Berry Springs Park Improvements

Georgetown, TX

Water Pollution Abatement Plan Application

Williamson County

Submitted to:

TCEQ

Austin Regional Office

August 1, 2022

AVO 38049.002

HALFF

13620 Briarwick Drive, Suite 100
Austin, TX 78729
TBPE #F-312

AVO 38049.002

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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 Springs Park and Preserve					2. Regulated Entity No.: RN104334941				
3. Customer Name: Williamson County					4. Customer No.: CN600897888				
5. Project Type: (Please circle/check one)	New		Modification			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			8. Site (acres):			42.43
9. Application Fee:	$8,000		10. Permanent BMP(s):			Vegetated Filter Strips, Grassy Swales			
11. SCS (Linear Ft.):			12. AST/UST (No. Tanks):			Zero.			
13. County:	Williamson		14. Watershed:			Brushy 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.)	__	__	1
Region (1 req.)	__	__	1
County(ies)	__	__	1
Groundwater Conservation District(s)	__Edwards Aquifer Authority __Barton Springs/ Edwards Aquifer __Hays Trinity __Plum Creek	__Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	__Austin __Buda __Dripping Springs __Kyle __Mountain City __San Marcos __Wimberley __Woodcreek	__Austin __Bee Cave __Pflugerville __Rollingwood __Round Rock __Sunset Valley __West Lake Hills	__Austin __Cedar Park __Florence 1 Georgetown __Jerrell __Leander __Liberty Hill __Pflugerville __Round Rock

San Antonio Region					
County:	Bexar	Comal	Kinney	Medina	Uvalde
Original (1 req.)	__	__	__	__	__
Region (1 req.)	__	__	__	__	__
County(ies)	__	__	__	__	__
Groundwater Conservation District(s)	__ Edwards Aquifer Authority __Trinity-Glen Rose	__Edwards Aquifer Authority	__Kinney	__EAA __Medina	__EAA __Uvalde
City(ies) Jurisdiction	__Castle Hills __Fair Oaks Ranch __Helotes __Hill Country Village __Hollywood Park __San Antonio (SAWS) __Shavano Park	__Bulverde __Fair Oaks Ranch __Garden Ridge __New Braunfels __Schertz	NA	__San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Brian L. Vines
Print Name of Customer/Authorized Agent
Signature of Customer/Authorized Agent Date August 12, 2022

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.

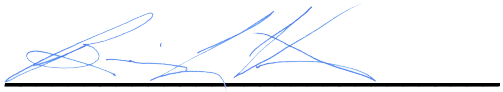
Signature

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: Brian L. Vines

Date: 8/12/2022

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Berry Springs Park
2. County: Williamson
3. Stream Basin: Berry Creek
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: Russell Fishbeck
Entity: Williamson County Parks Department
Mailing Address: 219 Perry Mayfield
City, State: Leander, TX Zip: 78641
Telephone: 512-943-1920 FAX: 512-943-1930
Email Address: Parksandexpo@wilco.org

8. Agent/Representative (If any):

Contact Person: Brian L. Vines
Entity: Halff Associates, Inc.
Mailing Address: 10800 Financial Centre Parkway, Suite 500
City, State: Little Rock, AR Zip: 72211
Telephone: (501) 801-2690 FAX: ———
Email Address: bVines@Halff.com

9. Project Location:

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

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

The site begins at the southeastern quadrant of the Tom McDaniel Parkway/County Road 152 intersection outside of Georgetown, TX. It extends to the northwest along Tom McDaniel Parkway approximately 0.20 miles in total. The project site continues to the north along the eastern edge of the gravel trail and wooded area, then west along the southern edge of the wooded area and the gravel road at the Park Host Home site. The project site continues at the intersection of the gravel road/Tom McDaneil Parkway to the southeast approximately 0.41 miles back to the intersection of Tom McDaniel parkway/County Road 152 where the project ends.

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: Completed

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: Park

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.

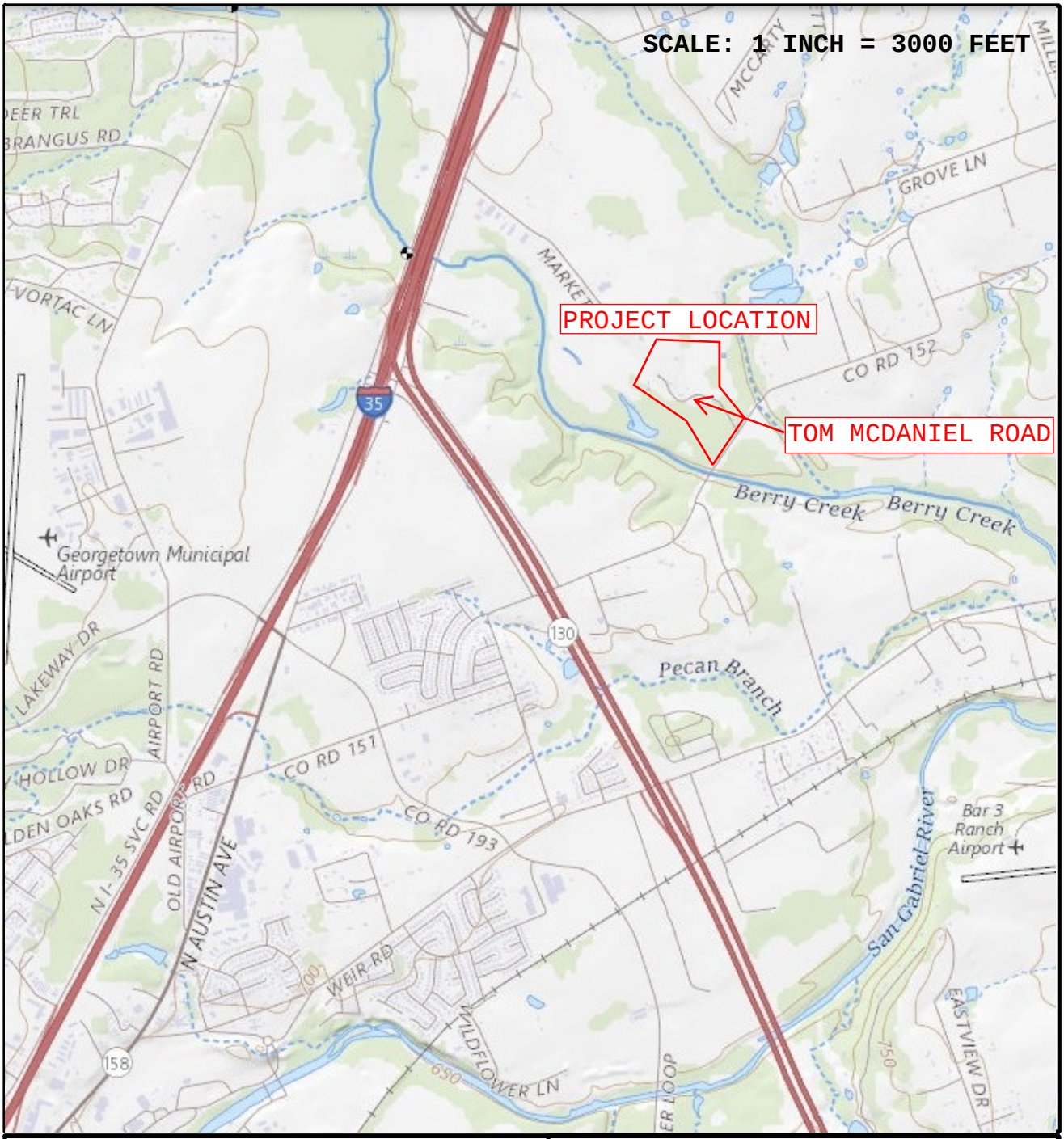
19. ☒ Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:

☐ 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 1A: ROAD MAP



DIRECTIONS:

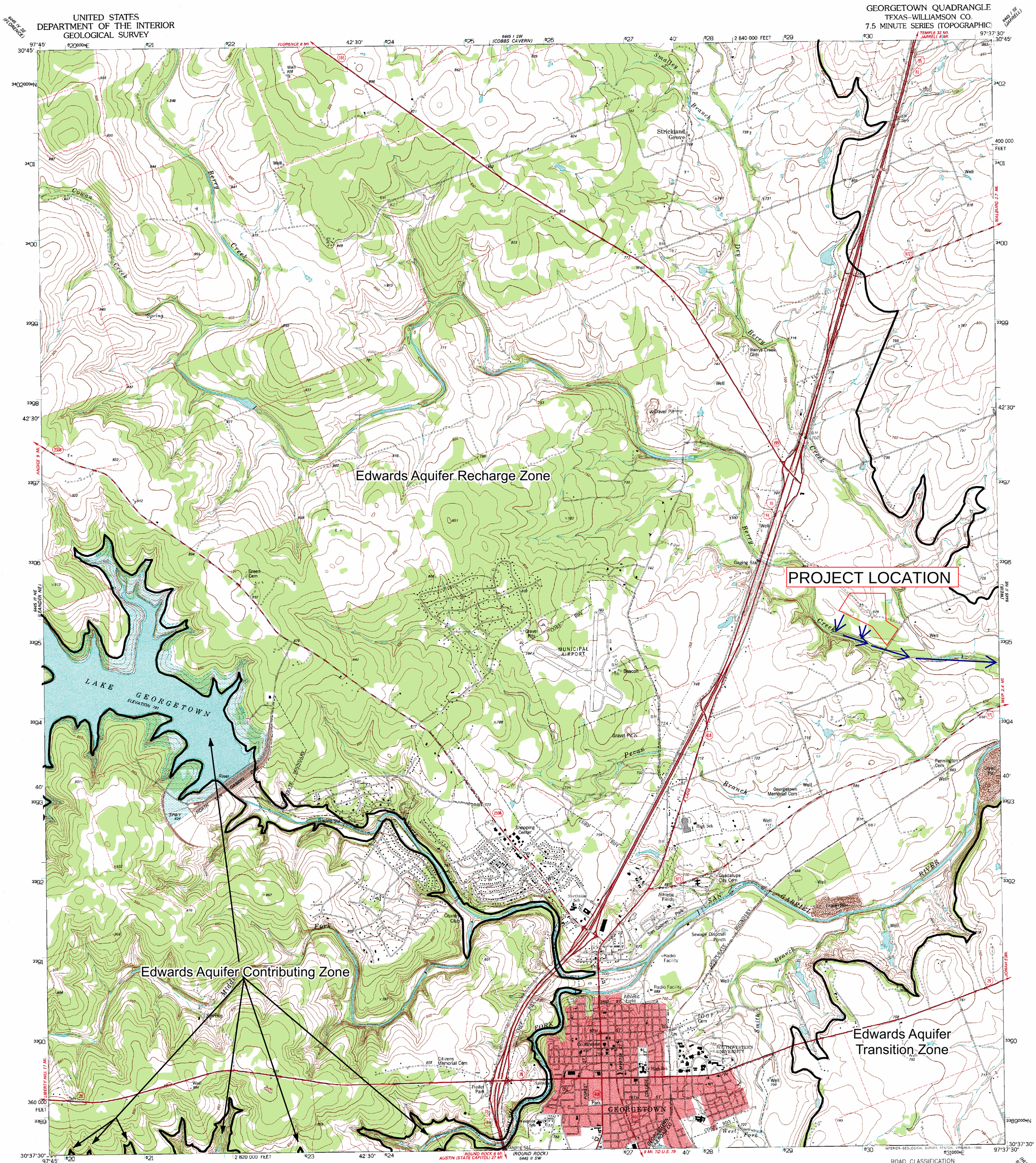
FROM I-35 NORTH:
TAKE EXIT 265 TOWARD TX-130 SOUTH.
TURN RIGHT ONTO TX-130 SOUTH.
TRAVEL 0.4 MILES, THEN TURN LEFT ONTO COUNTY ROAD 152.
TRAVEL 0.9 MILES, THEN TURN LEFT ONTO TOM MCDANIEL ROAD.
PROJECT LOCATION IS AT THE BERRY SPRINGS PARK GATE.

BERRY SPRINGS PARK AND PRESERVE

WILLIAMSON COUNTY, TEXAS

HALFF

Attachment 1B: USGS Edwards Recharge Zone Map



GEORGETOWN QUADRANGLE
TEXAS–WILLIAMSON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Produced by the United States Geological Survey
Control by USGS and NOS/NOAA
Compiled from aerial photographs taken 1974. Field checked 1975
Map edited 1982
North American Datum of 1927 (NAD 27). Projection and 10000-foot ticks: Texas Coordinate System, central zone (Lambert Conformal Conic)
Blue 1000-meter Universal Transverse Mercator ticks, zone 14
North American Datum of 1983 (NAD 83) is shown by dashed corner ticks. The values of the shift between NAD 27 and NAD 83 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software
Red tint indicates areas in which only landmark buildings are shown
Fine red dashed lines indicate selected fence lines
Areas covered by dashed light-blue pattern are subject to controlled inundation

UTM GRID AND 1982 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION
3097-313

ROAD CLASSIFICATION
Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

GEORGETOWN, TX
30097-H6-TF-024
1982
DMA 6445 II NW-SERIES V882

ISBN 0-607-51004-6

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program

Regulatory Zones

30 TAC Chapter 213- Edwards Aquifer
Effective March 1990

This map was produced by the Groundwater Planning and Assessment Team of the Texas Commission on Environmental Quality to detail the boundaries of the regulatory zones of the Edwards Aquifer Protection Program, as described in Texas Administrative Code Title 30, Part 1, §213.3. No other claims are made to the accuracy or completeness of the data or to its suitability for a particular use. For more information about the Edwards Aquifer Protection Program, please contact the TCEQ Regional Offices in San Antonio or Austin. Printed June 2006.

ATTACHMENT 1C - Project Description

Location:

The 42.43-acre site is located along Tom McDaniel Road off of County Road 152 approximately 0.8 miles northeast of State Highway 130 within the City of Georgetown Extra Territorial Jurisdiction. The existing site is partially developed. The developments at the portion of Berry Springs Park inside the project area include approximately 1 mile of paved and unpaved roadways, approximately 1.2 miles of nature trails, a 19-spot RV park/campground, parking lots, 2 restrooms and one shower facility, two open-air pavilions, a playground, historic compound, a park residence house, and a small cemetery. The undeveloped portions of Berry Springs Park are primarily native grasses and native trees. The park is bordered on the west by Berry Creek and on the east by Dry Berry Creek. Most of the undeveloped portions of the park will not be developed during the Berry Springs Park Improvements project.

The proposed improvements are situated entirely within the Edwards Aquifer Recharge zone.

Proposed Facility:

The proposed project consists of the demolition and removal of the existing Berry Springs House, unpaved roads, and granite walkways; the construction of a new park headquarters/visitor center, maintenance building, open-air pavilion, one remote restroom, concrete sidewalks, and roads; the addition of a new gravel parking lot at the proposed maintenance building; the expansion of a paved parking lot; the expansion of an existing sidewalk to the existing trail east of Country Road 152; and the installation of new planting areas, benches, fences, trees, signage, and a parking pay station.

Construction Activities:

Construction activities for the Berry Springs Park Improvements project will consist of grading, HMAC paving, flex base, concrete building slab foundations, waterline construction, sanitary sewer line, and OSSF construction.

Best Management Practices:

In order to comply with TCEQ Edwards Aquifer Regulations, sediment control fences, tree protection, a stabilized construction entrance/exit, and a concrete washout area will be used as Temporary Best Management Practices (BMPs). Vegetated filter strips and grassy swales are being proposed as permanent BMPs for this project at the parking lots and renovated entrance road area near the visitor center.

Geologic Assessment

Texas Commission on Environmental Quality

For Regulated Activities on The Edwards Aquifer Recharge/transition Zones and Relating to 30 TAC §213.5(b)(3), Effective June 1, 1999

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

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

Signature

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

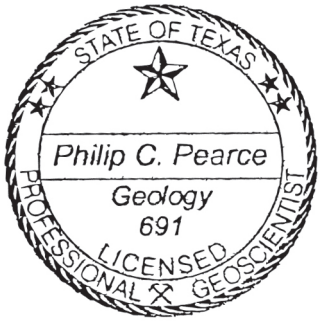
Print Name of Geologist: Philip Pearce, P.G. Telephone: 210.877.2847

Fax: 210.877.2848

Date: 7-29-2022

Representing: SWCA Environmental Consultants (TBPG Firm Registration #50159) (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:



Regulated Entity Name: Berry Springs Park Improvement GA

Project Information

1. Date(s) Geologic Assessment was performed: July 1, 2022
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)
Krum silty clay, 0 to 1 percent slopes (KrA)	C	4
Krum silty clay, 1 to 3 percent slopesKrum silty clay, 1 to 3 percent slopes (KrB)	C	3.5
Oakalla silty clay loam, 0 to 2 percent slopes, occasionally flooded (OaA)	B	4-5
Oakalla silty clay loam, 0 to 2 percent slopes, frequently flooded (OkA)	B	4-5
Queeny clay loam, 1 to 5 percent slopes (QuC)	D	4-5

** 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" = 20'
   Site Geologic Map Scale: 1" = 20'
   Site Soils Map Scale (if more than 1 soil type): 1" = 833'

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 _____ (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)
    ☐ The wells are not in use and have been properly abandoned.
    ☐ The wells are not in use and will be properly abandoned.
    ☐ The wells are in use and comply with 16 TAC Chapter 76.
    ☒ There are no wells or test holes of any kind known to exist on the project site.

Administrative Information

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

ATTACHMENT A

Geologic Assessment Table

GEOLOGIC ASSESSMENT TABLE

PROJECT NAME: Berry Springs Park Improvement GA

LOCATION			FEATURE CHARACTERISTICS											EVALUATION			PHYSICAL SETTING		
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11	12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)	TOPOGRAPHY
						X	Y	Z		10						<40	>40	<1.6	>1.6	
BS-01	30.68548	-97.64281	O	5	Qal	20	15	?	-	0	-	-	F	5	10	X		X		Hillside

* DATUM: NAD83

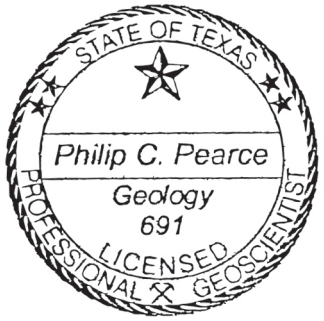
2A TYPE	TYPE	2B POINTS
C	Cave	30
SC	Solution cavity	20
SF	Solution-enlarged fracture(s)	20
F	Fault	20
O	Other natural bedrock features	5
MB	Manmade feature in bedrock	30
SW	Swallow hole	30
SH	Sinkhole	20
CD	Non-karst closed depression	5
Z	Zone, clustered or aligned features	30

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

12 TOPOGRAPHY

Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed

I have read, I understood, and I have followed the Texas Commission on Environmental Quality's Instructions to Geologists. The information presented here complies with that document and is a true representation of the conditions observed in the field.
My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.



_____

Date 7/29/2022

Sheet 1 of 1

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

ATTACHMENT B

Stratigraphic Column

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

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

[1] Blome, C.D., Faith, J.R., Pdraza, D.E, Ozuna, G.B, Cole, J.C., Clark, A.K., Small, T.A., and Morris, R.R. 2005. Geologic map of the Edwards aquifer recharge zone, south-central-Texas. U.S. Geological Survey SIM-2873. Scale 1:200,000.

ATTACHMENT C

Narrative Description of Site Geology

1 INTRODUCTION

This narrative Geologic Assessment accompanies the Texas Commission on Environmental Quality (TCEQ) Geologic Assessment form TCEQ-0585 completed for the approximate 28.2-acre site comprised of three parcels located within Berry Springs Park and Preserve approximately 0.8 miles east of Interstate-35. This site is located inside the city limits of Georgetown, Williamson County, Texas (Project Site) (Figure 1).

2 METHODOLOGY

An SWCA scientist conducted a field assessment of the Project Site on July 1, 2022. The assessment was completed by walking parallel transects spaced approximately 50 feet apart as directed by the TCEQ in the Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (Rev. 10-01-04). Closer spacing was used where vegetation inhibited clear observation. The SWCA scientist carefully examined all potential karst features, including depressions, holes, and animal burrows, for subsurface extent evidence. SWCA used several techniques for this effort, including probing with a digging implement to determine the thickness and consistency of fill material and feeling for air flow which may indicate the presence of a sub-surface void space. Other techniques included recording notable feature site characteristics such as vegetation types or a semi-circular burrow mound produced by small mammal activity. Surveys were limited by soil and other landscaping material stockpiles throughout the property.

3 RESULTS

3.1 Site Overview

The Project Site is comprised of three separate parcels that lie within the Recharge Zone of the Edwards Aquifer (TCEQ 2022). The Project Site lies on a gently sloping hillside with land surface elevations that range from approximately 660 to 670 feet above mean sea level. Surface water drains generally towards the south towards Berry Creek.

Business developments are located to the north, east and west of the park property. Berry Creek is located on the southern boundary of the project site.

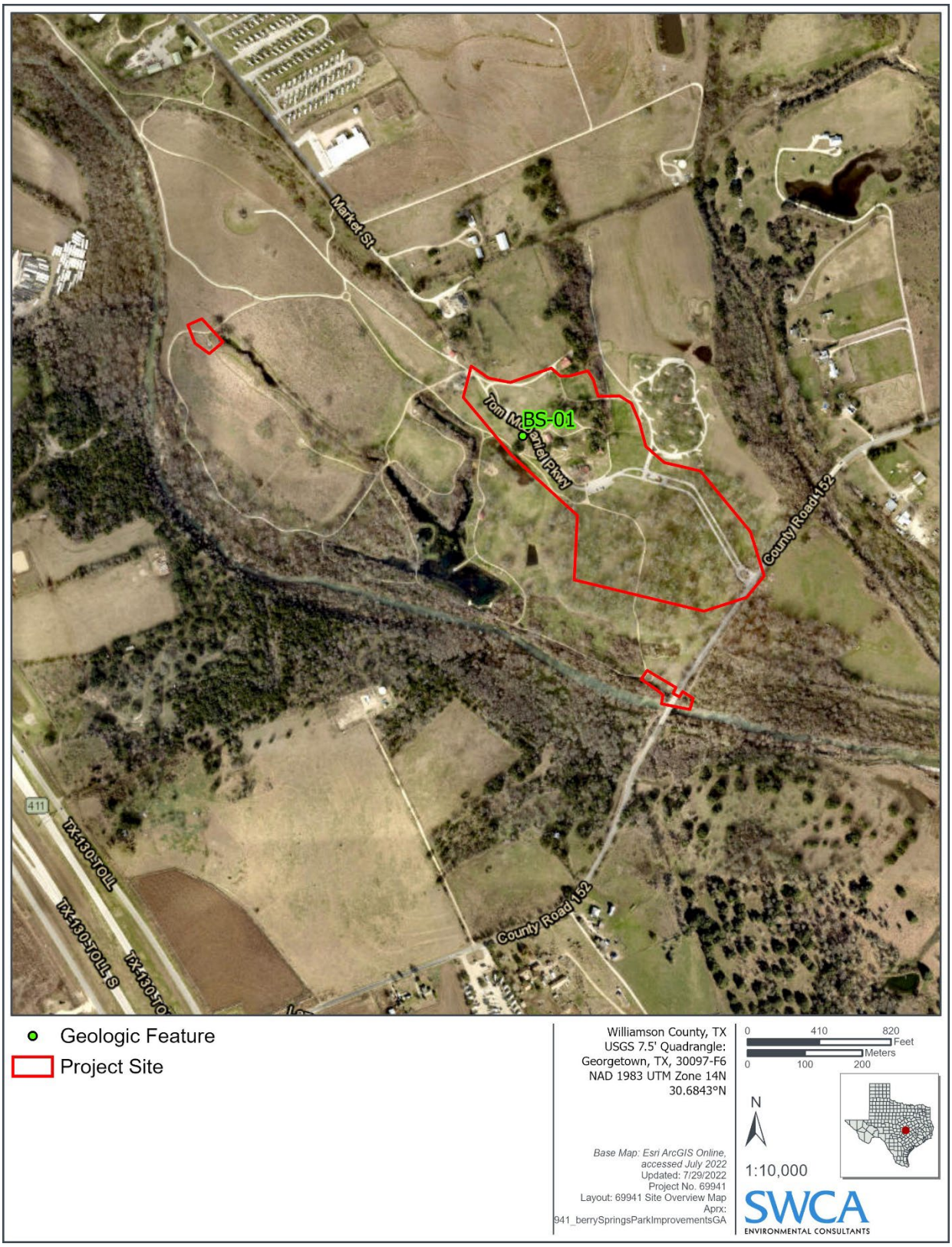


Figure 1. Project Site location map.

3.2 Geology

Rock outcroppings on the Project Site are Quarternary in age and consists of alluvium overlying the Georgetown Formation (Kgt) (Attachment D). The geology of the Project Site has been mapped recently at a useful scale by Collins (2005) and SWCA finds this interpretation of the geology to be generally accurate. A Stratigraphic Column is included as Attachment B within Appendix A.

The Project Site occurs along the Balcones Fault Zone (BFZ) within the Edwards Aquifer Recharge Zone. Structural down-warping occurred with the Gulf of Mexico's ancestral formation during the middle Tertiary. The earth's crust was stretched in response and the BFZ formed along a zone of weakness, which currently marks the boundary between the Edwards Plateau and the Gulf Coastal Plain in central Texas. This zone is characterized by a series of northeast trending, predominantly normal, nearly vertical, en echelon faults. No faults are mapped crossing the Project Site (Collins 2005). Bedrock in the majority of the park is concealed beneath alluvial deposits, which makes accurate identification of fault and fracture locations impossible.

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

3.3 Soils

The Natural Resources Conservation Service (NRCS) identified three soil units within the Project Site (NRCS 2022):

Project Site soils are mapped within the following series:

- Krum silty clay, 0 to 1 percent slopes (KrA), hydrologic group "C"
- Krum silty clay, 1 to 3 percent slopes (KrB), hydrologic group "C"
- Oakalla silty clay loam, 0 to 2 percent slopes, occasionally flooded (OaA), hydrologic group "B"
- Oakalla silty clay loam, 0 to 2 percent slopes, frequently flooded (OkA), hydrologic group "B"
- Queeny clay loam, 1 to 5 percent slopes (QuC), hydrologic group "D"

Project Site soil types are within the "B", "C", and "D" hydrologic soil group classifications.

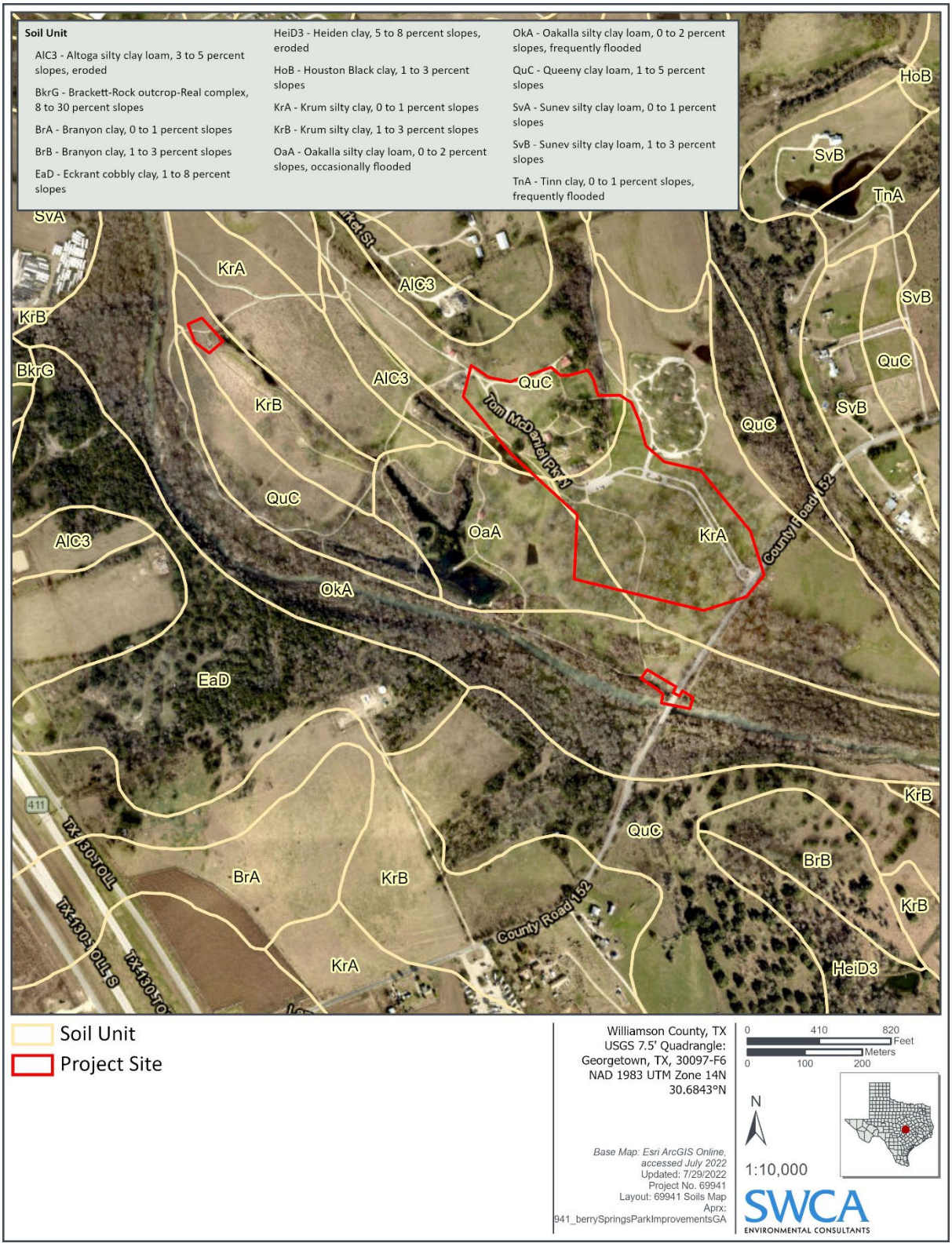


Figure 2. Project Site soils map.

3.4 Site Hydrogeologic Assessment

The Kgt and Ked compose the Edwards Aquifer; however, in the vicinity of the Project Site, the Kgt is relatively impermeable and acts as an upper confining unit. Water within the underlying Ked is under artesian pressure and flows up through fractures/faults/conduits in the Kgt and emerges as springs in the vicinity of the Project Site (Land and Dorsey 1988). The largest springs near the project are referred to as Berry Springs, which are located in the park (SWCA 2020).

Regionally, Berry Springs lie near the tip of a fault block that dips toward the north-northeast. Due to the dip of the rocks, the Ked dips beneath the Kgt and other overlying confining units, resulting in the confined, artesian condition in the Edwards Aquifer. Water appears to move up through approximately 50 feet or more of the Kgt before reaching the land surface.

The overall potential for fluid migration to the Edwards Aquifer for the site appears relatively low compared to background infiltration rates due to lack of sensitive geologic recharge features, the low permeability of the Kgt, and the artesian pressure within the Ked. The depth to water in the Edwards Aquifer below the ground surface is roughly 0-22 feet, as measured by the USGS in nearby water wells (58-19-619) and (58-19-609) (TWDB 2022). Berry Spring is present approximately 600 feet from the project area, where groundwater flows under artesian pressure to the land surface. The southern project area location is located along Berry Creek downstream of the spring.

The predominant structural trend for the site is approximately N25ºE, based on the average trends of faults in the vicinity of the Project Site.

SWCA identified one geologic features on site, BS-01.

BS-01 - This feature consists of a man-made feature consisting of an in-ground septic system. This feature is quaternary alluvium and does not occur in bedrock. Due to a lack of bedrock, the probability of rapid infiltration is low.

4 REFERENCES

Blome, C.D., Faith, J.R., Pedraza, D.E, Ozuna, G.B, Cole, J.C., Clark, A.K., Small, T.A., and Morris, R.R. 2005. Geologic Map of the Edwards Aquifer Recharge Zone, South-Central Texas. U.S. Geological Survey SIM-2873. Scale 1:200,000.

Collins, E. 2005. Geologic Map of the West Half of the Taylor, Texas, 30 x 60 minute quadrangle: Central Texas Urban Corridor, Encompassing Round Rock, Georgetown, Salado, Briggs, Liberty Hill, and Leander. University of Texas at Austin, Bureau of Economic Geology. Miscellaneous Map 43. 1:1000.

Land, L. F., and Dorsey, M. E. 1988. Reassessment of the Georgetown Limestone as a hydrogeologic unit of the Edwards Aquifer, Georgetown area, Texas: - U.S. Geological Survey, Water-Resources Investigations. WRI 88-4190, 49 p.

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ATTACHMENT D

Site Geologic Map

Qal_AU

BERRY SPRINGS PARK IMPROVEMENTS
GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA
ENVIRONMENTAL CONSULTANTS

Geologic Feature
Qal - Alluvium, Georgetown Formation
Project Area

Williamson County, TXUSGS
7.5' Quadrangle:
Georgetown, TX, 30097-
F6NAD 1983 UTM Zone
14N30.6871°N
Base Map: ESRI ArcGIS Online,
Accessed July 2022
Updated: 7/14/2022
Project No. 72669
Layout: 69941 Geologic Map
22x36

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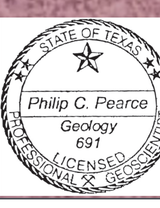
SWCA
ENVIRONMENTAL CONSULTANTS



Qt_AU

599

Qal_AU

Tom McDaniel Pkwy

BS-01

STATE OF TEXAS
Philip C. Pearce
Geology
691
LICENSED
PROFESSIONAL GEOSCIENTIST

BERRY SPRINGS PARK IMPROVEMENTS
GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

- Geologic Feature
- Qal - Alluvium, Georgetown Formation
- Qt - Fluviatile terrace deposits
- Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6857°N
Base Map: ESRI ArcGIS Online, Accessed July 2022
Updated: 7/14/2022
Project No. 72669
Layout: 69941 Geologic Map 22x36

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SWCA ENVIRONMENTAL CONSULTANTS

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Qal_AU

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STATE OF TEXAS

BERRY SPRINGS PARK IMPROVEMENTS
GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

- Geologic Feature
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- Qt - Fluviatile terrace deposits
- Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6857°N
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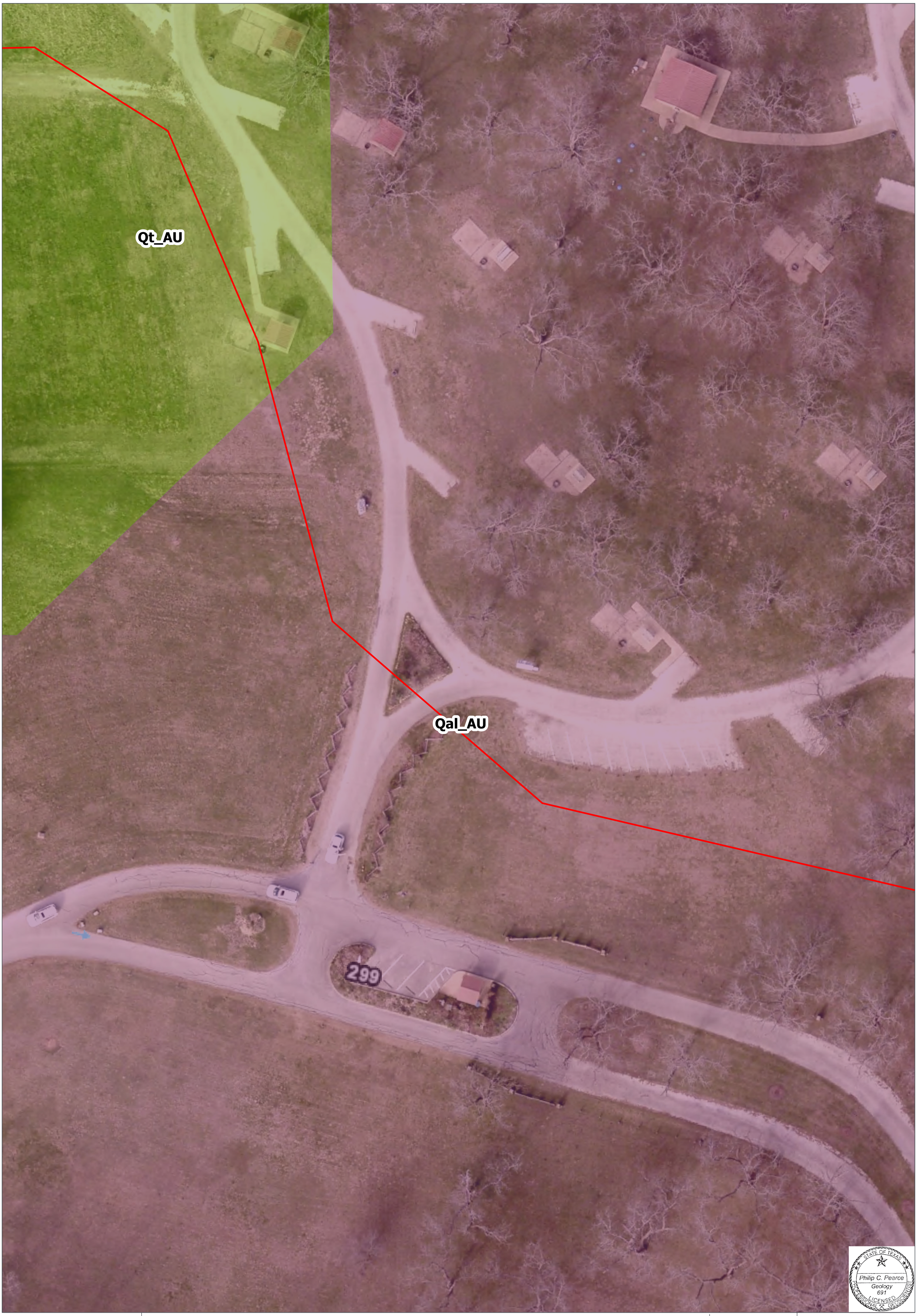
SWCA ENVIRONMENTAL CONSULTANTS



BERRY SPRINGS PARK IMPROVEMENTS
GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

- Geologic Feature
- Qal - Alluvium, Georgetown Formation
- Qt - Fluviatile terrace deposits
- Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6852°N
Base Map: ESRI ArcGIS Online, Accessed July 2022
Updated: 7/14/2022
Project No. 72669
Layout: 69941 Geologic Map 22x36

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GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

- Geologic Feature
- Qal - Alluvium, Georgetown Formation
- Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6839°N

Base Map: ESRI ArcGIS Online, Accessed July 2022
Updated: 7/14/2022
Project No. 72669
Layout: 69941 Geologic Map 22x36

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BERRY SPRINGS PARK IMPROVEMENTS
GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

Geologic Feature
Qal - Alluvium, Georgetown Formation
Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6835°N
Base Map: ESRI ArcGIS Online, Accessed July 2022
Updated: 7/14/2022
Project No. 72669
Layout: 69941 Geologic Map 22x36

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SWCA ENVIRONMENTAL CONSULTANTS

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GEOLOGIC ASSESSMENT
Geologic Map
1 inch = 20 feet

SWCA ENVIRONMENTAL CONSULTANTS

Geologic Feature
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Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6828°N
Base Map: ESRI ArcGIS Online, Accessed July 2022
Updated: 7/14/2022
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Geologic Feature
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Project Area

Williamson County, TXUSGS 7.5' Quadrangle: Georgetown, TX, 30097-F6NAD 1983 UTM Zone 14N30.6841°N
Base Map: ESRI ArcGIS Online, Accessed July 2022
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SWCA
ENVIRONMENTAL CONSULTANTS

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: Brian L. Vines

Date: 8/12/2022

Signature of Customer/Agent:

Regulated Entity Name: Berry Springs Park and Preserve

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property):42.43

3. Estimated projected population:N/A

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	14,390	÷ 43,560 =	0.33
Parking	112,420	÷ 43,560 =	2.58
Other paved surfaces	117,612	÷ 43,560 =	2.7
Total Impervious Cover	244.422	÷ 43,560 =	5.61

Total Impervious Cover 5.61 ÷ Total Acreage 42.43 X 100 = 13.22% Impervious Cover

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

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

For Road Projects Only

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

7. Type of project:

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

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

☐ Concrete
☐ Asphaltic concrete pavement
☐ Other: _____

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

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

10. Length of pavement area: _____ feet.

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

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

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

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

100% Domestic	TBDGallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day
TOTAL gallons/day TBD	

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 _____ (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" = 50'.

18. 100-year floodplain boundaries:

☒ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☐ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): _____

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

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

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

☐ There are _____ (#) 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 3A:
Factors Affecting Water Quality

During construction, there are several factors that may affect surface water and groundwater quality, including:

- Removal of vegetation will leave the ground surface exposed, increasing the chance for erosion during rainfall events
- Material storage and application (e.g. concrete and asphalt)
- Sanitary portable toilets
- Any spill of hazardous material(s)

TCEQ-certified temporary BMPs will be installed to mitigate for the pollutants caused by these factors during construction activities.

Vegetated filter strips and grassy swales will be the permanent BMP utilized to mitigate pollutants associated with the increase in impervious cover.

Attachment 3B:
Volume and Character of Stormwater

RG-348, *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices*, was used to calculate the volume and character of stormwater, for water quality purposes. Refer to Attachment 4G - Drainage Area Maps for the volume of stormwater.

The selected permanent BMPs to treat the TSS for the increased impervious cover are vegetated filter strips which have a removal efficiency of 85% and grassy swales which have a removal efficiency of 70%.

Not all of the proposed impervious cover drains directly to the vegetated filter strips (VFS). The proposed impervious cover at the maintenance building gravel parking lot and the west parking lot will drain into grassy swales and then to the vegetated filter strips. The filter strips have also been designed and placed to treat portions of the previously untreated existing impervious cover in addition to portions of the proposed project impervious cover. By treating portions of the existing impervious cover, the proposed BMPs will successfully mitigate the TSS load caused by the increase of impervious area of 2.84 acres.

IMPERVIOUS AREA CALCULATIONS		
Total Project Area =	42.43	Acres
Pre-Development Impervious Cover =	3.63	Acres
Post-Development Impervious Cover =	5.61	Acres
Net Increase Impervious Cover =	1.98	Acres
Required TSS Removal =	1,723.38	lbs

TSS LOAD REMOVAL SUMMARY		
Basin ID	TSS Load Removal Required (lbs)	TSS Load Removal Capacity (lbs)
PR-1	591.87	1760.2
PR-2	313.34	1393.8
PR-3	156.67	785.73
PR-4	661.5	1538.5
SUB-TOTAL AREA TO BMP =	1,723.38	5,478.23
SUB-TOTAL AREAS NOT TO BMPs =	0	0
PROJECT TOTAL =	1,723.38	5,478.23

SITE RUNOFF COEFFICIENT	
Pre-Project (100-yr)	Post-Project (100-yr)
0.11	0.15 (fully developed)

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: **Berry Springs Park and Preserve**
Date Prepared: **4/13/2023**

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

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

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

where:

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

Site Data: Determine Required Load Removal Based on the Entire Project

County =	**Williamson**	
Total project area included in plan * =	**42.43**	acres
Predevelopment impervious area within the limits of the plan * =	**3.63**	acres
Total post-development impervious area within the limits of the plan* =	**5.61**	acres
Total post-development impervious cover fraction * =	**0.13**	
P =	**32**	inches
$L_{M\ TOTAL\ PROJECT}$ =	**1723**	lbs.

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

Number of drainage basins / outfalls areas leaving the plan area = **17**

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

Drainage Basin/Outfall Area No. =	**PR-1**	PR-2	PR-3	PR-4	
Total drainage basin/outfall area =	**10.64**	**14.41**	**7.64**	**9.74**	acres
Predevelopment impervious area within drainage basin/outfall area =	**1.17**	**1.01**	**0.6**	**0.85**	acres
Post-development impervious area within drainage basin/outfall area =	**1.85**	**1.37**	**0.78**	**1.61**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.17**	**0.10**	**0.10**	**0.17**	
$L_{M\ THIS\ BASIN}$ =	**592**	**313**	**157**	**662**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = **Vegetated Filter Strips**
Removal efficiency = **85** percent

Aqualogic Cartridge Filter
Bioretention
Contech StormFilter
Constructed Wetland
Extended Detention
Grassy Swale
Retention / Irrigation
Sand Filter
Stormceptor
Vegetated Filter Strips
Vortechs
Wet Basin
Wet Vault

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

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

where:

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

A_C =	**10.64**	**14.41**	**7.64**	**9.74**	acres
A_I =	**1.85**	**1.37**	**0.78**	**1.61**	acres
A_P =	**8.79**	**13.04**	**6.86**	**8.13**	acres
L_R =	**1870**	**1481**	**835**	**1635**	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	**592**	**313**	**157**	**662**	lbs.
F =	**0.32**	**0.21**	**0.19**	**0.40**	

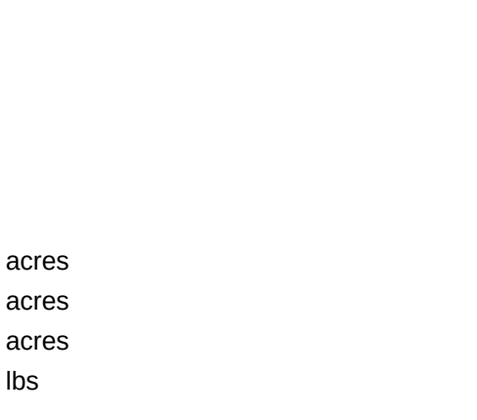
6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	**0.21**	inches
Post Development Runoff Coefficient =	**0.18**	
On-site Water Quality Volume =	**1475**	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 =	**295**	
Total Capture Volume (required water quality volume(s) x 1.20) =	**1770**	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.



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The values for BMP Types not selected in cell C45 will show NA.

7. Retention/Irrigation System — Designed as Required in RG-348 — Pages 3-42 to 3-46

Required Water Quality Volume for retention basin =	**NA**	cubic feet	
Irrigation Area Calculations:			
Soil infiltration/permeability rate =	**0.1**	in/hr	**Enter determined permeability rate or assumed value of 0.1**
Irrigation area =	**NA**	square feet	
	NA	acres	

8. Extended Detention Basin System — Designed as Required in RG-348 — Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin =	**NA**	cubic feet	

9. Filter area for Sand Filters — Designed as Required in RG-348 — Pages 3-58 to 3-63

9A. Full Sedimentation and Filtration System

Water Quality Volume for sedimentation basin =	**NA**	cubic feet	
Minimum filter basin area =	**NA**	square feet	
Maximum sedimentation basin area =	**NA**	square feet	**For minimum water depth of 2 feet**
Minimum sedimentation basin area =	**NA**	square feet	**For maximum water depth of 8 feet**

9B. Partial Sedimentation and Filtration System

Water Quality Volume for combined basins =	**NA**	cubic feet	
Minimum filter basin area =	**NA**	square feet	
Maximum sedimentation basin area =	**NA**	square feet	**For minimum water depth of 2 feet**
Minimum sedimentation basin area =	**NA**	square feet	**For maximum water depth of 8 feet**

10. Bioretention System — Designed as Required in RG-348 — Pages 3-63 to 3-65

Required Water Quality Volume for Bioretention Basin =	**NA**	cubic feet

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

Required capacity of Permanent Pool =	**NA**	cubic feet	**Permanent Pool Capacity is 1.20 times the WQV**
Required capacity at WQV Elevation =	**NA**	cubic feet	**Total Capacity should be the Permanent Pool Capacity plus a second WQV.**

12. Constructed Wetlands — Designed as Required in RG-348 — Pages 3-71 to 3-73

Required Water Quality Volume for Constructed Wetlands =	**NA**	cubic feet

13. AquaLogic™ Cartridge System — Designed as Required in RG-348 — Pages 3-74 to 3-78

**** 2005 Technical Guidance Manual (RG-348) does not exempt the required 20% increase with maintenance contract with AquaLogic™.**

Required Sedimentation chamber capacity =	**NA**	cubic feet
Filter canisters (FCs) to treat WQV =	**NA**	cartridges
Filter basin area (RIA_F) =	**NA**	square feet

14. Stormwater Management StormFilter® by CONTECH

Required Water Quality Volume for Contech StormFilter System =	**NA**	cubic feet

THE SIZING REQUIREMENTS FOR THE FOLLOWING BMPs / LOAD REMOVALS ARE BASED UPON FLOW RATES - NOT CALCULATED WATER QUALITY VOLUMES

15. Grassy Swales — Designed as Required in RG-348 — Pages 3-51 to 3-54

Design parameters for the swale:

	Maint. Building Lot	West Parking Lot	East Parking Lot	
Drainage Area to be Treated by the Swale = A =	0.82	0.9	0.51	acres
Impervious Cover in Drainage Area =	0.82	0.9	0.51	acres
Rainfall intensity = i =	1.1	1.1	1.1	in/hr
Swale Slope =	0.025	0.025	0.01	ft/ft
Side Slope (z) =	3	3	3	
Design Water Depth = y =	0.33	0.33	0.33	ft
Weighted Runoff Coefficient = C =	0.74	0.74	0.74	
A_{CS} = cross-sectional area of flow in Swale =	1.18	1.30	1.17	sf
P_W = Wetted Perimeter =	4.65	5.05	4.64	feet
R_H = hydraulic radius of flow cross-section = A_{CS}/P_W =	0.25	0.26	0.25	feet
n = Manning's roughness coefficient =	0.2	0.2	0.2	

15A. Using the Method Described in the RG-348

Manning's Equation: $Q = \frac{1.49}{n} A_{CS} R_H^{2/3} S^{0.5}$

$b = \frac{0.134 \times Q}{y^{1.67} S^{0.5}} - zy$ =	2.54	2.96	2.55	feet
Q = CiA =	0.67	0.73	0.42	cfs

To calculate the flow velocity in the swale:

V (Velocity of Flow in the swale) = Q/A_{CS} =	0.57	0.56	0.36	ft/sec

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To calculate the resulting swale length:

L = Minimum Swale Length = V (ft/sec) * 300 (sec) =	169.56	168.42	106.52	feet

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters must be modified and the solver rerun.

15B. Alternative Method using Excel Solver

Design Q = CiA =	0.67	cfs		
Manning's Equation Q =	1.20	cfs	Error 1 =	-0.53
Swale Width=	6.00	ft		

Instructions are provided to the right (green comments).

Flow Velocity	0.57	ft/s
Minimum Length =	169.56	ft

Instructions are provided to the right (blue comments).

Design Width =	6	ft		
Design Discharge =	1.20	cfs	Error 2 =	-0.53
Design Depth =	0.33	ft		
Flow Velocity =	0.51	cfs		
Minimum Length =	154.12	ft		

If any of the resulting values do not meet the design requirement set forth in RG-348, the design parameters may be modified and the solver rerun.
If any of the resulting values still do not meet the design requirement set forth in RG-348, widening the swale bottom value may not be possible.

16. Vegetated Filter Strips — Designed as Required in RG-348 — Pages 3-55 to 3-57

There are no calculations required for determining the load or size of vegetative filter strips.
The 80% removal is provided when the contributing drainage area does not exceed 72 feet (direction of flow) and the sheet flow leaving the impervious cover is directed across 15 feet of engineered filter strips with maximum slope of 20% or across 50 feet of natural vegetation with a maximum slope of 10%. There can be a break in grade as long as no slope exceeds 20%.

If vegetative filter strips are proposed for an interim permanent BMP, they may be sized as described on Page 3-56 of RG-348.

17. Wet Vaults — Designed as Required in RG-348 — Pages 3-30 to 3-32 & 3-79

Required Load Removal Based upon Equation 3.3 =	**NA**	lbs

First calculate the load removal at 1.1 in/hour

RG-348 Page 3-30 Equation 3.4: Q = CiA

C = runoff coefficient for the drainage area =	0.10		**C = Runoff Coefficient = 0.546 (IC)^2 + 0.328 (IC) + 0.03**
i = design rainfall intensity =	1.1	in/hour	
A = drainage area in acres =	1	acres	
Q = flow rate in cubic feet per second =	0.11	cubic feet/sec	

RG-348 Page 3-31 Equation 3.5: V_{OR} = Q/A

Q = Runoff rate calculated above =	0.11	cubic feet/sec
A = Water surface area in the wet vault =	150	square feet
V_{OR} = Overflow Rate =	0.00	feet/sec
Percent TSS Removal from Figure 3-1 (RG-348 Page 3-31) =	53	percent
Load removed by Wet Vault =	#VALUE!	lbs

If a bypass occurs at a rainfall intensity of less than 1.1 in/hours
Calculate the efficiency reduction for the actual rainfall intensity rate

Actual Rainfall Intensity at which Wet Vault bypass Occurs =	0.5	in/hour
Fraction of rainfall treated from Figure 3-2 RG-348 Page 3-32 =	0.75	percent
Efficiency Reduction for Actual Rainfall Intensity =	0.83	percent
Resultant TSS Load removed by Wet Vault =	#VALUE!	lbs

18. Permeable Concrete — Designed as Required in RG-348 — Pages 3-79 to 3-83

PERMEABLE CONCRETE MAY ONLY BE USED ON THE CONTRIBUTING ZONE

19. BMPs Installed in a Series — Designed as Required in RG-348 — Pages 3-32

Michael E. Barrett, Ph.D.. P.E. recommended that the coefficient for E_2 be changed from 0.5 to 0.65 on May 3, 2006

E_{TOT} = [1 - ((1 - E_1) X (1 - 0.65E_2) x (1 - 0.25E_3))] X 100 =	86.38	percent	NET EFFICIENCY OF THE BMPs IN THE SERIES
EFFICIENCY OF FIRST BMP IN THE SERIES = E_1 =	75.00	percent	
EFFICIENCY OF THE SECOND BMP IN THE SERIES = E_2 =	70.00	percent	
EFFICIENCY OF THE THIRD BMP IN THE SERIES = E_3 =	0.00	percent	

THEREFORE, THE NET LOAD REMOVAL WOULD BE:
(A_I AND A_P VALUES ARE FROM SECTION 3 ABOVE)

	PR-1	PR-2	PR-3	PR-4	
L_R = E_{TOT} X P X (A_I X 34.6 X A_P X0.54) =	**1900.43**	**1504.82**	**848.34**	**1661.06**	lbs

20. Stormceptor

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

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BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if multiple values provided in Calculated Model Size or if you are choosing a larger model size) =	0	Model Size
Surface Area =	#N/A	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit $\geq$ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

21. Vortech

Required TSS Removal in BMP Drainage Area=	**NA**	lbs
Impervious Cover Overtreatment=	0.0000	ac
TSS Removal for Uncaptured Area =	0.00	lbs

BMP Sizing

Effective Area =	NA	EA
Calculated Model Size(s) =	#N/A	
Actual Model Size (if choosing larger model size) =	Vx1000	Pick Model Size
Surface Area =	7.10	ft^2
Overflow Rate =	#VALUE!	V_{or}
Rounded Overflow Rate =	#VALUE!	V_{or}
BMP Efficiency % =	#VALUE!	%
L_R Value =	#VALUE!	lbs
TSS Load Credit =	#VALUE!	lbs
Is Sufficient Treatment Available? (TSS Credit $\geq$ TSS Uncapt.)	#VALUE!	
TSS Treatment by BMP (LM + TSS Uncapt.) =	#VALUE!	

4/13/2023

Temporary Stormwater Section

Texas Commission on Environmental Quality

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

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

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

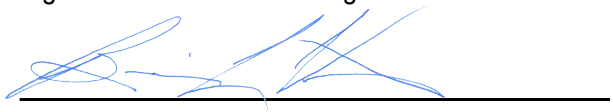
Signature

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

Print Name of Customer/Agent: Brian L. Vines

Date: 8/12/2022

Signature of Customer/Agent:



Regulated Entity Name: Berry Springs Park and Preserve

Project Information

Potential Sources of Contamination

Examples: Fuel storage and use, chemical storage and use, use of asphaltic products, construction vehicles tracking onto public roads, and existing solid waste.

1. Fuels for construction equipment and hazardous substances which will be used during construction:

   ☐ The following fuels and/or hazardous substances will be stored on the site: _____

   These fuels and/or hazardous substances will be stored in:

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

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

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

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

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

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

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

Sequence of Construction

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

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

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

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

Temporary Best Management Practices (TBMPs)

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

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

☒ A description of how BMPs and measures will prevent pollution of surface water, groundwater or stormwater that originates upgradient from the site and flows across the site.

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

☒ A description of how BMPs and measures will prevent pollutants from entering surface streams, sensitive features, or the aquifer.

☒ A description of how, to the maximum extent practicable, BMPs and measures will maintain flow to naturally-occurring sensitive features identified in either the geologic assessment, TCEQ inspections, or during excavation, blasting, or construction.

8. ☐ The temporary sealing of a naturally-occurring sensitive feature which accepts recharge to the Edwards Aquifer as a temporary pollution abatement measure during active construction should be avoided.

   ☐ Attachment E - Request to Temporarily Seal a Feature. A request to temporarily seal a feature is attached. The request includes justification as to why no reasonable and practicable alternative exists for each feature.

   ☐ There will be no temporary sealing of naturally-occurring sensitive features on the site.

9. ☒ Attachment F - Structural Practices. A description of the structural practices that will be used to divert flows away from exposed soils, to store flows, or to otherwise limit runoff discharge of pollutants from exposed areas of the site is attached. Placement of structural practices in floodplains has been avoided.

10. ☒ Attachment G - Drainage Area Map. A drainage area map supporting the following requirements is attached:

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin will be provided.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a smaller sediment basin and/or sediment trap(s) will be used.

    ☐ For areas that will have more than 10 acres within a common drainage area disturbed at one time, a sediment basin or other equivalent controls are not attainable, but other TBMPs and measures will be used in combination to protect down slope and side slope boundaries of the construction area.

    ☐ There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time. A smaller sediment basin and/or sediment trap(s) will be used in combination with other erosion and sediment controls within each disturbed drainage area.

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

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

☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

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

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

Administrative Information

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

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

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

Attachment 4A:
Spill Response Actions

No spills of hydrocarbons or hazardous substances are expected. However, in the event such an incident does occur, the contractor should carefully follow the following TCEQ guidelines:

General Measures

(1) To the extent that work can be accomplished safely, spills of oil, petroleum products, substances listed under 40 CFR parts 110, 117, and 302, and sanitary and septic wastes should be contained and cleaned up immediately.
(2) Store hazardous materials and wastes in covered containers and protect from vandalism.
(3) Place a stockpile of spill cleanup materials where it will be readily accessible.
(4) Train employees in spill prevention and cleanup.
(5) Designate responsible individuals to oversee and enforce control measures.
(6) Spills should be covered and protected from stormwater run-on during rainfall to the extent that doesn't compromise clean-up activities.
(7) Do not bury or wash spills with water.
(8) Store and dispose of used clean up materials, contaminated materials, and recovered spill material that is no longer suitable for the intended purpose in conformance with the provisions in applicable BMPs.
(9) Do not allow water used for cleaning and decontamination to enter storm drains or watercourses. Collect and dispose of contaminated water in accordance with applicable regulations.
(10) Contain water overflow or minor water spillage and do not allow it to discharge into drainage facilities or watercourses.
(11) Place Material Safety Data Sheets (MSDS), as well as proper storage, cleanup, and spill reporting instructions for hazardous materials stored or used in the project site in an open, conspicuous, and accessible location.
(12) Keep waste storage areas clean, well organized, and equipped with ample cleanup supplies as appropriate for the materials being stored. Perimeter controls, containment structures, covers, and liners should be repaired or replaced as needed to maintain proper function.

Cleanup

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

Minor Spills

(1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
(2) Use absorbent materials on small spills rather than hosing down or burying the spill.

(3) Absorbent materials should be promptly removed and disposed of properly.
(4) Follow the practice below for a minor spill:
    - Contain the spread of the spill
    - Recover spilled materials
    - Clean the contaminated area and properly dispose of contaminated materials.

Semi-Significant Spills

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

Spills should be cleaned up immediately:

(1) Contain spread of the spill.
(2) Notify the project foreman immediately.
(3) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
(4) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil.
(5) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant Spills

The Reportable Quantity (RQ) of any hazardous substance shall be the quantity designated as the Final Reportable Quantity in Table 302.4 in 40 CFR 302.4.

The Reportable Quantity for petroleum product and used oil shall be 25 gallons.

For significant or hazardous spills that are in reportable quantities:

(1) Notify the TCEQ by telephone as soon as possible and within 24 hours at 512-339-2929 (Austin) or 210-490-3096 (San Antonio) between 8 AM and 5 PM. After hours, contact the Environmental Release Hotline at 1-800-832-8224. It is the contractor's responsibility to have all emergency phone number at the construction site.
(2) For spills of federal reportable quantities, in conformance with the requirements in 40 CFS parts 110, 119, and 302, the contractor should notify the National Response Center at (800) 424-8802.
(3) Notification should first be made by telephone and followed up with a written report.
(4) The services of a spills contractor or a Haz-Mat team should be obtained immediately. Construction personnel should not attempt to clean up until the appropriate and qualified staffs have arrived at the job site.
(5) Other agencies which may need to be consulted include, but are not limited to, the City Police Department, County Sheriff Office, Fire Departments, etc.

More information on spill rules and appropriate responses is available on the TCEQ website at: http://www.tceq.state.tx.us/response/spills.html

Attachment 4B:
Potential Sources of Contamination

Potential sources of sediment to stormwater runoff:

(1) Clearing and grubbing
(2) Grading and excavation
(3) Vehicle tracking
(4) Landscaping

Potential pollutants and sources, other than sediment, to stormwater runoff:

(1) Combined staging area – small fueling, minor equipment maintenance, sanitary facility
(2) Materials storage area – solvents, adhesives, paving materials, aggregates, trash, etc.
(3) Construction activities – paving, concrete pouring
(4) Concrete washout area

Potential on-site pollutants:

(1) Gasoline, diesel fuel, hydraulic fluids, antifreeze
(2) Fertilizer
(3) Concrete, asphalt
(4) Sanitary toilets

Attachment 4C:
Sequence of Major Construction Activities

The approximate construction sequencing is as follows:

1) Install tree protection and initiate tree mitigation measures.
2) Install erosion controls and off-site erosion controls as indicated on the approved plans. Sediment control fence, concrete washout area, and stabilized construction entrance/exit will be used as temporary control measures in each phase of construction.
3) Contact Williamson County to schedule pre-construction coordination meeting.
4) Evaluate temporary erosion control installation. Review construction schedule with the erosion control plans.
5) Begin site clearing and grading. Inspect and maintain all erosion control measures. (Total disturbed area is approximately 5 acres)
6) Construct infrastructure including: parking lots, concrete sidewalks, gravel roads, granite trails, maintenance building, visitor center, remote toilet, event pavilion, planting areas, water lines, septic tanks, septic field lines, and sewer service lines.
7) Grade and revegetate disturbed areas.
8) Schedule final inspection with Williamson County.
9) Remove temporary sedimentation controls at grass growth.

Attachment 4D:
Temporary Best Management Practices and Measures

Please see erosion and sedimentation control sheets for the temporary BMPs. The BMPs will be placed prior to construction activities.

Prior to commencing construction the following tasks will occur:

- Install tree protection, as shown on the erosion and sedimentation control layouts.
- Establish stabilized construction entrance(s)/exit(s).
- Install sediment control fence as shown on the erosion and sedimentation control layouts.
- Install concrete washout area, as shown on the erosion and sedimentation control layouts.

At the completion of construction, the following tasks will occur:

- Installation of soil retention blankets; and placement of topsoil and hydromulch, according to the attached Construction Plans.
- Once all areas on the site have established permanent stabilization, the temporary BMPs will be removed.

Additional notes regarding temporary BMPs:

- Sediment control fence, inlet protection, concrete washout area, and a stabilized construction entrance/exit will be utilized as temporary BMPs during the construction phase. These erosion and sediment controls have been designed to retain sediment on-site to the extent practicable. Specifically, surface water run-off will be filtered by the sediment control fences before leaving the site. The construction entrance/exit and concrete washout area will supplement the control of off-site tracking of contaminated materials. The final stabilization measure will be the application of soil retention blankets, topsoil and hydromulch, which will cover and stabilize all areas disturbed by construction activities.
- Material storage will be managed in designated areas determined by the contractor. Containment and/or drainage control will be used for portable toilets or any hazardous materials. Designated staging areas are outside of the 100-yr floodplain.

Attachment 4F:
Structural Practices

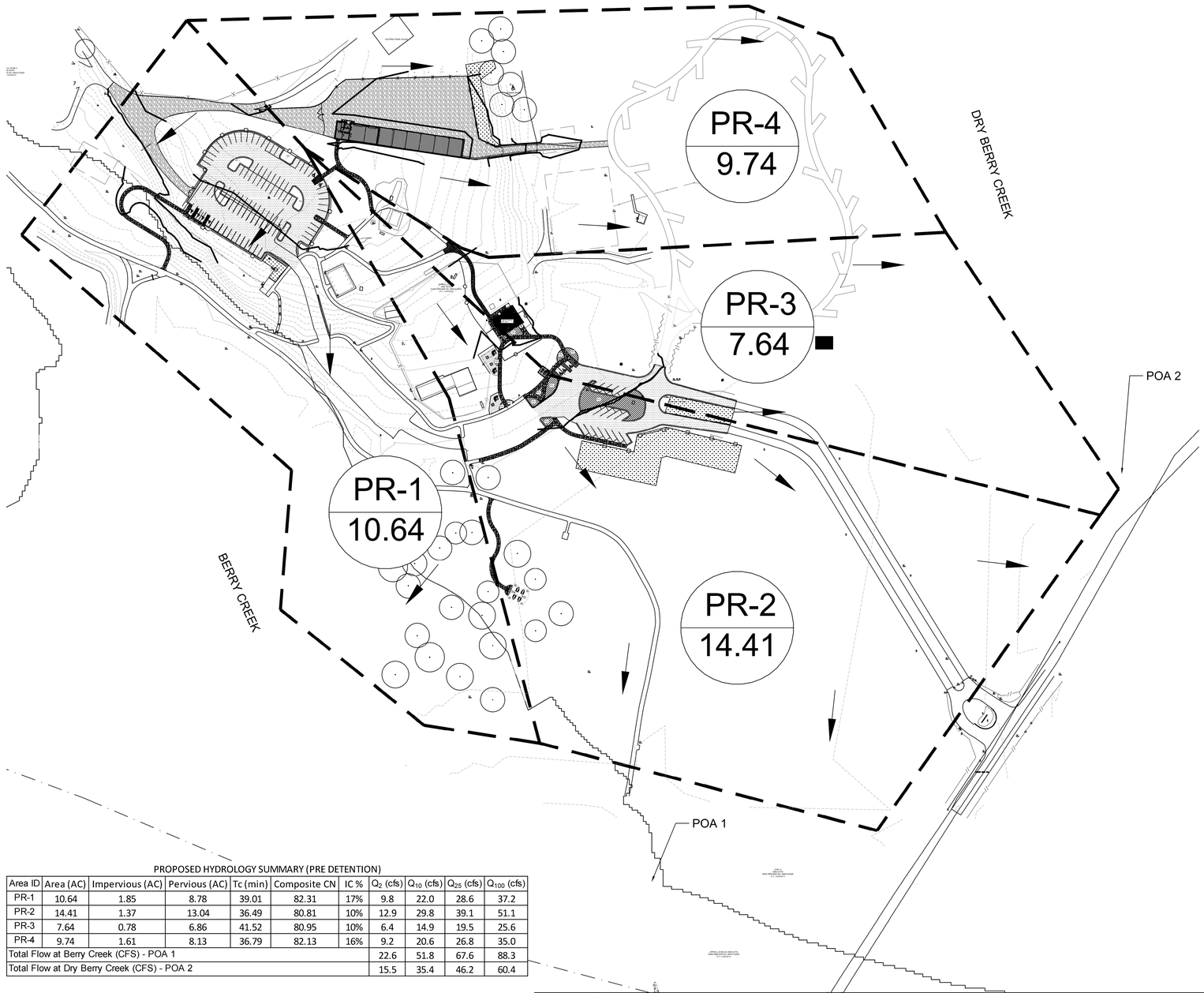
The following temporary BMP structural practices will be employed on site:

- Silt Fence: used as barrier protection around the perimeter of the limits of disturbance. The fence retains sediment primarily by retarding flow and promoting deposition on the uphill side of the slope. Runoff is filtered as is passes through the geotextile.
- Stabilized Construction Entrance/Exit: Anti-tracking pads consisting of stone will be installed at the site exit to prevent the off-site transport of sediment by construction vehicles. The anti-tracking pads will be at least 50 feet long, a minimum of 12 feet wide, flared at the end closest to the existing paved road, graded to flow back on to the construction site, and will consist of a 4 to 8-inch-thick layer of coarse aggregate. The aggregate will be placed over a layer of geotextile filter fabric to reduce the mitigation of sediment from the underlying soil.
- Concrete Washout Area: prevents or reduces the discharge of pollutants to stormwater from concrete waste by performing onsite washout in a designated area by trained employees and subcontractors.

Construction of the Country Road 152 Sidewalk and trail extension, event pavilion, and general landscaping will take place in the floodplain. In order to prevent sediment from discharging off-site, silt fence will be utilized as temporary BMPs within the floodplain.

Attachment 4G:
Drainage Area Map

See attached sheets for the proposed project Drainage Area Maps. There are no areas greater than 10 acres within a common drainage area that will be disturbed at one time.



LEGEND

- DRAINAGE AREA
- 100 YEAR FLOOD PLAIN
- FLOW DIRECTION
- XX / XX — AREA ID / AREA (AC)

NOTES:

1. HEC-HMS 4.1 WAS USED TO DEVELOP THE EXISTING AND PROPOSED CONDITION PEAK FLOW.
2. CN VALUE IS CALCULATED WITH THE FOLLOWING ASSUMPTION:
   SOIL HYDROLOGIC GROUP: C
   PERIOUS AREA: OPEN SPACE FAIR CONDITION (CN VALUE 79)
   IMPERVIOUS AREA: PAVED PARKING LOTS, ROOFS, DRIVEWAYS, ETC. (CN VALUE 98)

PROPOSED HYDROLOGY SUMMARY (PRE DETENTION)

Area ID	Area (AC)	Impervious (AC)	Pervious (AC)	Tc (min)	Composite CN	IC %	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
PR-1	10.64	1.85	8.78	39.01	82.31	17%	9.8	22.0	28.6	37.2
PR-2	14.41	1.37	13.04	36.49	80.81	10%	12.9	29.8	39.1	51.1
PR-3	7.64	0.78	6.86	41.52	80.95	10%	6.4	14.9	19.5	25.6
PR-4	9.74	1.61	8.13	36.79	82.13	16%	9.2	20.6	26.8	35.0
Total Flow at Berry Creek (CFS) - POA 1							22.6	51.8	67.6	88.3
Total Flow at Dry Berry Creek (CFS) - POA 2							15.5	35.4	46.2	60.4

PROPOSED HYDROLOGY SUMMARY (DETENTION NOT REQUIRED)

Area ID	Area (AC)	Impervious (AC)	Pervious (AC)	Tc (min)	Composite CN	IC %	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
PR-1	10.64	1.85	8.78	39.01	82.31	17%	9.8	22.0	28.6	37.2
PR-2	14.41	1.37	13.04	36.49	80.81	10%	11.4	28.2	37.3	49.0
PR-3	7.64	0.78	6.86	41.52	80.95	10%	5.7	12.5	16.7	22.5
PR-4	9.74	1.61	8.13	36.79	82.13	16%	9.2	20.6	26.8	35.0
Total Flow at Berry Creek (CFS) - POA 1							20.7	49.8	65.5	85.8
Total Flow at Dry Berry Creek (CFS) - POA 2							14.1	31.5	41.1	54.6

DRAINAGE AREA	*Subbasin Area*	*TR-55 Time of Concentration Calculations*														
		Overland Flow				*Shallow Concentrated Flow*				*Channelized Flow*			*Time of Concentration*		*Lag Time*
		n	*Length*	*Avg. Slope*	*T1*	*Cover*	*Avg. Slope*	*Length*	*T2*	*Velocity*	*Length*	*T3*			
	acres		*ft*	*ft/ft*	*hrs*		*ft/ft*	*ft*	*hrs*	*ft/sec*	*ft*	*hrs*	*hrs*	*min*	*min*
PR-1	10.64	0.41	100.00	0.01	0.46	Unpaved	0.02	1,437.32	0.19	0	0	0	0.65	39.01	23.40
PR-2	14.41	0.41	100.00	0.01	0.46	Unpaved	0.02	1,127.39	0.15	0	0	0	0.61	36.49	21.89
PR-3	7.64	0.41	100.00	0.01	0.50	Unpaved	0.02	1,370.60	0.19	0	0	0	0.69	41.52	24.91
PR-4	9.74	0.41	100.00	0.01	0.46	Unpaved	0.02	1,279.97	0.15	0	0	0	0.61	36.79	22.08

NORTH

0 50 100 200
SCALE 1" = 100'

BERRY SPRINGS
PARK IMPROVEMENTS
Williamson County, Texas

WILLIAMSON COUNTY 1848

HALFF
13620 Briarwick Drive, Suite 100
Austin, TX 78729
MAIN (512) 777-4600
FAX (512) 252-8141

Revision No.	Date	Description
A	A_Date	A_Desc
B	B_Date	B-Desc
C	C_Date	C_Desc
D	D_Date	D_Desc
E	E_Date	E_Desc
F	F_Date	F_Desc
G	G_Date	G_Desc

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED PROFESSIONAL ENGINEER
12/21/2022

Project No.:	38049
Issued:	7/15/2022
Drawn By:	AS
Checked By:	BV

Sheet Title
PROPOSED DRAINAGE AREA

Sheet Number C5.02
Sheet No. 1 of XX
Project Page Number

Attachment 4I:
Inspection and Maintenance for BMPs

The inspection and maintenance of temporary BMP's will be made according to TCEQ RG-348, *Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices*, July 2005.

Inspection Personnel: Inspections shall be conducted by qualified representatives of the contractor acting on behalf of the owner or a designated party if hired separately by the owner. Each operator must delegate authority to the specifically described position or person performing inspections, as provided by 30 TAC 305.128, as an authorized person for signing reports and performing certain activities requested by the director or required by the TPDES general permit. This delegation of authority must be provided to the director of TCEQ in writing and a copy shall be kept along with the signed effective copy of the SWPPP.

Inspection Schedule and Procedures: Inspections must comply with the following:

An inspection shall occur weekly and after any rain event.

The authorized party shall inspect all disturbed areas of the site, areas used for storage of materials that are exposed to precipitation, structural control measures, and locations where vehicles enter or exit the site.

Disturbed areas and areas used for storage of materials that are exposed to precipitation or within limits of the 1% annual chance (100 year) floodplain must be inspected for evidence of, or the potential for, pollutants entering the runoff from the site. Erosion and sediment control measures identified in the plan must be observed to ensure that they are operating correctly. Observations can be made during wet or dry weather conditions. Where discharge locations or points are accessible, they must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. This can be done by inspecting receiving waters to see whether any signs or erosion or sediment are associated with the discharge location. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment tracking.

Based on the results of the inspection, the site description and the pollution prevention measures identified in the plan must be revised as soon as possible after an inspection that reveals inadequacies. The inspection and plan review process must provide for timely implementation of any changes to the plan with 7 calendar days following the inspection.

An inspection report that summarizes the scope of the inspection, name(s) and qualifications of personnel conducting the inspection, the dates of the inspection, major observations relating to the implementation of the SWPPP. Major observations shall include as a minimum location of discharges of sediment or other pollutants from the site, location of BMPs that need to be maintained, location of BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where BMPs are needed. Actions taken as a result of the inspections must be described within, and retained as a part of, the SWPPP. Reports must identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the facility or site is in compliance with the SWPPP and the TPDES

general permit. The report must be signed by the authorized representative delegated by the operators in accordance with TAC 305.128.

Maintenance and Corrective Actions: Maintenance of erosion control facilities shall consist of the minimum requirements as follows:

A. In ongoing construction areas inspect erosion control improvements to confirm facilities are in place and operable. Where facilities have been temporarily set aside or damaged due to construction activity, place facilities in service before leaving job site.

B. If weather forecast predicts possibility of rain, check entire facilities throughout site to assure facilities are in place and operable. If job site weather conditions indicate high probability of rain, make special inspection of erosion control facilities.

C. After rainfall events review erosion control facilities as soon as site is accessible. Clean rock berms, berm/swales and other structural facilities. Determine where additional facilities or alternative techniques are needed to control sediment leaving site.

D. After portions of site have been seeded, review these areas on regular basis in accordance with project specifications to assure proper watering until grass is established. Reseed areas where grass is not well established.

E. Spills are to be handled as specified by the manufacturer of the product in a timely safe manner by personnel. The site superintendent will be responsible for coordinating spill prevention and cleanup operations.

F. Concrete trucks will discharge extra concrete or wash out drum only at an approved location on site. Residual product shall be properly disposed of.

G. Inspect vehicle entrance and exits for evidence of off-site tracking and correct as needed.

H. Remove sediment from traps/ponds no later than when the design capacity has been reduced by 50%.

I. If sediment escapes the site, the contractor where feasible and where access is available shall collect and remove sedimentation material by appropriate non-damaging methods. Additionally, the contractor shall correct the condition causing discharges.

J. If inspections or other information sources reveal a control has been used incorrectly, or that a control is performing inadequately, the contractor must replace, correct or modify the control as soon as practical after discovery of the deficiency.

Attachment 4J:
Schedule of Interim and Permanent Soil Stabilization Practices

The schedule of interim and permanent soil stabilization practices will be according to Federal Register / Vol. 63, No 31 (February 17, 1998).

Prior to Disturbance: Install all temporary erosion and sedimentation control features.

During Construction: Maintain all temporary erosion and sedimentation control structures. Inspect all temporary erosion and sedimentation control structures on a weekly basis and after rain events.

After Completion of Permanent Erosion and Sediment Controls: Stabilize and restore all areas disturbed during construction. Permanent hydromulch will be applied immediately after the final design grades are achieved on portions of the site but no later than 14 days after construction activities have permanently ceased. Where disturbance has occurred in close proximity to the Berry Creek, soil retention blankets will also be installed to aid in soil stabilization. Revegetation will also include establishing the vegetative filter strips. After the entire site is stabilized, any sediment that has accumulated will be removed and hauled off-site for disposal. Construction debris, trash and temporary BMPs including silt fences, material storage areas, sanitary toilets, etc., will also be removed and any areas disturbed during removal will be revegetated immediately.

The Contractor shall keep records at the site of the dates when major grading activities occur, dates when construction activities temporarily or permanently cease on a portion of the site, and the dates when stabilization measures are initiated.

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.

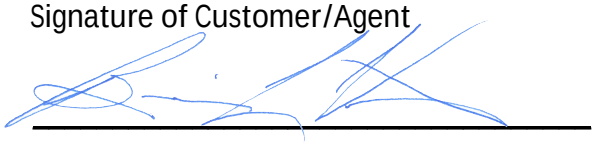
Signature

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: Brian L. Vines

Date: 8/12/2022

Signature of Customer/Agent



Regulated Entity Name: Berry Springs Park and Preserve

Permanent Best Management Practices (BMPs)

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

1. ☒ Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.

   ☐ N/A

2. ☒ These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.

   ☒ The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

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

☐ N/A

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

   ☐ N/A

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

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

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

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

6. ☒ Attachment B - BMPs for Upgradient Stormwater.

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

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

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

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

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

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

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

☐ N/A

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

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

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

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

☐ Design calculations (TSS removal calculations)

☒ TCEQ construction notes

☒ All geologic features

☐ All proposed structural BMP(s) plans and specifications

☐ N/A

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

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

    ☐ N/A

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

    ☒ N/A

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

    ☐ N/A

Responsibility for Maintenance of Permanent BMP(s)

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

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

    ☐ N/A

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

    ☒ N/A

Attachment 5B:
BMPs for Upgradient Stormwater

Upgradient runoff that originates from the north side of the project site will generally continue to flow in its existing condition towards either Berry Creek to the west or Dry Berry Creek to the east. A portion of the upgradient runoff will flow toward the new parking lot of the west end of the project site; however, a portion of it will be treated by the proposed vegetated filter strips and grassy swales. Upgradient impervious cover draining through the vegetated filter strips and grassy swales has been accounted for in the permanent BMP calculations, thereby resulting in overtreatment of existing impervious cover.

Attachment 5C:
BMPs for On-site Stormwater

Vegetated filter strips and grassy swales have been selected as the permanent BMPs to reduce the TSS loading as a result of the Berry Springs Park and Preserve project. Engineered vegetated filter strips and grassy swales will be constructed to treat the runoff attributable to the new proposed parking lots, new maintenance building and gravel parking lot, new visitor center, new sidewalks, and new section of entrance road near the proposed visitor center.

The west parking lot, visitor center, park entrance parking lot, and entrance road improvements have been designed with additional natural vegetation between the BMPs (engineered vegetated filter strips and grassy swale) and Berry Creek. The maintenance building parking lot has been designed with additional natural vegetation between the BMPs (grassy swale and engineered vegetative filter strips) and the existing RV park. Additionally, a portion of the sidewalk passes under County Road 152; and since vegetation does not generally grow well under bridges without sunlight, filter strips have been excluded from this select area as well. The increase in impervious cover is negligible in this area under Interstate 35.

Altogether, the vegetated buffer strips and the grassy swales have been designed to remove 5,478 lbs of TSS. Although ideal, not all the proposed impervious cover will be treated by a designated and adjacent filter strip. However, a portion of the existing off-site impervious cover will be treated with the proposed filter strips and grassy swales, thereby offsetting the on-site untreated proposed impervious cover. Ultimately, the proposed designated filter strips and grassy swales will successfully mitigate the TSS load caused by the 1.98 acres of increased impervious cover. It can be safely concluded that there will be a negligible impact on the water quality in the project area, as a majority of the stormwater will sheet flow through the grassy swales and vegetated buffer strips.

IMPERVIOUS AREA CALCULATIONS		
Total Project Area =	42.43	Acres
Pre-Development Impervious Cover =	3.63	Acres
Post-Development Impervious Cover =	5.61	Acres
Net Increase Impervious Cover =	1.98	Acres
Required TSS Removal =	1,723.38	lbs

TSS LOAD REMOVAL SUMMARY		
Basin ID	TSS Load Removal Required (lbs)	TSS Load Removal Capacity (lbs)
PR-1	591.87	1870
PR-2	313.34	1481
PR-3	156.67	835
PR-4	661.5	1635
SUB-TOTAL AREA TO BMP =	1,723.38	5,821
SUB-TOTAL AREAS NOT TO BMPs =	0	0
PROJECT TOTAL =	1,723.38	5,821

Attachment 5D:
BMPs for Surface Streams

The BMPs utilized to reduce the amount of pollutant load from entering the surface streams, sensitive features, or the Edwards Aquifer are grassy swales and vegetated filter strips. These grassy swales and vegetated filter strips are described in more detail in Attachment 5C.

Attachment 5F:
Construction Plans

(Under Separate Cover)
See Berry Springs Park Improvements

Attachment 5G:
Inspection, Maintenance, Repair, and Retrofit Plan

The inspection and maintenance of permanent BMP's should be done in conformance with TCEQ RG-348, *Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices*, July 2005.

Maintenance for grassy swales is minimal and is largely aimed at keeping the grass cover dense and vigorous. Maintenance practices and schedules should be developed and included as part of the original plans to alleviate maintenance problems in the future. Recommended practices include:

- *Pest Management* – An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.
- *Seasonal Mowing and Lawn Care* – Lawn mowing should be performed routinely, as needed, throughout the growing season. Grass height should not exceed 18 inches. Grass cuttings should be collected and disposed of offsite, or a mulching mower can be used. Regular mowing should also include weed control practices; however, herbicide use should be kept to a minimum. Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients.
- *Inspection* – Inspect swales at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The swale should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections should be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.
- *Debris and Litter Removal* – Trash tends to accumulate in swale areas, particularly along highways. Any swale structures (i.e. check dams) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than two times per year.
- *Sediment Removal* – Sediment accumulating near culverts and in channels needs to be removed when they build up to 3 inches at any spot, or cover vegetation. Excess sediment should be removed by hand or with flat-bottomed shovels. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level with the bottom of the swale. Sediment removal should be performed periodically, as determined through inspection.
- *Grass Reseeding and Mulching* – A healthy dense grass should be maintained in the channel and side slopes. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during swale establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established.
- *Public Education* – Private homeowners are often responsible for roadside swale maintenance. Unfortunately, overzealous lawn care on the part of homeowners can present some problems. For example, mowing the swale too close to the ground, or excessive application of fertilizer and pesticides will all be detrimental to the performance of the swale. Pet waste

can also be a problem in swales, and should be removed to avoid contamination from fecal coliform and other waste-associated bacteria. The delegation of maintenance responsibilities to individual landowners is a cost benefit to the locality. However, localities should provide an active educational program to encourage the recommended practices.

Generally, little additional maintenance is required once a vegetated filter strip is well established. It is important, however, to properly care for and maintain the area in the first few months after it is planted in order to establish a viable vegetated feature. After the vegetated filter strips are well established, basic maintenance is recommended to maintain the health of the plants, including:

- *Pest Management* – An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.
- *Seasonal Mowing and Lawn Care* – If the filter strip is made up of turf grass, it should be mowed as needed to limit vegetation height to 18-inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Weed control practices should also be incorporated into the regular mowing activities. Use of herbicides should be kept to a minimum. Due to the fact that runoff typically contains sources of nutrients, healthy grasses may be maintained without the use of fertilizers. Irrigation may be required to ensure a dense and healthy vegetative cover.
- *Inspection* – In the first few years after the establishment of the filter strip, the grass cover should be inspected frequently. These inspections should identify any existing or emerging issues with the vegetation growth. If needed, plans should be made for restorative maintenance. Filter strips shall be inspected at a minimum twice annually, evaluating erosion or damage to the vegetation. It is recommended that additional inspections be conducted after periods of heavy runoff, in which the following conditions should be checked: uniformity of grass cover; debris and litter; and areas of sediment accumulation. If bare spots and/or erosion areas are identified, replanting and restoration is required to meet specifications. If deemed necessary, a level spreader device may be required to be constructed in order to re-establish shallow flow conditions.
- *Debris and Litter Removal* – It is common for trash to accumulate in vegetated areas. Filter strip structures should be kept free of obstructions for aesthetic purposes, as well as to reduce the amount of trash migrating downstream. Debris and litter removal should be performed at a minimum frequency of four times per year (i.e. quarterly), but may be done more often as determined through periodic inspections.
- *Sediment Removal* – Although sediment removal is not normally required for filter strips, sediment may accumulate along the upstream boundary of the strip preventing uniform sheet flow. As required, excess sediment should be removed by hand or with a flat-bottomed shovel.
- *Grass Reseeding and Mulching* – Healthy dense grasses / vegetation shall be maintained on the filter strips. If areas are found to be eroded, they should be filled, compacted, and reseeded, thereby establishing a level final grade. If any grass is damaged during the sediment removal process, it should promptly be replaced utilizing the same seed mix used during the initial filter strip establishment. Flow should be diverted from the damaged areas as much as possible, until the grass is firmly established. Any identified erosion and/or bare spots

during inspections should be replanted and restored to meet specifications. Corrective maintenance should be done more frequently in the first two to three years after installation to ensure stabilization; this may include weeding and/or replanting. Dense vegetation may require irrigation immediately after planting and during dry periods until vegetation is initially established.

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. 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.

Russell Fishbeck Digitally signed by Russell Fishbeck Date: 2023.04.13 08:02:31 -05'00'

Applicant

8/12/2022

Date

Attachment 5I:
Measures for Minimizing Surface Stream Contamination

The proposed permanent BMPs for water quality are grassy swales and vegetated filter strips, which will minimize surface stream contamination by reducing the TSS in the stormwater from the proposed site.

The increase in flows resulting from the construction of the proposed project will be so minimal that stream flashing, increased instream velocities, concentrated flows, and increased erosion is not expected.

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

I JESUS ANGEL GOMEZ,
Print Name

SENIOR PROJECT MANAGER - FACILITES MANAGEMENT/ODR,
Title - Owner/President/Other

of Williamson County, Texas,
Corporation/Partnership/Entity Name

have authorized Brian L. Vines, P.E.
Print Name of Agent/Engineer

of Halff Associates, Inc.
Print Name of Firm

to represent and act on the behalf of the above named Corporation, Partnership, or Entity for the purpose of preparing and submitting this plan application to the Texas Commission on Environmental Quality (TCEQ) for the review and approval consideration of regulated activities.

I also understand that:

1. The applicant is responsible for compliance with 30 Texas Administrative Code Chapter 213 and any condition of the TCEQ's approval letter. The TCEQ is authorized to assess administrative penalties of up to $10,000 per day per violation.

2. For those submitting an application who are not the property owner, but who have the right to control and possess the property, additional authorization is required from the owner.

3. Application fees are due and payable at the time the application is submitted. The application fee must be sent to the TCEQ cashier or to the appropriate regional office. The application will not be considered until the correct fee is received by the commission.

4. A notarized copy of the Agent Authorization Form must be provided for the person preparing the application, and this form must accompany the completed application.

5. No person shall commence any regulated activity on the Edwards Aquifer Recharge Zone, Contributing Zone or Transition Zone until the appropriate application for the activity has been filed with and approved by the Executive Director.

SIGNATURE PAGE:

Applicant's Signature

9/6/2022
Date

THE STATE OF Texas §

County of Williamson §

BEFORE ME, the undersigned authority, on this day personally appeared Jesus Angel Gomez 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 6th day of September, 2022.

NOTARY PUBLIC

REBECCA PRUITT
Notary Public, State of Texas
Comm. Expires 08-31-2024
Notary ID 132650479

Rebecca Pruitt
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 08-31-2024

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Berry Springs Park
Regulated Entity Location: Georgetown, TX
Name of Customer: Williamson County
Contact Person: Russell Fishbeck Phone: (512) 943-1920
Customer Reference Number (if issued):CN 600897888
Regulated Entity Reference Number (if issued):RN 104334941
Austin Regional Office (3373)

☐ Hays ☐ Travis ☒ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

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

☒ Austin Regional Office
☐ Mailed to: TCEQ - Cashier
Revenues Section
Mail Code 214
P.O. Box 13088
Austin, TX 78711-3088

☐ San Antonio Regional Office
☐ Overnight Delivery to: TCEQ - Cashier
12100 Park 35 Circle
Building A, 3rd Floor
Austin, TX 78753
(512)239-0357

Site Location (Check All That Apply):

☒ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

Type of Plan	*Size*	*Fee Due*
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$ n/a
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	$ n/a
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	42.43 Acres	$ 8,000
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$ n/a
Underground or Aboveground Storage Tank Facility	Tanks	$ n/a
Piping System(s)(only)	Each	$ n/a
Exception	Each	$ n/a
Extension of Time	Each	$ n/a

Signature: 

Date: 8/12/2022

Application Fee Schedule

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program 30 TAC Chapter 213 (effective 05/01/2008)

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

Project	*Project Area in Acres*	*Fee*
One Single Family Residential Dwelling	< 5	$650
Multiple Single Family Residential and Parks	< 5 5 < 10 10 < 40 40 < 100 100 < 500 ≥ 500	$1,500 $3,000 $4,000 $6,500 $8,000 $10,000
Non-residential (Commercial, industrial, institutional, multi-family residential, schools, and other sites where regulated activities will occur)	< 1 1 < 5 5 < 10 10 < 40 40 < 100 ≥ 100	$3,000 $4,000 $5,000 $6,500 $8,000 $10,000

Organized Sewage Collection Systems and Modifications

Project	*Cost per Linear Foot*	*Minimum Fee-Maximum Fee*
Sewage Collection Systems	$0.50	$650 - $6,500

Underground and Aboveground Storage Tank System Facility Plans and Modifications

Project	*Cost per Tank or Piping System*	*Minimum Fee-Maximum Fee*
Underground and Aboveground Storage Tank Facility	$650	$650 - $6,500

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

TCEQ Use Only

TCEQ Core Data Form

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

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☐ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☒ Other **EXPANSION OF REGULATED ENTITY**

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 **600897888**		RN **104334941**

SECTION II: Customer Information

4. General Customer Information	5. Effective Date for Customer Information Updates (mm/dd/yyyy)	

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership

☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name *(If an individual, print last name first: eg: Doe, John)*	*If new Customer, enter previous Customer below:*
WILLIAMSON COUNTY	

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*

11. Type of Customer:	☐ Corporation	☐ Individual	Partnership: ☐ General ☐ Limited
Government: ☐ City ☒ County ☐ Federal ☐ State ☐ Other		☐ Sole Proprietorship	☐ Other:

12. Number of Employees	13. Independently Owned and Operated?
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher	☐ Yes ☐ No

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☒ Owner ☐ Operator ☐ Owner & Operator

☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:	3101 SE INNER LOOP						
	City	GEORGETOWN	State	TX	ZIP	78626	ZIP + 4	6317

16. Country Mailing Information *(if outside USA)*	17. E-Mail Address *(if applicable)*

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 943-1193		( ) -

SECTION III: Regulated Entity Information

21. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name *(Enter name of the site where the regulated action is taking place.)*

BERRY SPRINGS PARK AND PRESERVE

23. Street Address of the Regulated Entity: *(No PO Boxes)*	1801 COUNTY ROAD 152							
	City	GEORGETOWN	State	TX	ZIP	78626	ZIP + 4	1951
24. County	WILLIAMSON							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:								

26. Nearest City	State	Nearest ZIP Code
Georgetown	TX	78626

27. Latitude (N) In Decimal:	30.684825	28. Longitude (W) In Decimal:	97.640347

Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
30	41	5.37	97	38	25.25

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)
9512		71219	712190

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

COUNTY PARK

34. Mailing Address:	350 DISCOVERY BLVD							
	City	CEDAR PARK	State	TX	ZIP	78613	ZIP + 4	2260

35. E-Mail Address:	PARKSANDEXPO@WILCO.ORG

36. Telephone Number	37. Extension or Code	38. Fax Number *(if applicable)*
(512) 943-1920		(512) 943-1930

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☒ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
		11-04052801		
☐ Municipal Solid Waste	☐ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

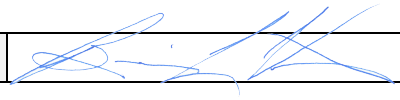
40. Name:	BRIAN L. VINES	41. Title:	TEAM LEADER

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
501-801-2690			BVINES@HALFF.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:	HALFF ASSOCIATES, INC.	Job Title:	
Name *(In Print):*	BRIAN L. VINES	Phone:	501-801-2690

Signature:		Date:	8/12/2022

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

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

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

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

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

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

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

7. Sediment must be removed from the sediment traps or sedimentation basins not later than

when it occupies 50% of the basin's design capacity.

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

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

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

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

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

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

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

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

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

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

WILLIAMSON COUNTY
1848
FACILITIES MANAGEMENT

Texas Commission on Environmental Quality
Edwards Aquifer Protection Program
Environmental Investigator
Attention: Mr. Colin Gearing

Re: Williamson County Project -Berry Springs Amenities RFP 2727-2-5-6-7 / P559

Dear Mr. Gearing,

Please find attached the Soil Suitability Analysis performed by Eckermann Engineering, Inc.

The Soil Analysis shall serve for the design of a park expansion which Williamson County has contracted with Halff to prepare documentation for. We hope this letter and Soil Analysis will suffice the requirements which TCEQ has requested.

Respectfully,

J. Ángel Gómez, CTCM
Senior Project Manager, Facilities Management
512-943-625 Cell 512-917-0894
Angel.gomez@wilco.org www.wilco.org
3101 SE Inner Loop, Georgetown, TX 78626

cc: Dale Butler, Senior Director, Williamson County Facilities Management
Russell Fishbeck, Williamson County Parks Director
Trenton Jacobs, Williamson County Architect
Wendy Dickey-Danzoy, Senior Administrator

ECKERMANN ENGINEERING, INC.

April 28, 2022

Brandon Hay, PLA, ASLA, CLARB
Halff Associates, Inc.
13620 Briarwick Drive, Suite 100
Austin, Texas 78729

RE: OSSF Site and Soil Evaluation Letter
Berry Springs Park and Preserve
1801 CR 152
Georgetown, Texas 78626

Mr. Hay,

Eckermann Engineering, Inc. (EEI) performed a preliminary site and soil evaluation on April 27, 2022, at Berry Springs Park and Preserve to assist with determining a basis for design for proposed On-Site Sewage Facilities serving new restroom facilities at the park. EEI understands that Williamson County is planning park improvements that include a new visitor's center and a maintenance building that will require an OSSF for sewer service.

Berry Springs Park and Preserve is located on a 126.69-acre tract and is located on the west side of CR 152 north of Berry Creek. Based on as-built information that was provided to EEI by others, the park has three existing OSSF's with a combined design or permitted flow of 2,147 GPD. All three systems are low-pressure dosing (LPD) systems placed in Class III and/or IV soils. Based on the permitted combined flow of the existing systems, the maximum design flow that can be treated or disposed of for a new system on the subject property is approximately 2,850 GPD to be permitted under 30 TAC Chapter 285.

Test holes were performed in two locations on site (see attached Test Hole Exhibit and OSSF Soil Evaluation Forms). Test Hole Area 1 is a large area located east of the proposed visitor center and north of the main entrance road into the park. Test Hole Area 2 is located adjacent to the proposed maintenance building.

Test Hole Area 1: Four test holes were excavated in Test Hole Area 1. All four test holes consisted of Class IV clay soils with one having a rock restrictive horizon at 36 inches. Based on topographic survey information provided by others, the area slopes from west to east at approximately 1 to 3 percent slope and appears to have a low ponding area in the northeast quadrant of the test hole area. The area is located on the downstream side of a hill which may require diversion of upstream runoff around the drain field area in addition to minimal regrading to eliminate the ponding area within the drain field area. Vegetation within this area consists of tall grasses and wildflowers.

Test Hole Area 2: Two test holes were excavated in Test Hole Area 2. Both test holes consisted of Class IV clay topsoil over soil with greater than 30 percent gravel, which is unsuitable soil for standard subsurface disposal systems. Based on topographic survey information provided by others, the area slopes from west to east at a 1.5 percent slope. Vegetation in this area consists of grass.

A large portion of Berry Springs Park is located within Flood Zones A and AE per Federal Emergency Management Agency, National Flood Insurance Program, as shown on Map No. 48491C0292F, dated December 20, 2019 (Williamson County, Texas and Incorporated Areas). However, both test hole areas reviewed in this site and soil evaluation area located in the unshaded flood zone "X", which are defined as areas determined to be outside the 0.2% annual chance floodplain. Refer to the attached Floodplain Map for additional information.

No known easements or utilities exist within the reviewed drain field areas. An existing underground electric line does exist along the south side of Test Hole Area 1, but it appears to be located within future park road improvements and will be located outside of a future OSSF drain field area.

Current and future drainage patterns will not affect the proper function of the selected OSSF, except as noted above with the possibility of upstream runoff and the existing low ponding area identified in Test Hole Area 1. Positive drainage must be achieved throughout the entire drain field area.

Based on our findings from the site and soil evaluation, we recommend the use of Test Hole Area 1 for the disposal area serving both the visitor center and the maintenance building on one OSSF. Suitable recommended systems for this drain field area include a low-pressure dosing (LPD) system or an aerobic system with surface or drip disposal. The size and/or daily flow of the proposed system is to be determined by others and careful attention shall be given to the maximum available drain field area reviewed in this evaluation. Based on our preliminary calculations of the available area utilizing survey and proposed site plan information provided by others, it appears that a maximum of approximately 16,000 sf of area is available in Test Hole Area 1, which would equate to a maximum daily treated and disposed flow of up to 1,600 GPD for an LPD or aerobic drip system in Class IV soil or up to approximately 1,000 GPD for an aerobic system with surface application.

It shall be noted that this site and soil evaluation was performed solely to determine a suitable drain field area and obtain a basis for design for the future OSSF to serve the park improvements. Prior to constructing the new OSSF in this area, the OSSF system designer and/or selected installer shall be required to perform additional test holes that are to be inspected by Williamson County OSSF during the OSSF plan review and permitting process.

Please contact me at (512) 556-8160 or derrek@eckermannengineering.com if you should have any questions or require any additional information.

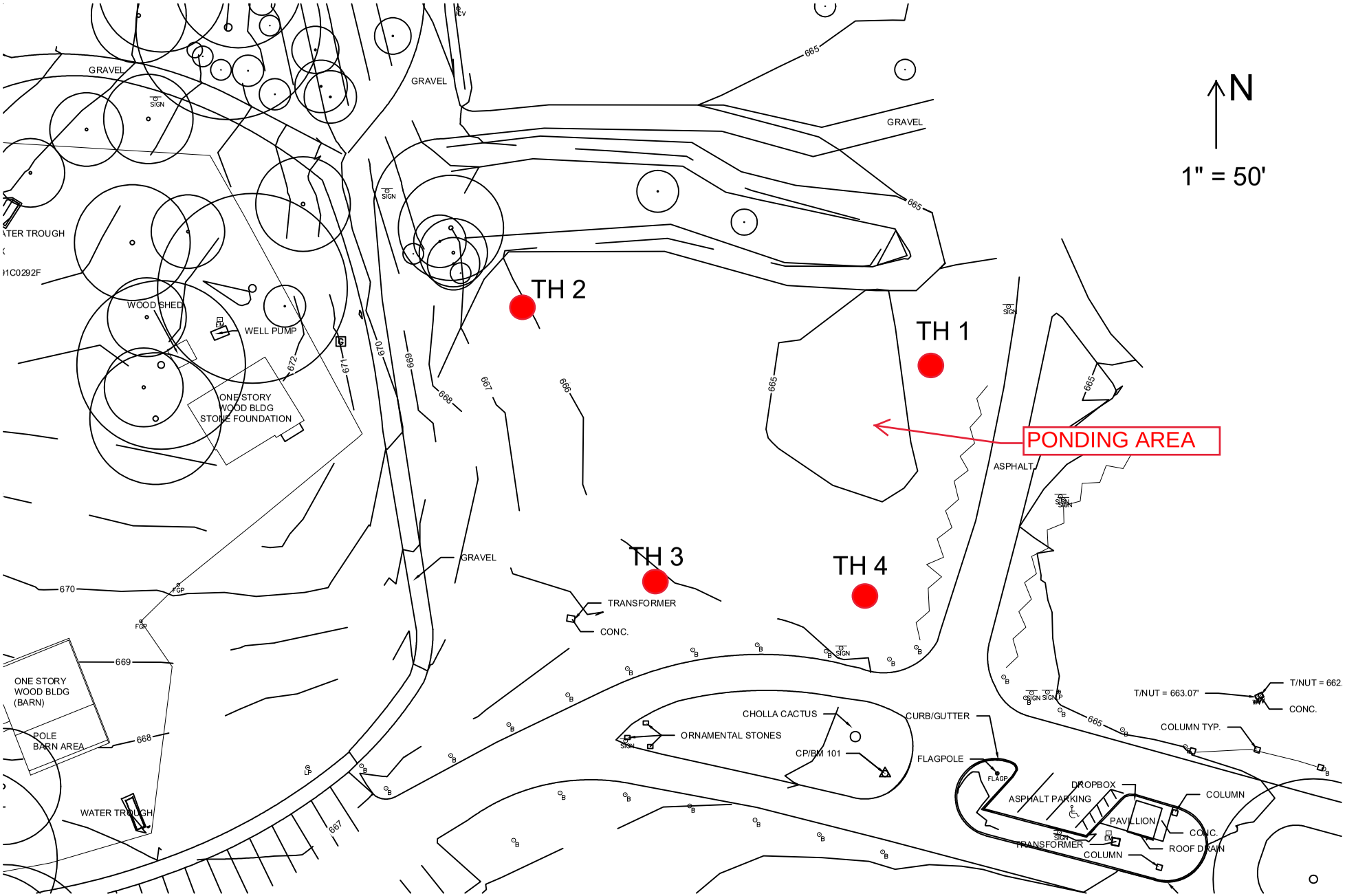
Sincerely,

Derrek Eckermann, P.E.
President
Eckermann Engineering, Inc. (F-10496)

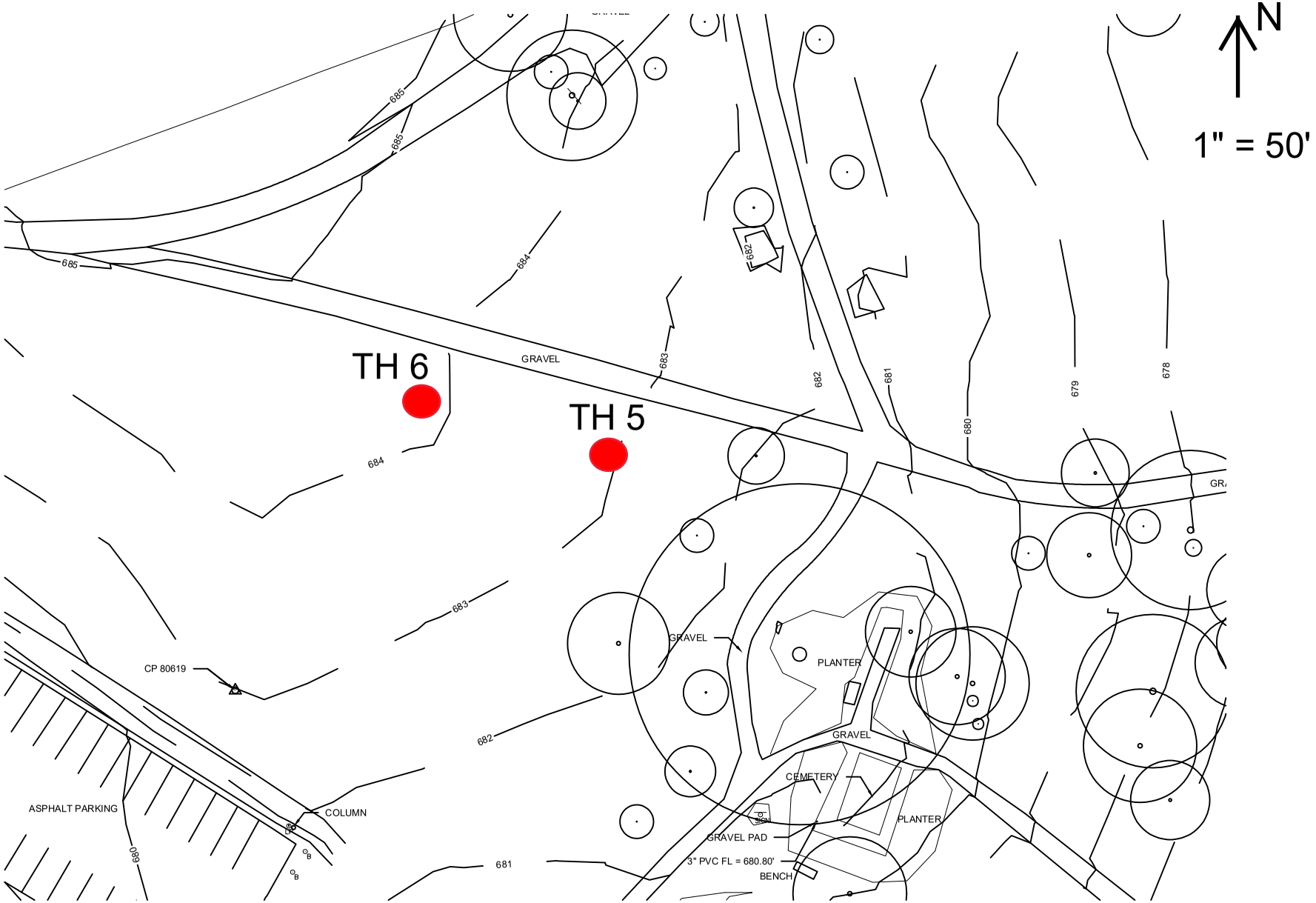
Attachments


Test Hole Area Exhibit
Berry Springs Park and Preserve
Legend
Approximate Proposed Maintenance Building Location
TH 6
TH 5
Existing LPD Drain field
Existing Ponding Area
TH 2
TH 1
Approximate Proposed Visitor Center Building Location
TH 3
TH 4
Berry Springs Park and Preserve
Google Earth
N
400 ft

TEST HOLE AREA 1 EXHIBIT



TEST HOLE AREA 2 EXHIBIT



OSSF SOIL EVALUATION

Date Performed: 4/27/2022

Property Location: Berry Springs Park

Proposed Excavation Depth: < 5'

Name of Site Evaluator: Derrek Eckermann

License Number: PE 98278

Requirements:

At least two soil excavations must be performed on the site, at opposite ends of the proposed disposal area. Locations of soil borings or dug pits must be shown on the site drawing.

For subsurface disposal, soil evaluations must be performed to a depth of at least two feet below the proposed excavation depth. For surface disposal, the surface horizon must be evaluated.

Describe each soil horizon and identify any restrictive features on the form. Indicate depths where features appear.

Soil Boring Number: 1

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0" – 12" (0-24")	IV	Blocky	None	No	Dark top soil < 30% gravel
24" – 48" (24-60")	IV	Blocky	None	No	Light brown clay soil < 30% gravel
60"					

Soil Boring Number: 2

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0" – 12" (0-20")	IV	Blocky	None	No	Dark top soil < 30% gravel
24" – 48" (20-60")	IV	Blocky	None	No	Light brown clay soil < 30% gravel
60"					

I certify that the findings of this report are based on my field observations and are accurate to the best of my ability.

Site Evaluator:

Name: Derrek Eckermann Signature: Derrek Eck License No.: PE 98278

OSSF SOIL EVALUATION

Date Performed: 4/27/2022

Property Location: Berry Springs Park

Proposed Excavation Depth: < 5'

Name of Site Evaluator: Derrek Eckermann

License Number: PE 98278

Requirements:

At least two soil excavations must be performed on the site, at opposite ends of the proposed disposal area. Locations of soil borings or dug pits must be shown on the site drawing.

For subsurface disposal, soil evaluations must be performed to a depth of at least two feet below the proposed excavation depth. For surface disposal, the surface horizon must be evaluated.

Describe each soil horizon and identify any restrictive features on the form. Indicate depths where features appear.

Soil Boring Number: 3

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0" 0-12"	IV	Blocky	None	No	Dark top soil < 30% gravel
12" 12-36"	III	Granular < 30% gravel	None	Rock @ 36"	Tan / Light Broan
24"					
36"					
48"				Yes	
60"					

Soil Boring Number: 4

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0"					
12"					
24" 0-60"	IV	Blocky	None	No	Dark clay < 30% gravel
36"					
48"					
60"					

I certify that the findings of this report are based on my field observations and are accurate to the best of my ability.

Site Evaluator:

Name: Derrek Eckermann Signature: DerrekEck License No.: PE 98278

DATE: 4/27/2022

OSSF NUMBER:

Applicant Information:

Name: Williamson County (Berry Springs Park)
Address: 1801 CR 152
City: Georgetown State: TX
Zip Code: 78626 Phone: Fax:

Site Evaluator Information:

Name: Derrek Eckermann
Address: PO Box 388
City: Lampasas State: TX
Zip Code: 76550 Phone: 512-556-8160 Fax:

Property Location:

Lot: Block: Subdivision:
County: Williamson Unincorporated Area? Y N
City: Zip Code: 78626
Additional Information: Berry Springs Park
Georgetown, TX

Installer Information:

Name: NA
Address:
City: State:
Zip Code: Phone: Fax:

Schematic of Lot or Tract

Show:
Compass North, adjacent streets, property lines, property dimensions, location of buildings, easements, swimming pools, water lines, and other structures where known.
Location of existing or proposed water wells within 150 feet of property.
Indicate slope or provide contour lines from the structure to the farthest location of the proposed soil absorption or irrigation area.
Location of soil borings or dug pits (show location with respect to a known reference point).
Location of natural, constructed, or proposed drainage ways, (streams, ponds, lakes, rivers, high tide of salt water bodies) water impoundment areas, cut or fill bank, sharp slopes and breaks.

Lot size (acres): 126.69

SITE DRAWING
Scale: 1 inch = 50 feet

Show Compass North

Refer to attached test hole layout exhibit.

Based on this site evaluation, the following systems may be utilized:

- ☐ CONVENTIONAL
- ☒ DRIP
- ☒ ET
- ☐ GRAVELESS
- ☐ LEACHING CHAMBER
- ☒ LPD
- ☒ MOUND
- ☐ SOIL SUBSTITUTION
- ☒ SURFACE IRRIGATION
- ☐ OTHER

Features of Site Area

Presence of 100 year flood zone	Yes	No X
Presence of upper water shed	Yes X	No
Presence of adjacent ponds, streams, water impoundments	Yes	No X
Existing or proposed water well in nearby area	Yes	No X
Organized sewage service available to lot or tract	Yes	No X
EARZ features within 150' of OSSF	Yes	No X
Evidence of groundwater	Yes	No X

Site Evaluator:

Name: Derrek Eckermann Signature: Derrek Eckermann License No.: PE 98278

OSSF SOIL EVALUATION

Date Performed: 4/27/2022

Property Location: Berry Springs Park

Proposed Excavation Depth: <5'

Name of Site Evaluator: Derrek Eckermann

License Number: PE 98278

Requirements:

At least two soil excavations must be performed on the site, at opposite ends of the proposed disposal area. Locations of soil borings or dug pits must be shown on the site drawing.

For subsurface disposal, soil evaluations must be performed to a depth of at least two feet below the proposed excavation depth. For surface disposal, the surface horizon must be evaluated.

Describe each soil horizon and identify any restrictive features on the form. Indicate depths where features appear.

Soil Boring Number: 5

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0" 0-12" 12"	IV	<30% gravel	None	No	Dark top soil
24" 12-36" 36"	III	Gravel >30%	None	No	Tan >30% gravel
48" 60"				Yes, @ rock 36"	

Soil Boring Number: 6

Depth (Inches)	Textural Class	Structure (If applicable)	Drainage (Mottles/Water Table)	Restrictive Horizon	Observations
0" 0-14" 12"	IV	<30% gravel	None	No	Dark top soil
24" 14-36" 36"	III	>30% gravel	None	No	Tan >30% gravel
48" 60"				Yes rock @ 36"	

I certify that the findings of this report are based on my field observations and are accurate to the best of my ability.

Site Evaluator:

Name: Derrek Eckermann Signature: Derek Eck License Nc.. PE 98278

DATE: 4/27/2022

OSSF NUMBER: PE 98278

Applicant Information:

Name: Williamson County (Berry Springs Park)
Address: 1801 CR 152
City: Georgetown State: TX
Zip Code: 78626 Phone: _____ Fax: _____

Site Evaluator Information:

Name: Derrek Eckermann
Address: PO Box 388
City: Lampasas State: TX
Zip Code: 76550 Phone: 512-556-8160 Fax: —

Property Location:

Lot: _____ Block: _____ Subdivision: _____
County: Williamson Unincorporated Area? Y N
City: _____ Zip Code: 78626
Additional Information: Berry Springs Park

Installer Information:

Name: NA
Address: _____
City: _____ State: _____
Zip Code: _____ Phone: _____ Fax: _____

Schematic of Lot or Tract

Show:
Compass North, adjacent streets, property lines, property dimensions, location of buildings, easements, swimming pools, water lines, and other structures where known.
Location of existing or proposed water wells within 150 feet of property.
Indicate slope or provide contour lines from the structure to the farthest location of the proposed soil absorption or irrigation area.
Location of soil borings or dug pits (show location with respect to a known reference point).
Location of natural, constructed, or proposed drainage ways, (streams, ponds, lakes, rivers, high tide of salt water bodies) water impoundment areas, cut or fill bank, sharp slopes and breaks.

Lot size (acres): 126.69

SITE DRAWING
Scale: 1 inch = 50 feet

Show Compass North

Refer to attached test hole layout exhibit

Based on this site evaluation, the following systems may be utilized:

- ☐ CONVENTIONAL
- ☐ DRIP
- ☐ ET
- ☐ GRAVELESS
- ☐ LEACHING CHAMBER
- ☐ LPD
- ☒ MOUND
- ☒ SOIL SUBSTITUTION
- ☒ SURFACE IRRIGATION
- ☐ OTHER

Features of Site Area

Presence of 100 year flood zone	Yes _____	No X
Presence of upper water shed	Yes _____	No X
Presence of adjacent ponds, streams, water impoundments	Yes _____	No X
Existing or proposed water well in nearby area	Yes _____	No X
Organized sewage service available to lot or tract	Yes _____	No X
EARZ features within 150' of OSSF	Yes _____	No X
Evidence of groundwater	Yes _____	No X

Site Evaluator:

Name: Derrek Eckermann Signature: Derrek Eck License No.: PE 98278

National Flood Hazard Layer FIRMette

FEMA

97°38'45"W 30°41'23"N

97°38'8"W 30°40'52"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/28/2022 at 10:26 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

GENERAL NOTES

1. There are numerous utilities within and adjacent to the limits of construction and an attempt has been made to indicate their presence on the plan. Prior to beginning any type of excavation, the contractor shall contact the various utility location markings until they are no longer necessary. The Contractor shall be responsible for location and/or damage to utilities.

2. All procedures, material, and workmanship shall conform to these plans and specifications and to the requirements of state and local building codes.

3. Existing utilities shown from As-Built drawings from contractor. contractor to verify on site.

4. Any conflicts of existing utilities need to be reported to engineer.

DEMOLITION NOTES

1. The intent of the demolition plan is to remove all items necessary for the completion of the project. The main items to be removed are: curb and gutter, sidewalks, pavements, and fencing. The main items to remain include: fire hydrants, traffic signals/controls and other utilities on or near the property.

2. Demolition of sidewalks, curbs, and storm drainage structures within the city right-of-way and directly adjacent to the roadways shall not be executed until immediately prior to construction of the sidewalks, curbs, and storm drainage structures that will replace them.

3. The Contractor is to protect all items to remain, streets, drives, walks, drainage structures, fences, signs, etc. Those that are disturbed shall be restored to their original or better condition using like materials. Cost of such repairs shall be borne by the Contractor unless provisions for payment is made in the proposal.

4. The location of known subsurface structures, pipes, power, gas, phone, etc. are shown on the plans. The Contractor shall be responsible for obtaining information and satisfying himself to as to the location of the aforementioned items, shown and not shown. All repairs or relocations necessary shall be made as required by the Owner of the utility or structure. The cost of such repairs or relocations necessary shall be borne by the Contractor.

5. Without regard to the materials encountered, all roadway excavation, rough excavation, and drainage excavation shall be unclassified and shall be designated as "excavation". It shall be distinctly understood that any reference to subsurface materials on the plans and in the bid documents, whether in numbers, words, letters or lines is solely for the Owner's information and is not to be taken as an indication of classified excavation or the quantity of either rock, earth, or any other material involved. The Contractor must draw his own conclusions as to the conditions to be encountered. The Owner does not give any guarantee as to the accuracy of the data, and no claim will be considered for additional compensation when the materials encountered are not in accord with the classification shown.

6. All salvageable items shall be stored for review by Owner prior to removal.

7. Contractor to dispose of all unsalvageable material to be removed. All materials to be removed shall become the property of the Contractor and shall be disposed of as specified, unless otherwise noted.

8. All abandoned service lines shall be disconnected and capped per utility companies requirements. Coordinate all disconnections with utility companies.

9. At all locations where existing concrete is to be removed and is immediately adjacent to concrete to remain, sawcut at existing control joint. Verify in field. All curb and gutter along streets are to be removed with saw cut at concrete/asphalt joint.

10. Demolition Contractor must visit site and verify all existing site conditions.

11. Contractor is to bring to the attention of the Engineer any area of demolition in question before proceeding with work.

12. Contractor to review and coordinate demolition limits with new construction plans.

SITE PREPARATION

1. Review with Engineer's representative the project location, limits, and methods to be used prior to commencing Work.

2. The location of known subsurface structures, pipe, power, gas, phone, etc. are shown on the Plans. The Contractor shall be responsible for obtaining information and satisfying himself as to the location of the aforementioned items, shown and not shown. All repairs to utilities damaged by Contractor shall be made as required by the owner of the utility or structure. The cost of such repairs necessary shall be borne by the Contractor.

3. The Contractor is required to notify the One Call Center at 811 at least 48 hours prior to digging in order that underground utilities can be located.

4. All streets, drives, walks, drainage structures, fences, etc. that are disturbed shall be restored to their original or better condition using like materials. Cost of such repairs shall be borne by the Contractor.

5. Protect trees, shrubbery, and other vegetation from damage that is not designated for removal.

UTILITY NOTES

1. THE CONTRACTOR SHALL NOT ASSUME THAT UTILITIES ARE PRECISELY LOCATED. UTILITIES ARE SHOWN TO HELP MAKE THE CONTRACTOR AWARE OF THEIR EXISTENCE. THIS MEASURE IS TAKEN TO HELP PROTECT THE INVESTMENTS AND SERVICES OF THE OWNERS OF THE UTILITIES AND THEIR CUSTOMERS. CONTRACTOR SHALL CALL '811' FOR HELP IN LOCATING UTILITIES.

2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE AND VERIFY THE EXACT LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION. THE CONTRACTOR SHALL ASCERTAIN WHETHER ANY ADDITIONAL UTILITIES OR FACILITIES, OTHER THAN THOSE SHOWN ON THE PLANS, MAY BE PRESENT ON THE SITE OF THE WORK.

3. PRIOR TO PROCEEDING WITH CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE OWNER AND/OR DESIGN CONSULTANT IF CONFLICTS OR POTENTIAL CONFLICTS OCCUR BETWEEN THE EXISTING UTILITIES AND PROPOSED CONSTRUCTION.

4. PRIOR TO PROCEEDING WITH CONSTRUCTION, THE CONTRACTOR SHALL COORDINATE THE AFFECTED PARTS OF THE UTILITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PRESERVE AND PROTECT ALL UTILITIES.

5. THE CONTRACTOR WILL IMMEDIATELY NOTIFY THE UTILITY OWNER AND MAKE RESTITUTION FOR ANY UTILITY THAT IS DAMAGED BY THE CONTRACTOR IN THE COURSE OF THE WORK.

6. THE CONTRACTOR SHALL CONTACT THE OWNER TO LOCATE EXISTING IRRIGATION PIPE AND COMMUNICATION LINES THAT MAY EXISTING WITHIN THE SITE OF THE WORK.

UTILITY PROVIDERS:

ELECTRIC: PEDERNALES ELECTRIC
WATER: JONAH WATER SPECIAL UTILITY DISTRICT
WASTEWATER: WILLIAMSON COUNTY
NATURAL GAS: ATMOS ENERGY

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

CAUTION - ELECTRICITY PRESENT

THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS THAT ENTER OR WORK ON THIS PROJECT ARE RESPONSIBLE FOR LOCATING, USING 811 OR THE ELECTRIC UTILITIES THEMSELVES, ALL OVERHEAD AND UNDERGROUND ELECTRICAL OF ANY NATURE AND FOR SAFEGUARDING ALL PERSONNEL ON THIS PROJECT, INCLUDING ANY OFF-SITE WORK AREAS SHOWN ON THE PLAN, FROM ANY INTERFERENCE WITH THE ELECTRIC LINES OR FROM DAMAGING, DIGGING UP OR UNCOVERING THE ELECTRIC LINES, GETTING A LADDER IN HARMS WAY OR ANY OTHER ACTIVITY OF ANY NATURE THAT COULD HARM ANY INDIVIDUAL IN ANY MANNER. THIS RESPONSIBILITY HEREBY REMOVES BAKER-AICKLEN & ASSOCIATES AND THE OWNER FROM ANY LIABILITY OF ANY NATURE.

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

TCEQ-0592 (Rev. July 15, 2015)

1. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROJECT MUST BE PROVIDED WITH COMPLETE COPIES OF THE APPROVED WATER POLLUTION ABATEMENT PLAN (WPAP) AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS ARE REQUIRED TO KEEP ON-SITE COPIES OF THE APPROVED PLAN AND APPROVAL LETTER.

3. IF ANY SENSITIVE FEATURE(S) (CAVES, SOLUTION CAVITY, SINK HOLE, ETC.) IS DISCOVERED DURING CONSTRUCTION, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE SHALL BE SUSPENDED IMMEDIATELY. THE APPROPRIATE TCEQ REGIONAL OFFICE MUST BE IMMEDIATELY NOTIFIED OF ANY SENSITIVE FEATURES ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION ACTIVITIES MAY NOT BE RESUMED UNTIL THE TCEQ HAS REVIEWED AND APPROVED THE APPROPRIATE PROTECTIVE MEASURES IN ORDER TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY.

4. NO TEMPORARY OR PERMAMENT HAZARDOUS SUBSTANCE STORAGE TANK SYSTEM SHALL BE INSTALLED WITHIN 150 FEET OF A WATER SUPPLY SOURCE, DISTRIBUTION SYSTEM, WELL, OR SENSITIVE FEATURE.

5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE APPROVED PLANS AND MANUFACTURERS SPECIFICATIONS. IF INSPECTIONS INDICATE A CONTROL HAS BEEN USED INAPPROPRIATELY, OR INCORRECTLY, THE APPLICANT MUST REPLACE OR MODIFY THE CONTROL FOR SITE SITUATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMAMENTLY STABILIZED.

6. ANY SEDIMENT THAT ESCAPES THE CONSTRUCTION SITE MUST BE COLLECTED AND PROPERLY DISPOSED OF BEFORE THE NEXT RAIN EVENT TO ENSURE IT IS NOT WASHED INTO SURFACE STREAMS, SENSITIVE FEATURES, ETC.

7. SEDIMENT MUST BE REMOVED FROM THE SEDIMENT TRAPS OR SEDIMENTATION BASINS NOT LATER THAN WHEN IT OCCUPIES 50% OF THE BASIN'S DESIGN CAPACITY.

8. LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION CHEMICALS EXPOSED TO STORMWATER SHALL BE PREVENTED FROM BEING DISCHARGE OFFSITE.

9. ALL SPOILS (EXCAVATED MATERIAL) GENERATED FROM THE PROJECT SITE MUST BE STORED ON-SITE WITH PROPER E&S CONTROLS. FOR STORAGE OR DISPOSAL OF SPOILS AT ANOTHER SITE ON THE EDWARDS AQUIFER RECHARGE ZONE, THE OWNER OF THE SITE MUST RECEIVE APPROVAL OF A WATER POLLUTION ABATEMENT PLAN FOR THE PLACEMENT OF FILL MATERIAL OR MASS GRADING PRIOR TO THE PLACEMENT OF SPOILS AT THE OTHER SITE.

10. IF PORTIONS OF THE SITE WILL HAVE A TEMPORARY OR PERMANENT CEASE IN CONSTRUCTION ACTIVITY LASTING LONGER THAN 14 DAYS, SOIL STABILIZATION IN THOSE AREAS SHALL BE INITIATED AS SOON AS POSSIBLE PRIOR TO THE 14TH DAY OF INACTIVITY. IF ACTIVITY WILL RESUME PRIOR TO THE 21ST DAY, STABILIZATION MEASURES ARE NOT REQUIRED. IF DROUGHT CONDITIONS OR INCLEMENT WEATHER PREVENT ACTION BY THE 14TH DAY, STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE.

11. THE FOLLOWING RECORDS SHALL BE MAINTAINED AND MADE AVAILABLE TO THE TCEQ UPON REQUEST:
   - THE DATES WHEN MAJOR GRADING ACTIVITIES OCCUR
   - THE DATES WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE; AND
   - THE DATES WHEN STABILIZATION MEASURES ARE INITIATED.

12. THE HOLDER OF ANY APPROVED EDWARDS AQUIFER PROTECTION PLAN MUST NOTIFY THE APPROPRIATE REGIONAL OFFICE IN WRITING AND OBTAIN APPROVAL FROM THE EXECUTIVE DIRECTOR PRIOR TO INITIATING ANY OF THE FOLLOWING:

    A. ANY PHYSICAL OR OPERATIONAL MODIFICATION OF ANY WATER POLLUTION ABATEMENT STRUCTURE(S), INCLUDING BUT NOT LIMITED TO PONDS, DAMS, BERMS, SEWAGE TREATMENT PLANTS, AND DIVERSIONARY STRUCTURES;

    B. ANY CHANGE IN THE NATURE OR CHARACTER OF THE REGULATED ACTIVITY FROM THAT WHICH WAS ORIGINALLY APPROVED OR A CHANGE WHICH WOULD SIGNIFICANTLY IMPACT THE ABILITY OF THE PLAN TO PREVENT POLLUTION OF THE EDWARDS AQUIFER;

    C. ANY DEVELOPMENT OF LAND PREVIOUSLY IDENTIFIED AS UNDEVELOPED IN THE ORIGINAL WATER POLLUTION ABATEMENT PLAN.

    AUSTIN REGIONAL OFFICE
    MAILING ADDRESS: MC R11
    P.O. BOX 13087
    AUSTIN, TX 78711-3087

    STREET ADDRESS: 12100 PARK 35 CIRCLE, BLDG 1, RM 179
    AUSTIN, TX 78753
    PHONE: (512) 339-2929
    FAX: (512) 339-3795

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

BERRY SPRINGS
PARK IMPROEMENTS
Williamson County, Texas

WILLIAMSON COUNTY 1848

halff
13620 Briarwick Drive
Suite 100
Austin, Texas 78729-1102
MAIN (512) 777-4600
FAX (512) 252-8141

Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED
PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title

GENERAL NOTES

Sheet Number	Project Page Number
N1.00	

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

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

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

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

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

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

6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist's assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the

executive director has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality while maintaining the structural integrity of the line.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) *Low Pressure Air Test.*

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

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

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

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

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

Where:

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

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

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

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

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

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

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

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

(2) *Infiltration/Exfiltration Test.*

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

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

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

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

(E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce

the infiltration or exfiltration to an amount within the limits specified. An owner shall retest a pipe following a remediation action.

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

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

(A) *Mandrel Sizing.*

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

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

(iii) All dimensions must meet the appropriate standard.

(B) *Mandrel Design.*

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

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

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

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

(C) *Method Options.*

(i) An adjustable or flexible mandrel is prohibited.

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

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

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

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

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

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

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

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

(a) All manholes must pass a leakage test.

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

(1) Hydrostatic Testing.

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

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

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

(2) Vacuum Testing.

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

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

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

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

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

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

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

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

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

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

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

Know what's below. Call before you dig.

CAUTION - ELECTRICITY PRESENT

THE GENERAL CONTRACTOR AND ALL SUBCONTRACTORS THAT ENTER OR WORK ON THIS PROJECT ARE RESPONSIBLE FOR LOCATING, USING 811 OR THE ELECTRIC UTILITIES THEMSELVES, ALL OVERHEAD AND UNDERGROUND ELECTRICAL OF ANY NATURE AND FOR SAFEGUARDING ALL PERSONNEL ON THIS PROJECT, INCLUDING ANY OFF-SITE WORK AREAS SHOWN ON THE PLAN, FROM ANY INTERFERENCE WITH THE ELECTRIC LINES OR FROM DAMAGING, DIGGING UP OR UNCOVERING THE ELECTRIC LINES, GETTING A LADDER IN HARMS WAY OR ANY OTHER ACTIVITY OF ANY NATURE THAT COULD HARM ANY INDIVIDUAL IN ANY MANNER. THIS RESPONSIBILITY HEREBY REMOVES BAKER-AICKLEN & ASSOCIATES AND THE OWNER FROM ANY LIABILITY OF ANY NATURE.

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Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
GENERAL NOTES

Sheet Number	Project Page Number
N1.01	

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

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

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

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

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

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

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

7. Sediment must be removed from the sediment traps or sedimentation basins not later than

when it occupies 50% of the basin's design capacity.

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

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

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

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

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

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

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

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

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Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title

GENERAL NOTES

Sheet Number	Project Page Number
N1.02	

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

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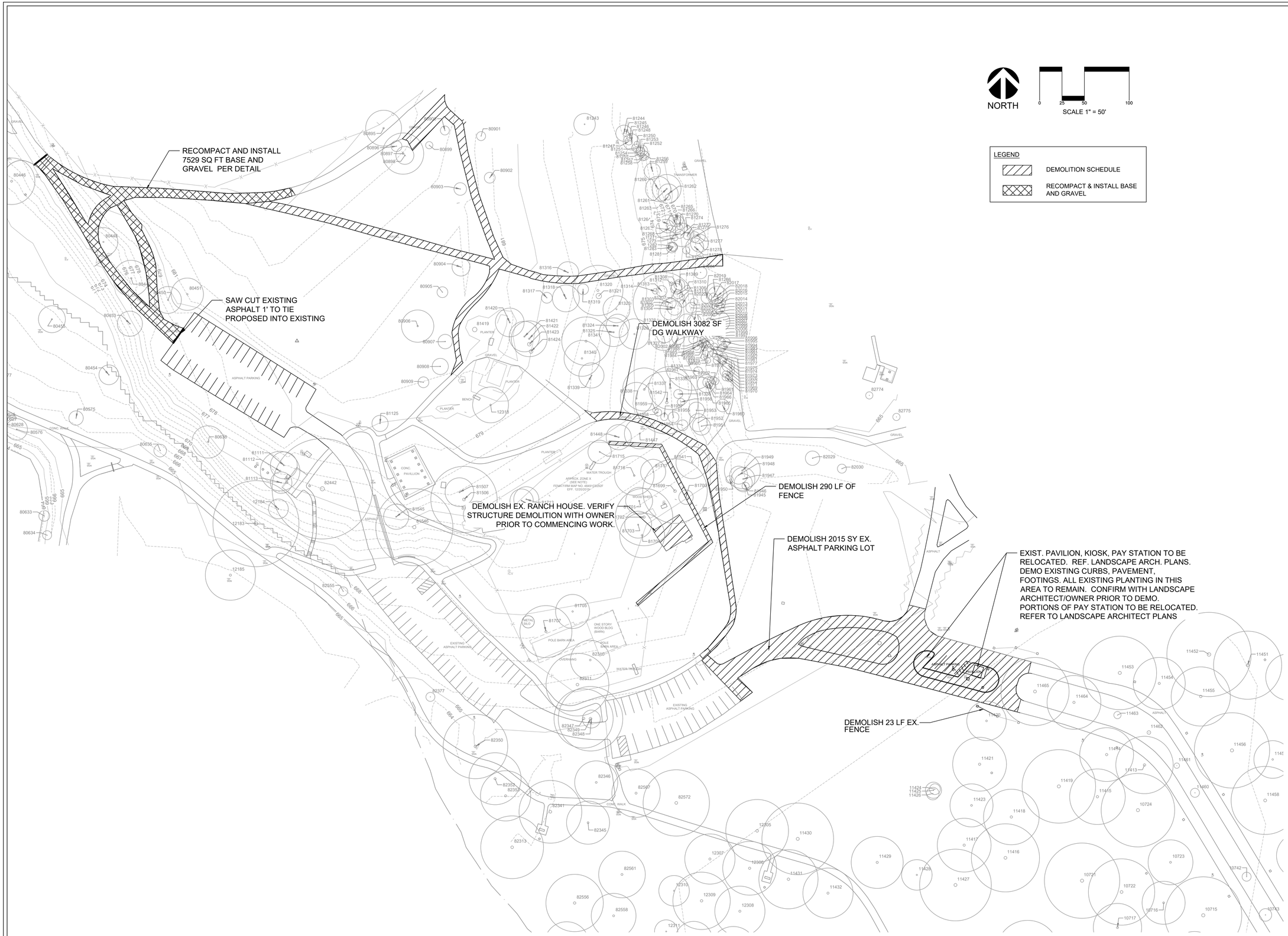

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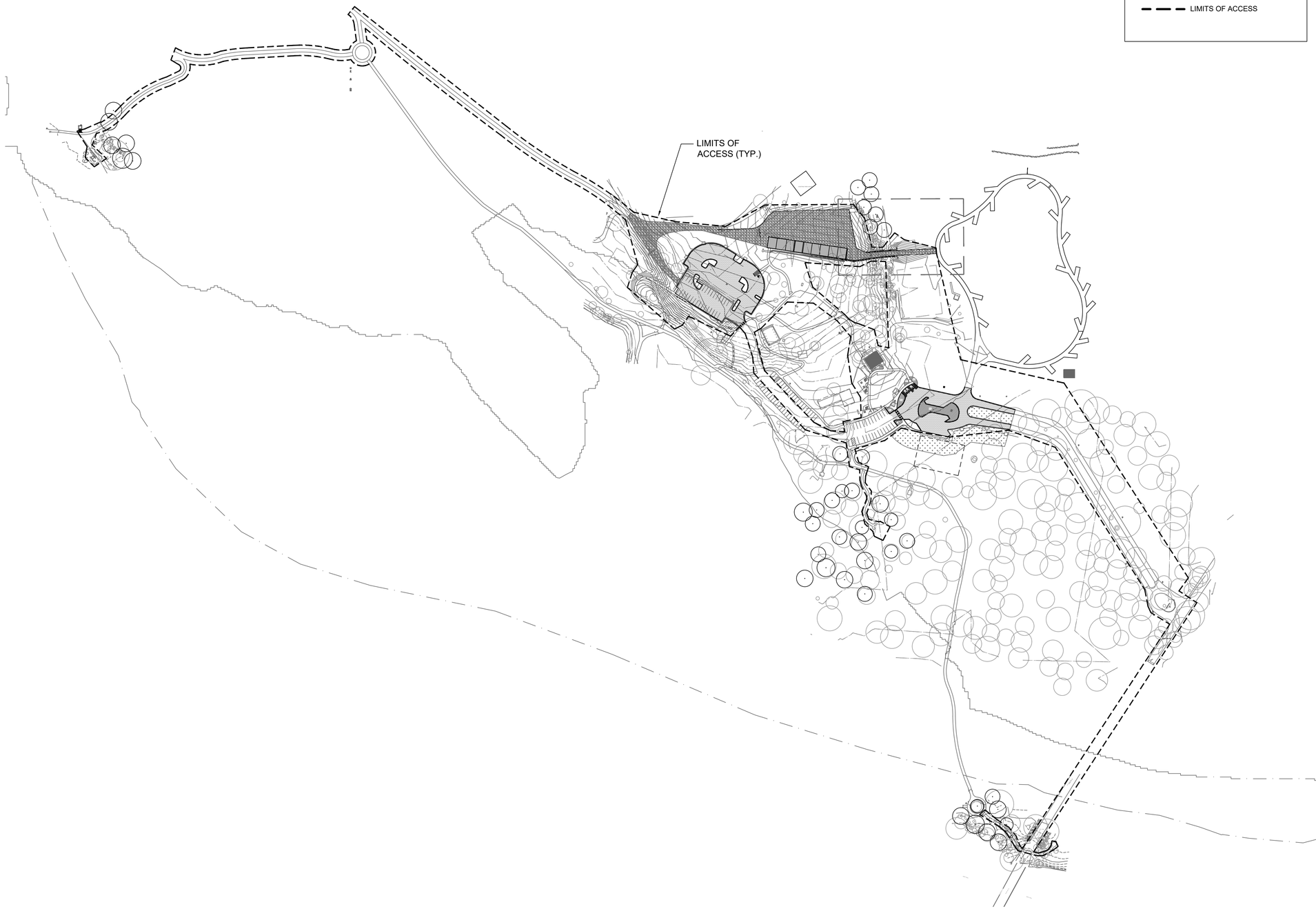
Sheet Title

DEMOLITION PLAN

Sheet Number	Project Page Number
C1.00	



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Sheet Title

LIMITS OF ACCESS

Sheet Number	Project Page Number
C1.01	

NORTH

SCALE 1" = 50'

EXISTING LEACH FIELD. REFER TO AS-BUILT DRAWINGS. CONTRACTOR TO VERIFY LOCATION.

TREE AND TRUNK PROTECTION FENCE. SEE DETAIL. POSTED 2 'X 2' SIGN STATING "XX DOLLAR FINE WILL BE ASSESSED FOR DAMAGE TO TREE" (TYP.)

PROP. MAINTENANCE BUILDING

CONTRACTOR TO VERIFY LOCATION AND EXTENTS OF EXISTING LEACH FIELD. IF THE LEACH FIELD FALLS UNDER THE PROPOSED EMBANKMENT, THE CONTRACTOR SHALL RELOCATE THE LEACH FIELD OUTSIDE THE LIMITS OF THE EMBANKMENT TO THE NORTH.

EXISTING LEACH FIELD. REFER TO AS-BUILT DRAWINGS. CONTRACTOR TO VERIFY LOCATION.

PROP. VISITOR CENTER

SILT FENCE (TYP.)

CONTINUE TO CR152

CONCRETE WASHOUT AREA

STABILIZED CONSTRUCTION ENTRANCE

REMOTE TOILET INSET
1"=20'

REMOTE TOILET

COUNTY ROAD 152 SIDEWALK TIE-IN INSET
1"=50'

CR 152

EVENT PAVILLION INSET
1"=50'

PROP. EVENT PAVILLION

NOTES:

1. WILLIAMSON COUNTY HAS THE AUTHORITY TO ADD OR MODIFY EROSION/SEDIMENT CONTROLS ON SITE THROUGHOUT THE DURATION OF THE PROJECT.
2. ALL NATURAL VEGETATED FILTER STRIPS ARE TO BE LEFT UNDISTURBED AND IN THEIR NATURAL STATE AS DELINEATED ON THE PLANS.
3. ALL TREES WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED UNLESS OTHERWISE NOTED. ALL TREES WITHIN THE CONSTRUCTION LIMITS NOT SHOWN TO BE EITHER PROTECTED OR REMOVED, SHALL BE CONSIDERED TO REMAIN. IF REMOVAL IS REQUIRED, COSTS WILL BE CONSIDERED SUBSIDIARY TO THE PROJECT.
4. CONTRACTOR TO NOTIFY LANDSCAPE ARCHITECT PRIOR TO REMOVING ANY TREE NOT CALLED OUT FOR REMOVAL. CONTRACTOR SHALL ONLY REMOVE SUCH TREES AFTER APPROVAL FROM THE CIVIL ENGINEER.
5. WITHIN LIMITS OF DISTURBANCE, CEDAR TREES 6" AND UNDER SHALL BE REMOVED. ALL CEDARS GREATER THAN 6" THAT ARE IN CONFLICT SHALL BE COORDINATED WITH CLIENT AND LANDSCAPE ARCHITECT PRIOR TO REMOVAL. NO HARDWOODS SHALL BE REMOVED WITHOUT OWNER AND LANDSCAPE ARCHITECTS APPROVAL.

NOTES (CONT.):

5. ALL BRUSH AND TRIMMINGS TO BE REMOVED THAT ARE NOT REUSED ARE TO BE MULCHED FOR ONSITE USE. TREES TO BE UTILIZED FOR ONSITE USE WILL SHRED EXISTING TREE BRANCHES & LEAVES. MACHINE MUST BE CAPABLE OF PRODUCING SHREDDINGS 1/8" - 1" THICK, 1/4" - 2" WIDE AND UP TO 16" LONG. CONTRACTOR OPTION TO SHRED LARGE TREE TRUNKS & STUMPS TO REDUCE HAUL-OFF FROM SITE.
6. CONTRACTOR SHALL PROVIDE CONCRETE WASHOUT IN ACCORDANCE WITH THE STANDARD DETAIL. CONCRETE WASHOUT SHALL BE LOCATED OUTSIDE OF THE 100-YEAR FLOODPLAIN AND OUTSIDE OF ANY PROPOSED IMPROVEMENTS. LOCATION OF WASHOUT SHALL BE APPROVED BY COUNTY INSPECTOR PRIOR TO USE.
7. ALL BOULDERS LARGER THAN 12" DIAMETER SHALL BE STOCKPILED ON SITE AND REUSED PER THE LANDSCAPE ARCHITECT.
8. WATER LINE EROSION CONTROL INFORMATION FOUND ON SHEET C4.00-C4.02

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Sheet Title
TREE PROTECTION & EROSION CONTROL PLAN

Sheet Number	Project Page Number
C2.00	

EDGE GRAVEL			
Number	Length	Radius	Line/Chord Direction
C2	25.10'	100.000'	S85° 08' 00"W
C3	20.52'	199.500'	N84° 43' 46"W
C7	49.87'	564.728'	N84° 18' 45"W
C8	17.50'	49.500'	N76° 42' 53"W
C9	35.00'	160.000'	N60° 19' 16"W
C10	8.00'	24.512'	S41° 39' 23"E
C11	110.07'	335.282'	S42° 40' 39"E
C12	6.39'	15.000'	N58° 41' 39"W
C13	58.31'	264.663'	N40° 10' 11"W
C14	48.58'	129.702'	N24° 22' 16"W
C15	28.08'	24.307'	N19° 27' 11"E

EDGE GRAVEL			
Number	Length	Radius	Line/Chord Direction
C16	26.26'	64.889'	N64° 08' 23"E
C17	63.94'	268.017'	N82° 33' 58"E
C18	11.93'	50.000'	S82° 15' 21"E
C20	49.81'	51.371'	N60° 26' 00"E
L3	21.682'		N77° 06' 39"E
L4	9.367'		N15° 45' 50"W
L9	11.356'		S77° 56' 34"W
L10	26.914'		N87° 40' 34"W
L11	25.225'		N81° 46' 57"W
L12	57.460'		N86° 50' 32"W
L13	5.251'		N54° 03' 18"W

EDGE GRAVEL			
Number	Length	Radius	Line/Chord Direction
L14	17.651'		S40° 12' 21"W
L15	86.859'		S32° 18' 06"E
L16	38.108'		S32° 18' 06"E
L22	18.641'		N32° 08' 08"E
L23	9.348'		N70° 54' 23"W
L24	31.606'		S89° 05' 24"E
L25	164.139'		S75° 25' 17"E

WEST PARKING LOT			
Number	Length	Radius	Line/Chord Direction
C27	68.46'	43.000'	N12° 59' 41"W
C28	66.85'	43.000'	S76° 51' 32"W
C29	71.29'	43.000'	S11° 10' 48"E
L26	79.980'		N32° 36' 57"E
L27	92.295'		N58° 36' 19"W
L28	35.012'		S32° 19' 24"W
L29	134.244'		S58° 36' 19"E

LEGEND

PROPOSED GRAVEL

PROPOSED HMAC PAVEMENT

PA — PLANTING AREA

NORTH

SCALE 1" = 30'

FENCE LINE, NO CONSTRUCTION ACTIVITY SHALL OCCUR ON OR BEYOND FENCE LINE.

APPROX. EXTENTS OF EXISTING UNPAVED ROAD

PROP. 562 CY 4" GRAVEL ROAD AND PARKING LOT REFER TO GRAVEL STANDARD PAVEMENT SECTION

MATCH TO EXISTING UNPAVED ROAD ELEVATION

N:10224831.90 E:3142330.23

N:10224828.82 E:3142334.48

N:10224811.52 E:3142364.83

N:10224807.52 E:3142381.77

N:10224804.36 E:3142439.14

N:10224818.42 E:3142318.84

N:10224812.46 E:3142324.13

N:10224799.42 E:3142488.75

N:10224795.81 E:3142513.72

N:10224793.93 E:3142534.14

N:10224792.83 E:3142561.03

N:10224794.96 E:3142585.98

N:10224797.33 E:3142597.08

N:10224835.90 E:3142741.43

APPROX. EXTENTS OF EXISTING UNPAVED ROAD

MATCH TO EXISTING UNPAVED ROAD ELEVATION

N:10224842.16 E:3142955.87

GRAVEL

TRANSFORMER

CENTER OF GATE N:10224774.40 E:3142700.32

N:10224781.53 E:3142498.94

N:10224781.03 E:3142530.54

N:10224783.48 E:3142578.49

N:10224786.62 E:3142673.00

N:10224788.32 E:3142599.63

N:10224761.96 E:3142725.90

N:10224732.32 E:3142721.49

N:10224749.19 E:3142703.75

N:10224738.11 E:3142701.19

MAINTENANCE SHOP

N:10224731.21 E:3142977.10

EXISTING ROAD

N:10224728.77 E:3142948.16

N:10224699.23 E:3142943.83

N:10224696.69 E:3142971.74

197.8'

N:10224739.05 E:3142370.55

N:10224736.88 E:3142403.39

N:10224773.28 E:3142435.69

N:10224761.91 E:3142412.23

N:10224779.47 E:3142542.19

N:10224692.89 E:3142423.31

N:10224645.12 E:3142466.28

N:10224648.42 E:3142460.85

N:10224706.84 E:3142390.91

N:10224642.06 E:3142475.11

N:10224675.99 E:3142511.96

POST & CABLE FENCE. SEE SHEET L1.01

PROP. RIBBON CURB (TYP.)

CONCRETE WALKWAY. SEE SHEET L1.01

EXISTING LEACH FIELD. REFER TO AS-BUILT DRAWINGS. CONTRACTOR TO VERIFY LOCATION.

SIDEWALK REFER TO LANDSCAPE ARCHITECTURAL PLANS

N:10224626.28 E:3142465.19

RIBBON CURB

HANDICAP SIGNS, MARKINGS, AND STRIPING. SEE SHEET C8.06

R7-8T R7-8P RESERVED PARKING VAN ACCESSIBLE VIOLATORS SUBJECT TO FINE AND TOWING

R7-8T RESERVED PARKING VIOLATORS SUBJECT TO FINE AND TOWING

R7-8T RESERVED PARKING VIOLATORS SUBJECT TO FINE AND TOWING

HANDICAP SIGN, MARKINGS, AND STRIPING. SEE SHEET C8.06

PROP. 36125 SF ASPHALT PARKING LOT EXPANSION REFER TO HMAC STANDARD PAVEMENT SECTION

CONCRETE WALKWAY. SEE SHEET L1.01

PLANTER

GRAVEL

ASPHALT PARKING

CP 80619

N:10224583.15 E:3142664.08

RIBBON CURB

PROP. WHEEL STOP (TYP.)

CONC. WALK

EXISTING SEPTIC LINE. REFER TO AS-BUILT DRAWINGS

DETECTABLE WARNING PAVERS AND CROSSWALK STRIPING. SEE DETAIL SHEET L5.00

EXISTING SIDEWALKS

EXISTING RESTROOM TO REMAIN

EXISTING ASPHALT

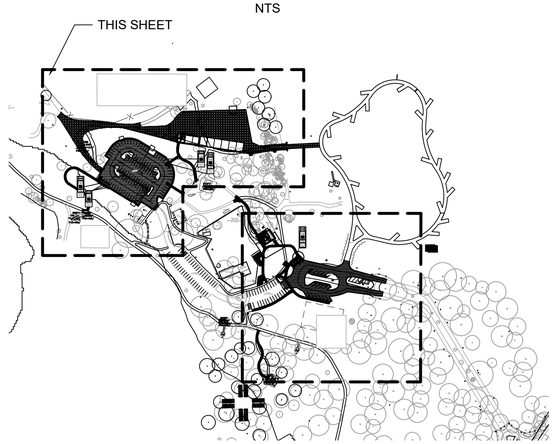
ASPHALT

CONC. PAVILI

CONTROL SURFACE:
- CP100,10225073.98,3140652.57,672.02,1/2-INCH IRON ROD SET
- CP101,10224275.69,3143266.57,665.63,1/2-INCH IRON ROD SET
- CP80000,10223137.21,3143292.60,655.85,1/2-INCH IRON ROD SET
- CP80619,10224627.14,3142604.90,683.11,1/2-INCH IRON ROD SET

KEY MAP
NTS

THIS SHEET



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Williamson County, Texas

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BRIAN LEE VINES
128439
LICENSED PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
PARKING AREA PARK IMPROVEMENTS (SHEET 1 OF 2)

Sheet Number	Project Page Number
C3.00	

NORTH

0 15 30 60

SCALE 1" = 30'

LEGEND

PROPOSED HMAC PAVEMENT

PLANTING AREA

N:10224436.08
E:3143035.96

PROPOSED VISITOR CENTER

N:10224406.61
E:3143055.60

N:10224411.28
E:3143000.11

N:10224383.06
E:3143018.93

PA. SEE SHEET L1.03

REFER TO LANDSCAPE ARCHITECTURE PLANS FOR KIOSK AND PAY STATION

SIDEWALK REFER TO LANDSCAPE ARCHITECTURAL PLANS

N:10224306.81
E:3143148.55

N:10224263.22
E:3143132.72

DETECTABLE WARNING PAVERS AND CROSSWALK STRIPING. SEE DETAIL SHEET C8.06.

EXISTING ASPHALT PARKING

R7-8T
R7-8P
RESERVED PARKING
VAN ACCESSIBLE
VIOLATORS SUBJECT TO FINE AND TOWING

HANDICAP SIGNS, MARKINGS, AND STRIPING. SEE SHEET C8.06

APPROX. EXTENTS OF EXISTING ASPHALT ROAD

ASPHALT

PROP. WHEEL STOP (TYP.)

SAW CUT AND MATCH EXISTING

N:10224315.51
E:3143174.34

N:10224298.76
E:3143250.93

N:10224287.58
E:3143319.04

PROP. RIBBON CURB

PROP. 22046 SF ASPHALT PARKING LOT

APPROX. EXTENTS OF EXISTING ASPHALT ROAD

CP/BM 101

N:10224260.44
E:3143431.61

MATCH TO EXISTING ASPHALT ROAD ELEVATION

N:10224217.25
E:3143419.58

N:10224235.01
E:3143308.48

N:10224232.57
E:3143290.24

N:10224220.81
E:3143245.52

N:10224221.91
E:3143227.54

N:10224237.88
E:3143153.35

SIDEWALK REFER TO LANDSCAPE ARCHITECTURAL PLANS

MATCH TO EXISTING ASPHALT PARKING LOT ELEVATION

EXISTING PARKING LOT TO REMAIN

4" WHITE PARKING STRIPES (TYP.)

MATCH TO EXISTING ASPHALT ROAD ELEVATION

CONC. WALK

WOOD SHED

WATER TROUGH

STORY D BLDG (N)

POLE BARN AREA

EAST PARKING LOT			
Number	Length	Radius	Line/Chord Direction
C21	28.59'	26.445'	S71° 21' 41"W
C22	47.37'	66.445'	S19° 57' 38"W
C23	35.30'	26.133'	S39° 09' 27"E
C24	18.09'	60.000'	S86° 29' 13"E
C25	46.46'	138.552'	N75° 16' 12"E
C26	18.66'	32.000'	N82° 22' 22"E
L17	115.800'		N76° 26' 53"W
L18	69.022'		N80° 40' 45"W
L19	78.394'		N77° 39' 47"W
L20	75.884'		S77° 51' 01"E
L21	112.507'		S80° 55' 04"E

CONTROL SURFACE:
△ CP100,10225073.98,3140652.57,672.02,1/2-INCH IRON ROD SET
△ CP101,10224275.69,3143266.57,665.63,1/2-INCH IRON ROD SET
△ CP80000,10223137.21,3143292.60,655.85,1/2-INCH IRON ROD SET
△ CP80619,10224627.14,3142604.90,683.11,1/2-INCH IRON ROD SET

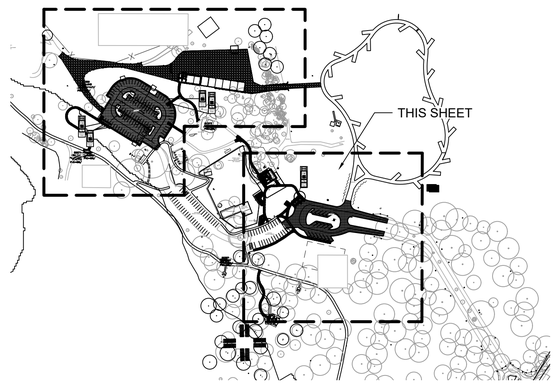
MATCH TO EXISTING ASPHALT ROAD ELEVATION

CONCRETE WHEEL STOP (TYP.)

DETAILED DIMENSIONING

CONCRETE WHEEL STOP (TYP.)

PARKING LAYOUT KEY MAP
NTS



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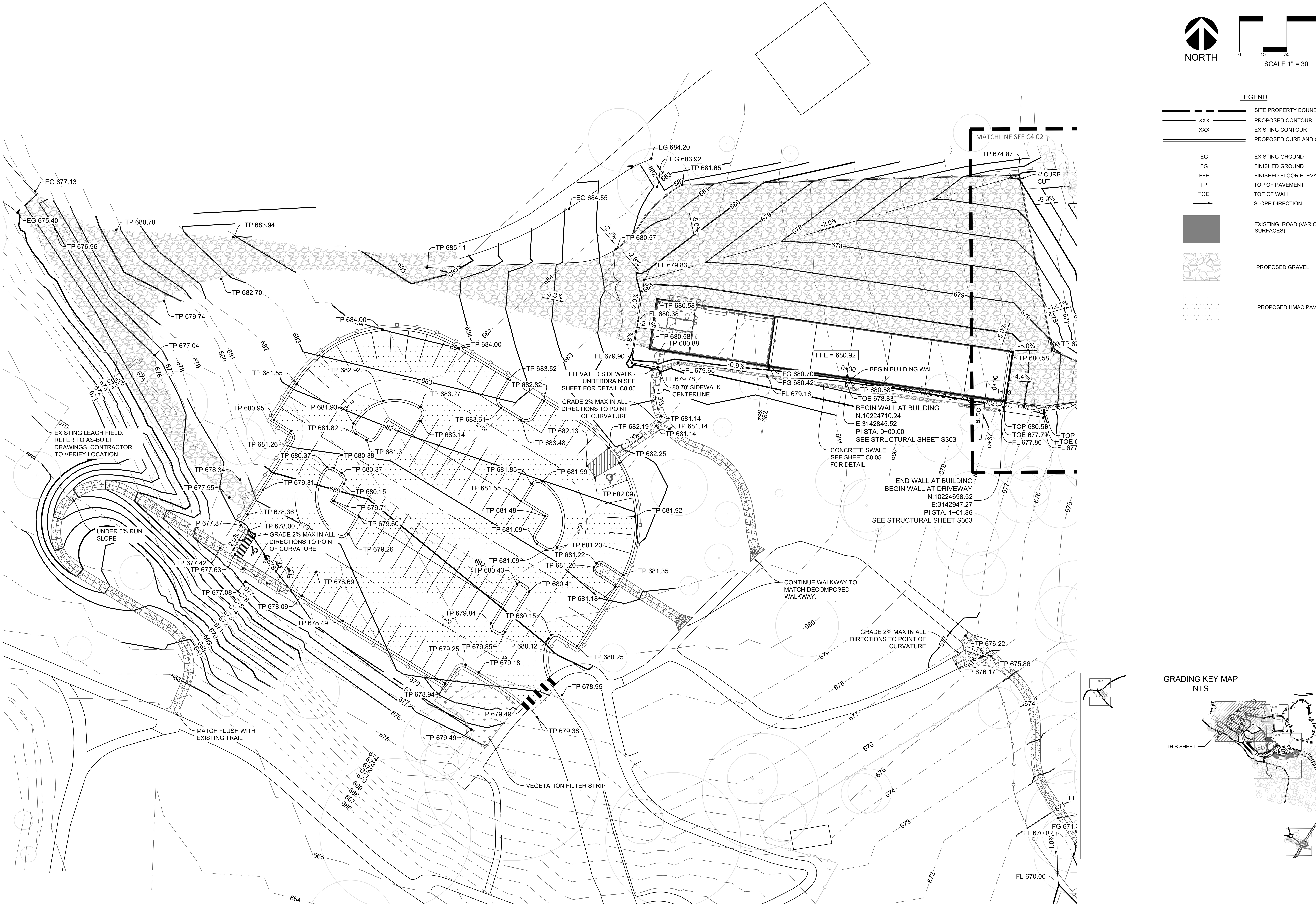
Sheet Title
PARKING AREA PARK IMPROVEMENTS (SHEET 2 OF 2)

Sheet Number	Project Page Number
C3.01	



NORTH

SCALE 1" = 30'

0 15 30 60

LEGEND

	SITE PROPERTY BOUNDARY
XXX	PROPOSED CONTOUR
XXX	EXISTING CONTOUR
	PROPOSED CURB AND GUTTER
EG	EXISTING GROUND
FG	FINISHED GROUND
FFE	FINISHED FLOOR ELEVATION
TP	TOP OF PAVEMENT
TOE	TOE OF WALL
→	SLOPE DIRECTION
	EXISTING ROAD (VARIOUS SURFACES)
	PROPOSED GRAVEL
	PROPOSED HMAC PAVEMENT

GRADING KEY MAP
NTS
THIS SHEET

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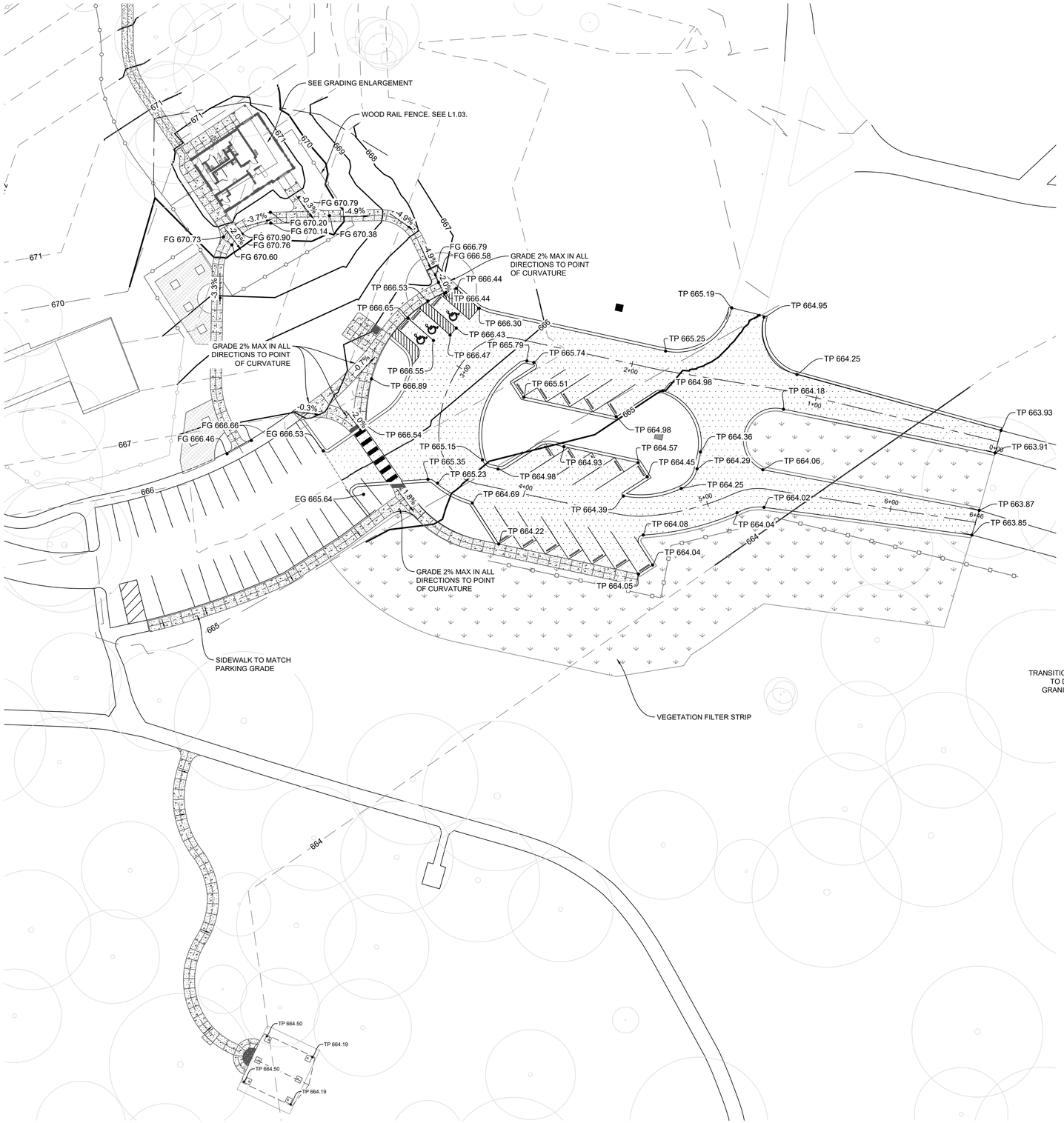
Sheet Title
GRADING PLAN
(SHEET 1 OF 4)

Sheet Number	Project Page Number
C4.00	



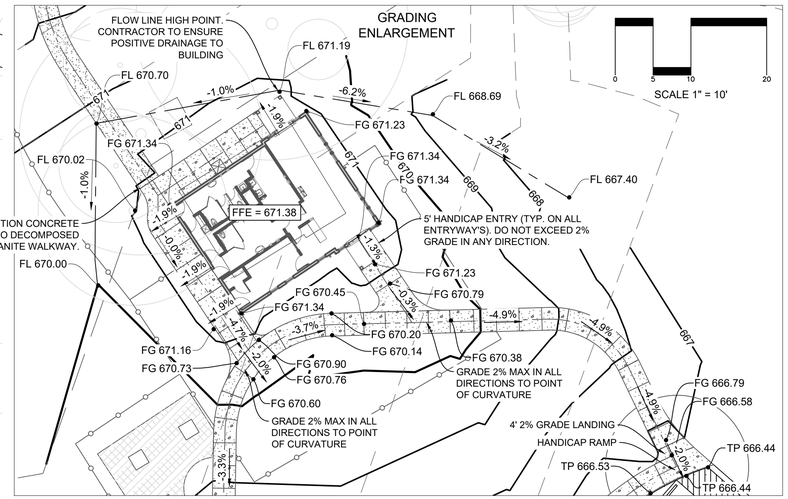
NORTH

SCALE 1" = 30'

LEGEND

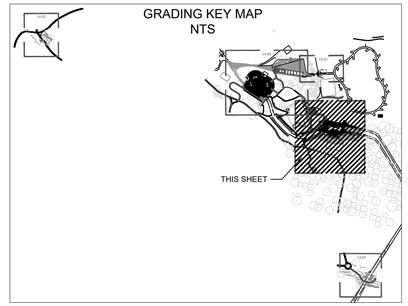
	SITE PROPERTY BOUNDARY
XXX	PROPOSED CONTOUR
XXX	EXISTING CONTOUR
	PROPOSED CURB AND GUTTER
EG	EXISTING GROUND
FG	FINISHED GROUND
FFE	FINISHED FLOOR ELEVATION
TP	TOP OF PAVEMENT
FL	FLOW LINE
	SLOPE DIRECTION
	PROPOSED HMAC PAVEMENT

GRADING ENLARGEMENT



SCALE 1" = 10'

GRADING KEY MAP
NTS



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(SHEET 2 OF 4)

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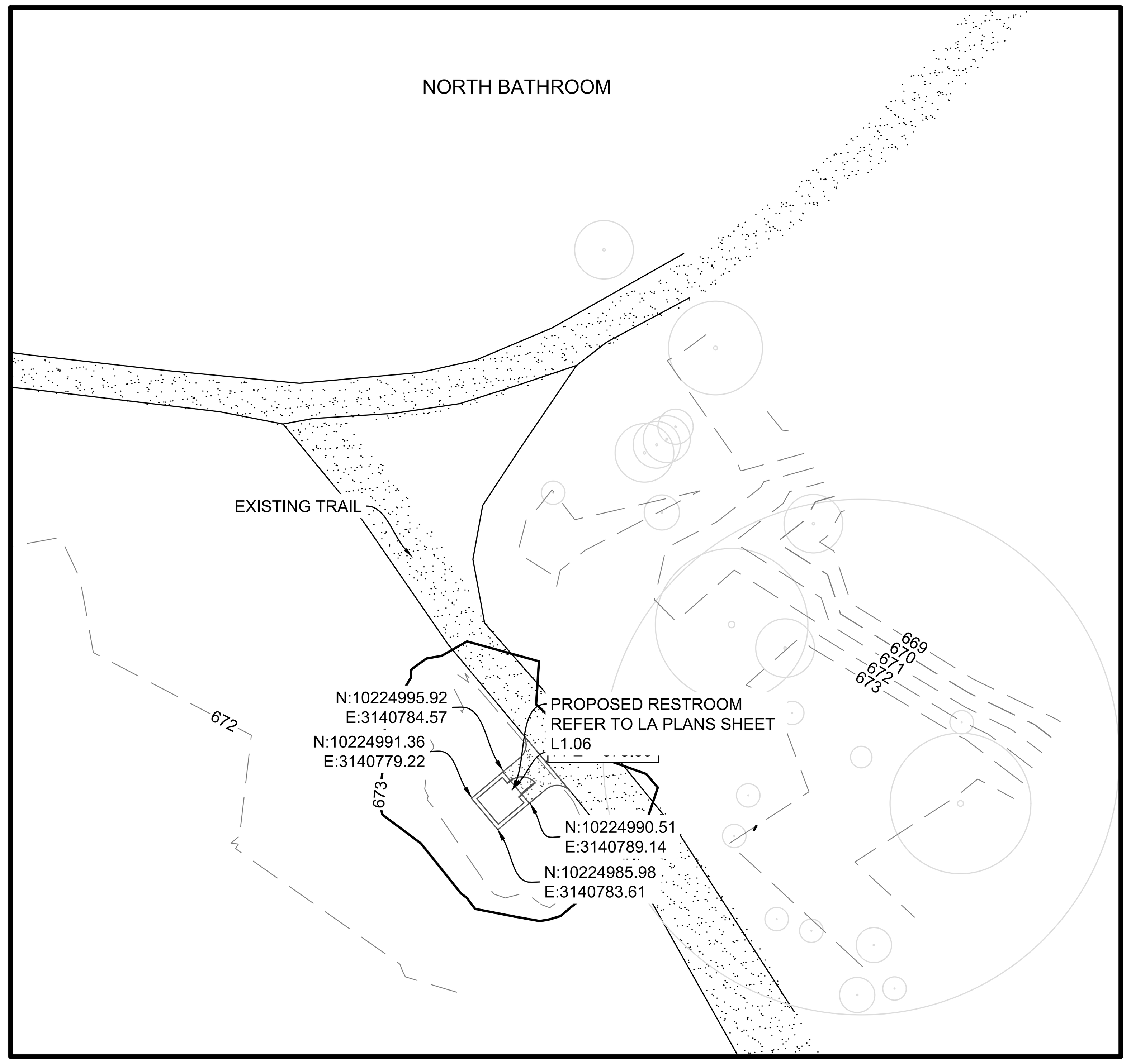
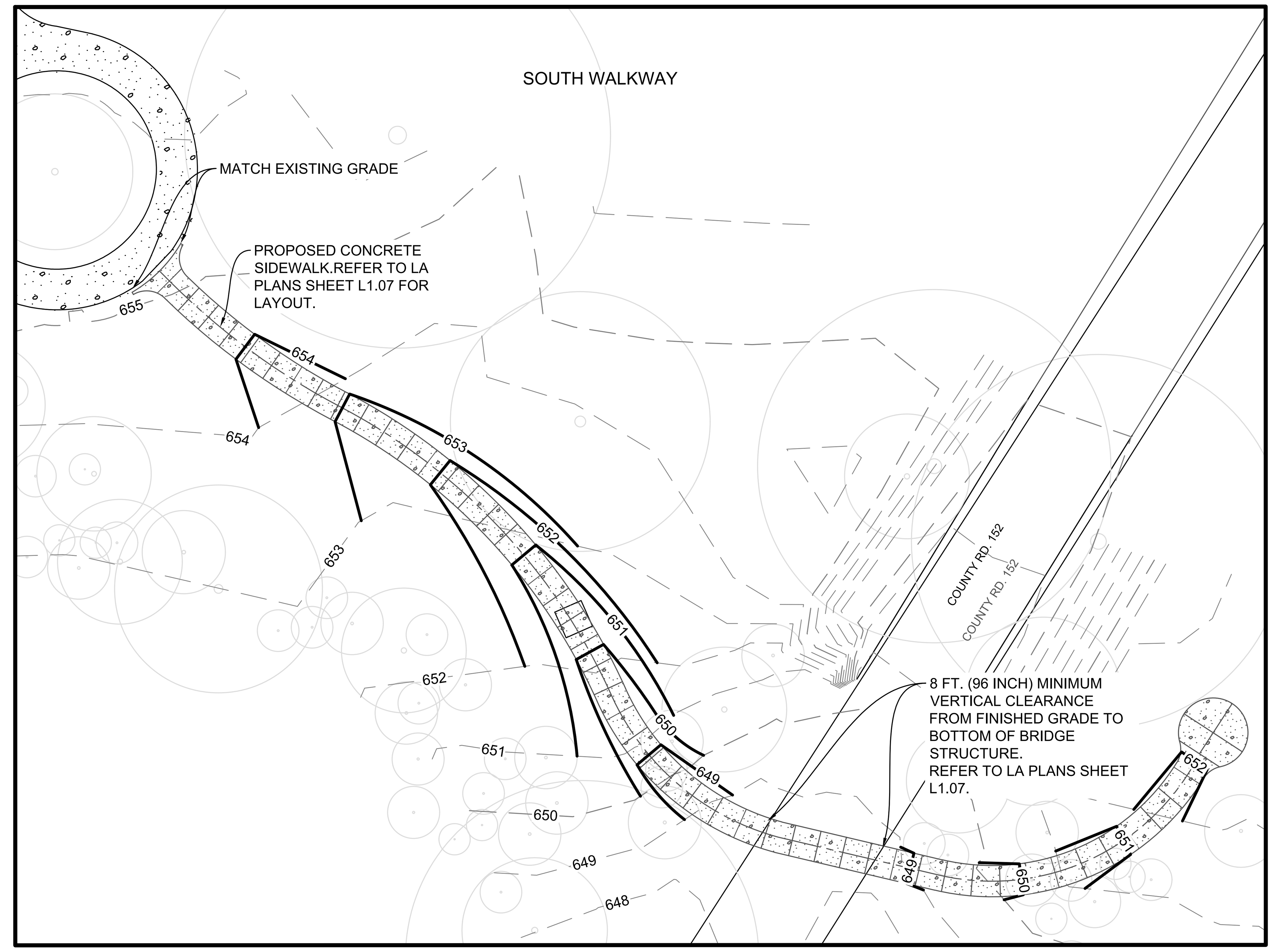
C4.01	




SOUTH WALKWAY
MATCH EXISTING GRADE
PROPOSED CONCRETE
SIDEWALK.REFER TO LA
PLANS SHEET L1.07 FOR
LAYOUT.
8 FT. (96 INCH) MINIMUM
VERTICAL CLEARANCE
FROM FINISHED GRADE TO
BOTTOM OF BRIDGE
STRUCTURE.
REFER TO LA PLANS SHEET
L1.07.
COUNTY RD. 152
655
654
653
652
651
650
649
648

NORTH

SCALE 1" = 20'

0 10 20 40

LEGEND

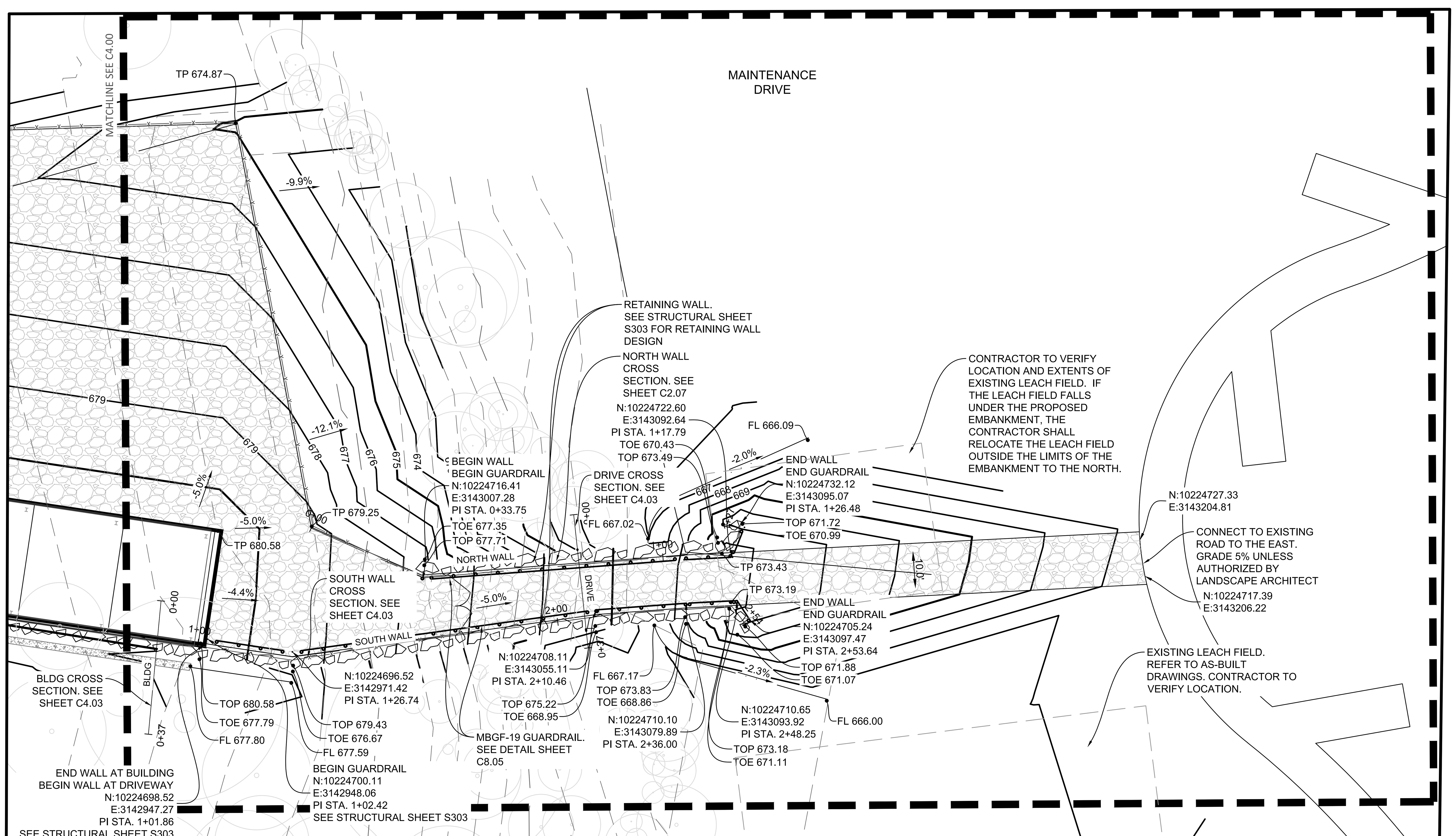
SITE PROPERTY BOUNDARY
XXX PROPOSED CONTOUR
XXX EXISTING CONTOUR
PROPOSED CURB AND GUTTER

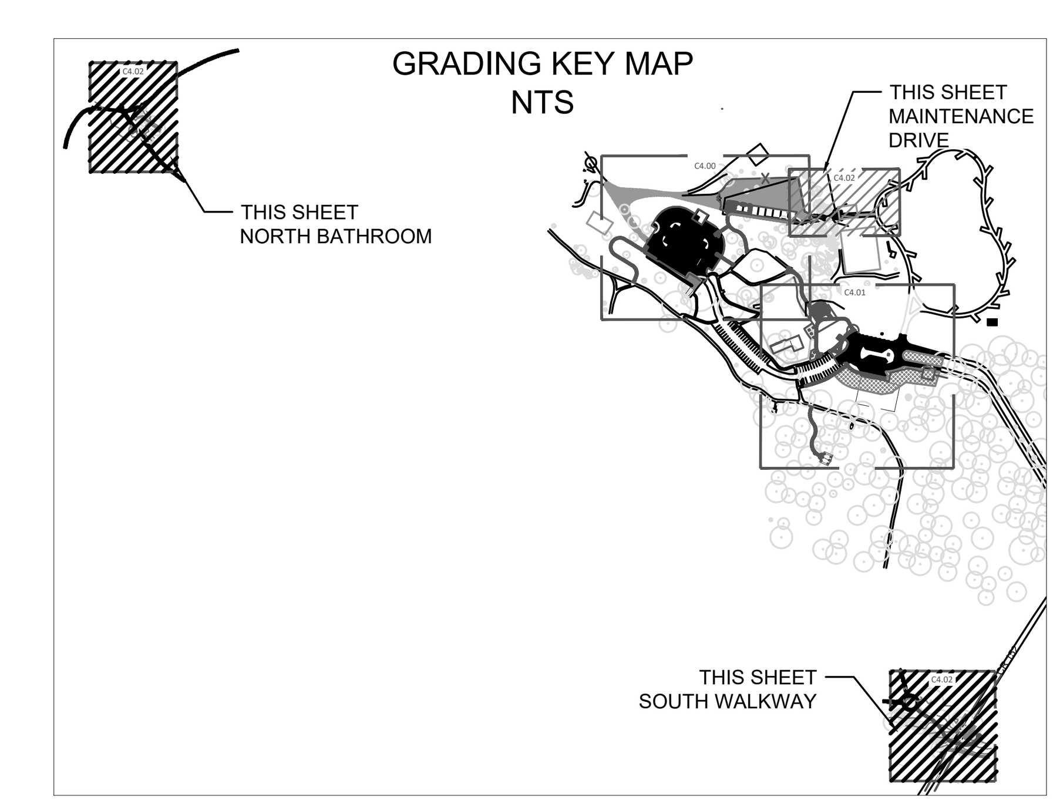
EG	EXISTING GROUND
FG	FINISHED GROUND
FFE	FINISHED FLOOR ELEVATION
TP	TOP OF PAVEMENT
TOE	TOE OF WALL
→	SLOPE DIRECTION

EXISTING ROAD (VARIOUS SURFACES)

PROPOSED GRAVEL

PROPOSED HMAC PAVEMENT


MAINTENANCE
DRIVE
MATCHLINE SEE C4.00
TP 674.87
-9.9%
RETAINING WALL.
SEE STRUCTURAL SHEET
S303 FOR RETAINING WALL
DESIGN
NORTH WALL
CROSS
SECTION. SEE
SHEET C2.07
N:10224722.60
E:3143092.64
PI STA. 1+17.79
TOE 670.43
TOP 673.49
FL 666.09
CONTRACTOR TO VERIFY
LOCATION AND EXTENTS OF
EXISTING LEACH FIELD. IF
THE LEACH FIELD FALLS
UNDER THE PROPOSED
EMBANKMENT, THE
CONTRACTOR SHALL
RELOCATE THE LEACH FIELD
OUTSIDE THE LIMITS OF THE
EMBANKMENT TO THE NORTH.
-12.1%
BEGIN WALL
BEGIN GUARDRAIL
N:10224716.41
E:3143007.28
PI STA. 0+33.75
TOE 677.35
TOP 677.71
DRIVE CROSS
SECTION. SEE
SHEET C4.03
FL 667.02
-2.0%
END WALL
END GUARDRAIL
N:10224732.12
E:3143095.07
PI STA. 1+26.48
TOP 671.72
TOE 670.99
TP 673.43
TP 673.19
N:10224727.33
E:3143204.81
CONNECT TO EXISTING
ROAD TO THE EAST.
GRADE 5% UNLESS
AUTHORIZED BY
LANDSCAPE ARCHITECT
N:10224717.39
E:3143206.22
TP 679.25
-5.0%
TP 680.58
-4.4%
SOUTH WALL
CROSS
SECTION. SEE
SHEET C4.03
NORTH WALL
SOUTH WALL
-5.0%
DRIVE
END WALL
END GUARDRAIL
N:10224705.24
E:3143097.47
PI STA. 2+53.64
TOP 671.88
TOE 671.07
-2.3%
EXISTING LEACH FIELD.
REFER TO AS-BUILT
DRAWINGS. CONTRACTOR TO
VERIFY LOCATION.
BLDG CROSS
SECTION. SEE
SHEET C4.03
BLDG
N:10224696.52
E:3142971.42
PI STA. 1+26.74
N:10224708.11
E:3143055.11
PI STA. 2+10.46
FL 667.17
TOP 673.83
TOE 668.86
TOP 675.22
TOE 668.95
N:10224710.10
E:3143079.89
PI STA. 2+36.00
N:10224710.65
E:3143093.92
PI STA. 2+48.25
FL 666.00
TOP 673.18
TOE 671.11
TOP 680.58
TOE 677.79
FL 677.80
TOP 679.43
TOE 676.67
FL 677.59
MBGF-19 GUARDRAIL.
SEE DETAIL SHEET
C8.05
END WALL AT BUILDING
BEGIN WALL AT DRIVEWAY
N:10224698.52
E:3142947.27
PI STA. 1+01.86
SEE STRUCTURAL SHEET S303
BEGIN GUARDRAIL
N:10224700.11
E:3142948.06
PI STA. 1+02.42
SEE STRUCTURAL SHEET S303
679
678
677
676
675
674
669
668
667
0+00
1+00
2+00
0+37



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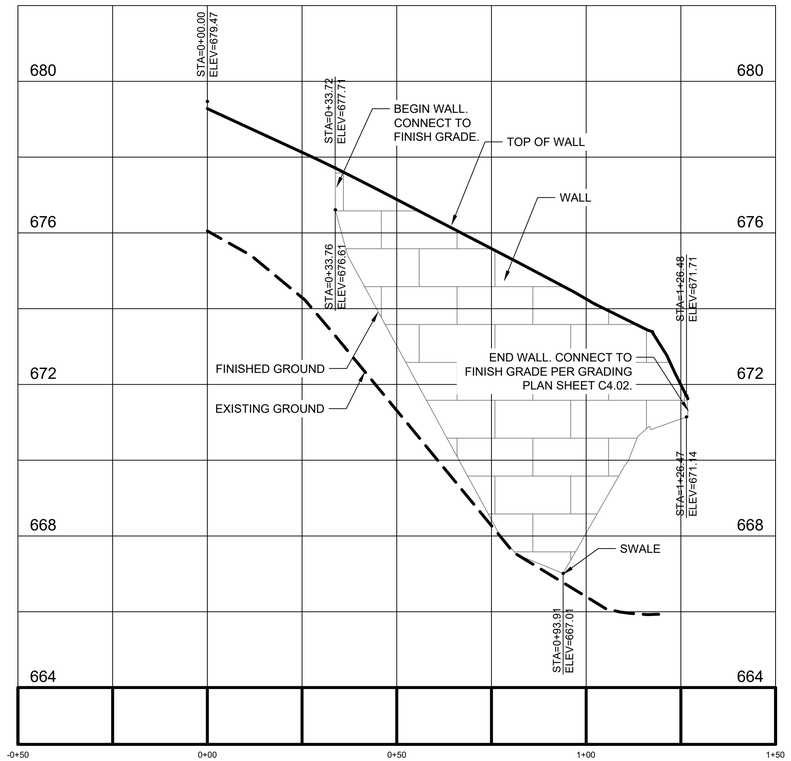
Sheet Title
GRADING PLAN
(SHEET 3 OF 4)

Sheet Number	Project Page Number
C4.02	

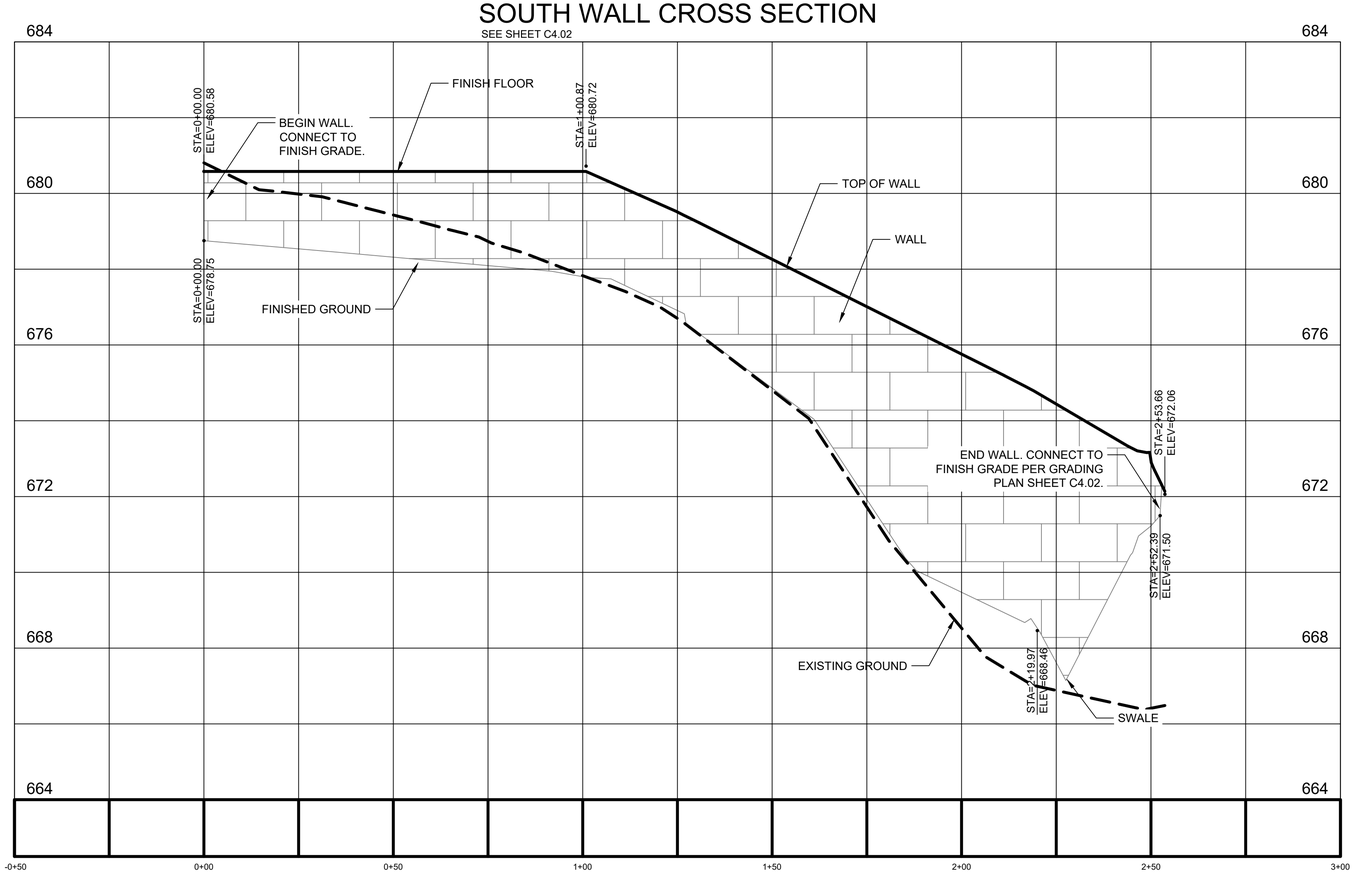
NORTH WALL CROSS SECTION

SEE SHEET C4.02



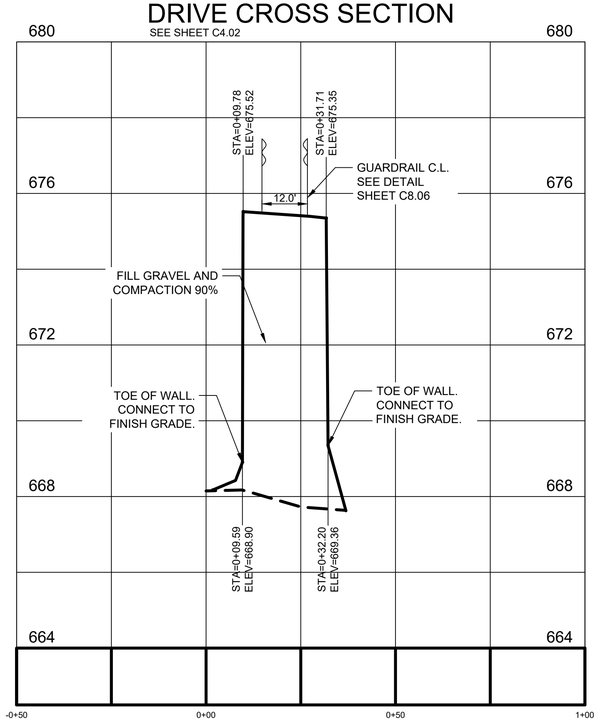
SOUTH WALL CROSS SECTION

SEE SHEET C4.02



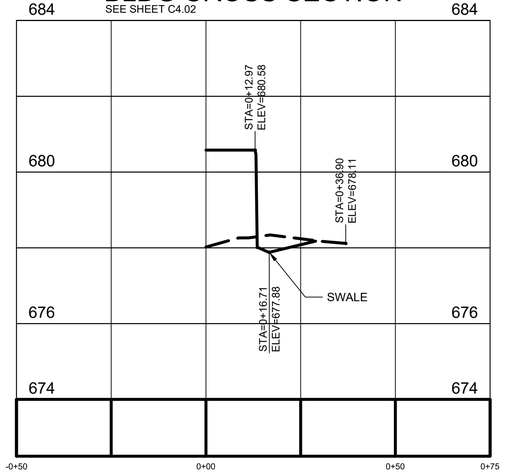
DRIVE CROSS SECTION

SEE SHEET C4.02



BLDG CROSS SECTION

SEE SHEET C4.02



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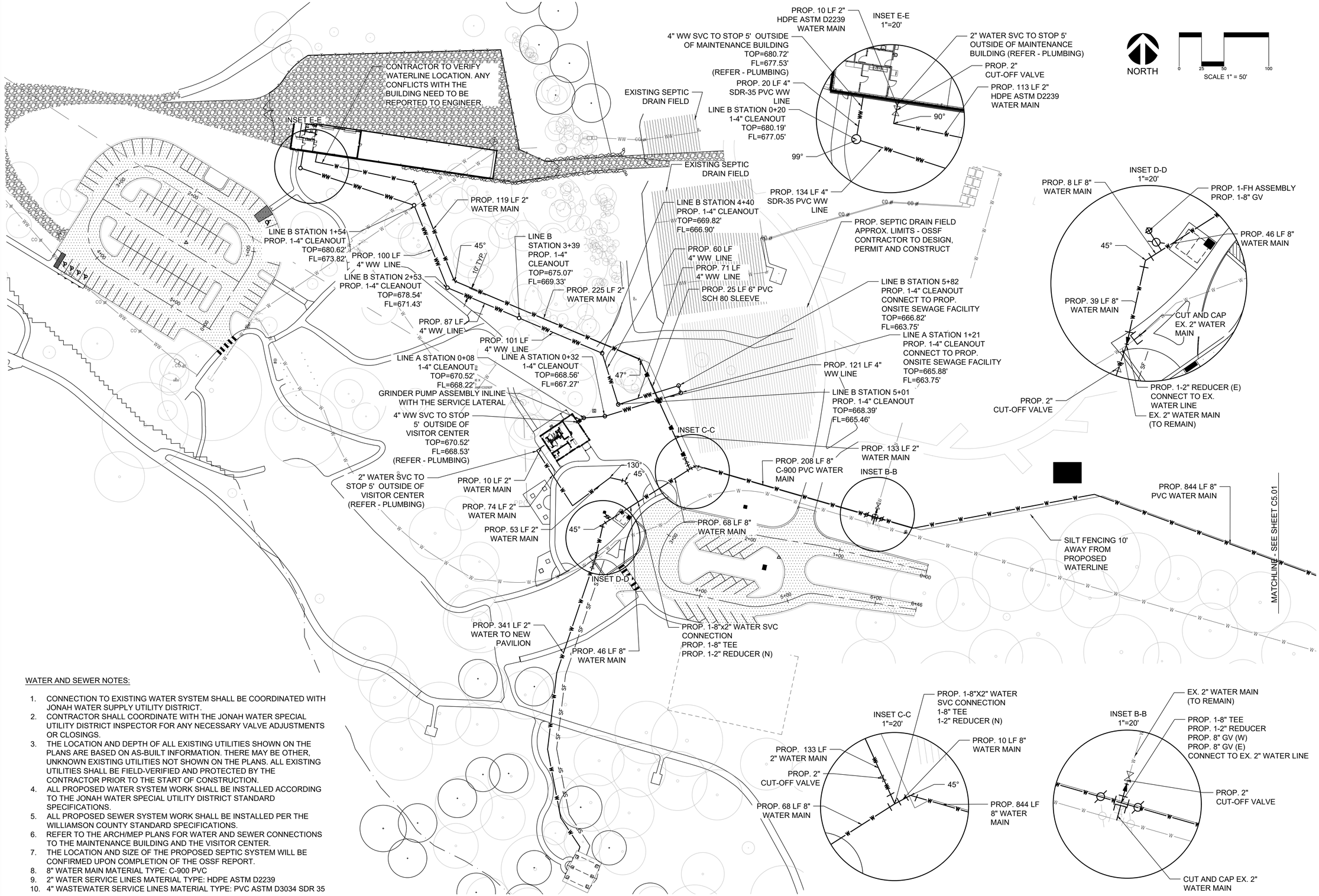
Sheet Title
GRADING PLAN
(SHEET 4 OF 4)

Sheet Number	Project Page Number
C4.03	



WATER AND SEWER NOTES:

1. CONNECTION TO EXISTING WATER SYSTEM SHALL BE COORDINATED WITH JONAH WATER SUPPLY UTILITY DISTRICT.
2. CONTRACTOR SHALL COORDINATE WITH THE JONAH WATER SPECIAL UTILITY DISTRICT INSPECTOR FOR ANY NECESSARY VALVE ADJUSTMENTS OR CLOSINGS.
3. THE LOCATION AND DEPTH OF ALL EXISTING UTILITIES SHOWN ON THE PLANS ARE BASED ON AS-BUILT INFORMATION. THERE MAY BE OTHER, UNKNOWN EXISTING UTILITIES NOT SHOWN ON THE PLANS. ALL EXISTING UTILITIES SHALL BE FIELD-VERIFIED AND PROTECTED BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
4. ALL PROPOSED WATER SYSTEM WORK SHALL BE INSTALLED ACCORDING TO THE JONAH WATER SPECIAL UTILITY DISTRICT STANDARD SPECIFICATIONS.
5. ALL PROPOSED SEWER SYSTEM WORK SHALL BE INSTALLED PER THE WILLIAMSON COUNTY STANDARD SPECIFICATIONS.
6. REFER TO THE ARCH/MEP PLANS FOR WATER AND SEWER CONNECTIONS TO THE MAINTENANCE BUILDING AND THE VISITOR CENTER.
7. THE LOCATION AND SIZE OF THE PROPOSED SEPTIC SYSTEM WILL BE CONFIRMED UPON COMPLETION OF THE OSSF REPORT.
8. 8" WATER MAIN MATERIAL TYPE: C-900 PVC
9. 2" WATER SERVICE LINES MATERIAL TYPE: HDPE ASTM D2239
10. 4" WASTEWATER SERVICE LINES MATERIAL TYPE: PVC ASTM D3034 SDR 35

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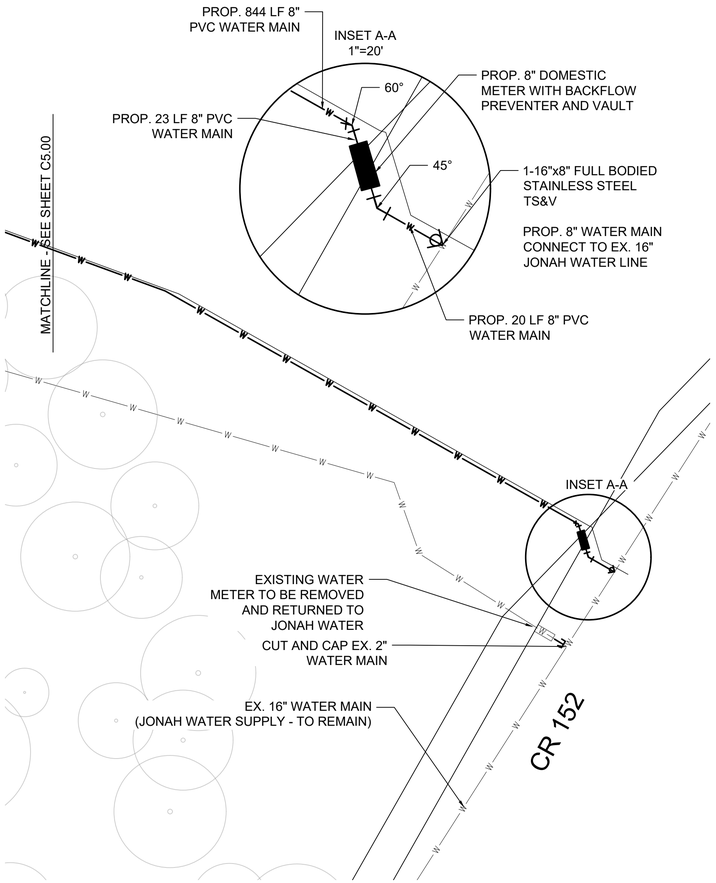
Sheet Title
WATER AND SEWER PLAN (SHEET 1 OF 3)

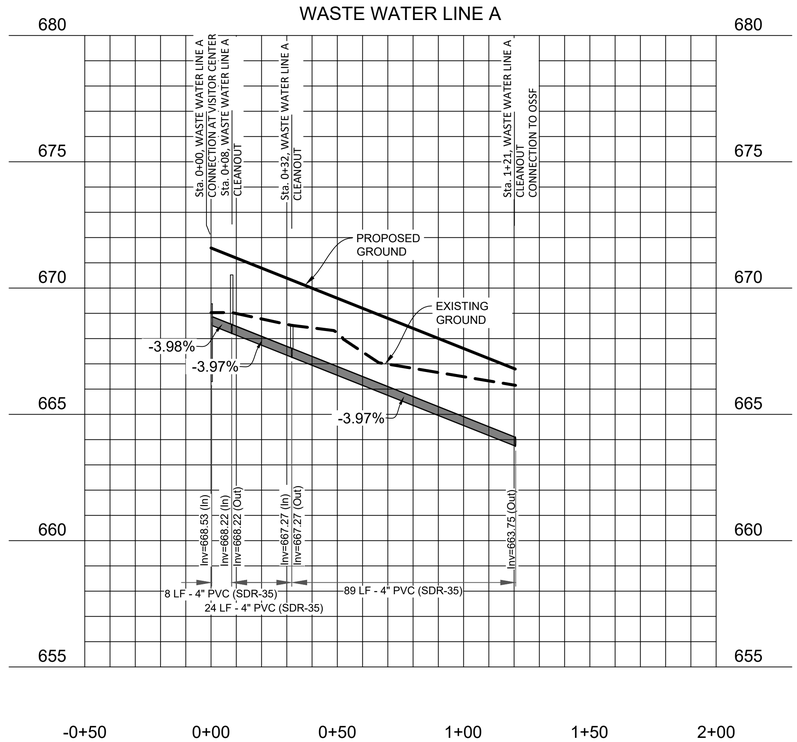
Sheet Number	Project Page Number
C5.00	

NORTH

0 25 50 100

SCALE 1" = 50'





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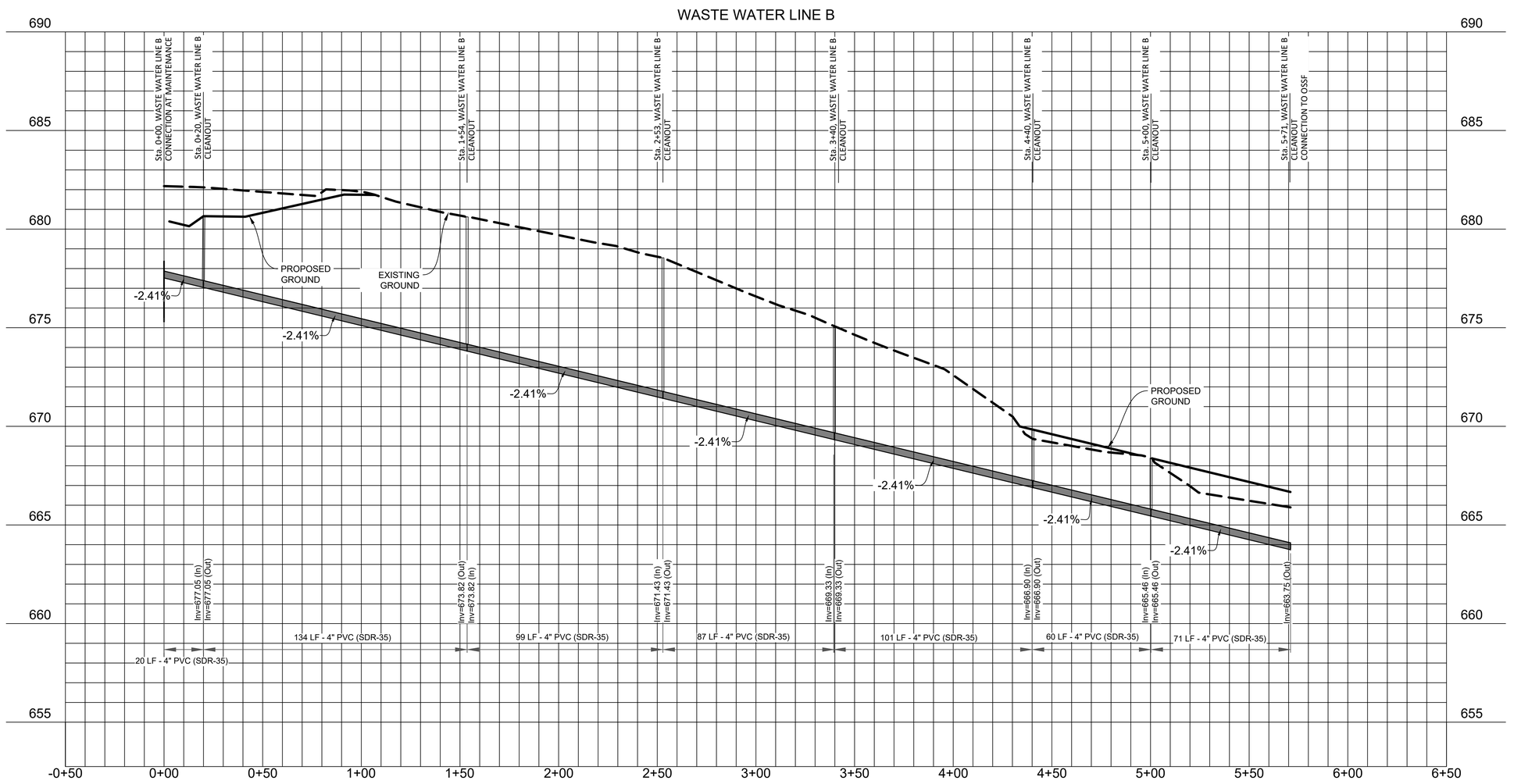
Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED
PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
WATER AND SEWER PLAN (SHEET 2 OF 3)

Sheet Number	Project Page Number
C5.01	



BERRY SPRINGS
PARK IMPROEMENTS
Williamson County, Texas

WILLIAMSON COUNTY
1848

halff
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April 12, 2023

Project No.:	38049
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Drawn By:	JS, MB, AS
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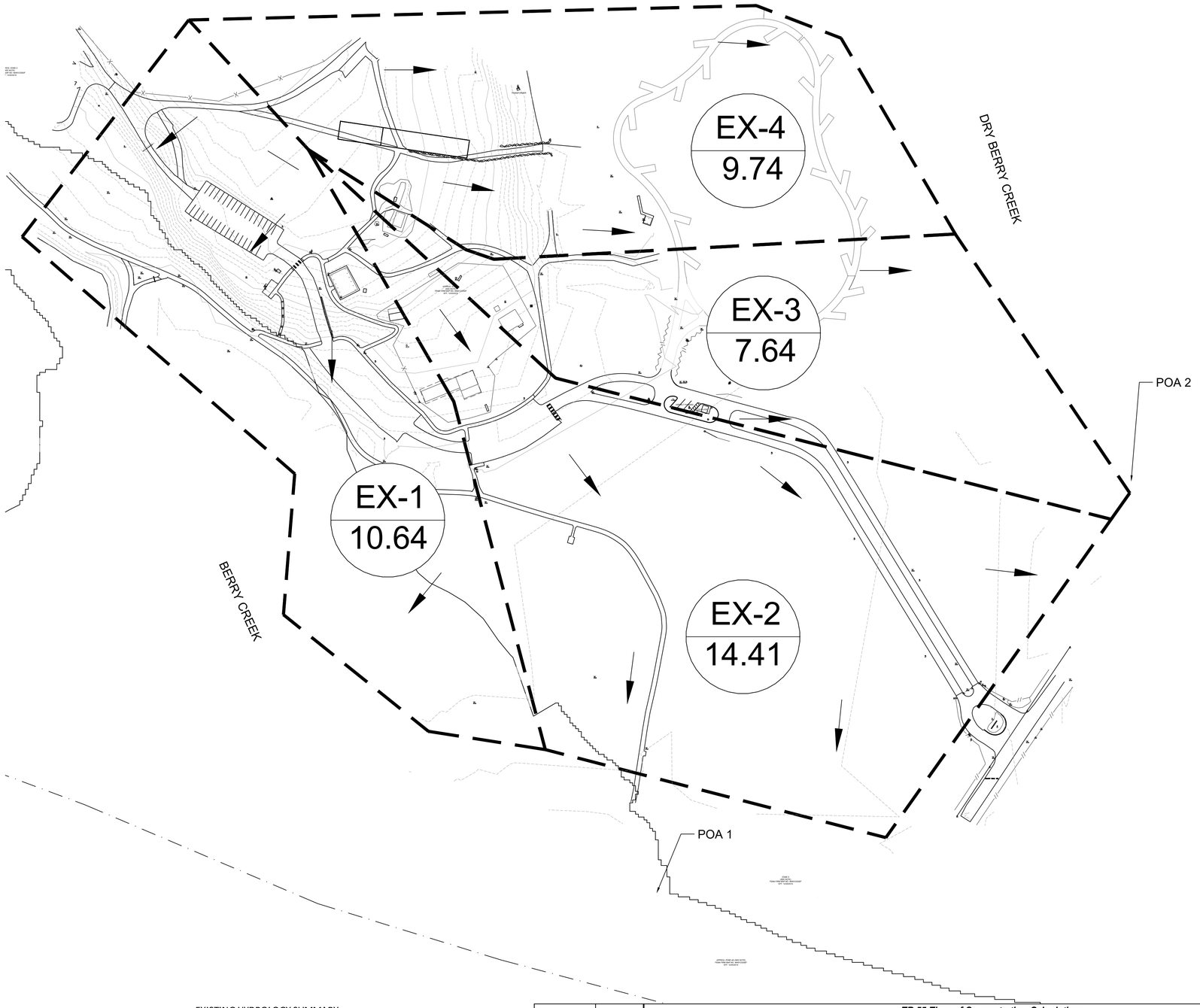
Sheet Title
WATER AND SEWER PLAN (SHEET 3 OF 3)

Sheet Number	Project Page Number
C5.02	



LEGEND

- DRAINAGE AREA
- 100 YEAR FLOOD PLAIN (FP)
- FLOW DIRECTION
- XX / XX — AREA ID / AREA (AC)

NOTES:

1. HEC-HMS 4.1 WAS USED TO DEVELOP THE EXISTING AND PROPOSED CONDITION PEAK FLOW.
2. CN VALUE IS CALCULATED WITH THE FOLLOWING ASSUMPTION:
   SOIL HYDROLOGIC GROUP: C
   PERIOUS AREA: OPEN SPACE FAIR CONDITION (CN VALUE 79)
   IMPERVIOUS AREA: PAVED PARKING LOTS, ROOFS, DRIVEWAYS, ETC. (CN VALUE 98)

EXISTING HYDROLOGY SUMMARY

Area ID	Area (AC)	Impervious (AC)	Pervious (AC)	Tc (min)	Composite CN	IC %	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
EX-1	10.64	1.17	9.46	39.01	81.10	11%	9.3	21.4	28.0	36.7
EX-2	14.41	1.01	13.40	36.49	80.33	7%	12.6	29.5	38.7	50.8
EX-3	7.64	0.60	7.04	41.52	80.49	8%	6.2	14.7	19.3	25.4
EX-4	9.74	0.85	8.88	36.79	80.67	9%	8.6	20.0	26.2	34.4
Total Flow at Berry Creek (CFS) - POA 1							21.9	50.9	66.7	87.5
Total Flow at Dry Berry Creek (CFS) - POA 2							14.8	34.6	45.4	59.6

DRAINAGE AREA	*Subbasin Area*	*TR-55 Time of Concentration Calculations*													
		Overland Flow				*Shallow Concentrated Flow*				*Channelized Flow*			*Time of Concentration*		*Lag Time*
	acres	*n*	*Length ft*	*Avg. Slope ft/ft*	*T1 hrs*	*Cover*	*Avg. Slope ft/ft*	*Length ft*	*T2 hrs*	*Velocity ft/sec*	*Length ft*	*T3 hrs*	*hrs*	*min*	*min*
EX-1	10.64	0.41	100.00	0.01	0.46	Unpaved	0.02	1,437.32	0.19	0	0	0	0.65	39.01	23.40
EX-2	14.41	0.41	100.00	0.01	0.46	Unpaved	0.02	1,127.39	0.15	0	0	0	0.61	36.49	21.89
EX-3	7.64	0.41	100.00	0.01	0.50	Unpaved	0.02	1,370.60	0.19	0	0	0	0.69	41.52	24.91
EX-4	9.74	0.41	100.00	0.01	0.46	Unpaved	0.02	1,279.97	0.15	0	0	0	0.61	36.79	22.08

NORTH

0 50 100 200
SCALE 1" = 100'

BERRY SPRINGS
PARK IMPROEMENTS
Williamson County, Texas

WILLIAMSON COUNTY 1848

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Project No.:	38049
Issued:	04-12-2023
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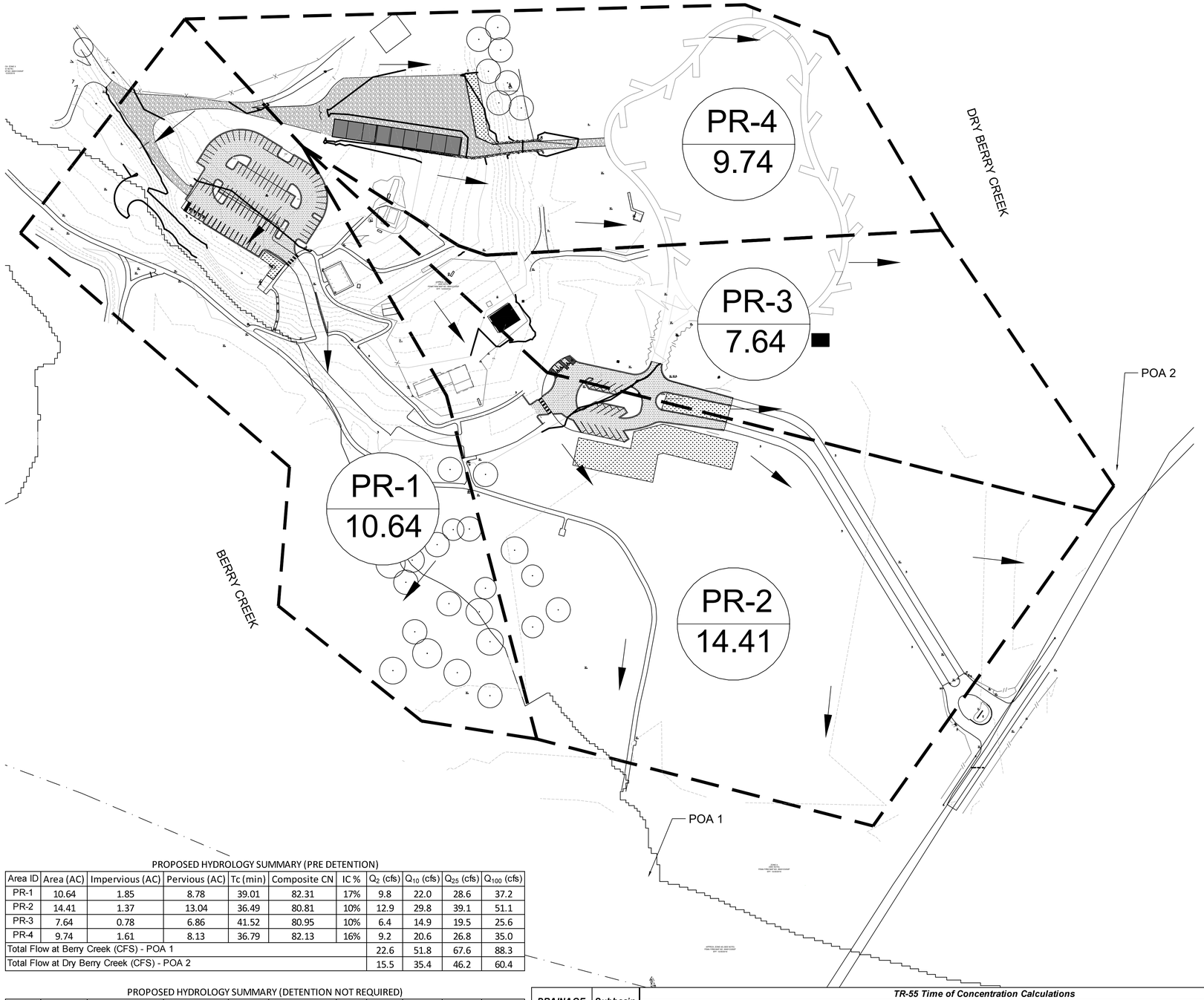
Sheet Title
EXISTING DRAINAGE AREA

Sheet Number	Project Page Number
C6.00	



LEGEND

- DRAINAGE AREA
- 100 YEAR FLOOD PLAIN (FP)
- FLOW DIRECTION
- XX / XX — AREA ID / AREA (AC)

NOTES:

1. HEC-HMS 4.1 WAS USED TO DEVELOP THE EXISTING AND PROPOSED CONDITION PEAK FLOW.
2. CN VALUE IS CALCULATED WITH THE FOLLOWING ASSUMPTION:
   SOIL HYDROLOGIC GROUP: C
   PERVIOUS AREA: OPEN SPACE FAIR CONDITION (CN VALUE 79)
   IMPERVIOUS AREA: PAVED PARKING LOTS, ROOFS, DRIVEWAYS, ETC. (CN VALUE 98)

PROPOSED HYDROLOGY SUMMARY (PRE DETENTION)

Area ID	Area (AC)	Impervious (AC)	Pervious (AC)	Tc (min)	Composite CN	IC %	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
PR-1	10.64	1.85	8.78	39.01	82.31	17%	9.8	22.0	28.6	37.2
PR-2	14.41	1.37	13.04	36.49	80.81	10%	12.9	29.8	39.1	51.1
PR-3	7.64	0.78	6.86	41.52	80.95	10%	6.4	14.9	19.5	25.6
PR-4	9.74	1.61	8.13	36.79	82.13	16%	9.2	20.6	26.8	35.0
Total Flow at Berry Creek (CFS) - POA 1							22.6	51.8	67.6	88.3
Total Flow at Dry Berry Creek (CFS) - POA 2							15.5	35.4	46.2	60.4

PROPOSED HYDROLOGY SUMMARY (DETENTION NOT REQUIRED)

Area ID	Area (AC)	Impervious (AC)	Pervious (AC)	Tc (min)	Composite CN	IC %	Q_2 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
PR-1	10.64	1.85	8.78	39.01	82.31	17%	9.8	22.0	28.6	37.2
PR-2	14.41	1.37	13.04	36.49	80.81	10%	11.4	28.2	37.3	49.0
PR-3	7.64	0.78	6.86	41.52	80.95	10%	5.7	12.5	16.7	22.5
PR-4	9.74	1.61	8.13	36.79	82.13	16%	9.2	20.6	26.8	35.0
Total Flow at Berry Creek (CFS) - POA 1							20.7	49.8	65.5	85.8
Total Flow at Dry Berry Creek (CFS) - POA 2							14.1	31.5	41.1	54.6

DRAINAGE AREA	Subbasin Area	TR-55 Time of Concentration Calculations														
		Overland Flow				Shallow Concentrated Flow				Channelized Flow			Time of Concentration		Lag Time
		n	Length	Avg. Slope	T1	Cover	Avg. Slope	Length	T2	Velocity	Length	T3			
	acres		ft	ft/ft	hrs		ft/ft	ft	hrs	ft/sec	ft	hrs	hrs	min	min
PR-1	10.64	0.41	100.00	0.01	0.46	Unpaved	0.02	1,437.32	0.19	0	0	0	0.65	39.01	23.40
PR-2	14.41	0.41	100.00	0.01	0.46	Unpaved	0.02	1,127.39	0.15	0	0	0	0.61	36.49	21.89
PR-3	7.64	0.41	100.00	0.01	0.50	Unpaved	0.02	1,370.60	0.19	0	0	0	0.69	41.52	24.91
PR-4	9.74	0.41	100.00	0.01	0.46	Unpaved	0.02	1,279.97	0.15	0	0	0	0.61	36.79	22.08

NORTH

0 50 100 200
SCALE 1" = 100'

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128439
LICENSED PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
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Sheet Title
PROPOSED DRAINAGE AREA

Sheet Number	Project Page Number
C6.01	

15' DRAINAGE SWALE

15' WIDE ENGINEERED
VEGETATIVE FILTER STRIPS.
SEE DETAIL ON SHEET C8.04.

15' WIDE ENGINEERED
VEGETATIVE FILTER STRIPS.
SEE DETAIL ON SHEET C8.04.

50' WIDE NATURAL
VEGETATIVE FILTER STRIPS.
SEE DETAIL ON SHEET C8.04.

APPROX. ZONE X
(SEE NOTE)
FEMA FIRM MAP NO. 48491C0250F
EFF. 12/20/2019

LEGEND

VEGETATIVE FILTER STRIPS (TYP.)
SEE DETAIL ON SHEET C8.04

NORTH

0 25 50 100
SCALE 1" = 50'

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April 12, 2023

Project No.:	38049
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Sheet Title
OVERALL WATER QUALITY

Sheet Number	Project Page Number
C7.00	

Project Name: Berry Springs Park and Preserve

Date Prepared: 04/07/2023

1. The Required Load Reduction for the total project:

County =	**Williamson**	
Total project area included in plan * =	**42.43**	acres
Predevelopment impervious area within the limits of the plan * =	**3.63**	acres
Total post-development impervious area within the limits of the plan* =	**5.61**	acres
Total post-development impervious cover fraction * =	**0.13**	
P =	**32**	inches
LM TOTAL PROJECT =	**1723**	lbs.

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

Drainage Basin/Outfall Area No. =	**PR-1**	PR-2	PR-3	PR-4	
Total drainage basin/outfall area =	**10.64**	**14.41**	**7.64**	**9.74**	acres
Predevelopment impervious area within drainage basin/outfall area =	**1.17**	**1.01**	**0.6**	**0.85**	acres
Post-development impervious area within drainage basin/outfall area =	**1.85**	**1.37**	**0.78**	**1.61**	acres
Post-development impervious fraction within drainage basin/outfall area =	**0.17**	**0.10**	**0.10**	**0.17**	
LM THIS BASIN =	**592**	**313**	**157**	**662**	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	**Vegetated Filter Strips**
Removal efficiency =	**85** percent

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

RG-348 Page 3-33 Equation 3.7: LR = (BMP efficiency) x P x (AI x 34.6 + AP x 0.54)

AC = Total On-Site drainage area in the BMP catchment area

AI = Impervious area proposed in the BMP catchment area

AP = Pervious area remaining in the BMP catchment area

LR = TSS Load removed from this catchment area by the proposed BMP

AC =	**10.64**	**14.41**	**7.64**	**9.74**	acres
AI =	**1.85**	**1.37**	**0.78**	**1.61**	acres
AP =	**8.79**	**13.04**	**6.86**	**8.13**	acres
LR =	**1870**	**1481**	**835**	**1635**	lbs

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

Desired LM THIS BASIN =	**592**	**313**	**157**	**662**	lbs.
F =	**0.32**	**0.21**	**0.19**	**0.40**	

Design parameters for the swales:

	Maint. Building Lot	West Parking Lot	East Parking Lot	
Drainage Area to be Treated by the Swale = A =	0.82	0.9	0.51	acres
Impervious Cover in Drainage Area =	0.82	0.9	0.51	acres
Rainfall intensity = i =	1.1	1.1	1.1	in/hr
Swale Slope =	0.025	0.025	0.01	ft/ft
Side Slope (z) =	3	3	3	
Design Water Depth = y =	0.33	0.33	0.33	ft
Weighted Runoff Coefficient = C =	0.74	0.74	0.74	
ACS = cross-sectional area of flow in Swale =	1.18	1.30	1.17	sf
PW = Wetted Perimeter =	4.65	5.05	4.64	feet
RH = hydraulic radius of flow cross-section = ACS/PW =	0.25	0.26	0.25	feet
n = Manning's roughness coefficient =	0.2	0.2	0.2	

Swale Bottom Width Calculations:

From Manning's Equation: b =	2.54	2.96	2.55	feet
Q = CiA =	0.67	0.73	0.42	cfs

To calculate the flow velocity in the swale:

Flow Velocity in the Swale: V = Q/ACS =	0.57	0.56	0.36	ft/sec

Minimum Swale Length Calculation:

Minimum Swale Length = V * 300 seconds = L =	169.56	168.42	106.52	feet

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WILLIAMSON COUNTY 1848

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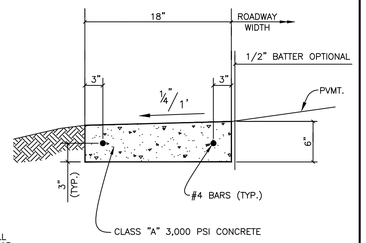
Sheet Title
OVERALL WATER QUALITY A

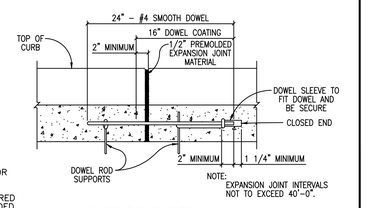
Sheet Number: C7.01
Project Page Number:



RIBBON CURB

NOTES:

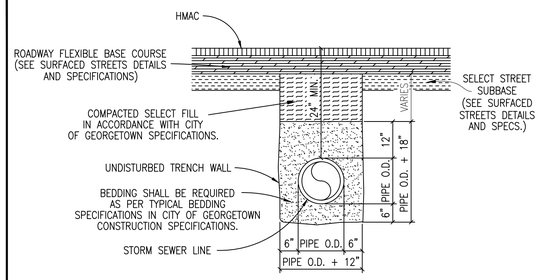
1. ALL WORK AND MATERIAL SHALL CONFORM TO ASTM A615, A615M, C309, AND D1752. BROOM FINISH EXPOSED SURFACE.
2. CONTRACTION JOINT SPACING 10' MAX.
3. EXPANSION JOINTS AS PER STD. ASTM D-1752.
4. 1/2" EXPANSION JOINT MATERIAL SHALL BE PROVIDED WHERE CURB IS ADJACENT TO SIDEWALK OR RIP-RAP.
5. TRANSITIONS BETWEEN CURBS OR DIFFERING CROSS SECTIONS SHALL OCCUR OVER A 20 FOOT LENGTH AS APPROVED BY THE ENGINEER OR TH CITY OF GEORGETOWN.
6. ALL CONCRETE SHALL BE CLASS A, 3000 PSI.
7. ALL SURFACES THAT ARE CHIPPED OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED.
8. ONE OF THE FOLLOWING SCHEMES OF REINFORCEMENT SHALL BE REQUIRED. THE MANNER OF PLACEMENT AND LOCATION SHALL BE TO THE SATISFACTION OF THE ENGINEER OR THE CITY OF GEORGETOWN.
   A. CURB AND GUTTER (REINFORCED) SHALL HAVE LONGITUDINAL REINFORCING BARS AS FOLLOWS: THREE #4,
   B. ALL TYPES OF CURB (REINFORCED) SHALL HAVE #4 BAR FOR LONGITUDINAL REINFORCEMENT.
9. REINFORCING BARS SHALL BE LAPPED A MINIMUM OF 15 INCH.
10. REINFORCING BARS SHALL BE SUPPORTED WITH REBAR CHAIRS OR OTHER APPROVED METHODS.
11. REBAR SUPPORTS ARE NOT REQUIRED ON MACHINE PLACED CURB PROVIDED THAT REBAR IS PROPERLY GUIDED INTO THE CURB SECTION.



CURB DOWEL DETAIL

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

REVISION NOTE:	ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	
DRAWING NAME:	SD08
RIBBON CURB DETAILS	
SCALE: NTS	DATE: 1/2003
DRAWN BY: MRS	APPROVED BY: TRB



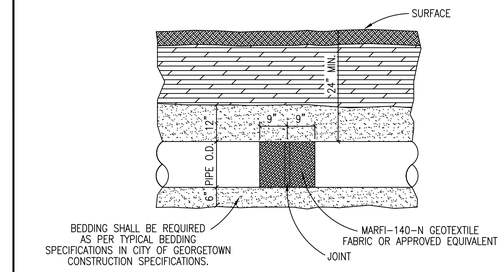
NOTES:

1. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE CITY OF GEORGETOWN CONSTRUCTION SPECIFICATIONS AND STANDARDS.
2. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL (SEE C9 FLOWABLE BACKFILL FOR THE SPECIFICATION).

TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

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

REVISION NOTE:	ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	
DRAWING NAME:	SD41
TRENCH AND EMBEDMENT DETAIL UNDER PROPOSED ROADWAY FOR STORM SEWER	
SCALE: NTS	DATE: 1/2003
DRAWN BY: MRS	APPROVED BY: TRB

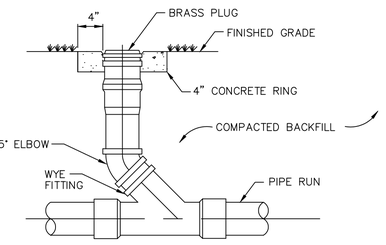


NOTES

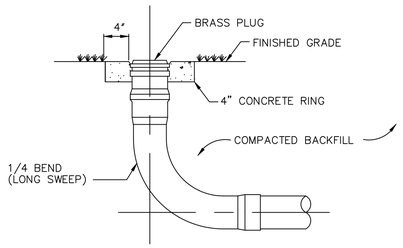
1. PIPE SHALL BE REINFORCED CONCRETE PIPE CLASS III UNLESS THE DEPTH OF PIPE REQUIRES A STRONGER CLASS.
2. ALL FITTINGS AND WYES SHALL BE MANUFACTURED AND NOT CONSTRUCTED ON THE PROJECT WITHOUT PRIOR APPROVAL FROM THE CITY.
3. ALL JOINTS SHALL BE WRAPPED WITH MARFI-140-N GEOTEXTILE FABRIC OR APPROVED EQUIVALENT. EACH JOINT SHALL BE WRAPPED WITH 18" WIDE FABRIC CENTERED ON THE JOINT.

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

REVISION NOTE:	ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	
DRAWING NAME:	SD42
TRENCH AND EMBEDMENT DETAIL (PROFILE) FOR STORM SEWER	
SCALE: NTS	DATE: 1/2003
DRAWN BY: MRS	APPROVED BY: TRB

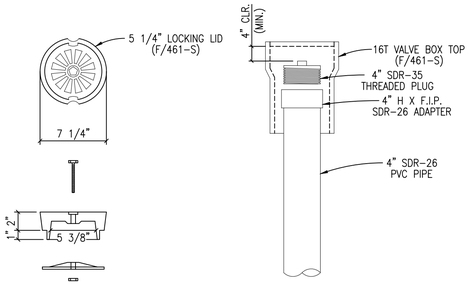


IN-LINE CLEANOUT



TERMINAL CLEANOUT

NOTE: CONCRETE COLLAR REQUIRED IN UNPAVED AREAS

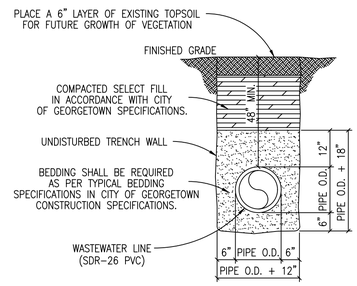


5 1/4" LOCKING LID
(F/461-S)

SEWER CLEAN-OUT
CITY OF GEORGETOWN
(RESIDENTIAL SERVICE)

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

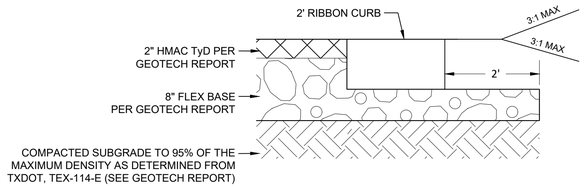
REVISION NOTE:	ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	
DRAWING NAME:	WW12
SEWER CLEAN-OUT DETAIL	
SCALE: NTS	DATE: 1/2003
DRAWN BY: MRS	APPROVED BY: TRB



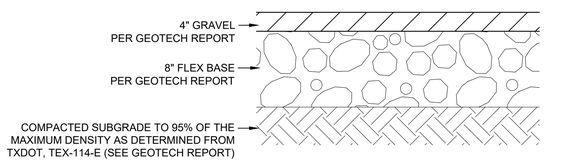
TRENCH WIDTHS
*PIPE LESS THAN 20" DIAMETER
1'-0" + PIPE O.D.
*20" DIAMETER PIPE AND LARGER
2'-0" + PIPE O.D.

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

REVISION NOTE:	ADOPTED 6/21/2006
CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS	
DRAWING NAME:	WW16
TRENCH AND EMBEDMENT DETAIL UNDER NON-PAVED AREAS	
SCALE: NTS	DATE: 1/2003
DRAWN BY: MRS	APPROVED BY: TRB



HMAC STANDARD PAVEMENT SECTION
N.T.S



GRAVEL STANDARD PAVEMENT SECTION
N.T.S

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Sheet Number	C8.00
Project Page Number	

WATER MAINS AND SANITARY SEWERS SHALL BE INSTALLED NO CLOSER TO EACH OTHER THAN 9 FT. IN ALL DIRECTIONS AND PARALLEL LINES MUST BE INSTALLED IN SEPARATE TRENCHES. WHERE THE 9 FT. SEPARATION CANNOT BE ACHIEVED, THE FOLLOWING TABLE SHALL GOVERN:

CONDITION	LOCATION	MATERIAL		MINIMUM SEPARATION		COMMENTS
		WATER	SEWER	VERT.	HORIZ.	
NEW WATER AND NEW SEWER						
SEWER FORCE MAIN AND GRAVITY SANITARY SEWER PARALLEL TO WATER MAIN	WATER ABOVE SEWER	STD.	C.I., D.I., P.V.C., 150 P.S.I.	2'	4'	SEPARATE TRENCHES
GRAVITY SANITARY SEWER CROSSING WATER MAIN	WATER ABOVE SEWER OR SEWER ABOVE WATER	STD.	C.I., D.I., P.V.C., 150 P.S.I.	6"	NA	CENTER ONE JOINT OF SEWER PIPE ON WATER MAIN
GRAVITY SANITARY SEWER CROSSING WATER MAIN	WATER ABOVE SEWER	STD.	ABS., CLAY, CONCRETE COMPOSITE	2'	NA	CEMENT STABILIZE SAND BACKFILL INITIAL BACKFILL ZONE OF SEWER FOR 9 FT. EACH SIDE OF CROSSING. CENTER ONE JOINT OF SEWER PIPE ON WATER MAIN.
NEW WATER AND EXISTING SANITARY SEWER						
NEW WATER PARALLEL TO EXISTING SEWER	WATER ABOVE SEWER	STD.	CLAY, CONC., ABS., C.I., D.I., P.V.C.	2'	4'	IF SEWER SHOWS NO SIGN OF LEAKAGE, THEN LEAVE SEWER ALONE. IF SEWER SHOWS SIGNS OF LEAKAGE, THEN REPAIR OR REPLACE.
NEW WATER CROSSING EXISTING SEWER	WATER ABOVE SEWER	STD.	ABS., CLAY., CONCRETE COMPOSITE	2'	NA	IF SEWER SHOWS NO SIGN OF LEAKAGE, THEN LEAVE SEWER ALONE. IF SEWER SHOWS SIGNS OF LEAKAGE, THEN REPAIR OR REPLACE.
NEW WATER CROSSING EXISTING SEWER	SEWER ABOVE WATER	STD.	ABS., CLAY., CONCRETE COMPOSITE	2'	NA	REPLACE EXISTING SEWER WITH ONE JOINT C.I., D.I., P.V.C. - 150 P.S.I., CENTERING OVER WATER LINE.
NEW WATER PARALLEL TO EXISTING SEWER	SEWER ABOVE WATER	STD.	ABS., CLAY., CONCRETE COMPOSITE	2'	4'	REPLACE EXISTING SEWER WITH C.I., D.I., P.V.C.-150 P.S.I. OR CEMENT STABILIZED SAND BACK FILL IN INITIAL BACKFIELD ZONE OF SEWER WHERE PARALLEL CLOSER THAN 9 FT. OR ENCASE THE WATER IN 150 P.S.I. PIPE TWO NOMINAL SIZES LARGER.
EXISTING WATER AND NEW SANITARY SEWER						
NEW SEWER PARALLEL TO EXISTING WATER	WATER ABOVE SEWER OR SEWER ABOVE WATER	STD.	C.I., D.I., P.V.C., 150 P.S.I.	2'	4'	SEPARATE TRENCHES
NEW SEWER CROSSING EXISTING WATER	WATER ABOVE SEWER OR SEWER ABOVE WATER	STD.	C.I., D.I., P.V.C., 150 P.S.I.	6"	NA	CENTER ONE JOINT OF SEWER PIPE ON WATER MAIN
NEW SEWER CROSSING EXISTING WATER	WATER ABOVE SEWER	STD.	ABS., CLAY., CONCRETE COMPOSITE	2'	NA	CEMENT STABILIZE SAND BACKFIELD ONE JOINT OF SEWER PIPE ON WATER MAIN.

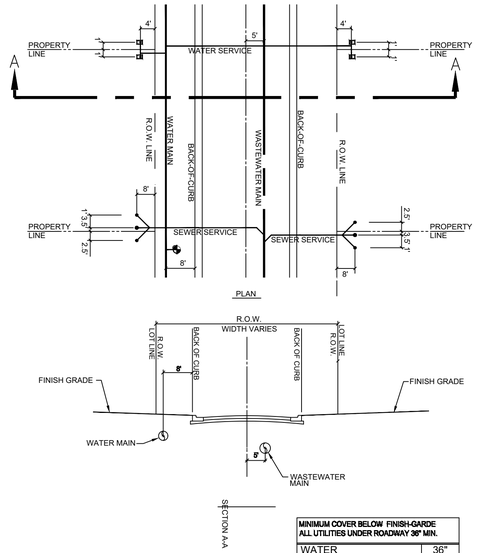
FIRE HYDRANTS SHALL NOT BE LOCATED WITHIN 9 FT. VERTICALLY OR HORIZONTALLY OF ANY SANITARY SEWER, REGARDLESS OF CONSTRUCTION.
WATER MAINS SHALL NOT BE INSTALLED CLOSER THAN 10 FT. TO SEPTIC TANK DRAINFIELDS.

JONAH SUD

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS

TABLE FOR SEPARATION OF WATER AND SEWER PIPE LINES

REVISION NOTE:
DRAWING NAME: W15
SCALE: N.T.S. DATE: 7-2-13
DRAWN BY: M.W.W. APPROVED BY: W.E.A.



MINIMUM COVER BELOW FINISH-GARDE ALL UTILITIES UNDER ROADWAY 36" MIN.	
WATER	36"
WASTEWATER	48"

JONAH SUD

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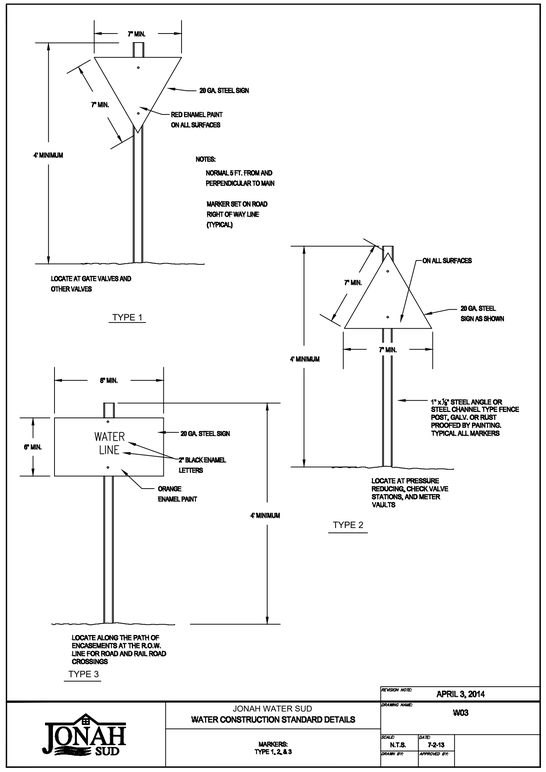
WATER CONSTRUCTION STANDARD DETAILS

UTILITY ASSIGNMENTS FOR LOCAL STREETS, RESIDENTIAL COLLECTORS AND MAJOR COLLECTORS

REVISION NOTE: MARCH 6, 2017
DRAWING NAME: W01
SCALE: N.T.S. DATE: 7-2-13
DRAWN BY: M.W.W. APPROVED BY: W.E.A.



JONAH SUD

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WATER CONSTRUCTION STANDARD DETAILS

MARKERS:
TYPE 1, 2, & 3

REVISION NOTE: APRIL 3, 2014
DRAWING NAME: W03
SCALE: N.T.S. DATE: 7-2-13
DRAWN BY: APPROVED BY:

Hydrostatic Testing

Hydrostatic testing described in this section shall be conducted with water.

General

The contractor shall provide measurement gauge, pump, pipe, connection, and other necessary apparatuses, unless otherwise specified. Prior to testing the contractor shall place sufficient backfill to prevent pipe movement. The contractor shall ensure that thrust-blocking or other types of restraint systems will provide adequate restraint prior to pressurizing the pipeline.

Test Duration

The duration of the hydrostatic test shall be 2 hours.

Test Pressure

The hydrostatic test pressure shall not be less than 1.25 times the maximum anticipated sustained working pressure at the highest point along the test section unless the pressure exceeds the design pressure limit for any pipe, thrust restraint, valve, fitting or other appurtenance of the test section. In no case shall the test pressure exceed the design pressure limit for any pipe, thrust restraint, valve, fittings, or other appurtenance of the test section.

Test Allowance

The testing allowance shall be defined as the quantity of water that must be supplied to the pipe section being tested to maintain the pressure within 5 psi of the specified hydrostatic test pressure. The installation will not be accepted, by the owner, if the quantity of the makeup water is greater than that determined by the formula below. All visible leaks are to be repair regardless of the amount of leakage.

$$Q = \frac{LxDxP}{148000}$$

Q = quantity of makeup water in gallons per hour (gal./hr.)
L = length of pipe being tested in feet (ft.)
D = nominal diameter of pipe in inches (in.)
P = average test pressure during the hydrostatic test in pounds per square inch (psi)

Disinfection (Does Not Apply To Sewer Force Mains.)

New mains shall be thoroughly disinfected in accordance with AWWA Standard C651 and then flushed and sampled before being placed in service. Samples shall be collected for microbiological analysis to check the effectiveness of the disinfection procedure. Sampling shall be repeated if contamination persists. A minimum of one sample for each 1,000 feet of completed waterline will be required or at the next available sampling point beyond 1,000 feet as designated by the design engineer.

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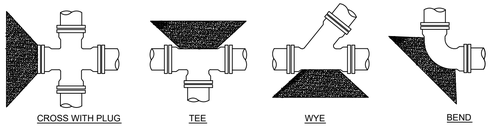
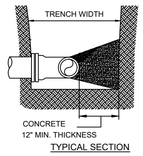
WATER CONSTRUCTION STANDARD DETAILS

TESTING REQUIREMENTS FOR PRESSURIZED PIPELINES (POTABLE WATERLINES AND SEWER FORCEMAINS)

REVISION NOTE:
DRAWING NAME: W18
SCALE: N.T.S. DATE: 7-2-13
DRAWN BY: M.W.W. APPROVED BY: W.E.A.





TYPICAL SECTION

ALL THRUST BLOCKING SHALL BE FORMED. LAID FORMS SHALL BE INSPECTED BY JWSUD PRIOR TO THE POURING OF CONCRETE AND SHALL ALSO BE INSPECTED BY JWSUD PRIOR TO COVERING. TYPICAL LOCATIONS WHICH REQUIRE CONCRETE REACTION (THRUST) BLOCKS, FOR PRESSURE MAINS TWO INCHES (2") AND GREATER. CONCRETE SHALL HAVE 2500 P.S.I. MINIMUM STRENGTH AT TWENTY EIGHT (28) DAYS AND BEAR AGAINST UNDISTURBED STABLE SOILS, AREA OF CONTACT SHALL BE GOVERNED BY PIPE SIZE, MAXIMUM PRESSURE IN PIPE AND BEARING CAPACITY OF SOIL. PROTECT FITTINGS, BOLTS, ETC. BY COVERING WITH VISQUEEN OR OTHER ACCEPTABLE MATERIAL CONCRETE SHALL BE A MINIMUM OF TWELVE INCHES (12") THICK.

#5 REBAR MIN. 2 REQUIRED BENT TO FIT AND PAINT WITH 2 COATS OF BITUMINISTIC PAINT BEFORE ASSEMBLY

*DEADMAN

PIPE SIZE	THRUST BLOCK AREA REQUIRED	PIPE SIZE	THRUST BLOCK AREA REQUIRED	REMARKS
4"	2.0 SQ. FT.	18"	30.0 SQ. FT.	VALUES ARE FOR 90 DEGREE BENDS, BASED ON 2000 P.S.F. SAFE BEARING LOAD AND PIPE PRESSURE OF 150 P.S.I. PLUS 33% SAFETY FACTOR FOR OTHER SOILS AND PRESSURES, THE AREA REQUIRED IS IN DIRECT PROPORTION.
6"	4.0 SQ. FT.	20"	37.0 SQ. FT.	
8"	6.6 SQ. FT.	24"	53.0 SQ. FT.	
10"	10.0 SQ. FT.	27"	80.0 SQ. FT.	
12"	14.0 SQ. FT.	30"	98.0 SQ. FT.	
14"	18.0 SQ. FT.	36"	127.0 SQ. FT.	
16"	24.0 SQ. FT.			

***THE ENGINEER OF RECORD SHALL CALCULATE THE SIZE OF THE DEADMAN REQUIRED AS WELL AS ANY INSTALLATION WHICH IS NOT COVERED BY THE ABOVE.**

NOTE:

- **ALL 3" AND LARGER ELLS, TEES AND BENDS SHALL BE MJ DUCTILE IRON FITTINGS WITH "MEGALUG" OR APPROVED EQUAL JOINT RESTRAINTS - CONCRETE THRUST BLOCKING AS SHOWN IN THE ABOVE TABLE SHALL BE INSTALLED. JOINT RESTRAINTS SHALL ALSO BE USED FOR ANY PIPE LENGTH LESS THAN ONE FULL PIPE JOINT AWAY FROM EACH M.J. FITTING.**
- **ALL 2-1/2" AND SMALLER CAPS, ELLS, TEES AND 45° BENDS SHALL BE HARCO PUSH-ON DUCTILE IRON FITTINGS WITH KNUCKLE JOINT RESTRAINT OR APPROVED EQUAL - CONCRETE THRUST BLOCKING AS SHOWN IN THE ABOVE TABLE SHALL BE INSTALLED.**
- **OTHER THRUST BLOCKING DIMENSIONS ACCEPTED IF DESIGNED BY LICENSED ENGINEER.**

JONAH SUD

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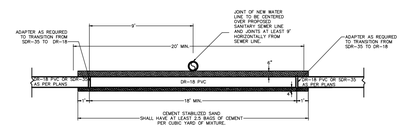
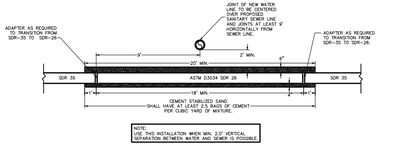
WATER CONSTRUCTION STANDARD DETAILS

TYPICAL THRUST BLOCKS FOR WATER AND FORCE MAINS DETAIL

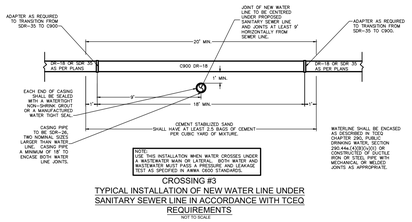
REVISION NOTE: JANUARY 13, 2017
DRAWING NAME: W09
SCALE: N.T.S. DATE: 7-2-13
DRAWN BY: M.W.W. APPROVED BY: W.E.A.



CROSSING #1
TYPICAL INSTALLATION OF NEW WATER LINE OVER NEW SANITARY SEWER LINE IN ACCORDANCE WITH TCEQ REQUIREMENTS
NOT TO SCALE



CROSSING #2
TYPICAL INSTALLATION OF NEW WATER LINE OVER NEW NON-PRESSURE RATED SANITARY SEWER LINE IN ACCORDANCE WITH TCEQ REQUIREMENTS
NOT TO SCALE



CROSSING #3
TYPICAL INSTALLATION OF NEW WATER LINE UNDER SANITARY SEWER LINE IN ACCORDANCE WITH TCEQ REQUIREMENTS
NOT TO SCALE

BERRY SPRINGS
PARK IMPROEMENTS
Williamson County, Texas

WILLIAMSON COUNTY 1848

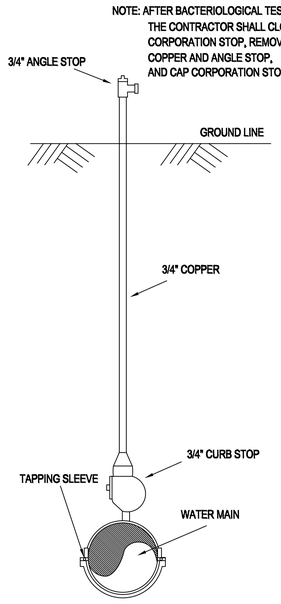
halff
13620 Briarwick Drive
Suite 100
Austin, Texas 78729-1102
MAIN (512) 777-4600
FAX (512) 252-8141

Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED PROFESSIONAL ENGINEER
April 12, 2023

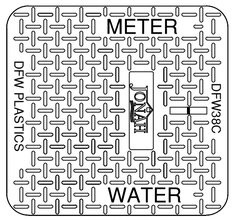
Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV
Sheet Title	DETAILS
Sheet Number	C8.01
Project Page Number	

Xref ...\ReferencesLIT\38049-Border.dwg

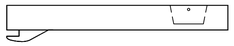


JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
TEMPORARY SAMPLING TEST STATION

REVISION NOTE:
DRAWING NAME: W10
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.



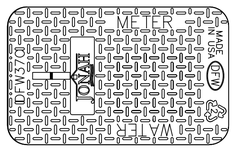
PLAN VIEW



COVER SECTION

METER LID DETAIL FOR DUAL 5/8", 3/4", OR 1" METERS

DRAWING PROVIDED BY:
DFW PLASTICS, INC.
PRODUCT NUMBER:
DFW38C-14-AF3P JSUD



PLAN VIEW

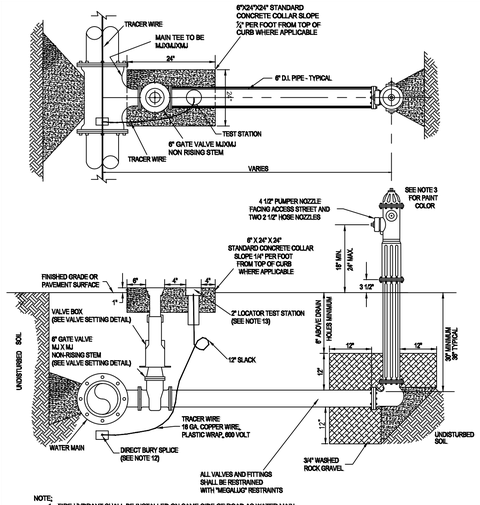
COVER SECTION

METER LID DETAIL FOR DUAL 5/8", 3/4", OR 1" METER

DRAWING PROVIDED BY:
DFW PLASTICS, INC.
PRODUCT NUMBER:
DFW37C-12-AF3P JSUD

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
METER LID DETAILS

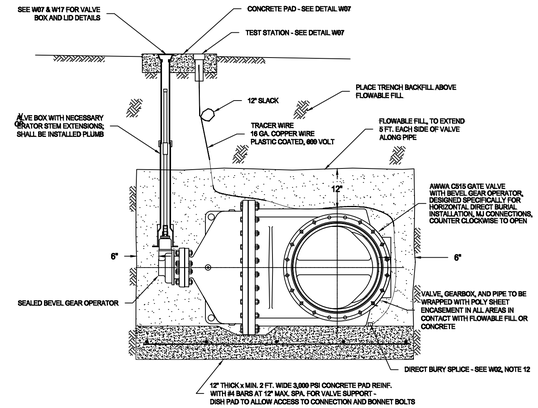
REVISION NOTE: 9/25/19
DRAWING NAME: W16
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.



NOTE:
1. FIRE HYDRANT SHALL BE INSTALLED ON SAME SIDE OF ROAD AS WATER MAIN.
2. FIRE HYDRANT SHALL BE INSTALLED PLUMB AND TRUE.
3. ALL FIRE HYDRANT EXTERIORS SHALL BE FACTORY PRIMED AND PAINTED RED USING A HIGH GRADE ENAMEL.
4. HEEL AND THRUST BLOCKS TO REST IN UNDISTURBED SOIL.
5. THE ONLY FIRE HYDRANTS ACCEPTABLE ARE:
   5.1. AMERICAN DARLING - B84B
   5.2. CLOW
   5.3. KENNEDY - K81A
6. DOUBLE BLUE REFLECTOR "HYE-LITES" BRAND, MANUFACTURED BY PAVEMENT MARKERS INC. TO BE INSTALLED AT 1' OFFSET FROM CENTER OF STREET TOWARDS AND PERPENDICULAR TO HYDRANT.
7. TEST STATION SHALL BE HANDLEY INDUSTRIES INC. - 2 INCH CATHODIC TEST STATIONS OR APPROVED EQUAL.
8. THE 18" ABS PLASTIC BOX SHALL BE A FLANGED TOP FOR INSTALLATION AT GROUND LEVEL.
9. ALL TERMINALS ARE TO BE MADE OF SOLID BRASS.
10. PLASTIC LIDS SHALL BE COLOR BLUE AND MARKED "WATER".
11. TEST TERMINALS ARE TO BE INCORPORATED WITH HANDLEY VALVE BOXES.
12. BURY SPLICE SHALL BE 3M DIRECT BURY SPLICE (DBS) OR APPROVED EQUAL.
13. TEST STATIONS SHALL BE INSTALLED AT EACH FIRE HYDRANT LOCATION, AND LINE GATE VALVES. ONLY ONE TEST STATION IS REQUIRED AT A VALVE CLUSTER OF TWO OR MORE.
14. HYDRANT SHALL BE GREASED WITH FOOD GRADE APPROVED LUBRICANT.
15. WHERE NECESSARY, SWIVEL-LOCK PIPING CAN BE USED BETWEEN TEE AND VALVE, OR VALVE AND HYDRANT.

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
TYPICAL FIRE HYDRANT, TRACER WIRE, AND TEST STATION DETAIL

REVISION NOTE: 1/27/2022
DRAWING NAME: W02
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.

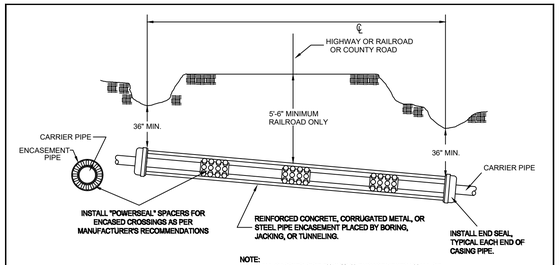


SECTIONAL ELEVATION

NOTES:
1. FLOWABLE FILL SHALL BE PLACED IN 12" HEIGHT MAXIMUM LIFTS.
2. PIPING CONNECTIONS SHALL BE RESTRAINED ON EACH SIDE OF VALVE.
3. VALVE GEAR BOX AND OPERATOR SHALL BE PLACED ON THE SIDE NEAREST TO THE EXISTING FENCE AND/OR PROPERTY LINE, UNLESS OTHERWISE APPROVED.
4. IF THE VALVE OPERATOR NUT IS MORE THAN 3 FT. BELOW THE SURFACE, EXTENSIONS SHALL BE PROVIDED TO BRING THE NUT TO WITHIN 2 FT. OF THE SURFACE.
5. VALVE OPERATOR NUT SHALL BE 2" SQUARE.
6. VALVE BOX SHALL BE EAST JORDAN IRON WORKS SERIES 8550 TWO PIECE SCREW TYPE, OR APPROVED EQUAL, HAVING AN ADJUSTMENT RANGE OF +/- 6 INCHES FROM FINISHED SURFACE.
7. SEE PLAN/PROFILE SHEETS FOR VALVE LOCATION AND SIZE.

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
TYPICAL HORIZONTAL GATE VALVE INSTALLATION DETAILS

REVISION NOTE:
DRAWING NAME: W24
SCALE: N.T.S. | DATE: 1-18-19
DRAWN BY: W.E.A. | APPROVED BY: M.W.W.

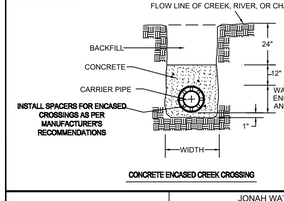


NOTE:
ALL CARRIER PIPE THROUGH ENCASEMENTS SHALL BE RESTRAINED JOINT TYPE OR FUSIBLE ENDS TYPE PIPE AND SHALL BE INCLUDED IN THE PRICE OF THE CROSSING.

COUNTY ROAD, HIGHWAY AND RAILROAD CROSSINGS

STEEL ENCASEMENT WALL THICKNESS CHART FOR SMOOTH STEEL CASING PIPE WITH A MINIMUM YIELD STRENGTH OF 35,000 PSI.		
MINIMUM THICKNESS		DIAMETER OF CASING PIPE:
0'-0.2500"	0'-0 1/4"	12" OR LESS
0'-0.3125"	0'-0 5/16"	OVER 12" TO 18"
0'-0.3750"	0'-0 3/8"	OVER 18" TO 22"
0'-0.4375"	0'-0 7/16"	OVER 22" TO 28"
0'-0.5000"	0'-0 1/2"	OVER 28" TO 34"
0'-0.5625"	0'-0 9/16"	OVER 34" TO 42"
0'-0.6250"	0'-0 5/8"	OVER 42" TO 48"

NOTE:
1. ALL CARRIER PIPING SHALL BE RESTRAINED JOINT TYPE OR BUTT-FUSIBLE TYPE OF THE SAME SIZE AND THE SAME PRESSURE CLASS AT MINIMUM OF THE APPLICABLE PIPELINE.
2. OPEN CUT ENCASEMENT PIPE SHALL HAVE THE SAME TRENCH AND EMBEDMENT DETAILS AS AS SHOWN FOR PIPELINES.
3. DO NOT USE WEDGES BETWEEN TOP OF CARRIER PIPE AND INSIDE OF CASING TO KEEP THE CARRIER PIPE FROM MOVING.
4. PRIOR TO INSERTING CARRIER PIPE, ANY WATER SHOULD BE PUMPED OUT OF THE CASING PIPE SO THAT NO MORE THAN A FEW INCHES OF WATER REMAINS.
5. SPACERS SHALL BE REQUIRED WITHIN AT LEAST 3 FEET FROM BOTH ENDS OF THE ENCASEMENT PIPE.
6. ENCASEMENT PIPE SHALL BE SMOOTH STEEL, 35,000 PSI YIELD STRENGTH WITH WALL THICKNESS ACCORDING TO THE WALL THICKNESS CHART.
7. THE RESTRAINED JOINT CARRIER PIPE SHALL EXTEND A MINIMUM OF 10 L.F. PAST BOTH ENDS OF THE ENCASEMENT PIPING BEFORE TRANSITIONING BACK TO NON-JOINT RESTRAINED PIPING.

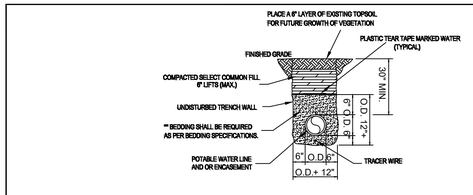


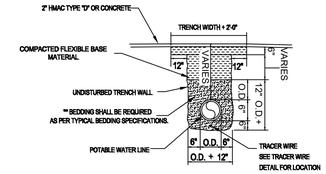
CONCRETE ENCASED CREEK CROSSING

NOTE:
WHERE FITTINGS ARE TO BE USED TO ADJUST PIPE ELEVATIONS TO BELOW BOTTOM OF CREEK, THE CONTRACTOR SHALL OBTAIN APPROVAL OF CONCRETE UP-THRUST AND DOWN-THRUST BLOCKING FROM THE ENGINEER PRIOR TO CONSTRUCTION AND SHALL INSTALL JOINT RESTRAINTS INBETWEEN FITTINGS IF APPROVED TO DO SO.

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
INSTALLATION OF PIPE THROUGH CASING/CREEK CROSSING

REVISION NOTE:
DRAWING NAME: W14
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.





NOTES:
1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE.
2. FLEXIBLE BASE MATERIAL TYPE II (TYPICAL) SHALL BE PLACED IN MULTIPLE LIFTS NOT TO EXCEED 8". EACH LAYER SHALL BE THOROUGHLY ROLLED OR TAMPED TO SPECIFIED MAXIMUM DENSITY. VERIFY BASE MATERIAL WITH APPLICABLE CITY OR COUNTY SPECIFICATIONS.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE.
5. DENSITY TESTS SHALL BE TAKEN IN ACCORDANCE WITH APPLICABLE CITY OR COUNTY SPECIFICATIONS.
6. CONTRACTOR OR ENGINEER MAY USE FLOWABLE BACKFILL AS AN ALTERNATE BACKFILL MATERIAL IF PERMITTED BY CITY OR COUNTY (SEE APPLICABLE CITY OR COUNTY FLOWABLE BACKFILL SPECIFICATION).

** TYPICAL BEDDING SPECIFICATIONS:

SIEVE SIZE	3/8" F % RETAINED
1/2"	0
3/8"	0-2
4m	40-85
10m	95-100
3/4"	-

	1/2" D % RETAINED	WASHED GRAVEL % RETAINED
	0	0
	5-25	-
	80-100	-
	96-100	-
	-	100

NOTE:
BURIED PIPING SHALL HAVE THE FOLLOWING LISTED MINIMUM COVER:

12" AND SMALLER - 30" MINIMUM COVER

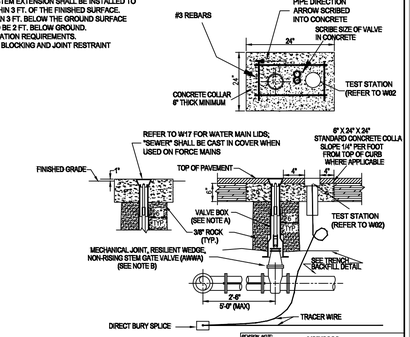
14" THRU 24" - 54" MINIMUM COVER

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
TRENCH & EMBEDMENT DETAIL

REVISION NOTE: MARCH 10, 2014
DRAWING NAME: W04
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.

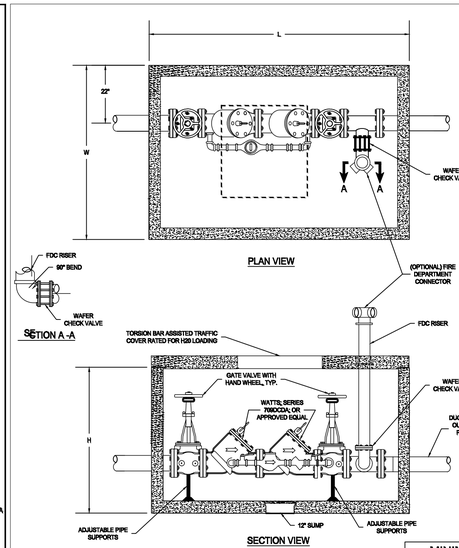
NOTES:
1. REPLACED BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE.
2. BASE MATERIAL SHALL BE PLACED IN TWO OR THREE LAYERS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 95% MAXIMUM DENSITY.
3. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED.
4. SURFACE MATERIAL WILL BE CONSISTENT WITH THE EXISTING SURFACE.
5. A MINIMUM OF TWO DENSITY TESTS SHALL BE TAKEN FOR EACH SIX (6) INCH LIFT OF SUBGRADE AND EACH OPEN CUT CROSSING WHEN THE SPECIFIED COMPACTED BASE IS GREATER THAN SIX AND ONE-HALF (6 1/2") INCHES THE BASE SHALL BE CONSTRUCTED IN TWO OR MORE COURSES. PROCTORS FOR MATERIALS USED IN BACKFILLING SHALL BE OBTAINED BY A CERTIFIED LABORATORY. DENSITY TEST SHALL BE CONDUCTED BY A CERTIFIED LABORATORY OF THE PERMITTEE'S CONSULTANTS. THE PERCENTAGE OF MAXIMUM DENSITY REQUIRED SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF "TxDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" AT THE TIME THE PERMIT WAS ISSUED. ALL DENSITY TESTS SHALL BE COMPLETED AND ACCEPTED DENSITY TESTS SHALL BE FURNISHED TO JWSUD. BACKFILL COMPACTION SHALL BE A MINIMUM OF 95% MAXIMUM DENSITY PER AASHTO T-180 SPECIFICATIONS.
6. THESE SPECIFICATIONS MAY BE SUPERSEDED BY THE GOVERNING AGENCY.
7. SELECT MATERIAL TYPE II:
   7. TxDOT TYPE A - GRADE 2 OR BETTER CRUSHED LIMESTONE BASE COMPACTED TO 95% OF ASTM D-698 AT OPTIMUM MOISTURE. PROCTOR TO BE PROVIDED BY THE CONTRACTOR TO THE S.U.D. INSPECTOR.

NOTES:
A. VALVE BOX SHALL BE EAST JORDAN IRON WORKS SERIES 8550 TWO PIECE SCREW TYPE OR APPROVED EQUAL. HAVING AN ADJUSTABLE RANGE OF +/- 6 INCHES FROM INSTALLED FINISH GRADE.
B. 2. ACCEPTABLE GATE VALVES ARE:
   B. AMERICAN FLOW CONTROL - SERIES 2500
   B. MUELLER - 2360 SERIES
   B. CLOW
C. FOR IN LINE VALVES, USE MECHANICAL JOINT WITH "MEGALUG" RESTRAINTS (OR APPROVED EQUAL) ON EACH SIDE OF VALVE.
D. IF THE TOP OF THE VALVE OPERATING NUT IS MORE THAN 3 FT. BELOW THE FINISHED SURFACE, A OPERATING STEM EXTENSION SHALL BE INSTALLED TO BRING THE OPERATING NUT TO WITHIN 3 FT. OF THE FINISHED SURFACE.
E. VALVE OPERATING NUTS MORE THAN 3 FT. BELOW THE GROUND SURFACE ELEVATION SHALL BE EXTENDED TO BE 2 FT. BELOW GROUND.
F. REFER TO DETAIL W02 FOR TEST STATION REQUIREMENTS.
G. REFER TO DETAIL W09 FOR THRUST BLOCKING AND JOINT RESTRAINT REQUIREMENTS.



JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
TYPICAL VALVE SETTING (LESS THAN 24")

REVISION NOTE: 1/27/2022
DRAWING NAME: W07
SCALE: N.T.S. | DATE: 7-2-13
DRAWN BY: M.W.W. | APPROVED BY: W.E.A.



SECTION VIEW

NOTES:
- JOINTS TO THE SEALED WITH RAM-NEK
- CONCRETE SHALL BE 5,000 PSI
- REINFORCING PER ASTM -615 OR A-185

MINIMUM VAULT DIMENSIONS

VALVE SIZE (INCHES)	"W"	"L"	"H"
4	5'-0"	9'-0"	5'-6"
6	5'-0"	9'-0"	5'-6"
8	5'-0"	9'-0"	6'-6"
10	5'-0"	9'-0"	7'-0"

JONAH WATER SUD
WATER CONSTRUCTION STANDARD DETAILS
STANDARD DOUBLE DETECTOR CHECK BACKFLOW PREVENTER

REVISION NOTE:
DRAWING NAME: W21
SCALE: N.T.S. | DATE: 11-28-17
DRAWN BY: M.W.W. | APPROVED BY: M.W.W.

BERRY SPRINGS
PARK IMPROEMENTS
Williamson County, Texas

WILLIAMSON COUNTY
1848

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Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED
PROFESSIONAL ENGINEER
April 12, 2023

Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV
Sheet Title	DETAILS
Sheet Number	C8.02
Project Page Number	

Xref ...\ReferencesLIT\38049-Border.dwg

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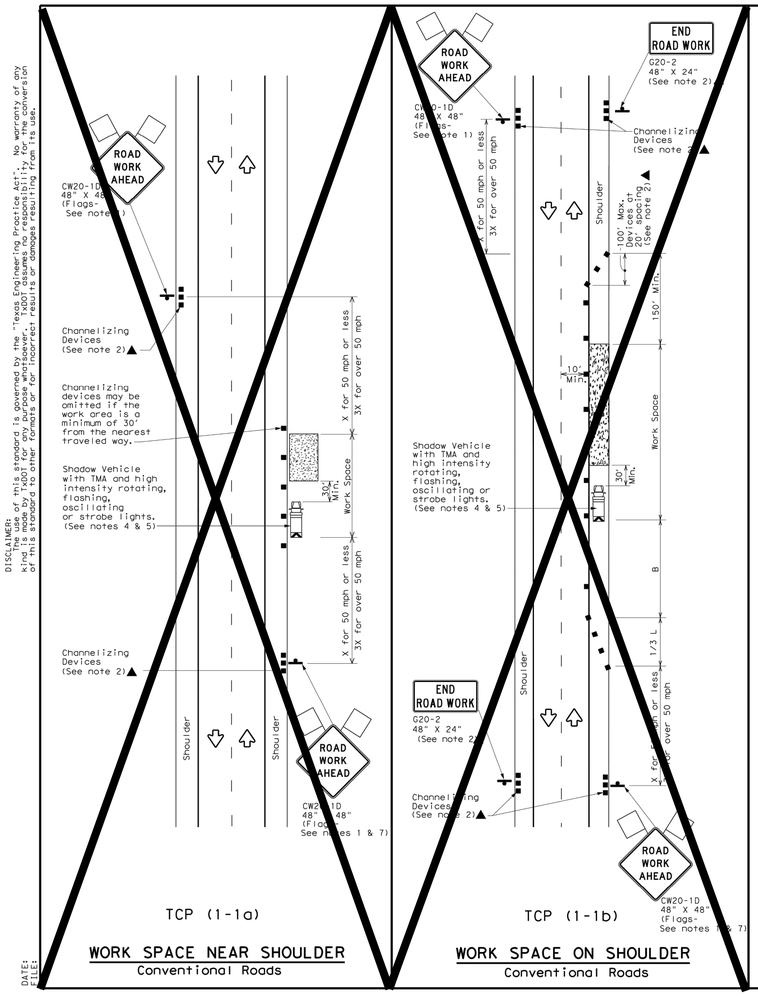
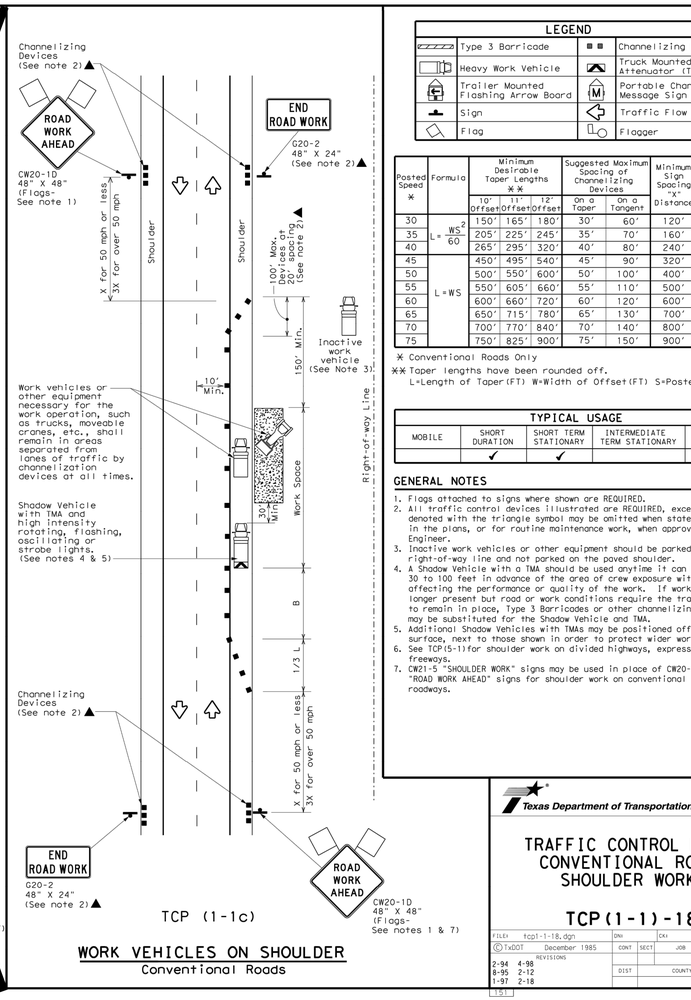


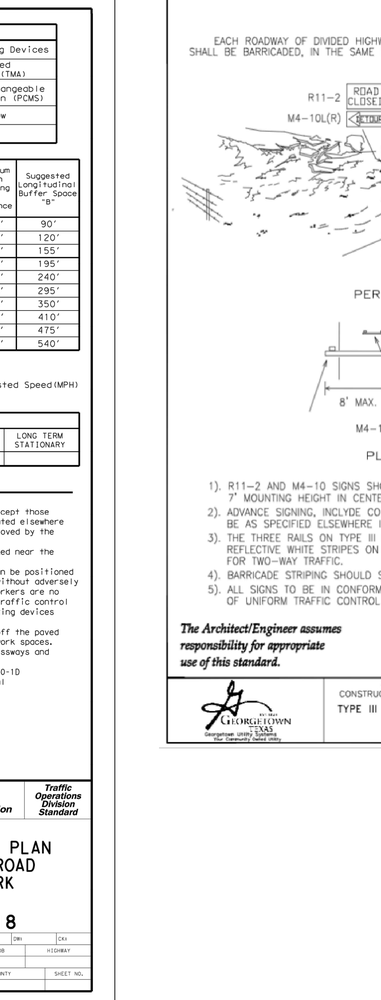
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
30	L= WS²/60	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L=WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* Conventional Roads Only
** Taper lengths have been rounded off.
L=Length of Taper(FT) W=Width of Offset(FT) S=Posted Speed(MPH)

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓		

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
6. See TCP(5-1)for shoulder work on divided highways, expressways and freeways.
7. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation — Traffic Operations Division Standard

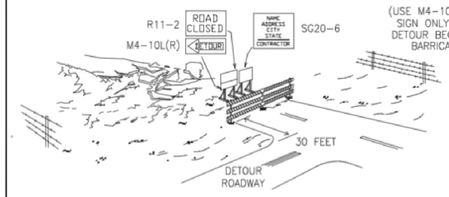
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

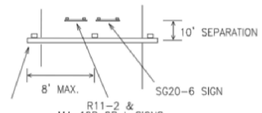
FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	DIST	COUNTY		SHEET NO.

151

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



PERSPECTIVE VIEW



PLAN VIEW

1). R11-2 AND M4-10 SIGNS SHOULD BE MOUNTED ON INDEPENDENT SUPPORTS AT 7' MOUNTING HEIGHT IN CENTER OF ROADWAY.
2). ADVANCE SIGNING, INCLYDE CONSTRUCTION WARNING, SIGNS AND DETOUR SIGNING SHALL BE AS SPECIFIED ELSEWHERE IN THE PLANS.
3). THE THREE RAILS ON TYPE III BARRICADES SHALL BE REFLECTIVE ORANGE AND REFLECTIVE WHITE STRIPES ON ONE SIDE FACING ONE-WAY TRAFFIC AND BOTH SIDES FOR TWO-WAY TRAFFIC.
4). BARRICADE STRIPING SHOULD SLANT DOWNWARD IN THE DIRECTON OF DETOUR.
5). ALL SIGNS TO BE IN CONFORMANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD).

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

CITY OF GEORGETOWN, TEXAS
Georgetown Utility Systems
Your Community Owned Utility

CITY OF GEORGETOWN
CONSTRUCTION STANDARDS AND DETAILS
TYPE III CONSTRUCTION BARRICADE

Revision date: ADOPTED 6/21/2006
Drawing name: SD22
SCALE: NTS
DATE: 1/2003
DRAWN BY: MPS
APPROVED BY: TRB

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WILLIAMSON COUNTY
1848

Revision No.	Date	Description

STATE OF TEXAS
BRIAN LEE VINES
128439
LICENSED
PROFESSIONAL ENGINEER
April 12, 2023

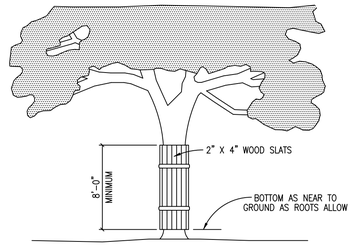
Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
TRAFFIC CONTROL DETAILS

Sheet Number	Project Page Number
C8.03	

NOTES: DESIGNATED AREA SHALL
1. CONTAIN DESNSE VEGITATION
2. ENGINEERED VEGETATED FILTER STRIPS SLOPES SHALL BE LESS THAN 20%
3. NATURAL VEGETATED FILTER STRIP SLOPES SHALL BE LESS THAN 10%
4. LATERALLY TRAVERSE THE CONTRIBUTING RUNOFF AREA

VEGETATIVE FILTER STRIP
NTS

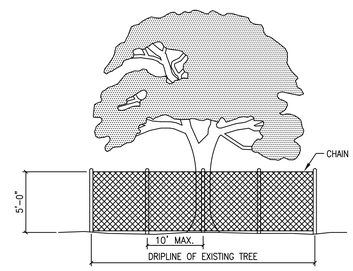


NOTES:

1. WHERE ANY EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN FOUR FEET (4'-0") TO A TREE TRUNK; PROTECT THE TRUNK WITH STRAPPED-ON-PLANKING TO A HEIGHT OF EIGHT FEET (8'-0"), OR TO THE LIMITS OF LOWER BRANCHING IN ADDITION TO THE REDUCED FENCING PROVIDED.
2. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN TWO (2) DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE, AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
3. PRIOR EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINE, MAKE A CLEAN CUT BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT, TO MINIMIZE DAMAGE TO REMAINING ROOTS.
4. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES SHOULD BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS SHOULD BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.
5. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
6. NO LANDSCAPE TOPSOIL DRESSING GREATER THE FOUR INCHES (4") SHALL BE PERMITTED WITHIN THE DRIPLINE OF A TREE. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.
7. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS.

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

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS **TREE PROTECTION – WOOD SLATS**	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: EC10 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

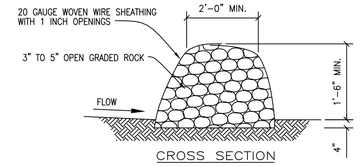


NOTES:

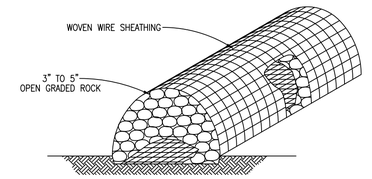
1. TREE PROTECTION FENCES SHALL BE INSTALLED PRIOR TO THE COMMENCEMENT OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING).
2. FENCES SHALL COMPLETELY SURROUND THE TREE, OR CLUSTERS OF TREES; WILL BE LOCATED AT THE OUTERMOST LIMIT OF THE TREE BRANCHES (DRIPLINE), AND WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PROJECT IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN SIX INCHES (6") CUT OR FILL, OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY.
   C. WOUNDS TO EXPOSED ROOTS, TRUNKS OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES, SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING AND FIRE.
3. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIPLINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE PERMEABLE PAVING IS TO BE INSTALLED, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA.
   B. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE NO CLOSER THAN SIX FEET (6'-0") TO BUILDING.

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

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS **TREE PROTECTION – CHAIN LINK FENCE**	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: EC09 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB



CROSS SECTION

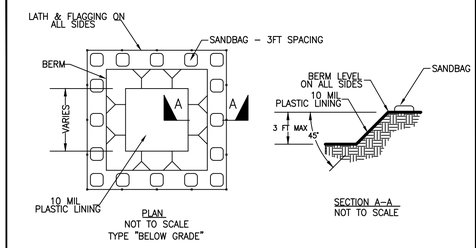


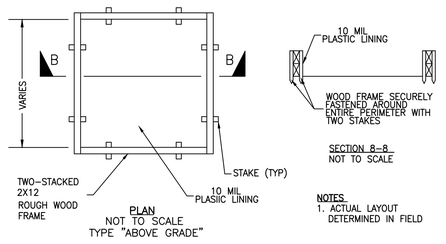
INSTALLATION:
- LAYOUT THE ROCK BERM FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- PLACE WOVEN WIRE FABRIC ON THE GROUND ALONG THE PROPOSED INSTALLATION WITH ENOUGH OVERLAP TO COMPLETELY ENCIRCLE THE FINISHED SIZE OF THE BERM.
- PLACE THE ROCK ALONG THE CENTER OF THE WIRE TO THE DESIGNATED HEIGHT.
- WRAP THE STRUCTURE WITH THE PREVIOUSLY PLACED WIRE MESH SECURE ENOUGH SO THAT WHEN WALKED ACROSS THE STRUCTURE RETAINS IT'S SHAPE.
- SECURE WITH TIE WIRE.
- THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROX. 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.
- THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL EVENT BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.
- REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER.
- REPAIR ANY LOOSE WIRE SHEATHING.
- THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.
- THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

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

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS **ROCK BERM DETAIL**	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: EC03 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

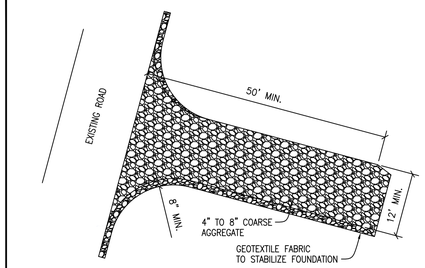




NOTES
1. ACTUAL LAYOUT DETERMINED IN FIELD

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

	CONSTRUCTION STANDARDS AND DETAILS **CONCRETE_WASHOUT**	REVISION NOTE: DRAWING NAME: SCALE: NTS DATE: DRAWN BY: APPROVED BY:



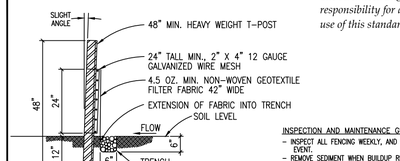
INSTALLATION:
- CLEAR THE AREA OF DEBRIS, ROCKS OR PLANTS THAT WILL INTERFERE WITH INSTALLATION.
- GRADE THE AREA FOR THE ENTRANCE TO FLOW BACK ON TO THE CONSTRUCTION SITE. RUNOFF FROM THE STABILIZED CONSTRUCTION
- PLACE GEOTEXTILE FABRIC AS APPROVED BY THE CITY.
- PLACE ROCK AS APPROVED BY THE CITY.

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

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

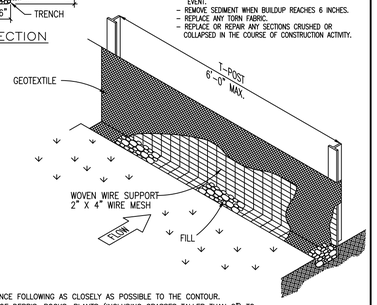
GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS **STABILIZED CONSTRUCTION ENTRANCE**	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: EC06 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

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



CROSS SECTION

INSPECTION AND MAINTENANCE GUIDELINES:
- INSPECT ALL FENCING WEEKLY, AND AFTER ANY RAINFALL EVENT.
- REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.
- REPLACE ANY TORN FABRIC.
- REPLACE OR REPAIR ANY SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY.



INSTALLATION:
- LAYOUT THE SILT FENCE FOLLOWING AS CLOSELY AS POSSIBLE TO THE CONTOUR.
- CLEAR THE GROUND OF DEBRIS, ROCKS, PLANTS (INCLUDING GRASSES TALLER THAN 2") TO PROVIDE A SMOOTH FLOW APPROACH SURFACE. EXCAVATE 6" DEEP X 6" WIDE TRENCH ON UPSTREAM SIDE OF FACE PER PLANS.
- DRIVE THE HEAVY DUTY T–POST AT LEAST 12 INCHES INTO THE GROUND AND AT A SLIGHT ANGLE TOWARDS THE FLOW.
- ATTACH THE 2" X 4" 12 GAUGE WELDED WIRE MESH TO THE T–POST WITH 11 1/2 GAUGE GALVANIZED T–POST CLIPS. THE TOP OF THE WIRE TO BE 24" ABOVE GROUND LEVEL. THE WELDED WIRE MESH TO BE OVERLAPPED 6" AND TIED AT LEAST 6 TIMES WITH HOG RINGS.
- THE SILT FENCE TO BE INSTALLED WITH A SKIRT A MINIMUM OF 6" WIDE PLACED ON THE UPHILL SIDE OF THE FENCE INSIDE EXCAVATED TRENCH. THE FABRIC TO OVERLAP THE TOP OF THE WIRE BY 1".
- ANCHOR THE SILT FENCE BY BACKFILLING WITH EXCAVATED DIRT AND ROCKS (NOT LARGER THAN 2").
- GEOTEXTILE SPLICES SHOULD BE A MINIMUM OF 18" WIDE ATTACHED IN AT LEAST 6 PLACES. SPLICES IN CONCENTRATED FLOW AREAS WILL NOT BE ACCEPTED.
- SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

GEORGETOWN TEXAS	CITY OF GEORGETOWN CONSTRUCTION STANDARDS AND DETAILS **SILT FENCE DETAIL**	REVISION NOTE: ADOPTED 6/21/2006 DRAWING NAME: EC02 SCALE: NTS DATE: 1/2003 DRAWN BY: MRS APPROVED BY: TRB

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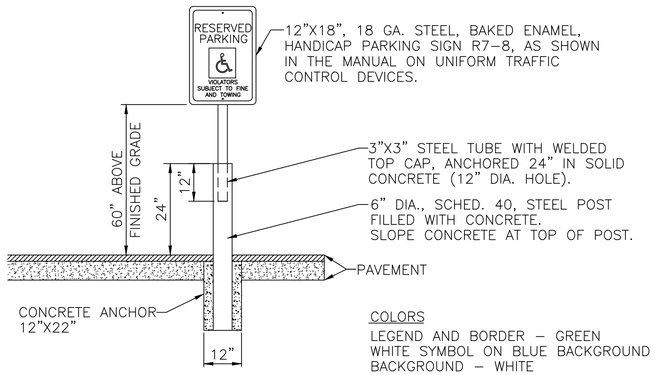
BRIAN LEE VINES
128439
LICENSED
PROFESSIONAL ENGINEER
April 12, 2023

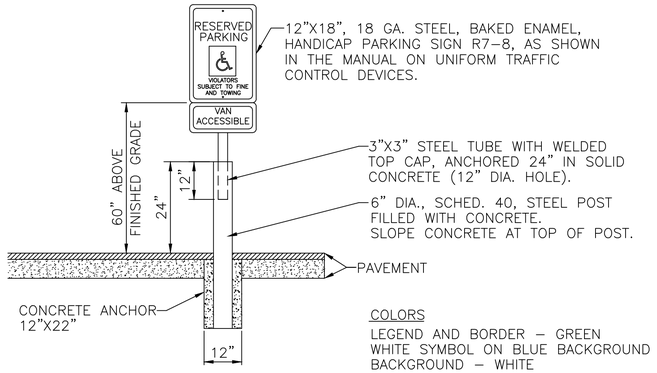
Project No.:	38049
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
EROSION CONTROL DETAILS

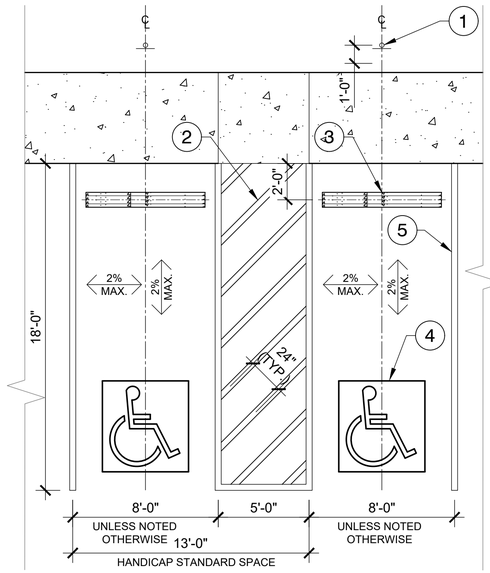
Sheet Number	Project Page Number
C8.04	



HANDICAP SIGN
NTS



VAN ACCESSIBLE HANDICAP SIGN
NTS



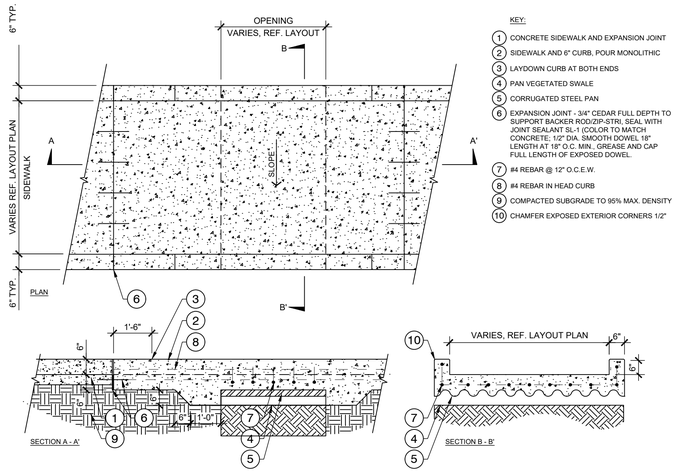
KEY:

1. HANDICAPPED PARKING SIGN WHERE NOTED ON PLANS. REFER TO HANDICAP SIGN DETAIL.
2. 4" WIDE DIAGONAL AT 45 DEGREES WHITE PAINT @ 24" ON CENTER.
3. CONCRETE WHEEL STOP, CENTERED IN PARKING SPACE WHERE NOTED ON PLANS.
4. STANDARD HANDICAPPED SYMBOL TO BE PAINTED ON PAVEMENT WITH NONREFLECTIVE PAINT. PROVIDE BLUE COLOR ACCORDING TO THE LATEST EDITION OF THE ADA STANDARDS FOR ACCESSIBLE DESIGN.
5. 4" WIDE WHITE PAINT STRIPING.

NOTES:

1. SURFACE SLOPES SHALL COMPLY WITH ADA/TAS REQUIREMENTS.
2. EACH HANDICAPPED PARKING SPACE SHALL BE SIGNED IN ACCORDANCE WITH ADA REQUIREMENTS.
3. HANDICAP PARKING SPACES NOT TO EXCEED 2% CROSS SLOPE.

ADA STANDARD CAR PARKING SPACE LAYOUT
NTS



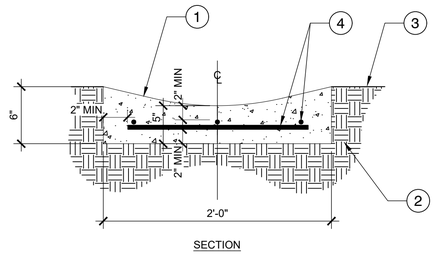
ELEVATED SIDEWALK - UNDERDRAIN
NTS

NOTES:

1. 4" MINIMUM DEPTH OF CONCRETE AT CENTER LINE OF SWALE.
2. MAINTAIN 2" COVER ABOVE, BELOW, AND TO OUSIDES OF REBAR

KEY:

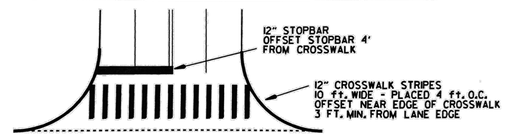
1. CONCRETE SWALE - 3000 PSI.
1. COMPACTED SUBGRADE TO 95% MAX. DENSITY.
3. FINISH GRADE.
4. #3 10" SP. O.C. BOTH DIRECTIONS



SECTION

CONCRETE SWALE
NTS

STRIPING AT ADJACENT NO PASSING LANES



CROSSWALK AND STOPBAR DETAILS
NTS

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Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
HARDSCAPE DETAILS

Sheet Number	Project Page Number
C8.05	

DISCLAIMER:
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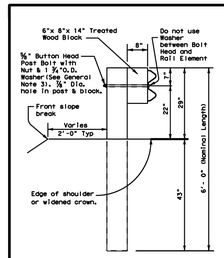
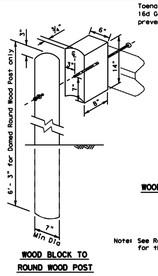
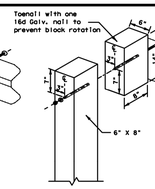


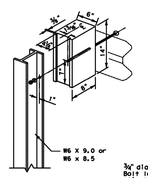
TYPICAL POST



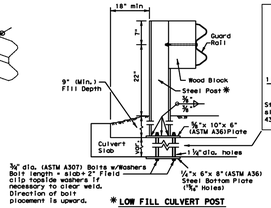
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



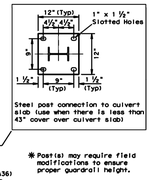
WOOD BLOCK TO STEEL POST



⅝" dia. (ASTM A307) Bolts w/Washers Bolt length = slab+2" Field clip topslab washers if necessary to clear weld. Direction of bolt placement is upward.

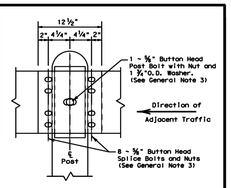
* LOW FILL CULVERT POST

FOR USE ON NON-BRIDGE CLASS CULVERTS ONLY

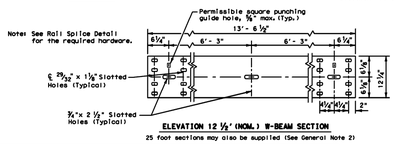


Steel post connection to culvert slab (use when there is less than 43" cover over culvert slab)

* Post(s) may require field modifications to ensure proper guardrail height.



RAIL SPLICE DETAIL



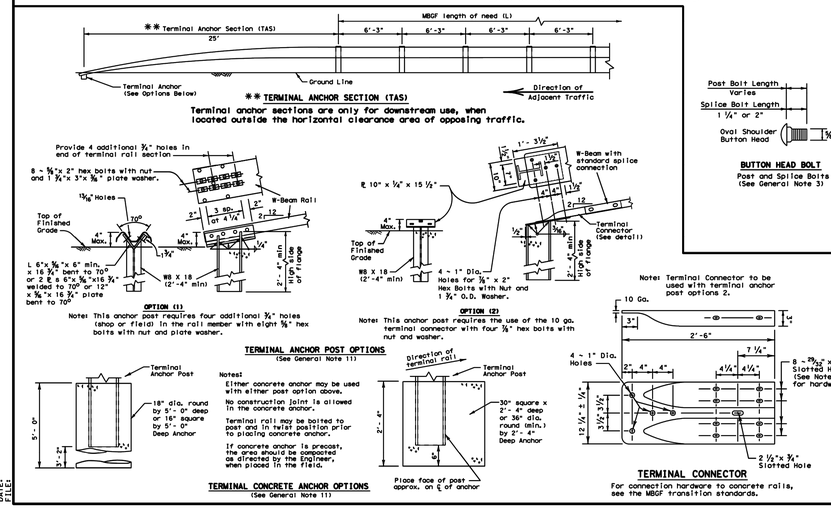
ELEVATION 12 ½' (NOM.) W-BEAM SECTION

25 foot sections may also be supplied (See General Note 2)

GENERAL NOTES

1. The type of post (round wood post, rectangular wood post, or steel post) will be shown elsewhere in the plans. The exact position of MBGF shall be shown elsewhere in the plans or as directed by the Engineer. Steel posts to be galvanized in accordance with Item 445, "Galvanizing."
2. Rail element shall meet the requirements of Item 540, "Metal Beam Guard Fence" except as modified on the plans. The Contractor may furnish rail elements of 12 ½' or 25 foot nominal lengths.
3. Button head "post" bolts (ASTM A307) shall be of sufficient length to extend through the full thickness of the nut (ASTM A563) and Type A (1 ¾" O.D.)washer and not more than 1" beyond it. Button head "splice" bolts (ASTM A307) are ⅝" x 1 ¼" (or 2" long at triple rail splices) with a ⅝" double recessed nut (ASTM A563).
4. Fittings (bolts, nuts, and washers) shall be galvanized in accordance with Item 445, "Galvanizing." Fittings shall be subsidiary to the bid item.
5. Crown shall be widened to accommodate the Metal Beam Guard Fence.
6. The lateral approach to the guard fence, shall have a slope rate of not more than 1V:10H.
7. Unless otherwise shown in the plans, guard fence placed in the vicinity of curbs shall be positioned so that the face of curb is located directly below or behind the face of the block. Rail placed over curbs shall be installed so that the post bolt is located approximately 21 inches above the gutter pan or roadway surface.
8. If solid rock is encountered within 0 to 18" of the finished grade, drill a 22" dia. hole, 24" into the rock, or drill two 12" dia. front to back overlapping holes, 24" into the rock. If solid rock is encountered below 18", drill a 12" dia. hole, 12" into the rock or to the standard embedment depth, whichever is less. Any excess post length, after meeting these depths, may be field cut to ensure proper guardrail mounting height. Backfill with a cohesionless material.
9. Posts shall not be set in concrete, of any depth.
10. Special fabrication will be required at installations having a curvature of less than 150 ft. radius.
11. The terminal anchor section (TAS) post shall be set in Class A concrete (unless otherwise shown in the plans) in accordance with Item 421, "Hydraulic Cement Concrete." Concrete shall be subsidiary to the bid item requiring construction of the terminal anchor section (TAS). Terminal anchor post to be galvanized in accordance with Item 445, "Galvanizing."
12. Unless otherwise shown in the plans, a composite material post and/or block that meets the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence" may be substituted for posts and/or blocks of similar dimensions. The Construction Division, TxDOT maintains a Material Producer List (MPL) for producers of materials conforming to DMS-7210. Only producers on the MPL can furnish composite material posts and/or blocks.

ONLY FOR USE IN MAINTENANCE REPAIRS OR HIGHLY CONSTRAINED SITE CONDITIONS.



** TERMINAL ANCHOR SECTION (TAS)

Terminal anchor sections are only for downstream use, when located outside the horizontal clearance area of opposing traffic.

OPTION (1)

Notes: This anchor post requires four additional ¾" holes (shop or field) in the rail member with eight ⅝" hex bolts with nut and plate washer.

OPTION (2)

Notes: This anchor post requires the use of the 10 ga. terminal connector with four ⅝" hex bolts with nut and washer.

Post Bolt Length Varies
Splice Bolt Length 1 ¼" or 2"
Oval Shoulder Button Head
¾"

BUTTON HEAD BOLT

Post and Splice Bolts (See General Note 3)

Notes: Terminal Connector to be used with terminal anchor post options 2.

TERMINAL CONNECTOR

For connection hardware to concrete rails, see the MBGF transition standards.

TERMINAL ANCHOR POST OPTIONS

(See General Note 11)

Notes:
Either concrete anchor may be used with either post option above.

No construction joint is allowed in the concrete anchor.

Terminal rail may be bolted to post and in twist position prior to placing concrete anchor.

If concrete anchor is precast, the area should be compacted as directed by the Engineer, when placed in the field.

TERMINAL CONCRETE ANCHOR OPTIONS

(See General Note 11)

DATE:
FILE:

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE

MBGF-19

FILE: mbgf19.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		SHEET NO.

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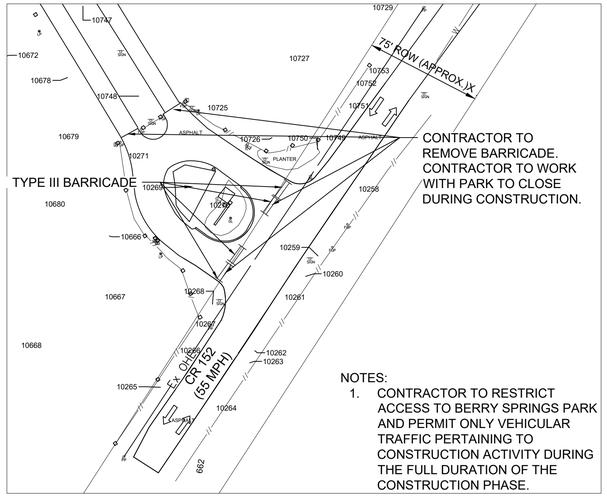
Issued:	04-12-2023
Drawn By:	JS, MB, AS
Checked By:	BV

Sheet Title
HARDSCAPE DETAILS

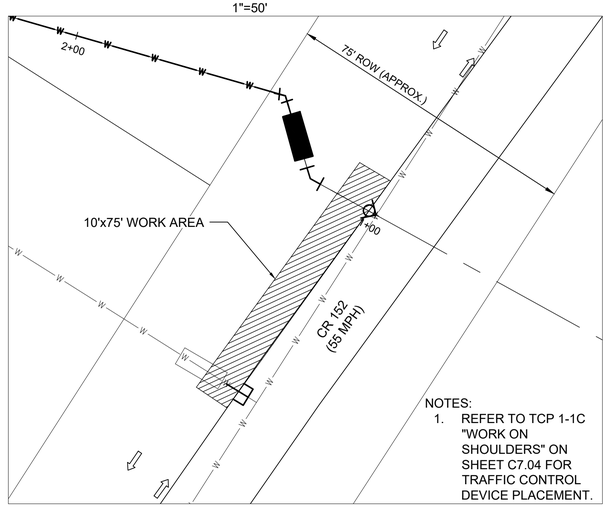
Sheet Number	Project Page Number
C8.06	

INSET A-A: BERRY SPRINGS PARK ENTRANCE
1"=50'



NOTES:
1. CONTRACTOR TO RESTRICT ACCESS TO BERRY SPRINGS PARK AND PERMIT ONLY VEHICULAR TRAFFIC PERTAINING TO CONSTRUCTION ACTIVITY DURING THE FULL DURATION OF THE CONSTRUCTION PHASE.

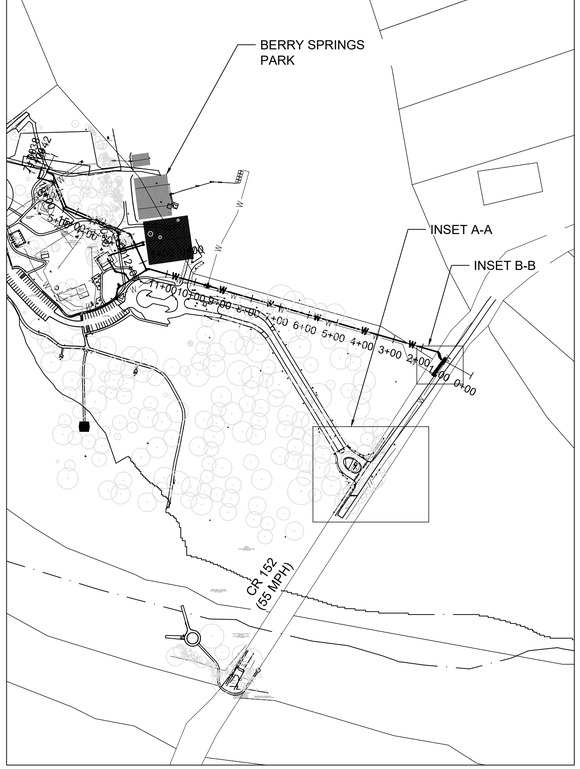
INSET B-B: TIE-IN TO JONAH WATER SUPPLY LINE 16" WL
1"=50'



NOTES:
1. REFER TO TCP 1-1C "WORK ON SHOULDERS" ON SHEET C7.04 FOR TRAFFIC CONTROL DEVICE PLACEMENT.

NORTH

LEGEND
- CHANNELIZING DEVICE
- TEMPORARY TRAFFIC SIGN
- TYPE I BARRICADE
- TYPE III BARRICADE
- PORTABLE WATER-FILLED BARRIER
- EXISTING TRAFFIC FLOW
- PROPOSED TRAFFIC FLOW
- WORK AREA
- FLASHING ARROW BOARD (SHOWN FACING DOWN)
- FLAGGER



TRAFFIC CONTROL GENERAL NOTES:

1. THE ENGINEER MAY DIRECT THE CONTRACTOR TO FURNISH ADDITIONAL SIGNS, BARRICADES, AND CHANNELIZING DEVICES AS REQUIRED TO MAINTAIN TRAFFIC SAFETY DURING WORK.
2. THE TRAFFIC CONTROL DEVICES SHALL BE UTILIZED AS SHOWN ON THE PLANS, ON A PER PHASE BASIS. THEREFORE, ANY DEVICES UTILIZED IN A PREVIOUS PHASE THAT CONFLICT WITH THE TRAFFIC CONTROL FOR THE CURRENT PHASE SHALL BE REMOVED.
3. THE CONTRACTOR SHALL MAINTAIN ACCESS TO DRIVEWAYS AND BUSINESSES AT ALL TIMES DURING PROJECT WORK.
4. THE SITE SHALL BE RETURNED TO ITS ORIGINAL CONDITION UPON COMPLETION OF PROJECT. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE PROJECT.
5. INSTALL ADVANCED WARNING SIGNS, CROSSROADS BARRICADES/SIGNS, AS SHOWN ON THE PLANS, IN ACCORDANCE WITH INSTRUCTIONS FROM THE ENGINEER. THESE SIGNS SHALL BE PLACED PRIOR TO COMMENCING THE PROPOSED WORK, AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE WORK AND UNTIL COMPLETION.
6. THE CONTRACTOR SHALL USE THE STANDARDS ATTACHED TO DETERMINE TAPER AND BUFFER LENGTHS AND THE PROPER DISTANCING BETWEEN EACH TEMPORARY TRAFFIC SIGN.
7. THE CONTRACTOR SHALL USE TRAFFIC CONTROLS THAT ARE IN ACCORDANCE WITH THE CURRENT EDITION OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE CITY OF AUSTIN TRANSPORTATION CRITERIA MANUAL.

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Sheet Title
TRAFFIC CONTROL PLAN

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C9.00	