
9. Complete permanent erosion control and restoration of site vegetation. (±7.3 acres)
10. Remove and dispose of temporary erosion/sedimentation control measures.

Complete any necessary final dress up of areas. Conduct a final inspection and complete all punch list items.

ATTACHMENT D -- TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

Temporary Best Management Practices (BMPs) and measures will be used during construction to prevent pollution of groundwater, surface water and naturally occurring environmental features. Silt fence, inlet protection, stabilized construction entrance, and construction stockpiling areas will be installed prior to beginning construction and prior to commencement of any of the activities defined in the sequence of construction as *Attachment C*. Inspection and maintenance of the on-site controls shall be performed during the site clearing and rough grading process. The perimeter fence shall be regularly monitored to ensure that the buffers remain no-construction zones until the site work has been completed and authorization has been granted by the Engineer. Please reference attached copy of the Erosion and Sedimentation Control Plans for specific controls and details.

Best Management Practices and measures will prevent pollution of surface water or groundwater that originates on site or flows off-site, including pollution caused by contaminated stormwater run-off from the site, through the use of silt fences placed immediately downstream of disturbed areas. To minimize destruction to any portion of the Recharge Zone, on-site perimeter silt fence will also be implemented for pertinent areas throughout the entirety of construction. The Contractor is expected to inspect the controls weekly and after significant rainfalls to ensure proper function. When silt accumulates six (6) inches in depth the Contractor shall promptly remove the silt from the controls. As noted earlier, the proposed water quality ponds will be used to treat storm water from the construction of the site. The water quality facility shall be properly inspected throughout construction and restored upon completion of the respective phase.

BMPs and measures will prevent pollutants from entering surface streams or the aquifer by intercepting stormwater potentially carrying sediment and other pollutants. BMPs and measures will implement two (2) stabilized construction entrances and a construction stockpiling/staging area to help minimize pollutant run-off and erosion generated during construction. Paved streets and driveways adjacent to these sites will be cleaned regularly to remove excess mud, dirt or rock tracked from the site. Sedimentation will be concentrated only in these areas for efficient maintenance. Water trucks will be on-site as necessary to aid in controlling dust. No setbacks were proposed for the site; however, BMPs will be implemented to limit/prevent contaminated inflow from entering surface streams or the aquifer. These practices are to include the following measures: the use of silt fence, triangular filter dikes and vegetative buffer zones. The fabricated silt fence barricade, triangular filter dikes and natural living filter vegetative buffer will provide help to reduce the likelihood of contaminated runoff from entering the aquifer. If any sensitive features are identified by TCEQ inspections, or during excavation or construction, measures appropriate to the sensitivity of the discovered feature will be enacted. No blasting is proposed.

Temporary Erosion and Sedimentation Notes:

1. The Contractor shall maintain, install erosion/sedimentation controls and tree/natural protective fencing prior to any site preparation work (clearing, grubbing or excavation).
2. The placement of erosion/sedimentation controls and tree/natural protective fencing shall be in accordance with Williamson County's current Environmental Protection rules and the approved Erosion and Sedimentation Control Plan. No erosion controls shall be placed beyond the property lines of the site unless written permission has been obtained from adjacent property Owners.
3. A pre-construction conference shall be held on-site with the Contractor, Design Engineer/permit applicant and Environmental Inspector after installation of the erosion/sedimentation and tree/natural area protection measures and prior to beginning any site preparation work. The Contractor shall notify the Environmental Inspector at least three (3) days prior to the meeting date.
4. Any major variation in materials or locations of controls or fences from those shown on the approved plans will require a revision and must be approved by the Reviewing Engineer, Environmental Specialist or City Arborist as appropriate. Minor changes to be made as field revisions to the Erosion and Sedimentation Control Plan may be required by the Environmental Inspector during the course of construction to correct control inadequacies.
5. The Contractor is required to inspect the controls at weekly intervals and after significant rainfall events to ensure that they are functioning properly. The person(s) responsible for maintenance of controls shall immediately make any necessary repairs to damaged areas. Silt accumulation at controls must be removed when the depth reaches six (6) inches.
6. Prior to final acceptance by the City of Georgetown and Williamson County, haul roads and waterway crossing constructed for temporary Contractor access must be removed, accumulated sediment removed from the waterway and the area restored to the original grade and revegetated. All land clearing debris shall be disposed of in approved spoil disposal sites.
7. All work must stop if a void in the rock substrate is discovered, which is one (1) square foot in total area, blows air from within the substrate, and/or consistently received water during any rain event. At this time it is the responsibility of the Project Manager to immediately contact an Environmental Inspector for further investigation.
8. Erosion control measures, site work and restoration work shall be in accordance with the Williamson County Storm Water Management System Requirements.

9. All slopes shall be sodded or seeded with approved grass, grass mixtures or ground cover suitable to the area and season in which they are applied.
10. Silt fences, rock berms, sedimentation basins and similarly recognized techniques and materials shall be employed during construction to prevent point source sedimentation loading of downstream facilities, such installation shall be regularly inspected by Williamson County for effectiveness. Additional measures may be required if, in the opinion of the County Engineer, they are warranted.
11. All temporary erosion control measures shall not be removed until final inspection and approval of the project by the Engineer. It shall be the responsibility of the Contractor to maintain all temporary erosion control structures and to remove each structure as approved by the Engineer.
12. Any dirt, mud, rocks, debris, etc., that is spilled, tracked, or otherwise deposited on any existing paved street shall be cleaned up immediately.

ATTACHMENT E - REQUEST TO SEAL FEATURES

No environmental features are being temporarily sealed. Therefore, this section is not applicable.

ATTACHMENT F – STRUCTURAL PRACTICES

Silt fencing will be placed on the down gradient side of any exposed soils in order to limit the discharge of silt and pollutant from exposed areas of the site. Additionally, triangular filter dikes will be placed down gradient of areas that may require dewatering. Dewatering shall be directed toward the water quality pond and/or filter dikes to limit the discharge of silt and pollutants from exposed areas of the site. Also included are stabilized construction entrances to reduce the amount of mud tracked onto surrounding streets by construction vehicles. Inspection and maintenance of the onsite controls shall be performed during the site clearing and rough grading process.

Additionally, the use of the proposed pond will also protect against contaminated runoff leaving the site. The Contractor will be responsible for proper inlet protection in addition to cleaning out all structures adversely affected by sediment after heavy rainfalls.

ATTACHMENT G – DRAINAGE AREA MAPS

(See Construction Plans)

ATTACHMENT H – TEMPORARY SEDIMENT POND PLANS AND CALCULATIONS

The proposed water quality pond will be used as a sediment basin during construction. Developed Water Quality Area to the Water Quality Pond is approximately 77-acres with no offsite drainage. A surface skimmer will be utilized for dewatering during construction if warranted. Any excess sediment generated during construction will be spoiled in the location outlined in the construction plans. The entire system shall be protected from erosion and maintained throughout the course of construction until final site restoration is complete. The construction plans and design calculations will identify that adequate storage volume will be provided for construction.

ATTACHMENT I – INSPECTION AND MAINTENANCE FOR BEST MANAGEMENT PRACTICES

The following sections address inspection and maintenance taken from the TNRCC Manual, “Complying with Edward Aquifer Rules: Technical Guidance on Best Management Practices.”

Silt Fence:

1. Inspection shall be made weekly and after each rainfall event, in accordance with Section 1.4.3 of RG-348.
2. Torn fabric shall be replaced or a second line of fencing parallel to the torn section shall be implemented as needed.
3. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
4. Silt fence shall be removed when the site is completely stabilized so as not to block or impede storm flow or drainage.

Inlet Protection:

1. Daily inspection shall be made by the Contractor and silt accumulation must be removed when depth reaches 50 millimeters (two (2) inches).
2. Contractor shall monitor the performance of inlet protection during each rainfall event and immediately remove the inlet protections if the storm water begins to overtop the curb.
3. Inlet protections shall be removed as soon as the source of sediment is stabilized.

Stabilized Construction Entrance:

1. The entrance shall be maintained in a condition that will prevent tracking or flowing of sediment onto public roadway. This may require periodic top dressing with additional stone as conditions demand. As well as repair and clean out of any measure device used to trap sediment. All sediments that are spilled, dropped, washed or tracked onto public roadway must be removed immediately.
2. Entrance shall be properly graded to prevent run-off from leaving the construction site.

Concrete Washout Area:

1. Routine inspection in accordance with Section 1.4.18 of RG-348 of the area to insure

ATTACHMENT J – SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Prior to commencing construction, all temporary erosion and sedimentation control measures must be properly selected, installed, and maintained in accordance with the Manufacturer's Specifications And Good Engineering Practices. Controls specified in the Storm Water Pollution Prevention Plan section of the approved Edwards Aquifer Contributing Zone Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.*

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 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.*

(*see General Notes for Edwards Aquifer Recharge Zone Plan)

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: AC Steadman, P.E. -Kimley-Horn

Date: 08/04/2023

Signature of Customer/Agent



Regulated Entity Name: Berry Creek Highlands Phase 6A

Permanent Best Management Practices (BMPs)

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

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

that sufficient quantity and volume remain to contain all liquid and concrete waste generated by washout operations.

2. Plastic lining material should be a minimum of 10 millimeters in polyethylene sheeting and should be free of holes, tears, or other defects that compromise the impermeability of the material.
3. 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.

Sediment Basins

1. Inspection should be made weekly and after each rainfall in accordance to Section 1.4.13 of RG-348.
2. To prevent clogging of the outlet structure of proposed water quality facilities implemented as temporary sediment basins, trash and other debris shall be removed promptly after each rainfall event.
3. Silt accumulation should be removed as well as basin re-graded to original dimensions once the capability of the facility has been reduced to 75% of original storage capacity.
4. Removed sediment should be redistributed in the respective phases' stockpiling area.

Rock Berm

1. Inspection should be made weekly and after each rainfall in accordance to Section 1.4.5 of RG-348. If placed in streambeds, inspection should occur on a daily basis.
2. Accumulated silt shall be removed when it reaches a depth of six (6) inches. The silt shall be disposed of on an approved site and in such a manner that will not contribute to additional siltation.
3. Loose wire sheathing shall be repaired immediately when necessary and the berm shall be reshaped as needed during inspection.
4. Berm shall be replaced if the structure ceases to function as initially intended due to

factors such as silt accumulation, washout, construction traffic damage, etc.

5. When all upstream areas are stabilized and the accumulated silt has been removed, the rock berm should be removed and disposed of.

A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: _____

N/A

3. Owners must insure that permanent BMPs and measures are constructed and function as designed. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the appropriate regional office within 30 days of site completion.

N/A

4. Where a site is used for low density single-family residential development and has 20 % or less impervious cover, other permanent BMPs are not required. This exemption from permanent BMPs must be recorded in the county deed records, with a notice that if the percent impervious cover increases above 20% or land use changes, the exemption for the whole site as described in the property boundaries required by 30 TAC §213.4(g) (relating to Application Processing and Approval), may no longer apply and the property owner must notify the appropriate regional office of these changes.

The site will be used for low density single-family residential development and has 20% or less impervious cover.

The site will be used for low density single-family residential development but has more than 20% impervious cover.

The site will not be used for low density single-family residential development.

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

Attachment A - 20% or Less Impervious Cover Waiver. The site will be used for multi-family residential developments, schools, or small business sites and has 20% or less impervious cover. A request to waive the requirements for other permanent BMPs and measures is attached.

The site will be used for multi-family residential developments, schools, or small business sites but has more than 20% impervious cover.

The site will not be used for multi-family residential developments, schools, or small business sites.

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

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

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

Responsibility for Maintenance of Permanent BMP(s)

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

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

ATTACHMENT A -- 20% OR LESS IMPERVIOUS COVER WAIVER

No waiver is being requested because this site will be more than 20% impervious cover. Therefore this section is not applicable to our submittal.

ATTACHMENT B -- BMPs FOR UPGRADIENT STORM WATER

The upgradient storm water for Berry Creek Highlands Phase 6A. All the storm water that originates onsite and that originates on phase 8B and phase 6B is captured in the proposed storm sewer system and routed to the existing Batch Detention Pond constructed with Berry Creek Highlands, phase 6A, proposed Batch Detention Pond. That water in the batch detention pond will be regulated using the smartBATCH automated detention system.

ATTACHMENT C -- BMPs FOR ONSITE STORMWATER

Storm water runoff arising from this development will be conveyed through a combination of sheet flow and storm sewer flow to the Batch Detention Pond constructed with Berry Creek Highlands Phase 6A, Ultimately the ponds will discharge into South Fork of the San Gabriel River. See attached plans for the proposed expansion to the water quality pond included with the construction plans under **Attachment F**. See TSS removal calculations under **Attachment I**.

1. Permanent Erosion and Sedimentation Notes:

All disturbed areas shall be restored as noted below.

- a. A minimum of four inches of topsoil shall be placed in all drainage channels (except rock) and between the curb and right-of-way line.
- b. The seeding for permanent erosion control shall be applied over areas disturbed by construction as follows:

Broadcast seeding:

- i. From September 15 to March 1, seeding shall be with a combination of two (2) pounds per 1,000 square feet of unhulled Bermuda and seven (7) pounds per 1,000 square feet of Winter Rye with a purity of 95% with 90% germination.
- ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of two (2) pounds per 1,000 square feet with a purity of 95% with 85% germination.
- iii. Fertilizer shall be a pelleted or granular slow release with an analysis of 15-15-15 to be applied once at planting and once during the period of establishment at a rate of one (1) pounds per 1,000 square feet.
- iv. Mulch type used shall be hay, straw or mulch applied at a rate of 45 pounds per 1,000 square feet.

Hydraulic seeding:

- i. From September 15 to March 1, seeding shall be with a combination of one (1) pounds per 1,000 square feet of unhulled Bermuda and seven (7) pounds per 1,000 square feet of Winter Rye with a purity of 95% with 90% germination.
 - ii. From March 2 to September 14, seeding shall be with hulled Bermuda at a rate of one (1) pounds per 1,000 square feet with a purity of 95% with 85% germination.
 - iii. Fertilizer shall be a water soluble fertilizer with an analysis of 15-15-15 at a rate of 1.5 pounds per 1,000 square feet.
 - iv. Mulch type used shall be hay, straw or mulch applied at a rate of 45 pounds per 1,000 square feet, with soil tackifier at a rate of 1.4 pounds per 1,000 square feet.
- c. The planted area shall be irrigated or sprinkled in a manner that will not erode the topsoil, but will sufficiently soak the soil to a depth of six (6) inches. The irrigation shall occur at ten (10)-day intervals during the first two (2) months. Rainfall occurrences of half ($\frac{1}{2}$) inch or more shall postpone the watering schedule for one (1) week.
 - d. Restoration shall be acceptable when the grass has grown at least one and a half ($1\frac{1}{2}$) inches high with 95% coverage, provided no bare spots larger than 16 square feet exist.
 - e. When required, native grass seeding shall comply with the requirements of the City of Georgetown.

ATTACHMENT D -- BMPs FOR SURFACE STREAMS

As described in *Attachments B* and *C*, storm water runoff will be treated and contained within the exiting Batch Detention Pond constructed with Berry Creek Highlands phase 6A, proposed Batch Detention Pond. The permanent water quality ponds are batch detention ponds with a TSS reduction efficiency of 91%. Please refer to *Attachment I* of this section for the TSS removal calculations.

ATTACHMENT E - REQUEST TO SEAL FEATURES

No environmental features are being sealed. Therefore, this section is not applicable.

ATTACHMENT F – CONSTRUCTION PLANS

See attached construction plans.

ATTACHMENT G – INSPECTION, MAINTENANCE, REPAIR AND RETROFIT PLAN

Inspection, Maintenance, Repair and Retrofit Plan, and Schedule for Batch Detention Water Quality Ponds

PROJECT NAME: Berry Creek Highlands Phase 6A
ADDRESS: Intersection of SH 195 and Shell Rd.
CITY, STATE ZIP: Georgetown, Texas 78626

BATCH DETENTION WATER QUALITY PONDS

Routine Maintenance:

Mowing. The upper stage, side slopes, embankment, and emergency spillway of an extended detention basin must be mowed regularly to discourage woody growth and control weeds. Grass areas in and around basins should be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas. When mowing of grass is performed, a mulching mower should be used, or grass clippings should be caught and removed.

Inspections. Basins should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. When possible, inspections should be conducted during wet weather to determine if the pond is meeting the target detention times. In particular, the extended detention control device should be regularly inspected for evidence of clogging, or conversely, for too rapid a release. If the design drawdown times are exceeded by more than 24 hours, then repairs should be scheduled immediately. The upper stage pilot channel, if any, and its flow path to the lower stage should be checked for erosion problems. During each inspection, erosion areas inside and downstream of the BMP should be identified and repaired or revegetated immediately.

Debris and Litter Removal. Debris and litter will accumulate near the extended detention control device and should be removed during regular mowing operations and inspections. Particular attention should be paid to floating debris that can eventually clog the control device or riser.

Erosion Control. The pond side slopes, emergency spillway, and embankment all may periodically suffer from slumping and erosion, although this should not occur often if the soils are properly compacted during construction. Regrading and revegetation may be required to correct the problems. Similarly, the channel connecting an upper stage with a lower stage may periodically need to be replaced or repaired. g: Grass areas in and around sand filters must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscape areas. Vegetation on the pond embankments should be mowed as appropriate to prevent the establishment of woody vegetation.

Nuisance Control. Standing water (not desired in a extended detention basin) or soggy conditions within the lower stage of the basin can create nuisance conditions for nearby residents. Odors, mosquitoes, weeds, and litter are all occasionally perceived to be problems. Most of these problems are generally a sign that regular inspections and maintenance are not being performed (e.g., mowing, debris removal, clearing the outlet control device).

Non-routine maintenance.

Structural Repairs and Replacement. With each inspection, any damage to the structural elements of the system (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. These repairs should include patching of cracked concrete, sealing of voids, and removal of vegetation from cracks and joints. The various inlet/outlet and riser works in a basin will eventually deteriorate and must be replaced. Public works experts have estimated that corrugated metal pipe (CMP) has a useful life of about 25 yr, whereas reinforced concrete barrels and risers may last from 50 to 75 yr.

Sediment Removal. When properly designed, dry extended detention basins will accumulate quantities of sediment over time. Sediment accumulation is a serious maintenance concern in extended detention dry ponds for several reasons. First, the sediment gradually reduces available stormwater management storage capacity within the basin. Second, unlike wet extended detention basins (which have a permanent pool to conceal deposited sediments), sediment accumulation can make dry extended detention basins very unsightly. Third, and perhaps most importantly, sediment tends to accumulate around the control device. Sediment deposition increases the risk that the orifice will become clogged, and gradually reduces storage capacity reserved for pollutant removal. Sediment can also be resuspended if allowed to accumulate over time and escape through the hydraulic control to downstream channels and streams. For these reasons, accumulated sediment needs to be removed from the lower stage when sediment buildup fills 20% of the volume of the basin or at least every 10 years.

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.

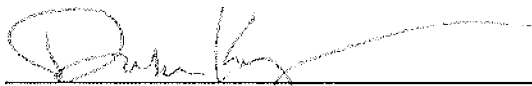
Responsible Party for Maintenance: Berry Creek Highlands Phase 6A

Address: 129 Canyon View Road

City, State, Zip: Georgetown, Texas 78626

Telephone Number: (662) 846-2787 932-201-2800

Signature of Responsible Party:



Anthony R. O'Connell Representative

Hillwood Communities, Austin General Manager

ATTACHMENT H – PILOT-SCALE FIELD TESTING PLAN

A pilot-scale field testing plan is not applicable for this project.

ATTACHMENT I – MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

All flows generated onsite due to this development are conveyed through a combination of sheet flow and storm sewer to the proposed Batch Detention Pond constructed Berry Creek Highlands Phase 6A. Ultimately the flows are conveyed to the South Fork of the San Gabriel River.

The TSS removal calculations for the proposed pond are attached.

TSS Removal Calculations 04-20-2009

Project Name: **BERRY CREEK - PHASE 6A**
 Date Prepared: **8/4/2022**

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

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

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

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

Site Data: Determine Required Load Removal Based on the Entire Project
 County = **Williamson**
 Total project area included in plan * = **117.89** acres
 Predevelopment impervious area within the limits of the plan * = **0.00** acres
 Total post-development impervious area within the limits of the plan * = **47.37** acres
 Total post-development impervious cover fraction * = **0.40**
 P = **32** inches

$L_{M \text{ TOTAL PROJECT}}$ = **41231** lbs. **80% REDUCTION**

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

Number of drainage basins / outfalls areas leaving the plan area = **2**



8/21/23

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

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

Total drainage basin/outfall area = **44.80** acres
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
 Post-development impervious area within drainage basin/outfall area = **22.21** acres
 Post-development impervious fraction within drainage basin/outfall area = **0.50**
 $L_{M \text{ THIS BASIN}}$ = **19332** lbs. **80% REDUCTION**

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Batch Detention**
 Removal efficiency = **91** percent

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

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

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

A_C = **44.80** acres
 A_I = **22.21** acres
 A_P = **22.59** acres
 L_R = **22733** lbs

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

Desired $L_{M \text{ THIS BASIN}}$ = **21500** lbs.

F = **0.95**

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

Rainfall Depth = **2.60** inches
 Post Development Runoff Coefficient = **0.36**
 On-site Water Quality Volume = **150177** cubic feet

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

Off-site area draining to BMP = 0.00 acres
Off-site Impervious cover draining to BMP = 0.00 acres
Impervious fraction of off-site area = 0
Off-site Runoff Coefficient = 0.00
Off-site Water Quality Volume = 0 cubic feet

Storage for Sediment = 30035


Total Capture Volume (required water quality volume(s) x 1.20) = 180213 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.

SIGNATURE PAGE:

BERRY CREEK (GEORGETOWN) ASLI IX, LLC, a Delaware limited liability company

- 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: Marvin Shapiro
 Title: President

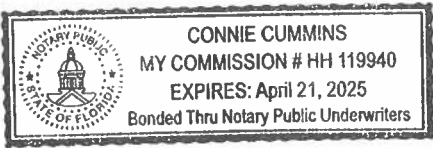
Berry Creek (Georgetown) ASLI IX, LLC, a Delaware limited liability company
 Attn: Mr. Marvin Shapiro

 923 N Pennsylvania Avenue
 Winter Park, FL 32789

THE STATE OF Florida
 County of Orange §

BEFORE ME, the undersigned authority, on this day personally appeared Marvin Shapiro 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 9 day of August, 2023.



Connie Cummins
 NOTARY PUBLIC
Connie Cummins
 Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 4/21/25

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Berry Creek Highlands Phase 6A
 Regulated Entity Location: City of Georgetown , Williamson County, TX
 Name of Customer: BERRY CREEK ASLI IX, LLC
 Contact Person: Carter DeWalch Phone: 512-720-5466
 Customer Reference Number (if issued):CN _____
 Regulated Entity Reference Number (if issued):RN _____

Austin Regional Office (3373)

Hays Travis Williamson

San Antonio Regional Office (3362)

Bexar Medina Uvalde
 Comal Kinney

Application fees must be paid by check, certified check, or money order, payable to the **Texas Commission on Environmental Quality**. Your canceled check will serve as your receipt. **This form must be submitted with your fee payment.** This payment is being submitted to:

Austin Regional Office San Antonio Regional Office
 Mailed to: TCEQ - Cashier Overnight Delivery to: TCEQ - Cashier
 Revenues Section 12100 Park 35 Circle
 Mail Code 214 Building A, 3rd Floor
 P.O. Box 13088 Austin, TX 78753
 Austin, TX 78711-3088 (512)239-0357

Site Location (Check All That Apply):

Recharge Zone Contributing Zone Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	24.91 Acres	\$ 6,500
Sewage Collection System	2,036 L.F.	\$ 1,018
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: 08/04/2023

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



TCEQ Core Data Form

TCEQ Use Only

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

SECTION I: General Information

1. Reason for Submission (If other is checked please describe in space provided.)		
<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	
2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN		RN

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	08/04/2023	
<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)			
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).			
6. Customer Legal Name (If an individual, print last name first: e.g.: Doe, John)		If new Customer, enter previous Customer below:	
Berry Creek ASLI IX, LLC			
7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (if applicable)
32067561699			
11. Type of Customer:	<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input checked="" type="checkbox"/> Limited
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	<input type="checkbox"/> Other:	
12. Number of Employees		13. Independently Owned and Operated?	
<input type="checkbox"/> 0-20 <input checked="" type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14. Customer Role (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:			
15. Mailing Address:	923 N. Pennsylvania Ave.		
	City	Winter Park	State
	FL	ZIP	32789
	ZIP + 4		
16. Country Mailing Information (if outside USA)		17. E-Mail Address (if applicable)	
		mshapiro@avantiprop.com	
18. Telephone Number	19. Extension or Code	20. Fax Number (if applicable)	
(740)-862-8488		() -	

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (If "New Regulated Entity" is selected below this form should be accompanied by a permit application)	
<input type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information	
The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
Berry Creek Highlands Phase 6A	

23. Street Address of the Regulated Entity: (No PO Boxes)	Bonnet Ln.						
	City	Georgetown	State	TX	ZIP	78633	ZIP + 4
24. County	Williamson						

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	The Project site is located on the West side of the State Highway Cowboy 195 at the intersection with Shell Rd.						
26. Nearest City	Georgetown			State	TX	Nearest ZIP Code	
27. Latitude (N) In Decimal:	30 72315		28. Longitude (W) In Decimal:	-97 69878			
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds		
30	43	23.3	-97	41	55.6		
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	1611	236115		237310			
33. What is the Primary Business of this entity? (Do not repeat the SIC or NAICS description.)							
Single Family Subdivision							
34. Mailing Address:	923 N. Pennsylvania Ave.						
	City	Winter Park	State	FL	ZIP	3278	ZIP + 4
35. E-Mail Address:	mshapiro@avantiprop.com						
36. Telephone Number		37. Extension or Code		38. Fax Number (if applicable)			
(740)-862-8488				() -			

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 type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
		SCS/WPAP		
<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:	AC STEADMAN		41. Title:	PROJECT MANAGER
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address	
(512)-720-5466		() -	AC.STEADMAN@KIMLEY-HORN.COM	

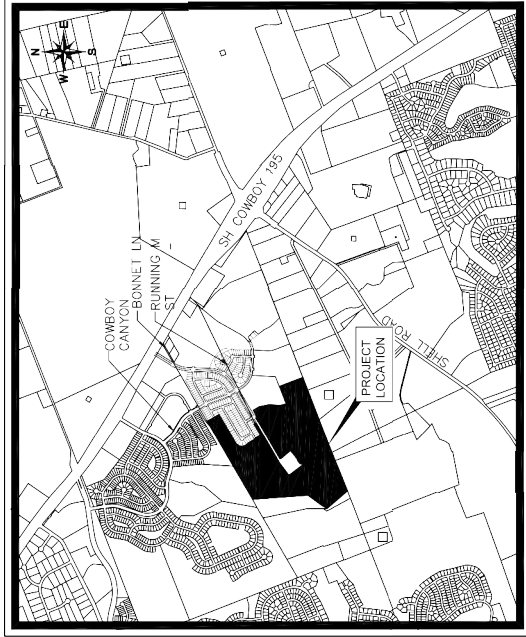
SECTION V: Authorized Signature

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 AND ASSOCIATES, INC.	Job Title:	PROJECT MANAGER
Name (In Print):	AC STEADMAN, P.E.	Phone:	(512)-720-5466
Signature:		Date:	

PLAN SUBMITTAL/REVIEW LOG

7/19/2022
1ST SUBMITTAL TO CITY
7/22/2022
3RD SUBMITTAL TO CITY



VICINITY MAP
SCALE: 1" = 2,000'

SHEET INDEX

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	OVERALL PRELIMINARY PLAN
3	PHASE 6A PRELIMINARY PLAN (SHEET 2 OF 4)
4	PHASE 6B PRELIMINARY PLAN (SHEET 2 OF 4)
5	PHASE 6C PRELIMINARY PLAN (SHEET 2 OF 4)
6	PHASE 6D PRELIMINARY PLAN (SHEET 2 OF 4)
7	LEGAL DESCRIPTION AND TREE INFORMATION

Phase	1st Lot	5th Lot	5th Lot	Total
Phase 1	51	56	4	111
Phase 2	1	1	1	3
Phase 3	1	1	1	3
Phase 4A	1	1	1	3
Phase 5	1	1	1	3
Phase 6, 7, 8A, 8B, & 9 Prelim	303	461	45	809
Total	364	517	37	918

STREET NAME	STREET TYPE	ROW	FOC/FOE	CURB TYPE	CLEAR ZONE	DESIGN SPEED (MPH)
BCH WAY	MAJOR COLLECTOR	84'	27'	VERTICAL	5'	35
LITTLE SNAKE WAY	LOCAL STREET	50'	31'	VERTICAL	5'	35
DOG IRON COURT	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET A	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET B	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET C	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET D	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET E	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET F	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET G	LOCAL STREET	50'	31'	VERTICAL	5'	35
STREET H	LOCAL STREET	50'	31'	VERTICAL	5'	35

Approved by the City of Georgetown
Planning & Zoning Commission on:
March 7, 2023
Per Section 3.08.07.01 of the Unified
Development Code this preliminary plan will
expire on **March 7, 2025** if a Final Plat is not
recorded.



OWNERS:
BERRY CREEK ASBLIX, LLC
933 N. PENNSYLVANIA AVENUE
WINTER PARK, TX 75789
PH: 817.752.0644
CONTACT: JACHPETRUS

DESIGNER:
KIMLEY-HORN AND ASSOCIATES, INC.
10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200
AUSTIN, TEXAS 78759
PH: 512.835.7209
CONTACT: JOHN FORKENS, P.E.

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TOTAL ACRES	111.66 ACRES
TOTAL NUMBER OF LOTS	918
LINEAR FOOT OF ROW	14,534
LINEAR FOOT OF 44' ROW	2,058
NUMBER OF SINGLE FAMILY LOTS	373
ACREAGE OF SINGLE FAMILY LOTS	65.98 ACRES
NUMBER OF OPEN SPACE LOTS	175 ACRES
ACREAGE OF OPEN SPACE LOTS	3
NUMBER OF PARKLAND LOTS	1
ACREAGE OF PARKLAND LOTS	1.81 ACRES
ACREAGE OF COMMON AREAS	20.90 ACRES
TOTAL NUMBER OF BLOCKS	18

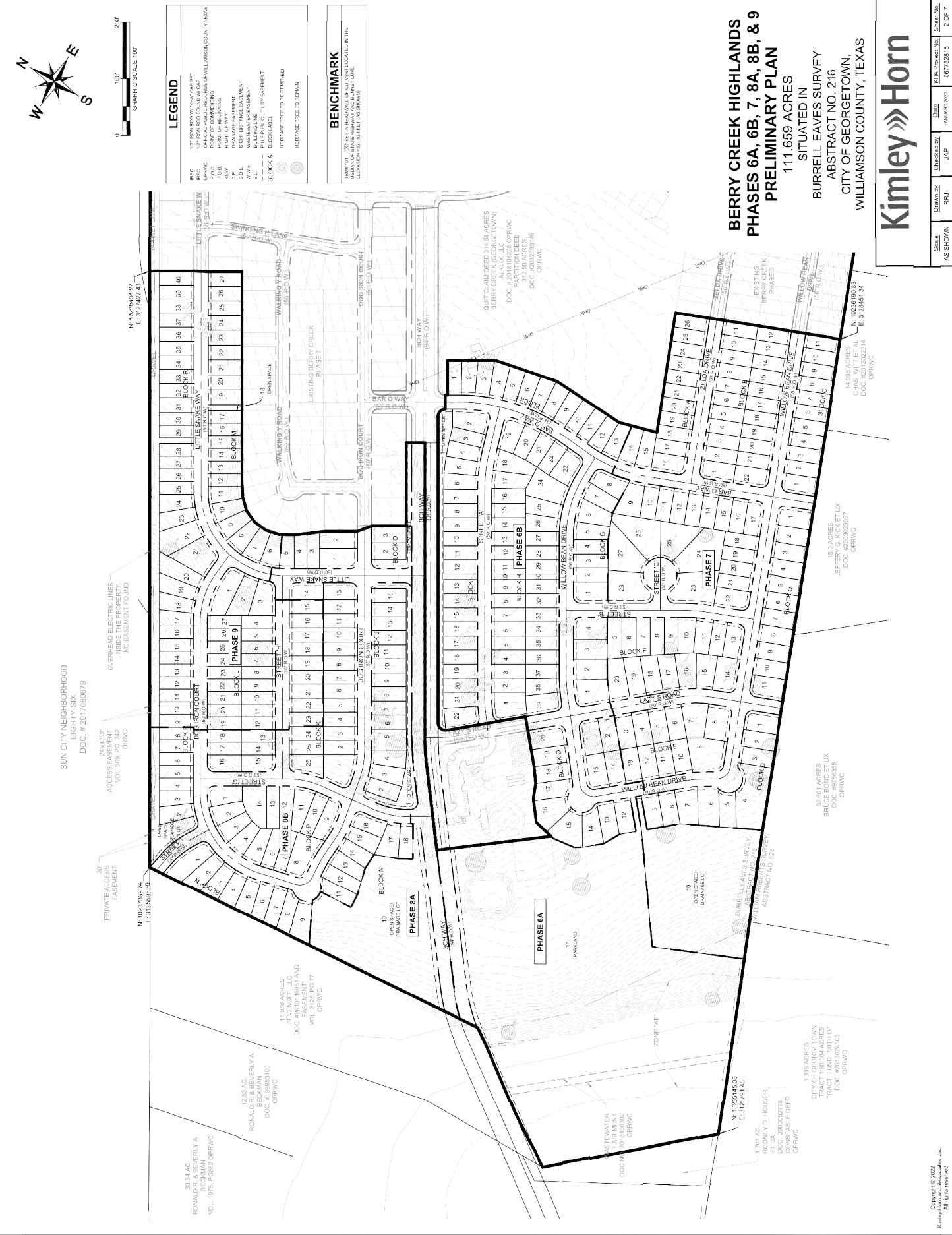
BERRY CREEK HIGHLANDS PHASES 6A, 6B, 7, 8A, 8B, & 9 PRELIMINARY PLAN

111.659 ACRES
SITUATED IN
BURRELL EAVES SURVEY
ABSTRACT NO. 216
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS



Status	Drawn By	Checked By	Date	Scale	Sheet No.
AS SHOWN	RFJ	JAP	JANUARY 2023	AS SHOWN	1 OF 7

City Project Number: 2022-24-PP



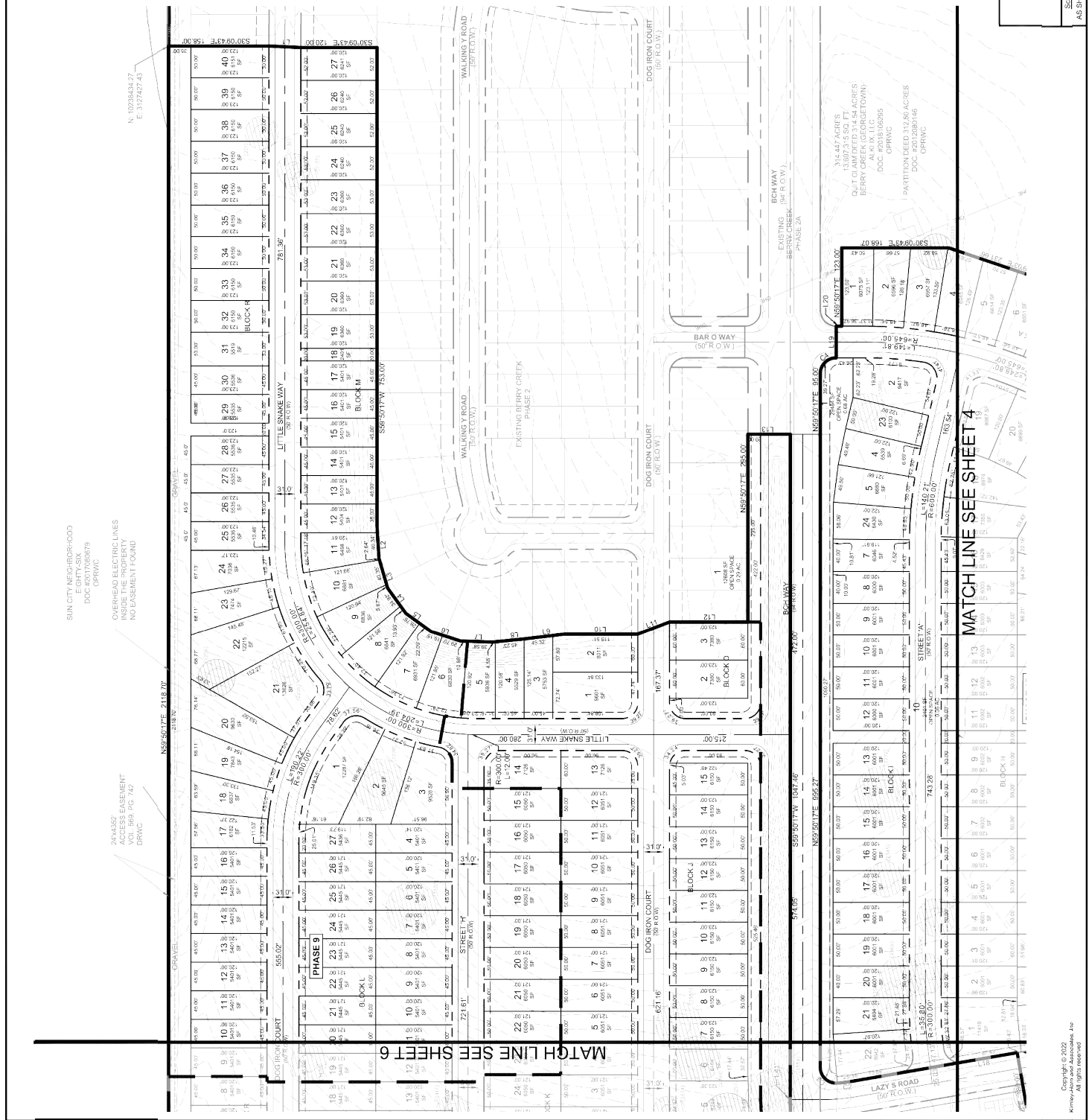
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Status	Drawn By	Checked By	Date	Scale	Sheet No.
AS SHOWN	RFJ	JAP	JANUARY 2023	AS SHOWN	2 OF 7

City Project Number: 2022-24-PP

BERRY CREEK HIGHLANDS PHASE 6A CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS	PRELIMINARY PLAT (1 OF 4)	KHA PROJECT 067782815	KIMLEY-HORN AND ASSOCIATES, INC. 10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM TEXAS REGISTERED ENGINEERING FIRM F-928			
		DATE AUGUST 2023	SCALE AS SHOWN	DESIGNED BY RWC	DRAWN BY RFJ	CHECKED BY ACS
SHEET NUMBER 2		KIMLEY-HORN AND ASSOCIATES, INC. 10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM TEXAS REGISTERED ENGINEERING FIRM F-928		NO.	REVISIONS	DATE



LEGEND

- 1" = 100' ROAD RIGHT-OF-WAY
- 12" ROAD RIGHT-OF-WAY
- OFFICIAL PUBLIC RECORDS OF WILLIAMSON COUNTY TEXAS
- P.O.C. POINT OF COMMENCEMENT
- ROW RIGHT-OF-WAY
- RIGHT-OF-WAY
- S.D.E. SURVEY DATA ELEMENT
- WATERWATER ELEMENT
- W.V.E. WETLANDS VEGETATION
- BLOCK A BLOCK LABEL
- HEIR-TREE TREE REMOVAL
- BLOCK A BLOCK LABEL
- HEIR-TREE TREE REMOVAL

BENCHMARK

TRIM 101 12' 00" TYPICAL BENCH MARK LOCATION IN THE MEAN OF ROAD PROPERTY ADJACENT TO THE ROADWAY

RETRACT SUMMARY	
FRONT	17
REAR	17
SIDE	5
SIDE STREET	17

NOTE:
 1. SEE SHEET 7 FOR LINE AND CURVE TABLES
 2. ROADWAY PAVEMENT DIMENSIONS ARE SHOWN TO THE FACE OF CURB

**BERRY CREEK HIGHLANDS
 PHASES 6A, 6B, 7, 8A, 8B, & 9
 PRELIMINARY PLAN**

111.659 ACRES
 SITUATED IN
 BURRELL EAVES SURVEY
 ABSTRACT NO. 216
 CITY OF GEORGETOWN,
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Scale	Drawn	Checked	Date	Project Number
AS SHOWN	RFJ	JAP	JANUARY 2022	2022-24-PP



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BENCHMARK

TRIM 101 12' 00" TYPICAL BENCH MARK LOCATION IN THE MEAN OF ROAD PROPERTY ADJACENT TO THE ROADWAY

RETRACT SUMMARY	
FRONT	17
REAR	17
SIDE	5
SIDE STREET	17

NOTE:
 1. SEE SHEET 7 FOR LINE AND CURVE TABLES
 2. ROADWAY PAVEMENT DIMENSIONS ARE SHOWN TO THE FACE OF CURB

**BERRY CREEK HIGHLANDS
 PHASES 6A, 6B, 7, 8A, 8B, & 9
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 WILLIAMSON COUNTY, TEXAS



Scale	Drawn	Checked	Date	Project Number
AS SHOWN	RFJ	JAP	JANUARY 2022	2022-24-PP

<p>BERRY CREEK HIGHLANDS PHASE 6A CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS</p>	<p>PRELIMINARY PLAT (2 OF 4)</p>	<p>Kimley-Horn</p> <p>© 2023 KIMLEY-HORN AND ASSOCIATES, INC. 10814 JOLLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM</p> <p>TEXAS REGISTERED ENGINEERING FIRM F-928</p>	<p>8/21/23</p> <p>KHA PROJECT 067782815</p> <p>DATE AUGUST 2023</p> <p>SCALE AS SHOWN</p> <p>DESIGNED BY RMC</p> <p>DRAWN BY RFJ</p> <p>CHECKED BY ACS</p>																																	
<p>SHEET NUMBER 3</p>	<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No.</th> <th>REVISIONS</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	No.	REVISIONS	DATE																															<p>BY</p>	<p>DATE</p>
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Plotted By: Ramirez, Adam Date: August 29, 2023 11:00:08am File Path: \\AUS-Civil\067782818-Berry_Creek_Coal\Projects\6A\6A\PlanSheets\6-General Notes.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 any part of this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.

Overall: 1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH THESE PLANS, CITY OR TOWN STANDARD DETAILS AND SPECIFICATIONS, THE FINAL GEOTECHNICAL REPORT AND ALL ISSUED ADDENDA, AND COMMONLY ACCEPTED CONSTRUCTION STANDARDS. 2. THE CONTRACTOR SHALL COMPLY WITH CITY OR TOWN GENERAL NOTES FOR CONSTRUCTION IF EXISTING AND REQUIRED BY THE CITY. 3. THE CONTRACTOR SHALL COMPLY WITH THE MORE RESTRICTIVE SPECIFICATION AND DETAIL SHALL BE FOLLOWED. 4. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BEGINNING CONSTRUCTION TO VERIFY THE EXISTING CONDITIONS. 5. THE EXISTING SURFACE TO BE CONSTRUCTED SHALL BE VERIFIED BY THE PROJECT SURVEYOR, AND ARE BASED ON THE BENCHMARKS SHOWN. 6. THE CONTRACTOR SHALL REVIEW AND VERIFY THE EXISTING TOPOGRAPHIC SURVEY SHOWN ON THE PLANS REPRESENTS EXISTING FIELD CONDITIONS PRIOR TO CONSTRUCTION, AND SHALL REPORT ANY DISCREPANCIES FOUND TO THE OWNER AND ENGINEER IMMEDIATELY. 7. IF THE CONTRACTOR DOES NOT ACCEPT THE EXISTING TOPOGRAPHIC SURVEY AS SHOWN ON THE PLANS, WITHOUT EXCEPTION, THEN THE CONTRACTOR SHALL ORDER AND SHALL ALSO COMPLY WITH THE SURVEY BY A REGISTERED PROFESSIONAL LAND SURVEYOR TO THE OWNER AND ENGINEER FOR REVIEW. 8. CONTRACTOR SHALL PROVIDE ALL CONSTRUCTION SURVEYING AND STAKING. 9. CONTRACTOR SHALL VERIFY HORIZONTAL AND VERTICAL CONTROL, INCLUDING BENCHMARKS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS. PROPERTY LINES AND CORNERS SHALL BE HELD AS THE HORIZONTAL CONTROL. 10. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS, ELEVATIONS, AND FIELD CONDITIONS THAT MAY AFFECT CONSTRUCTION, ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT AND ENGINEER BEFORE COMMENCING WORK, AND FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE ARCHITECT, ENGINEER, AND IF APPLICABLE THE CITY AND OWNER, NO CONSIDERATION WILL BE GIVEN TO CHANGE ORDERS FOR WHICH THE CITY, ENGINEER, AND OWNER WERE NOT CONTACTED PRIOR TO CONSTRUCTION OF THE AFFECTED ITEM. 11. CONTRACTOR SHALL THROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. OWNER/ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO COMMENCING CONSTRUCTION. 12. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BUREAU OR AERIAL RECORDS TO LOCATE THE EXISTING UTILITIES AND MANHOLES. COVERED UTILITIES PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION. 13. CONTRACTOR SHALL CALL TEXAS 811 AN ADEQUATE AMOUNT OF TIME PRIOR TO COMMENCING CONSTRUCTION OR ANY EXCAVATION, AND SHALL EXERCISE EXTREME CAUTION AS THE SITE CONTAINS UNKNOWN PUBLIC AND PRIVATE UTILITIES. 14. THE LOCATIONS, ELEVATIONS, DEPTH, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY MAPS AND PLANS, AND ARE CONSIDERED APPROXIMATE AND INCOMPLETE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE PRESENCE, LOCATION, AND DIMENSIONS OF EXISTING UTILITIES. 15. THE ENGINEER SHALL BE NOTIFIED WHEN A PROPOSED IMPROVEMENT CONFLICTS WITH AN EXISTING UTILITY. 16. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ANY ADJUSTMENTS AND RELOCATIONS OF EXISTING UTILITIES THAT ARE IN CONFLICT WITH THE PROPOSED IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO ADJUSTING EXISTING MANHOLES TO MATCH PROPOSED GRADE, RELOCATING EXISTING POLES AND GUY WIRES THAT ARE LOCATED IN PROPOSED DRIVEWAYS, ADJUSTING THE HORIZONTAL OR VERTICAL ALIGNMENT OF EXISTING UNDERGROUND UTILITIES TO ACCOMMODATE PROPOSED GRADE OR CROSSING WITH THE PROPOSED UTILITY, AND ANY OTHERS THAT MAY BE ENCOUNTERED THAT ARE UNKNOWN AT THIS TIME AND NOT SHOWN ON THESE PLANS. 17. CONTRACTOR SHALL ARRANGE FOR OR PROVIDE, AT ITS EXPENSE, ALL GAS, TELECOMMUNICATIONS, CABLE OVERHEAD AND UNDERGROUND POWER LINES, AND UTILITY POLE ADJUSTMENTS NEEDED. 18. CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF FRANCHISE UTILITIES THAT ARE NECESSARY FOR ON-SITE AND OFF-SITE CONSTRUCTION, AND SERVICE TO THE PROPOSED DEVELOPMENT. 19. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ALL DAMAGES DUE TO THE CONTRACTORS FAILURE TO EXACTLY LOCATE AND RELOCATE EXISTING UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY. THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED BY THE CONTRACTOR AND THE CONTRACTOR OBTAINED THE METHOD TO BE USED FOR SUCH WORK. 20. BRACING UTILITY POLES MAY BE REQUIRED BY THE UTILITY COMPANIES WHEN TRENCHING OR EXCAVATING IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR, WITH NO SEPARATE PAY ITEM FOR THIS WORK. THE COST IS INCIDENTAL TO THE PAY ITEM. 21. CONTRACTOR SHALL USE ALL NECESSARY SAFETY PRECAUTIONS TO AVOID CONTACT WITH OVERHEAD AND UNDERGROUND POWER LINES. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, FEDERAL AND UTILITY OWNER REGULATIONS PERTAINING TO WORK NEAR POWER LINES. 22. CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS, APPROVALS, AND BONDS PRIOR TO CONSTRUCTION. 23. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, GEOTECHNICAL REPORT AND ADDENDA, PROJECT AND CITY SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS. 24. ALL SHOP DRAWINGS AND OTHER DOCUMENTS THAT REQUIRE ENGINEER REVIEW SHALL BE SUBMITTED BY THE CONTRACTOR SUFFICIENTLY IN ADVANCE OF CONSTRUCTION OF THAT ITEM, SO THAT NO LESS THAN 10 BUSINESS DAYS FOR REVIEW AND RESPONSE IS AVAILABLE. 25. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES, AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO USE OF THE FACILITY AND THE FINAL CONNECTION OF SERVICES. 26. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS. 27. CONTRACTOR SHALL INCLUDE ALL INSPECTION FEES. 28. ALL SYMBOLS SHOWN ON THESE PLANS (E.G., FIRE HYDRANT, METERS, VALVES, INLETS, ETC.) ARE FOR PRESENTATION PURPOSES ONLY AND ARE NOT TO SCALE. CONTRACTOR SHALL COORDINATE FINAL SIZES AND LOCATIONS WITH APPROPRIATE CITY INSPECTOR. 29. THE SCOPE OF WORK FOR THE CIVIL IMPROVEMENTS SHALL BE LIMITED TO THE AREAS SHOWN ON THESE PLANS, REFERENCED TO THE BUILDING PLANS (E.G., ARCHITECTURAL, STRUCTURAL, MEP) FOR AREAS WITHIN 5 FEET OF THE BUILDING AND WITHIN THE BUILDING FOOTPRINT. 30. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR ALL FINAL BUILDING DIMENSIONS. 31. THE PROPOSED BUILDING FOOTPRINT DIMENSIONS WERE PROVIDED TO KIMLEY-HORN AND ASSOCIATES, INC. (KH) BY THE PROJECT ARCHITECT AT THE TIME THESE PLANS WERE PREPARED. IT MAY NOT BE THE FINAL CORRECT VERSION OF THE BUILDING DESIGN WAS ONGOING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFIRMING THE FINAL CORRECT VERSION OF THE BUILDING FOOTPRINT AND STRUCTURE PRIOR TO LAYOUT, DEMOLITION AND/OR CONSTRUCTION. 32. THE CONTRACTOR SHALL VERIFY THAT THE SHOWN ON THESE PLANS WERE BASED ON THE ABOVE STATED ARCHITECTURAL FOOTPRINT, AND ARE THEREFORE A PRELIMINARY LOCATION OF THE BUILDING. THE CONTRACTOR IS SOLELY RESPONSIBLE TO VERIFY WHAT PART OF THE BUILDING THE ARCHITECT'S FOOTPRINT REPRESENTS (E.G., SLAB, OUTSIDE WALL, MASONRY LEDGE, ETC.) AND TO CONFIRM ITS FINAL POSITION ON THE SITE BASED ON THE FINAL ARCHITECTURAL FOOTPRINT, CIVIL ENGINEERING CONTROL PLAN, SURVEY BOUNDARY AND/OR PLAN. ANY DIFFERENCES FOUND SHALL BE REPORTED TO KH IMMEDIATELY. 33. ALL CONSTRUCTION SHALL COMPLY WITH THE PROJECTS FINAL GEOTECHNICAL REPORT (OR LATEST EDITION), INCLUDING SUBSEQUENT ADDENDA. 34. CONTRACTOR IS RESPONSIBLE FOR ALL MATERIALS TESTING AND CERTIFICATION, UNLESS SPECIFIED OTHERWISE BY OWNER. ALL MATERIALS TESTING SHALL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR AND COMPLY WITH CITY STANDARD SPECIFICATIONS AND GEOTECHNICAL REPORT. TESTING SHALL BE PERFORMED BY AN APPROVED INDEPENDENT AGENCY FOR TESTING MATERIALS. OWNER SHALL APPROVE THE AGENCY NOMINATED BY THE CONTRACTOR FOR ALL TESTING MATERIALS. 35. ALL COPIES OF MATERIALS TEST RESULTS SHALL BE SENT TO THE OWNER, ENGINEER AND ARCHITECT DIRECTLY FROM THE TESTING AGENCY. 36. KH SHALL BE THE CONTRACTORS RESPONSIBILITY TO SHOW, BY THE STANDARD TESTING PROCEDURES OF THE MATERIALS, THAT THE WORK CONSTRUCTED MEETS THE PROJECT REQUIREMENTS AND CITY SPECIFICATIONS. 37. DUE TO THE POTENTIAL FOR DIFFERENTIAL SOIL MOVEMENT ADJACENT TO THE BUILDING, THE CONTRACTOR SHALL ADHERE TO GEOTECHNICAL REPORTS TO SUBGRADE PREPARATION SPECIFIC TO FLATWORK ADJACENT TO THE PROPOSED BUILDING. THE OWNER AND CONTRACTOR ARE ADVISED TO OBTAIN A GEOTECHNICAL ENGINEER RECOMMENDATION SPECIFIC TO FLATWORK ADJACENT TO THE BUILDING, IF NONE IS CURRENTLY EXISTING. 38. ALL CONTRACTORS MUST CONFINE THEIR ACTIVITIES TO THE WORK AREA, NO ENCROACHMENTS OUTSIDE OF THE WORK AREA WILL BE ALLOWED. THEREFROM SHALL BE CONTRACTORS SOLE RESPONSIBILITY TO REPAIR ALL DAMAGE TO THE FINISHED SURFACE. 39. THE CONTRACTOR SHALL PROTECT ALL EXISTING STRUCTURES, UTILITIES, MANHOLES, POLES, GUY WIRES, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, COMMUNICATION BOXES/PEDESTALS, AND OTHER FACILITIES TO REMAIN AND SHALL REPAIR ANY DAMAGES AT NO COST TO THE OWNER. 40. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PRIVATE PROPERTY OR PUBLIC IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO: FENCES, WALLS, SIGNS, PAVEMENT, CURBS, UTILITIES, SIDEWALKS, GRASS, TREES, LANDSCAPING, AND IRRIGATION SYSTEMS, ETC., TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER. 41. ALL AREAS IN EXISTING RIGHT-OF-WAY DISTURBED BY SITE CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL CONDITION OR BETTER, INCLUDING AS NECESSARY GRADING, LANDSCAPING, CURBVERTS, AND PAVEMENT. 42. THE CONTRACTOR SHALL SALVAGE ALL EXISTING POWER POLES, SIGNS, WATER VALVES, FIRE HYDRANTS, METERS, ETC., THAT ARE TO BE RELOCATED DURING CONSTRUCTION. 43. CONTRACTOR SHALL MAINTAIN ADEQUATE SITE DRAINAGE DURING ALL PHASES OF CONSTRUCTION, INCLUDING MAINTAINING EXISTING DITCHES OR CULVERTS FREE OF OBSTRUCTIONS AT ALL TIMES. 44. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REGULATIONS, INCLUDING OSHA FOR ALL TRENCHES, NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY. 45. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER. 46. SITE SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. 47. THESE PLANS DO NOT EXTEND TO OR INCLUDE DESIGNS OR SYSTEMS PERTAINING TO THE SAFETY OF THE CONTRACTOR OR ITS EMPLOYEES, AGENTS OR REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE ENGINEER SEAL HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEM. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF ALL REQUIRED SAFETY PROCEDURES AND PROGRAMS. 48. SIGNS RELATED TO SITE OPERATION OR SAFETY ARE NOT INCLUDED IN THESE PLANS. 49. CONTRACTING AREA SHALL BE DEFINED BY THE OWNER AND CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL PERMITTING REQUIREMENTS FOR THE CONSTRUCTION OF OFFICE, TRAILER, STORAGE, AND STAGING OPERATIONS AND LOCATIONS. 50. TRIP POLES, SIGNS, AND OTHER OBSTRUCTIONS SHALL NOT BE PLACED IN ACCESSIBLE ROUTES. 51. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. 52. RIM ELEVATIONS OF ALL EXISTING AND PROPOSED MANHOLES SHALL BE COORDINATED WITH TOP OF PAVEMENT OR FINISHED GRADE AND SHALL BE ADJUSTED TO FLUSH WITH THE ACTUAL FINISHED GRADE AT THE TIME OF PAVING. 53. CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION SEQUENCING AND PHASING, AND SHALL CONTACT THE APPROPRIATE CITY OFFICIALS INCLUDING BUILDING OFFICIALS, INSPECTOR, AND FIRE MARSHAL TO LEARN OF ANY REQUIREMENTS. 54. CONTRACTOR IS RESPONSIBLE FOR PREPARATION, SUBMITTAL, AND APPROVAL BY THE CITY OF A TRAFFIC CONTROL PLAN PRIOR TO THE START OF CONSTRUCTION, AND THEN THE IMPLEMENTATION OF THE PLAN. 55. CONTRACTOR SHALL KEEP A NEAT AND ACCURATE RECORD OF CONSTRUCTION, INCLUDING ANY DEVIATIONS OR VARIANCES FROM THE PLANS. 56. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AS-BUILT PLANS TO THE ENGINEER AND CITY IDENTIFYING ALL DEVIATIONS AND VARIATIONS FROM THESE PLANS MADE DURING CONSTRUCTION.

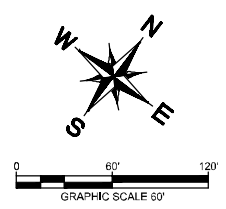
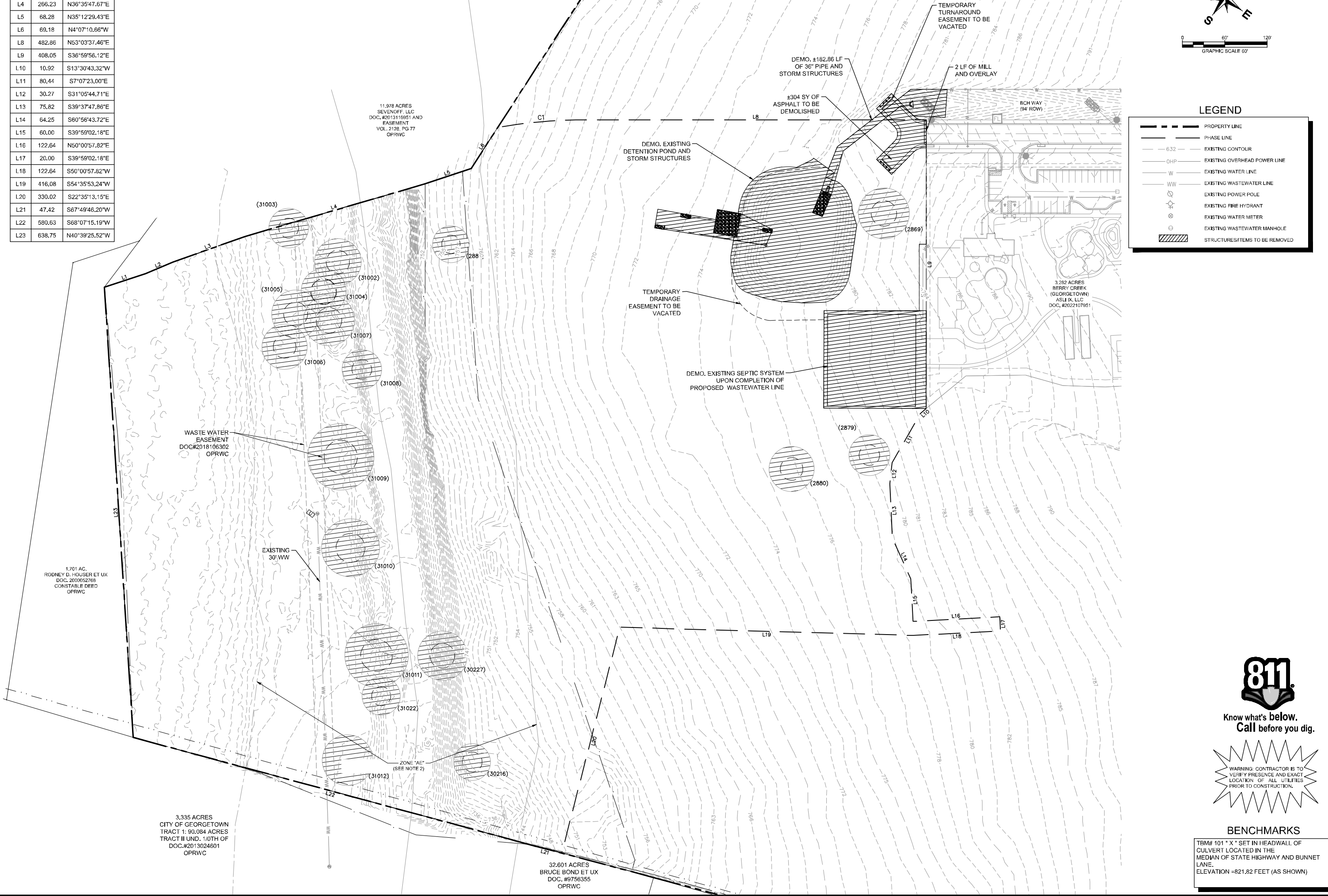
Erosion Control: 1. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATION CONTROL AND WATER QUALITY REQUIREMENTS, LAWS, AND ORDINANCES THAT APPLY TO THE CONSTRUCTION SITE. LAND DISTURBANCE. 2. CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE TCEQ GENERAL PERMIT TO DISCHARGE UNDER THE TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM TRP 150007. 3. EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE. 4. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT. 5. CONTRACTOR IS SOLELY RESPONSIBLE FOR INSTALLATION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION CONTROL DEVICES. BEST MANAGEMENT PRACTICES (BMPs), AND FOR UPDATING THE EROSION CONTROL PLAN DURING CONSTRUCTION AS FIELD CONDITIONS CHANGE. 6. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL FOR EACH BMP EMPLOYED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE. 7. AS STORM SEWER INLETS ARE INSTALLED ON-SITE, TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED AT EACH INLET PER APPROVED DETAILS. 8. THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE AREA IT PROTECTS HAS BEEN PERMANENTLY STABILIZED. 9. CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL DEVICES NEEDED DUE TO PROJECT PHASING. 10. CONTRACTOR SHALL OBSERVE THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES AND MAKE FIELD ADJUSTMENTS AND MODIFICATIONS AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE. IF THE EROSION CONTROL DEVICES DO NOT

EFFECTIVELY CONTROL EROSION AND PREVENT SEDIMENTATION FROM WASHING OFF THE SITE, THEN THE CONTRACTOR SHALL EFFECTIVELY CONTROL EROSION, SPOIL, AND STORAGE AREAS (IF APPLICABLE) ARE CONSIDERED AS PART OF THE PROJECT SITE AND MUST ALSO COMPLY WITH THE EROSION CONTROL REQUIREMENTS FOR THIS PROJECT. THIS INCLUDES THE INSTALLATION OF BMPs TO CONTROL EROSION AND SEDIMENTATION AND THE ESTABLISHMENT OF PERMANENT GRADING ON DISTURBED AREAS PRIOR TO FINISHING CONSTRUCTION. THE MORE RESTRICTIVE SPECIFICATION OR DETAIL SHALL BE FOLLOWED. 12. BMPs FOR THIS PROJECT PLAN TO INCLUDE BMPs FOR ANY OF-SITE THAT ARE NOT ANTICIPATED OR SHOWN ON THE EROSION CONTROL PLAN. 13. ALL STAGING, STOCKPILES, SPOIL, AND STORAGE SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER DRAINAGE. THE MORE RESTRICTIVE SPECIFICATION OR DETAIL SHALL BE FOLLOWED. 14. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER. 15. CONTRACTORS SHALL INSPECT ALL EROSION CONTROL DEVICES, BMPs, DISTURBED AREAS, AND VEHICLE ENTRY AND EXIT AREAS WEEKLY AND WITHIN 24 HOURS OF ANY EVENTS OF 0.5 INCHES OR GREATER, AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 16. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 17. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 18. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 19. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 20. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 21. CONTRACTOR SHALL MAINTAIN AN APPROPRIATE BARRIER AND KEEP RECORD OF THIS INSPECTION IN THE PROJECT MANUAL. 22. 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Plotted By: Ramirez, Adam Date: August 29, 2023 11:00:23am File Path: K:\AUS-Civil\067782815-Berry Creek\067782815-Existing Conditions & Demolition Plan.dwg
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LINE	LENGTH	BEARING
L1	61.49	N34°46'43.93"E
L2	41.77	N30°22'49.80"E
L3	107.84	N33°17'32.91"E
L4	266.23	N36°35'47.67"E
L5	68.28	N35°12'29.43"E
L6	69.18	N4°07'10.66"W
L8	482.86	N53°03'37.46"E
L9	408.05	S36°59'56.12"E
L10	10.92	S13°30'43.32"W
L11	80.44	S7°07'23.00"E
L12	30.27	S31°05'44.71"E
L13	75.82	S39°37'47.86"E
L14	64.25	S60°56'43.72"E
L15	60.00	S39°59'02.18"E
L16	122.64	N50°00'57.82"E
L17	20.00	S39°59'02.18"E
L18	122.64	S50°00'57.82"W
L19	416.08	S54°35'53.24"W
L20	330.02	S22°35'13.15"E
L21	47.42	S67°49'46.20"W
L22	580.63	S68°07'15.19"W
L23	638.75	N40°39'25.52"W

CURVE TABLE						
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA	TANGENT
C1	700.04'	124.40'	N47°57'54"E	124.24'	10°10'55"	62.37'



LEGEND	
	PROPERTY LINE
	PHASE LINE
	EXISTING CONTOUR
	EXISTING OVERHEAD POWER LINE
	EXISTING WATER LINE
	EXISTING WASTEWATER LINE
	EXISTING POWER POLE
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING WASTEWATER MANHOLE
	STRUCTURES/ITEMS TO BE REMOVED

NO.	REVISIONS	DATE	BY

Kimley-Horn
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 TEXAS REGISTERED ENGINEERING FIRM F-928

ALEXANDER C. STEAMAN
 138792
 LICENSED PROFESSIONAL ENGINEER
 8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RFJ
CHECKED BY	ACS

EXISTING CONDITIONS & DEMOLITION PLAN

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

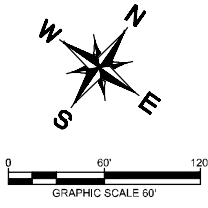
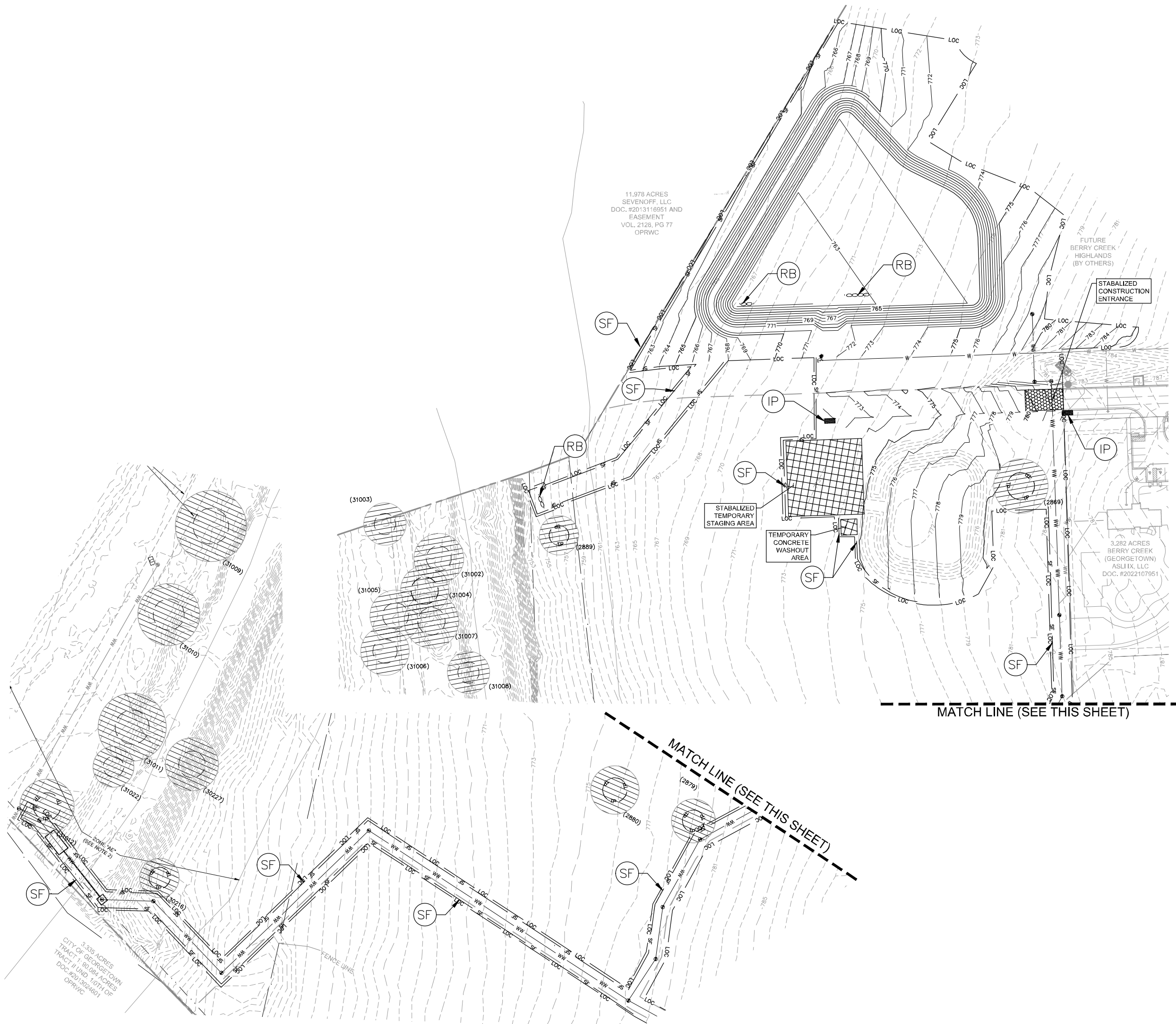
WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

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

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
8

Plotted By: Ramirez, Adam Date: August 29, 2023 11:00:58am File Path: K:\AUS_Civil\067782815-Berry_Creek_Cod\Phase 6A\PlanSheets\0-Erosion Control Plan.dwg
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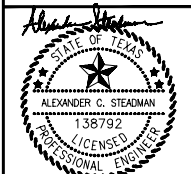


EROSION CONTROL LEGEND

---	PROPERTY LINE
- - -	PHASE LINE
---	PROPOSED CONTOUR
---	EXISTING CONTOUR
SF	SILT FENCE
CE	STABILIZED CONSTRUCTION ENTRANCE/EXIT
IP	INLET PROTECTION
RB	ROCK BERM
LOC	LIMITS OF CONSTRUCTION
T	TREE TO BE REMOVED

No.	REVISIONS	DATE	BY

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KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY:	RMC
DRAWN BY:	RRB
CHECKED BY:	ACS

EROSION CONTROL PLAN

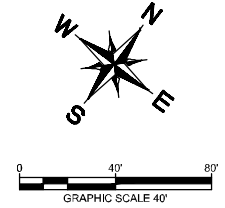
BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, TEXAS
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
9



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

Plotted By: Ramirez, Adam Date: August 29, 2023 11:02:30am File Path: K:\AUS-Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\C-Grading Plan.dwg
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LEGEND

- PROPERTY LINE
- PROPOSED CONTOUR
- EXISTING CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED SWALE
- STREET DRAINAGE FLOW DIRECTION
- EXISTING TREE TO REMAIN

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 Know what's below.
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BENCHMARKS
 TBM# 101" X 8" SET IN HEADWALL OF
 CULVERT LOCATED IN THE
 MEDIAN OF STATE HIGHWAY AND BUNNET
 LANE.
 ELEVATION = 821.82 FEET (AS SHOWN)

No.	REVISIONS	DATE	BY

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8/21/23

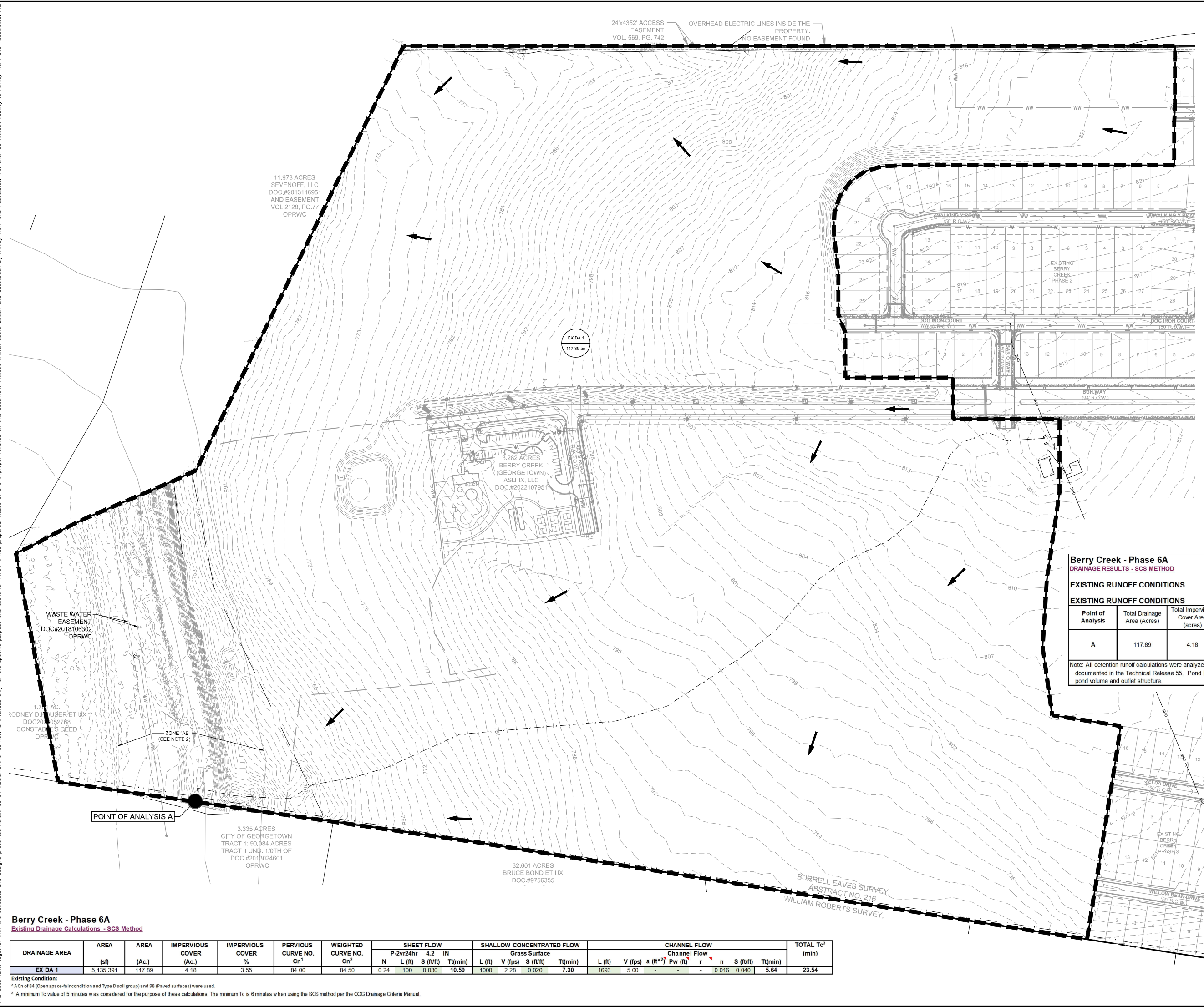
KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY:	RMC
DRAWN BY:	RFJ
CHECKED BY:	ACS

GRADING PLAN

**BERRY CREEK
 HIGHLANDS
 PHASE 6A**
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
13

Plotted By: Ramirez, Adam Date: August 29, 2023 11:02:48am File Path: K:\AUS-Civil\067782815-Berry_Creek_Col\Phase 6A\PlanSheets\C-Existing Drainage Area Map.dwg
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LEGEND

- AREA DESIGNATOR
AREA IN ACRES
- PROPERTY LINE
- EXISTING STORM DRAIN LINE
- EXISTING DRAINAGE DIVIDE
- EXISTING STORM DRAIN INLET
- EXISTING STORM DRAIN MANHOLE
- EXISTING STORM DRAIN HEADWALL
- EXISTING FLOW DIRECTION
- EXISTING CONTOUR
- TIME OF CONCENTRATION FLOW PATH

Berry Creek - Phase 6A
DRAINAGE RESULTS - SCS METHOD

EXISTING RUNOFF CONDITIONS

Point of Analysis	Total Drainage Area (Acres)	Total Impervious Cover Area (acres)	Impervious Area (%)	Storm Event	Existing Runoff (cfs)
A	117.89	4.18	3.55%	2	273.79
				10	488.99
				25	634.34
				100	874.84

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.

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 Know what's below.
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BENCHMARKS
 TBM# 101 * X * SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE.
 ELEVATION = 821.82 FEET (AS SHOWN)

Berry Creek - Phase 6A
Existing Drainage Calculations - SCS Method

DRAINAGE AREA	AREA (sf)	AREA (Ac.)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER (%)	PERVIOUS CURVE NO. Cn ¹	WEIGHTED CURVE NO. Cn ²	SHEET FLOW			SHALLOW CONCENTRATED FLOW			CHANNEL FLOW					TOTAL Tc ³ (min)					
							N	L (ft)	S (ft/ft)	Tl (min)	L (ft)	V (fps)	S (ft/ft)	Tl (min)	L (ft)	V (fps)	a (ft ²)		Pw (ft)	r	n	S (ft/ft)	Tl (min)
EX DA 1	5,135,391	117.89	4.18	3.55	84.00	84.50	0.24	100	0.030	10.59	1000	2.28	0.020	7.30	1693	5.00	-	-	-	0.010	0.040	5.64	23.54

Existing Condition:
¹ A Cn of 84 (Open space-fair condition and Type D soil group) and 98 (Paved surfaces) were used.
² A minimum Tc value of 5 minutes was considered for the purpose of these calculations. The minimum Tc is 6 minutes when using the SCS method per the COG Drainage Criteria Manual.

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8/21/23

KHA PROJECT: 067782815
 DATE: AUGUST 2023
 SCALE: AS SHOWN
 DESIGNED BY: RMC
 DRAWN BY: RJJ
 CHECKED BY: ACS

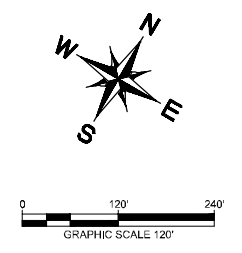
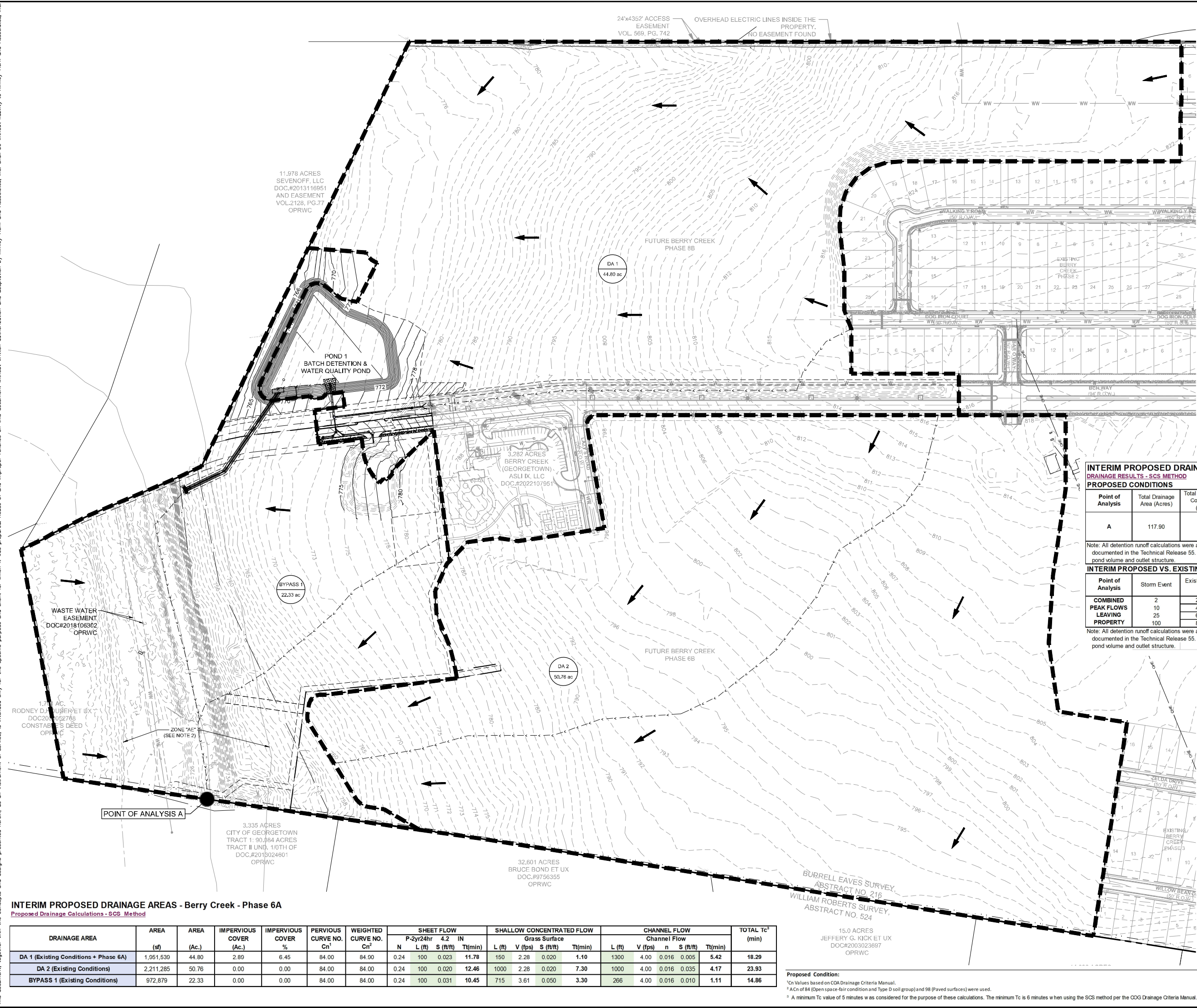
EXISTING DRAINAGE AREA MAP

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
14

NO.	REVISIONS	DATE	BY

Plotted By: Ramirez, Adam Date: August 29, 2023 11:03:20am File Path: \\AUS-Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\Interim Proposed Drainage Area Map.dwg
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LEGEND

	AREA DESIGNATOR AREA IN ACRES
	PROPERTY LINE
	EXISTING STORM DRAIN LINE
	EXISTING DRAINAGE DIVIDE
	EXISTING STORM DRAIN INLET
	EXISTING STORM DRAIN MANHOLE
	EXISTING STORM DRAIN HEADWALL
	EXISTING FLOW DIRECTION
	EXISTING CONTOUR
	TIME OF CONCENTRATION FLOW PATH

INTERIM PROPOSED DRAINAGE AREAS - Berry Creek - Phase 6A
DRAINAGE RESULTS - SCS METHOD
PROPOSED CONDITIONS

Point of Analysis	Total Drainage Area (Acres)	Total Impervious Cover Area (acres)	Impervious Area (%)	Storm Event	Developed Runoff (cfs)
A	117.90	2.89	2.45%	2 10 25	246.59 451.49 581.86 782.40

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.

INTERIM PROPOSED VS. EXISTING COMPARISON

Point of Analysis	Storm Event	Existing Runoff (cfs)	Developed Runoff (cfs)	Runoff Difference at Point of Analysis (cfs)	Is Developed ≤ Allowable?
COMBINED PEAK FLOWS LEAVING PROPERTY	2	273.79	246.59	27.20	YES
	10	488.99	451.49	37.50	YES
	25	634.34	581.86	52.48	YES
PROPERTY	100	874.84	782.40	92.44	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.

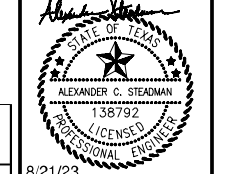
INTERIM PROPOSED DRAINAGE AREAS - Berry Creek - Phase 6A
Proposed Drainage Calculations - SCS Method

DRAINAGE AREA	AREA (sf)	AREA (Ac.)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER %	PERVIOUS CURVE NO. Cn ¹	WEIGHTED CURVE NO. Cn ²	SHEET FLOW				SHALLOW CONCENTRATED FLOW			CHANNEL FLOW			TOTAL Tc ³ (min)			
							P-2yr/24hr 4.2 IN				Grass Surface			Channel Flow						
							N	L (ft)	S (ft/ft)	Tt (min)	L (ft)	V (fps)	S (ft/ft)	Tt (min)	L (ft)	V (fps)		n	S (ft/ft)	Tt (min)
DA 1 (Existing Conditions + Phase 6A)	1,951,530	44.80	2.89	6.45	84.00	84.00	0.24	100	0.023	11.78	150	2.28	0.020	1.10	1300	4.00	0.016	0.005	5.42	18.29
DA 2 (Existing Conditions)	2,211,285	50.76	0.00	0.00	84.00	84.00	0.24	100	0.020	12.46	1000	2.28	0.020	7.30	1000	4.00	0.016	0.035	4.17	23.93
BYPASS 1 (Existing Conditions)	972,879	22.33	0.00	0.00	84.00	84.00	0.24	100	0.031	10.45	715	3.61	0.050	3.30	266	4.00	0.016	0.010	1.11	14.86

Proposed Condition:
¹Cn Values based on CDA Drainage Criteria Manual.
²A Cn of 84 (Open space-fair condition and Type D soil group) and 98 (Paved surfaces) were used.
³A minimum Tc value of 5 minutes was considered for the purpose of these calculations. The minimum Tc is 6 minutes when using the SCS method per the COG Drainage Criteria Manual.

No.	REVISIONS	BY	DATE

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KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RFJ
CHECKED BY	ACS

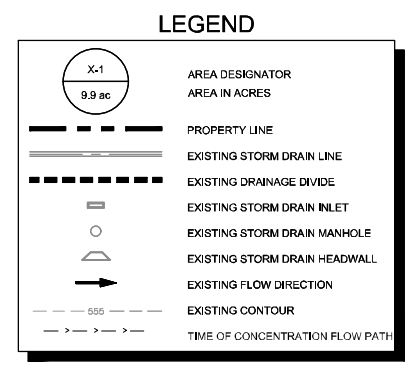
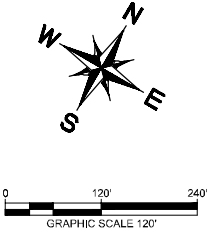
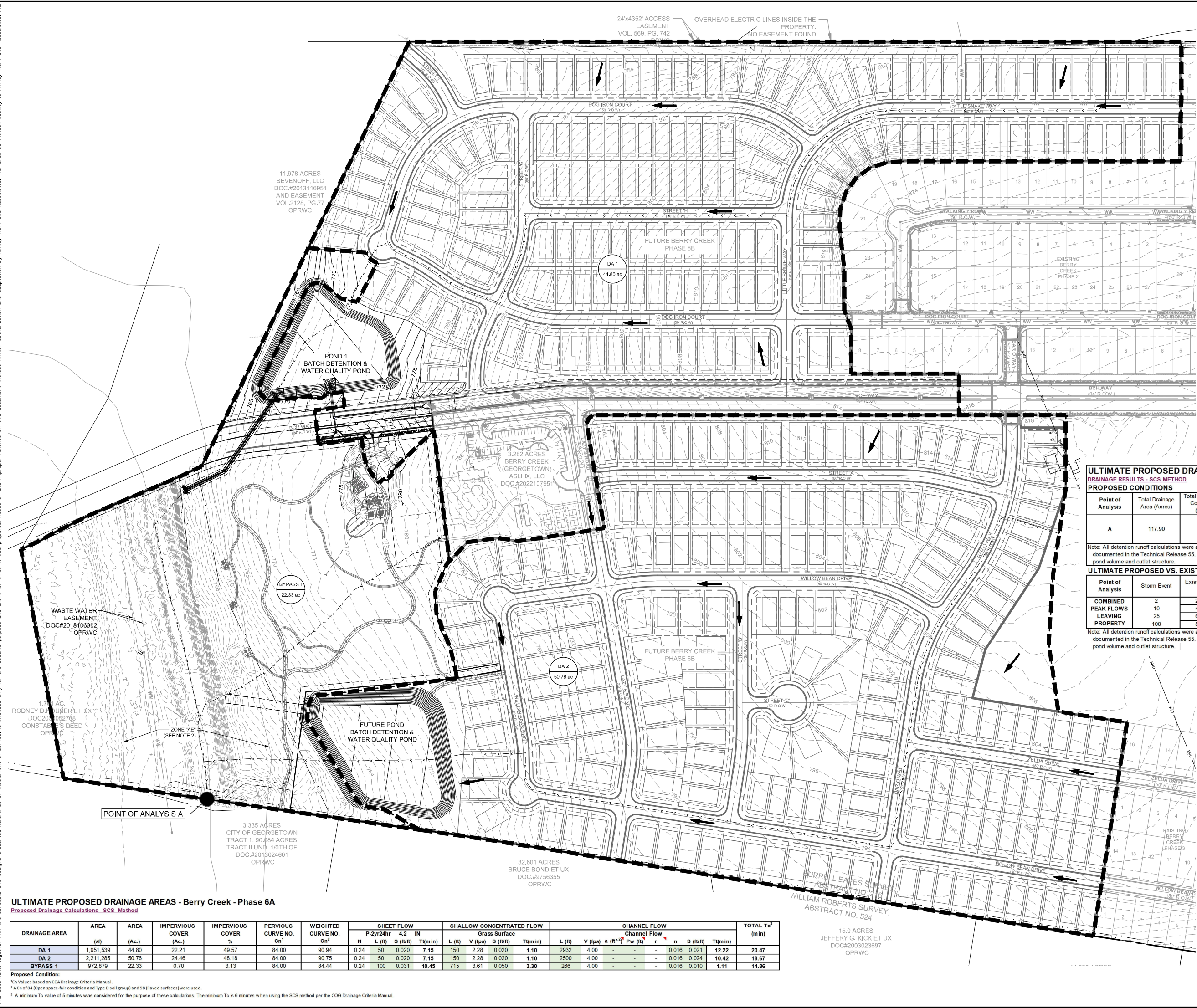
INTERIM PROPOSED DRAINAGE AREA MAP

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
15

811
 Know what's below. Call before you dig.
 WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
BENCHMARKS
 TBM# 101" X" SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE.
 ELEVATION = 821.82 FEET (AS SHOWN)

Plotted By: Ramirez, Adam Date: August 29, 2023 11:03:49am File Path: K:\AUS_Civil\067782815-Berry_Creek_Col\Phase 6A\PlanSheets\Proposed Drainage Area Map.dwg
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ULTIMATE PROPOSED DRAINAGE AREAS - Berry Creek - Phase 6A
DRAINAGE RESULTS - SCS METHOD

PROPOSED CONDITIONS

Point of Analysis	Total Drainage Area (Acres)	Total Impervious Cover Area (acres)	Impervious Area (%)	Storm Event	Developed Runoff (cfs)
A	117.90	47.37	40.18%	2	257.64
				10	451.78
				25	579.41
				100	763.93

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.

ULTIMATE PROPOSED VS. EXISTING COMPARISON

Point of Analysis	Storm Event	Existing Runoff (cfs)	Developed Runoff (cfs)	Runoff Difference at Point of Analysis (cfs)	Is Developed ≤ Allowable?
COMBINED	2	273.79	257.64	16.15	YES
PEAK FLOWS	10	488.99	451.78	37.21	YES
LEAVING	25	634.34	579.41	54.93	YES
PROPERTY	100	874.84	763.93	110.91	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.

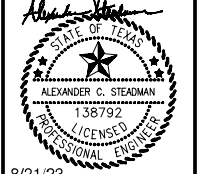
ULTIMATE PROPOSED DRAINAGE AREAS - Berry Creek - Phase 6A
Proposed Drainage Calculations - SCS Method

DRAINAGE AREA	AREA (sq)	AREA (Ac.)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER %	PERVIOUS CURVE NO. Cn ¹	WEIGHTED CURVE NO. Cn ²	SHEET FLOW				SHALLOW CONCENTRATED FLOW				CHANNEL FLOW				TOTAL Tc ³ (min)			
							P-2yr24hr 4.2 IN		Grass Surface		Channel Flow		Channel Flow		Channel Flow		Channel Flow					
							N	L (ft)	V (ft/s)	S (ft/ft)	Tt(min)	L (ft)	V (ft/s)	a (ft ² /s)	Pw (ft)	r	n	S (ft/ft)		Tt(min)		
DA 1	1,951,539	44.80	22.21	49.57	84.00	90.94	0.24	50	0.020	7.15	150	2.28	0.020	1.10	2932	4.00	-	-	0.016	0.021	12.22	20.47
DA 2	2,211,285	50.76	24.46	48.18	84.00	90.75	0.24	50	0.020	7.15	150	2.28	0.020	1.10	2500	4.00	-	-	0.016	0.024	10.42	18.67
BYPASS 1	972,879	22.33	0.70	3.13	84.00	84.44	0.24	100	0.031	10.45	715	3.61	0.050	3.30	266	4.00	-	-	0.016	0.010	1.11	14.86

Proposed Condition:
¹Cn Values based on CGO Drainage Criteria Manual.
²Ac of 84 (Open space-fair condition and type D soil group) and 98 (Paved surfaces) were used.
³A minimum Tc value of 5 minutes was considered for the purpose of these calculations. The minimum Tc is 6 minutes when using the SCS method per the CGO Drainage Criteria Manual.

No.	REVISIONS	DATE	BY

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KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RWC
DRAWN BY	RFJ
CHECKED BY	ACS

ULTIMATE PROPOSED DRAINAGE AREA MAP

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

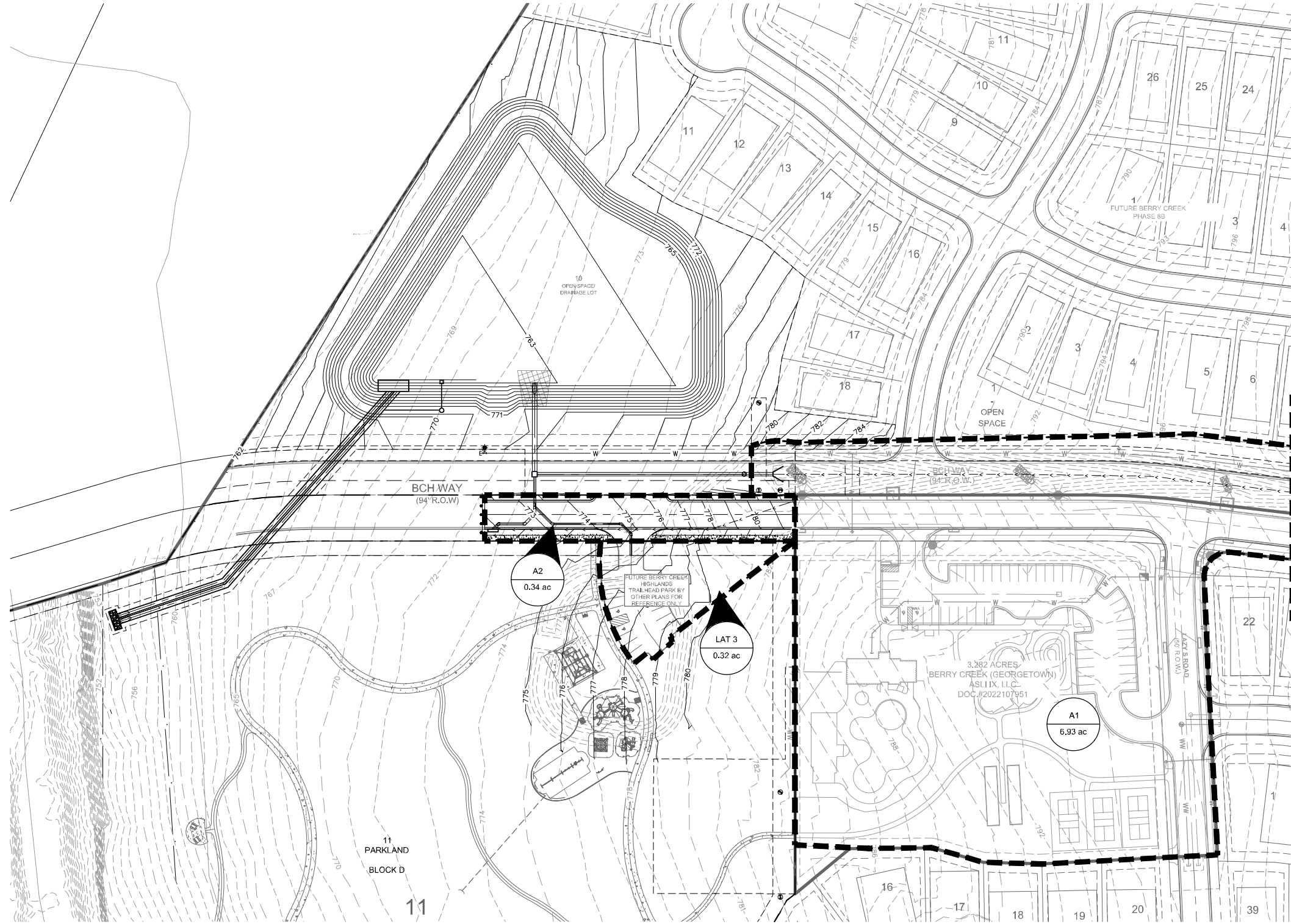
SHEET NUMBER	16
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WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

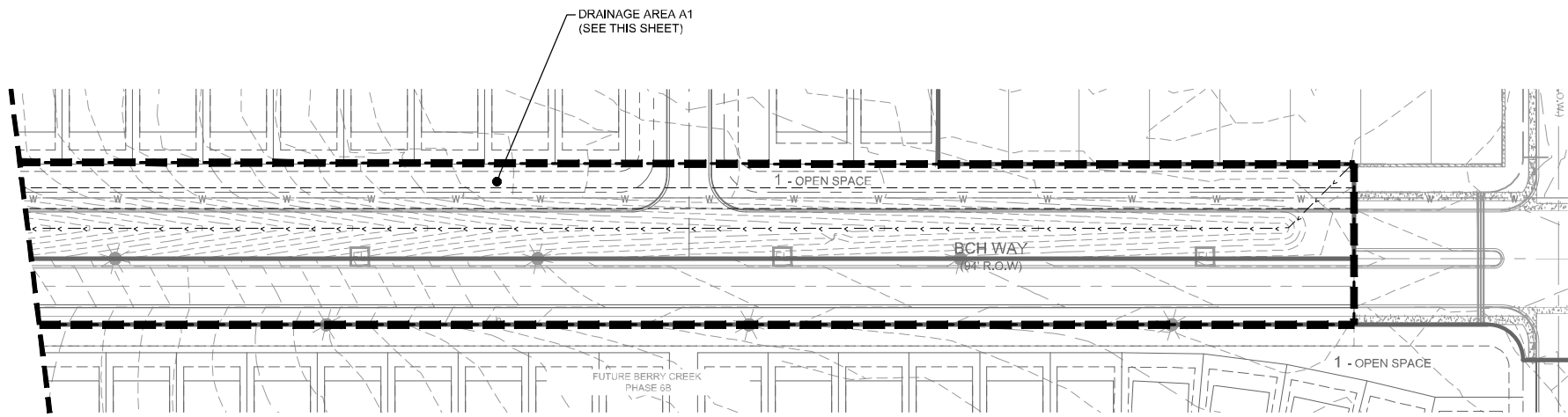
BENCHMARKS
 TBM# 101" X 8" SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE.
 ELEVATION = 821.82 FEET (AS SHOWN)

Plotted By: Ramirez, Adam Date: August 29, 2023 11:04:31am File Path: K:\AUS_Civil\067782815-Berry_Creek\Cad\Phase 6A\PlanSheets\C-1-Inlet Drainage Area Map.dwg
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MATCH LINE (SEE THIS SHEET)

MATCH LINE (SEE THIS SHEET)



0 60' 120'
 GRAPHIC SCALE 60'

LEGEND

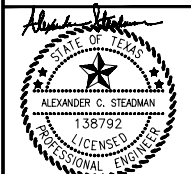
	AREA DESIGNATOR
	AREA IN ACRES
	TIME OF CONCENTRATION PATH
	PROPERTY LINE
	PROPOSED STORM DRAIN LINE
	EXISTING STORM DRAIN LINE
	PROPOSED DRAINAGE DIVIDE
	PROPOSED STORM DRAIN INLET
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN HEADWALL
	PROPOSED FLOW DIRECTION
	PROPOSED CONTOUR
	EXISTING CONTOUR
	PHASE LINE
	TIME OF CONCENTRATION FLOW PATH

NOTES:

- SEE SHEET 18 FOR INLET DRAINAGE CALCULATIONS.
- REFER TO BERRY CREEK AMENITY CENTER (2021-71-SDP) FOR INLET DRAINAGE CALCULATIONS FOR THE STORM STRUCTURES DRAINING TO THE PROPOSED HEADWALL A1.

NO.	REVISIONS	DATE	BY

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DESIGNED BY:	RMC
DRAWN BY:	RFJ
CHECKED BY:	ACS

INTLET DRAINAGE AREA
 MAP

BERRY CREEK
 HIGHLANDS
 PHASE 6A
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS



BENCHMARKS

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

SHEET NUMBER
 17

Plotted By: Ramirez, Adam Date: August 29, 2023 11:04:31am File Path: K:\AUS-Civil\067782815-Berry_Creek\Cad\Phase 6A\PlanSheets\C-Inlet Drainage Area Map.dwg
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Berry Creek - Phase 6A Proposed "C" Value Calculations									
DRAINAGE AREA	AREA (SF)	AREA (AC)	IMPERVIOUS COVER (SF)	IMPERVIOUS COVER (Ac.)	IMPERVIOUS COVER %	Comp. C ₂	Comp. C ₁₀	Comp. C ₂₅	Comp. C ₁₀₀
A-1	301,749.75	6.93	114,207	2.62	38%	0.56	0.59	0.61	0.65
A-2	14,860.32	0.34	11,761	0.27	79%	0.83	0.84	0.85	0.86
LAT 3	13,806.28	0.32	6,184	0.14	45%	0.61	0.63	0.65	0.69

Berry Creek - Phase 6A "Tc" Value Calculations	
DRAINAGE AREA	TOTAL Tc** (min)
A-1	5.00
A-2	5.00
LAT 3	5.00

**The minimum Tc is 5 minutes per the City of Austin DCM.

Berry Creek - Phase 6A Proposed Inlet Runoff (Q) Calculations															
D.A. Number	Drainage Area (Ac)	TOTAL I.C. (%)	Comp. C ₂	Comp. C ₁₀	Comp. C ₂₅	Comp. C ₁₀₀	TOTAL T _c (Min.)	i ₂ (in/hr)	i ₁₀ (in/hr)	i ₂₅ (in/hr)	i ₁₀₀ (in/hr)	Q ₂ (cfs)	Q ₁₀ (cfs)	Q ₂₅ (cfs)	Q ₁₀₀ (cfs)
A-1	6.93	38%	0.56	0.59	0.61	0.65	5.00	6.48	8.64	9.84	11.88	26.13	35.37	41.54	52.74
A-2	0.34	79%	0.83	0.84	0.85	0.86	5.00	6.48	8.64	9.84	11.88	1.84	2.48	2.85	3.50
LAT 3	0.32	45%	0.61	0.63	0.65	0.69	5.00	6.48	8.64	9.84	11.88	1.24	1.73	2.03	2.59

Berry Creek - Phase 6A INLET FLOW CALCULATION TABLE (25-Yr Flows)																						
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)
A-2	Grade	A-2	69'	2.85	0.50	2.74	2.85		2.85	2.00%	5.0	0.273	11.24	10	0.73	3.93	10	2.54	1.53	2.54	7.25	0.00

Berry Creek - Phase 6A INLET FLOW CALCULATION TABLE (100-Yr Flows)																						
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)
A-2	Grade	A-2	69'	2.85	0.50	2.74	3.50		3.50	2.00%	5.0	0.294	12.36	10	0.75	4.89	10	2.13	1.42	2.13	7.47	0.00

**Culvert Calculator Report
Culvert A1**

Solve For: Headwater Elevation

Culvert Summary			
Allowable HW Elevation	782.00 ft	Headwater Depth/Height	1.30
Computed Headwater Elev.	781.89 ft	Discharge	53.74 cfs
Inlet Control HW Elev.	781.89 ft	Tailwater Elevation	769.86 ft
Outlet Control HW Elev.	781.87 ft	Control Type	Inlet Control

Grades			
Upstream Invert	778.00 ft	Downstream Invert	763.00 ft
Length	337.00 ft	Constructed Slope	0.044510 ft/ft

Hydraulic Profile			
Profile Composite Pressure Profile	S1S2	Depth, Downstream	1.29 ft
Slope Type	N/A	Normal Depth	1.29 ft
Flow Regime	N/A	Critical Depth	2.38 ft
Velocity Downstream	18.57 ft/s	Critical Slope	0.036900 ft/ft

Section			
Section Shape	Circular	Manning's Coefficient	0.013
Section Material	Concrete	Span	3.00 ft
Section Size	36 inch	Rise	3.00 ft
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev	781.87 ft	Upstream Velocity Head	1.24 ft
Kc	0.20	Entrance Loss	0.25 ft

Inlet Control Properties			
Inlet Control HW Elev.	781.89 ft	Flow Control	Submerged
Inlet Type	Beveled ring, 45° bevels	Area Full	7.1 ft ²
K	0.03190	HDS 5 Chart	3
M	2.52000	HDS 5 Scale	A
C	0.03000	Equation Form	1
Y	0.74000		



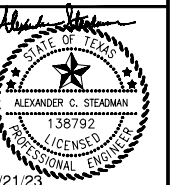
Know what's below.
Call before you dig.



BENCHMARKS

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

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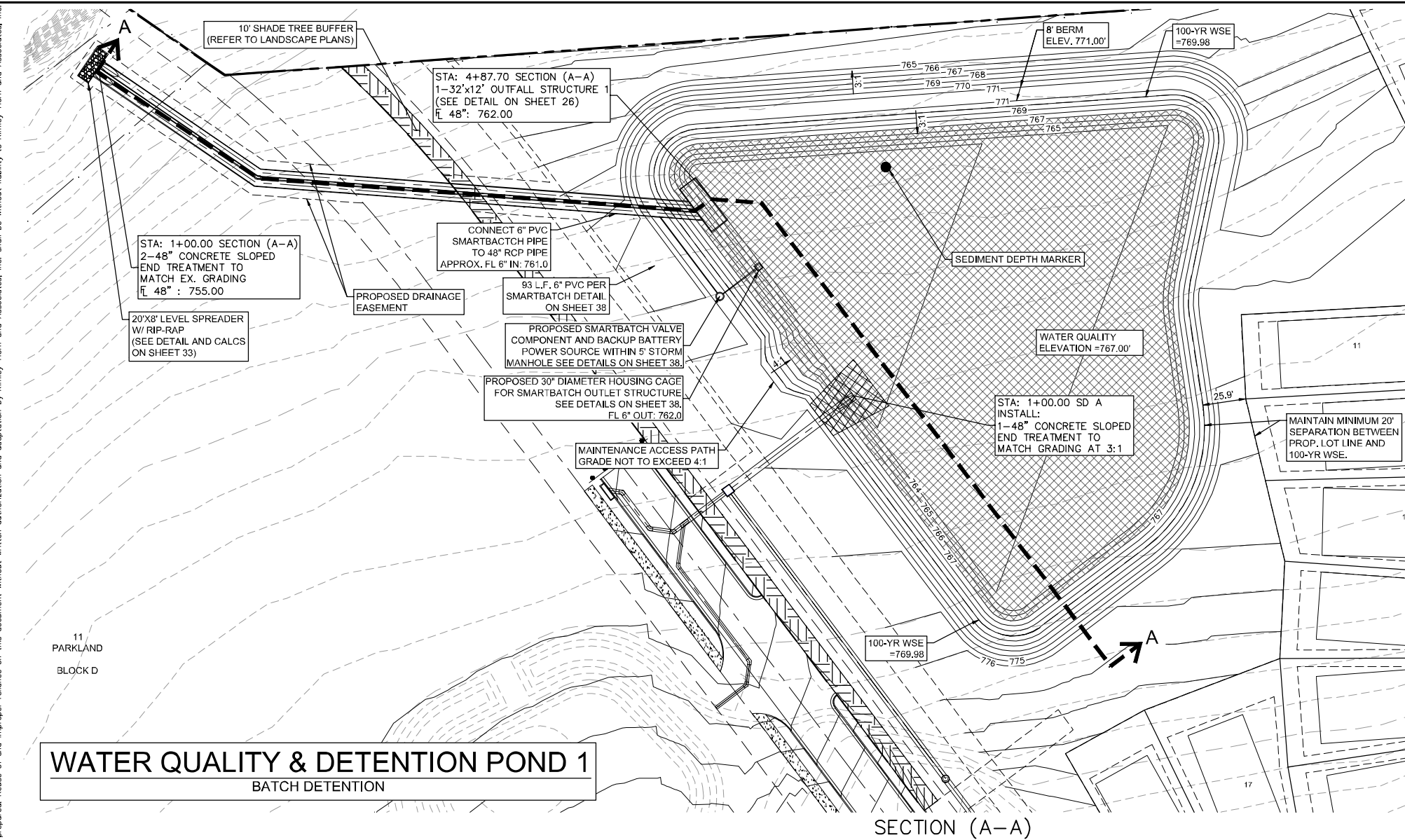
8/21/23
 KHA PROJECT: 067782815
 DATE: AUGUST 2023
 SCALE: AS SHOWN
 DESIGNED BY: RMC
 DRAWN BY: RJJ
 CHECKED BY: ACS

**INTLET DRAINAGE AREA
CALCULATIONS**

**BERRY CREEK
HIGHLANDS
PHASE 6A**
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

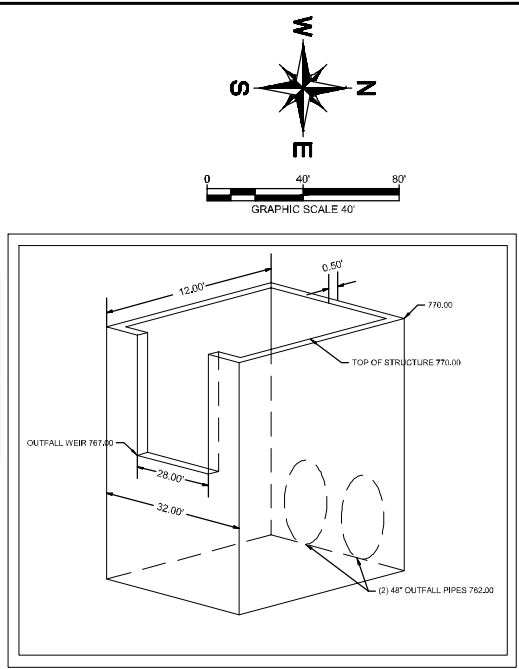
SHEET NUMBER
18

Plotted By: Ramirez, Adam Date: August 29, 2023 11:04:59am File Path: K:\AUS_Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\C-Pond Plan.dwg
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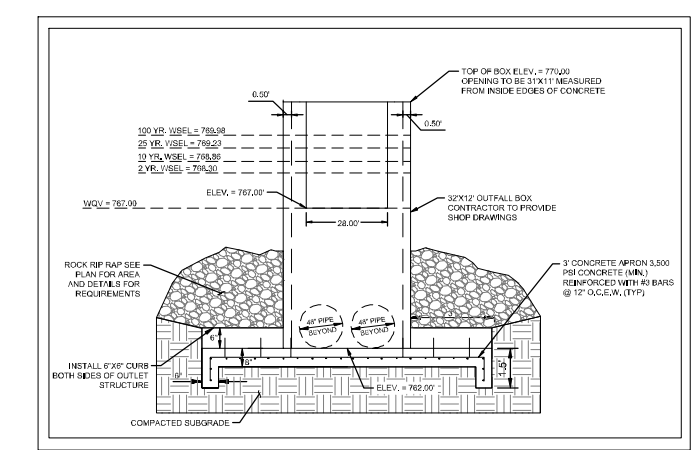


STAGE (FT MSL)	AREA (SF)	STORAGE (CF)	CUMULATIVE STORAGE (CF)	DISCHARGE (CFS)	CONTRIBUTING STRUCTURES
762.00	200.00	N/A	0.00	0.00	NONE
763.00	1470.00	245.00	245.00	0.00	NONE
764.00	3996.00	2738.00	3493.00	0.00	NONE
765.00	55089.00	47527.50	82320.50	0.00	NONE
766.00	58049.00	56569.00	138889.50	0.00	NONE
767.00	61067.00	59558.00	198447.50	0.00	WEIR
768.00	64141.00	62604.00	261051.50	72.80	WEIR
769.00	67271.00	65706.00	326757.50	205.90	WEIR
770.00	70458.00	68864.50	395622.00	288.58	WEIR
771.00	73701.00	72079.50	467701.50	334.55	WEIR

DESIGN SCENARIO	PEAK INFLOW (FT ³ /S)	COMPUTED PEAK OUTFLOW (FT ³ /S)	MAXIMUM WATER SURFACE ELEVATION (FT)	MAXIMUM STORAGE (FT ³)
2 YR	137.56	109.33	768.30	81968.00
10 YR	221.82	185.81	768.86	118965.00
25 YR	277.95	229.47	769.23	144132.00
100 YR	371.00	287.27	769.98	195728.00

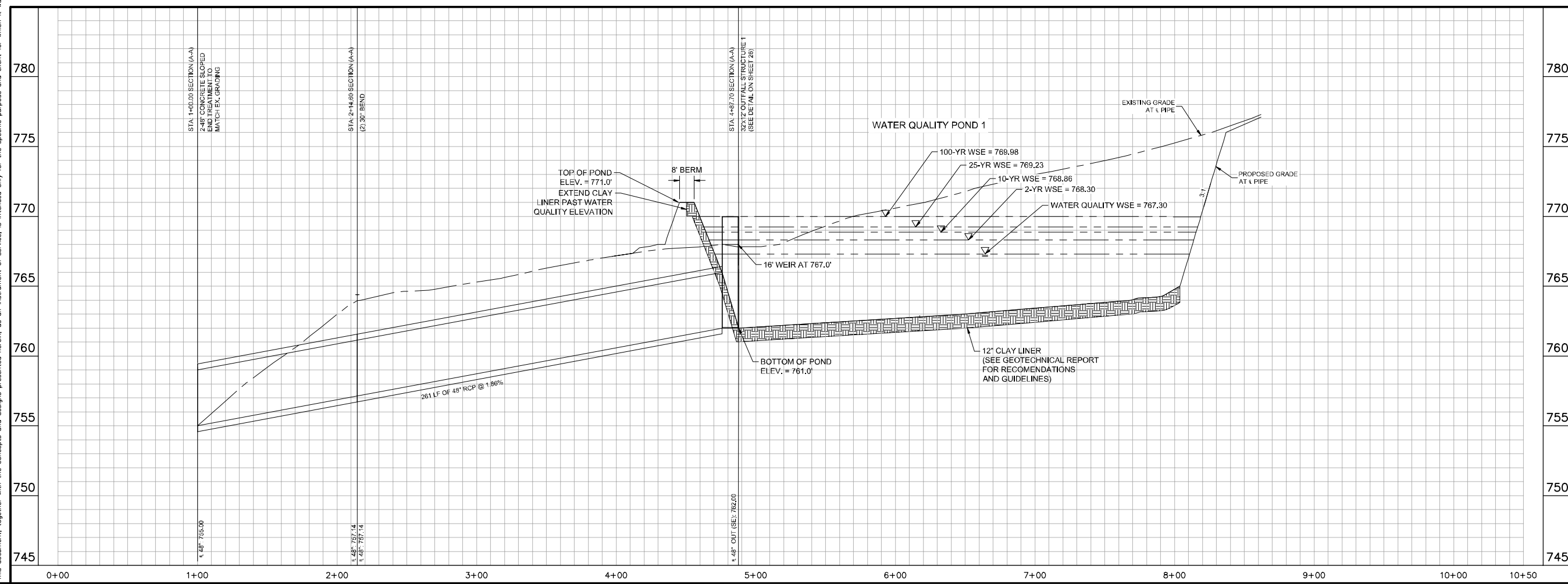


Structure ID: Weir - 1	Structure Type: Rectangular Weir
Number of Openings	1
Elevation	767.00 ft
Weir Length	28.00 ft
Weir Coefficient	2.40 (H ^{0.5})
Structure ID: Culvert - 1	Structure Type: Culvert-Circular
Number of Bents	2
Diameter	48.0 in
Length	377.00 ft
Length (Computed Barrel)	377.03 ft
Slope (Computed)	0.023 ft/ft
Outlet Control Data	
Manning's n	0.013
Kc	0.200
Kb	0.005
Kr	0.000
Convergence Tolerance	0.00 ft
Inlet Control Data	
Equation Form	Form 1
K	0.0045
H	2.0000
C	0.0317
Y	0.0000
T1 ratio (HW/D)	1.089
T2 ratio (HW/D)	1.191
Slope Correction Factor	0.500



WATER QUALITY & DETENTION POND 1
BATCH DETENTION

SECTION (A-A)



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

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

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

BENCHMARKS
TBM# 101" X 4" SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE. ELEVATION = 821.82 FEET (AS SHOWN)

<p>© 2023 KIMLEY-HORN AND ASSOCIATES, INC. 10814 JULLYVILLE ROAD, CAMPUS IV, SUITE 200, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM</p>	<p>DATE: AUGUST 2023</p> <p>SCALE: AS SHOWN</p> <p>DESIGNED BY: RMC</p> <p>DRAWN BY: RFJ</p> <p>CHECKED BY: ACS</p>						
	<p>REVISIONS</p> <table border="1"> <tr><th>NO.</th><th>DATE</th><th>BY</th></tr> <tr><td> </td><td> </td><td> </td></tr> </table>	NO.	DATE	BY			
	NO.	DATE	BY				
<p>TEXAS REGISTERED ENGINEERING FIRM F-928</p>							
<p>PROJECT: KHA PROJECT 067782815</p> <p>DATE: AUGUST 2023</p> <p>SCALE: AS SHOWN</p> <p>DESIGNED BY: RMC</p> <p>DRAWN BY: RFJ</p> <p>CHECKED BY: ACS</p>							

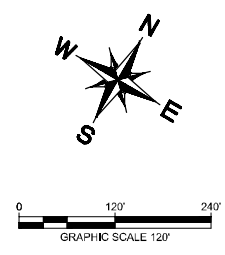
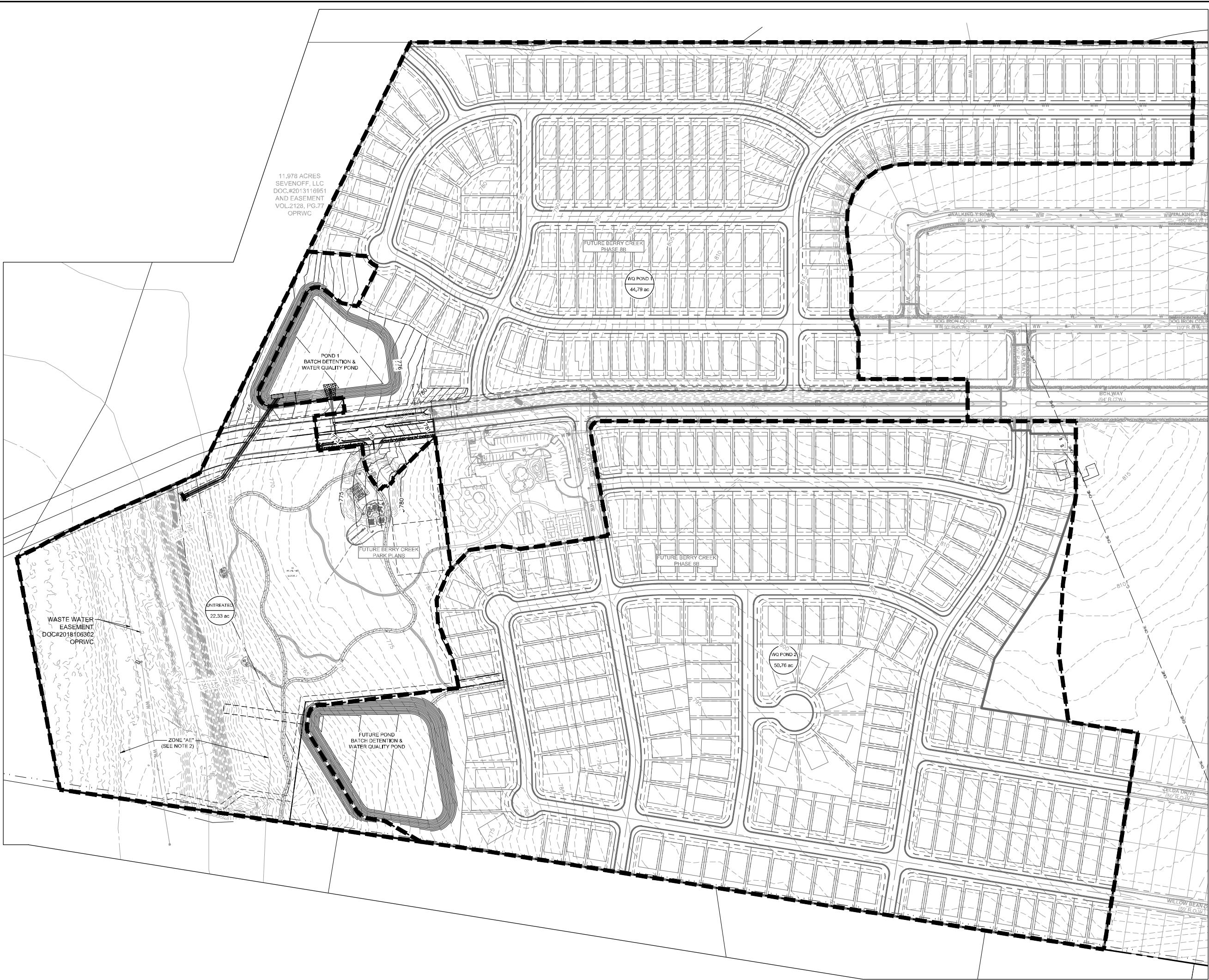
WQ-DETENTION POND 1 PLAN

BERRY CREEK HIGHLANDS PHASE 6A
CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER **19**

2023-17-CON

Plotted By: Ramirez, Adam Date: August 29, 2023 11:05:20am File Path: K:\AUS_Civil\067782815-Berry_Creek_Cool\Phase 6A\PlanSheets\Cool\WQ Drainage Area Map.dwg
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LEGEND

	AREA DESIGNATOR
	AREA IN ACRES
	PROPERTY LINE
	PROPOSED STORM DRAIN LINE
	EXISTING STORM DRAIN LINE
	PROPOSED DRAINAGE DIVIDE
	PROPOSED STORM DRAIN INLET
	PROPOSED STORM DRAIN MANHOLE
	PROPOSED STORM DRAIN HEADWALL
	PROPOSED FLOW DIRECTION
	PROPOSED CONTOUR
	EXISTING CONTOUR

- NOTES:**
- REFER TO WATER QUALITY CALCULATIONS (SHEETS 19 AND 21) FOR BMP BASIN CALCULATIONS.

NO.	REVISIONS	DATE	BY

Kimley-Horn

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 TEXAS REGISTERED ENGINEERING FIRM F-928



KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY:	RMC
DRAWN BY:	RFJ
CHECKED BY:	ACS

**WATER QUALITY AREA
MAP**



BENCHMARKS
 TBM# 101" X 4" SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE.
 ELEVATION = 821.82 FEET (AS SHOWN)

**BERRY CREEK
HIGHLANDS
PHASE 6A
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS**

SHEET NUMBER
20

Plotted By: Ramirez, Adam Date: August 29, 2023 01:44:53pm File Path: K:\AUS_Civil\067782815-Berry_Creek\Cad\Phase 6A\PlanSheets\0-WQ Drainage Area Map.dwg
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Texas Commission on Environmental Quality

BERRY CREEK - PHASE 6A

TSS Removal Calculations 04-20-2009 Project Name: **6A**
Date Prepared: **8/4/2022**

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

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

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

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

Site Data: Determine Required Load Removal Based on the Entire Project
 County = **Williamson**
 Total project area included in plan = **117.89** acres
 Predevelopment impervious area within the limits of the plan = **0.00** acres
 Total post-development impervious area within the limits of the plan = **47.37** acres
 Total post-development impervious cover fraction = **0.40**
 P = **32** inches

$L_{M \text{ TOTAL PROJECT}}$ = **41231** lbs. **80% REDUCTION**

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

Number of drainage basins / outfalls areas leaving the plan area = **2**

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

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

Total drainage basin/outfall area = **44.80** acres
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
 Post-development impervious area within drainage basin/outfall area = **22.21** acres
 Post-development impervious fraction within drainage basin/outfall area = **0.50**
 $L_{M \text{ THIS BASIN}}$ = **19332** lbs. **80% REDUCTION**

3. Indicate the proposed BMP Code for this basin.
 Proposed BMP = **Batch Detention**
 Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.
 RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
 A_i = Impervious area proposed in the BMP catchment area
 A_p = Pervious area remaining in the BMP catchment area
 L_R = TSS Load removed from this catchment area by the proposed BMP

A_C = **44.80** acres
 A_i = **22.21** acres
 A_p = **22.59** acres
 L_R = **22733** lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area
 Desired $L_{M \text{ THIS BASIN}}$ = **21500** lbs.
 F = **0.95**

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

Rainfall Depth = **2.60** inches
 Post Development Runoff Coefficient = **0.36**
 On-site Water Quality Volume = **150177** cubic feet

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

Off-site area draining to BMP = **0.00** acres
 Off-site impervious cover draining to BMP = **0.00** acres
 Impervious fraction of off-site area = **0**
 Off-site Runoff Coefficient = **0.00**
 Off-site Water Quality Volume = **0** cubic feet

Storage for Sediment = **30035** cubic feet
Total Capture Volume (required water quality volume(s) x 1.20) = 180213 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.

Texas Commission on Environmental Quality

BERRY CREEK - PHASE 6A

TSS Removal Calculations 04-20-2009 Project Name: **BERRY CREEK - PHASE 6A**
Date Prepared: **8/4/2022**

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

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

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

Site Data: Determine Required Load Removal Based on the Entire Project
 County = **Williamson**
 Total project area included in plan = **117.89** acres
 Predevelopment impervious area within the limits of the plan = **0.00** acres
 Total post-development impervious area within the limits of the plan = **47.37** acres
 Total post-development impervious cover fraction = **0.40**
 P = **32** inches

$L_{M \text{ TOTAL PROJECT}}$ = **41231** lbs. **80% REDUCTION**

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

Number of drainage basins / outfalls areas leaving the plan area = **2**

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

Drainage Basin/Outfall Area No. = **WQ Pond 2**

Total drainage basin/outfall area = **50.76** acres
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
 Post-development impervious area within drainage basin/outfall area = **24.46** acres
 Post-development impervious fraction within drainage basin/outfall area = **0.48**
 $L_{M \text{ THIS BASIN}}$ = **21290** lbs. **80% REDUCTION**

3. Indicate the proposed BMP Code for this basin.
 Proposed BMP = **Batch Detention**
 Removal efficiency = **91** percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.
 RG-348 Page 3-33 Equation 3.7: $L_R = (\text{BMP efficiency}) \times P \times (A_i \times 34.6 + A_p \times 0.54)$

where: A_C = Total On-Site drainage area in the BMP catchment area
 A_i = Impervious area proposed in the BMP catchment area
 A_p = Pervious area remaining in the BMP catchment area
 L_R = TSS Load removed from this catchment area by the proposed BMP

A_C = **50.76** acres
 A_i = **24.46** acres
 A_p = **26.30** acres
 L_R = **25058** lbs.

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area
 Desired $L_{M \text{ THIS BASIN}}$ = **22900** lbs.
 F = **0.91**

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

Rainfall Depth = **1.80** inches
 Post Development Runoff Coefficient = **0.35**
 On-site Water Quality Volume = **115327** cubic feet

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

Off-site area draining to BMP = **0.00** acres
 Off-site impervious cover draining to BMP = **0.00** acres
 Impervious fraction of off-site area = **0**
 Off-site Runoff Coefficient = **0.00**
 Off-site Water Quality Volume = **0** cubic feet

Storage for Sediment = **23065** cubic feet
Total Capture Volume (required water quality volume(s) x 1.20) = 138393 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.
 plus a second WQV.

Texas Commission on Environmental Quality

BERRY CREEK - PHASE 6A

TSS Removal Calculations 04-20-2009 Project Name: **6A**
Date Prepared: **8/4/2022**

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

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

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

Site Data: Determine Required Load Removal Based on the Entire Project
 County = **Williamson**
 Total project area included in plan = **111.66** acres
 Predevelopment impervious area within the limits of the plan = **0.00** acres
 Total post-development impervious area within the limits of the plan = **47.37** acres
 Total post-development impervious cover fraction = **0.42**
 P = **32** inches

$L_{M \text{ TOTAL PROJECT}}$ = **41231** lbs. **80% REDUCTION**

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

Number of drainage basins / outfalls areas leaving the plan area = **2**

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

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

Total drainage basin/outfall area = **22.33** acres
 Predevelopment impervious area within drainage basin/outfall area = **0.00** acres
 Post-development impervious area within drainage basin/outfall area = **0.70** acres
 Post-development impervious fraction within drainage basin/outfall area = **0.03**
 $L_{M \text{ THIS BASIN}}$ = **609** lbs. **80% REDUCTION**

		TSS REMOVAL SUMMARY							
		AREA NAME	BMP TYPE	TSS REMOVAL EFFICIENCY	BASIN AREA (AC.)	IMPERVIOUS (AC.)	IMPERVIOUS (%)	REQUIRED TSS LOAD REMOVAL (LBS.)	PROVIDED TSS LOAD REMOVAL (LBS.)
BERRY CREEK PHASE 6A	WQ Pond 1	Batch Detention	91	44.80	22.21	50%	19332	21500	
	WQ Pond 2	Batch Detention	91	50.76	24.46	48%	21290	22900	
	Untreated	NONE	0	22.33	0.70	3%	609	0	
Berry Creek Totals					117.89	47.37	40%	41231	44400

811
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WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

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

BY: _____ DATE: _____

REVISIONS: _____

No. _____

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TEXAS REGISTERED ENGINEERING FIRM F-928

AUGUST 2023
SCALE: AS SHOWN
DESIGNED BY: RMC
DRAWN BY: RJJ
CHECKED BY: ACS

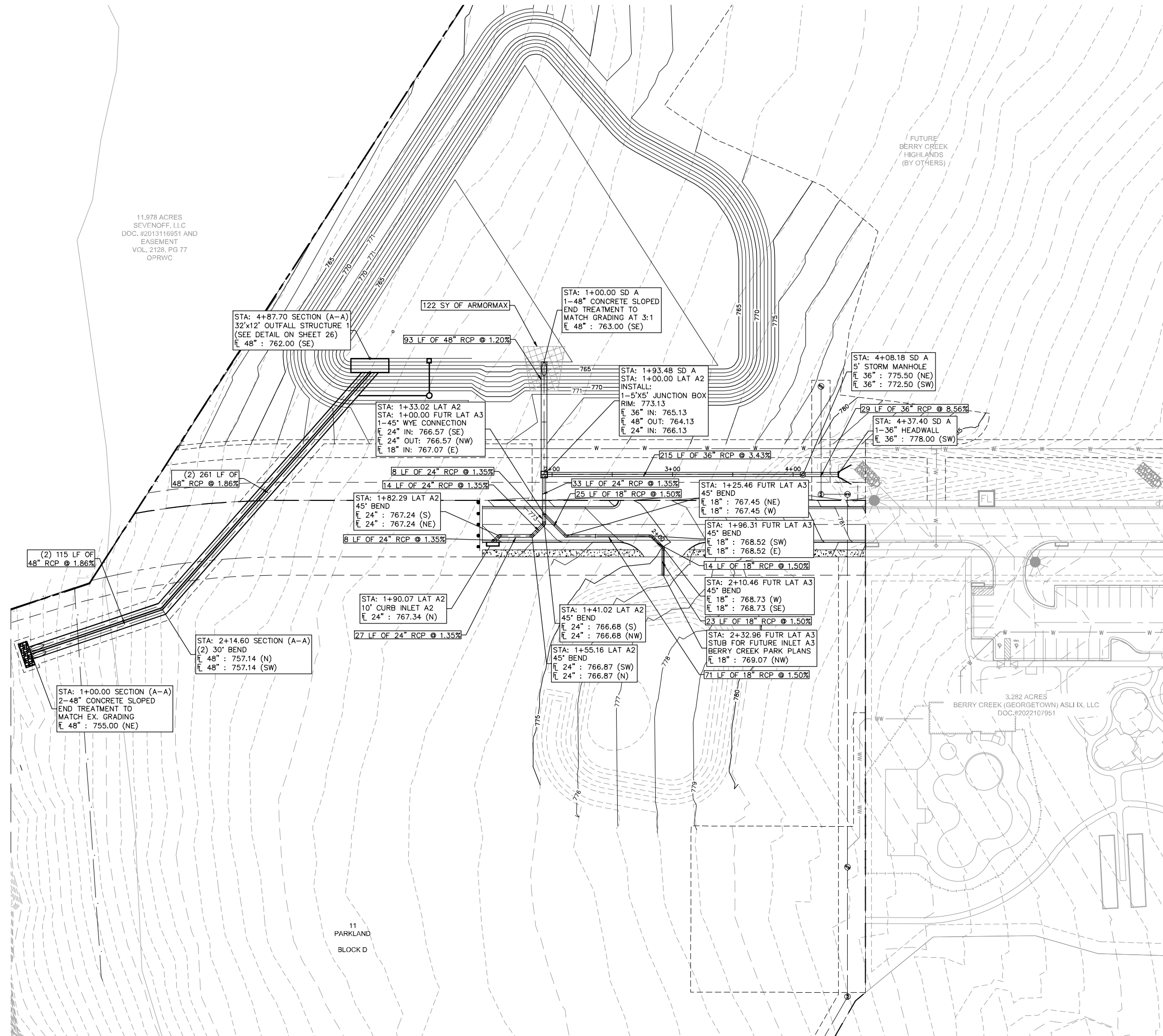
WATER QUALITY CALCULATIONS (2)

BERRY CREEK HIGHLANDS PHASE 6A
CITY OF GEORGETOWN, TEXAS
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
21

2023-17-CON

Plotted By: Ramirez, Adam Date: August 29, 2023 11:05:57am File Path: K:\AUS_Civil\067782815-Berry_Creek_Cool\Phase 6A\PlanSheets\Overall Storm Plan.dwg
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 DOC. #2013116951 AND
 EASEMENT
 VOL. 2128, PG 77
 OPRWC

FUTURE
 BERRY CREEK
 HIGHLANDS
 (BY OTHERS)

3.282 ACRES
 BERRY CREEK (GEORGETOWN) ASLI IX, LLC
 DOC.#2022107951

11
 PARKLAND
 BLOCK D



0 40' 80'
 GRAPHIC SCALE 40'

LEGEND

	MATCH LINE
	PROPERTY LINE
	PHASE LINE
	EXISTING WATER LINE
	EXISTING UNDERGROUND FIBER OPTIC LINE
	EXISTING UNDERGROUND TELEPHONE LINE
	EXISTING GAS LINE
	EXISTING OVERHEAD ELECTRIC LINE
	PROPOSED FIRE HYDRANT
	PROPOSED WATER LINE
	PROPOSED SANITARY SEWER LINE
	PROPOSED STORM SEWER LINE
	DOUBLE SANITARY SEWER SERVICE
	SINGLE SANITARY SEWER SERVICE
	SINGLE WATER SERVICE
	DOUBLE WATER SERVICE

No.	REVISIONS	DATE	BY

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 TEXAS REGISTERED ENGINEERING FIRM F-928

Alexander C. Steadman
 STATE OF TEXAS
 LICENSED PROFESSIONAL ENGINEER
 138792
 8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RRJ
CHECKED BY	ACS

OVERALL STORM PLAN



Know what's below.
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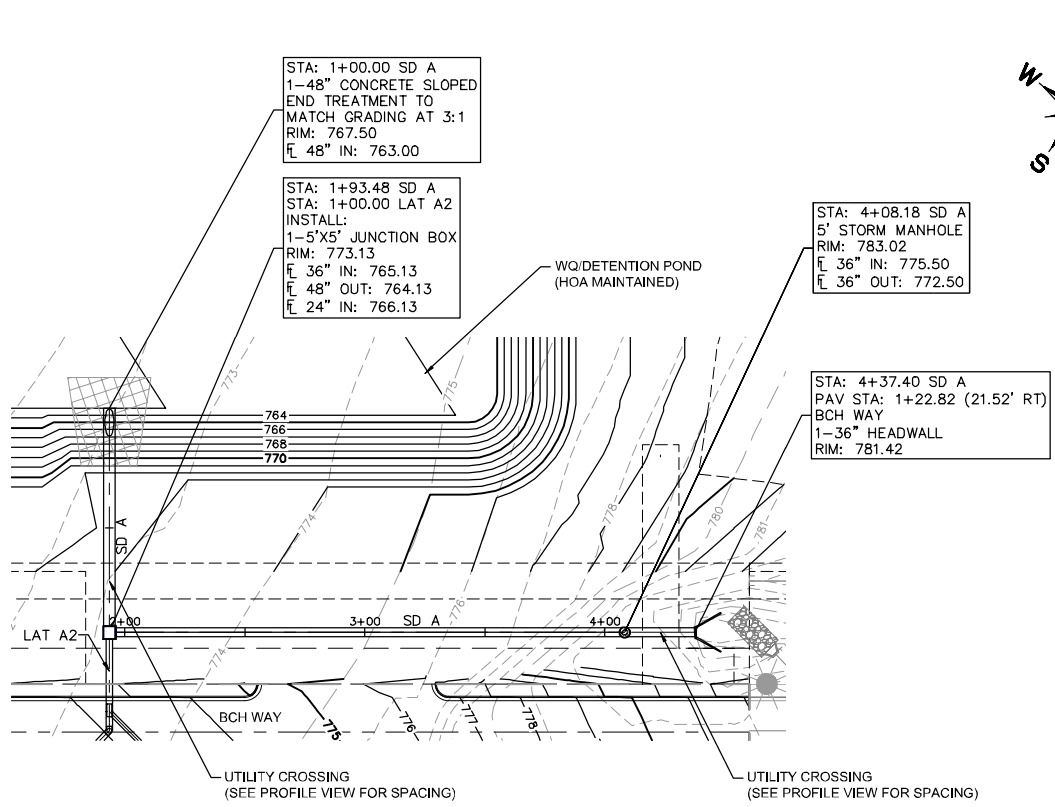
BENCHMARKS

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

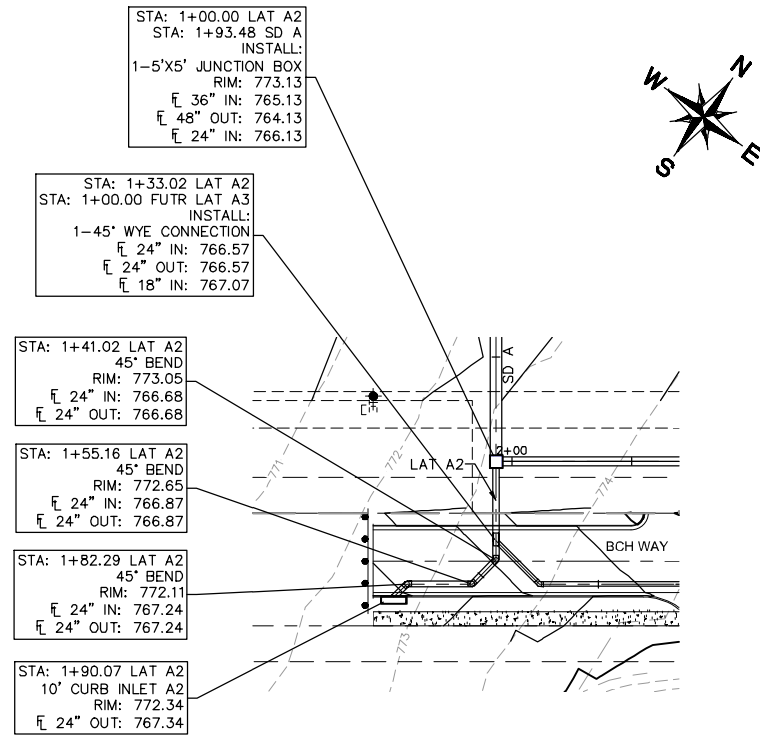
BERRY CREEK
 HIGHLANDS
 PHASE 6A
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
 22

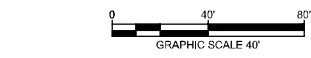
Plotted By: Ramirez, Adam Date: August 29, 2023 11:06:31am File Path: K:\AUS_Civil\067782815-Berry_Creek_Cod\Phase 6A\PlanSheets\C-Storm_P&P.dwg
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SD A



LAT A2



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
- — — — — PROPOSED SANITARY SEWER LINE
- — — — — PROPOSED STORM SEWER LINE
- — — — — MATCH LINE
- — — — — DOUBLE SANITARY SEWER SERVICE
- — — — — SINGLE SANITARY SEWER SERVICE

- STORM 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.

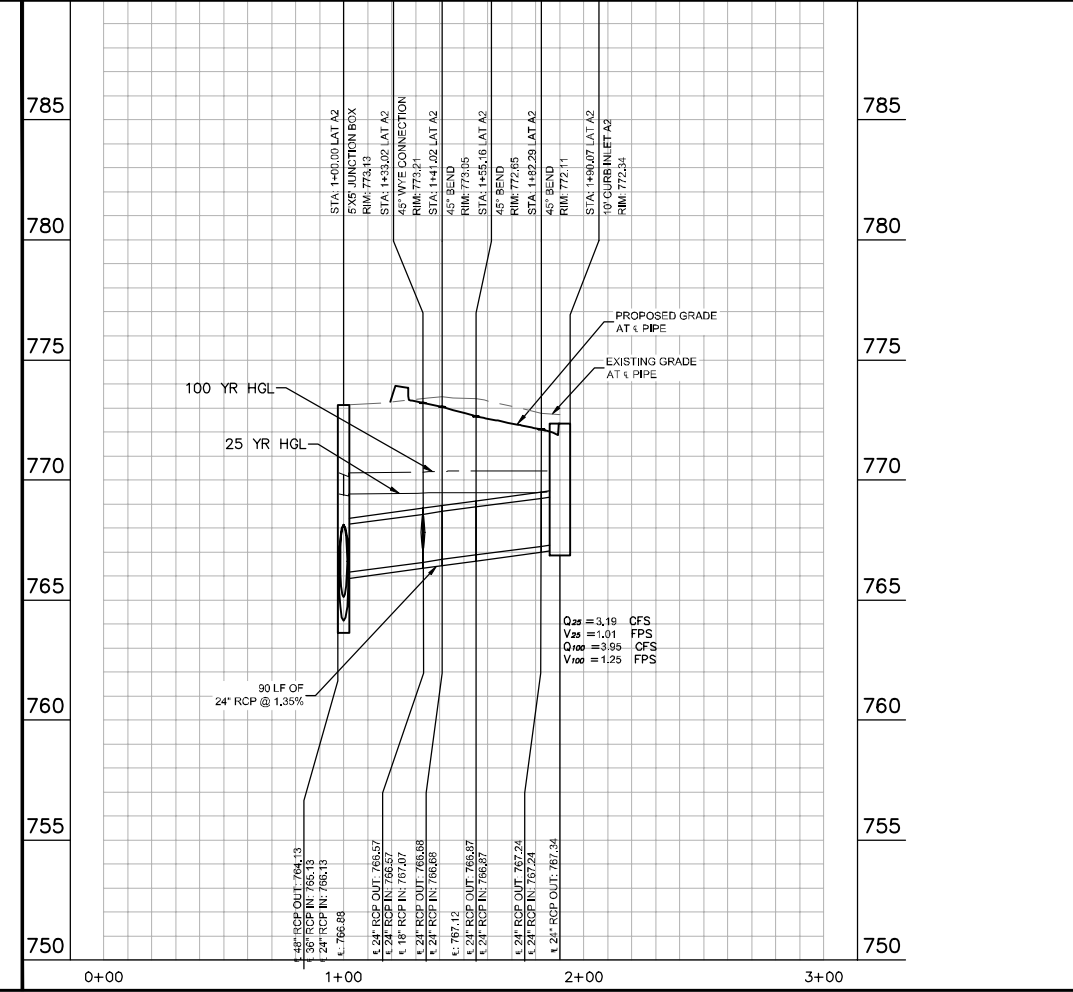
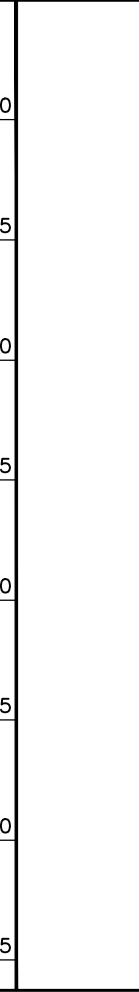
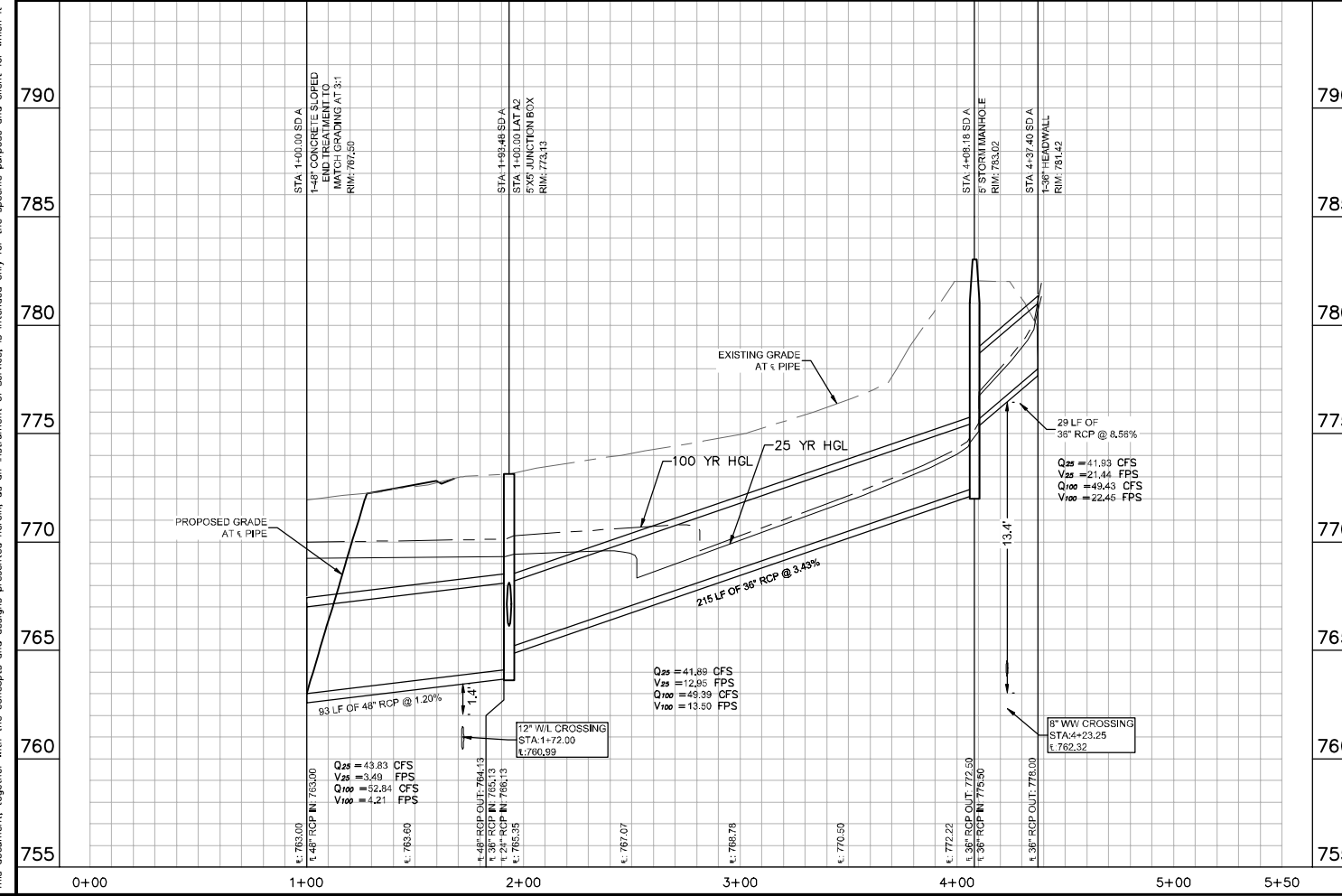
NO.	REVISIONS	DATE	BY

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8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
DESIGNED BY:	RMC
DRAWN BY:	RRJ
CHECKED BY:	ACS



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

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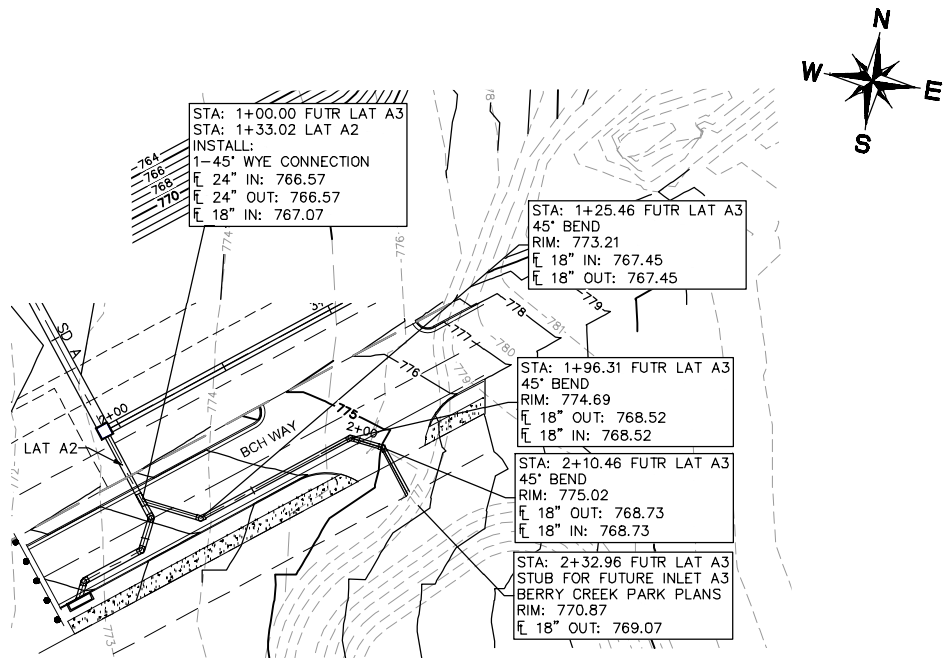
BENCHMARKS
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 ELEVATION = 821.82 FEET (AS SHOWN)

STORM PLAN & PROFILE
 (1 OF 2)

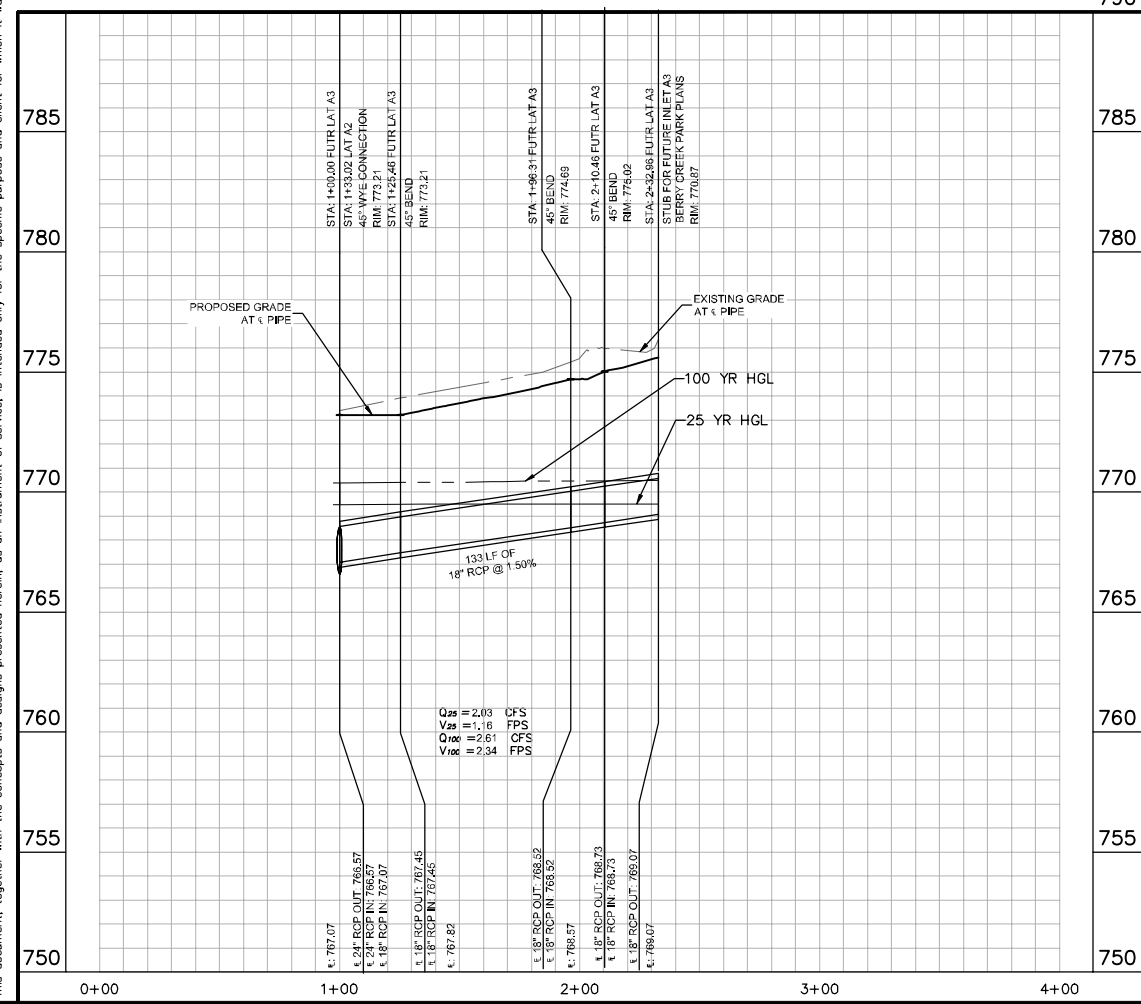
BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
23

Plotted By: Ramirez, Adam Date: August 29, 2023 11:06:39am File Path: K:\AUS_Civil\067782815-Berry_Creek_Col\Phase 6A\PlanSheets\Storm_P&P.dwg
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FUTR LAT A3 790



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



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BENCHMARKS
 TBM# 101 * X * SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIAN OF STATE HIGHWAY AND BUNNET LANE.
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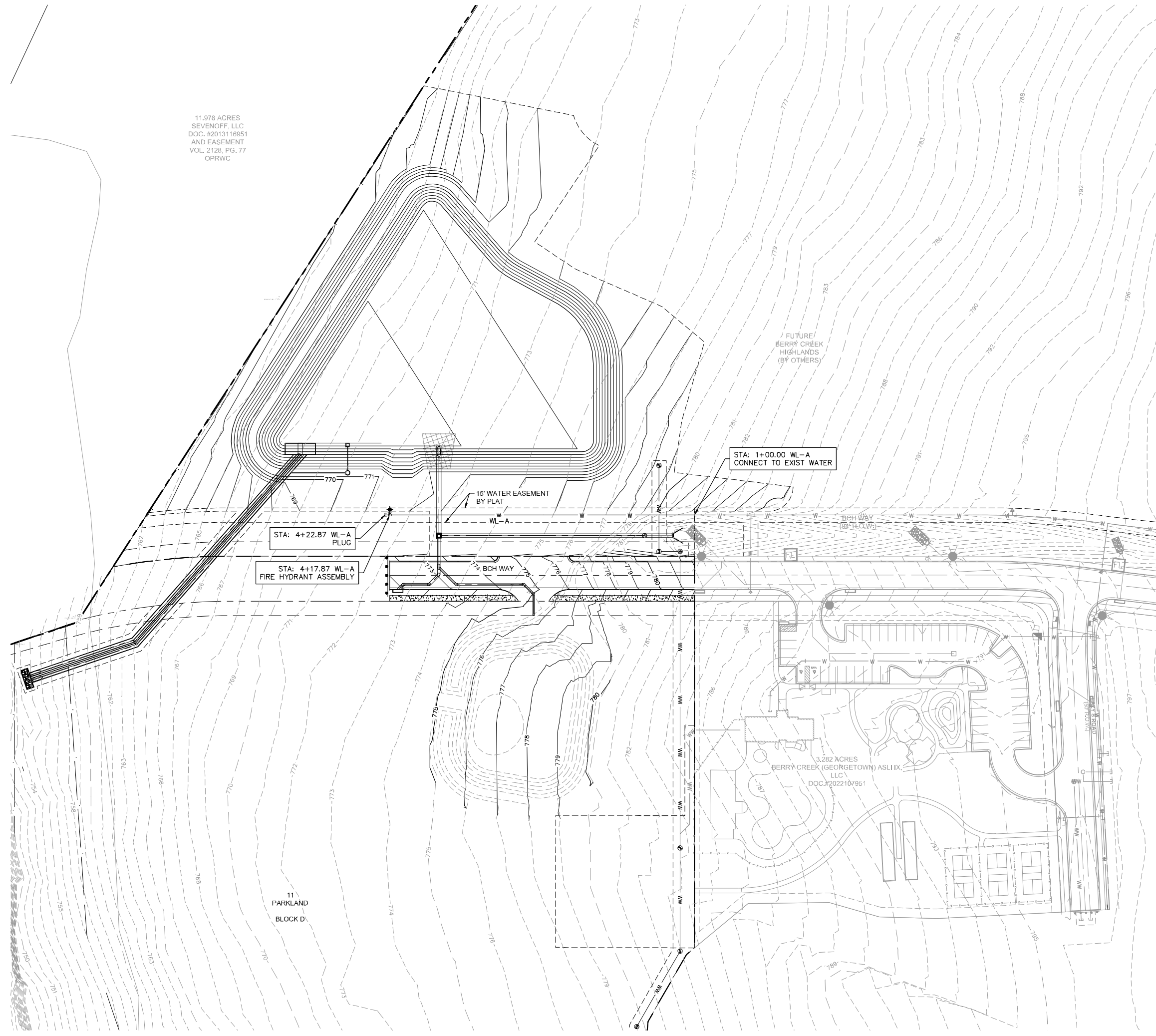
KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RRJ
CHECKED BY	ACS

STORM PLAN & PROFILE
 (2 OF 2)

BERRY CREEK
 HIGHLANDS
 PHASE 6A
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
 24

Plotted By: Ramirez, Adam Date: August 29, 2023 11:07:05am File Path: K:\AUS-Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\C--Overall Water Plan.dwg
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 AND EASEMENT
 VOL. 2128, PG. 77
 OPRWC



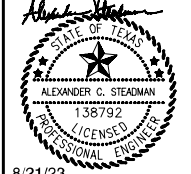
0 50' 100'
 GRAPHIC SCALE 50'

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

No.	REVISIONS	DATE	BY

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 TEXAS REGISTERED ENGINEERING FIRM F-928



8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RFJ
CHECKED BY	ACS

OVERALL WATER PLAN

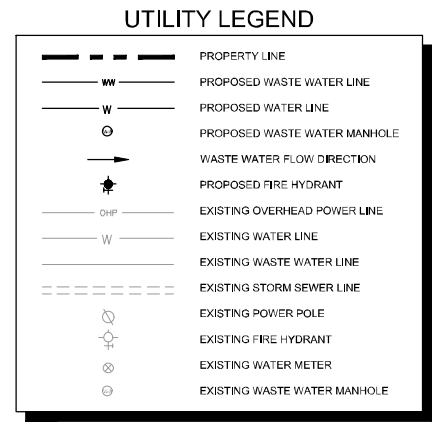
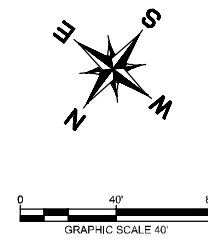
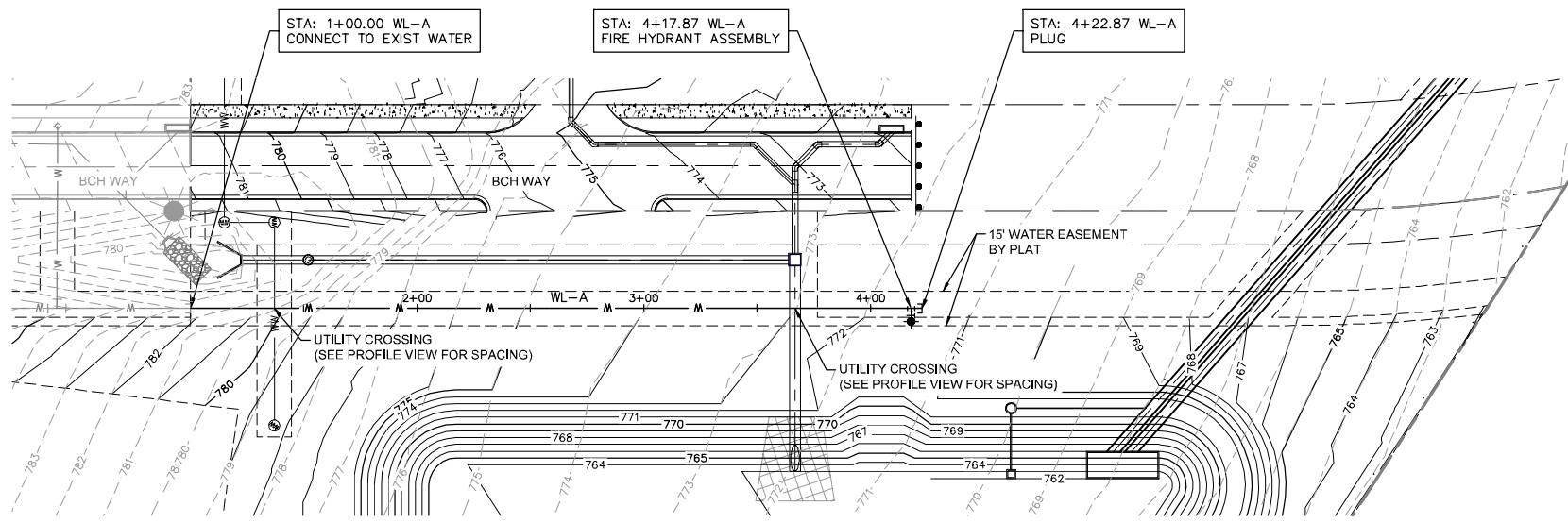
811
 Know what's below.
 Call before you dig.

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

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

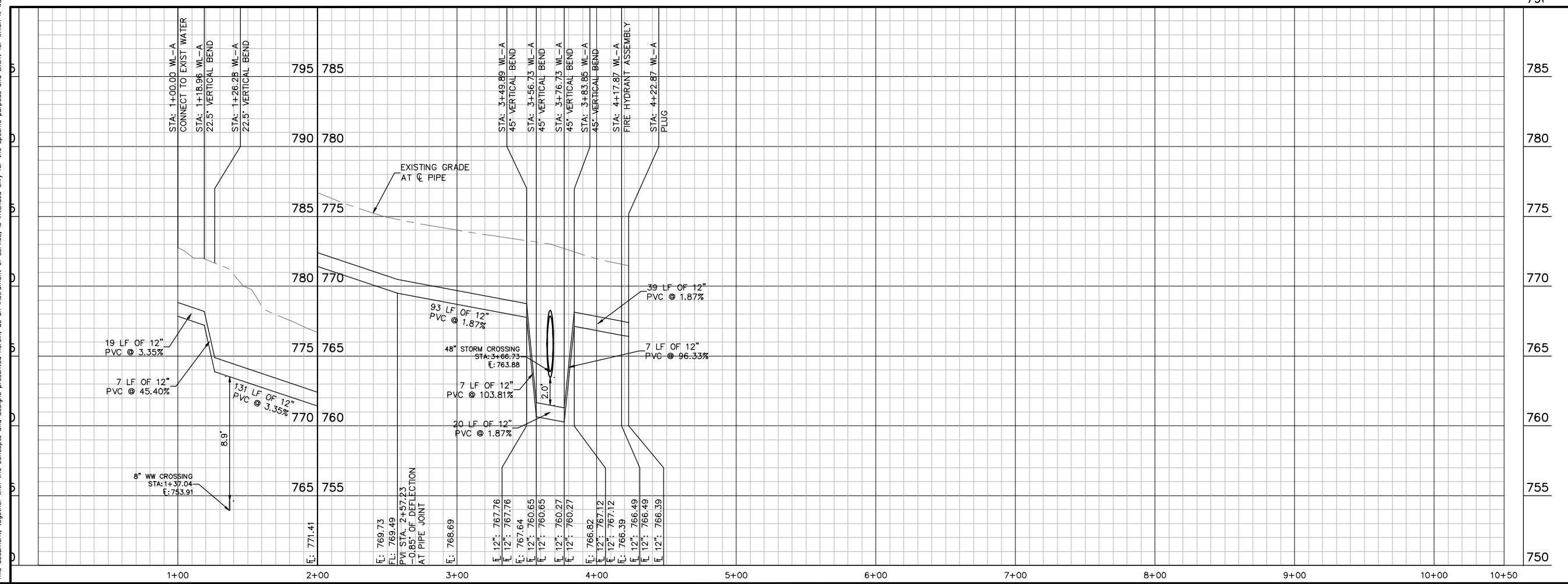
SHEET NUMBER
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Plotted By: Ramirez, Adam Date: August 29, 2023 11:07:27am File Path: K:\AUS-Civil\067782815-Berry Creek\Coa\Phase 6A\PlanSheets\Coa-Water Plan & Profile.dwg
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WL-A

791



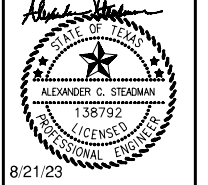
PROFILE SCALE
 1" = 40' HORIZONTAL
 1" = 4' VERTICAL



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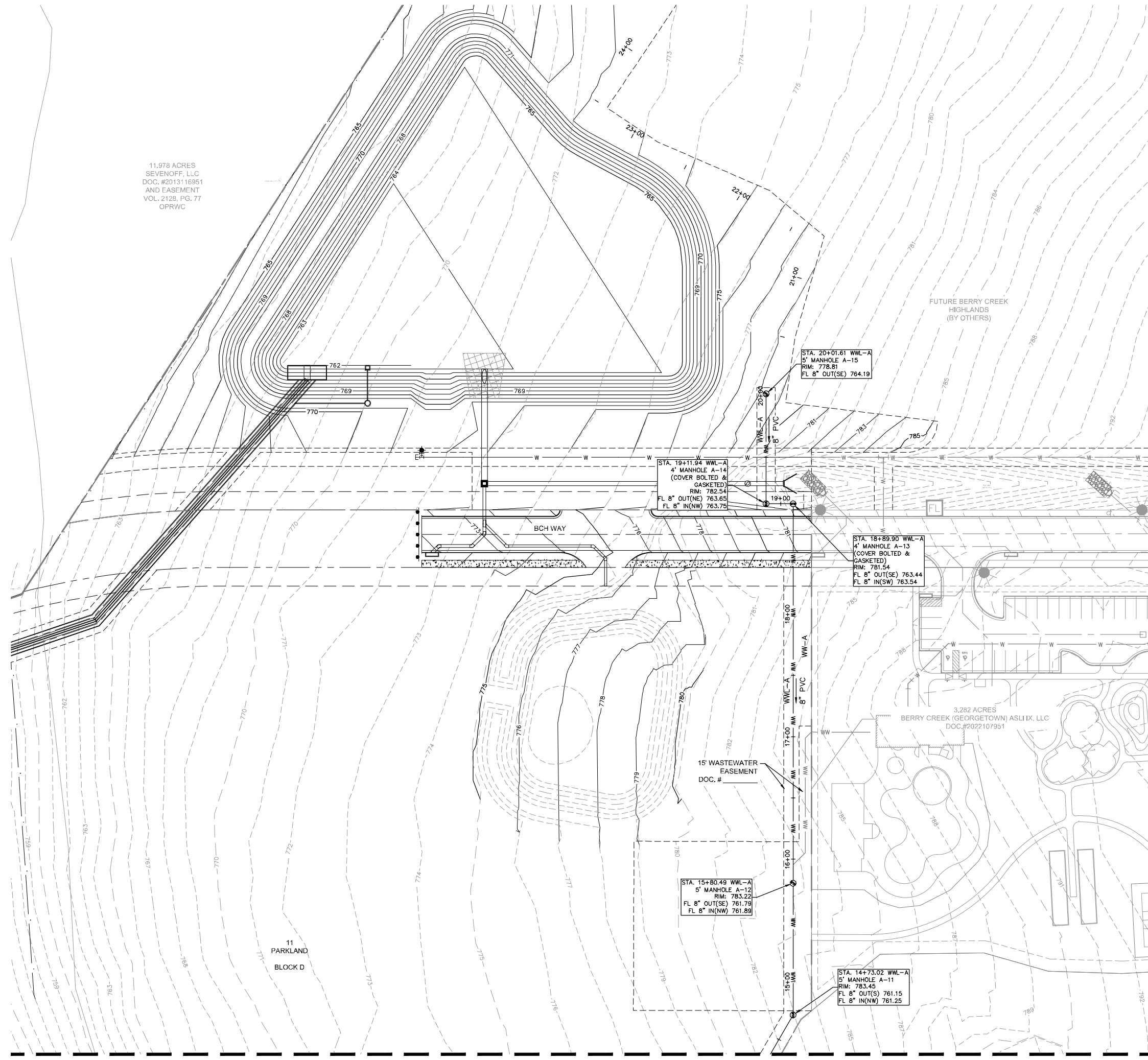
KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RRJ
CHECKED BY	ACS

WATER PLAN & PROFILE

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
26

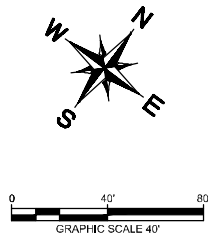
Plotted By: Ramirez, Adam Date: August 29, 2023 11:07:58am File Path: K:\AUS-Civil\067782815-Berry_Creek_Col\Phase 6A\PlanSheets\C-Overall Wastewater Plan.dwg
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11.978 ACRES
 SEVENOFF, LLC
 DOC. #2013116951
 AND EASEMENT
 VOL. 2128, PG. 77
 OPRWC

11
 PARKLAND
 BLOCK D

MATCHLINE SEE SHEET 28



UTILITY LEGEND

- PHASE LINE
- - - 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

No.	REVISIONS	DATE	BY

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8/21/23

KHA PROJECT 067782815
 DATE AUGUST 2023
 SCALE AS SHOWN
 DESIGNED BY: RMC
 DRAWN BY: RJJ
 CHECKED BY: ACS

**OVERALL WASTEWATER
 PLAN (1 OF 2)**

**BERRY CREEK
 HIGHLANDS
 PHASE 6A
 CITY OF GEORGETOWN,
 WILLIAMSON COUNTY, TEXAS**

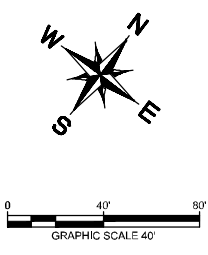
811
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WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

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

SHEET NUMBER
27

MATCHLINE SEE SHEET 27



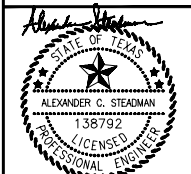
UTILITY LEGEND

	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

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TEXAS REGISTERED ENGINEERING FIRM F-928



8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RRJ
CHECKED BY	ACS

OVERALL WASTEWATER PLAN (2 OF 2)



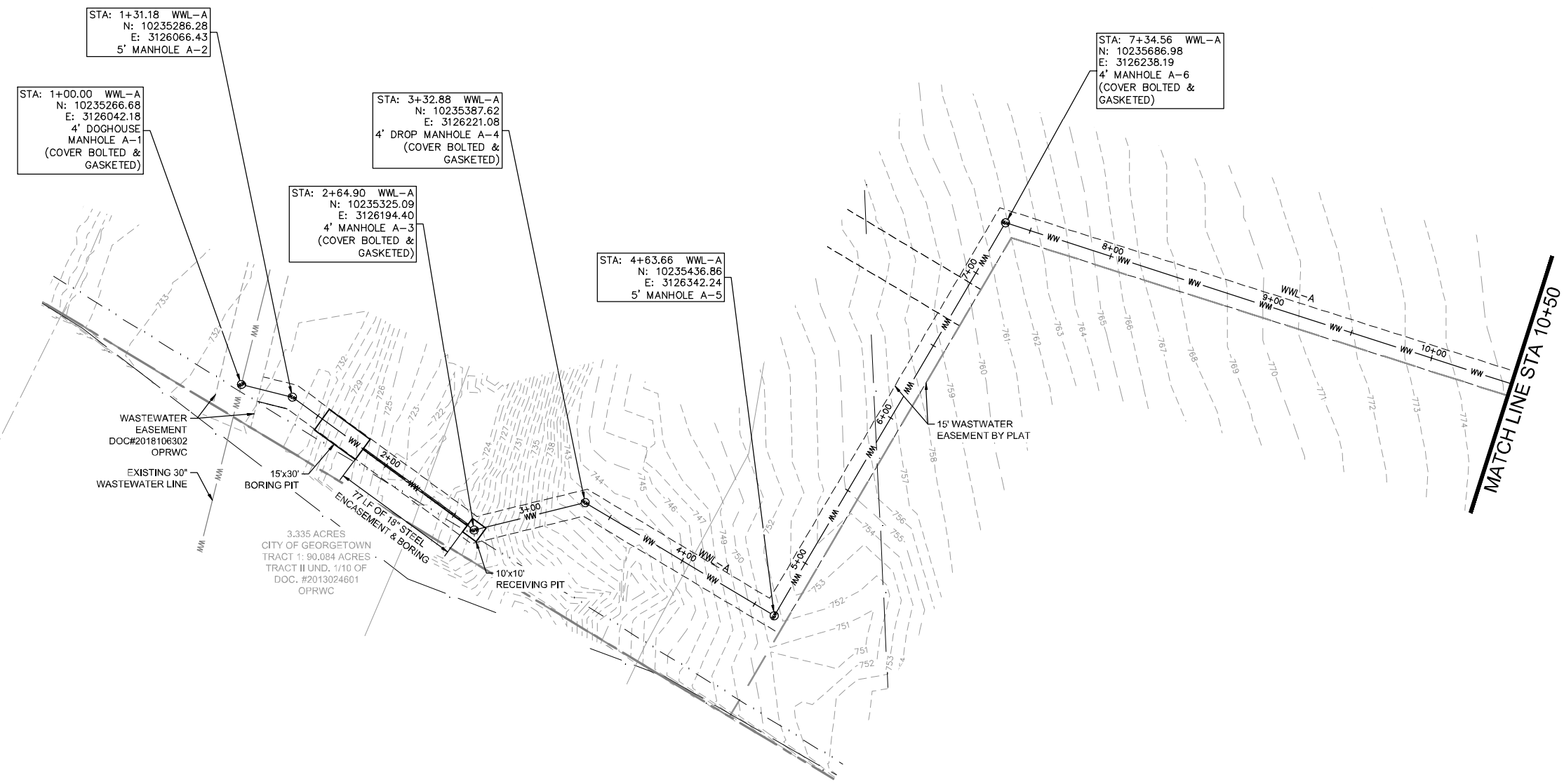
WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

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

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
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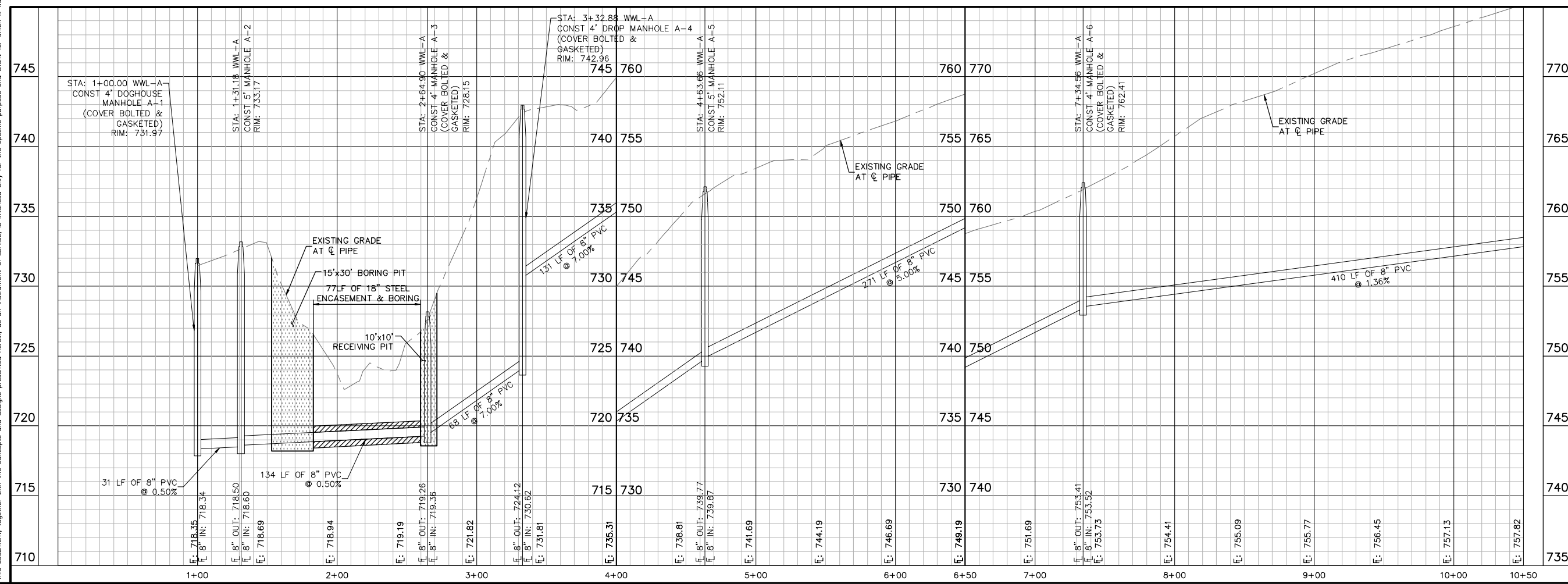
Plotted By: Ramirez, Adam Date: August 29, 2023 11:08:19am File Path: K:\AUS_Civil\067782815-Berry_Creek_Cod\Phase 6A\PlanSheets\C-Wastewater Plan & Profile.dwg
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UTILITY LEGEND

- PROPERTY LINE
- PROPOSED WASTE WATER LINE
- 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

WWL-A



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

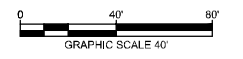
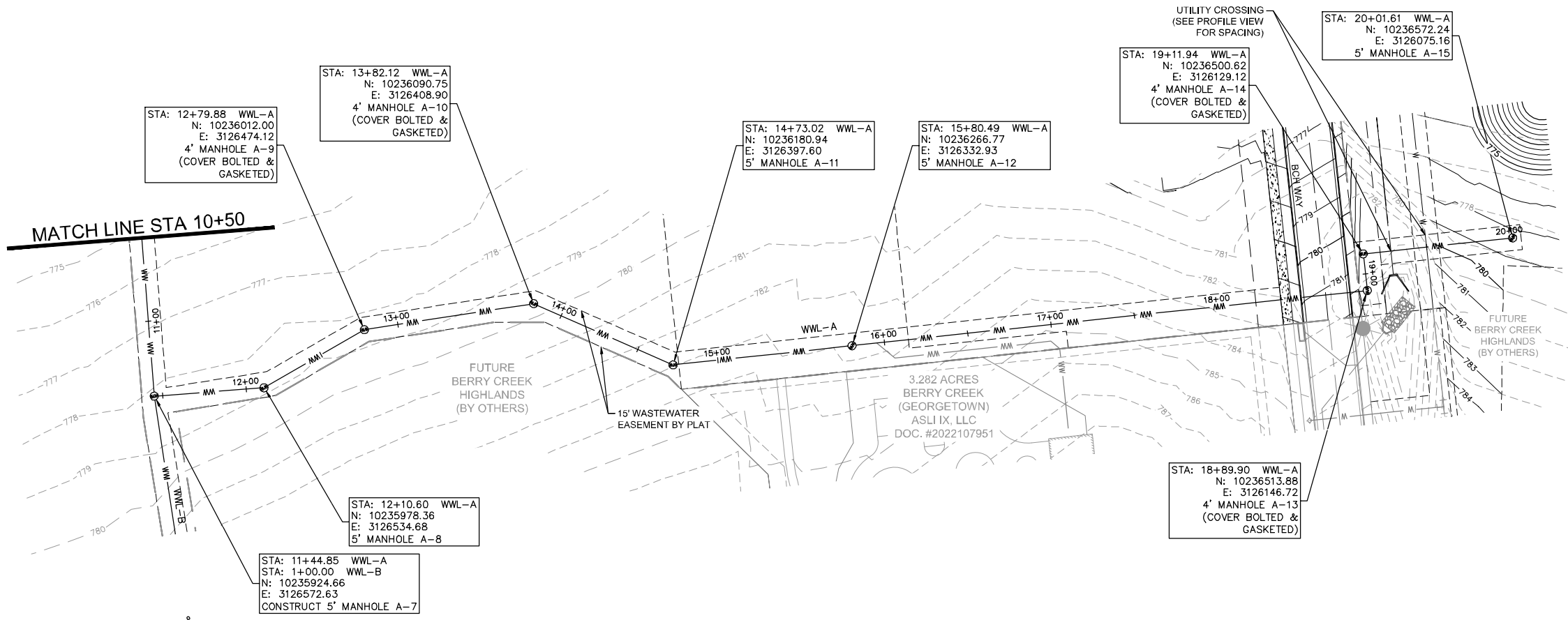
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MATCH LINE STA 10+50

KHA PROJECT 067782815		DATE AUGUST 2023		SCALE: AS SHOWN		DESIGNED BY: RMC		DRAWN BY: RRJ		CHECKED BY: ACS											
KIMLEY-HORN AND ASSOCIATES, INC. 10814 JOLLYVILLE ROAD, SUITE 200, AUSTIN, TX 78759 PHONE: 512-418-1771 FAX: 512-418-1791 WWW.KIMLEY-HORN.COM		STATE OF TEXAS ALEXANDER C. STEAMAN 138792 LICENSED PROFESSIONAL ENGINEER		BERRY CREEK HIGHLANDS PHASE 6A CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS		WASTEWATER PLAN & PROFILE - WWL-A (1 OF 2)		SHEET NUMBER 29		2023-17-CON											
<p>Kimley-Horn</p> <p>TEXAS REGISTERED ENGINEERING FIRM F-928</p>										<p>REVISIONS</p> <table border="1"> <tr><th>No.</th><th>DATE</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>		No.	DATE								
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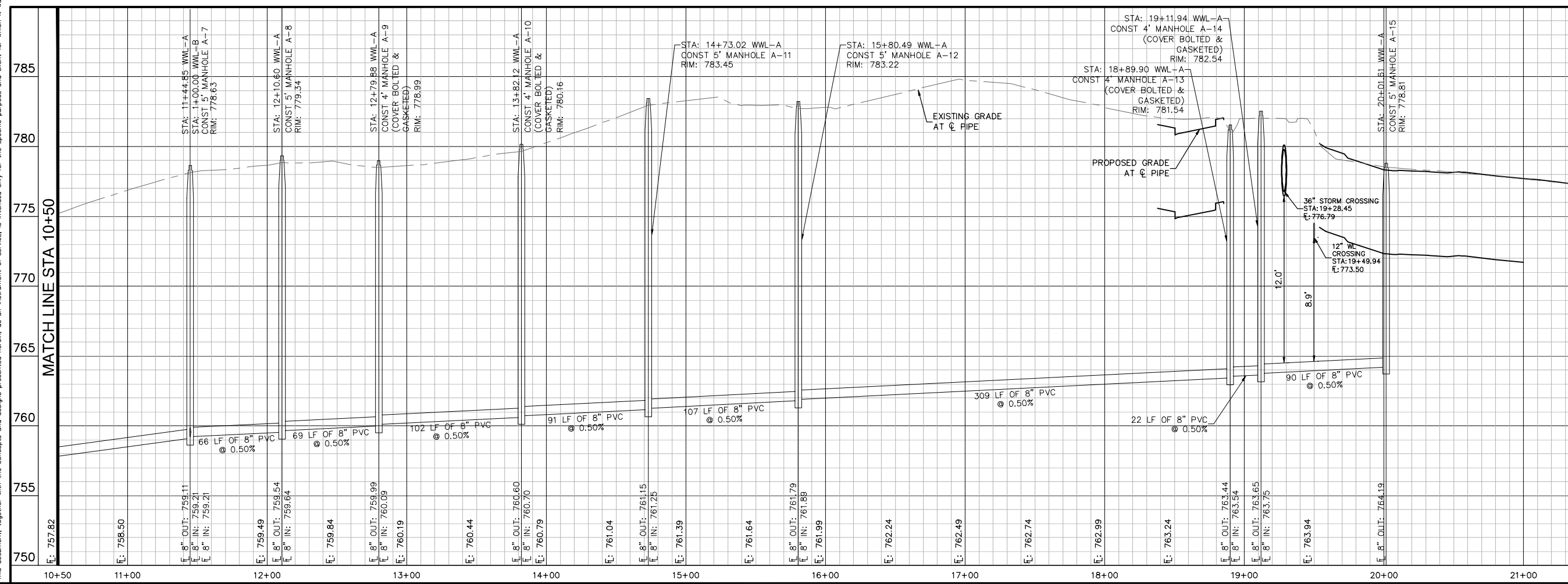
Plotted By: Ramirez, Adam Date: August 29, 2023 11:08:24am File Path: K:\AUS_Civil\067782819-Berry_Creek_Co\Phase 6A\PlanSheets\C-Wastewater Plan & Profile.dwg
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UTILITY LEGEND

---	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

WWL-A



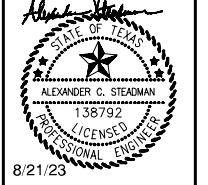
PROFILE SCALE
 1" = 40' HORIZONTAL
 1" = 4' VERTICAL



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

No.	REVISIONS	DATE	BY

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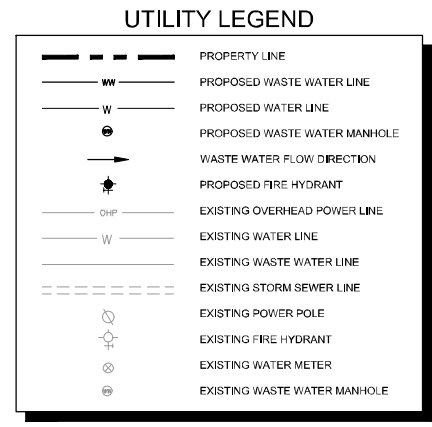
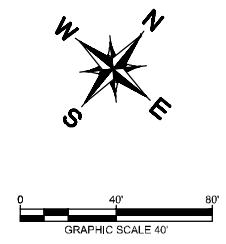
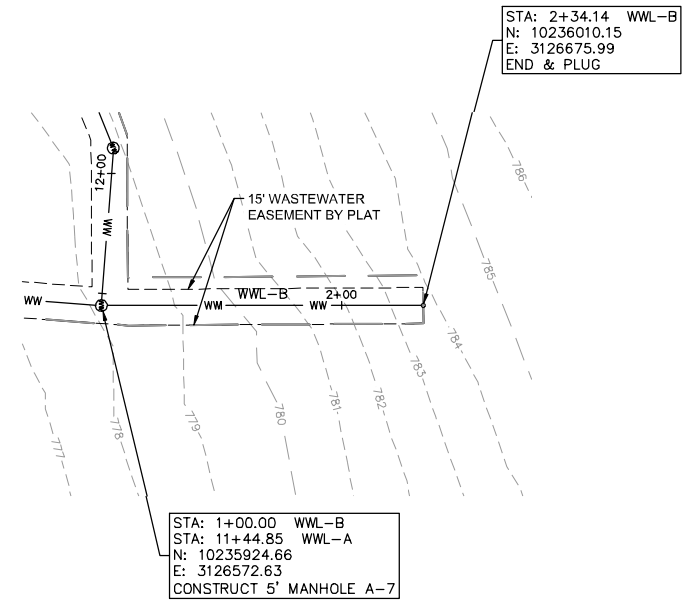


KHA PROJECT	067782819
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RRJ
CHECKED BY	ACS

WASTEWATER PLAN & PROFILE - WWL-A (2 OF 2)

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Plotted By: Ramirez, Adam Date: August 29, 2023 11:08:29am File Path: K:\AUS-Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\Wastewater Plan & Profile.dwg
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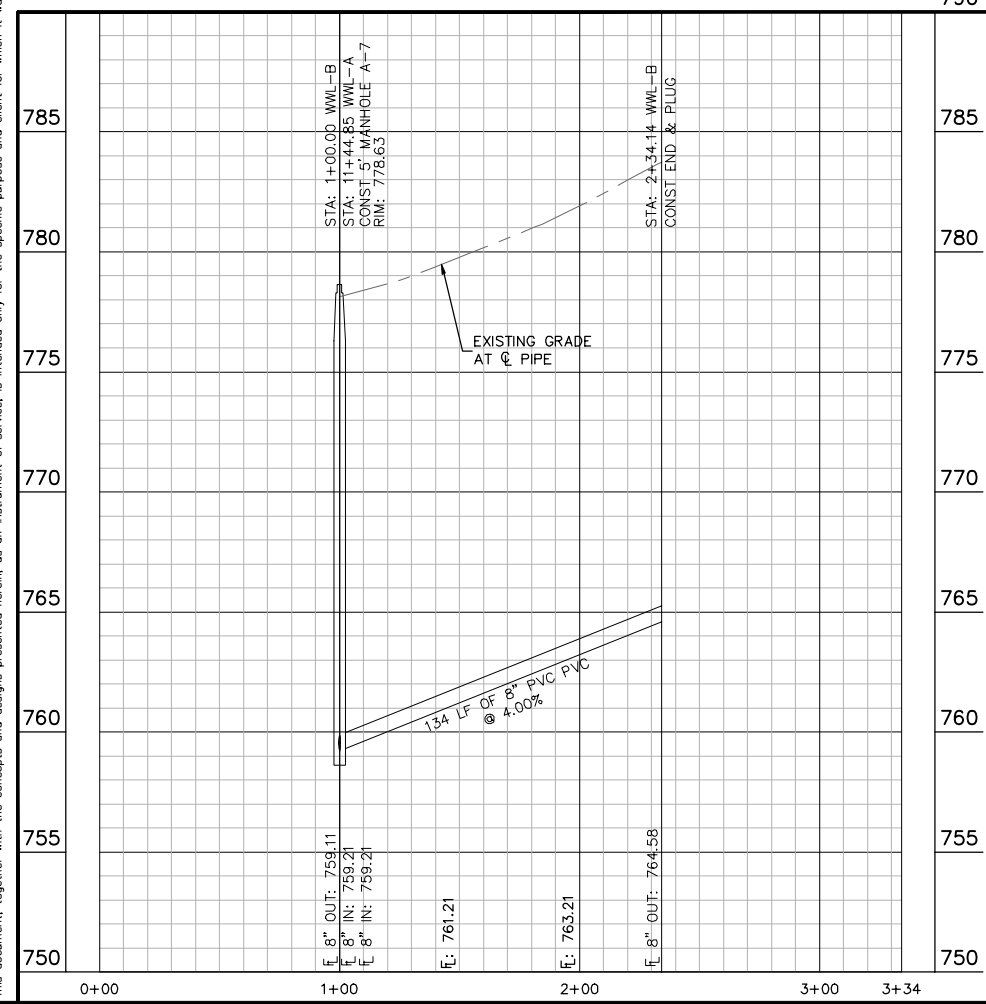
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KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY:	RMC
DRAWN BY:	RRJ
CHECKED BY:	ACS

WWL-B

790



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



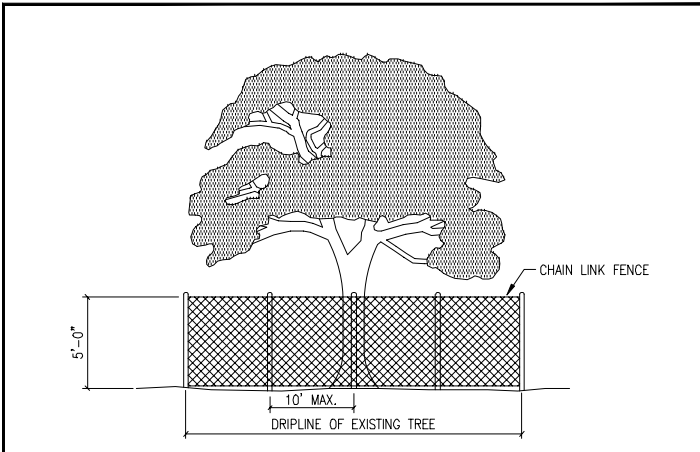
WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

WASTEWATER PLAN & PROFILE - WWL-B

BERRY CREEK HIGHLANDS PHASE 6A CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

SHEET NUMBER 31

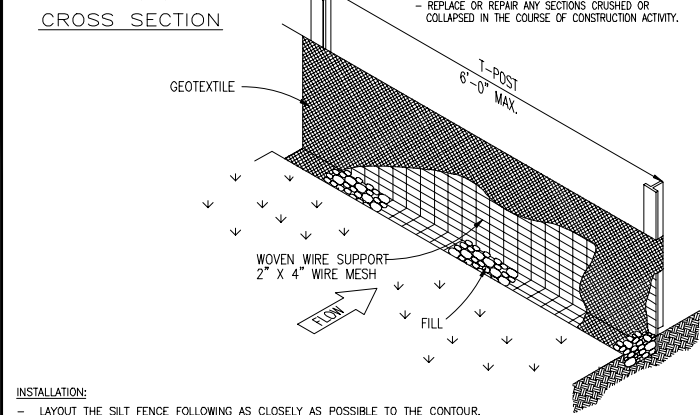
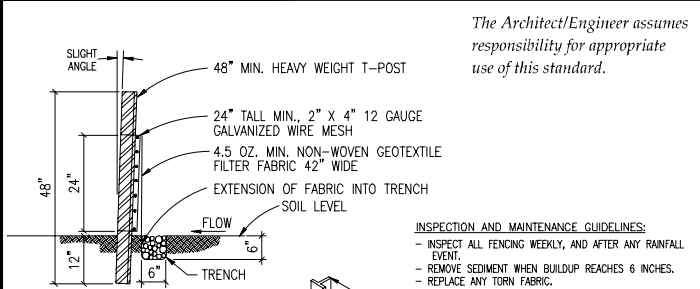
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- NOTES:
- TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
 - FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES, WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
 - SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
 - ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
 - WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
 - OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
 - EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
 - WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
 - 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.

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC09	DATE 6/21/2006
TREE PROTECTION - CHAIN LINK FENCE		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB



- INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
 - CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2') TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
 - DRIVE THE HEAVY DUTY T-POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
 - ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T-POST WITH 1 1/2 GAUGE GALVANIZED T-POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
 - THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1'.
 - ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
 - GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
 - SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

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

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC02	DATE 6/21/2006
SILT FENCE DETAIL		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC06	DATE 6/21/2006
STABILIZED CONSTRUCTION ENTRANCE		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB

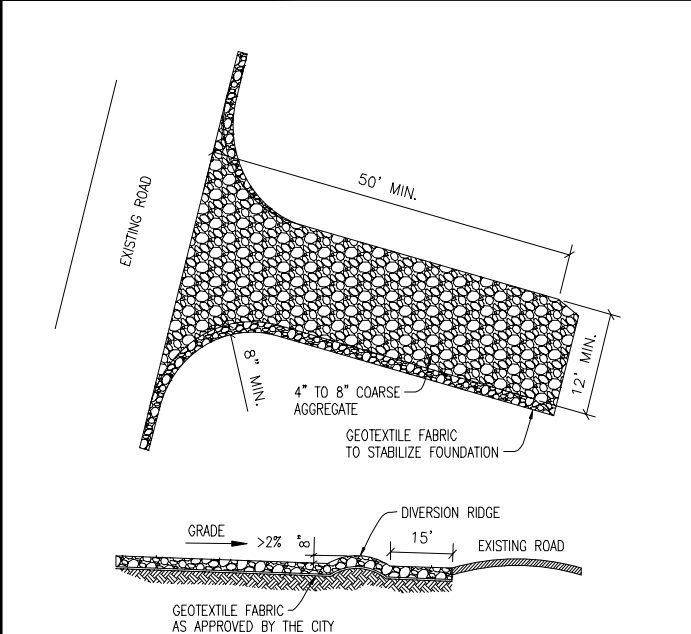
GUIDELINES FOR DESIGN AND INSTALLATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROLS

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
50 FEET	1/4 ACRE	> 30% SLOPE	
ROCK BERM *, **	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.

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

	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC01	DATE 6/21/2006
TEMPORARY EROSION AND SEDIMENTATION CONTROL GUIDELINES		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB



- INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
 - GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
 - PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
 - PLACE ROCK AS APPROVED BY THE CITY.
- INSPECTIONS AND MAINTENANCE GUIDELINES:
- THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
 - ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ON TO PUBLIC RIGHTS-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.
 - WHEN NECESSARY, WHEELS SHOULD BE CLEARED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY.
 - WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
 - ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

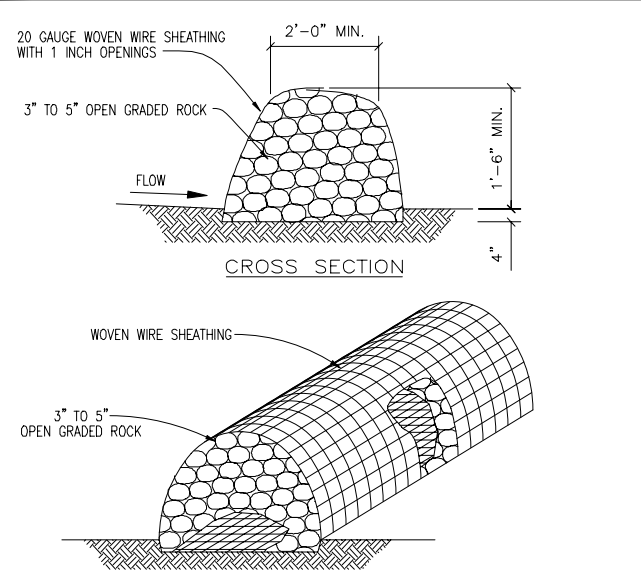
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	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC03	DATE 6/21/2006
ROCK BERM DETAIL		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB

- NOTE: THIS SECTION IS INTENDED TO ASSIST THOSE PERSONS PREPARING WATER POLLUTION ABATEMENT PLANS (WPAP) OR STORM WATER POLLUTION PREVENTION PLANS (SWPPP) THAT COMPLY WITH FEDERAL, STATE AND/OR LOCAL STORM WATER REGULATIONS.
- THE CONTRACTOR TO INSTALL AND MAINTAIN EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING, GRADING, OR EXCAVATION). CONTRACTOR TO REMOVE EROSION/SEDIMENTATION CONTROLS AT THE COMPLETION OF PROJECT AND GRASS RESTORATION.
 - ALL PROJECTS WITHIN THE RECHARGE ZONE OF THE EDWARDS AQUIFER SHALL SUBMIT A BEST MANAGEMENT PRACTICES AND WATER POLLUTION AND ABATEMENT PLAN TO THE TDCR FOR APPROVAL PRIOR TO ANY CONSTRUCTION.
 - THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS TO BE IN ACCORDANCE WITH THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN AND WATER POLLUTION ABATEMENT PLAN. DEVIATIONS FROM THE APPROVED PLAN MUST BE SUBMITTED TO AND APPROVED BY THE OWNER'S REPRESENTATIVE.
 - ALL PLANTING SHALL BE DONE BETWEEN MAY 1 AND SEPTEMBER 15 EXCEPT AS SPECIFICALLY AUTHORIZED IN WRITING. IF PLANTING IS AUTHORIZED TO BE DONE OUTSIDE THE DATES SPECIFIED, THE SEED SHALL BE PLANTED WITH THE ADDITION OF WINTER FERTILIZER (KENTUCKY 37) AT A RATE OF 100#/ACRE. GRASS SHALL BE COMMON BERMAUDA GRASS, HULLED, MINIMUM 80% PURE LIVE SEED. ALL GRASS SEED SHALL BE FREE FROM NOXIOUS WEED, GRADE A RECENT CROP, RECLEANED AND TREATED WITH APPROPRIATE FUNGICIDE AT TIME OF MIXING. SEED SHALL BE FURNISHED IN SEALED, STANDARD CONTAINERS WITH DEALER'S GUARANTEED ANALYSIS.
 - ALL DISTURBED AREAS TO BE RESTORED AS NOTED IN THE WATER POLLUTION ABATEMENT PLAN.
 - THE PLANTED AREA TO BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL, BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF FOUR (4) INCHES. THE IRRIGATION TO OCCUR AT 10-DAY INTERVALS DURING THE FIRST TWO MONTHS TO INSURE GERMINATION AND ESTABLISHMENT OF THE GRASS. RAINFALL OCCURRENCES OF 1/2 INCH OR GREATER TO POSTPONE THE WATERING SCHEDULE ONE WEEK.
 - RESTORATION TO BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1-1/2 INCHES HIGH WITH 95% COVERAGE. PROVIDED NO BARE SPOTS LARGER THAN 25 SQUARE FEET EXIST.
 - A MINIMUM OF FOUR (4) INCHES OF TOPSOIL TO BE PLACED IN ALL AREAS DISTURBED BY CONSTRUCTION.
 - THE CONTRACTOR TO HYDROMULCH OR SOO (AS SHOWN ON PLANS) ALL EXPOSED CUTS AND FILLS UPON COMPLETION OF CONSTRUCTION.
 - EROSION AND SEDIMENTATION CONTROLS TO BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN TREE DRIPLINE.
 - TO AVOID SOIL COMPACTION, CONTRACTOR SHALL NOT ALLOW VEHICULAR TRAFFIC, PARKING, OR STORAGE OF EQUIPMENT OR MATERIALS IN THE TREE DRIPLINE AREAS.
 - 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.
 - TREES TO BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
 - 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.
 - CONTRACTOR TO PRUNE VEGETATION TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT BEFORE DAMAGE OCCURS (SPRINGS OF BRANCHES, ETC.) ALL FINISHED PRUNING TO BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES).
 - THE CONTRACTOR IS TO INSPECT THE CONTROLS AT WEEKLY INTERVALS AND AFTER EVERY RAINFALL EXCEEDING 1/4 INCH TO VERIFY THAT THEY HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY ACCUMULATED SEDIMENT AFTER A SIGNIFICANT RAINFALL TO BE REMOVED AND PLACED IN THE OWNER DESIGNATED SPOIL DISPOSAL SITE. THE CONTRACTOR TO CONDUCT PERIODIC INSPECTIONS OF ALL EROSION/SEDIMENTATION CONTROLS AND TO MAKE ANY REPAIRS OR MODIFICATIONS NECESSARY TO ASSURE CONTROLLED EFFECTIVE OPERATION OF EACH DEVICE.
 - WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT IMMEDIATELY ADJACENT TO A PROTECTED TREE, ERECT THE FENCE APPROXIMATELY TWO TO FOUR FEET (2'-4') BEHIND THE AREA IN QUESTION.
 - NO ABOVE AND/OR BELOW GROUND TEMPORARY FUEL STORAGE FACILITIES TO BE STORED ON THE PROJECT SITE.
 - IF EROSION AND SEDIMENTATION CONTROL SYSTEMS ARE EXISTING FROM PRIOR CONTRACTS, OWNER'S REPRESENTATIVE AND THE CONTRACTOR TO EXAMINE THE EXISTING EROSION AND SEDIMENTATION CONTROL SYSTEMS FOR DAMAGE PRIOR TO CONSTRUCTION. ANY DAMAGE TO PREEXISTING EROSION AND SEDIMENTATION CONTROLS NOTED TO BE REPAIRED AT OWNERS EXPENSE.
 - INTENTIONAL RELEASE OF VEHICLE OR EQUIPMENT FLUIDS ONTO THE GROUND IS NOT ALLOWED. CONTAMINATED SOIL RESULTING FROM ACCIDENTAL SPILL TO BE REMOVED AND DISPOSED OF PROPERLY.

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

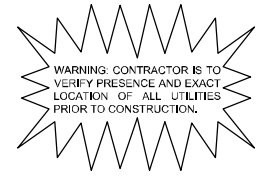
	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC01A	DATE 6/21/2006
EROSION AND SEDIMENTATION AND TREE PROTECTION NOTES		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB



- INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
 - CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
 - PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCLOSE THE FINISHED SIZE OF THE BERM.
 - PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
 - WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS ITS SHAPE.
 - SECURE WITH THE WIRE.
 - THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
 - THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.
- INSPECTIONS AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
 - REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
 - REMOVE 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.

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	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	ADOPTED 6/21/2006	
		NO. EC03	DATE 6/21/2006
ROCK BERM DETAIL		DATE 1/2003	APPROVED BY TRB
		DATE 1/2003	APPROVED BY TRB



BENCHMARKS

TBM# 101 * X * SET IN HEADWALL OF CULVERT LOCATED IN THE MEDIUM OF STATE HIGHWAY AND BUNNET LANE. ELEVATION = +821.82 FEET (AS SHOWN)

		REVISIONS	DATE
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KHA PROJECT 067782815	DATE AUGUST 2023	SCALE AS SHOWN	DESIGNED BY RWC
		DRAWN BY RJJ	CHECKED BY ACS
EROSION CONTROL DETAILS			
BERRY CREEK HIGHLANDS PHASE 6A CITY OF GEORGETOWN, TEXAS WILLIAMSON COUNTY, TEXAS			
SHEET NUMBER 33			
2023-17-CON			

Pinned By: Ramirez, Adam Date: August 29, 2023 11:09:04am File Path: \\AUS-CHIL\067782819-Berry_Creek_Coal\Phase 6A\PlanSheets\C-Paving Details.dwg
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NOTES:

1. COMMERCIAL SIDEWALKS WIDTHS - 6'
2. RESIDENTIAL SIDEWALKS WIDTHS - 5'
3. ALL SLOPES ARE MAXIMUM ALLOWABLE. FLATTER SLOPES THAT WILL STILL DRAIN PROPERLY ARE ENCOURAGED.
4. ALL CONCRETE SURFACES SHALL RECEIVE A LIGHT BROOM FINISH UNLESS NOTED OTHERWISE IN THE PLANS.
5. FOR PURPOSES OF WARNING, THE CURB RAMPS SHALL HAVE A LIGHT REFLECTIVE VALUE AND TEXTURE THAT SIGNIFICANTLY CONTRASTS WITH THAT OF ADJACENT PEDESTRIAN ROUTES.
6. TEXTURES MAY CONSIST OF PAVERS WITH TRUNCATED DOMED SURFACES. TEXTURES ARE REQUIRED TO BE DETECTABLE UNDERFOOT SURFACES THAT WOULD ALLOW WATER TO ACCUMULATE ARE PROHIBITED.
7. COLOR CONTRAST, FOR EXAMPLE, MAY BE ACCOMPLISHED WITH COLORED CONCRETE PAVERS THAT HAVE TRUNCATED DOMES WHICH WOULD PROVIDE A CONTRAST WITH TYPICALLY LIGHT COLORED CONCRETE.
8. ADDITIONAL INFORMATION ON CURB RAMP LOCATION, DESIGN, VISIBILITY AND TEXTURE MAY BE FOUND IN THE CURRENT EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (AS) PREPARED AND ADMINISTERED BY THE TEXAS DEPARTMENT OF LICENSING AND REGULATION (TDLR).
9. RAISED MEDIANS SEPARATE OPPOSING DIRECTIONS OF TRAFFIC AND PROVIDE A REFUGE AREA FOR PEDESTRIANS IF THEY ARE UNABLE TO CROSS THE ENTIRE ROADWAY IN THE ALLOTTED SIGNAL PHASE. MEDIAN CROSSING SHALL BE A MINIMUM OF 5' WIDE. MEDIANS SHOULD BE DESIGNED TO PROVIDE ACCESSIBLE PASSAGE OVER OR THROUGH THEM.
10. ALL SIDEWALK PLANS AND DETAILS SHALL BE SUBMITTED AND APPROVED BY "REGISTERED ACCESSIBILITY SPECIALIST" (RAS).
11. ANY PART OF THE ACCESSIBLE ROUTE WITH A SLOPE GREATER THAN 1:20 (5%) SHALL BE CONSIDERED A RAMP. IF A RAMP HAS A RISE GREATER THAN 6 INCHES OR A HORIZONTAL PROJECTION GREATER THAN 72 INCHES, THEN IT SHALL MEET THE REQUIREMENTS OF A RAMP PER THE 405:101 ONLY EXCEPTION IS AT CURB RAMPS. HANDRAILS ARE NOT REQUIRED ON CURB RAMPS. CURB RAMPS SHALL BE PROVIDED WHERE EVER AN ACCESSIBLE ROUTE CROSSES (PENETRATES) A CURB.
12. TRAFFIC SIGNAL OR ILLUMINATION POLES, GROUND BOXES, CONTROLLER BOXES, SIGNS, DRAINAGE FACILITIES AND OTHER ITEMS SHALL BE PLACED SO NOT TO OBSTRUCT THE ACCESSIBLE ROUTE OR NOT PROTRUDING OBJECTS.
13. ALL SIDEWALKS SHALL BE DOWNE INTO EXISTING SIDEWALKS, DRIVEWALKS, DRIVEWAYS, INLET BOXES, RETAINING WALLS, ETC.
14. ALL SIDEWALK CROSS-SLOPES SHALL NOT EXCEED 1:50, UNLESS A VARIANCE IS PROVIDED BY TDLR.

(PENETRATES) A CURB.

REVISED 6/20/2018 WSD	SD28
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
PEDESTRIAN RAMPS GENERAL NOTES

STREET AND ROADWAY DESIGN CRITERIA

LOCAL CLASSIFICATION	TOTAL EQUIVALENT 10K AXLE LOAD APPLICATIONS (20 YEAR, FLEETABLE DESIGN)
LOCAL	25,000
RESIDENTIAL	25,000
LOCAL DRIVEWAY	25,000
COLLECTORS	80,000
RESIDENTIAL	25,000
MAJOR NEIGHBORHOOD	25,000
MEDIAN	1,000,000
MAJOR INTERVAL	2,500,000

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REVISED 6/23/2015 WSD	SD01
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPICAL HALF CROSS - SECTIONS FOR H.W.A.C. SURFACED STREETS

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REVISED 6/23/2015 WSD	SD06
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CURB AND GUTTER DETAILS

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REVISED 6/20/2018 WSD	SD15
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE DRIVEWAY APPROACH TYPICAL

EACH ROADWAY OF DIVIDED HIGHWAY SHALL BE BARRICADED, IN THE SAME MANNER.

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REVISED 6/23/2015 WSD	SD22
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPE III CONSTRUCTION BARRICADE

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REVISED 6/23/2015 WSD	SD14
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK SECTION AND JOINT DETAIL

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REVISED 6/23/2015 WSD	SD03
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
CONCRETE VALLEY GUTTER DETAIL

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REVISED 6/20/2018 WSD	SD31
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
SIDEWALK RAMPS DETAILS TYPE 1-3

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REVISED 6/23/2015 WSD	CFD-122
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DECORATIVE STREETLIGHT POLE (DARK GREEN)

MATERIAL LIST

ITEM NO.	STOCK NO.	DESCRIPTION	8'	10'	12'	14'
zz	360274	Streetlight, Luminaire, 100W, Type II	1	1	1	1
zz	360370	Streetlight, Luminaire, 100W, Type V	1	1	1	1
zz	360276	Streetlight Post, Bark Green, 8'	1	1	1	1
zz	360377	Streetlight Post, Bark Green, 10'	1	1	1	1
zz	360378	Streetlight Post, Bark Green, 12'	1	1	1	1
zz	360379	Streetlight Post, Bark Green, 14'	1	1	1	1

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REVISED 6/23/2015 WSD	CFD-122A
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DECORATIVE STREETLIGHT POLE (DARK GREEN)

SIGN TYPE "A"

SIGN TYPE "B"

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REVISED 6/23/2015 WSD	CFD-122A
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
DECORATIVE STREETLIGHT POLE (DARK GREEN)

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REVISED 6/23/2015 WSD	CFD-122A
ADOPTED 6/21/2006 TRB	

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
BENCHMARKS

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

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

BENCHMARKS

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

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TEXAS REGISTERED ENGINEERING FIRM # 928

STATE OF TEXAS
ALEXANDER C. STEADMAN
138792
LICENSED PROFESSIONAL ENGINEER

8/21/23

KHA PROJECT: 067782815
DATE: AUGUST 2023
SCALE: AS SHOWN
DESIGNED BY: RMC
DRAWN BY: RJJ
CHECKED BY: ACS

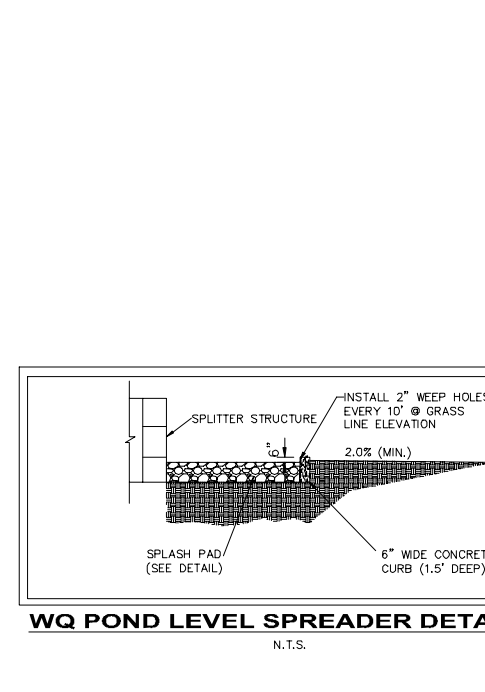
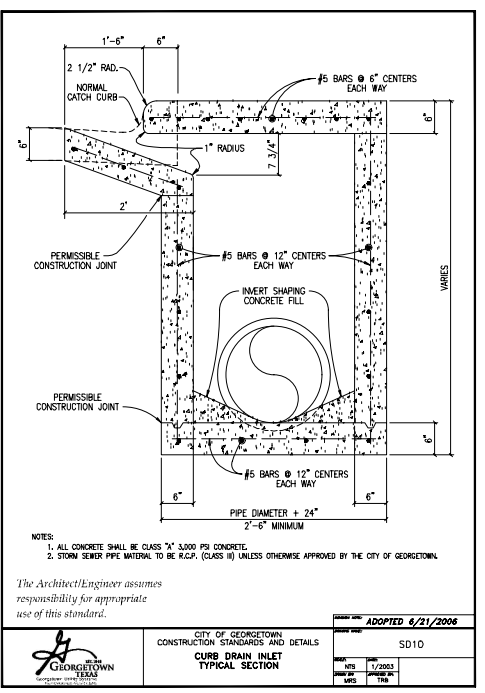
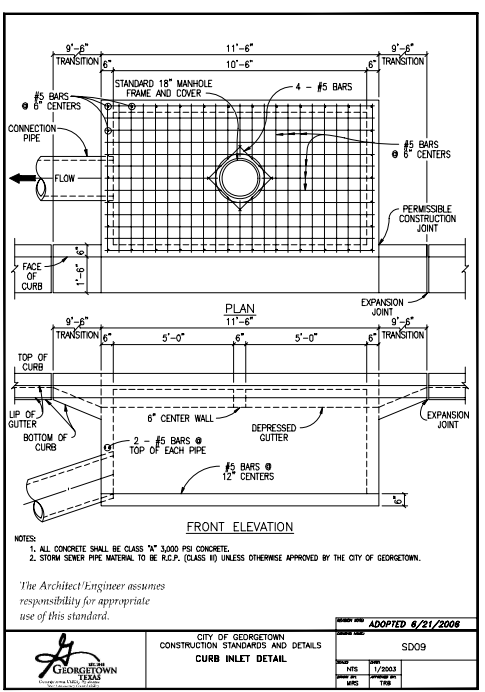
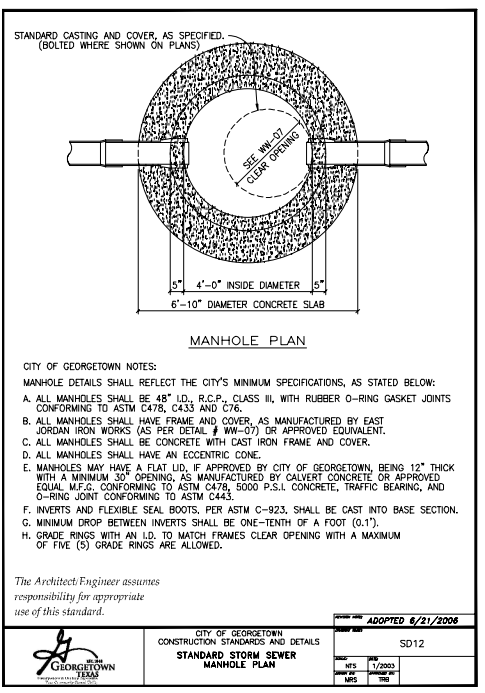
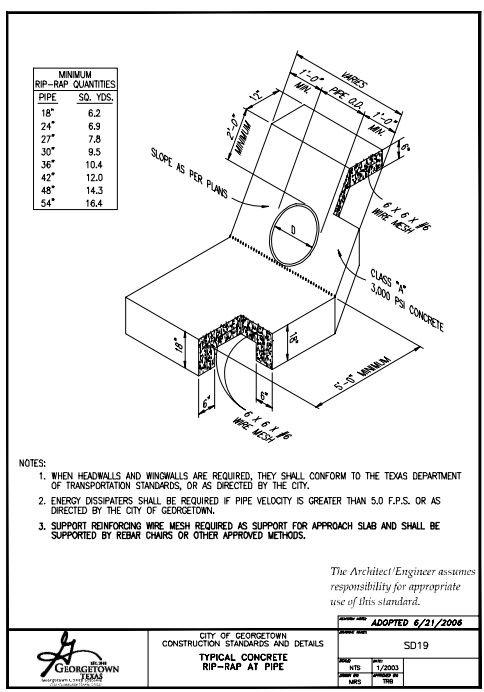
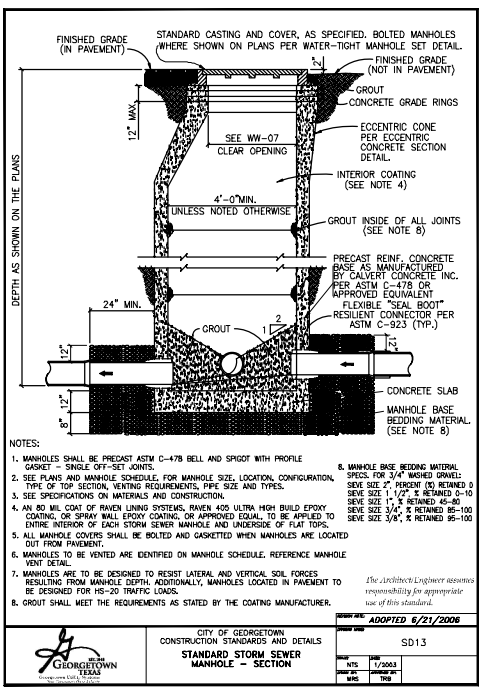
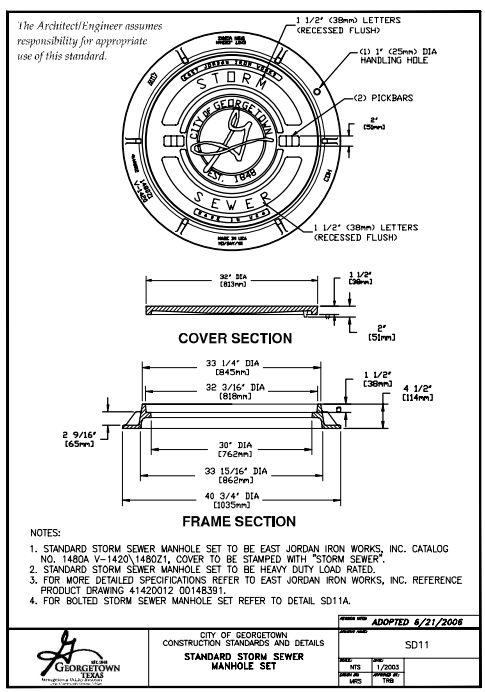
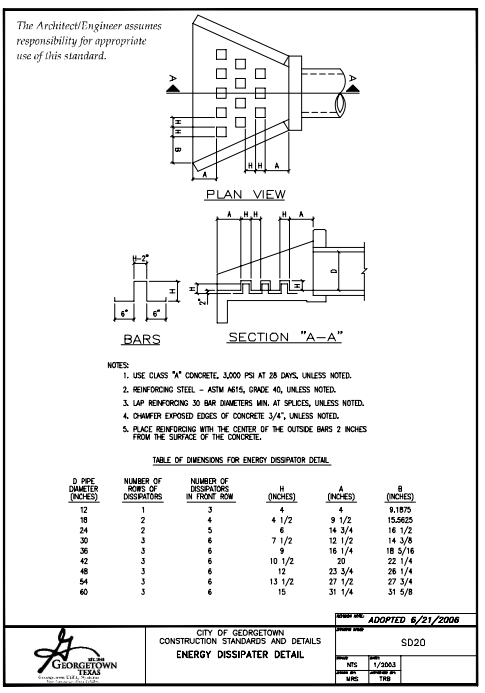
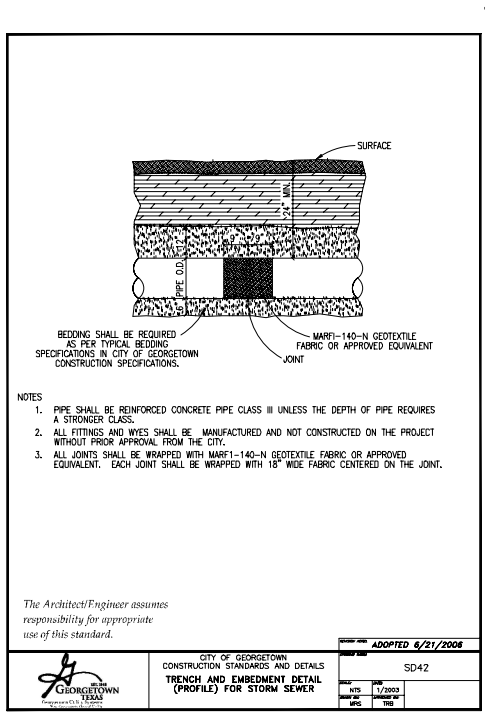
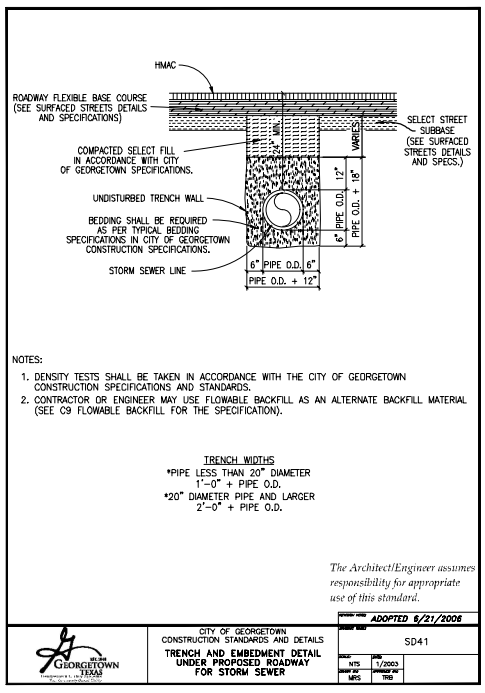
PAVING DETAILS

BERRY CREEK HIGHLANDS PHASE 6A
CITY OF GEORGETOWN, TEXAS
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER **34**

2023-17-CON

Plotted By: Ramirez, Adam Date: August 29, 2023 11:09:23am File Path: K:\AUS-Civil\067782815-Berry Creek_CoolPhase 6A\PlanSheets\Storm Drain Details.dwg
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WQ POND 1
100 YEAR VELOCITY AFTER LEVEL SPREADER

MANNING'S EQUATION: $Q = \left(\frac{1.49}{n}\right) A R^2 S \sqrt{S}$
 n = MANNING'S ROUGHNESS COEFFICIENT
 A = AREA OF CHANNEL (FT²)
 R = HYDRAULIC RADIUS (FT)
 S = SLOPE (FT/FT)
 d = NORMAL DETPH (FT)

Q = 287.27 CFS
 n = 0.069 (6" RIP-RAP)
 w = 20 FT
 A = w x d FT²
 R = w x d FT
 w + 2d
 S = 0.005

CALCULATING FOR d = 8.00 FT
 $V = \left(\frac{Q}{A}\right)$
 V = 1.795 FT/S²

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

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

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, TEXAS
 WILLIAMSON COUNTY, TEXAS

STORM DRAIN DETAILS

SHEET NUMBER
35

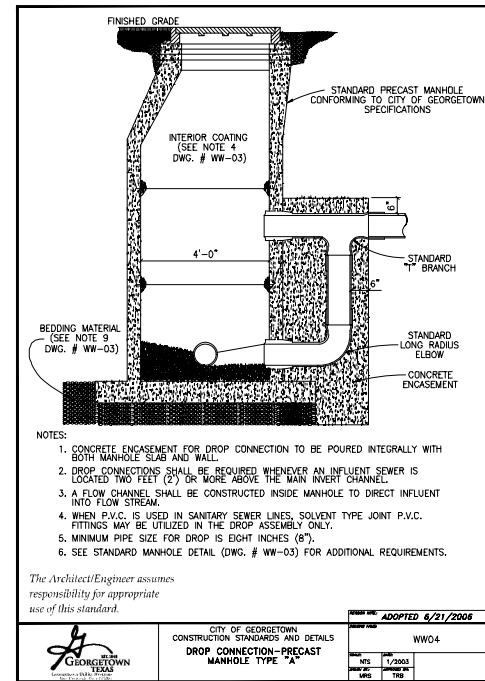
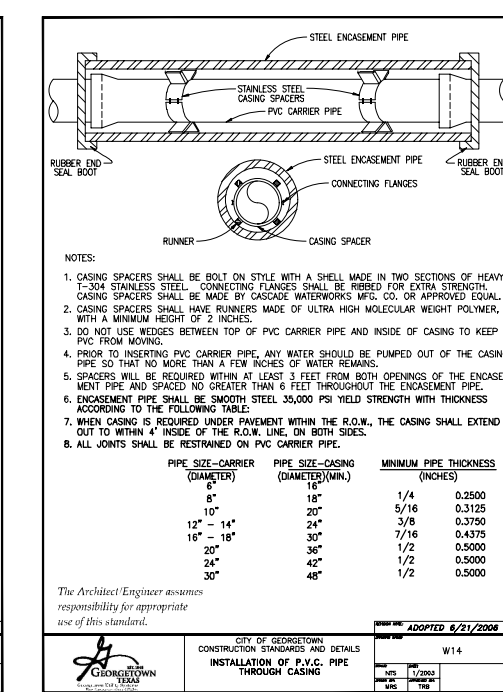
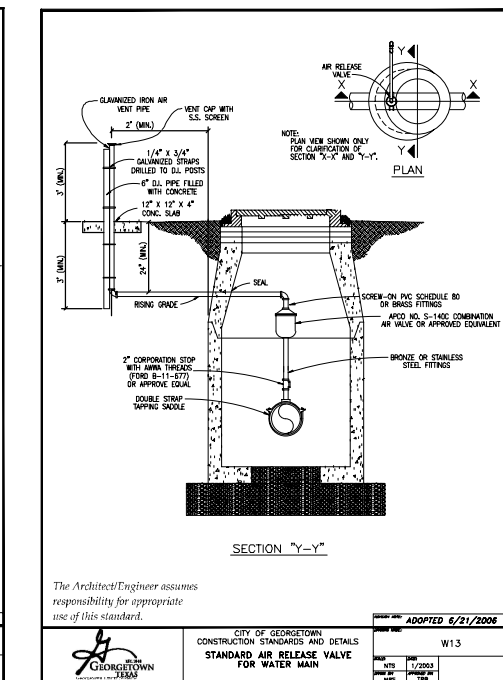
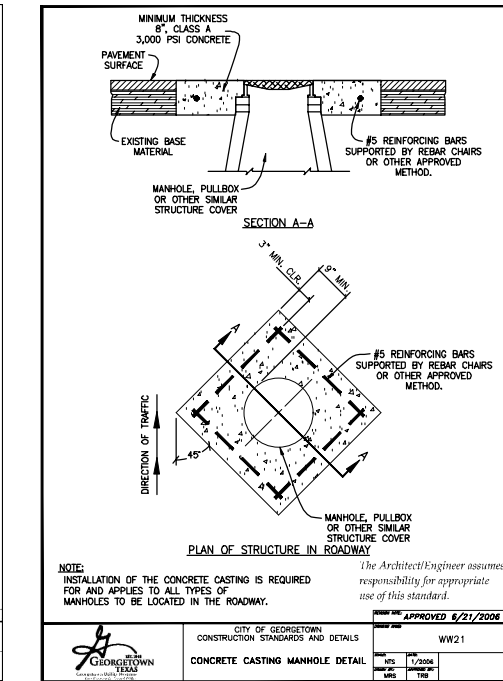
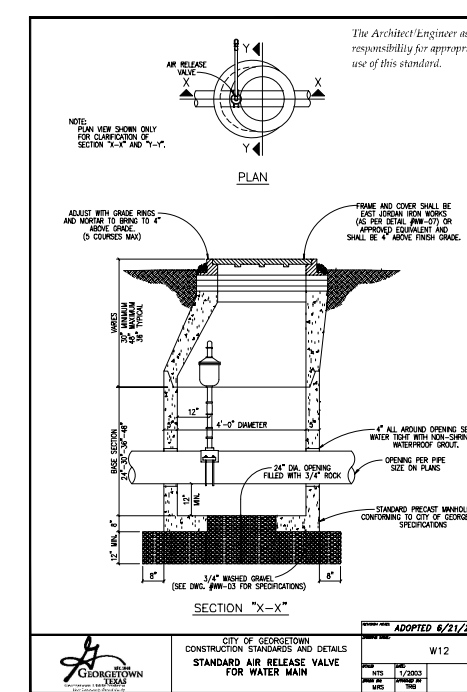
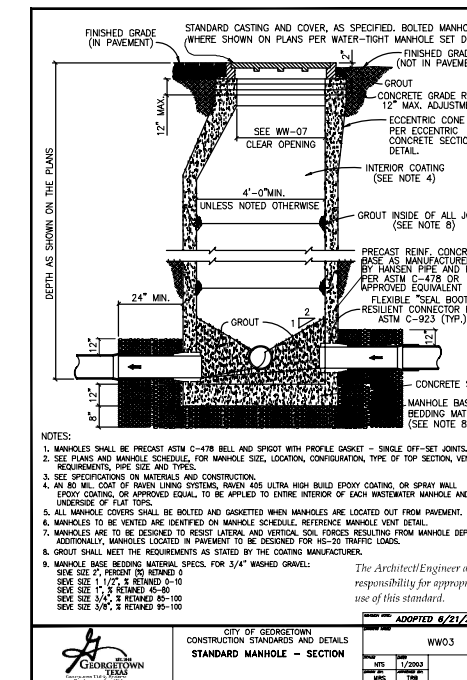
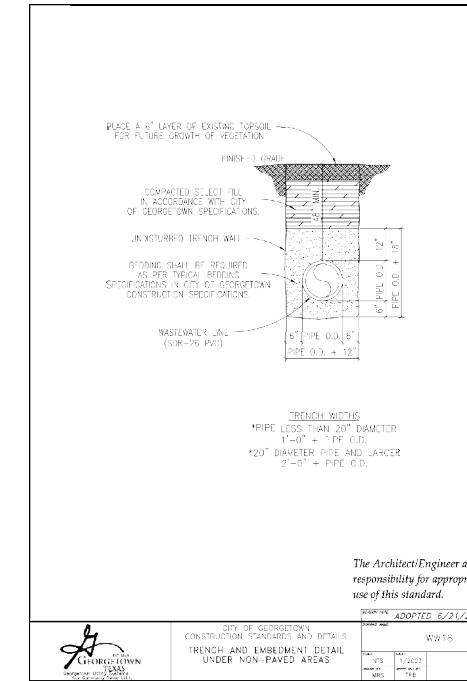
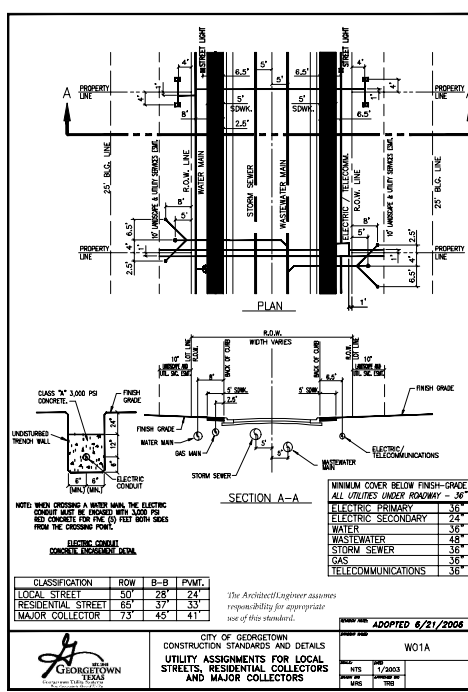
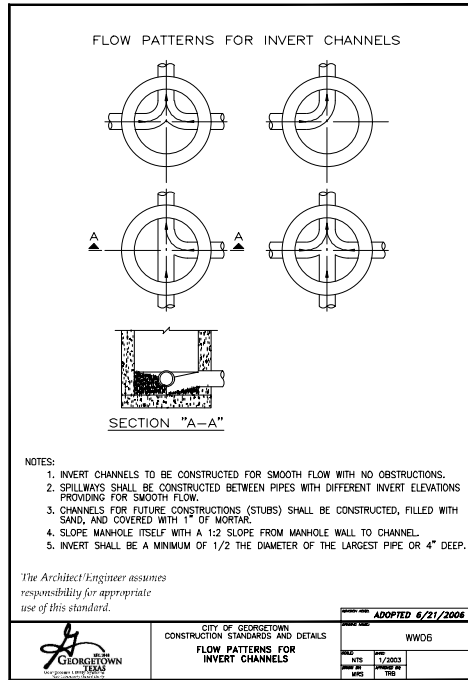
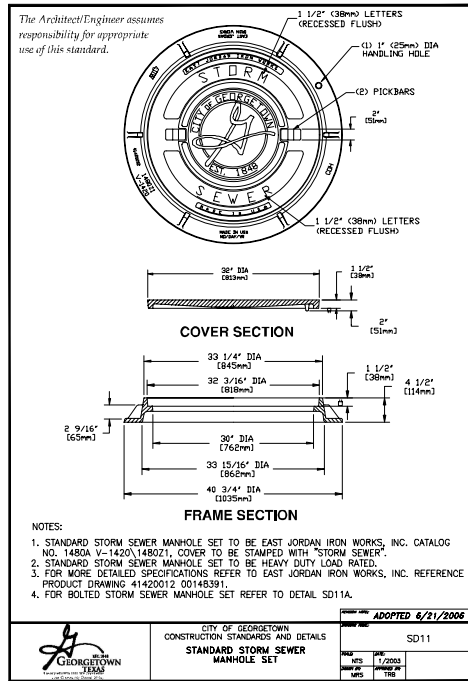
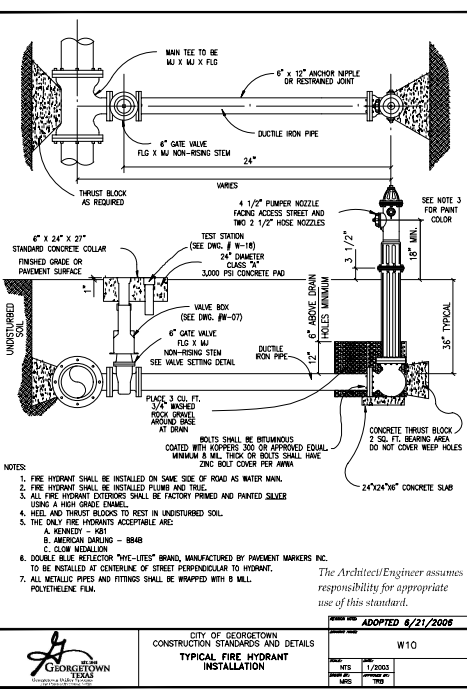
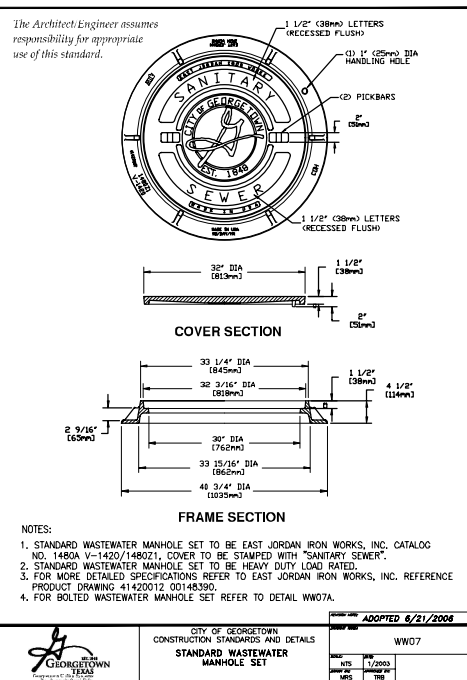
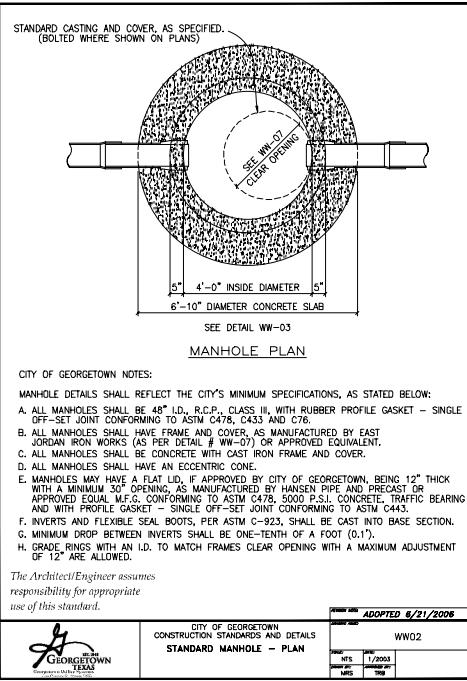
DATE
 REVISIONS
 NO.
 BY

8/21/23

KHA PROJECT: 067782815
 DATE: AUGUST 2023
 SCALE: AS SHOWN
 DESIGNED BY: RMC
 DRAWN BY: RJJ
 CHECKED BY: ACS

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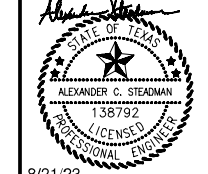
Plotted By: Ramirez, Adam Date: August 29, 2023 11:09:37am File Path: K:\AUS-Civil\067782819-Berry Creek_Creek_Coal_Phase 6A\PlanSheets\C-Water Details.dwg
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WARNING: CONTRACTOR IS TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.

NO.	REVISIONS	DATE	BY

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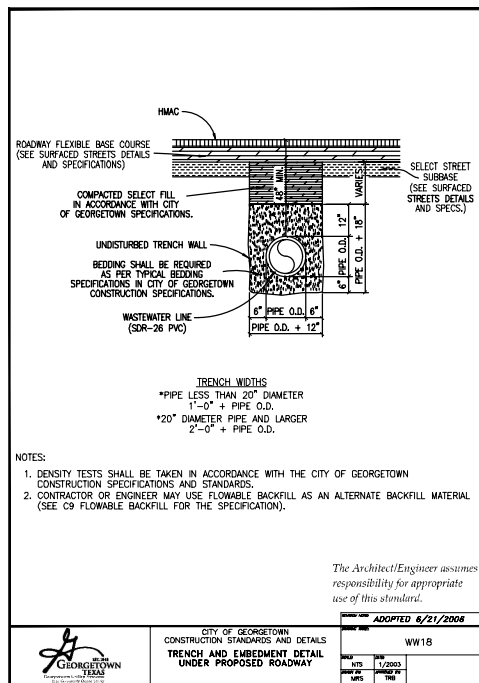
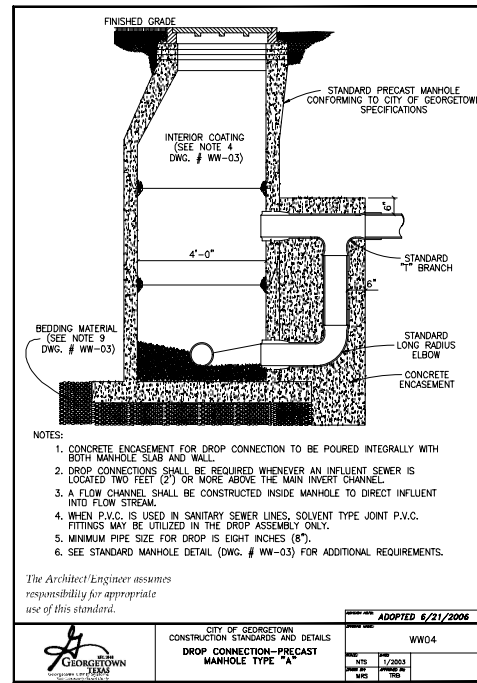
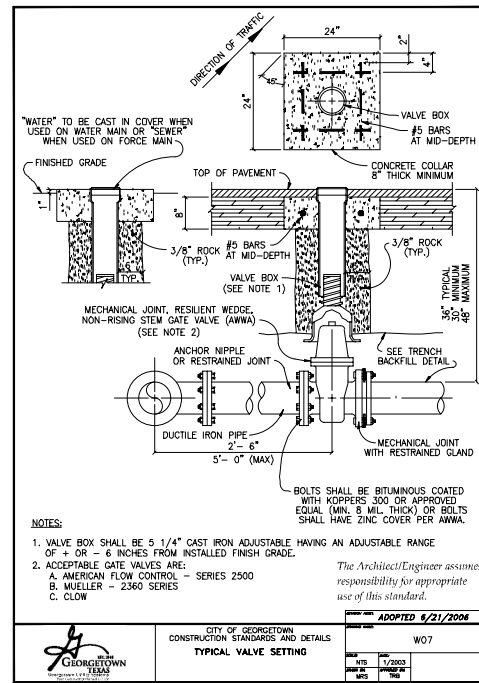
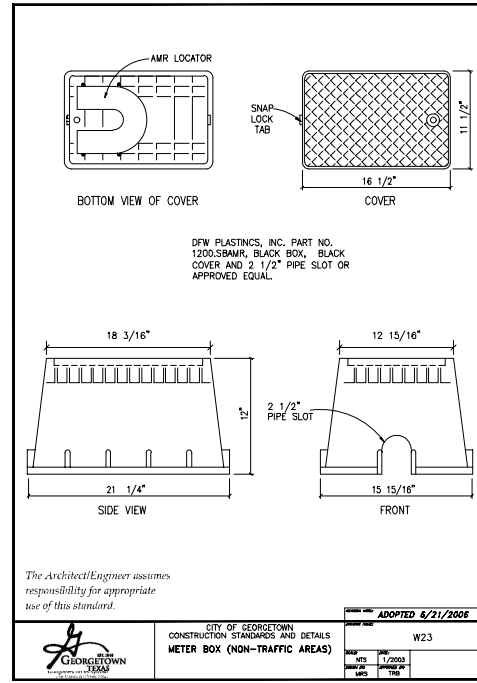


KHA PROJECT	067782819
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY:	RWC
DRAWN BY:	RFJ
CHECKED BY:	ACS

BERRY CREEK HIGHLANDS WATER & WASTEWATER DETAILS (1 OF 2)

BERRY CREEK HIGHLANDS PHASE 6A
 CITY OF GEORGETOWN, WILLIAMSON COUNTY, TEXAS

Plotted By: Ramirez, Adam Date: August 29, 2023 11:09:40am File Path: K:\AUS_Civil\067782815-Berry_Creek_Coal\Phase 6A\PlanSheets\C-Water_Details.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.

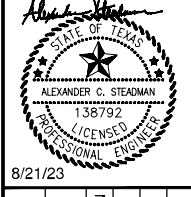


No.	REVISIONS	DATE	BY

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TEXAS REGISTERED ENGINEERING FIRM F-928



8/21/23

KHA PROJECT	067782815
DATE	AUGUST 2023
SCALE	AS SHOWN
DESIGNED BY	RMC
DRAWN BY	RFJ
CHECKED BY	ACS

**WATER & WASTEWATER
DETAILS (2 OF 2)**

**BERRY CREEK
HIGHLANDS
PHASE 6A**
CITY OF GEORGETOWN,
WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
37

