

TCEQ EDWARDS AQUIFER RECHARGE ZONE EXCEPTION REQUEST

CITY OF ROLLINGWOOD PROPOSED DRAINAGE IMPROVEMENTS FOR PLEASANT DRIVE AND NIXON DRIVE

PREPARED FOR:

CITY OF ROLLINGWOOD



PREPARED BY



1120 S. Capital of Texas Highway
CityView 2, Suite 100, Austin, Texas 78746
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TBPE Firm No. 6535

FIRM No. 6535

FEBRUARY 2024

Recharge and Transition Zone Exception Request Form Checklist

- Edwards Aquifer Application Cover Page (TCEQ-20705)**
- General Information Form (TCEQ-0587)**
 - Attachment A - Road Map
 - Attachment B - USGS / Edwards Recharge Zone Map
 - Attachment C - Project Description
- Geologic Assessment Form (TCEQ-0585), if necessary**
 - Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
 - Attachment B - Soil Profile and Narrative of Soil Units
 - Attachment C - Stratigraphic Column
 - Attachment D - Narrative of Site Specific Geology
 - Site Geologic Map(s)
 - Table or list for the position of features' latitude/longitude (if mapped using GPS)
- Recharge and Transition Zone Exception Request Form (TCEQ-0628)**
 - Attachment A - Nature of Exception
 - Attachment B - Documentation of Equivalent Water Quality Protection
- Temporary Stormwater Section (TCEQ-0602)**
 - Attachment A - Spill Response Actions
 - Attachment B - Potential Sources of Contamination
 - Attachment C - Sequence of Major Activities
 - Attachment D - Temporary Best Management Practices and Measures
 - Attachment E - Request to Temporarily Seal a Feature
 - Attachment F - Structural Practices
 - Attachment G - Drainage Area Map
 - Attachment H - Temporary Sediment Pond(s) Plans and Calculations
 - Attachment I - Inspection and Maintenance for BMPs
 - Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices
- Agent Authorization Form (TCEQ-0599)**
- Fee Application Form (TCEQ-0574)**
- Check Payable to the "Texas Commission on Environmental Quality"**
- Core Data Form (TCEQ-10400)**

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: City of Rollingwood Water CIP and Drainage Improvements					2. Regulated Entity No.: RN111870267				
3. Customer Name: City of Rollingwood					4. Customer No.: CN600674691				
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):	0.96	
9. Application Fee:	\$500		10. Permanent BMP(s):			N/A			
11. SCS (Linear Ft.):	N/A		12. AST/UST (No. Tanks):			N/A			
13. County:	Travis		14. Watershed:			Lady Bird Lake			

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)	<input type="checkbox"/> Edwards Aquifer Authority <input type="checkbox"/> Barton Springs/ Edwards Aquifer <input type="checkbox"/> Hays Trinity <input type="checkbox"/> Plum Creek	<input checked="" type="checkbox"/> Barton Springs/ Edwards Aquifer	NA
City(ies) Jurisdiction	<input type="checkbox"/> Austin <input type="checkbox"/> Buda <input type="checkbox"/> Dripping Springs <input type="checkbox"/> Kyle <input type="checkbox"/> Mountain City <input type="checkbox"/> San Marcos <input type="checkbox"/> Wimberley <input type="checkbox"/> Woodcreek	<input type="checkbox"/> Austin <input type="checkbox"/> Bee Cave <input type="checkbox"/> Pflugerville <input checked="" type="checkbox"/> Rollingwood <input type="checkbox"/> Round Rock <input type="checkbox"/> Sunset Valley <input type="checkbox"/> West Lake Hills	<input type="checkbox"/> Austin <input type="checkbox"/> Cedar Park <input type="checkbox"/> Florence <input type="checkbox"/> Georgetown <input type="checkbox"/> Jerrell <input type="checkbox"/> Leander <input type="checkbox"/> Liberty Hill <input type="checkbox"/> Pflugerville <input type="checkbox"/> Round Rock

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

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.	
Geoffrey Elfers	
Print Name of Customer/Authorized Agent	
<i>Geoffrey Elfers</i>	2/22/2024
Signature of Customer/Authorized Agent	Date

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

General Information Form

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Customer/Agent: Geoffrey Elfers, PE

Date: 2/22/2024

Signature of Customer/Agent:



Project Information

1. Regulated Entity Name: Rollingwood
2. County: Travis
3. Stream Basin: Lady Bird Lake / Colorado River
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:
 Recharge Zone
 Transition Zone
6. Plan Type:
 WPAP
 SCS
 Modification
 AST
 UST
 Exception Request

7. Customer (Applicant):

Contact Person: Ashley Wayman
Entity: City of Rollingwood
Mailing Address: 403 Nixon Dr
City, State: Rollingwood, Texas Zip: 78746
Telephone: (512) 327-1838 FAX: _____
Email Address: awayman@rollingwoodtx.gov

8. Agent/Representative (If any):

Contact Person: Geoffrey Elfers, PE
Entity: K Friese + Associates
Mailing Address: 1120 S Capital of Texas Highway, Bldg 1, Ste 100
City, State: Austin, TX Zip: 78746
Telephone: (512) 338-1704 FAX: (512) 338-1784
Email Address: gelfers@kfriese.com

9. Project Location:

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

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

This Project is a storm sewer improvement project intended to reduce flooding in an existing residential area. The storm sewer begins at the intersection of Pickwick Lane and Hubbard Circle, proceeds downstream along Hubbard Circle, passes within easement between lots to Hatley Drive (running alongside 2801 Hubbard Circle and 2802 Hatley Drive), crosses 2805 Hatley Drive within an easement to Almarion Way, crosses Almarion Way, and then discharges to an existing drainage easement between 2803 Hatley Drive and 205 Almarion Way. The runoff contained within the drainage easement ultimately discharges to Lady Bird Lake / Colorado River.

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: N/A
14. **Attachment C – Project Description.** Attached at the end of this form is a detailed narrative description of the proposed project. The project description is consistent throughout the application and contains, at a minimum, the following details:
- Area of the site
 - Offsite areas
 - Impervious cover
 - Permanent BMP(s)
 - Proposed site use
 - Site history
 - Previous development
 - Area(s) to be demolished
15. Existing project site conditions are noted below:
- Existing commercial site
 - Existing industrial site
 - Existing residential site
 - Existing paved and/or unpaved roads
 - Undeveloped (Cleared)
 - Undeveloped (Undisturbed/Uncleared)
 - Other: _____

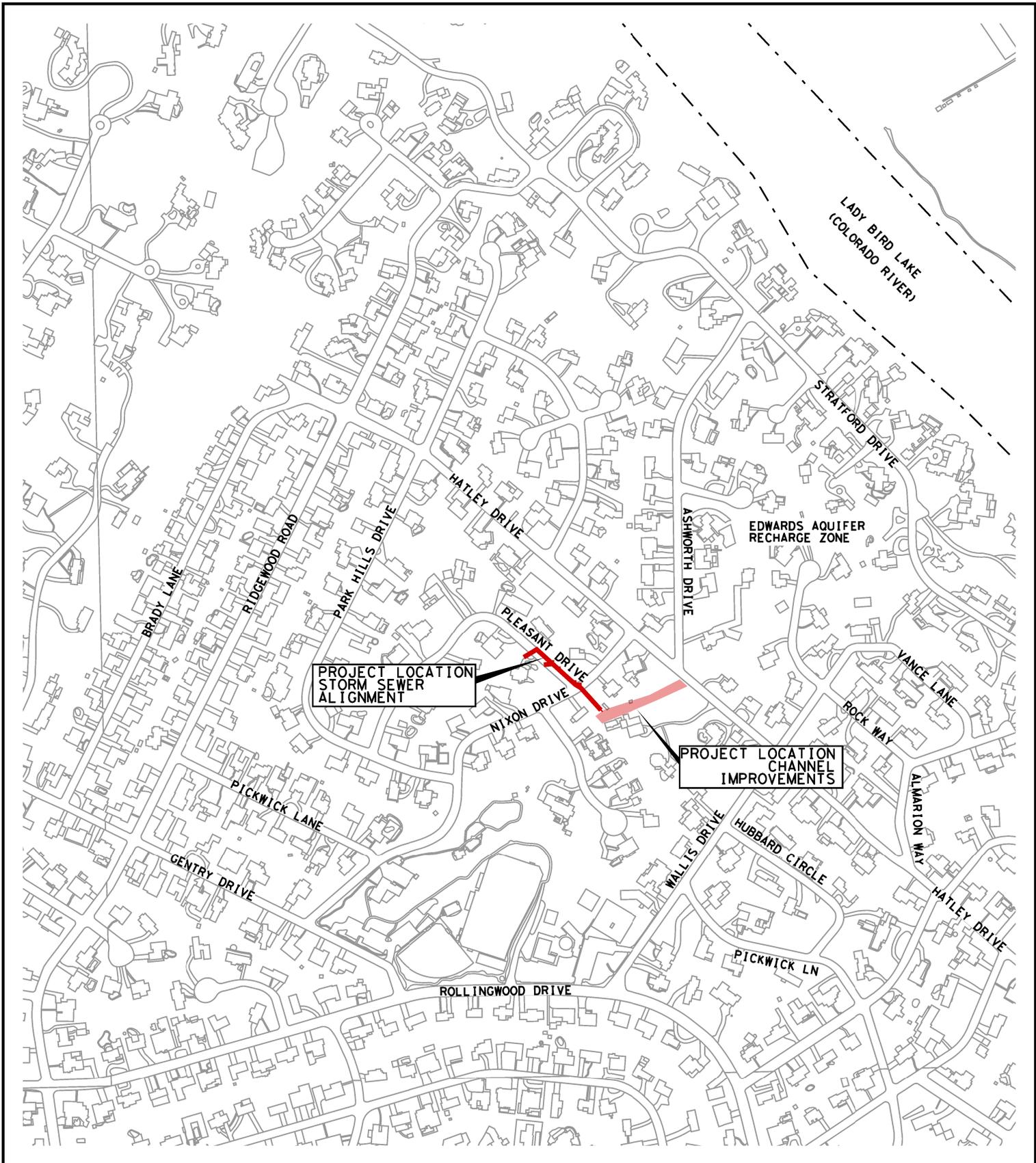
Prohibited Activities

16. I am aware that the following activities are prohibited on the Recharge Zone and are not proposed for this project:
- (1) Waste disposal wells regulated under 30 TAC Chapter 331 of this title (relating to Underground Injection Control);
 - (2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;
 - (3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;
 - (4) The use of sewage holding tanks as parts of organized collection systems; and
 - (5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

- (6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.
17. I am aware that the following activities are prohibited on the Transition Zone and are not proposed for this project:
- (1) Waste disposal wells regulated under 30 TAC Chapter 331 (relating to Underground Injection Control);
 - (2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and
 - (3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

18. The fee for the plan(s) is based on:
- For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
 - For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
 - For a UST Facility Plan or Modification or an AST Facility Plan or Modification, the total number of tanks or piping systems.
 - A request for an exception to any substantive portion of the regulations related to the protection of water quality.
 - A request for an extension to a previously approved plan.
19. Application fees are due and payable at the time the application is filed. If the correct fee is not submitted, the TCEQ is not required to consider the application until the correct fee is submitted. Both the fee and the Edwards Aquifer Fee Form have been sent to the Commission's:
- TCEQ cashier
 - Austin Regional Office (for projects in Hays, Travis, and Williamson Counties)
 - San Antonio Regional Office (for projects in Bexar, Comal, Kinney, Medina, and Uvalde Counties)
20. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
21. No person shall commence any regulated activity until the Edwards Aquifer Protection Plan(s) for the activity has been filed with and approved by the Executive Director.



PROJECT LOCATION
STORM SEWER
ALIGNMENT

PROJECT LOCATION
CHANNEL
IMPROVEMENTS



ROLLINGWOOD
TEXAS

ROLLINGWOOD
STORM SEWER IMPROVEMENT

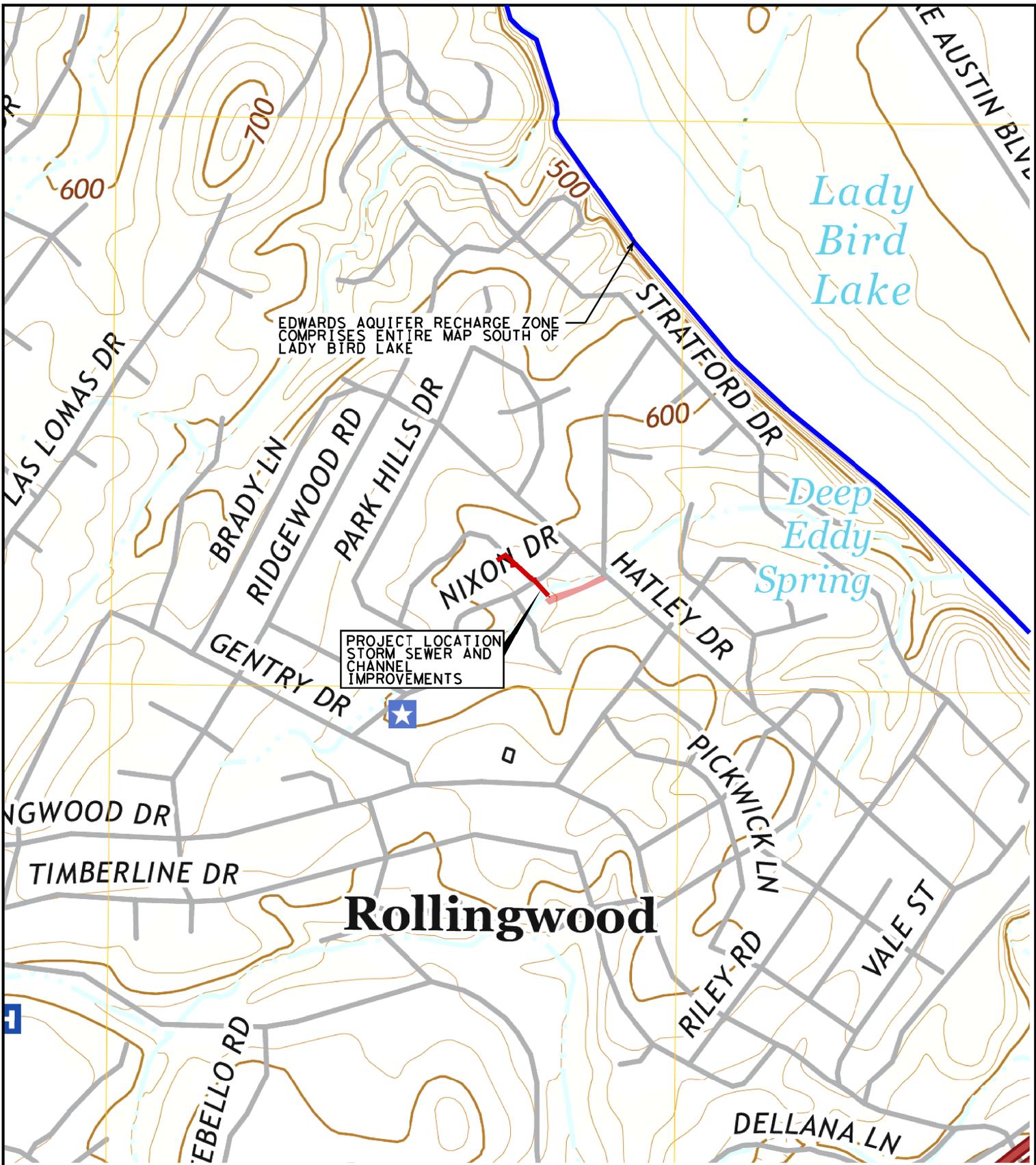
ATTACHMENT A
ROAD MAP

K·FRIESE
+ ASSOCIATES
A LOCHNER COMPANY

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Austin, Texas 78746
P 512.338.1704 F 512.338.1784
TBPE Firm No. 6535
www.kfriesse.com

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ROLLINGWOOD
STORM SEWER IMPROVEMENT

ATTACHMENT B
USGS QUADRANGLE



1120 S. Capital of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P 512.338.1704 F 512.338.1784
TBPE Firm No. 6535
www.kfriesse.com

ATTACHMENT C PROJECT DESCRIPTION

The City of Rollingwood proposes storm sewer and channel improvements through a residential area to reduce localized flooding. The improvements consist of constructing curb inlets and storm sewer headwalls along 300 and 301 Pleasant Drive. A 5'x4' box culvert storm sewer under Pleasant Drive is proposed to collect runoff from the inlets and headwalls. The box culvert storm sewer discharges to an existing earthen and limestone channel between 2910 Hatley Drive and 301 and 303 Nixon Drive. Channel grading improvements with rock walls and rock riprap are proposed between the box culvert discharge point and an existing (2) 7'x4' multi box culvert. Approximately 350 linear feet of channel improvement is proposed. No improvements are proposed downstream of the existing (2) 7'x4' multi box culvert, nor is the existing multi box culvert proposed to be improved. The project is tributary to the Colorado River / Lady Bird Lake. The project is located within the Edwards Aquifer Recharge Zone.

The site area for the Project is contained within existing and proposed right-of-way and easements and totals approximately 0.96 acres. Under pre-project conditions there is approximately 0.32 acres of impervious cover (33% of the total project area) within the project's disturbed area consisting of asphalt pavement. The project's existing ground and pavement will be restored after storm sewer installation and the project is anticipated to result in a negligible increase to impervious cover (<0.01 acres) due to the installation of additional curb inlets and headwalls.

The right-of-way for the Project is predominantly owned by the City of Rollingwood consisting of the residential roads Pleasant Drive and Nixon Drive. Portions of the project will be constructed within existing and proposed easements on 301 Pleasant Drive, 303 Pleasant Drive, 305 Nixon Drive, 303 Nixon Drive, 2910 Hatley Drive, 301 Nixon Drive, and 303 Nixon Drive. There are no existing EAPP permits to be modified.

There are no permanent water quality BMPs proposed as part of this project as the overall project scope is the installation of underground storm sewers and channel grading improvements. The existing residential roads and lots will be restored to existing conditions at project completion.

**TCEQ EDWARDS AQUIFER
PROTECTION PROGRAM
RECHARGE ZONE EXCEPTION REQUEST**

**CITY OF ROLLINGWOOD
PROPOSED DRAINAGE IMPROVEMENTS
FOR PLEASANT DRIVE AND NIXON DRIVE**

ATTACHMENT C.1:
CONSTRUCTION PLANS

PREPARED FOR:
CITY OF ROLLINGWOOD



**PREPARED:
FEBRUARY 2024**

CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD NIXON/PLEASANT DRAINAGE IMPROVEMENTS FOR PLEASANT DRIVE AND NIXON DRIVE



PREPARED & SUBMITTED FOR APPROVAL BY:



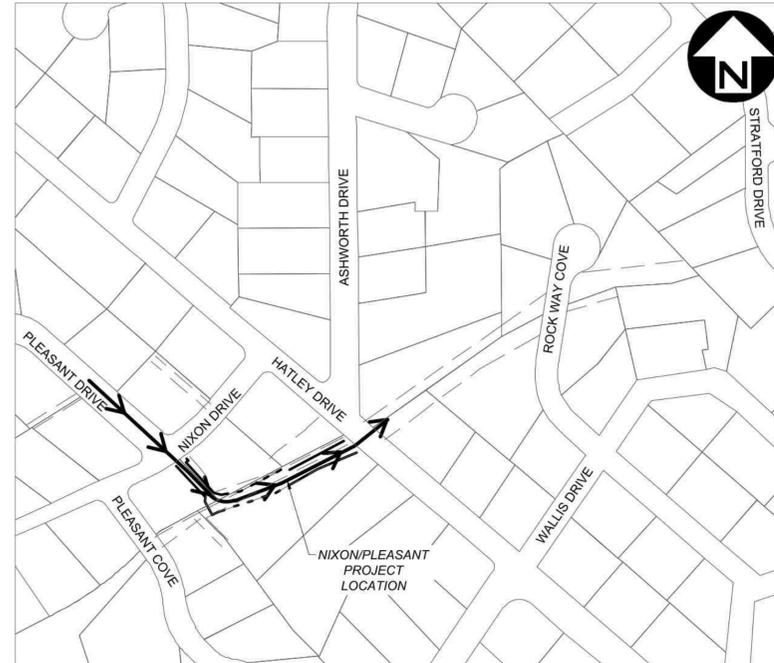
Abe A. Salinas III
ABE A. SALINAS III, P.E.

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ABE A. SALINAS III, LIC. # 105144
I CERTIFY THAT THESE DRAWINGS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THEIR INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION UNTIL FORMAL CITY APPROVAL.

09/21/2023
DATE

SHEET INDEX

#	ID	DESCRIPTION
1	G001	COVER SHEET
2	G002	GENERAL NOTES (1 OF 2)
3	G003	GENERAL NOTES (2 OF 2)
4	G004	EASEMENT LAYOUT
5	G005	ESTIMATED QUANTITIES
6	G006	HORIZONTAL CONTROL LAYOUT SHEET
7	CA101	CONSTRUCTION ACCESS AND SEQUENCING
8	CT101	TRAFFIC CONTROL PLAN
9	DP101	DEMOLITION AND PROTECTION PLAN
10	DP102	DEMOLITION AND PROTECTION PLAN
11	DAM02	PROPOSED DRAINAGE AREA MAP
12	CH01	CHANNEL HYDRAULIC CALCULATIONS
13	CH02	HYDRAULIC CALCULATIONS
14	SECT01	CHANNEL TYPICAL SECTIONS
15	PLPR01	CHANNEL PLAN AND PROFILE STA. 1+00.00 TO END
16	PLPR02	STORM SEWER PLAN & PROFILE STA. 10+00.00 TO STA. 12+67.58
17	PLPR03	STORM SEWER LATERAL PROFILES
18	SECT02	CHANNEL CROSS SECTIONS
19	GD101	GRADING PLAN
20	GD102	GRADING PLAN
21	CV01	WATER LINE RELOCATION PLAN
22	PV501	PAVING DETAILS 1 OF 2
23	PV502	PAVING DETAILS 2 OF 2
24	SD501	DRAINAGE DETAILS 1 OF 12
25	SD502	DRAINAGE DETAILS 2 OF 12
26	SD503	DRAINAGE DETAILS 3 OF 12
27	SD504	DRAINAGE DETAILS 4 OF 12
28	SD505	DRAINAGE DETAILS 5 OF 12
29	SD506	DRAINAGE DETAILS 6 OF 12
30	SD507	DRAINAGE DETAILS 7 OF 12
31	SD508	DRAINAGE DETAILS 8 OF 12
32	SD509	DRAINAGE DETAILS 9 OF 12
33	SD510	DRAINAGE DETAILS 10 OF 12
34	SD511	DRAINAGE DETAILS 11 OF 12
35	SD512	DRAINAGE DETAILS 12 OF 12
36	WA501	WATER LINE DETAILS 1 OF 2
37	WA502	WATER LINE DETAILS 2 OF 2
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39	EV102	EROSION CONTROL PLAN
39	OL01	OVERALL TREE LAYOUT
40	TP01	TREE PRESERVATION
41	TP02	TREE PRESERVATION
42	LL01	LANDSCAPE LAYOUT
43	LL02	LANDSCAPE LAYOUT
44	LD01	LANDSCAPE DETAILS
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46	S2.00	STRUCTURAL WALL DETAILS
47	S2.01	STRUCTURAL RETAINING WALLS
48	S2.02	RETAINING WALLS MISCELLANEOUS DETAILS



LOCATION MAP
N.T.S.

MAYOR
GAVIN MASSINGILL
COUNCIL MEMBERS

SARA HUTSON
ALEC ROBINSON
BROOK BROWN
PHIL McDUFFEE
KEVIN GLASHEEN

CITY ADMINISTRATOR
ASHLEY WAYMAN

RECOMMENDED FOR APPROVAL BY:

Gavin Massingill
MAYOR GAVIN MASSINGILL - CITY OF ROLLINGWOOD

12/14/2023
DATE

Ashley Wayman
ASHLEY WAYMAN - CITY ADMINISTRATOR

12/14/2023
DATE



1120 S. Capital of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P - 512.338.1704 F - 512.338.1784
TBPE Firm #6535
www.kfriese.com

CONFORMED FOR CONSTRUCTION

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS

JUDY WILLIS

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CONSTRUCTION ACCESS AND SEQUENCING NOTES:

- CHANNEL DEMOLITION AND CONSTRUCTION SHALL BE SEQUENCED FROM DOWNSTREAM TO UPSTREAM. EACH SEGMENT MUST BE ACCEPTED BY THE CITY PRIOR TO COMMENCING NEXT SEGMENT. THE CONTRACTOR SHALL SUBMIT AN ALTERNATE SEQUENCING PLAN FOR REVIEW AND ACCEPTANCE BY THE CITY IN WRITING.
- EROSION CONTROL MEASURES MUST BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES.
- NO MORE THAN (10) WORKING DAYS SHALL PASS BETWEEN COMPLETION OF DEMOLITION AND COMMENCEMENT OF PROPOSED CHANNEL ACTIVITIES.
- CONTRACTOR SHALL REQUEST WRITTEN AUTHORIZATION FROM CITY PRIOR TO MOVING TO A NEW SEGMENT OF CONSTRUCTION. ALLOW FOR 3 DAYS FROM AUTHORIZATION REQUEST TO RECEIVE AUTHORIZATION TO PROCEED.
- CARE OF WATER SHALL BE PROVIDED AT ALL TIMES SO AS NOT TO IMPEDE THE FLOW OF STORMWATER.
- CONTRACTOR SHALL MAINTAIN DRAINAGE BETWEEN THE EXISTING CULVERT AND PROPOSED CULVERT AT 300 PLEASANT DURING ALL PHASES.
- SUGGESTED POINTS OF ACCESS ARE SHOWN TO ASSIST THE CONTRACTOR WITH DEMOLITION AND MATERIAL ENTRY. LETTERS OF PERMISSION FOR THESE LOCATIONS ARE NOT INCLUDED WITH THE BID CONTRACT DOCUMENTS AND WILL BE COORDINATED WITH THE CITY.
- CONTRACTOR SHALL NOTIFY PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY CONSTRUCTION RELATED ACTIVITIES ON THEIR PROPERTY.
- CONTRACTOR SHALL MAINTAIN UP-TO-DATE COPIES OF ALL RIGHT-OF-ENTRY FORMS ON THE PROJECT SITE.
- UPON COMPLETION OF WORK ALL STAGING AREAS SHALL BE RESTORED TO THE ORIGINAL LINES, GRADES, CLEARED OF ALL BRUSH AND DEBRIS, AND REVEGETATED PER SPECIFICATION 609S UNLESS OTHERWISE SPECIFIED IN THE PLANS.
- ALL TREES, SIGNS, WALKWAYS, UTILITIES AND OTHER PHYSICAL FEATURES (WHETHER SHOWN OR NOT SHOWN ON THE PLANS) SHALL BE PROTECTED DURING CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE CITY OR IN THESE PLANS.
- CONTRACTOR IS RESPONSIBLE FOR PROTECTING PRIVATE PROPERTY FROM DAMAGES, ALL PRIVATE PROPERTY DAMAGED BY CONSTRUCTION ACTIVITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
- CONTRACTOR MAY NEGOTIATE ADDITIONAL ACCESS AND/OR STORAGE WITH INDIVIDUAL PROPERTY OWNERS AT THEIR EXPENSE.
- CONTRACTOR IS RESPONSIBLE FOR EXPENSES DUE TO NEGLIGENCE.
- CONTRACTOR SHALL OBTAIN APPROVAL FROM THE CITY TO REMOVE TREES NOT IDENTIFIED FOR REMOVAL ON THE DEMOLITION PLAN.
- NO CONSTRUCTION STORAGE OR STAGING SHALL OCCUR WITHIN THE FEMA FLOODPLAIN.

CONSTRUCTION SEQUENCING NOTES:

- PHASE 1 CONSTRUCTION ACTIVITIES SHALL INCLUDE CHANNEL CONSTRUCTION PROGRESSING FROM STATION 1+00 TO 4+75 DOWNSTREAM TO UPSTREAM.
- PHASE 2 CONSTRUCTION ACTIVITIES SHALL INCLUDE CONSTRUCTION OF THE STORM DRAIN IMPROVEMENTS PROGRESSING FROM STATION 10+00.00 TO 13+80.00 DOWNSTREAM TO UPSTREAM.
- CONSTRUCTION SHALL BE SEQUENCED IN A MANNER THAT WILL NOT DISTURB OR DAMAGE PREVIOUSLY CONSTRUCTED WORK.

PHASE 1: CHANNEL IMPROVEMENTS

- PHASE 1 CONSTRUCTION ACTIVITIES SHALL INCLUDE CHANNEL CONSTRUCTION PROGRESSING FROM STATION 1+00 TO 4+50 DOWNSTREAM TO UPSTREAM.
- INSTALL TEMPORARY FENCING AT 303 NIXON DRIVE TO ENCLOSE BACKYARD PERIMETER AREA PRIOR TO BEGINNING CONSTRUCTION. TEMPORARY FENCING SHALL REMAIN IN PLACE THRU DURATION OF CONSTRUCTION UNTIL NEW FENCING IS IN PLACE AND BACKYARD PERIMETER IS SECURED. PERMANENT FENCING SHALL BE INSTALLED PRIOR TO COMMENCING WITH PHASE 2.
- PERFORM DEMOLITION AND REMOVAL OF LARGE ROCK, CONCRETE RIPRAP AND OTHER DELETERIOUS MATERIALS FROM THE EXISTING CHANNEL LOCATED ALONG 303 NIXON DRIVE AND REPLACE WITH SELECT FILL COMPACTED TO 95% STANDARD PROCTOR DENSITY.
- CONSTRUCT CHANNEL IMPROVEMENTS INCLUDING EXCAVATION, GRADING, ACTIVITIES AND ROCK BOULDER PLACEMENT. CONTRACTOR TO PROVIDE MATERIAL SAMPLES PRIOR TO SELECTION AND DELIVERY OF ROCK BOULDERS.
- CONTRACTOR SHALL PROVIDE 48 HOURS NOTICE TO THE CITY PRIOR TO PLACEMENT OF ROCK BOULDERS IN THE CHANNEL.
- PLACEMENT OF TOP SOIL AND LANDSCAPE PLANTINGS SHALL BE PERFORMED AS PART OF PHASE 3 FINAL WORK.
- COMPLETE ALL WORK IN THIS PHASE BEFORE STARTING PHASE 2.



PHASE 2: PLEASANT DRIVE IMPROVEMENTS

- CONSTRUCT ALL STORM DRAIN AND ROADWAY IMPROVEMENTS WITHIN THE WORK ZONE PER THE PLANS. ADJUST ANY VALVES AND MANHOLES TO MEET PROPOSED GROUND ELEVATIONS FOR UTILITIES WITHIN THE WORK ZONE PER THE UTILITY PLANS.
- CONSTRUCT THE STORM DRAIN BOX IN PHASES TO MAINTAIN ACCESS TO ALL RESIDENTIAL PROPERTIES WITHIN THE WORK ZONE. COORDINATE ANY REQUIRED DRIVEWAY CLOSURES WITH THE RESIDENTS OF THE PROPERTY AT LEAST 48 HOURS IN ADVANCE.
- CONSTRUCTION OF STORM DRAIN BOX SHALL PROGRESS FROM DOWNSTREAM TO UPSTREAM. IT IS WITH THE INTENTION OF AIDING WITH CONSTRUCTABILITY AND ACCESS THAT CAST-IN-PLACE BOX CULVERT IS PROPOSED FROM STATIONS 10+32 TO 11+23. ALTERNATIVELY, THE CONTRACTOR MAY SUBMIT A PLAN FOR THE USE OF A PRECAST BOX FOR THIS SEGMENT, SUBJECT TO APPROVAL BY THE ENGINEER. NO ADDITIONAL WORK DAYS WILL BE AWARDED FOR THIS SUBSTITUTION.
- DUE TO THE OVERALL SIZE OF THE STORM DRAIN WITHIN PLEASANT DRIVE, SAFETY IS OF THE UTMOST IMPORTANCE. MAINTAIN BARRIERS AND SAFETY FENCING AROUND ANY OPEN EXCAVATIONS. MAKE SURE ALL TRENCHES ARE FILLED IN AT THE END OF THE WORK DAY.
- MAINTAIN 3:1 MAX SIDE SLOPES AT THE END OF EACH WORK DAY FOR PAVEMENT DROP-OFFS GREATER THAN 2'.

PHASE 3: FINAL WORK

- CONSTRUCT FINAL 2" LIFT OF THE TYPE D HOT MIX ASPHALTIC PAVEMENT SURFACE LAYER USING TXDOT TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS STANDARD (7-1) AND TXDOT TCP MOBILE OPERATIONS STANDARD (3-1).
- PERFORM ANY REMAINING FINAL GRADING AND PLACE TOPSOIL AND SEEDING AND/OR SODDING, AND LANDSCAPE PLANTINGS.
- REMOVE ALL TEMPORARY SW3P DEVICES AND TREE PROTECTION, AS DIRECTED.
- PERFORM FINAL CLEANUP.

**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.

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

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Page 1 of 2

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

- Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from being discharged offsite.
- 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.
- 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.
- 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.
- 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:
 - 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;
 - 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;
 - any development of land previously identified as undeveloped in the original water pollution abatement plan.

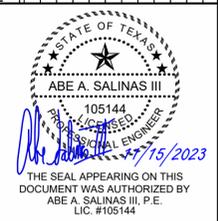
Austin Regional Office 12100 Park 35 Circle, Building A Austin, Texas 78753-1808 Phone (512) 339-2929 Fax (512) 339-3795	San Antonio Regional Office 14250 Judson Road San Antonio, Texas 78233-4480 Phone (210) 490-3096 Fax (210) 545-4329
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THESE GENERAL CONSTRUCTION NOTES MUST BE INCLUDED ON THE CONSTRUCTION PLANS PROVIDED TO THE CONTRACTOR AND ALL SUBCONTRACTORS.

TCEQ-0592 (Rev. July 15, 2015)

Page 2 of 2

REV. NO.	BY	DATE	REVISION DESCRIPTION
1	DB	10/05/2023	ADDENDUM #2



THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ABE A. SALINAS III, P.E. LIC. #105144

I CERTIFY THAT THESE DRAWINGS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THEIR INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION UNTIL FORMAL CITY APPROVAL.

CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS

GENERAL NOTES (2 OF 2)

ROLLINGWOOD TEXAS

K-FRIESE + ASSOCIATES

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NOTES	NAME	DATE
SURVEY BY		
DRAWN BY	AH	08/21
DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY		

G003	3	OF 49
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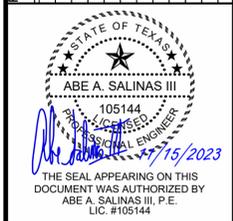
X:\PROJECTS\0607_ROLLINGWOOD_NIXONPLEASANT_DRAINAGE_IMPROVEMENTS\DESIGNSHEETS\0607-G\GN\NOTES-TX.DWG - 100 - COA_ESD.STB 11/15/2023 8:45 PM ALDO HERNANDEZ

CITY OF AUSTIN			TRAFFIC CONTROL PLAN	DEMOLITION SHEETS			DRAINAGE SHEETS					UTILITY SHEETS	SWPPP SHEETS		LANDSCAPE SHEETS				TOTAL
ITEM NO.	BID ITEM DESCRIPTION	UNIT	8 (CT101)	9 (DP101)	10 (DP102)	15 (PLPR01)	16 (PLPR02)	17 (PLPR03)	19 (GD101)	20 (GD102)	21 (CV01)	38 (EV101)	39 (EV102)	40 (TP01)	41 (TP02)	42 (LL01)	43 (LL02)		
1	MOBILIZATION	LS																1	
101S-C	PREPARING RIGHT-OF-WAY	LS																1	
* (1)	REMOVE CHAIN LINK FENCE	LF		116														116	
* (1)	REMOVE 18" RCP AND CAP	LF		25														25	
* (1)	REMOVE CINDERBLOCK WALL	LF		86														86	
* (1)	REMOVE FOOT BRIDGE AND STAIRS	EA		1														1	
* (1)	REMOVE SHED AT 303 NIXON DRIVE	EA		1														1	
* (1)	REMOVE, SALVAGE, RELOCATE PLAYHOUSE AT 303 NIXON DRIVE	EA		1														1	
* (1)	REMOVE MISCELLANEOUS CONCRETE, MASONRY AND ROCKWALLS	LF		303	18													321	
* (1)	REMOVE ASPHALT PAVEMENT DRIVEWAYS	SY		36														36	
* (1)	REMOVE CONCRETE RIPRAP	SY		15														15	
* (1)	6" WATER LINE REMOVAL	LF									232							232	
* (1)	WATER VALVES, REMOVE AND SALVAGE	EA									3							3	
104S-A	REMOVE CONCRETE CURB	LF		312														312	
104S-C	REMOVE CONCRETE SIDEWALKS & DRIVEWAYS	SY		55														55	
110S-B	STREET EXCAVATION (12" DEPTH)	CY		177														177	
315S-A	SURFACE MILLING ASPHALTIC PAVEMENT (1.5" TO 2" DEPTH)	SY		864														864	
120S-B	CHANNEL EXCAVATION	CY					612											612	
132S-A	EMBANKMENT (FINAL) (ORD COMP) (TY A)	CY				0	148			11								159	
160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY					944			35								979	
210S-A	FLEXIBLE BASE (8" COMP. DEPTH)	CY					148											148	
340S-B-1	HOT MIX ASPHALTIC PAVEMENT, TYPE D (NO RAP, NO RAS, PG-64-22) (2" COMP. DEPTH)	SY					1112											1112	
340S-B-2	HOT MIX ASPHALTIC PAVEMENT, TYPE C OR D LEVEL UP (20% MAX RAP, NO RAS) (2" COMP. DEPTH)	SY					530											530	
340S-B-3	ASPHALTIC CONCRETE DRIVEWAY	SY					24											24	
401S-A	BOX CULVERT STRUCTURAL EXCAVATION & BACKFILL	CY				651												651	
402-A	FLOWABLE FILL (LOW STRENGTH)	CY					3.75	8.16										12	
509S-1	TRENCH EXCAVATION SAFETY PROTECTION	LF					262				195							457	
411S	BOX CULVERT RESURFACING & REPAIR (HATLEY CULVERTS)	EA				1												1	
420-6051	CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT (5'X4')	LF					91											91	
423-6013	STONE VENEER (LIMESTONE), DRAINAGE WALL	SY							86									86	
430S-A	P.C. CONCRETE CURB AND GUTTER (EXCAVATION) (6 IN TO 8 IN HEIGHT)	LF					197											197	
430S-C	P.C. CONCRETE CURB (EXCAVATION) (6 IN TO 8 IN HEIGHT)	LF						6										6	
432S-11	CONCRETE CINDERBLOCK (CMU) WALL (2' HIGH)	SF				7												7	
433S-A	PORTLAND CEMENT CONCRETE DRIVEWAYS (FLARED TYPE I)	SF					657											657	
462-6006	PRECAST REINFORCED CONCRETE BOX (5'X2')	LF						54										54	
462-6008	PRECAST REINFORCED CONCRETE BOX (5'X4')	LF					250											250	
464-6005	REINFORCED CONCRETE PIPE (CL III) (24" DIA)	LF						76										76	
466-6150	CONC HEADWALL WITH FLARED WINGS, HW=3 FT (CH-FW-0)	EA					1											1	
466-6154	CONC HEADWALL WITH FLARED WINGS, HW=7 FT (CH-FW-0)	EA					2											2	
466-6206	CONC HEADWALL WITH FLARED WINGS, HW=3 FT (SW-0)	EA					1											1	
506S-4	MINOR MANHOLE HEIGHT ADJUSTMENT	EA								1								1	
506S-12	JUNCTION BOX 8'X8'X6' W/ MH RISER	EA					1											1	
508S-9	4-SIDED AREA INLET (4'X4')	EA					1											1	
508S-E	ENERGY DISSIPATORS, 48 IN. DIA. (AT OUTFALL OF 5'X4' RCB)	EA				3												3	
508S-110R	INLET TYPE I (COMPLETE) (10 FT)	EA						1										1	
508S-120R	INLET TYPE I (COMPLETE) (20 FT)	EA						3										3	
591S-B	DRY ROCK RIPRAP (D50 18")	CY				57												57	
591S-F	CONCRETE RIPRAP (6" THICK)	SY				4												4	
701S-1	METAL FENCE (6' HIGH)	LF				170												170	
701S-J	METAL FENCE PEDESTIRAN GATE, 6 FOOT X 3 FOOT	EA				2												2	
701S-D	WOODEN FRAMED HOGWIRE FENCE	LF				21												21	
504S-3W	ADJUST WATER VALVE BOXES TO GRADE	EA																0	
510-AWR8	FACTORY RESTRAINED JOINT PIPE, 8-INCH DIA. PVC C900 DR14 (ALL DEPTHS), INCLUDING EXCAVATION AND BACKFILL	LF									254							254	
510-JW	WET CONNECTIONS, 8-IN DIA. x 6-IN DIA.	EA									3							3	
510-BW	CONNECTING NEW SERVICE TO EXISTING PRIVATE SERVICE	EA									3							3	
510-KW	DUCTILE IRON FITTINGS	TON									1							1	
511-A	VALVES, GATE TYPE, 8-INCH DIAMETER	EA									3							3	
102S-C	TREE REMOVAL	LS												1				1	
* (2)	REMOVAL, TREE	IN												269				269	
602S-8	ST. AUGUSTINE BLOCK SODDING	SY														138		138	
608S-1	SHRUB, 1 GALLON	CY														99		99	
608S-2	SHRUB, 2 GALLON	EA														21		21	
608S-3	SHRUB, 5 GALLON	EA														21		21	
608S-4	SHRUB, 10 GALLON	EA														9		9	
608S-5	TREE PLANTINGS, 2" CALIPER	EA														28		28	
608S-6	BROWN MULCH (1124 SQUARE FEET AT 3" THICK)	CY														11		11	
608S-7	DECOMPOSED GRANITE, CRUSHED FINE (375 SQUARE FEET AT 4" THICK)	TON														5		5	
608S-8	RAINBOW RIVER STONE, 2-4" (117 SQUARE FEET AT 4" THICK)	TON														2		2	
608S-9	STEEL EDGING	LF														350		350	
609S-C	GRASS, ZOYSIA GRASS OR MATCH EXISTING PRIVATE GRASS	SF														5626		5626	
609S-D	GRASS, NATIVE GRASSES	SF														6931		6931	
623S-1	LANDSCAPE WALL (LESS THAN 4 FEET TALL)	TON														254		254	
623S-2	LANDSCAPE WALL, BOULDERS (4-6 FEET TALL)	TON														288		288	
610S-0	TREE AND VEGETATION PROTECTION	LS									1							1	
639S-0	ROCK FILTER DAMS (INSTALL/REMOVE) (TYPE 3)	LF									20	77						97	
641S	CONSTRUCTION EXITS (INSTALL/REMOVE)	EA										1						1	
642S	TEMPORARY SEDIMENT CONTROL FENCE	LF									177							177	
648S	MULCH SOCK	LF									192							192	

(1) QUANTITIES FOR REMOVAL OF CHAIN LINK FENCE, INLET, ORNAMENTAL FENCE, RETAINING WALL, BOX CULVERT AND OTHER REMOVALS ARE FOR THE CONTRACTORS INFORMATION ONLY AND SHALL BE SUBSIDIARY TO PAY ITEM 101S-C (PREPARING RIGHT-OF-WAY)
(2) QUANTITIES FOR REMOVAL OF TREES IN CALIPER INCHES IS FOR THE CONTRACTORS INFORMATION ONLY AND SHALL BE SUBSIDIARY TO PAY ITEM 102S-C (TREE REMOVAL)

1

REV. NO.	DATE	REVISION DESCRIPTION
1	DB 10/06/2023	ADDENDUM #2



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CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS

ESTIMATED QUANTITIES

ROLLINGWOOD TEXAS

K-FRIESE + ASSOCIATES

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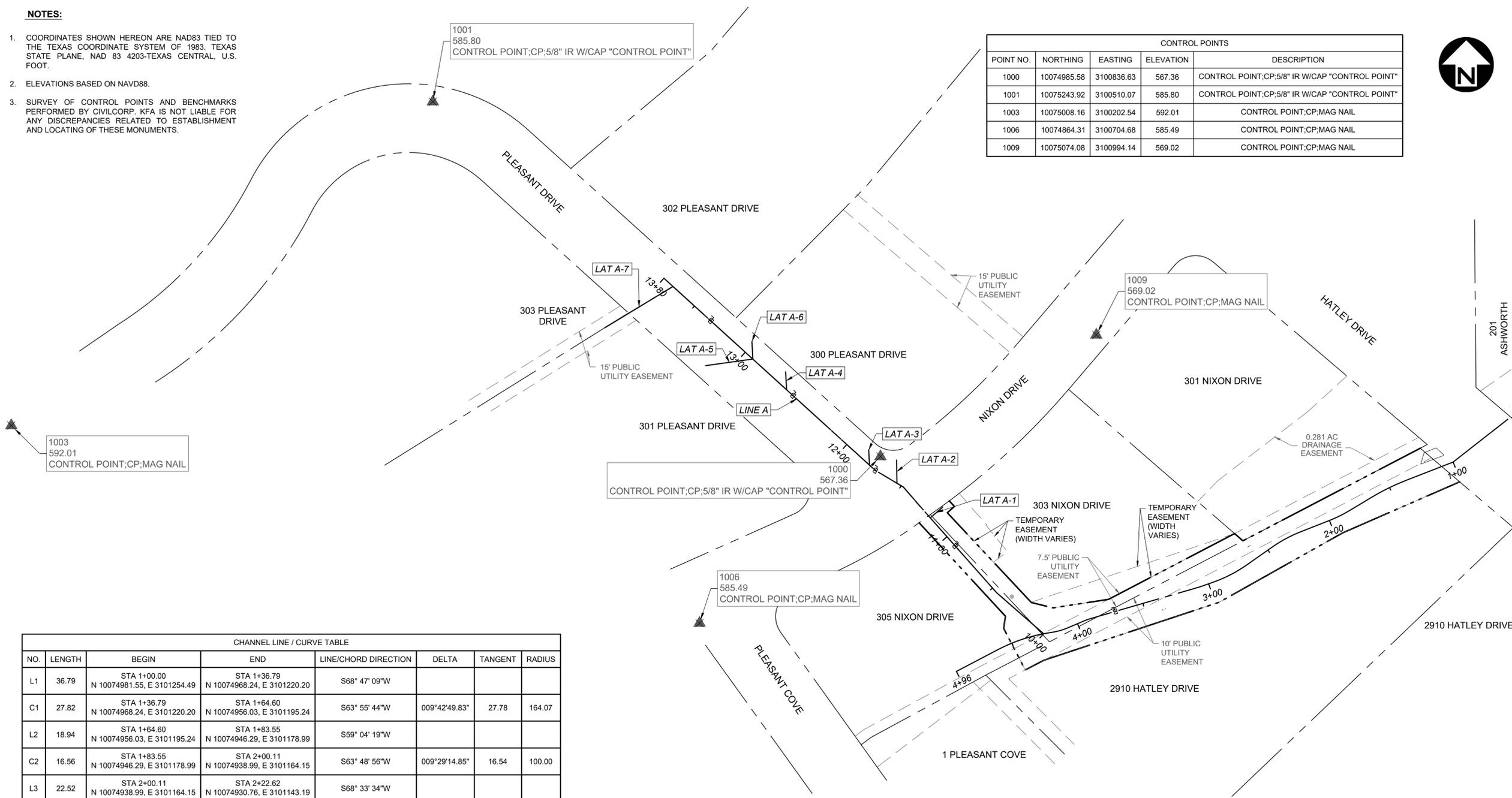
NOTES	NAME	DATE
SURVEY BY		
DRAWN BY	AH	08/21
DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY		

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NOTES:

- COORDINATES SHOWN HEREON ARE NAD83 TIED TO THE TEXAS COORDINATE SYSTEM OF 1983, TEXAS STATE PLANE, NAD 83 4203-TEXAS CENTRAL, U.S. FOOT.
- ELEVATIONS BASED ON NAVD88.
- SURVEY OF CONTROL POINTS AND BENCHMARKS PERFORMED BY CIVILCORP. KFA IS NOT LIABLE FOR ANY DISCREPANCIES RELATED TO ESTABLISHMENT AND LOCATING OF THESE MONUMENTS.

CONTROL POINTS				
POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1000	10074985.58	3100836.63	567.36	CONTROL POINT;CP;5/8" IR W/CAP "CONTROL POINT"
1001	10075243.92	3100510.07	585.80	CONTROL POINT;CP;5/8" IR W/CAP "CONTROL POINT"
1003	10075008.16	3100202.54	592.01	CONTROL POINT;CP;MAG NAIL
1006	10074864.31	3100704.68	585.49	CONTROL POINT;CP;MAG NAIL
1009	10075074.08	3100994.14	569.02	CONTROL POINT;CP;MAG NAIL



CHANNEL LINE / CURVE TABLE							
NO.	LENGTH	BEGIN	END	LINE/CHORD DIRECTION	DELTA	TANGENT	RADIUS
L1	36.79	STA 1+00.00 N 10074981.55, E 3101254.49	STA 1+36.79 N 10074968.24, E 3101220.20	S68° 47' 09"W			
C1	27.82	STA 1+36.79 N 10074968.24, E 3101220.20	STA 1+64.60 N 10074956.03, E 3101195.24	S63° 55' 44"W	009°42'49.83"	27.78	164.07
L2	18.94	STA 1+64.60 N 10074956.03, E 3101195.24	STA 1+83.55 N 10074946.29, E 3101178.99	S59° 04' 19"W			
C2	16.56	STA 1+83.55 N 10074946.29, E 3101178.99	STA 2+00.11 N 10074938.99, E 3101164.15	S63° 48' 56"W	009°29'14.85"	16.54	100.00
L3	22.52	STA 2+00.11 N 10074938.99, E 3101164.15	STA 2+22.62 N 10074930.76, E 3101143.19	S68° 33' 34"W			
C3	23.63	STA 2+22.62 N 10074930.76, E 3101143.19	STA 2+46.25 N 10074919.62, E 3101122.41	S61° 47' 22"W	013°32'22.81"	23.58	100.00
L4	22.77	STA 2+46.25 N 10074919.62, E 3101122.41	STA 2+69.02 N 10074906.56, E 3101103.76	S55° 01' 11"W			
C4	27.05	STA 2+69.02 N 10074906.56, E 3101103.76	STA 2+96.07 N 10074894.22, E 3101079.78	S62° 46' 04"W	015°29'47.19"	26.96	100.00
L5	9.35	STA 2+96.07 N 10074894.22, E 3101079.78	STA 3+05.42 N 10074891.10, E 3101070.97	S70° 30' 58"W			
C5	2.33	STA 3+05.42 N 10074891.10, E 3101070.97	STA 3+07.75 N 10074890.39, E 3101068.74	S72° 11' 14"W	003°20'32.65"	2.33	40.00
L6	81.75	STA 3+07.75 N 10074890.39, E 3101068.74	STA 3+89.50 N 10074867.66, E 3100990.22	S73° 51' 31"W			
C6	6.08	STA 3+89.50 N 10074867.66, E 3100990.22	STA 3+95.59 N 10074865.62, E 3100984.49	S70° 22' 27"W	006°58'08.39"	6.08	50.00
L7	11.80	STA 3+95.59 N 10074865.62, E 3100984.49	STA 4+07.38 N 10074860.99, E 3100973.64	S66° 53' 22"W			
C7	13.03	STA 4+07.38 N 10074860.99, E 3100973.64	STA 4+20.41 N 10074857.49, E 3100961.13	S74° 21' 23"W	014°56'01.52"	13.00	50.00
C8	41.02	STA 4+20.41 N 10074857.49, E 3100961.13	STA 4+61.44 N 10074844.94, E 3100922.28	S72° 05' 50"W	019°27'06.98"	40.83	120.83
L8	34.13	STA 4+61.44 N 10074844.94, E 3100922.28	STA 4+95.57 N 10074829.11, E 3100892.04	S62° 22' 17"W			

LEGEND	
ALIGNMENT	—————
PROPERTY LINE	- - - - -
EXIST EASEMENT	- · - · -
SURVEY CONTROL POINT	▲
PERM DRAINAGE ESMT	▨
TEMPORARY EASEMENT	▩

STORM DRAIN LINE / CURVE TABLE							
NO.	LENGTH	BEGIN	END	LINE/CHORD DIRECTION	DELTA	TANGENT	RADIUS
L1	45.26	STA 10+00.00 N 10074856.57, E 3100955.66	STA 10+45.26 N 10074886.31, E 3100921.55	N48° 55' 35"W			
L2	79.08	STA 10+45.26 N 10074886.31, E 3100921.55	STA 11+24.34 N 10074945.42, E 3100869.01	N41° 38' 00"W			
L3	23.78	STA 11+24.34 N 10074945.42, E 3100869.01	STA 11+48.12 N 10074963.34, E 3100853.39	N41° 03' 46"W			
L4	24.11	STA 11+48.12 N 10074963.34, E 3100853.39	STA 11+72.22 N 10074975.67, E 3100832.67	N59° 14' 13"W			
L5	10.68	STA 11+72.22 N 10074975.67, E 3100832.67	STA 11+82.90 N 10074982.85, E 3100824.76	N47° 47' 09"W			
L6	76.40	STA 11+82.90 N 10074982.85, E 3100824.76	STA 12+59.30 N 10075034.19, E 3100768.18	N47° 47' 09"W			
L7	33.25	STA 12+59.30 N 10075034.19, E 3100768.18	STA 12+92.56 N 10075056.51, E 3100743.54	N47° 49' 07"W			
L8	78.68	STA 12+92.56 N 10075056.51, E 3100743.54	STA 13+71.24 N 10075109.39, E 3100685.28	N47° 46' 18"W			
L9	8.89	STA 13+71.24 N 10075109.39, E 3100685.28	STA 13+80.13 N 10075115.37, E 3100678.69	N47° 47' 09"W			

REV. NO.	DATE	REVISION DESCRIPTION

STATE OF TEXAS
 ABE A. SALINAS III
 105144
 PROFESSIONAL ENGINEER
 7/15/2023

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY ABE A. SALINAS III, P.E. LIC. #105144

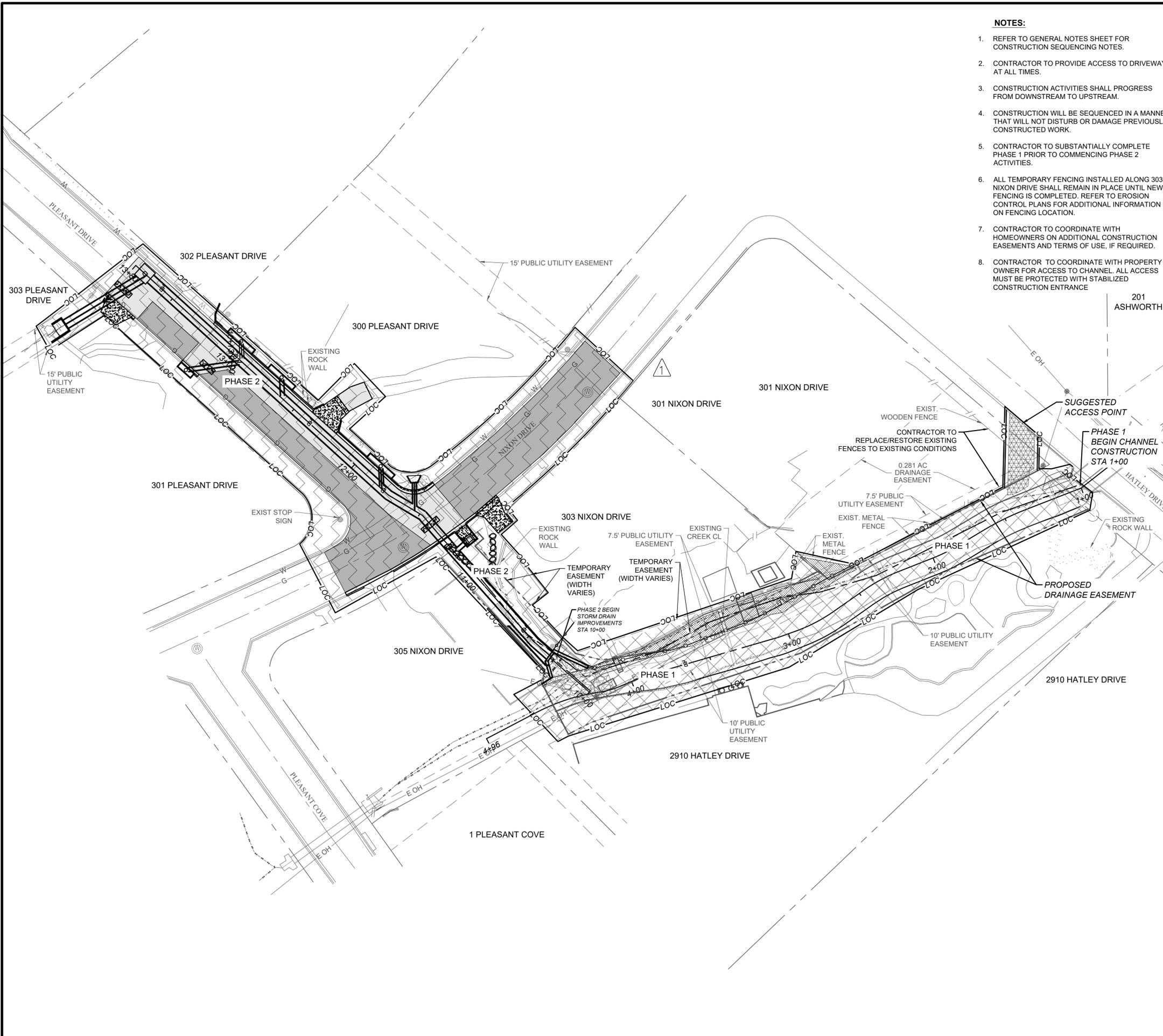
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CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 HORIZONTAL CONTROL LAYOUT SHEET

ROLLINGWOOD TEXAS
 K-FRIESE + ASSOCIATES
 PUBLIC PROJECT ENGINEERING
 1120 S. Capital of Texas Highway
 CityView 2, Suite 100
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 TBE Firm #6535
 www.kfriese.com

NOTES	NAME	DATE

0 40 80
 HORIZONTAL SCALE IN FEET



- NOTES:**
- REFER TO GENERAL NOTES SHEET FOR CONSTRUCTION SEQUENCING NOTES.
 - CONTRACTOR TO PROVIDE ACCESS TO DRIVEWAYS AT ALL TIMES.
 - CONSTRUCTION ACTIVITIES SHALL PROGRESS FROM DOWNSTREAM TO UPSTREAM.
 - CONSTRUCTION WILL BE SEQUENCED IN A MANNER THAT WILL NOT DISTURB OR DAMAGE PREVIOUSLY CONSTRUCTED WORK.
 - CONTRACTOR TO SUBSTANTIALLY COMPLETE PHASE 1 PRIOR TO COMMENCING PHASE 2 ACTIVITIES.
 - ALL TEMPORARY FENCING INSTALLED ALONG 303 NIXON DRIVE SHALL REMAIN IN PLACE UNTIL NEW FENCING IS COMPLETED. REFER TO EROSION CONTROL PLANS FOR ADDITIONAL INFORMATION ON FENCING LOCATION.
 - CONTRACTOR TO COORDINATE WITH HOMEOWNERS ON ADDITIONAL CONSTRUCTION EASEMENTS AND TERMS OF USE, IF REQUIRED.
 - CONTRACTOR TO COORDINATE WITH PROPERTY OWNER FOR ACCESS TO CHANNEL. ALL ACCESS MUST BE PROTECTED WITH STABILIZED CONSTRUCTION ENTRANCE



LEGEND

- CENTERLINE
- PROPERTY LINE
- - - - - EXIST EASEMENT
- - - - - PROP EASEMENT
- EDGE OF ASPHALT
- EDGE OF CONCRETE
- GUTTER
- CONCRETE PAVEMENT
- DRAINAGE FLOW LINE
- WOOD FENCE
- FENCE LINE
- PAVED PARKING / DRIVEWAY
- WW --- WASTEWATER LINE
- W --- WATER LINE
- ROCK WALL
- EXISTING RCP PIPE
- G --- NATURAL GAS LINE
- E OH --- ELECTRIC OVERHEAD
- E UG --- ELECTRIC UNDERGROUND
- GUY WIRE
- WATER METER
- WATER VALVE
- SPRINKLER VALVE
- WASTEWATER MANHOLE
- CLEANOUT
- FIRE HYDRANT
- POWER POLE
- ELECTRIC JUNCTION BOX
- SIGN
- MAILBOX
- TREE
- TREE TO BE REMOVED
- EXISTING CHANNEL CL

LEGEND

- LOC CONSTRUCTION AREA
- 007 CONSTRUCTION PHASE 1
- CONSTRUCTION PHASE 2
- STABILIZED CONSTRUCTION ENTRANCE
- TEMPORARY EASEMENT

REV. NO.	BY	DATE	REVISION DESCRIPTION
1	DB	10/05/2023	ADDENDUM #2

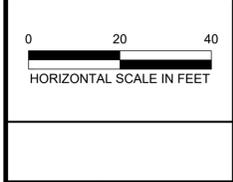
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 CONSTRUCTION ACCESS AND SEQUENCING

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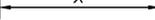
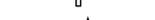




NOTES:

1. ALL PROPERTY OWNERS ADJACENT TO CONSTRUCTION MUST HAVE ACCESS TO THEIR PROPERTY AT ALL TIMES.
2. MACHINERY, VEHICLES AND OTHER EQUIPMENT OPERATE WITHIN THE LIMITS OF CONSTRUCTION AND SHALL NOT BE STORED IN ROAD OR BLOCK TRAFFIC WHEN AVOIDABLE.
3. ALL TRAFFIC CONTROL SHALL BE IN CONFORMANCE WITH CITY OF AUSTIN STANDARDS (PER STANDARD 804S-2)

LEGEND

-  CONSTRUCTION AREA
-  DRUMS OR 42" CONES @ 15' C-C
-  WATER FILLED BARRIER
-  TEMPORARY TRAFFIC SPACING
-  TYPE I BARRICADE
-  TYPE III BARRICADE
-  FLAGGER
-  TEMPORARY TRAFFIC SIGN
-  TRAFFIC FLOW DEPICTION
-  TEMPORARY PAVEMENT MARKING
-  MESSAGE BOARD
-  ARROW BOARD

SEE COA STANDARD DETAIL 804S-1 SERIES FOR MORE DETAILS

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**CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS**
TRAFFIC CONTROL PLAN


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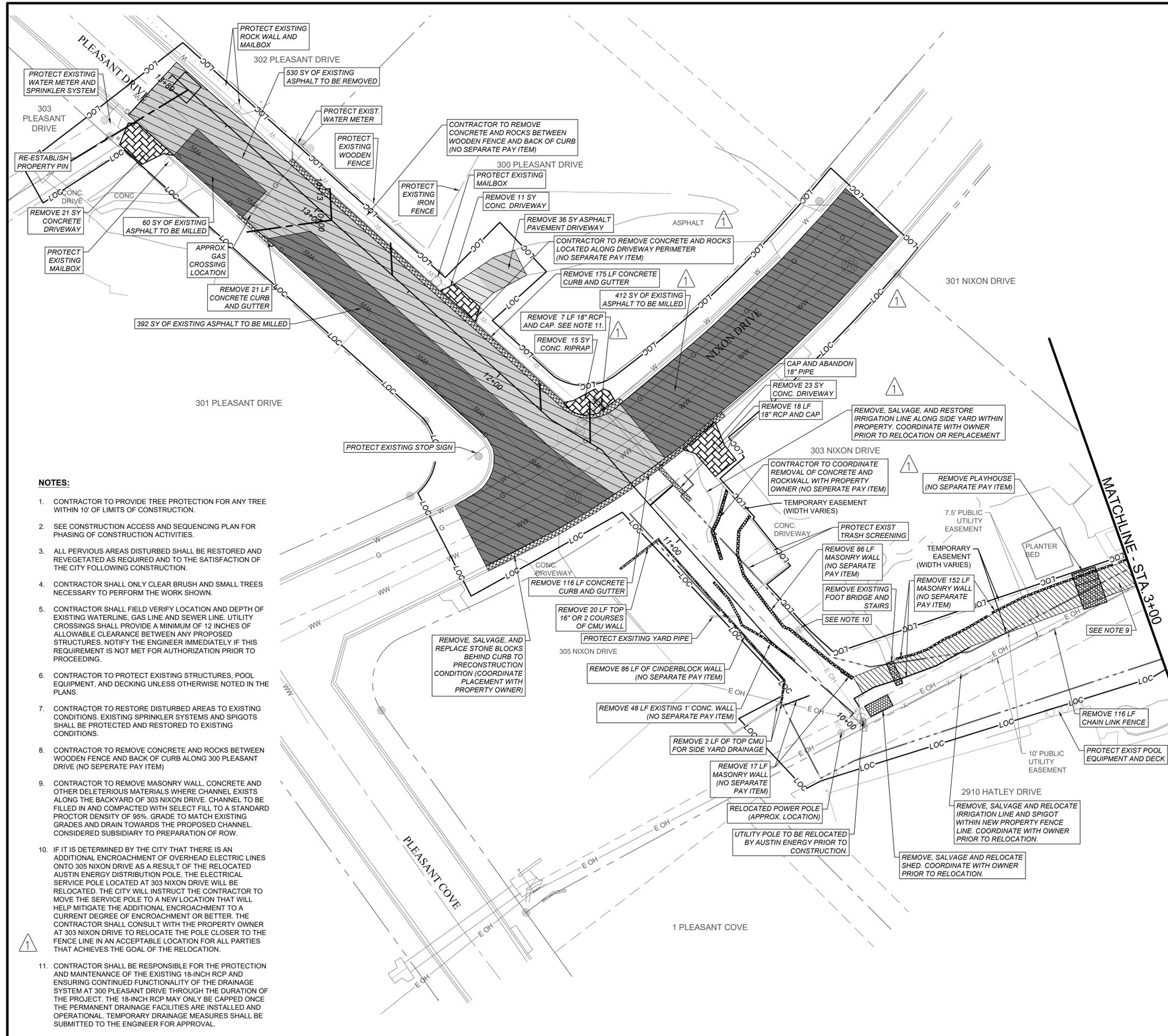
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 HORIZONTAL SCALE IN FEET

CT101 **8** OF **49**

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 ALDO HERNANDEZ



LEGEND

	CENTERLINE
	PROPERTY LINE
	EXIST EASEMENT
	PROP EASEMENT
	EDGE OF ASPHALT
	EDGE OF CONCRETE
	GUTTER
	CONCRETE PAVEMENT
	DRAINAGE FLOW LINE
	WOOD FENCE
	FENCE LINE
	PAVED PARKING / DRIVEWAY
	WASTEWATER LINE
	WATER LINE
	ROCK WALL
	EXISTING RCP PIPE
	NATURAL GAS LINE
	ELECTRIC OVERHEAD
	ELECTRIC UNDERGROUND
	GUY WIRE
	WATER METER
	WATER VALVE
	SPRINKLER VALVE
	WASTEWATER MANHOLE
	CLEANOUT
	FIRE HYDRANT
	POWER POLE
	ELECTRIC JUNCTION BOX
	SIGN
	MAILBOX
	TREE
	TREE TO BE REMOVED
	EXISTING CHANNEL CL

LEGEND

	DEMO FULL PAVEMENT DEPTH
	PAVEMENT MILLING
	DEMOLISH CURB & GUTTER
	DEMOLISH CONCRETE
	CLEAR & GRUB VEGETATION
	TO BE REMOVED
	REMOVE CHAIN LINK FENCE
	CHAIN LINK FENCE
	ALIGNMENT LINE

NOTES:

- CONTRACTOR TO PROVIDE TREE PROTECTION FOR ANY TREE WITHIN 10' OF LIMITS OF CONSTRUCTION.
- SEE CONSTRUCTION ACCESS AND SEQUENCING PLAN FOR PHASING OF CONSTRUCTION ACTIVITIES.
- ALL PERVIOUS AREAS DISTURBED SHALL BE RESTORED AND REVEGETATED AS REQUIRED AND TO THE SATISFACTION OF THE CITY FOLLOWING CONSTRUCTION.
- CONTRACTOR SHALL ONLY CLEAR BRUSH AND SMALL TREES NECESSARY TO PERFORM THE WORK SHOWN.
- CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF EXISTING WATERLINE, GAS LINE AND SEWER LINE. UTILITY CROSSINGS SHALL PROVIDE A MINIMUM OF 12 INCHES OF ALLOWABLE CLEARANCE BETWEEN ANY PROPOSED STRUCTURES. NOTIFY THE ENGINEER IMMEDIATELY IF THIS REQUIREMENT IS NOT MET FOR AUTHORIZATION PRIOR TO PROCEEDING.
- CONTRACTOR TO PROTECT EXISTING STRUCTURES, POOL EQUIPMENT, AND DECKING UNLESS OTHERWISE NOTED IN THE PLANS.
- CONTRACTOR TO RESTORE DISTURBED AREAS TO EXISTING CONDITIONS. EXISTING SPRINKLER SYSTEMS AND SPIGOTS SHALL BE PROTECTED AND RESTORED TO EXISTING CONDITIONS.
- CONTRACTOR TO REMOVE CONCRETE AND ROCKS BETWEEN WOODEN FENCE AND BACK OF CURB ALONG 300 PLEASANT DRIVE (NO SEPERATE PAY ITEM)
- CONTRACTOR TO REMOVE MASONRY WALL, CONCRETE AND OTHER DELETERIOUS MATERIALS WHERE CHANNEL EXISTS ALONG THE BACKYARD OF 303 NIXON DRIVE. CHANNEL TO BE FILLED IN AND COMPACTED WITH SELECT FILL TO A STANDARD PROCTOR DENSITY OF 95%. GRADE TO MATCH EXISTING GRADES AND DRAIN TOWARDS THE PROPOSED CHANNEL. CONSIDERED SUBSIDIARY TO PREPARATION OF ROW.
- IF IT IS DETERMINED BY THE CITY THAT THERE IS AN ADDITIONAL ENCROACHMENT OF OVERHEAD ELECTRIC LINES ONTO 305 NIXON DRIVE AS A RESULT OF THE RELOCATED AUSTIN ENERGY DISTRIBUTION POLE, THE ELECTRICAL SERVICE POLE LOCATED AT 303 NIXON DRIVE WILL BE RELOCATED. THE CITY WILL INSTRUCT THE CONTRACTOR TO MOVE THE SERVICE POLE TO A NEW LOCATION THAT WILL HELP MITIGATE THE ADDITIONAL ENCROACHMENT TO A CURRENT DEGREE OF ENCROACHMENT OR BETTER. THE CONTRACTOR SHALL CONSULT WITH THE PROPERTY OWNER AT 303 NIXON DRIVE TO RELOCATE THE POLE CLOSER TO THE FENCE LINE IN AN ACCEPTABLE LOCATION FOR ALL PARTIES THAT ACHIEVES THE GOAL OF THE RELOCATION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND MAINTENANCE OF THE EXISTING 18-INCH RCP AND ENSURING CONTINUED FUNCTIONALITY OF THE DRAINAGE SYSTEM AT 300 PLEASANT DRIVE THROUGH THE DURATION OF THE PROJECT. THE 18-INCH RCP MAY ONLY BE CAPPED ONCE THE PERMANENT DRAINAGE FACILITIES ARE INSTALLED AND OPERATIONAL. TEMPORARY DRAINAGE MEASURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



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1	10/05/2023	ADDENDUM #2



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CITY OF ROLLINGWOOD, TEXAS
CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
DEMOLITION AND PROTECTION PLAN

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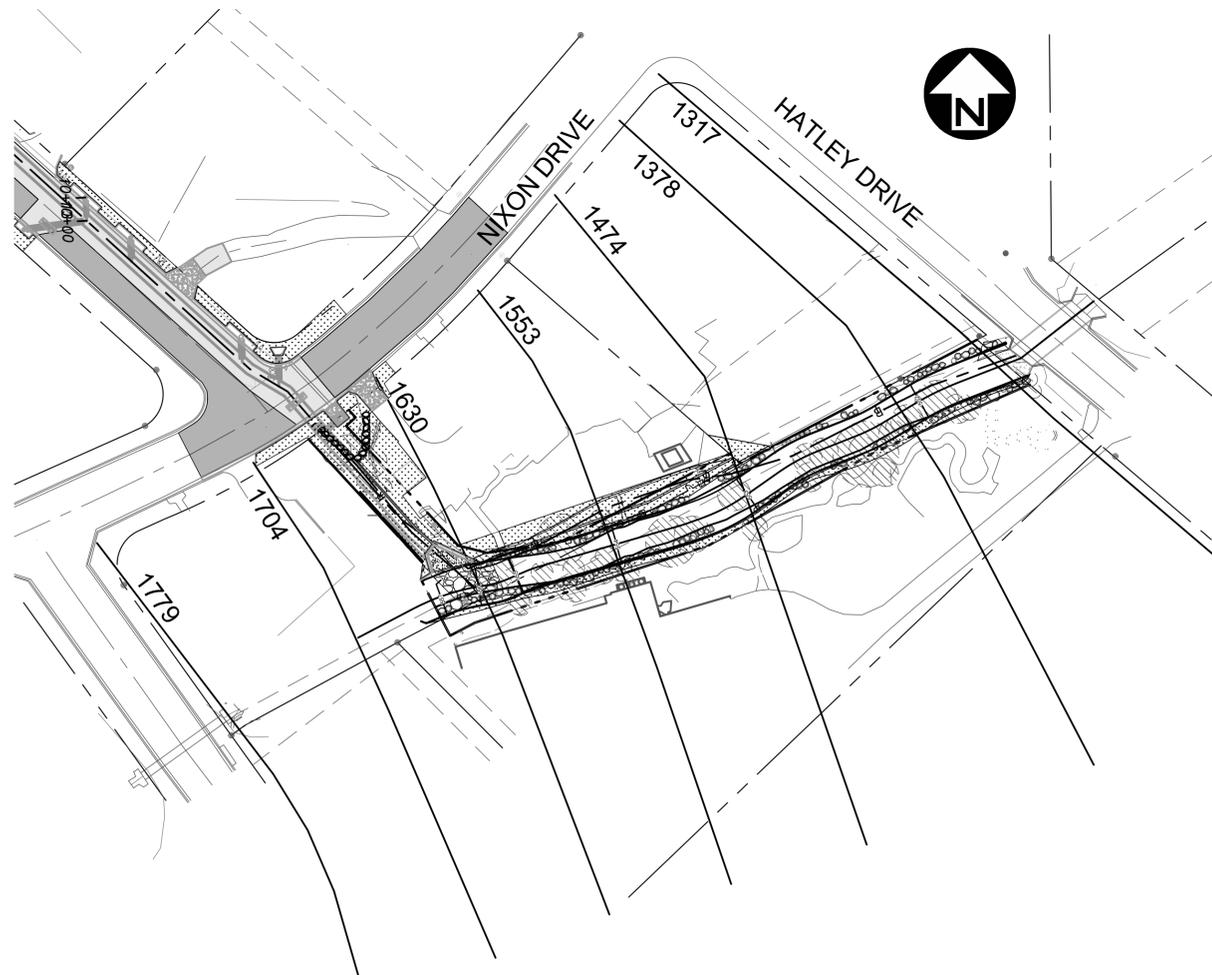
NOTES	NAME	DATE
SURVEY BY		
DRAWN BY	AH	08/21
DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY		



HEC-RAS CALCULATIONS

EXISTING CONDITIONS													PROPOSED CONDITIONS														
Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Ch Depth (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Ch Depth (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	1779	25-year	444	561.95	565.37	3.42	565.37	566.27	0.011482	8.53	62.92	42.46	0.91	Reach 1	1779	25-year	444	561.95	565.37	3.42	565.37	566.27	0.011482	8.53	62.92	42.46	0.91
Reach 1	1779	100-year	600	561.95	565.91	3.96	565.91	566.73	0.008598	8.34	89.24	49.95	0.82	Reach 1	1779	100-year	600	561.95	565.91	3.96	565.91	566.73	0.008598	8.34	89.24	49.95	0.82
Reach 1	1704	25-year	444	559.06	562.27	3.21	562.27	563.24	0.000145	8.01	60.06	36.5	1	Reach 1	1704	25-year	444	559.06	562.27	3.21	562.27	563.24	0.000145	8.01	60.06	36.5	1
Reach 1	1704	100-year	600	559.06	562.70	3.64	562.7	563.87	0.000137	8.85	77.27	43.72	1	Reach 1	1704	100-year	600	559.06	562.7	3.64	562.7	563.87	0.000137	8.85	77.27	43.72	1
Reach 1	1630	25-year	783	556.62	560.04	3.42	560.04	560.86	0.013948	9.12	145.69	95.54	1.02	Reach 1	1630	25-year	783	555.64	559.45	3.81	559.45	560.39	0.007517	8.49	138.34	83.76	0.81
Reach 1	1630	100-year	1031	556.62	560.46	3.84	560.46	561.31	0.012422	9.54	187.56	103.63	0.99	Reach 1	1630	100-year	1031	555.64	559.88	4.24	559.88	560.93	0.007558	9.23	176.56	92.46	0.83
Reach 1	1553	25-year	783	554.39	559.09	4.7		559.36	0.002295	4.73	244.99	107.61	0.44	Reach 1	1553	25-year	783	554.15	559.06	4.91		559.33	0.001762	5.02	269.81	106.61	0.4
Reach 1	1553	100-year	1031	554.39	559.78	5.39		560.06	0.001989	4.95	326.82	128.31	0.42	Reach 1	1553	100-year	1031	554.15	559.75	5.60		560.03	0.0017	5.3	351.03	125.44	0.4
Reach 1	1474	25-year	783	552.93	559.12	6.19		559.21	0.000767	3.49	392.52	104.87	0.27	Reach 1	1474	25-year	783	553.03	559.1	6.07		559.21	0.000514	3.45	403.65	104.74	0.25
Reach 1	1474	100-year	1031	552.93	559.80	6.87		559.92	0.00081	3.89	465.37	108.75	0.28	Reach 1	1474	100-year	1031	553.03	559.77	6.74		559.92	0.000566	3.89	476	108.62	0.27
Reach 1	1378	25-year	783	552.24	559.13	6.89		559.17	0.000155	1.8	671.8	140.45	0.13	Reach 1	1378	25-year	783	552.06	559.13	7.07		559.16	0.000154	2.13	682.52	140.36	0.14
Reach 1	1378	100-year	1031	552.24	559.82	7.58		559.86	0.000183	2.09	770.13	146.84	0.14	Reach 1	1378	100-year	1031	552.06	559.81	7.75		559.86	0.000184	2.49	780.58	146.74	0.16
Reach 1	1317	25-year	783	551.58	559.00	7.42	555.82	559.14	0.000853	3.16	304.36	108.77	0.27	Reach 1	1317	25-year	783	551.75	559.02	7.27	555.14	559.14	0.000505	2.84	330.96	108.99	0.24
Reach 1	1317	100-year	1031	551.58	559.66	8.08	556.54	559.83	0.000842	3.46	380.2	118.31	0.28	Reach 1	1317	100-year	1031	551.75	559.69	7.94	555.79	559.83	0.000519	3.17	406.94	118.58	0.25
Reach 1	1284		Culvert											Reach 1	1284		Culvert										

NOTE: THE EXISTING 2-7'x4' MULTIPLE BOX CULVERT AT HATLEY DRIVE IS CURRENTLY UNDERSIZED RESULTING IN A BACKWATER CONDITION THROUGH THE CHANNEL. THEREFORE, CHANNEL IMPROVEMENTS CONTAINED IN THIS PLAN SET PRODUCE A NEGLIGIBLE IMPACT AT THE UPSTREAM FACE OF CULVERT DUE TO THE EXISTING CULVERT CAPACITY. A FUTURE PROJECT MAY IMPROVE THE DOWNSTREAM CULVERT SIZE WHICH WOULD IMPROVE THE CHANNEL TAILWATER CONDITION AND LOWER WSELs WITHIN THE CHANNEL. SEE THE PRELIMINARY ENGINEERING REPORT FOR NIXON AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS PREPARED BY K. FRIESE + ASSOCIATES FOR MORE INFORMATION.



REVISION DESCRIPTION

DATE

REV BY

NO.



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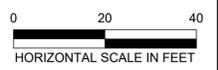
CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
CHANNEL HYDRAULIC CALCULATIONS

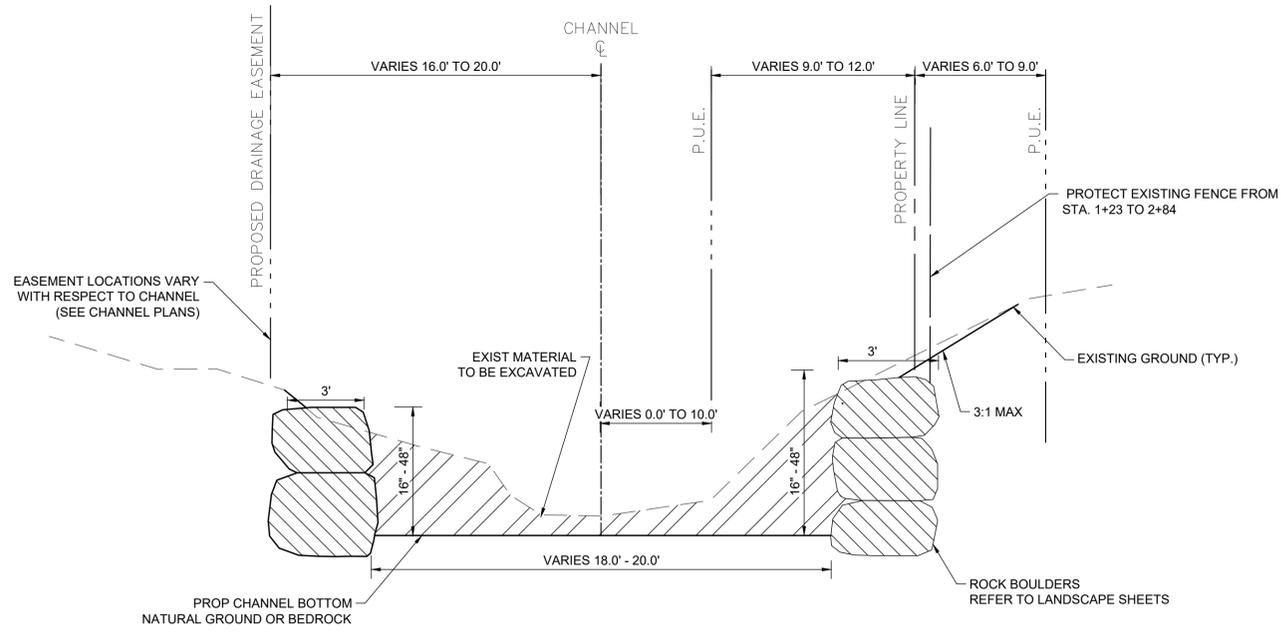


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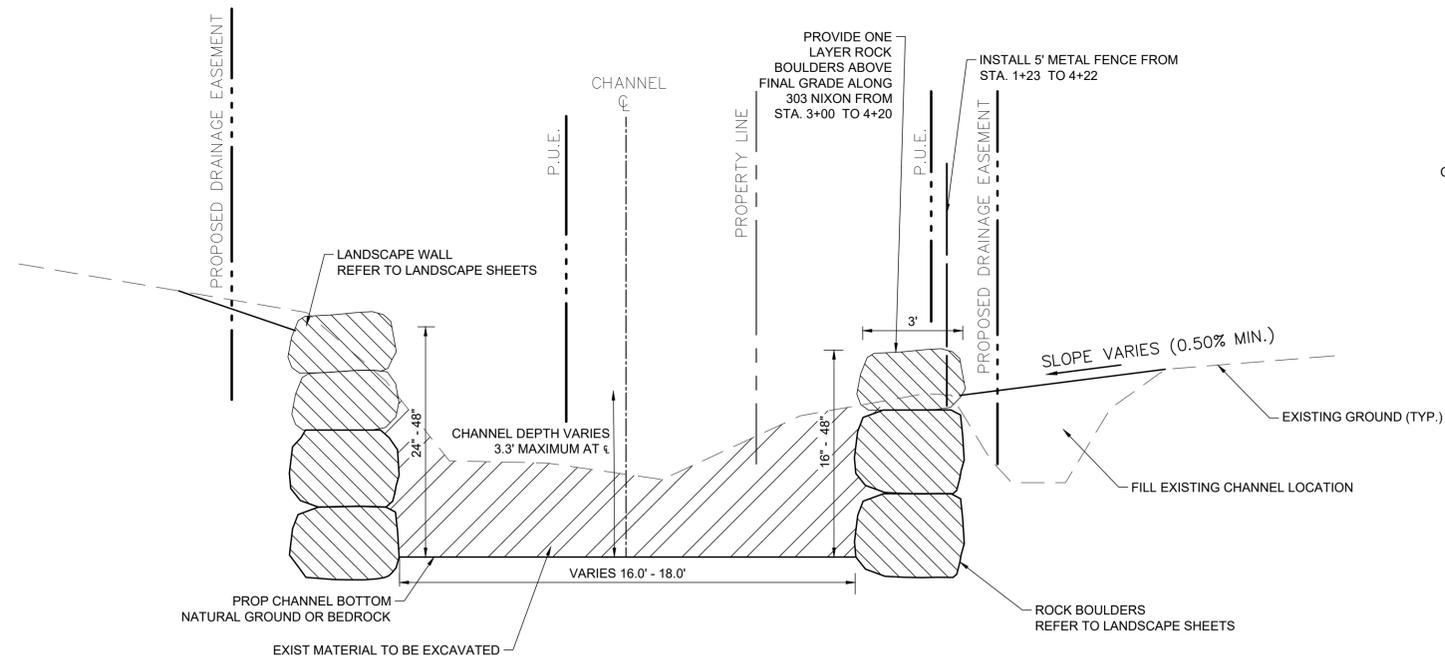
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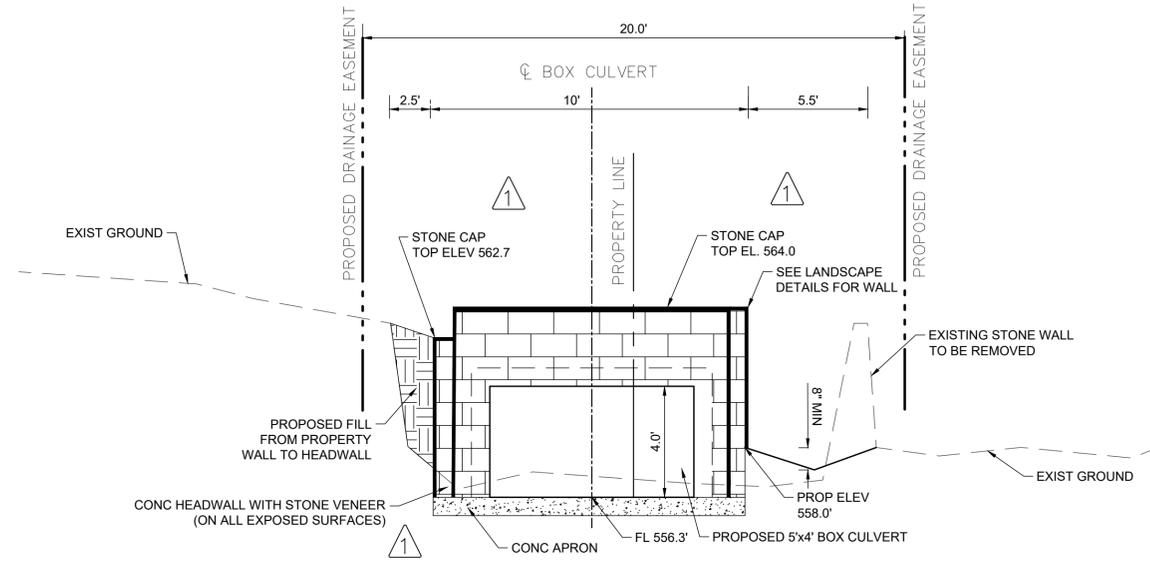
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TYPICAL CHANNEL SECTION A-A
NTS
BEGIN CHANNEL TO STA. 2+40.00



TYPICAL CHANNEL SECTION B-B
NTS
STA. 2+40.00 TO 4+20.00



TYPICAL CHANNEL SECTION C-C
NTS
BOX CULVERT TO CHANNEL

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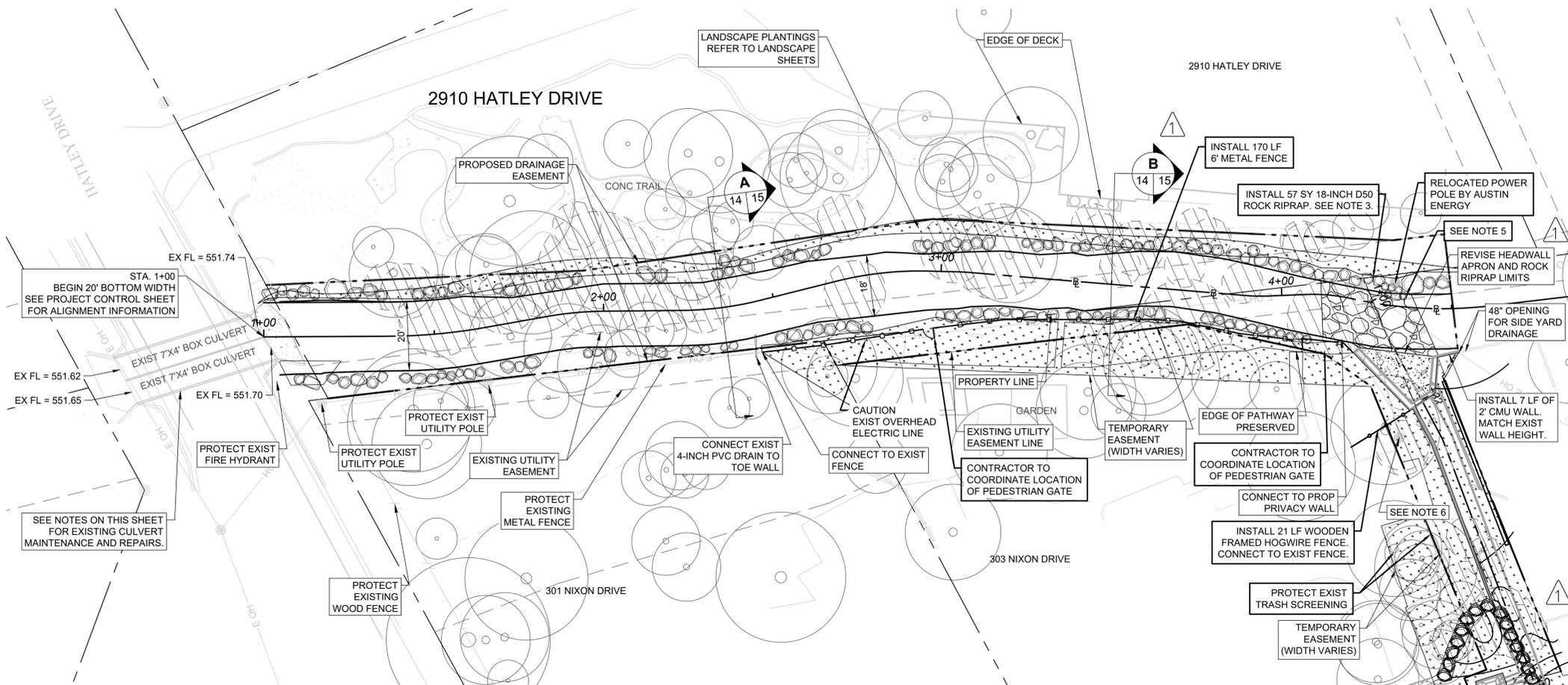
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CITY OF ROLLINGWOOD
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CHECKED BY	GE	08/21
REVIEWED BY	---	---



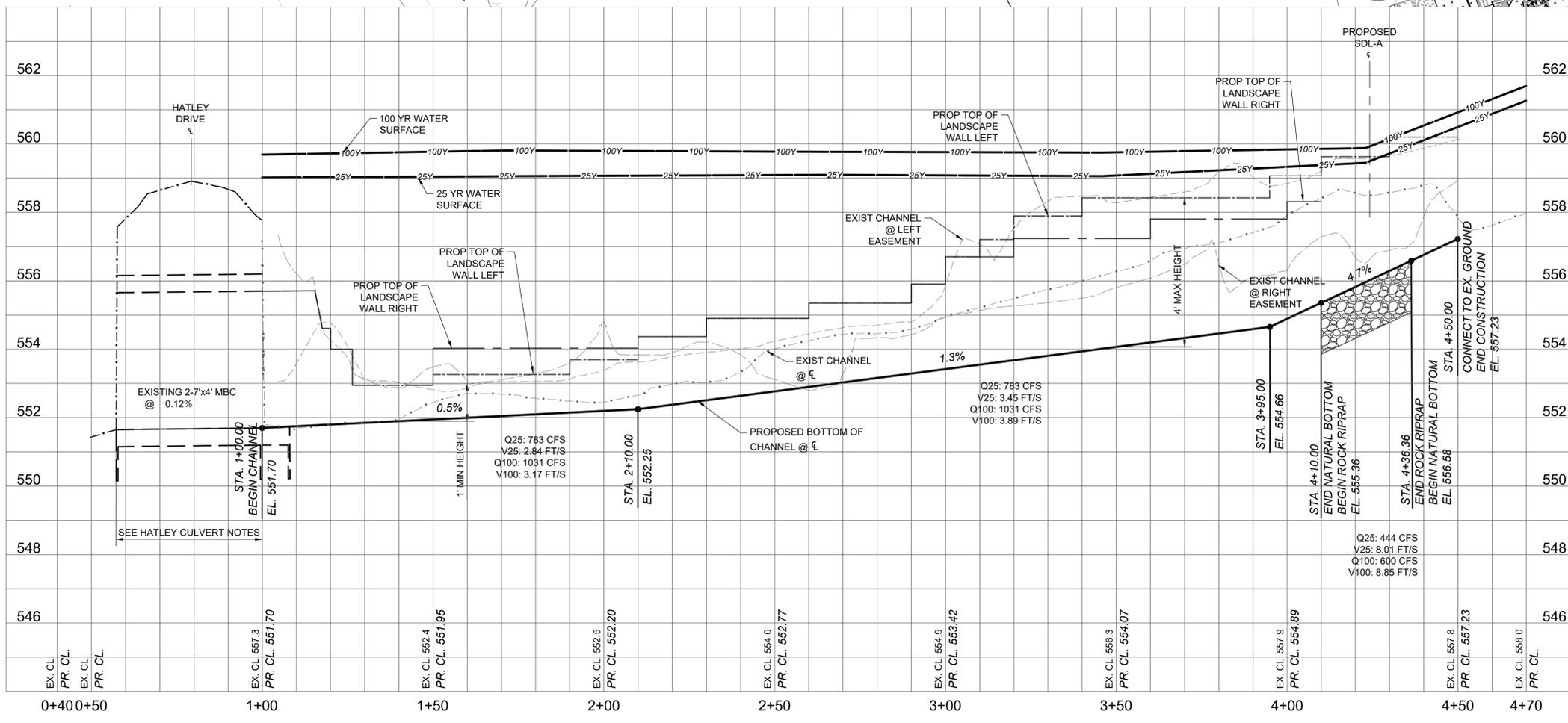


- NOTES:**
- COORDINATE RAINWATER CONNECTION TO CHANNEL IMPROVEMENTS WITH PROPERTY OWNER AT 301 NIXON DRIVE.
 - SEE LANDSCAPE SHEETS FOR LANDSCAPE WALL AND BOULDER PLACEMENT.
 - PLACEMENT OF ROCK RIPRAP SHALL HAVE A MINIMUM THICKNESS OF 36 INCHES OR TO THE DEPTH OF BEDROCK. COORDINATE WITH ENGINEER IF BEDROCK IS EXPOSED PRIOR TO ROCK PLACEMENT.
 - ALL PRESERVED TREES/CANOPY SHALL BE PROTECTED IN ACCORDANCE WITH TREE PROTECTION TABLE.
 - PROTECT THE RELOCATED ELECTRIC POWER POLE AND GUY WIRE BY INSTALLING ROCK BOULDERS AROUND THE BASE OF THE POLE. THE ROCK BOULDERS SHOULD BE AT LEAST ONE FOOT IN DIAMETER AND SHOULD BE PLACED AROUND THE BASE OF THE POLE, ENSURING THAT THE GUY WIRE IS NOT DISTURBED. THE ROCK BOULDERS SHOULD BE POSITIONED SLIGHTLY BELOW GROUND LEVEL AND TRANSITION TO NATURAL GROUND.
 - IF IT IS DETERMINED BY THE CITY THAT THERE IS AN ADDITIONAL ENCROACHMENT OF OVERHEAD ELECTRIC LINES ONTO 305 NIXON DRIVE AS A RESULT OF THE RELOCATED AUSTIN ENERGY DISTRIBUTION POLE, THE ELECTRICAL SERVICE POLE LOCATED AT 303 NIXON DRIVE WILL BE RELOCATED. THE CITY WILL INSTRUCT THE CONTRACTOR TO MOVE THE SERVICE POLE TO A NEW LOCATION THAT WILL HELP MITIGATE THE ADDITIONAL ENCROACHMENT TO A CURRENT DEGREE OF ENCROACHMENT OR BETTER. THE CONTRACTOR SHALL CONSULT WITH THE PROPERTY OWNER AT 303 NIXON DRIVE TO RELOCATE THE POLE CLOSER TO THE FENCE LINE IN AN ACCEPTABLE LOCATION FOR ALL PARTIES THAT ACHIEVES THE GOAL OF THE RELOCATION.

- HATLEY CULVERT NOTES:**
- WASH OUT THE SURFACE INSIDE OF BOX CULVERT. REMOVE ANY DEBRIS, DIRT, VEGETATION AND LOOSE MATERIALS.
 - SMOOTH BOTTOM SURFACE OF CULVERT TO ALLOW FOR POSITIVE DRAINAGE FREE OF PONDING WATER WITHIN THE BOX CULVERT. REPAIRS MAY INCLUDE GRINDING AND/OR RESURFACING THE BOTTOM SURFACE.
 - COVER EXPOSED REBAR WITH AN EPOXY GROUT, AS APPROVED BY THE ENGINEER.

LEGEND

	CENTERLINE
	RIGHT OF WAY LINE
	PROPERTY LINE
	EXISTING EASEMENT LINE
	PROPOSED EASEMENT LINE
	EXISTING DITCH EDGE
	EXISTING WOOD FENCE
	EXISTING MAJOR CONTOURS
	EXISTING MINOR CONTOURS
	PROPOSED MAJOR CONTOURS
	PROPOSED MINOR CONTOURS
	EXISTING ELECTRIC OVERHEAD
	EXISTING FENCE LINE
	PROPOSED CHAIN LINK FENCE
	PROPOSED STORM DRAIN
	TREE
	TREE TO BE REMOVED
	STONE RIPRAP
	LANDSCAPE PLANTING



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1	10/05/2023	ADDENDUM #2

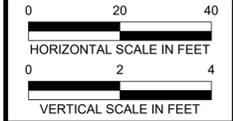


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CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 CHANNEL PLAN AND PROFILE STA. 1+00.00 TO END

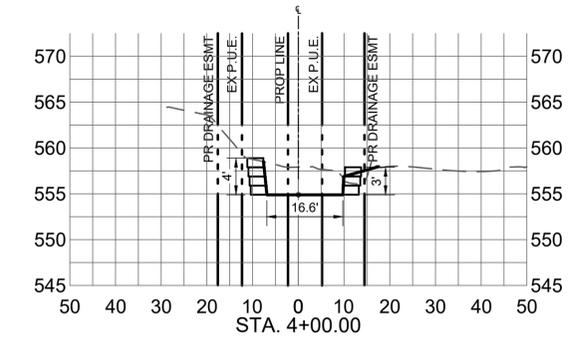
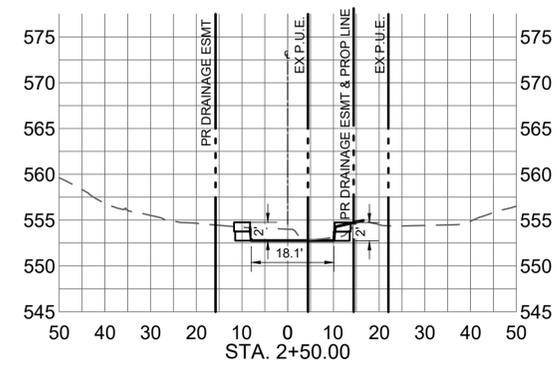
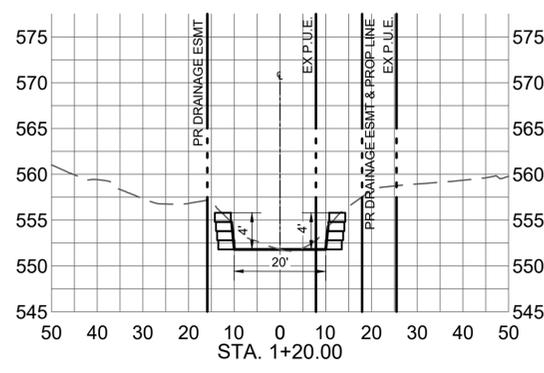
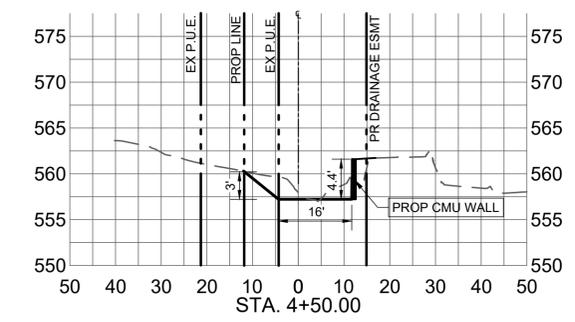
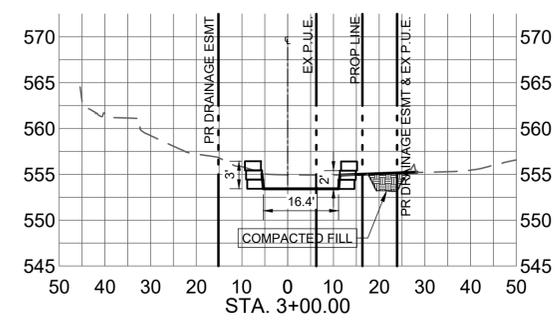
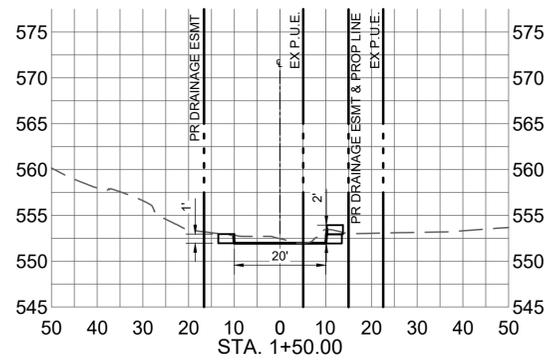
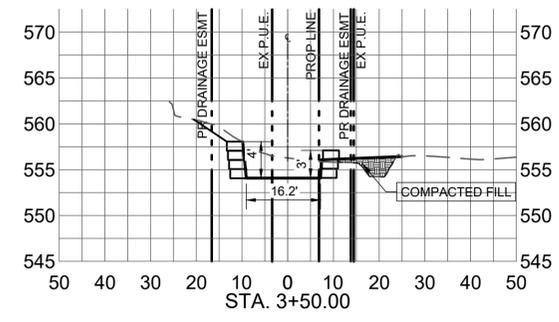
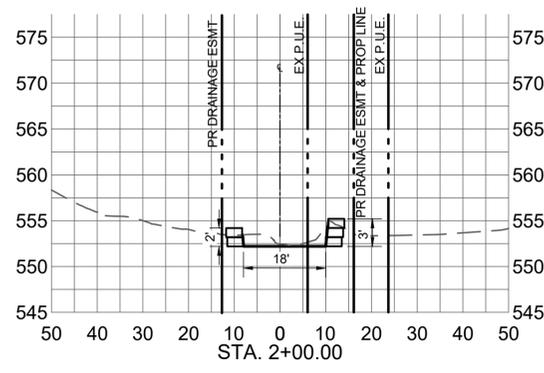
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NOTES	NAME	DATE
SURVEY BY		
DRAWN BY	AH	08/21
DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY		



NOTES:

- CROSS-SECTIONS ARE SHOWN ALONG THE BASELINE LOOKING UPSTREAM.
- EXISTING GROUND FOR CROSS-SECTIONS WERE GENERATED FROM CIVILCORP SURVEY DATA.
- ELEVATION CALLOUTS AT THE LIMITS OF THE EXCAVATION ARE TO THE ACCURACY OF THE SURVEY DATA. CONTRACTOR TO HOLD THE OFFSET IN THE EVENT OF A DISCREPANCY.
- APPARENT ROW OR EASEMENT LIMITS ARE SHOWN FOR INFORMATIONAL PURPOSES AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR.



REV. NO.	BY	DATE	REVISION DESCRIPTION

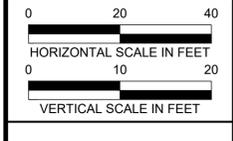
STATE OF TEXAS
 ABE A. SALINAS III
 105144
 PROFESSIONAL ENGINEER
 7/15/2023
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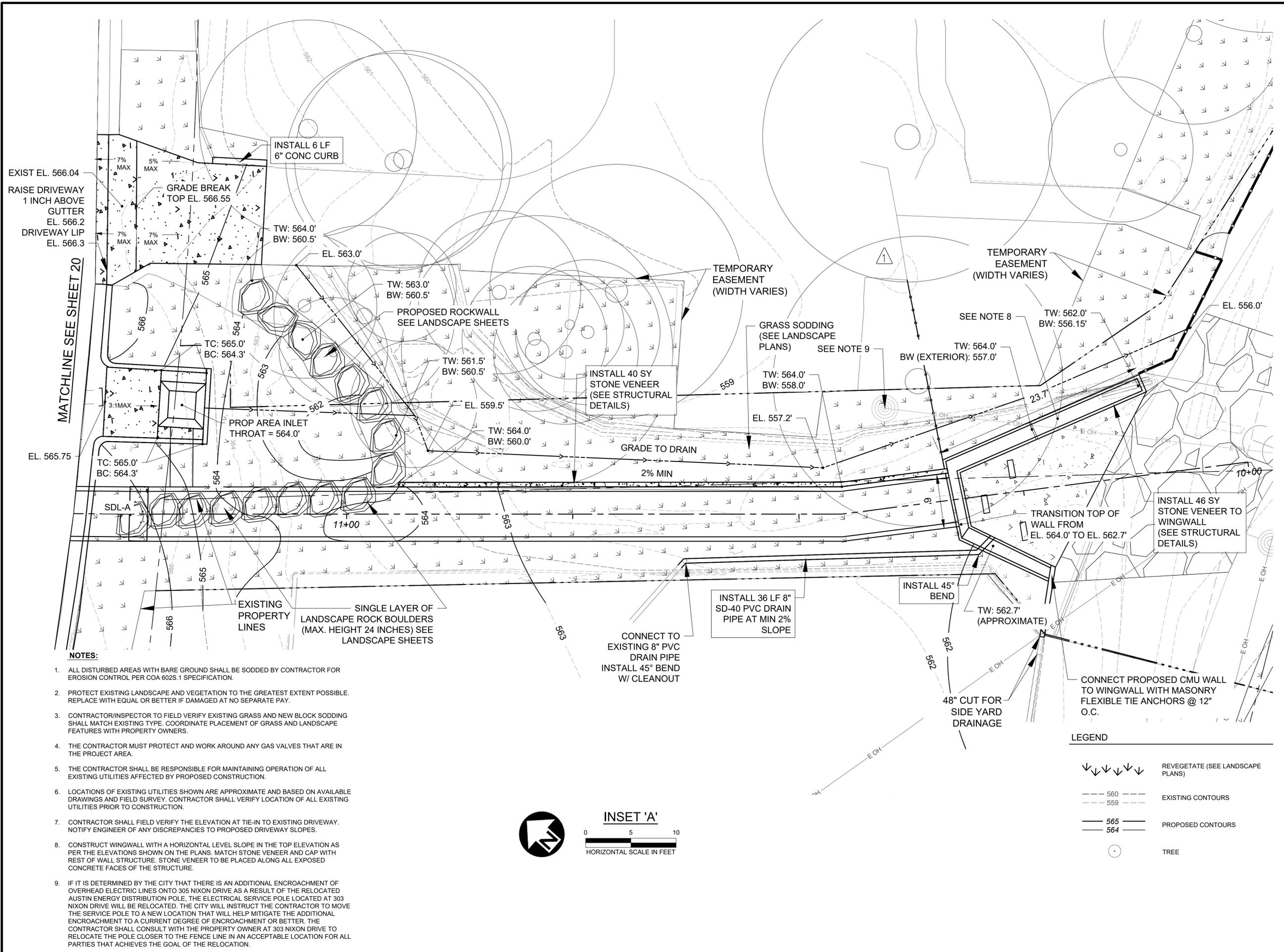
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CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 CHANNEL CROSS SECTIONS

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EXIST EL. 566.04
 RAISE DRIVEWAY
 1 INCH ABOVE
 GUTTER
 EL. 566.2
 DRIVEWAY LIP
 EL. 566.3

MATCHLINE SEE SHEET 20

NOTES:

- ALL DISTURBED AREAS WITH BARE GROUND SHALL BE SODDED BY CONTRACTOR FOR EROSION CONTROL PER COA 602S.1 SPECIFICATION.
- PROTECT EXISTING LANDSCAPE AND VEGETATION TO THE GREATEST EXTENT POSSIBLE. REPLACE WITH EQUAL OR BETTER IF DAMAGED AT NO SEPARATE PAY.
- CONTRACTOR/INSPECTOR TO FIELD VERIFY EXISTING GRASS AND NEW BLOCK SODDING SHALL MATCH EXISTING TYPE. COORDINATE PLACEMENT OF GRASS AND LANDSCAPE FEATURES WITH PROPERTY OWNERS.
- THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING OPERATION OF ALL EXISTING UTILITIES AFFECTED BY PROPOSED CONSTRUCTION.
- LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE AND BASED ON AVAILABLE DRAWINGS AND FIELD SURVEY. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL FIELD VERIFY THE ELEVATION AT TIE-IN TO EXISTING DRIVEWAY. NOTIFY ENGINEER OF ANY DISCREPANCIES TO PROPOSED DRIVEWAY SLOPES.
- CONSTRUCT WINGWALL WITH A HORIZONTAL LEVEL SLOPE IN THE TOP ELEVATION AS PER THE ELEVATIONS SHOWN ON THE PLANS. MATCH STONE VENEER AND CAP WITH REST OF WALL STRUCTURE. STONE VENEER TO BE PLACED ALONG ALL EXPOSED CONCRETE FACES OF THE STRUCTURE.
- IF IT IS DETERMINED BY THE CITY THAT THERE IS AN ADDITIONAL ENCROACHMENT OF OVERHEAD ELECTRIC LINES ONTO 305 NIXON DRIVE AS A RESULT OF THE RELOCATED AUSTIN ENERGY DISTRIBUTION POLE. THE ELECTRICAL SERVICE POLE LOCATED AT 303 NIXON DRIVE WILL BE RELOCATED. THE CITY WILL INSTRUCT THE CONTRACTOR TO MOVE THE SERVICE POLE TO A NEW LOCATION THAT WILL HELP MITIGATE THE ADDITIONAL ENCROACHMENT TO A CURRENT DEGREE OF ENCROACHMENT OR BETTER. THE CONTRACTOR SHALL CONSULT WITH THE PROPERTY OWNER AT 303 NIXON DRIVE TO RELOCATE THE POLE CLOSER TO THE FENCE LINE IN AN ACCEPTABLE LOCATION FOR ALL PARTIES THAT ACHIEVES THE GOAL OF THE RELOCATION.



LEGEND

- REVEGETATE (SEE LANDSCAPE PLANS)
- 560 --- EXISTING CONTOURS
- 559 --- EXISTING CONTOURS
- 565 --- PROPOSED CONTOURS
- 564 --- PROPOSED CONTOURS
- TREE

REV. NO.	BY	DATE	REVISION DESCRIPTION
1	DB	10/05/2023	ADDENDUM #2

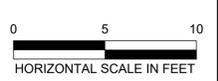


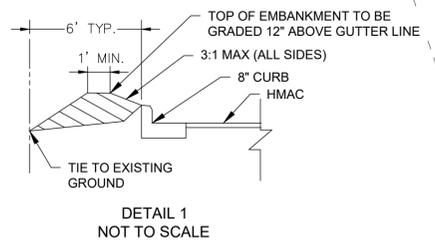
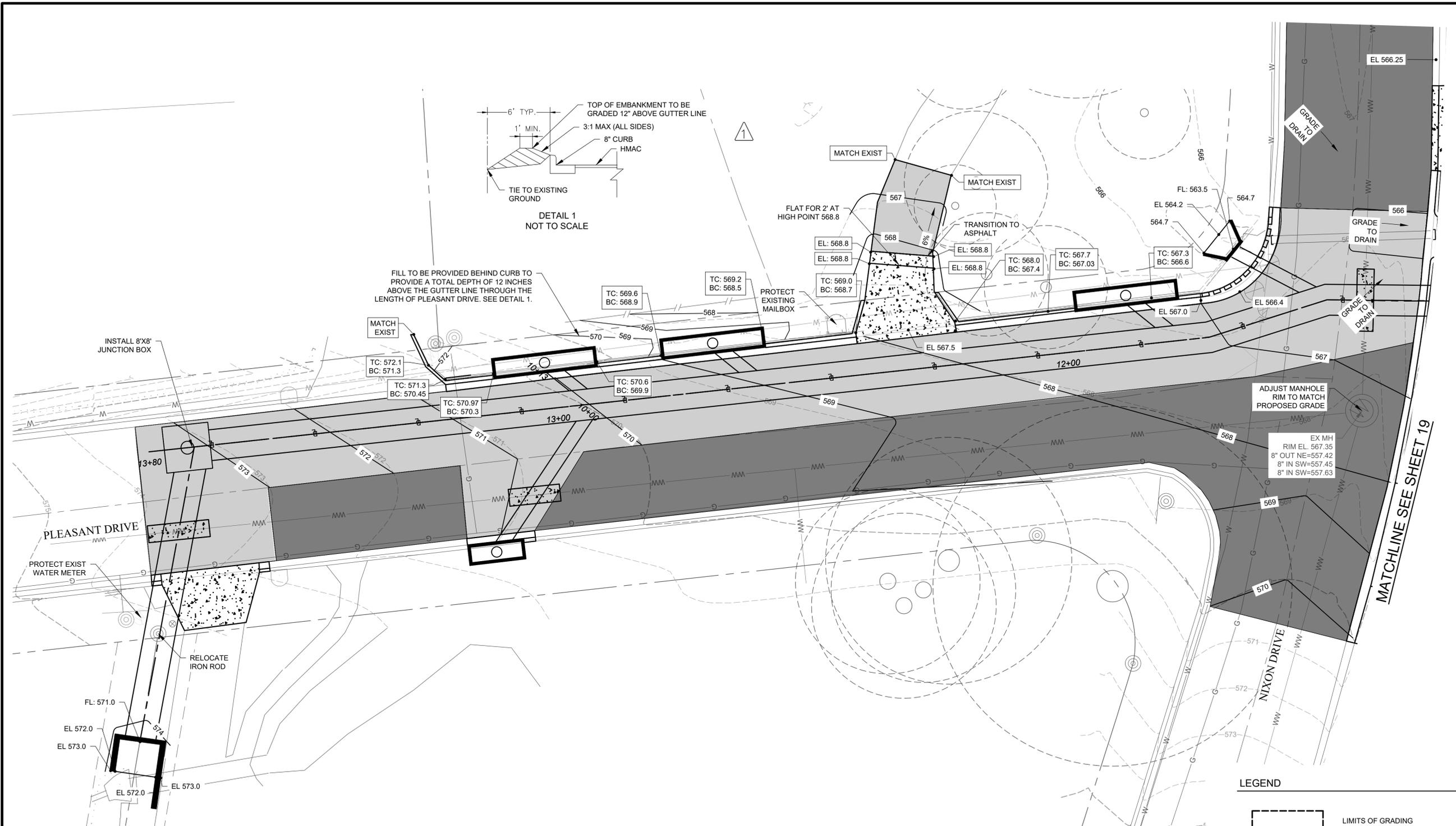
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CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 GRADING PLAN

ROLLINGWOOD TEXAS
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DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY		





FILL TO BE PROVIDED BEHIND CURB TO PROVIDE A TOTAL DEPTH OF 12 INCHES ABOVE THE GUTTER LINE THROUGH THE LENGTH OF PLEASANT DRIVE. SEE DETAIL 1.



- NOTES:**
1. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING OPERATION OF ALL EXISTING UTILITIES AFFECTED BY PROPOSED CONSTRUCTION.
 3. LOCATIONS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE AND BASED ON AVAILABLE DRAWINGS AND FIELD SURVEY. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
 4. ALL CALLOUTS ARE TO THE TOP OF PAVEMENT UNLESS OTHERWISE NOTED.

LEGEND

	LIMITS OF GRADING
	EXISTING CONTOURS
	PROPOSED CONTOURS
	PAVEMENT MILL & OVERLAY
	PAVEMENT FULL DEPTH REPAIR
	TREE
	TREE TO BE REMOVED
TC	TOP OF CURB
BC	BOTTOM OF CURB

REV. NO.	DATE	REVISION DESCRIPTION
1	DB 10/05/2023	ADDENDUM #2

STATE OF TEXAS
ABE A. SALINAS III
105144
PUBLIC ENGINEER
7/15/2023
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CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
GRADING PLAN

ROLLINGWOOD TEXAS

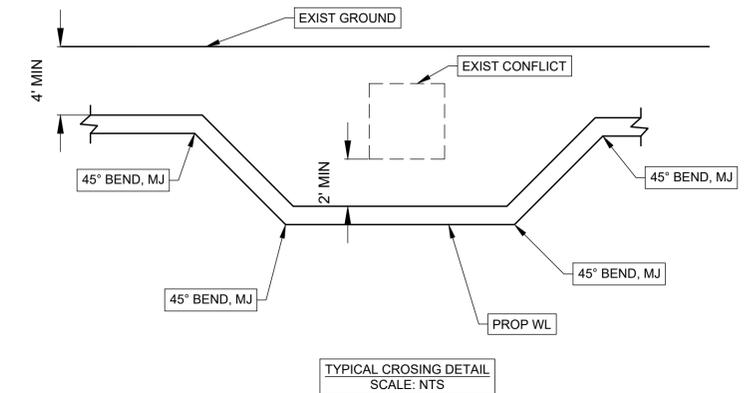
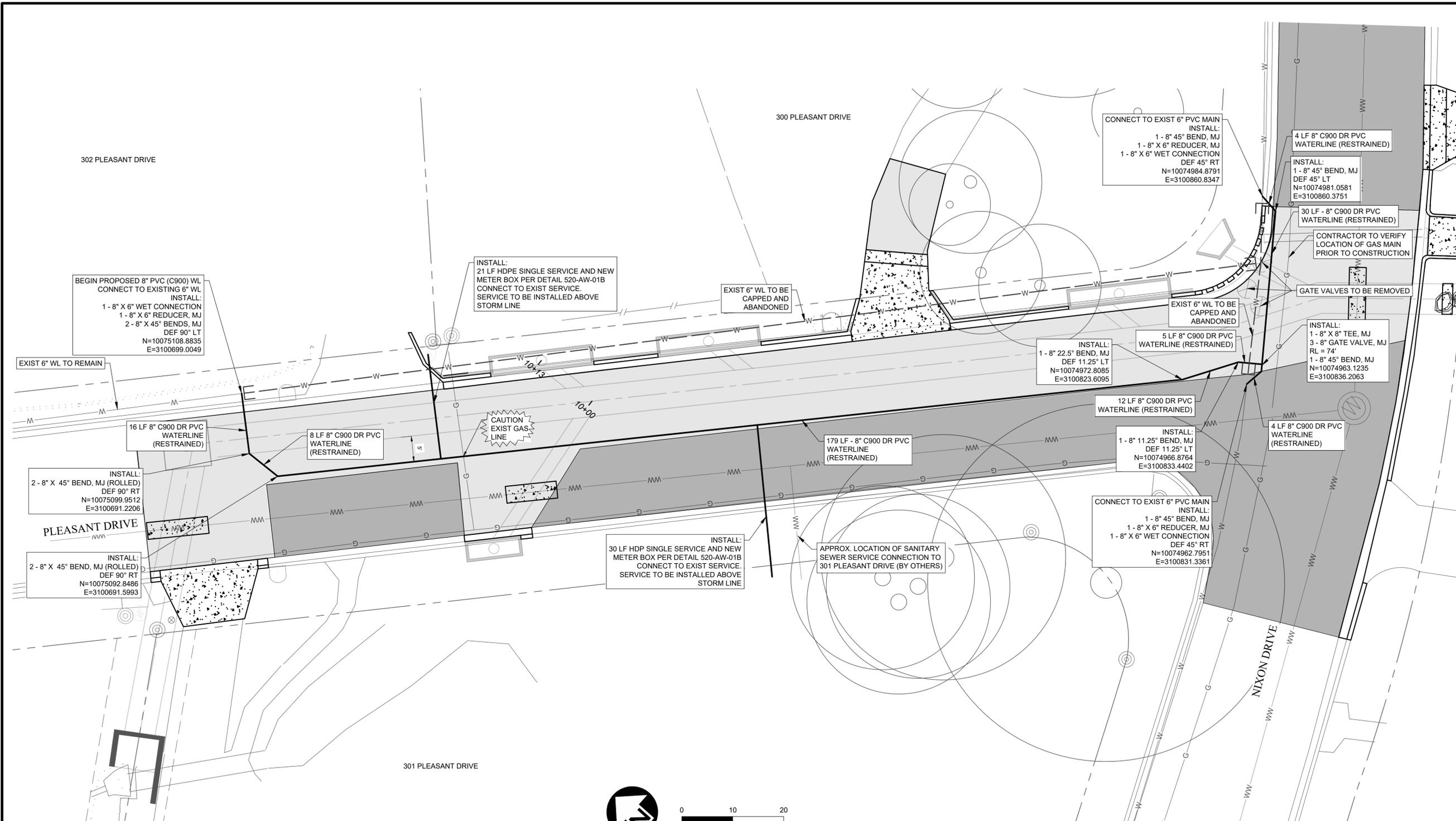
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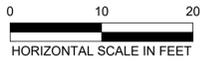
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HORIZONTAL SCALE IN FEET

GD102 20 OF 49



NOTES:

1. CONTRACTOR SHALL ENSURE WATER SERVICE TO PROPERTIES IS MAINTAINED THROUGHOUT CONSTRUCTION. ALL SERVICE DISRUPTIONS REQUIRE 48-HOURS NOTICE.
2. ALL PROPOSED WATER PIPE SHALL HAVE FACTORY RESTRAINED JOINTS PER CITY OF AUSTIN SPL WW 308A AND WW 308B.
3. LOCATIONS OF THE EXISTING UTILITIES ARE APPROXIMATE. CONTRACTOR MUST FIELD VERIFY THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION, AND SHALL NOTIFY THE ENGINEER IMMEDIATELY IF DISCREPANCIES ARE FOUND.
4. IF ANY SERVICE DISRUPTIONS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE CITY WITH 48 HOURS NOTICE. CONTRACTOR SHALL OBTAIN WRITTEN AUTHORITY FROM THE CITY OF ROLLINGWOOD FOR ANY OUTAGES. SERVICE DISRUPTIONS OUTSIDE THE HOURS OF 8AM TO 5PM WILL NOT BE PERMITTED.
5. CONTRACTOR SHALL PROTECT AND RESTORE MAILBOXES TO MATCH EXISTING CONDITIONS OR BETTER AT NO ADDITIONAL COST TO THE OWNER.
6. LANDSCAPING DAMAGED FROM SERVICE RELAYS SHALL BE REPLACED TO A CONDITION EQUAL TO OR BETTER THAN EXISTING AT NO ADDITIONAL COST TO THE OWNER.



LEGEND

- WATERLINE ABANDONED
- TREE
- TREE TO BE REMOVED

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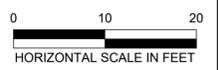
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 GREGORY T. BLACKBURN
 121663
 PROFESSIONAL ENGINEER
 11/15/2023
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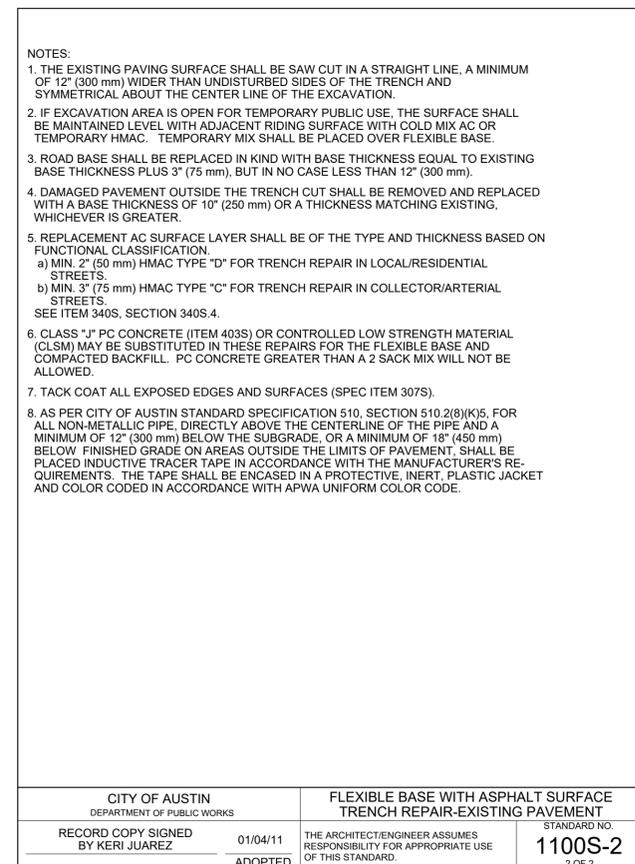
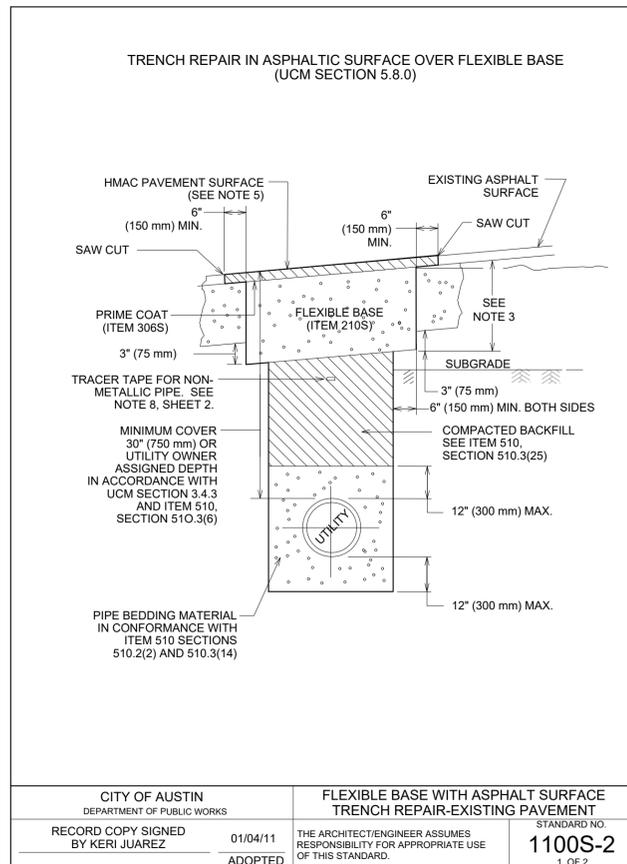
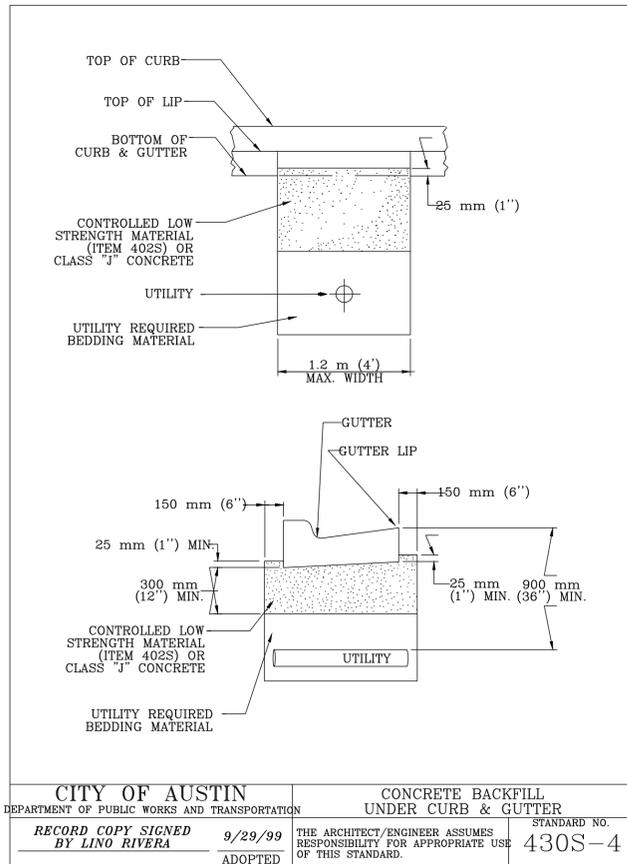
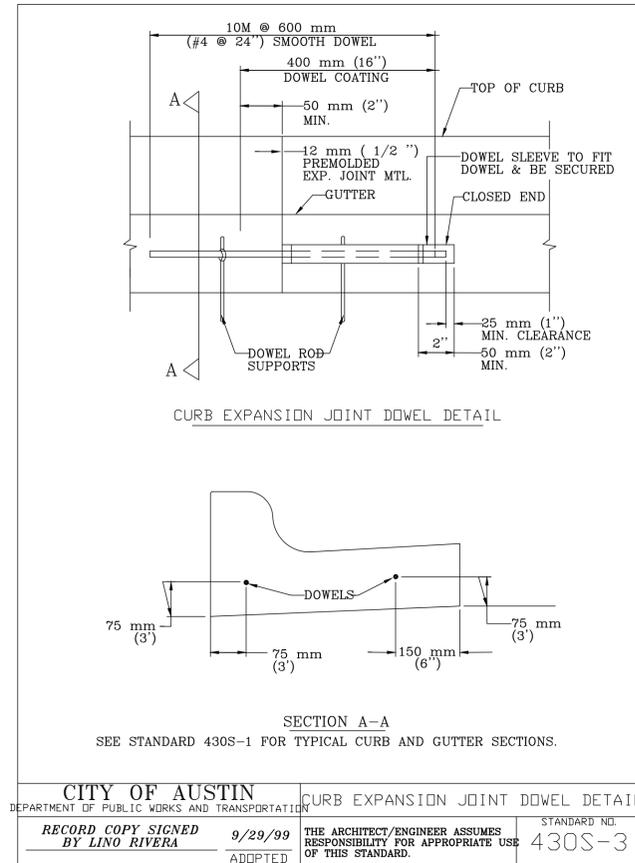
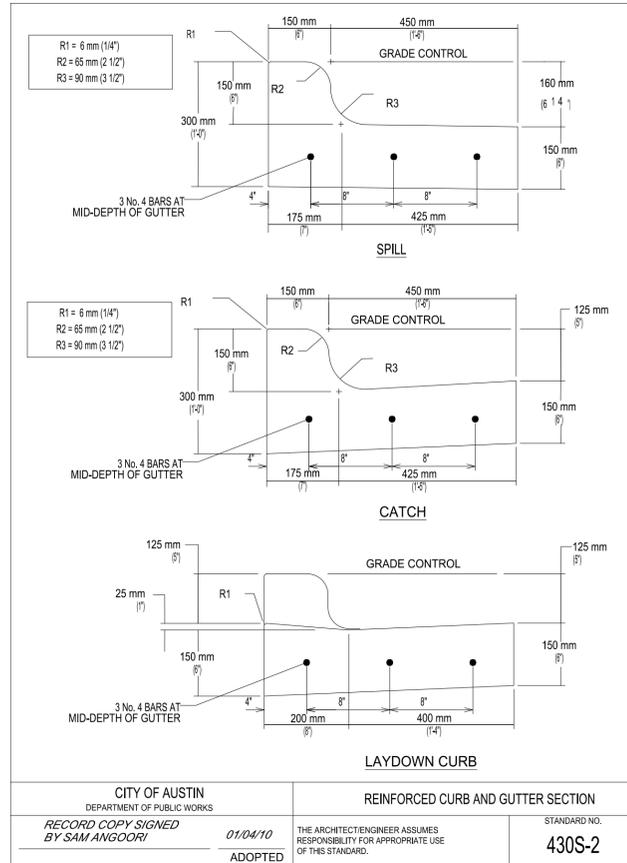
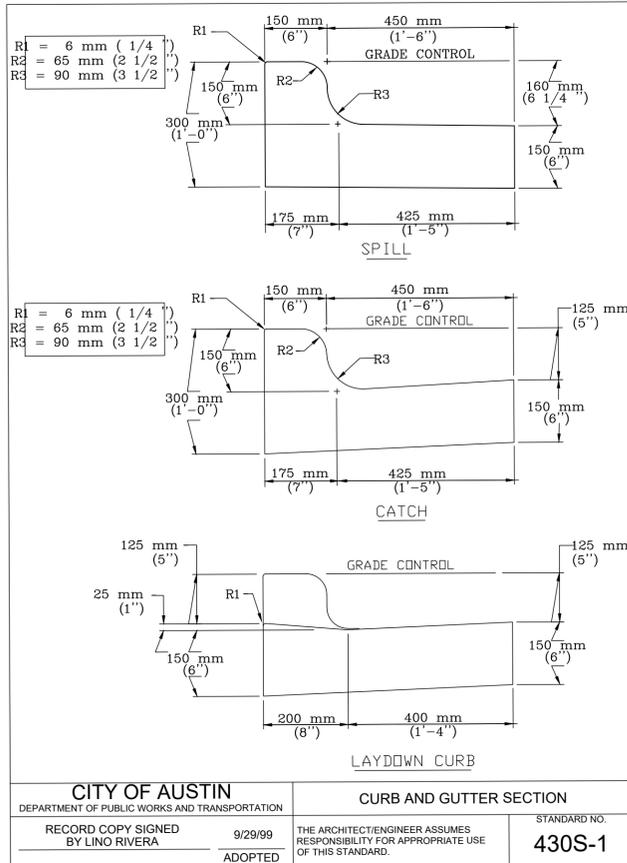
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CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 WATER LINE RELOCATION PLAN

ROLLINGWOOD TEXAS
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STATE OF TEXAS
ABE A. SALINAS III
105144
Professional Engineer
7/15/2023

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CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
PAVING DETAILS
2 OF 2

NOTES	NAME	DATE

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LWM	08/21

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GE	08/21

REVIEWED BY	DATE
PS	09/21

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PV502 23 OF 49

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DATE: FILE:

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2~wings)	
	W	X	Y	Z	Bars J1		Bars J2			
					Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2~wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$Hw = H + T + C - 0.250'$
 $A = (Hw - 0.333') (SL)$
 $B = (A) \text{ tangent } (30^\circ)$
 $Lw = (A) + \text{cosine } (30^\circ)$

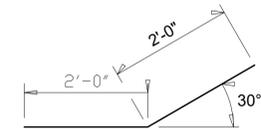
For cast-in-place culverts:
 $Ltw = (N) (S) + (N + 1) (U)$

For precast culverts:
 $Ltw = (N) (2U + S) + (N - 1) (0.5')$

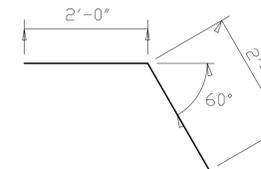
Total wingwall area (two wings ~ SF) = $(Hw + 0.333') (Lw)$

Hw = Height of wingwall
 $SL:1$ = Side slope ratio (horizontal:1 vertical)
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans

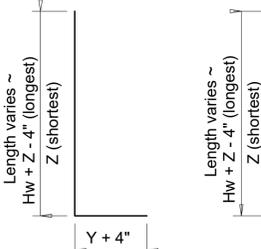
See applicable box culvert standard sheet for H, S, T, and U values.



BARS D

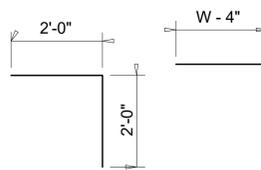


BARS R



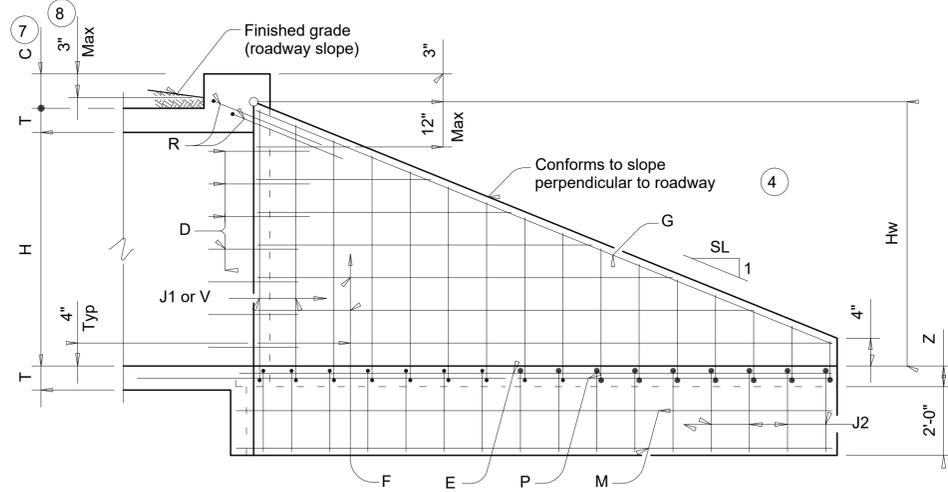
BARS J1

BARS V



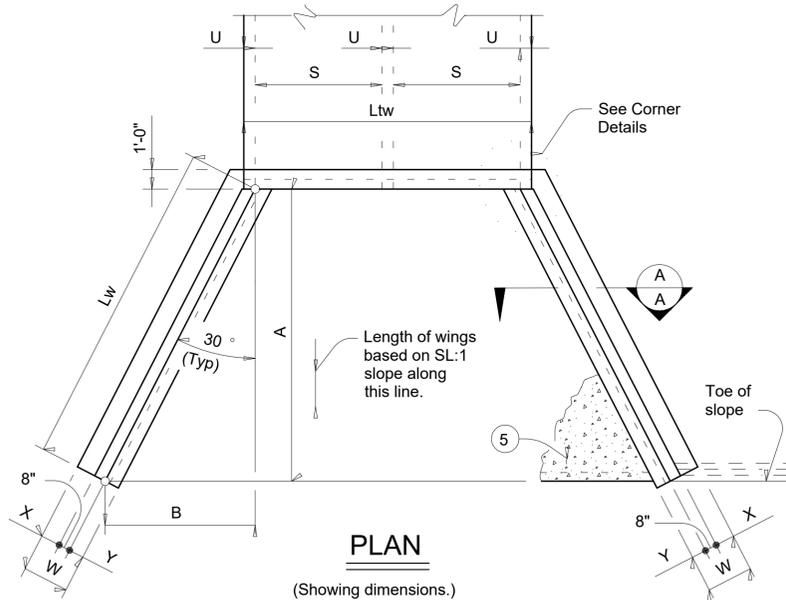
BARS L

BARS J2



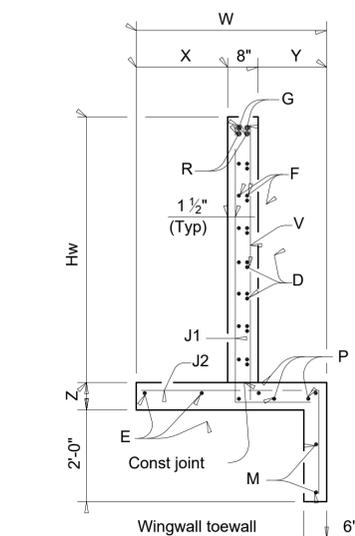
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

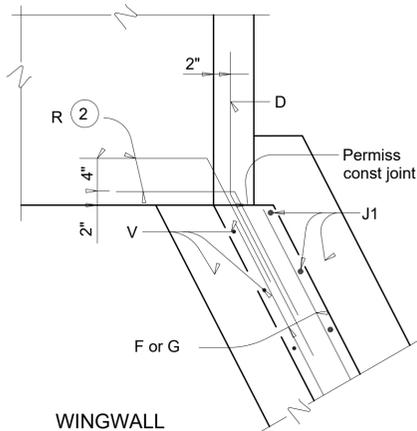


PLAN

(Showing dimensions.)



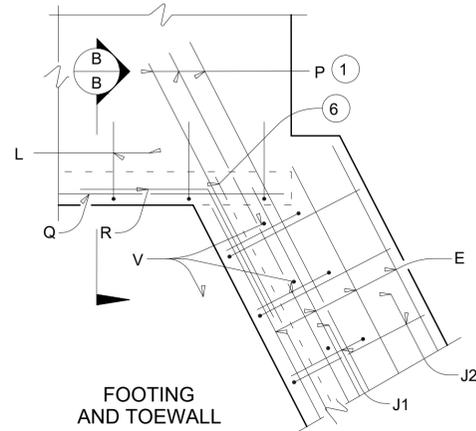
SECTION A-A



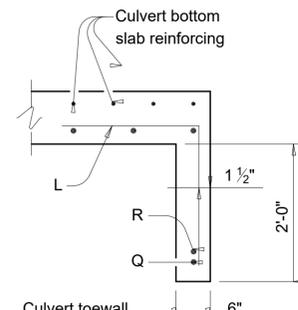
WINGWALL

CORNER DETAILS

(Culvert and culvert toewall reinforcing not shown for clarity.)



FOOTING AND TOEWALL



SECTION B-B

(5)

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

MATERIAL NOTES:

Provide Class C concrete ($f_c=3,600$ psi).
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 In riprap concrete synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation Bridge Division Standard

CONCRETE WINGWALLS WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS

FW-0

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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (2-wings)	
	W	X	Y	Z	Bars J1		Bars J2			
	Size	Spa	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)				
2'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	33.73	0.248
3'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.07	0.261
3'-6"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	37.74	0.273
4'-0"	2'-5"	1'-0"	9"	7"	#4	1'-0"	#4	1'-0"	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7"	#4	1'-0"	#4	1'-0"	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7"	#4	1'-0"	#4	1'-0"	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-6"	8"	#5	1'-0"	#4	1'-0"	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8"	#4	6"	#4	6"	81.49	0.535
10'-0"	5'-2"	2'-6"	2'-0"	8"	#5	6"	#4	6"	97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8"	#6	6"	#5	6"	133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9"	#7	6"	#5	6"	162.29	0.721
13'-0"	6'-8"	3'-3"	2'-9"	11"	#7	6"	#5	6"	178.80	0.856
14'-0"	7'-2"	3'-6"	3'-0"	1'-0"	#8	6"	#5	6"	216.78	0.959
15'-0"	7'-8"	4'-0"	3'-0"	1'-1"	#9	6"	#6	6"	283.06	1.068
16'-0"	8'-2"	4'-6"	3'-0"	1'-3"	#9	6"	#6	6"	297.02	1.234

TABLE OF WINGWALL REINFORCING
(2-wings)

Bar	Size	No.	Spa
D	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
R	#5	6	~
V	#4	~	1'-0"

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L	#4	~	1'-6"
Q	#4	1	~
Reinf (Lb/Ft)			2.45
Conc (CY/Ft)			0.037

WING DIMENSION FORMULAS:

(All values are in feet.)

$Hw = H + T + C - 0.250'$
 $Lw = (Hw - 0.333') (SL)$

For cast-in-place culverts:
 $Ltw = (N) (S) + (N + 1) (U)$

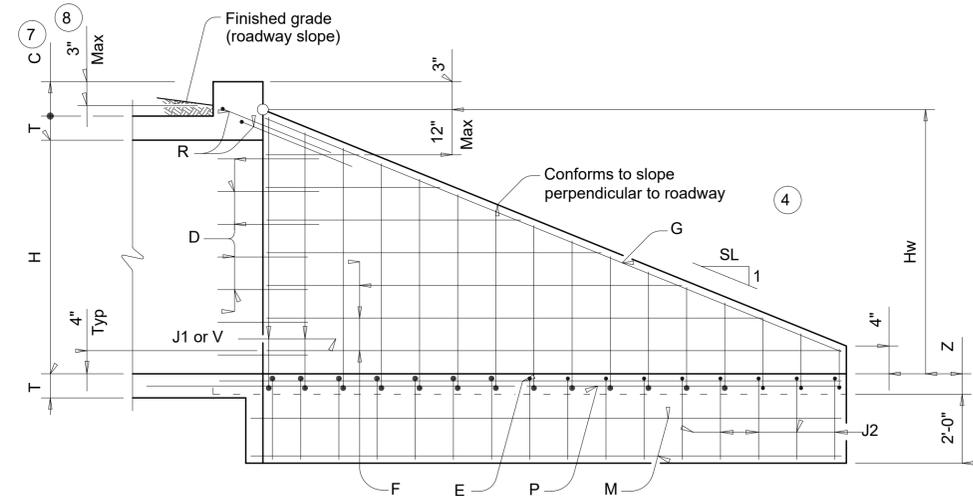
For precast culverts:
 $Ltw = (N) (2U + S) + (N - 1) (0.5')$

Total Wingwall Area (two wings ~ SF) = $(Hw + 0.333') (Lw)$

Hw = Height of wingwall
 SL:1 = Side slope ratio (horizontal:1 vertical)
 Lw = Length of wingwall
 Ltw = Culvert toewall length
 N = Number of culvert spans

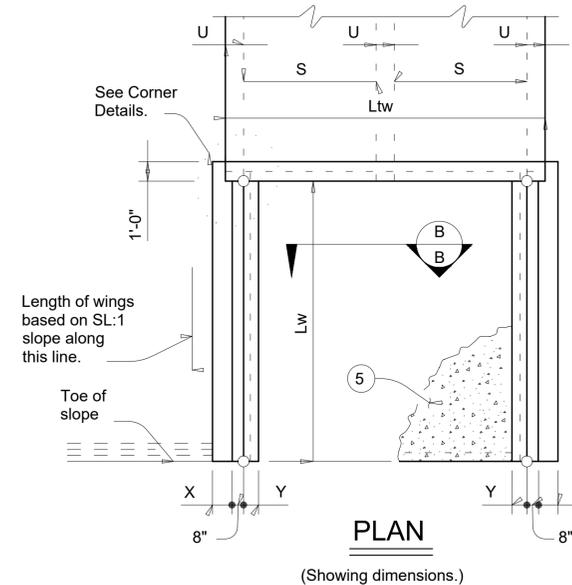
See applicable box culvert standard sheet for H, S, T, and U values.

- Extend Bars P 3'-0" minimum into bottom slab of box culvert.
- Adjust as necessary to maintain 1 1/2" clear cover and 4" minimum between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings, multiply the tabulated values by Lw.
- Recommended values of side slope are: 2:1, 3:1, 4:1, and 6:1.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, provide a 6" wide by 1'-6" deep reinforced concrete toewall along all edges of the riprap adjacent to natural ground; reinforce the toewall by extending typical riprap reinforcing into the toewall; and extend construction joints or grooved joints oriented in the direction of flow across the full distance of the riprap at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B will not be required.
- At Contractor's option, culvert toewall may be ended flush with wingwall toewall. Adjust reinforcing as needed.
- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.



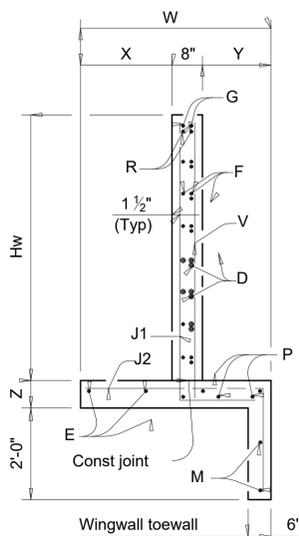
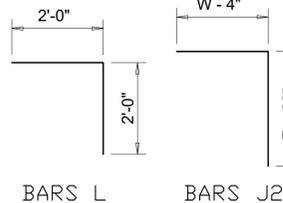
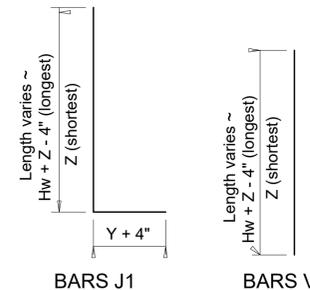
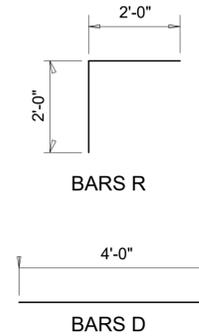
INSIDE ELEVATION

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

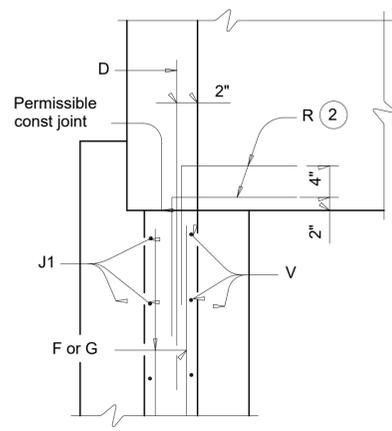


PLAN

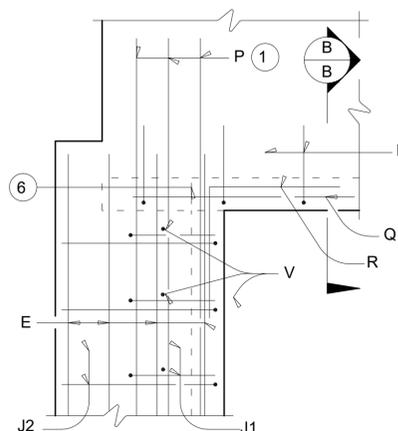
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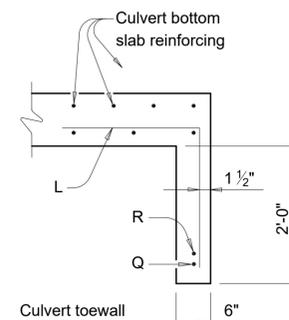
SECTION A-A



WINGWALL



FOOTING AND TOEWALL



SECTION B-B

MATERIAL NOTES:

Provide Class C concrete (f'c=3,600 psi).
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 In riprap concrete, synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing unless noted otherwise.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
 See Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing dimensions are out-to-out of bars.

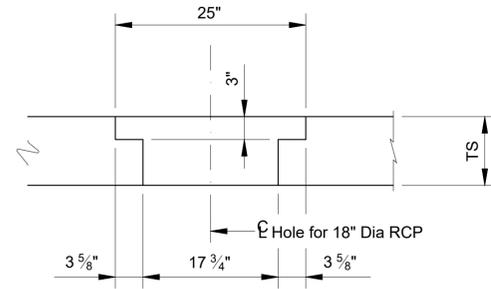
Bridge Division Standard

CONCRETE WINGWALLS WITH STRAIGHT WINGS FOR 0° SKEW BOX CULVERTS

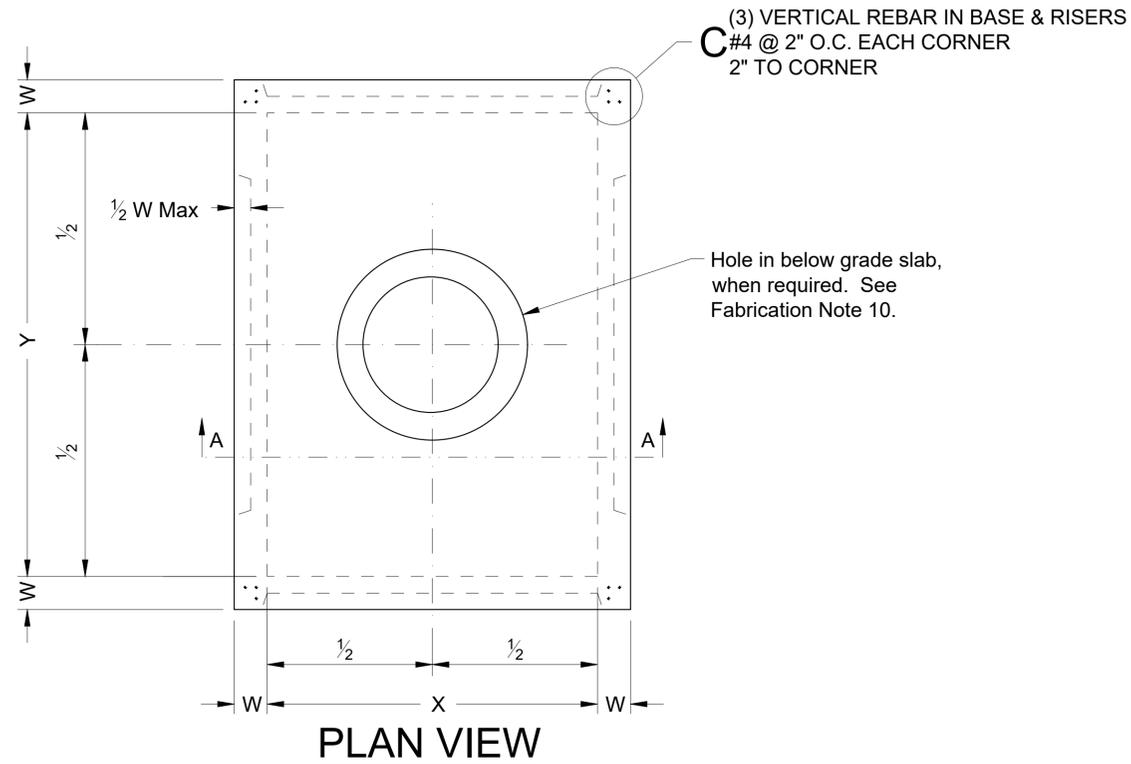
SW-O

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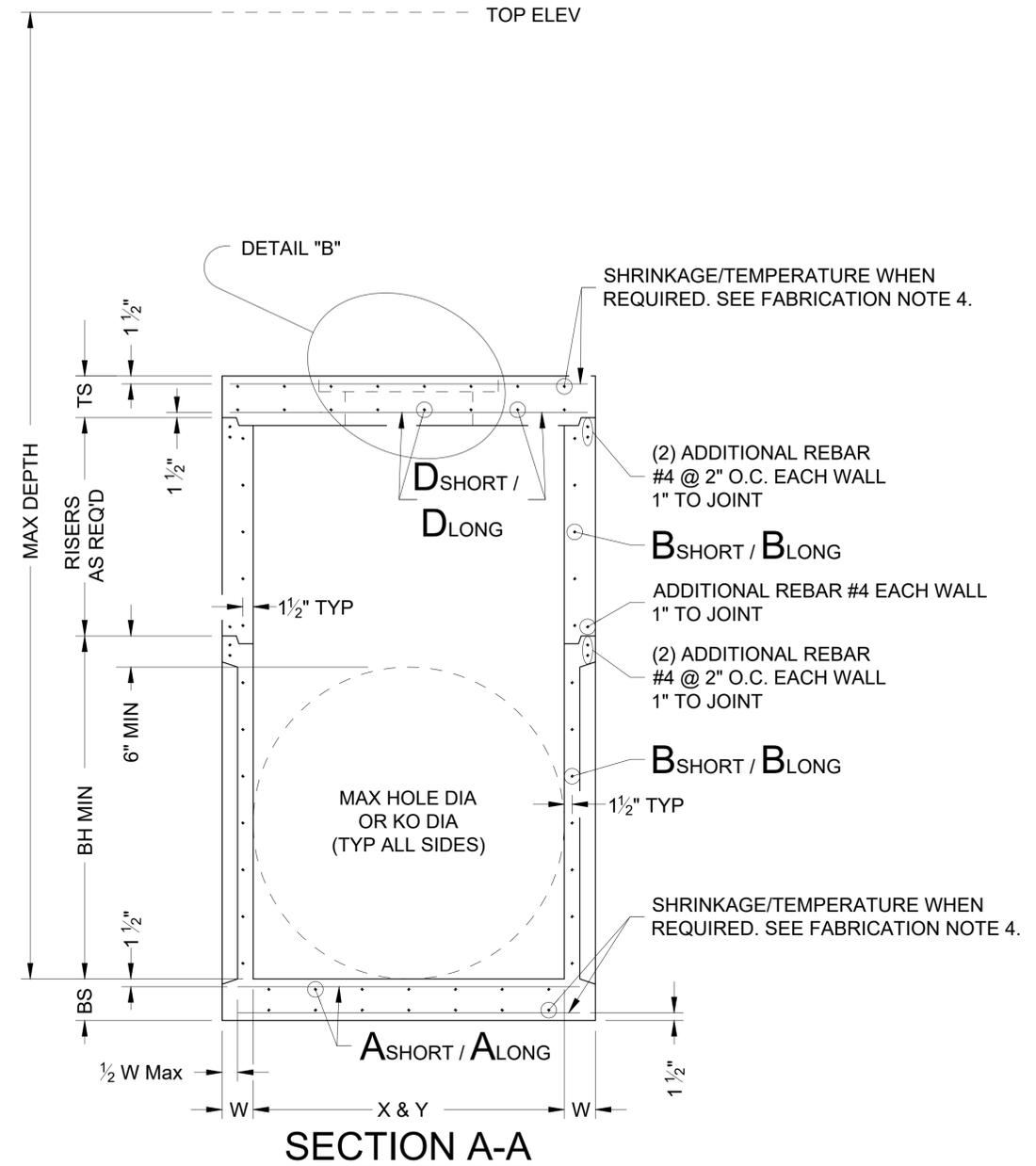
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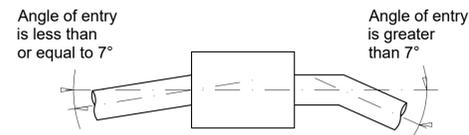
DETAIL "B"



PLAN VIEW



SECTION A-A



PIPE CONNECTION DETAIL

Connect pipes within 7° of normal to PJB wall. If necessary, use pipe elbow or curved approach alignment to stay within this limit.

FABRICATION NOTES:

1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
2. Provide Grade 60 reinforcing steel or equivalent area of VVWR.
3. Provide typical clear cover of 1 1/2" to reinforcing steel at interior or exterior walls.
4. Walls or slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
5. No substitution is allowed for vertical and horizontal #4 bars in corners.
6. Manufacture base and risers to nearest 3" increment.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
8. Provide lifting devices in conformance with Manufacturer's recommendations.
9. See sheet PDD for sizes, dimensions, and reinforcing steel not shown.
10. Provide hole in below grade slab only when PJB is installed with inlet type POD.

INSTALLATION NOTES:

1. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to junction box.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. For rigid pipe, cut hole in thin wall panel (KO) 4" Max, 2" Min larger than pipe OD.
5. For flexible pipe, consult boot/seal Manufacturer's specification for placement tolerance and hole size. Center pipe in hole and install boot/seal per Manufacturer's specification.

GENERAL NOTES:

1. Precast Junction Box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PDD for sizes.
2. Designed according to ASTM C913.
3. Payment for junction box is per Item 465 "Junction Boxes, Manholes, and Inlets" by type and size.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



Bridge Division Standard

PRECAST JUNCTION BOX

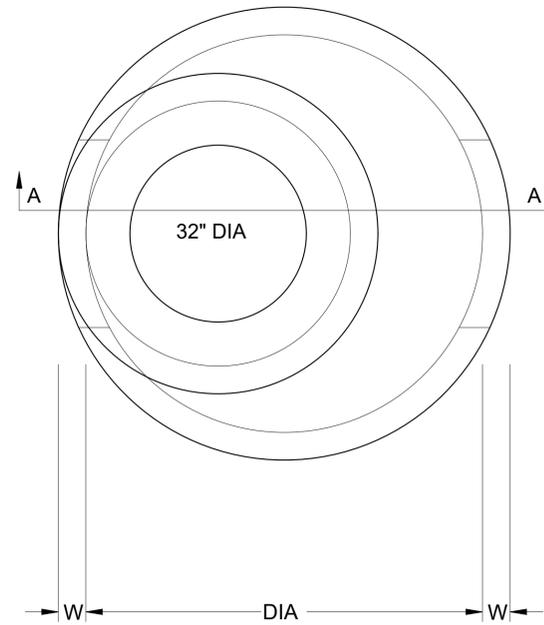
PJB

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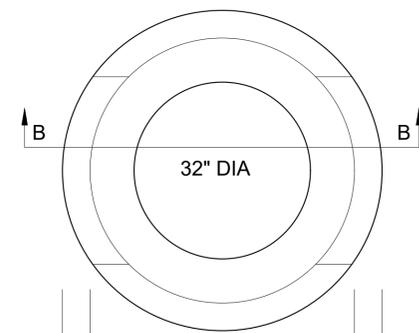
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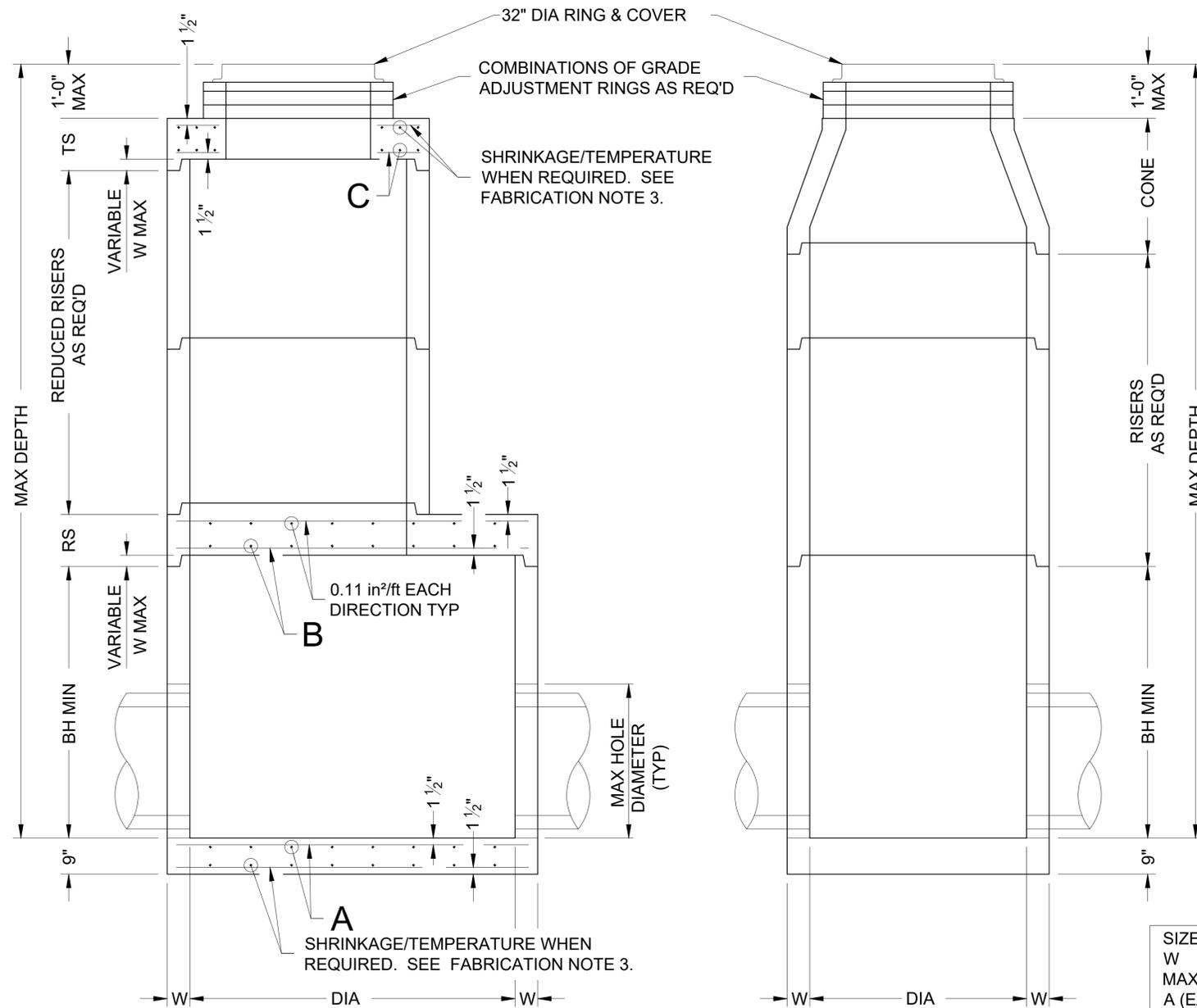
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PLAN VIEW "A"



PLAN VIEW "B"



SECTION A-A
ROUND REDUCED RISER OPTION
SHOWING FLAT SLAB TOP

SECTION B-B
ROUND RISER OPTION
SHOWING CONE

- FABRICATION NOTES:**
1. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
 2. Provide Grade 60 reinforcing steel or equivalent area of WWR. Provide circumferential reinforcing steel in vertical walls of base, riser and cone in accordance with ASTM C478.
 3. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing steel. Provide steel area = 0.11 in²/ft each way.
 4. Manufacture base and risers to nearest 3" increment.
 5. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is 3/4".
 6. Provide lifting devices in conformance with Manufacturer's recommendations.
 7. Provide cast iron solid cover, unless noted otherwise elsewhere in the plans.

- INSTALLATION NOTES:**
1. Cones may be concentric or eccentric. Reduction cones are acceptable. See Manufacturer for cone dimensions.
 2. Inverts (benching) to be provided by Contractor. Concrete or mortar used for invert is subsidiary to this item.
 3. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or 1/2 the joint depth, whichever is greater.
 4. Do not grout rubber gasket joints without Manufacturer's recommendation.
 5. Initial installation of grade adjustment rings is limited to 1'-0" Max as shown.
 6. Grade adjustment rings may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments may be made up to the Max depth shown. Structure must be evaluated if Max depth will be exceeded.

- GENERAL NOTES:**
1. Designed according to ASTM C478.
 2. Payment for manhole is per Item 465, "Junction Boxes, Manholes, and Inlets" by type and size.
 3. Pipe OD + placement tolerance must be equal or less than Max hole diameter. For rigid pipe, placement tolerance is 4" Max, 2" Min. For flexible pipe, consult boot/seal manufacturer's specification for placement tolerance.

Cover dimensions are clear dimensions, unless noted otherwise.

SIZE (DIA)	48 in	60 in	72 in
W	5 in	6 in	7 in
MAX DEPTH	25 ft	25 ft	25 ft
A (EACH WAY)	0.22 in ² /ft	0.30 in ² /ft	0.45 in ² /ft
B (EACH WAY)	N/A	0.37 in ² /ft	0.62 in ² /ft
C (EACH WAY)	0.24 in ² /ft	0.46 in ² /ft	0.46 in ² /ft
BH MIN	12 in	36 in	36 in
TS	9 in	9 in	9 in
RS	N/A	9 in	12 in
REDUCED RISER DIA	N/A	48 in	48/60 in
MAX HOLE DIA	32 in	40 in	54 in

HL93 LOADING



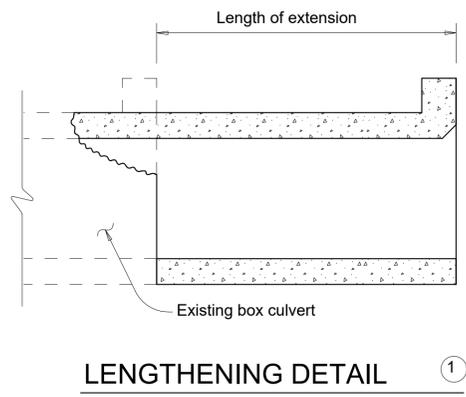
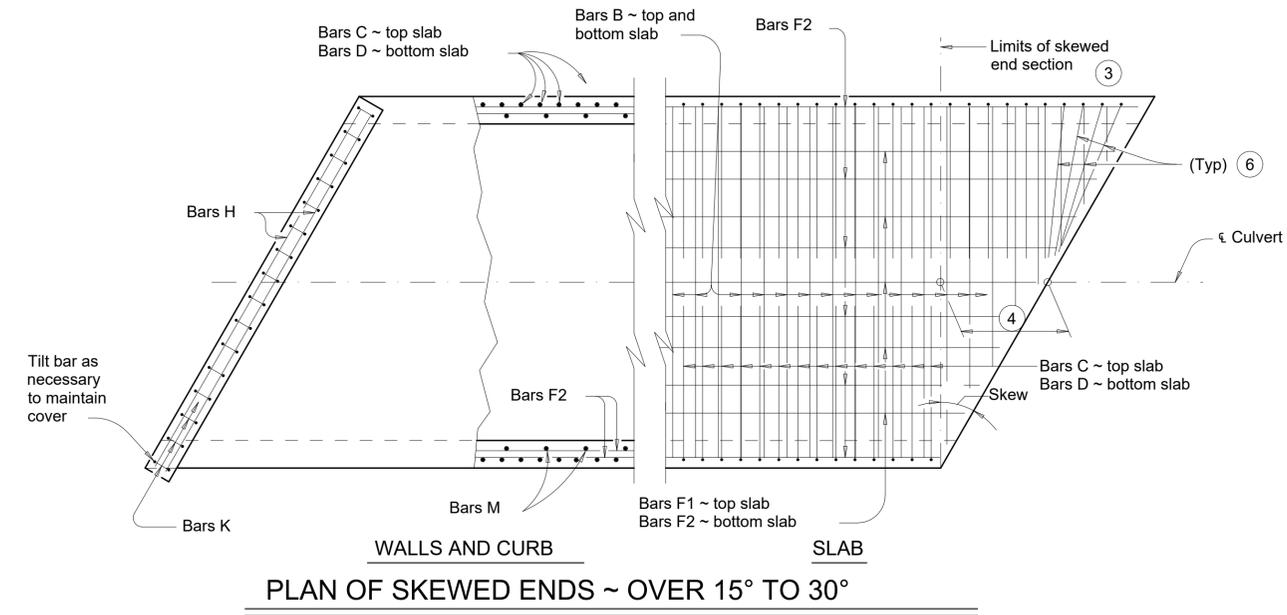
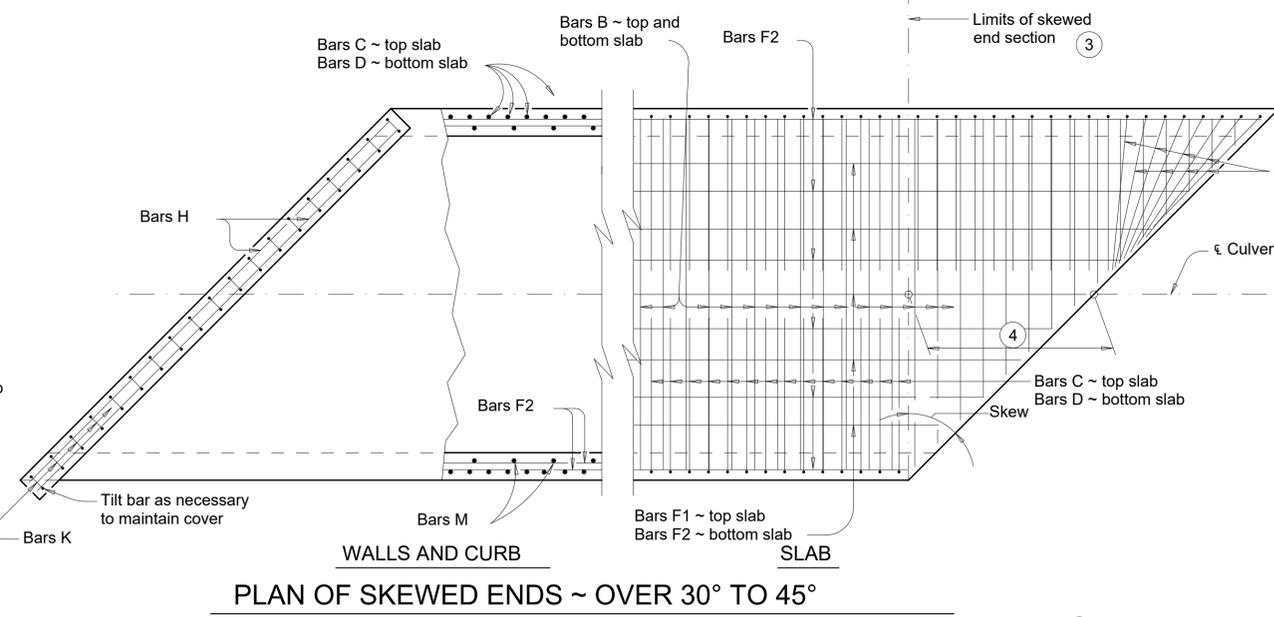
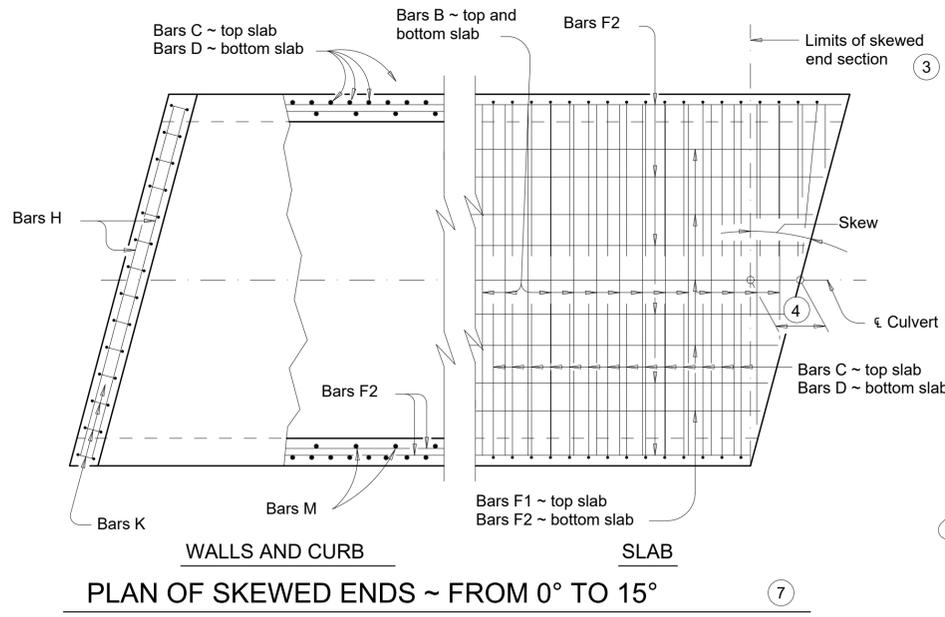
PRECAST ROUND MANHOLE

PRM

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FILE:



1 For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
 For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
 Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.

- 2 When the spacing between Bars B becomes less than half of the normal spacing, cut bars to avoid conflict.
- 3 The length of Bars B vary in the skewed end sections.
- 4 [One half of overall width] x [tangent of the skew angle]
- 5 Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
- 6 When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-6" for skews of 30° thru 45°.
- 7 At the Contractor's option, for skews of 15° or less, place Bars B, C, and D parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B shown on the Single Box Culverts Cast-In-Place (SCC) standards sheets to accommodate the skew.

CONSTRUCTION NOTES:
 Do not use permanent forms.
 When required, lap Bars H 1'-8" for uncoated or galvanized bars.
 Provide a minimum of 1 1/2" clear cover.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel, if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) with these exceptions:
 provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for details of straight sections of culvert.
 For skewed sections and angle sections, refer to Single Box Culverts Cast-in-Place (SCC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
 For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the culvert Single Box Culverts Cast-In-Place (SCC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



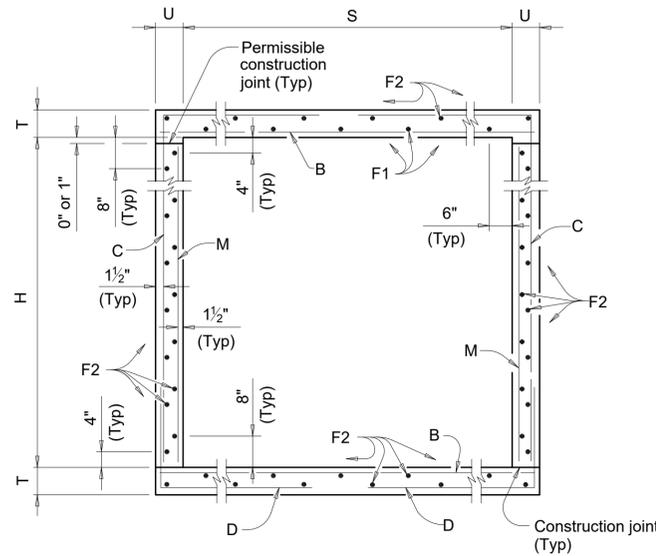
**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 MISCELLANEOUS DETAILS**

SCC-MD

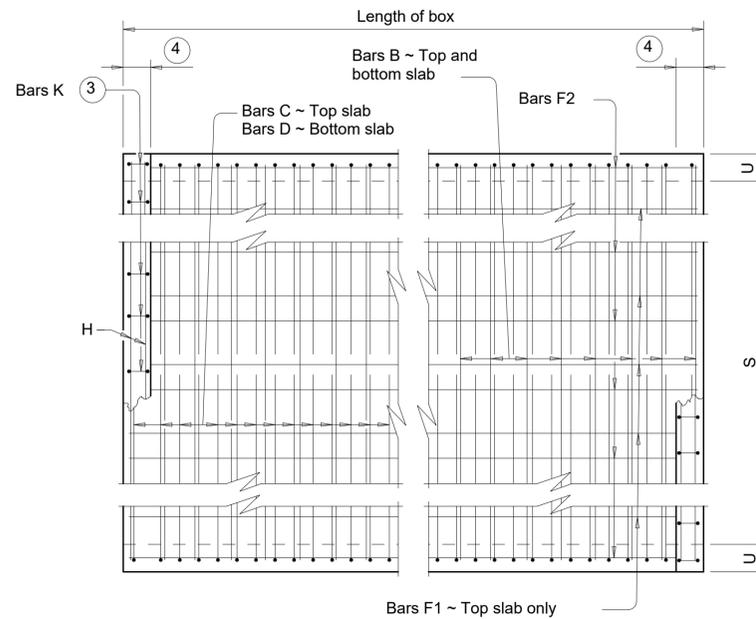
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© TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY			SHEET NO.
				31 OF 49

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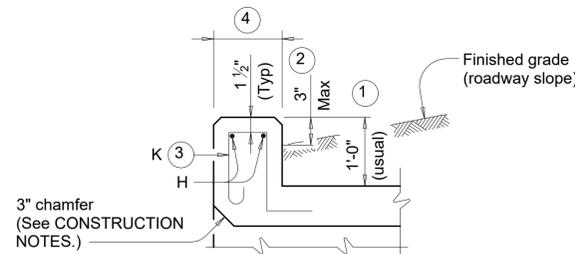
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TYPICAL SECTION



PLAN OF REINF STEEL



SECTION THRU CURB

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

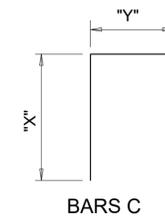
MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 - culverts with overlay,
 - culverts with 1-to-2 course surface treatment, or
 - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
 - Uncoated or galvanized ~ #4 = 1'-8" Min
 - Uncoated or galvanized ~ #5 = 2'-1" Min
 - Uncoated or galvanized ~ #6 = 2'-6" Min

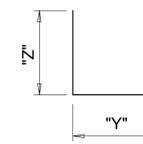
GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

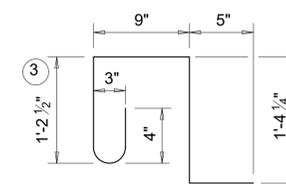
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.



BARS C



BARS D



BARS K (#4)
 (Spa = 1'-0" Max)
 (Length = 4'-2")

HL93 LOADING

SHEET 1 OF 2



Bridge
Division
Standard

**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

SCC-5 & 6

FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
C:TxDOT	February 2020	CONT	SECT	JOB
REVISIONS				
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
				32 OF 49

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SECTION DIMENSIONS				FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																												QUANTITIES										
					Bars B					Bars C					Bars D					Bars M ~ #4				Bars F1 ~ #4 at 18" Spa			Bars F2 ~ #4 at 18" Spa			Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total					
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Size	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
5' - 0"	2' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 3"	704	2' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.391	80.5	0.5	55	16.1	3,276
5' - 0"	2' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 4"	713	2' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.429	81.0	0.5	55	17.6	3,294
5' - 0"	3' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 3"	817	3' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.434	87.8	0.5	55	17.8	3,567
5' - 0"	3' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 4"	826	3' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.472	88.3	0.5	55	19.3	3,585
5' - 0"	4' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 3"	929	4' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.477	92.4	0.5	55	19.5	3,752
5' - 0"	4' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 4"	939	4' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 8"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.515	92.9	0.5	55	21.1	3,771
5' - 0"	5' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 3"	1,042	5' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.521	99.7	0.5	55	21.3	4,044
5' - 0"	5' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 4"	1,051	5' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.559	100.2	0.5	55	22.8	4,062
6' - 0"	2' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	6' - 7"	742	2' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.440	89.1	0.5	63	18.1	3,628
6' - 0"	2' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	6' - 8"	1,126	2' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.485	108.6	0.5	63	19.9	4,407
6' - 0"	2' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	6' - 10"	1,155	2' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	2' - 0"	110	5	39' - 9"	133	25	39' - 9"	664	7' - 1"	19	18	50	0.551	109.9	0.5	69	22.6	4,463
6' - 0"	3' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	7' - 7"	854	3' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.484	96.4	0.5	63	19.9	3,918
6' - 0"	3' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	7' - 8"	1,295	3' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.528	117.3	0.5	63	21.6	4,754
6' - 0"	3' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	7' - 10"	1,324	3' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	3' - 0"	164	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.601	118.1	0.5	69	24.6	4,792
6' - 0"	4' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	8' - 7"	967	4' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.527	101.0	0.5	63	21.6	4,104
6' - 0"	4' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	8' - 8"	1,464	4' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.571	123.3	0.5	63	23.4	4,996
6' - 0"	4' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	8' - 10"	1,493	4' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	4' - 0"	219	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.650	123.7	0.5	69	26.5	5,016
6' - 0"	5' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	9' - 7"	1,080	5' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.570	108.3	0.5	63	23.3	4,395
6' - 0"	5' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	9' - 8"	1,633	5' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.614	132.0	0.5	63	25.1	5,343
6' - 0"	5' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	9' - 10"	1,661	5' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	5' - 0"	274	5	39' - 9"	133	33	39' - 9"	876	7' - 1"	19	18	50	0.700	131.9	0.5	69	28.5	5,345
6' - 0"	6' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	10' - 7"	1,192	6' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.613	115.6	0.5	63	25.0	4,685
6' - 0"	6' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	10' - 8"	1,802	6' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.657	140.7	0.5	63	26.8	5,690
6' - 0"	6' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	10' - 10"	1,830	6' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	6' - 0"	329	5	39' - 9"	133	37	39' - 9"	982	7' - 1"	19	18	50	0.749	140.2	0.5	69	30.5	5,675

5 For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

HL93 LOADING SHEET 2 OF 2



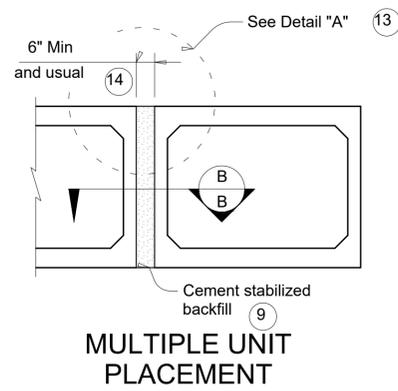
**SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL**

SCC-5 & 6

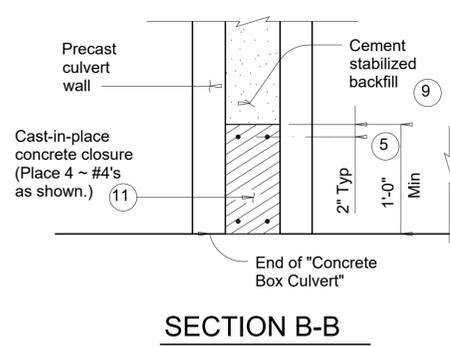
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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS				
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
			33 OF 49	

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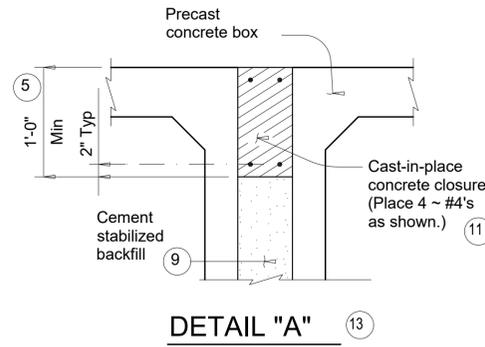
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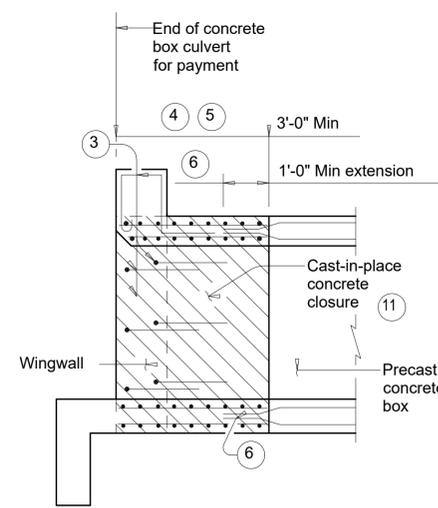
MULTIPLE UNIT PLACEMENT



SECTION B-B

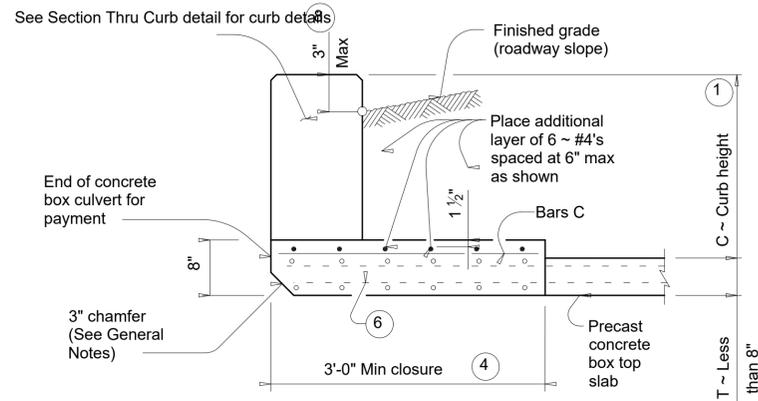


DETAIL "A"

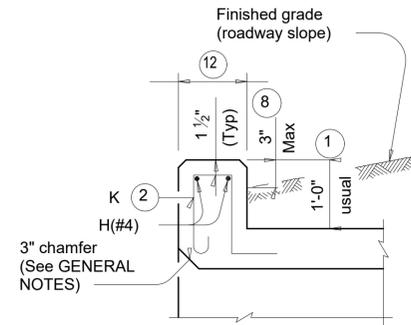


WINGWALL CONNECTION

(Also applies to safety end treatment.)



SECTION THRU TOP SLABS LESS THAN 8"

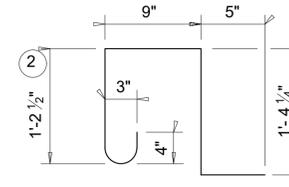


SECTION THRU CURB

QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY



BARS C (#4)
(Spa = 1'-0" Max)



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

- 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.
- Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast boxes short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.
- For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.
- Extend precast box reinforcing a minimum of 1'-0" into concrete closure (Typ).
- Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls (placed in the outside face only). Tack weld the bands to the exposed reinforcing at each point of contact.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Cement stabilized backfill between boxes is considered part of the box culvert for payment.
- All curb concrete and reinforcing is considered part of the box culvert for payment.
- Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.
- 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
- For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
- This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

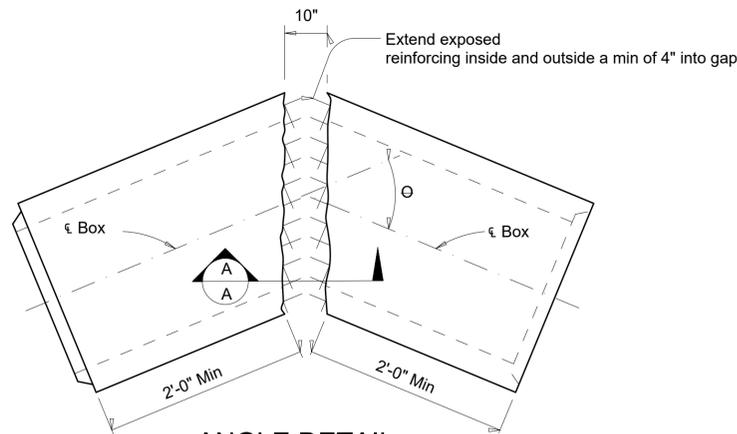
MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide ASTM A1064 welded wire reinforcement.
- Provide Class C concrete (f_c = 3,600 psi) for the closures.
- Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
- Any additional concrete required for the closures will be considered subsidiary to the box culvert.

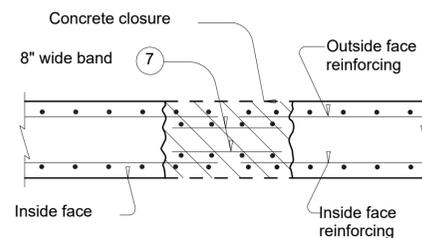
GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications.
- Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
- Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

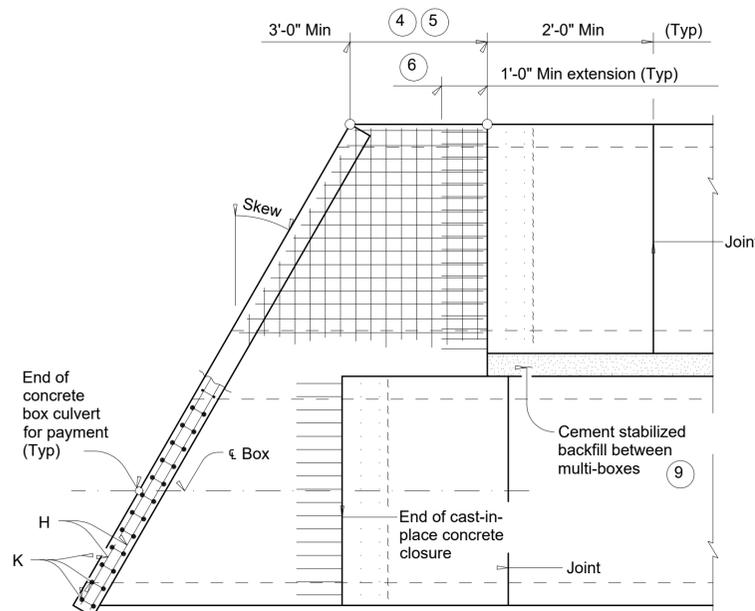
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.



ANGLE DETAIL



SECTION A-A



PLAN OF SKEWED ENDS

(Showing multi-box placement.)

HL93 LOADING

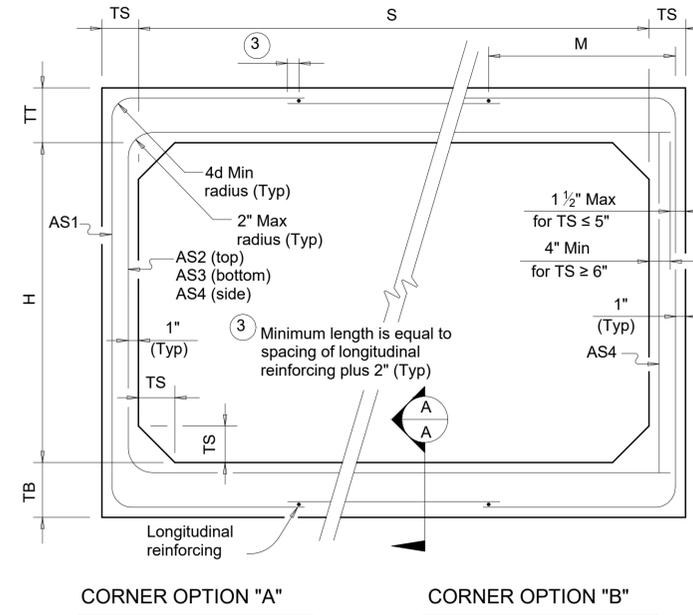
		<i>Bridge Division Standard</i>	
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS			
SCP-MD			
FILE: scpmdsts-20.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT
REVISIONS	CONT	SECT	JOB
			HIGHWAY
	DIST	COUNTY	SHEET NO.
			34 OF 49

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

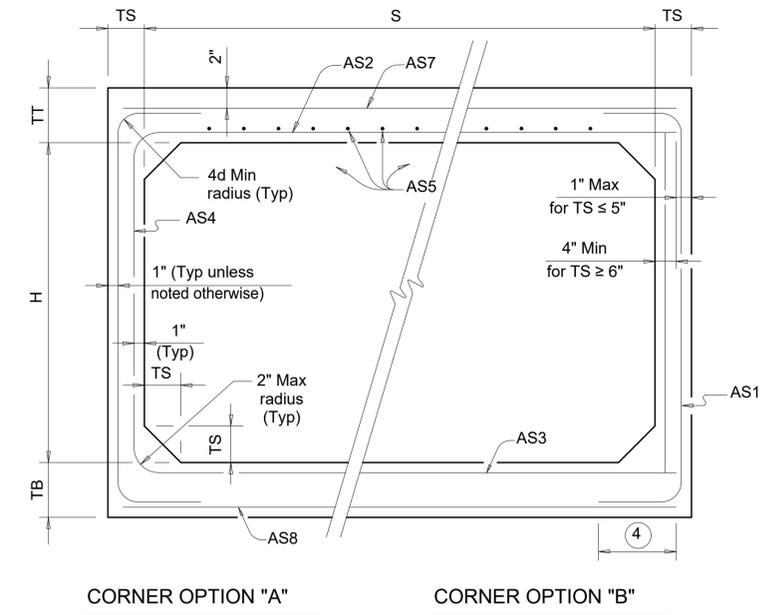
DATE:
FILE:

BOX DATA

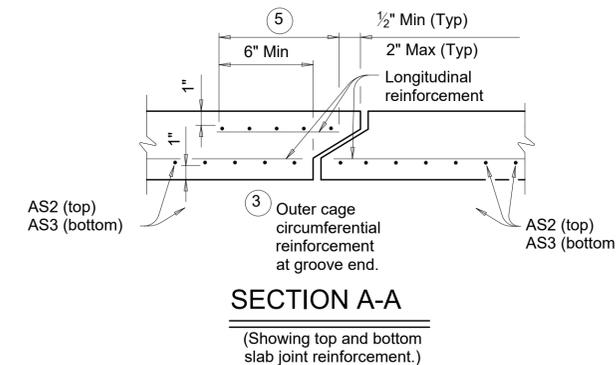
SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②								① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0	
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1	
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1	
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1	
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1	
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1	
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6	
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7	
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7	
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7	
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7	
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7	
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7	
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7	
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2	
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3	
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3	
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3	
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3	
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3	
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8	
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9	
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9	
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9	
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9	
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9	



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
 Provide 0.03 sq. in./ft. minimum longitudinal reinforcing at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
 Provide Class H concrete ($f_c = 5,000$ psi).

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

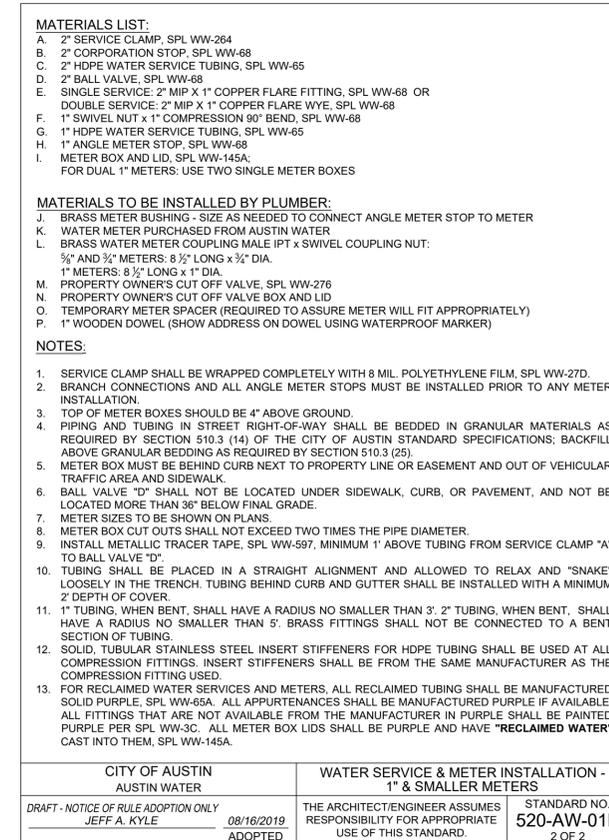
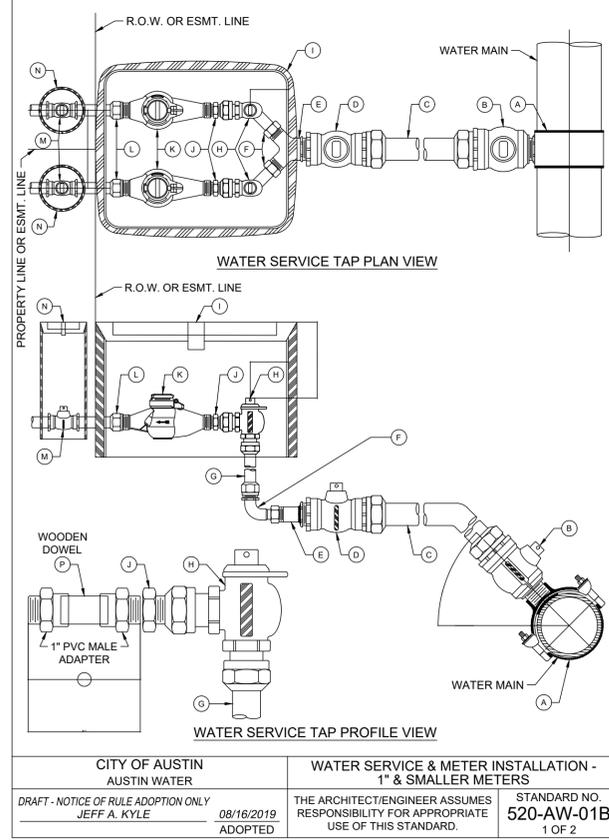
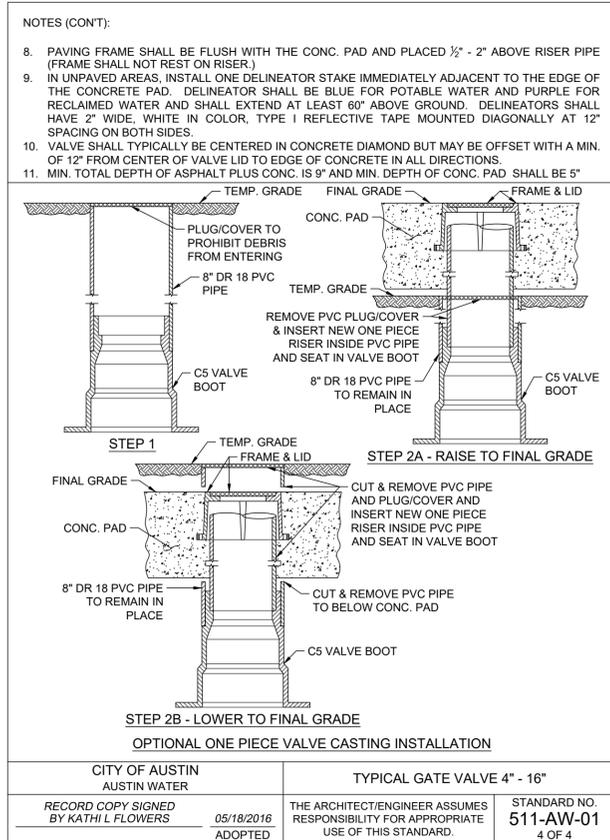
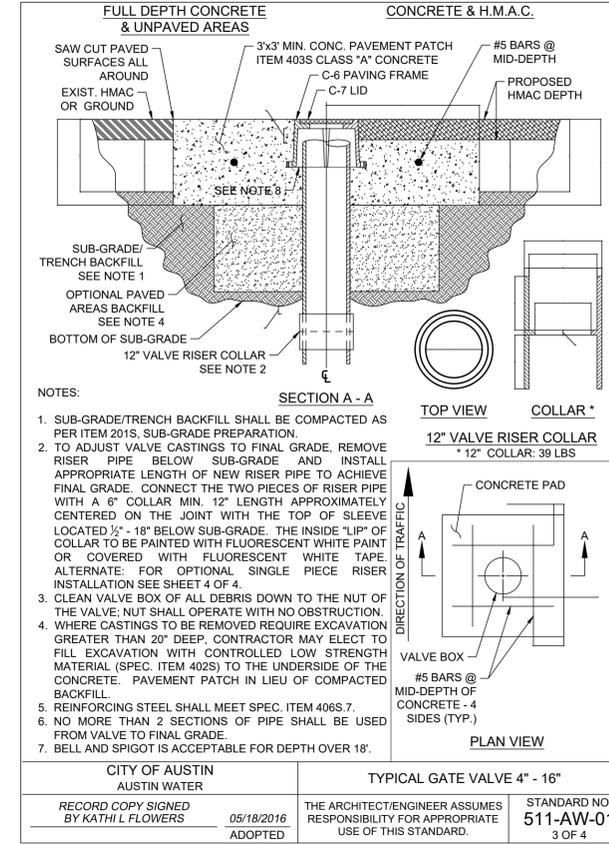
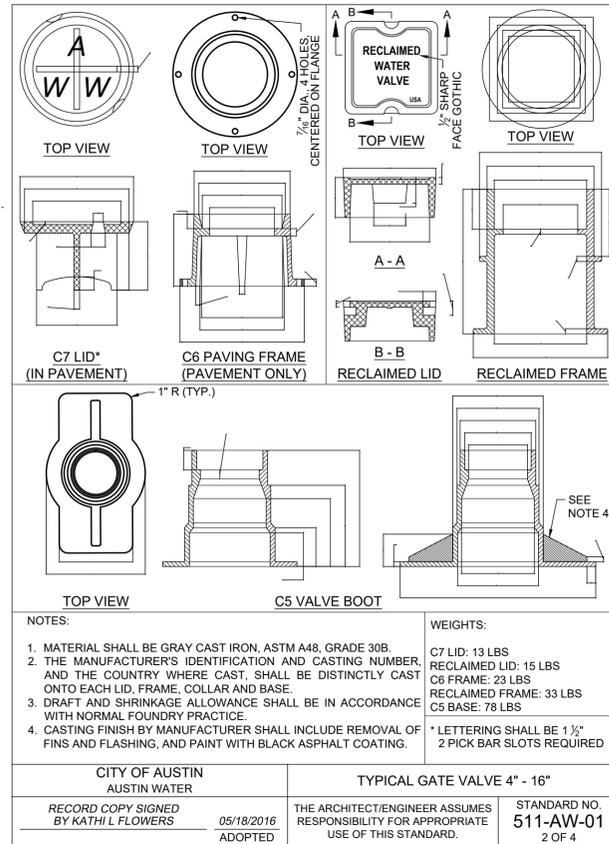
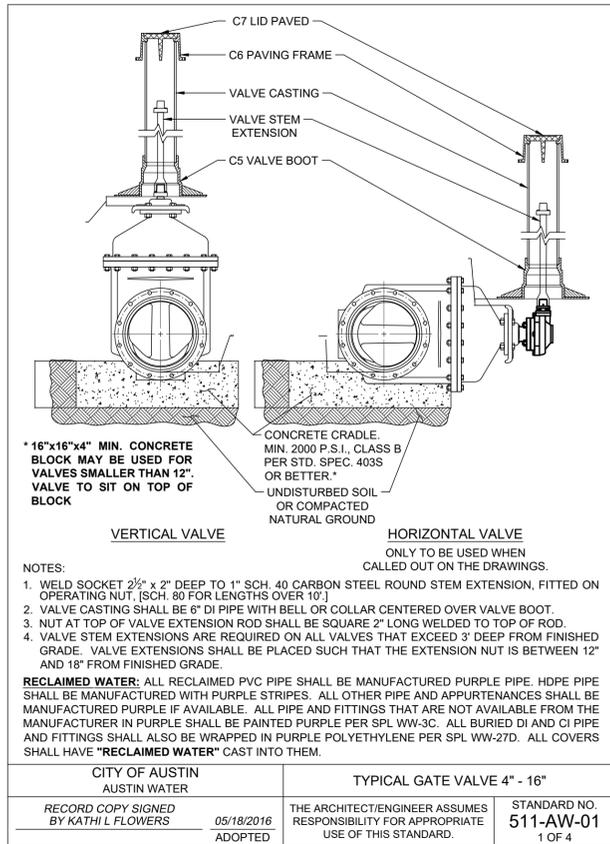


SINGLE BOX CULVERTS PRECAST 5'-0" SPAN

SCP-5

FILE: scp05sls-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	
			35 OF 49	

- ① For box length = 8'-0"
- ② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcing per linear foot of box length. AS5 is minimum required area of reinforcing per linear foot of box width.



REVISION DESCRIPTION	DATE	REV. BY	NO.

STATE OF TEXAS
GREGORY T. BLACKBURN
121663
PROFESSIONAL ENGINEER
11/15/2023

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY GREGORY T. BLACKBURN, PE LIC #121663

I CERTIFY THAT THESE DRAWINGS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THEIR INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION UNTIL FORMAL CITY APPROVAL.

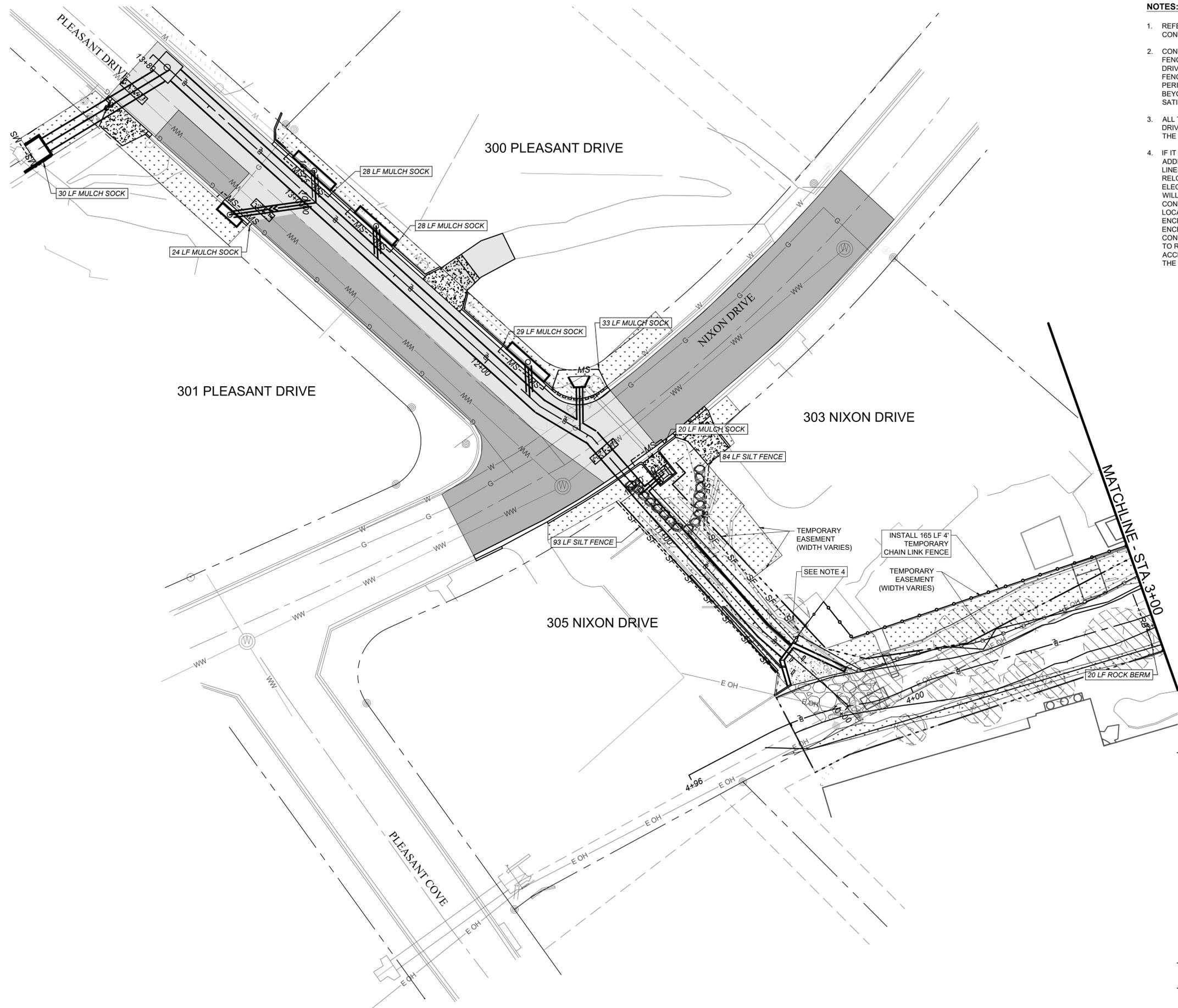
CITY OF ROLLINGWOOD, TEXAS

CITY OF ROLLINGWOOD
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
WATER LINE DETAILS
2 OF 2

NOTES	NAME	DATE

SURVEY BY		
DRAWN BY	AH	08/21
DESIGNED BY	LWM	08/21
CHECKED BY	GE	08/21
REVIEWED BY	PS	09/21

WA502 37 OF 49



- NOTES:**
1. REFERENCE LANDSCAPE SHEETS FOR PERMANENT EROSION CONTROLS.
 2. CONTRACTOR SHALL INSTALL TEMPORARY CHAIN LINK FENCING ALONG THE OF THE WORK AREA AT 303 NIXON DRIVE FOR THE DURATION OF THE PROJECT OR UNTIL NEW FENCING HAS BEEN INSTALLED TO SECURE THE BACKYARD PERIMETER AREA. ANY AREAS OR STRUCTURES DISTURBED BEYOND THESE LIMITS SHALL BE RESTORED TO THE SATISFACTION AND WITH NO ADDITIONAL COST TO THE CITY.
 3. ALL TEMPORARY FENCING INSTALLED ALONG 303 NIXON DRIVE SHALL INCLUDE A 4' GATE. GATE COST IS INCLUDED IN THE LINEAR FOOT COST OF THE TEMPORARY FENCING.
 4. IF IT IS DETERMINED BY THE CITY THAT THERE IS AN ADDITIONAL ENCROACHMENT OF OVERHEAD ELECTRIC LINES ONTO 305 NIXON DRIVE AS A RESULT OF THE RELOCATED AUSTIN ENERGY DISTRIBUTION POLE, THE ELECTRICAL SERVICE POLE LOCATED AT 303 NIXON DRIVE WILL BE RELOCATED. THE CITY WILL INSTRUCT THE CONTRACTOR TO MOVE THE SERVICE POLE TO A NEW LOCATION THAT WILL HELP MITIGATE THE ADDITIONAL ENCROACHMENT TO A CURRENT DEGREE OF ENCROACHMENT OR BETTER. THE CONTRACTOR SHALL CONSULT WITH THE PROPERTY OWNER AT 303 NIXON DRIVE TO RELOCATE THE POLE CLOSER TO THE FENCE LINE IN AN ACCEPTABLE LOCATION FOR ALL PARTIES THAT ACHIEVES THE GOAL OF THE RELOCATION.

REV. NO.	BY	DATE	REVISION DESCRIPTION



I CERTIFY THAT THESE DRAWINGS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THEIR INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION UNTIL FORMAL CITY APPROVAL.

CITY OF ROLLINGWOOD, TEXAS
 CITY OF ROLLINGWOOD
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 EROSION CONTROL PLAN

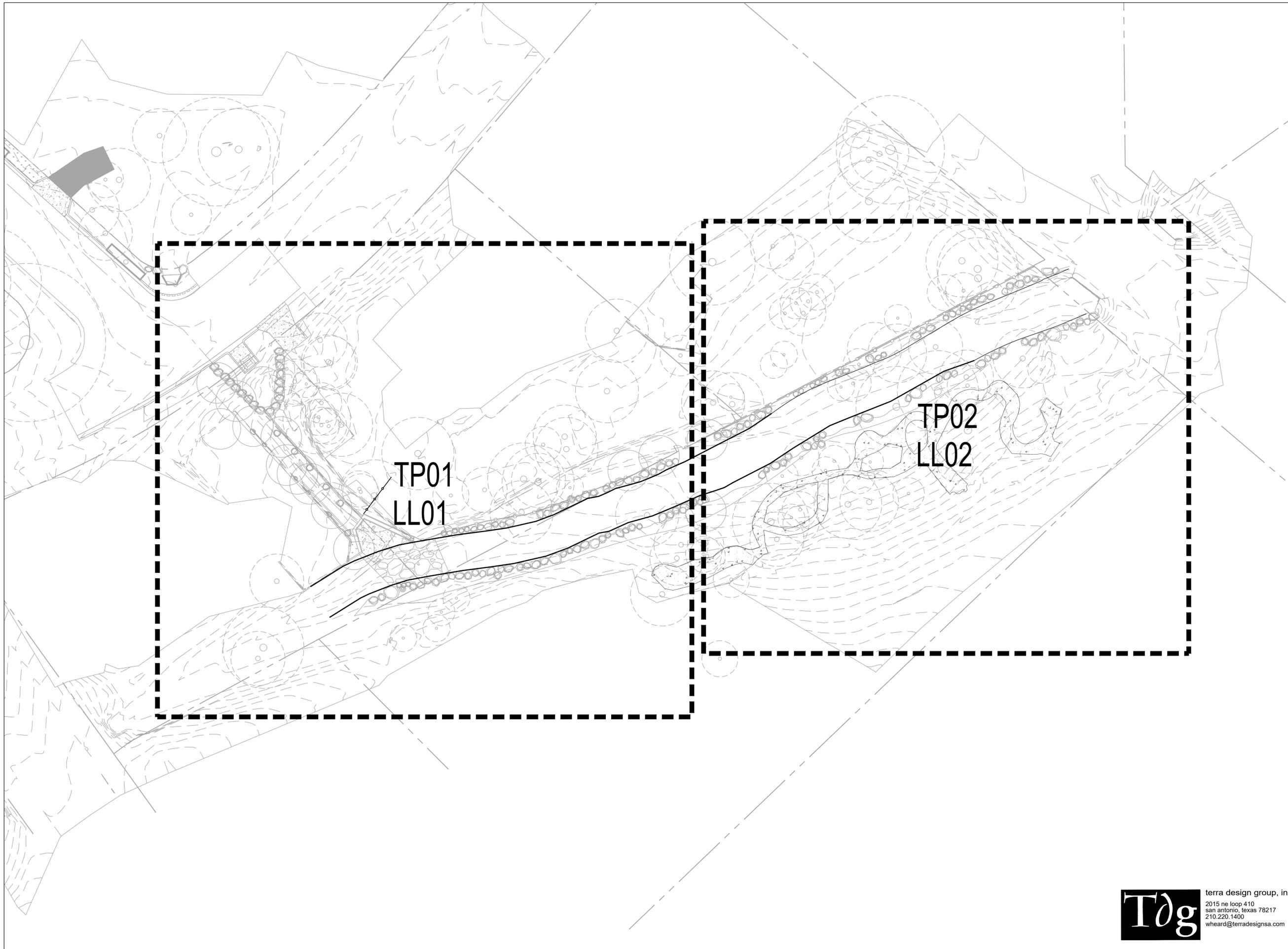
LEGEND

	LIMITS OF CONSTRUCTION
	MULCH SOCK
	TEMP CHAIN LINK FENCE
	SILT FENCE
	TREE PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	ROCK BERM
	TREE
	TREE TO BE REMOVED

ROLLINGWOOD TEXAS
K-FRIESE + ASSOCIATES
 PUBLIC PROJECT ENGINEERING
 1120 S. Capital of Texas Highway
 CityView 2, Suite 100
 Austin, Texas 78746
 P - 512.338.1704 F - 512.338.1784
 TPE Firm #6535
 www.kfriese.com

NOTES	NAME	DATE





REV. NO.	BY	DATE	REVISION DESCRIPTION
1	WH	10/04/2023	PREVIOUSLY PROPOSED PLANTING, CRUSHED LIMESTONE CHANGED TO BROWN MULCH.

100% SUBMITTAL

Walter H. Heard

CITY OF ROLLINGWOOD, TEXAS
PUBLIC WORKS
DEPARTMENT

PROPOSED DRAINAGE IMPROVEMENTS
NIXON/PLEASANT DRIVE IMPROVEMENTS

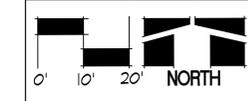
OVERALL TREE PRESERVATION
AND LANDSCAPE LAYOUT

ROLLINGWOOD
TEXAS

**K·FRIESE
+ ASSOCIATES**
PUBLIC PROJECT ENGINEERING

1120 S. Capital of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P - 512.338.1704 F - 512.338.1784
TBPE Firm #6535
www.kfriese.com

NOTES	NAME	DATE
SURVEY BY		
DRAWN BY		
DESIGNED BY		
CHECKED BY		
REVIEWED BY		



Tdg terra design group, inc.
2015 ne loop 410
san antonio, texas 78217
210.220.1400
wheard@terraesignsa.com

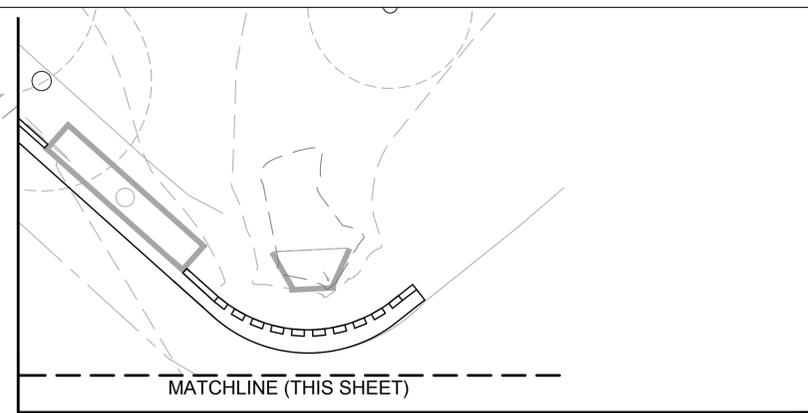
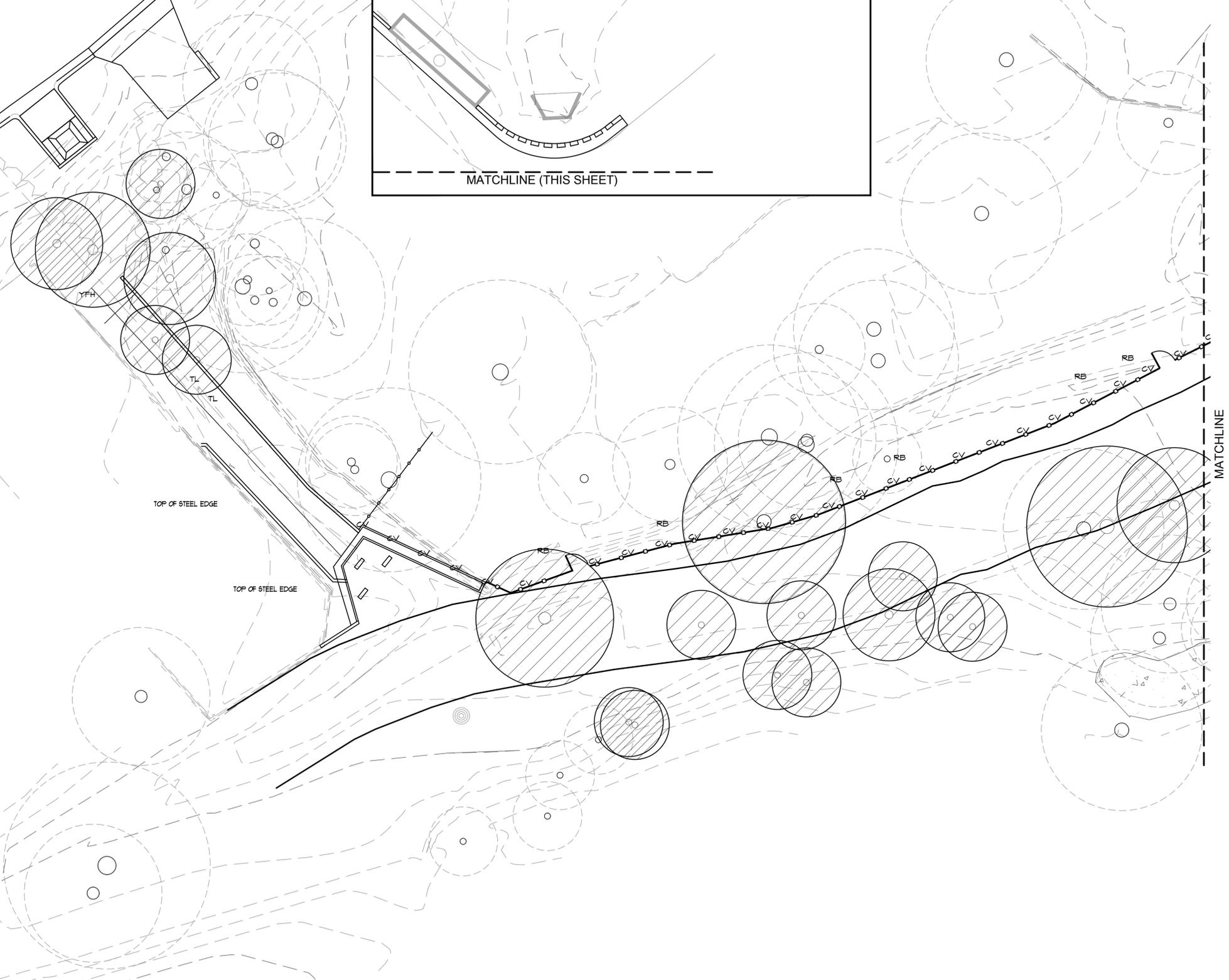
PIX FRIESE/NIXON DRIVE AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS/PLANTING/LANDSCAPE NIXON/PLEASANT DRAINAGE 3.17.23 DWG. - 100% MONO FULL CTR

TREE INVENTORY

ID	Species	Significant Trees 6" - 23.99"		Protection Level
		Removed	Saved	
75458	Oak		8	Preserve
75459	Oak		10	Preserve
75460	Oak		6	Preserve
75461	Oak		6	Preserve
75462	Hackberry	6		Remove
75463	Oak		7	Preserve
75464	Oak		10	Preserve
75465	Oak		14	Preserve
75466	Oak		6	Preserve
75467	Oak		8	Preserve
75468	Oak		8	Preserve
75469	Oak		8	Preserve
75470	Oak		15	Preserve
75471	Oak	8		Remove
75472	Oak	10		Remove
75473	Oak	8		Remove
75474	Oak	6		Remove
75475	Hackberry	6		Remove
75476	Hackberry		8	Preserve
75477	Hackberry		8	Preserve
75478	Oak		16	Preserve
75479	Oak		12	Preserve
75480	Oak		10	Preserve
75518	Oak		12	Preserve
75711	Chinaberry	6		Remove
75712	Chinaberry	6		Remove
75713	Chinaberry	6		Remove
75714	Hackberry	8		Remove
75715	Chinaberry	6		Remove
75716	Chinaberry	6		Remove
75718	Chinaberry	6		Remove
75719	Chinaberry	6		Remove
75720	Chinaberry	6		Remove
75721	Chinaberry	6		Remove
75722	Oak		6	Preserve
75723	Chinaberry		6	Preserve
75725	Chinaberry		6	Preserve
75726	Chinaberry		6	Preserve
75727	Cedar	14		Remove
75728	Oak		16	Preserve
75729	Oak		16	Preserve
75734	Oak		6	Preserve
75736	Oak	12		Remove
75993	Oak		14	Preserve
75994	Chinaberry	14		Remove
75995	Chinaberry	10		Remove
75996	Oak		14	Preserve
75997	Oak		12	Preserve
75998	Oak		12	Preserve
75999	Oak		8	Preserve
76000	Oak		8	Preserve
76001	Oak		8	Preserve
76002	Chinaberry		8	Preserve
76006	Hackberry		12	Preserve
76007	Oak		17	Preserve
76008	Cedar		6	Preserve
76009	Cedar		8	Preserve
76010	Cedar		8	Preserve
76011	Oak		7	Preserve
76012	Chinaberry	7		Remove
76013	Chinaberry	9		Remove
76014	Chinaberry		14	Preserve
76015	Hackberry		14	Preserve
76016	Cedar		6	Preserve
76027	Oak		16	Preserve
76028	Oak		18	Preserve
76029	Oak		18	Preserve
76030	Oak		8	Preserve
76031	Oak		8	Preserve
76032	Oak		6	Preserve
76040	Oak		8	Preserve
76041	Cedar	8		Remove
76042	Cedar	8		Remove
76043	Cedar	9		Remove
76044	Hackberry	8		Remove
76045	Hackberry		7	Preserve
76046	Tallow		6	Preserve
76047	Tallow		6	Preserve
76048	Tallow		15	Preserve
76049	Tallow		13	Preserve
76050	Tallow		7	Preserve
76051	Tallow		7	Preserve
76052	Tallow	7		Remove
76053	Cedar	7		Remove
76054	Tallow	7		Remove
76055	Tallow	7		Remove
76056	Tallow	9		Remove
76057	Oak		18	Preserve
76058	Tallow		18	Preserve
76059	Tallow		19	Preserve
76060	Oak		8	Preserve
76061	Oak		9	Preserve
76062	Oak		12	Preserve
76063	Oak		12	Preserve
76064	Tallow	12		Remove
76065	Tallow	8		Remove
76066	Tallow	7		Remove
76067	Oak		13	Preserve
76069	Oak		6	Preserve
76070	Oak		13	Preserve
76071	Oak		12	Preserve
76072	Oak		7	Preserve
76073	Oak		8	Preserve
76074	Oak		6	Preserve

Sub. Tot. Inches=	269	714
Total inches by category=		983
Preservation percentage=		73%
Mitigation required=	1 to 1	0

MATCHLINE (THIS SHEET)



TREE PRESERVATION NOTES:
 1. TREES TO BE REMOVED AS SHOWN ARE TO BE REMOVED TO 6" BELOW FINISH GRADE.
 2. CONTRACTOR TO IDENTIFY TREES FOR REMOVAL FOR REVIEW AND APPROVAL BY OWNER AND OWNER'S REPRESENTATIVE.
 3. CONTRACTOR IS ENCOURAGED TO VISIT THE SITE PRIOR TO BID AS ADDITIONAL TREES, PARTICULARLY UNDERSTORY TREES NOT IDENTIFIED IN THE TREE SURVEY, MAY BE REQUIRED REMOVAL TO CONSTRUCT THE IMPROVEMENTS. CONTRACTOR IS REQUIRED TO REMOVE ALL TREES AS NECESSARY TO CONSTRUCT THE IMPROVEMENTS.

Tdg terra design group, inc.
 2015 ne loop 410
 san antonio, texas 78217
 210.220.1400
 wheward@terradesigns.com

REVISION DESCRIPTION
 DATE
 BY
 NO.
 1 WH 10/04/2023 PREVIOUSLY PROPOSED PLANTING CRUSHED LIMESTONE CHANGED TO BROWN MULCH

100% SUBMITTAL

REGISTERED LANDSCAPE ARCHITECT
 WALTER H. HEARD
 STATE OF TEXAS
 629
 3.17.23
Walter H. Heard

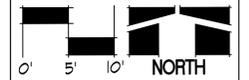
CITY OF ROLLINGWOOD, TEXAS
 PUBLIC WORKS
 DEPARTMENT

PROPOSED DRAINAGE IMPROVEMENTS
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS
 TREE PRESERVATION

ROLLINGWOOD TEXAS

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 TBPE Firm #6535
 www.kfrieese.com

NOTES	NAME	DATE
SURVEY BY		
DRAWN BY		
DESIGNED BY		
CHECKED BY		
REVIEWED BY		



TREE INVENTORY

Species	Significant Trees 6" - 23.99"		Protection Level
	Removed	Saved	
75458 Oak		8	Preserve
75459 Oak		10	Preserve
75460 Oak		6	Preserve
75461 Oak		6	Preserve
75462 Hackberry	6		Remove
75463 Oak		7	Preserve
75464 Oak		10	Preserve
75465 Oak		14	Preserve
75466 Oak		6	Preserve
75467 Oak		8	Preserve
75468 Oak		8	Preserve
75469 Oak		8	Preserve
75470 Oak		15	Preserve
75471 Oak	8		Remove
75472 Oak	10		Remove
75473 Oak	8		Remove
75474 Oak	6		Remove
75475 Hackberry	6		Remove
75476 Hackberry		8	Preserve
75477 Hackberry		8	Preserve
75478 Oak		16	Preserve
75479 Oak		12	Preserve
75480 Oak		10	Preserve
75518 Oak		12	Preserve
75711 Chinaberry	6		Remove
75712 Chinaberry	6		Remove
75713 Chinaberry	6		Remove
75714 Hackberry	8		Remove
75715 Chinaberry	6		Remove
75716 Chinaberry	6		Remove
75718 Chinaberry	6		Remove
75719 Chinaberry	6		Remove
75720 Chinaberry	6		Remove
75721 Chinaberry	6		Remove
75722 Oak		6	Preserve
75723 Chinaberry		6	Preserve
75725 Chinaberry		6	Preserve
75726 Chinaberry		6	Preserve
75727 Cedar	14		Remove
75728 Oak		16	Preserve
75729 Oak		16	Preserve
75734 Oak		6	Preserve
75736 Oak	12		Remove
75993 Oak		14	Preserve
75994 Chinaberry	14		Remove
75995 Chinaberry	10		Remove
75996 Oak		14	Preserve
75997 Oak		12	Preserve
75998 Oak		12	Preserve
75999 Oak		8	Preserve
76000 Oak		8	Preserve
76001 Oak		8	Preserve
76002 Chinaberry		8	Preserve
76006 Hackberry		12	Preserve
76007 Oak		17	Preserve
76008 Cedar		6	Preserve
76009 Cedar		8	Preserve
76010 Cedar		8	Preserve
76011 Oak		7	Preserve
76012 Chinaberry	7		Remove
76013 Chinaberry	9		Remove
76014 Chinaberry		14	Preserve
76015 Hackberry		14	Preserve
76016 Cedar		6	Preserve
76027 Oak		16	Preserve
76028 Oak		18	Preserve
76029 Oak		18	Preserve
76030 Oak		8	Preserve
76031 Oak		8	Preserve
76032 Oak		6	Preserve
76040 Oak		8	Preserve
76041 Cedar	8		Remove
76042 Cedar	8		Remove
76043 Cedar	9		Remove
76044 Hackberry	8		Remove
76045 Hackberry		7	Preserve
76046 Tallow		6	Preserve
76047 Tallow		6	Preserve
76048 Tallow		15	Preserve
76049 Tallow		13	Preserve
76050 Tallow		7	Preserve
76051 Tallow		7	Preserve
76052 Tallow	7		Remove
76053 Cedar	7		Remove
76054 Tallow	7		Remove
76055 Tallow	7		Remove
76056 Tallow	9		Remove
76057 Oak		18	Preserve
76058 Tallow		18	Preserve
76059 Tallow		19	Preserve
76060 Oak		8	Preserve
76061 Oak		9	Preserve
76062 Oak		12	Preserve
76063 Oak		12	Preserve
76064 Tallow	12		Remove
76065 Tallow	8		Remove
76066 Tallow	7		Remove
76067 Oak		13	Preserve
76069 Oak		6	Preserve
76070 Oak		13	Preserve
76071 Oak		12	Preserve
76072 Oak		7	Preserve
76073 Oak		8	Preserve
76074 Oak		6	Preserve

Sub. Tot. Inches=	269	714
Total inches by category=		983
Preservation percentage=		73%
Mitigation required=	1 to 1	0



TREE PRESERVATION NOTES:

- TREES TO BE REMOVED AS SHOWN ARE TO BE REMOVED TO 6" BELOW FINISH GRADE.
- CONTRACTOR TO IDENTIFY TREES FOR REMOVAL FOR REVIEW AND APPROVAL BY OWNER AND OWNER'S REPRESENTATIVE.
- CONTRACTOR IS ENCOURAGED TO VISIT THE SITE PRIOR TO BID AS ADDITIONAL TREES, PARTICULARLY UNDERSTORY TREES NOT IDENTIFIED IN THE TREE SURVEY, MAY BE REQUIRED REMOVAL TO CONSTRUCT THE IMPROVEMENTS. CONTRACTOR IS REQUIRED TO REMOVE ALL TREES AS NECESSARY TO CONSTRUCT THE IMPROVEMENTS.

Tdg terra design group, inc.
 2015 ne loop 410
 san antonio, texas 78217
 210.220.1400
 wheard@terradesigns.com

REV. NO.	DATE	BY	DESCRIPTION
1	10/04/2023	WH	REVISIONS PROPOSED PLANTING CRUISED LIMESTONE CHANGED TO BROWN MULCH

100% SUBMITTAL



CITY OF ROLLINGWOOD, TEXAS
 PUBLIC WORKS
 DEPARTMENT

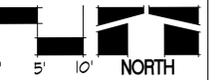
**PROPOSED DRAINAGE IMPROVEMENTS
 NIXON/PLEASANT DRAINAGE IMPROVEMENTS**

TREE PRESERVATION

ROLLINGWOOD TEXAS

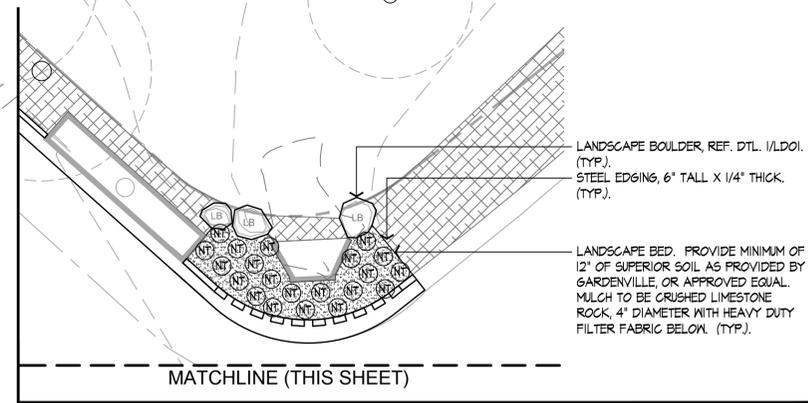
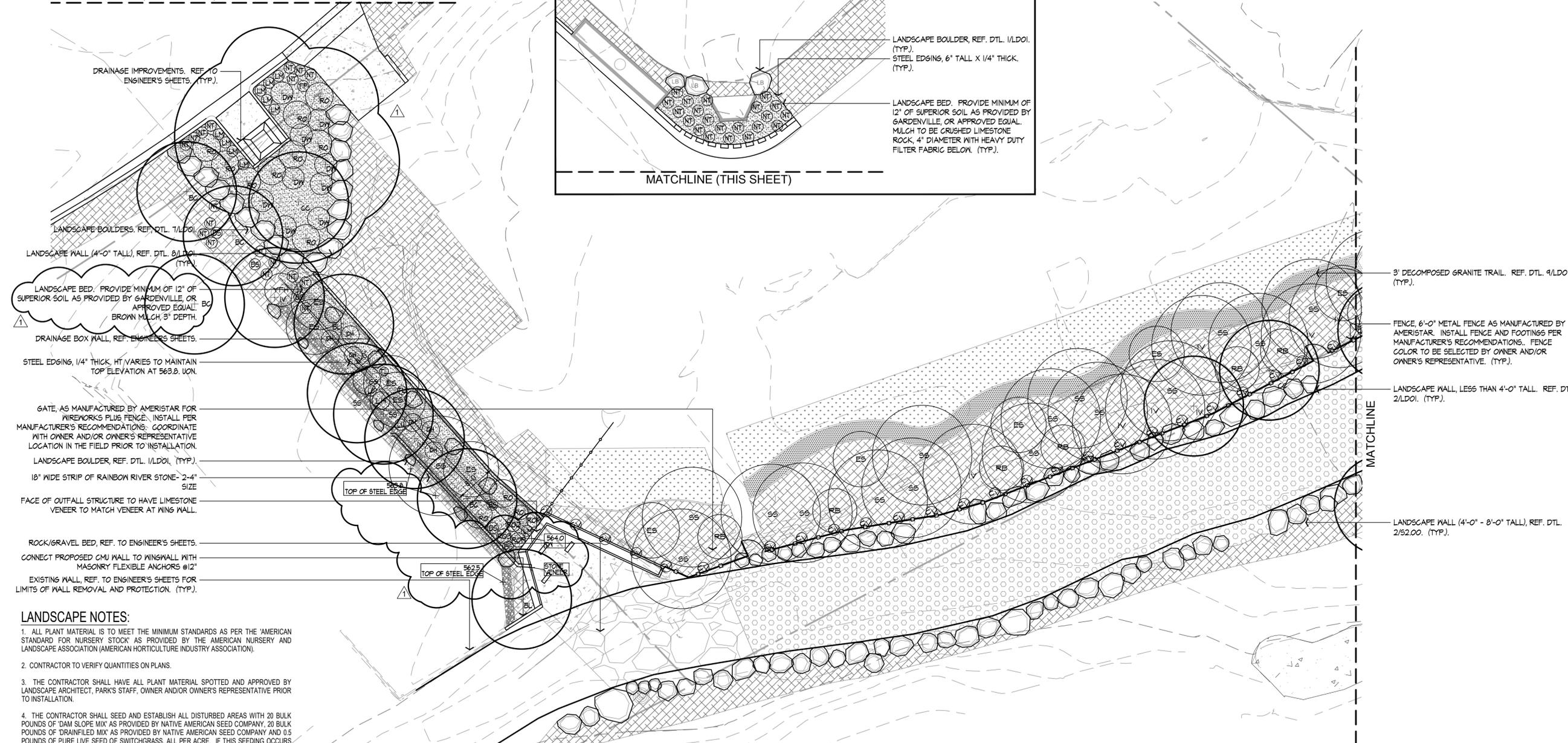
K-FRIESE + ASSOCIATES
 PUBLIC PROJECT ENGINEERING
 1120 S. Capital of Texas Highway
 CityView 2, Suite 100
 Austin, Texas 78746
 P - 512.338.1704 F - 512.338.1784
 TBPE Firm #6535
 www.kfriese.com

NOTES	NAME	DATE
SURVEY BY		
DRAWN BY		
DESIGNED BY		
CHECKED BY		
REVIEWED BY		



10/04/2023 3:11 PM P:\K FRIESE\NIXON DRIVE AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS\A\PLANS\BASE NIXON PLEASANT DRAINAGE 31.23.DWG - 100% TDS MONO FULL.CTB

MATCHLINE (THIS SHEET)



DRAINAGE IMPROVEMENTS, REF. TO ENGINEER'S SHEETS, (TYP.)

LANDSCAPE BOULDERS, REF. DTL. 1/LDOI, (TYP.)

LANDSCAPE MALL (4'-0" TALL), REF. DTL. 8/LDOI, (TYP.)

LANDSCAPE BED, PROVIDE MINIMUM OF 12" OF SUPERIOR SOIL AS PROVIDED BY GARDENVILLE, OR APPROVED EQUAL. BROWN MULCH, 3" DEPTH.

DRAINAGE BOX MALL, REF. ENGINEER'S SHEETS.

STEEL EDGING, 1/4" THICK, HT/VARIES TO MAINTAIN TOP ELEVATION AT 563.8 UCN.

GATE, AS MANUFACTURED BY AMERISTAR FOR WIREWORKS PLUS FENCE. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE WITH OWNER AND/OR OWNER'S REPRESENTATIVE LOCATION IN THE FIELD PRIOR TO INSTALLATION.

LANDSCAPE BOULDER, REF. DTL. 1/LDOI, (TYP.)

18" WIDE STRIP OF RAINBOW RIVER STONE - 2'-4" SIZE

FACE OF OUTFALL STRUCTURE TO HAVE LIMESTONE VENEER TO MATCH VENEER AT MING MALL.

ROCK/GRAVEL BED, REF. TO ENGINEER'S SHEETS.

CONNECT PROPOSED CMU WALL TO MINGWALL WITH MASONRY FLEXIBLE ANCHORS @12"

EXISTING MALL, REF. TO ENGINEER'S SHEETS FOR LIMITS OF WALL REMOVAL AND PROTECTION. (TYP.)

LANDSCAPE NOTES:

- ALL PLANT MATERIAL IS TO MEET THE MINIMUM STANDARDS AS PER THE AMERICAN STANDARD FOR NURSERY STOCK AS PROVIDED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (AMERICAN HORTICULTURE INDUSTRY ASSOCIATION).
- CONTRACTOR TO VERIFY QUANTITIES ON PLANS.
- THE CONTRACTOR SHALL HAVE ALL PLANT MATERIAL SPOTTED AND APPROVED BY LANDSCAPE ARCHITECT, PARKS STAFF, OWNER AND/OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL SEED AND ESTABLISH ALL DISTURBED AREAS WITH 20 BULK POUNDS OF 'DAM SLOPE MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY, 20 BULK POUNDS OF 'DRAINFILED MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY AND 0.5 POUNDS OF PURE LIVE SEED OF SWITCHGRASS, ALL PER ACRE. IF THIS SEEDING OCCURS BETWEEN OCTOBER-FEBRUARY, THE CONTRACTOR SHALL ADD 50 BULK POUNDS OF CEREAL RYE PER ACRE TO THE MIX (COOL SEASON COVER CROP). AREAS SHOWN WITH SOD DO NOT REQUIRE SEEDING.
- ALL PLANTING BEDS ARE TO BE SEPARATED FROM TURF AND NATIVE GRASS/TURF AREAS WITH STEEL EDGING. STEEL EDGING TO BE 6" TALL X 1/4" THICK.
- THE CONTRACTOR SHALL STAKE LOCATIONS OF PROPOSED TREES IN FIELD FOR REVIEW AND APPROVED BY LANDSCAPE ARCHITECT, OWNER OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
- THE PLANT MATERIAL (SHRUBS AND NON-TREE PLANTS) FOR THIS PROJECT, IS TO BE PLANTED ON A 2'-6" GRID. THE GRID IS NOT PLANTED SOLID BUT AS SHOWN IN THE LANDSCAPE LAYOUT.
- THE PLANTING BEDS ARE TO BE MULCHED WITH CRUSHED LIMESTONE, 4" DIAMETER. PROVIDE HEAVY DUTY FILTER FABRIC BELOW THE PINK GRANITE.
- FOR THE AREAS THAT REQUIRE SOD OR SEEDING, 4" OF TOPSOIL ARE TO BE PROVIDED. THE TOPSOIL IS TO BE 'SUPERIOR SOIL' AS PROVIDED BY GARDENVILLE OR APPROVED EQUAL. IF EXISTING SITE SOIL IS APPROVED BY THE LANDSCAPE ARCHITECT AND USED FOR THE SOD AND/OR SEED AREAS, THE EXISTING SOIL IS TO BE AMENDED WITH 2" OF COMPOSTED, LIGHTLY TILLED INTO THE TOP 4" OF THE SOIL. THE COMPOST IS TO BE 'ECO THRIVE' AS PROVIDED BY GARDENVILLE OR APPROVED EQUAL.
- ALL SOIL MEDIA AND MULCH ARE TO BE CLEAN AND FREE OF WEEDS AND UNWANTED GRASSES.
- THE ZOYSIA SOD MAY REQUIRE A LONG LEAD TIME. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ORDER AND SECURE SOD FOR THIS PROJECT IN A TIMELY MANNER TO MEET SUBSTANTIAL COMPLETION. THIS MAY REQUIRE ORDER/COORDINATION WITH THE SOD FARM AT THE START OF THE PROJECT. EXTENSION OF CONSTRUCTION TIME WILL NOT BE ACCEPTABLE WITHOUT WRITTEN DOCUMENTATION OF EARLY COORDINATION WITH THE SOD FARM(S).
- CONTRACTOR TO WATER ALL LANDSCAPE IMPROVEMENTS FOR THREE (3) MONTHS TO THE EQUIVALENT OF 1" OF WATER PER WEEK OR AS NEEDED FOR VEGETATION/PLANT ESTABLISHMENT.
- LANDSCAPE WALLS AND BOULDERS ARE TO BE PLACED TO MEET THE DRAINAGE REQUIREMENTS AS SHOWN IN THE ENGINEER'S SHEETS. LANDSCAPE WALL AND BOULDER ALIGNMENTS MAY BE MODIFIED WITH COORDINATION WITH THE OWNER'S REPRESENTATIVE AS NECESSARY TO MEET THE ENGINEER'S DRAINAGE REQUIREMENTS.

PLANT LIST

	COMMON NAME	SCIENTIFIC NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS
TREES							
CC	3	REDBUD	<i>CERCIS CANADENSIS</i>	2' CAL.	6'-8'	4'-6'	PER PLAN CONTAINER, STANDARD
DT	1	TEXAS PERSIMMON	<i>DIOSPYROS TEXANA</i>	2' CAL.	6'-8'	4'-6'	PER PLAN CONTAINER, STANDARD
IV	8	YAUPOH HOLLY	<i>ILEX VOMITORIA</i>	2' CAL.	6'-8'	4'-6'	PER PLAN CONTAINER
SS	20	MOUNTAIN LAUREL	<i>SOPHIA SEDUNIFLORA</i>	2 GAL.	6'-8'	4'-6'	PER PLAN CONTAINER, STANDARD
BL	2	ANAGACHO ORCHID	<i>BALSHINIA LUNARIOIDES</i>	5 GAL.	6'-12"	4'-6'	PER PLAN CONTAINER, STANDARD
ES	8	EVERGREEN SUMAC	<i>RHUS VIRENS</i>	2' CAL.	6'-8'	4'-6'	PER PLAN CONTAINER, STANDARD
RB	8	REDBUD	<i>CERCIS CANADENSIS</i>	2' CAL.	6'-12"	4'-6'	PER PLAN CONTAINER, STANDARD
BO	4	PINDO PALM	<i>BUTIA CAPITATA</i>	5 GAL.	8'-10"		PER PLAN CONTAINER, STANDARD
BL	1	ANAGACHO ORCHID TREE	<i>BUTIA CAPITATA</i>	5 GAL.	6'-12"		PER PLAN
SHRUBS							
LM	10	TRAILING LANTANA	<i>LANTANA MONTEVIDENSIS</i>	1 GAL.	16"	FULL	PER PLAN FULL, PURPLE
NT	34	TEXAS FEATHERGRASS	<i>NASSELLA TENUISSIMA</i>	1 GAL.	12"	FULL	PER PLAN FULL
RO	11	ROSE	<i>ROSE SPECIES</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
LH	1	LANTANA HYBRID	<i>LANTANA HYBRIDA</i>	1 GAL.	2'-4'	FULL	PER PLAN FULL
LW	2	LANTANA-TEXAS	<i>LANTANA URTICOIDES</i>	1 GAL.	3'-5'	FULL	PER PLAN FULL
ROP	2	ROSEMARY TRAILING	<i>ROSEMARINUS VAR POSTRATUS</i>	1 GAL.	12"	FULL	PER PLAN FULL
RO1	1	ROSE IMPERIAL	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
RO2	1	ROSE DREAM	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
RO3	1	ROSE KNOCKOUT	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
DH	6	YAUPOH HOLLY DWARF	<i>ILEX VOMITORIA "NANA"</i>	1 GAL.	2'-4'	FULL	PER PLAN FULL
GG	1	GOLDEN SHOWERS THRYALIS	<i>GALPHIMIA GLAUCA</i>	1 GAL.	4'-6'	FULL	PER PLAN FULL
WFH	1	YAUPOH HOLLY "WILL FLEMING"	<i>ILEX VOMITORIA "WILL FLEMING"</i>	2 GAL.	12-15"	FULL	PER PLAN FULL
BS	6	BOXWOOD LITTLE MISSY	<i>BUXUS MICROPHYLLA</i>	1 GAL.	2'-3'	FULL	PER PLAN FULL
CV	24	CROSS VINE	<i>BIGNONIA CAPREOLATA</i>	1 GAL.		FULL	PER PLAN
TL	2	TRAILING LANTANA	<i>LANTANA MONTEVIDENSIS</i>	1 GAL.	12-20"	FULL	PER PLAN
DW	1	SOTOL	<i>DASYLIRION WHEELERI</i>	10 GAL.	3'-4'	FULL	PER PLAN FULL
FP	1	CLIMBING FIG	<i>FIGUS FUMILA</i>	1 GAL.	12"	FULL	PER PLAN FULL

MISCELLANEOUS

5626 S.F.	ZOYSIA GRASS OR MATCH EXISTING PRIVATE GRASS	ZOYSIA JAPONICA	SOLID SOD.
6491 S.F.	NATIVE GRASSES (S.F.)	20 BULK POUNDS OF 'DAM SLOPE MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY, 20 BULK POUNDS OF 'DRAINFILED MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY AND 0.5 POUNDS OF PURE LIVE SEED OF SWITCHGRASS, ALL PER ACRE. IF THIS SEEDING OCCURS BETWEEN OCTOBER-FEBRUARY, THE CONTRACTOR SHALL ADD 50 BULK POUNDS OF CEREAL RYE PER ACRE TO THE MIX (COOL SEASON COVER CROP). INSTALL GEO-GRID 4" DEPTH AND WIDTH OF CHANNEL FLOOR. PROVIDE MINIMUM OF 6" OF SUPERIOR SOIL AS PROVIDED BY GARDENVILLE, OR APPROVED EQUAL.	
1124 S.F.	BROWN MULCH (S.F.)		3" DEPTH, GARDENVILLE STERILIZED HARDWOOD MULCH.
1240 S.F.	ST. AUGUSTINE TURF GRASS		SOLID SOD.
375 S.F.	DECOMPRESSED GRANITE TRAIL		CRUSHED FINE GRANITE, 4" DEPTH WITH WEED BARRIER BELOW.
117 S.F.	RAINBOW RIVER STONE		RAINBOW RIVER STONE 2'-4" SIZE, 4" DEPTH WITH WEED BARRIER BELOW.

REV. NO.	DATE	BY	DESCRIPTION
1	10/04/2023	WH	PREVIOUSLY PROPOSED PLANTING, CRUSHED LIMESTONE CHANGED TO BROWN MULCH.

100% SUBMITTAL



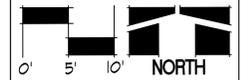
CITY OF ROLLINGWOOD, TEXAS
PUBLIC WORKS DEPARTMENT

PROPOSED DRAINAGE IMPROVEMENTS
NIXON/PLEASANT DRIVE DRAINAGE IMPROVEMENTS
LANDSCAPE LAYOUT



K-FRIESE + ASSOCIATES
PUBLIC PROJECT ENGINEERING
1120 S. Capitol of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P - 512.338.1704 F - 512.338.1784
TBP# Firm #6535
www.kfriese.com

NOTES	NAME	DATE
SURVEY BY		
DRAWN BY		
DESIGNED BY		
CHECKED BY		
REVIEWED BY		



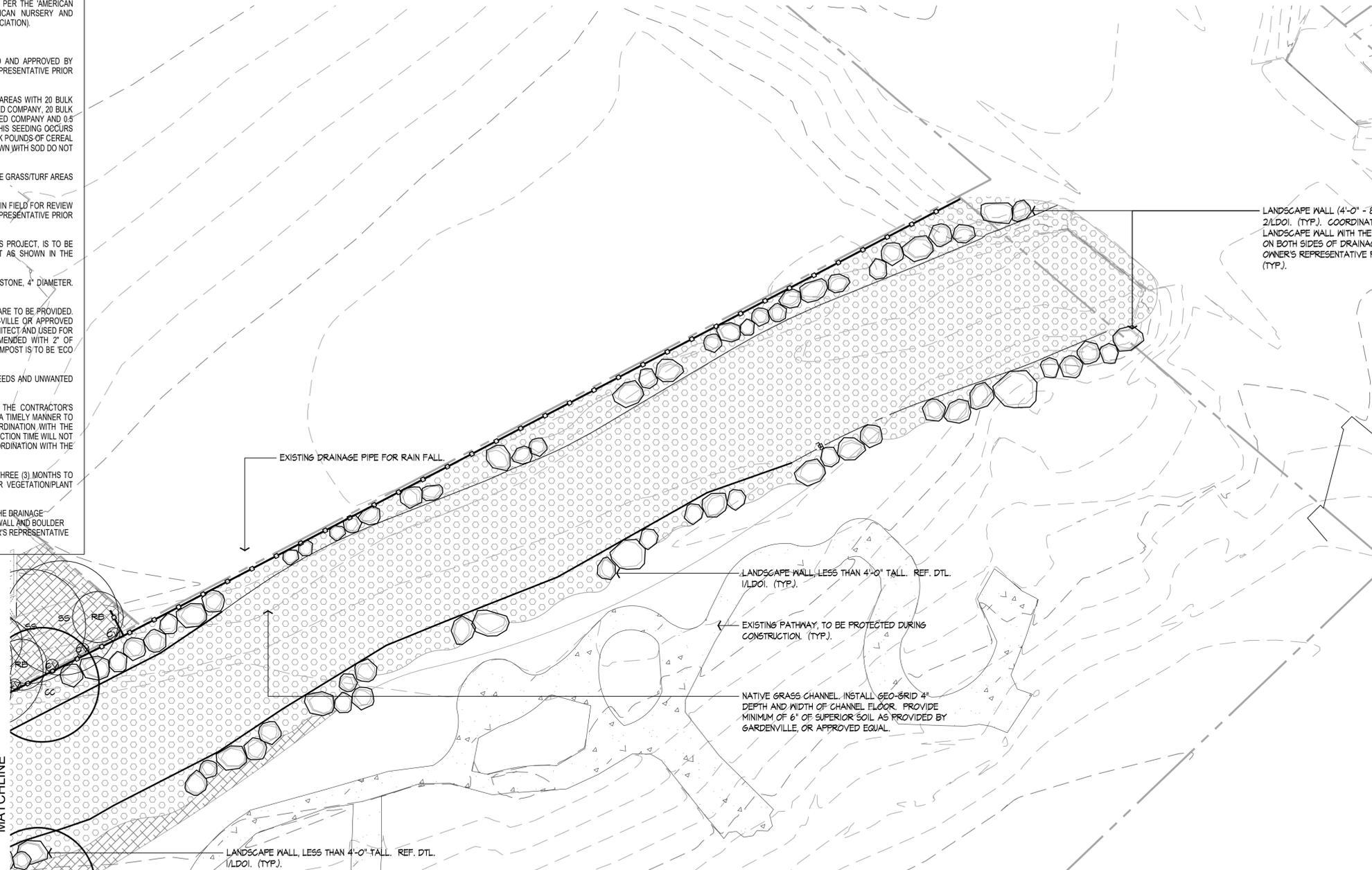
Tdg terra design group, inc.
2015 ne loop 410
san antonio, texas 78217
210.220.1400
wheard@terradesignsa.com

PIX FRIESE/NIXON DRIVE AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS/UTPLANS/BASE NIXON/PLEASANT DRAINAGE 31.23 DWG. --- TDS MONO FULL.CTX 10/4/2023 3:11 PM ESPERANZA, OROZCO

LANDSCAPE NOTES:

- ALL PLANT MATERIAL IS TO MEET THE MINIMUM STANDARDS AS PER THE 'AMERICAN STANDARD FOR NURSERY STOCK' AS PROVIDED BY THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION (AMERICAN HORTICULTURE INDUSTRY ASSOCIATION).
- CONTRACTOR TO VERIFY QUANTITIES ON PLANS.
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- THE CONTRACTOR SHALL SEED AND ESTABLISH ALL DISTURBED AREAS WITH 20 BULK POUNDS OF 'DAM SLOPE MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY, 20 BULK POUNDS OF 'DRAINFILED MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY AND 0.5 POUNDS OF PURE LIVE SEED OF SWITCHGRASS, ALL PER ACRE. IF THIS SEEDING OCCURS BETWEEN OCTOBER-FEBRUARY, THE CONTRACTOR SHALL ADD 50 BULK POUNDS OF CEREAL RYE PER ACRE TO THE MIX (COOL SEASON COVER CROP). AREAS SHOWN WITH SOD DO NOT REQUIRE SEEDING.
- ALL PLANTING BEDS ARE TO BE SEPARATED FROM TURF AND NATIVE GRASS/TURF AREAS WITH STEEL EDGING. STEEL EDGING TO BE 6" TALL X 1/4" THICK.
- THE CONTRACTOR SHALL STAKE LOCATIONS OF PROPOSED TREES IN FIELD FOR REVIEW AND APPROVED BY LANDSCAPE ARCHITECT, OWNER OR OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
- THE PLANT MATERIAL (SHRUBS AND NON-TREE PLANTS) FOR THIS PROJECT, IS TO BE PLANTED ON A 2'-6" GRID. THE GRID IS NOT PLANTED SOLID BUT AS SHOWN IN THE LANDSCAPE LAYOUT.
- THE PLANTING BEDS ARE TO BE MULCHED WITH CRUSHED LIMESTONE, 4" DIAMETER. PROVIDE HEAVY DUTY FILTER FABRIC BELOW THE PINK GRANITE.
- FOR THE AREAS THAT REQUIRE SOD OR SEEDING, 4" OF TOPSOIL ARE TO BE PROVIDED. THE TOPSOIL IS TO BE 'SUPERIOR SOIL' AS PROVIDED BY GARDENVILLE OR APPROVED EQUAL. IF EXISTING SITE SOIL IS APPROVED BY THE LANDSCAPE ARCHITECT AND USED FOR THE SOD AND/OR SEED AREAS, THE EXISTING SOIL IS TO BE AMENDED WITH 2" OF COMPOSTED, LIGHTLY TILLED INTO THE TOP 4" OF THE SOIL. THE COMPOST IS TO BE 'ECO THRIVE' AS PROVIDED BY GARDENVILLE OR APPROVED EQUAL.
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- CONTRACTOR TO WATER ALL LANDSCAPE IMPROVEMENTS FOR THREE (3) MONTHS TO THE EQUIVALENT OF 1" OF WATER PER WEEK OR AS NEEDED FOR VEGETATION/PLANT ESTABLISHMENT.
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MATCHLINE



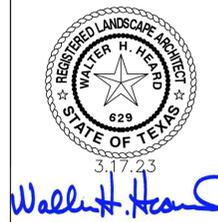
PLANT LIST

	COMMON NAME	SCIENTIFIC NAME	SIZE	HEIGHT	SPREAD	SPACING	REMARKS
TREES							
CC	3	REDBUD	<i>CERCIS CANADENSIS</i>	2" GAL.	6'-8"	4'-6"	PER PLAN CONTAINER STANDARD
DT	1	TEXAS PERSIMMON	<i>DIOSPYROS TEXANA</i>	2" GAL.	6'-8"	4'-6"	PER PLAN CONTAINER STANDARD
IV	8	YAUJON HOLLY	<i>ILEX VOMITORIA</i>	2" GAL.	6'-8"	4'-6"	PER PLAN CONTAINER
SS	20	MOUNTAIN LAUREL	<i>SOPHIA SEDUNDFLORA</i>	2 GAL.	6'-8"	4'-6"	PER PLAN CONTAINER STANDARD
BL	2	ANACACHO ORCHID	<i>BALSHINIA LUNARIODES</i>	5 GAL.	6'-12"	4'-6"	PER PLAN CONTAINER STANDARD
ES	8	EVERGREEN SUMAC	<i>RHUS VIRENS</i>	2" GAL.	6'-8"	4'-6"	PER PLAN CONTAINER STANDARD
RB	8	REDBUD	<i>CERCIS CANADENSIS</i>	2" GAL.	6'-12"	4'-6"	PER PLAN CONTAINER STANDARD
BC	4	PINDO PALM	<i>BUTIA CAPITATA</i>	5 GAL.	8'-10"		PER PLAN CONTAINER STANDARD
BL	1	ANACACHO ORCHID TREE	<i>BUTIA CAPITATA</i>	5 GAL.	6'-12"		PER PLAN
SHRUBS							
LM	10	TRAILING LANTANA	<i>LANTANA MONTEVIDENSIS</i>	1 GAL.	16"	FULL	PER PLAN FULL, PURPLE
NT	39	TEXAS FEATHERGRASS	<i>NASSELLA TENUISSIMA</i>	1 GAL.	12"	FULL	PER PLAN FULL
RO	11	ROSE	<i>ROSE SPECIES</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
LH	1	LANTANA HYBRID	<i>LANTANA HYBRIDA</i>	1 GAL.	2'-4'	FULL	PER PLAN FULL
LU	2	LANTANA TEXAS	<i>LANTANA URTICOIDES</i>	1 GAL.	3'-5'	FULL	PER PLAN FULL
ROP	2	ROSEMARY TRAILING	<i>ROSEMARINUS VAR POSTRATUS</i>	1 GAL.	12"	FULL	PER PLAN FULL
ROI	1	ROSE IMPERIAL	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
RO2	1	ROSE DREAM	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
RO3	1	ROSE KNOCKOUT	<i>ROSA</i>	5 GAL.	2'-3'	FULL	PER PLAN FULL
DH	6	YAUJON HOLLY DWARF	<i>ILEX VOMITORIA "NANA"</i>	1 GAL.	2'-4'	FULL	PER PLAN FULL
GG	1	GOLDEN SHOWERS THRYALIS	<i>GALPHIMIA GLAUCA</i>	1 GAL.	4'-6"	FULL	PER PLAN FULL
YFH	1	YAUJON HOLLY "WILL FLEMING"	<i>ILEX VOMITORIA "WILL FLEMING"</i>	2 GAL.	12'-15"	FULL	PER PLAN FULL
BS	6	BOXWOOD LITTLE MISSY	<i>BUXUS MICROPHYLLA</i>	1 GAL.	2'-3'	FULL	PER PLAN FULL
CV	24	CROSS VINE	<i>BIGNONIA CAPREOLATA</i>	1 GAL.		FULL	PER PLAN
TL	2	TRAILING LANTANA	<i>LANTANA MONTEVIDENSIS</i>	1 GAL.	12-20"	FULL	PER PLAN
DW	4	SOTOL	<i>DASTYLIRION WHEELERI</i>	10 GAL.	3'-4'	FULL	PER PLAN FULL
FP	1	CLIMBING FIG	<i>FIGUS PUMILA</i>	1 GAL.	12"	FULL	PER PLAN FULL

MISCELLANEOUS

5626	ZOYSIA GRASS OR MATCH EXISTING PRIVATE GRASS	ZOYSIA JAPONICA	SOLID SOD.
6931	NATIVE GRASSES (S.F.)	20 BULK POUNDS OF 'DAM SLOPE MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY, 20 BULK POUNDS OF 'DRAINFILED MIX' AS PROVIDED BY NATIVE AMERICAN SEED COMPANY AND 0.5 POUNDS OF PURE LIVE SEED OF SWITCHGRASS, ALL PER ACRE. IF THIS SEEDING OCCURS BETWEEN OCTOBER-FEBRUARY, THE CONTRACTOR SHALL ADD 50 BULK POUNDS OF CEREAL RYE PER ACRE TO THE MIX (COOL SEASON COVER CROP). INSTALL GEO-GRID 4" DEPTH AND WIDTH OF CHANNEL FLOOR. PROVIDE MINIMUM OF 6" OF SUPERIOR SOIL AS PROVIDED BY GARDENVILLE, OR APPROVED EQUAL.	
1124	BROWN MULCH (S.F.)	3" DEPTH. GARDENVILLE STERILIZED HARDWOOD MULCH.	
1240	ST. AUGUSTINE TURF GRASS	SOLID SOD.	
375	DECOMPRESSED GRANITE TRAIL	CRUSHED FINE GRANITE, 4" DEPTH WITH WEED BARRIER BELOW.	
117	RAINBOW RIVER STONE	RAINBOW RIVER STONE 2'-4" SIZE, 4" DEPTH WITH WEED BARRIER BELOW.	

100% SUBMITTAL



CITY OF ROLLINGWOOD, TEXAS
PUBLIC WORKS DEPARTMENT

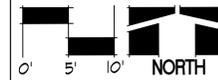
PROPOSED DRAINAGE IMPROVEMENTS
NIXON/PLEASANT DRAINAGE IMPROVEMENTS
LANDSCAPE LAYOUT

ROLLINGWOOD TEXAS

K-FRIESE + ASSOCIATES
PUBLIC PROJECT ENGINEERING

1120 S. Capitol of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P - 512.338.1704 F - 512.338.1784
TBPE Firm #6535
www.kfriese.com

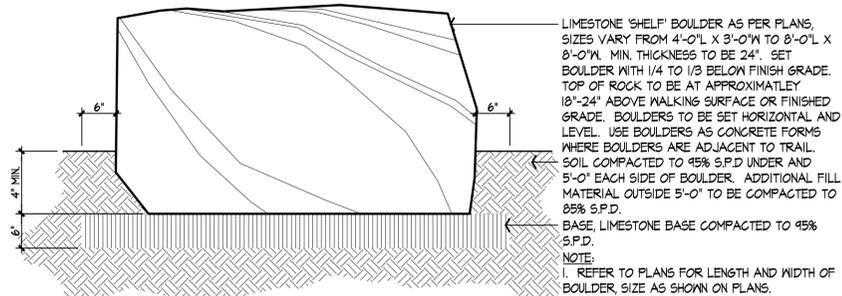
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SURVEY BY		
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DESIGNED BY		
CHECKED BY		
REVIEWED BY		



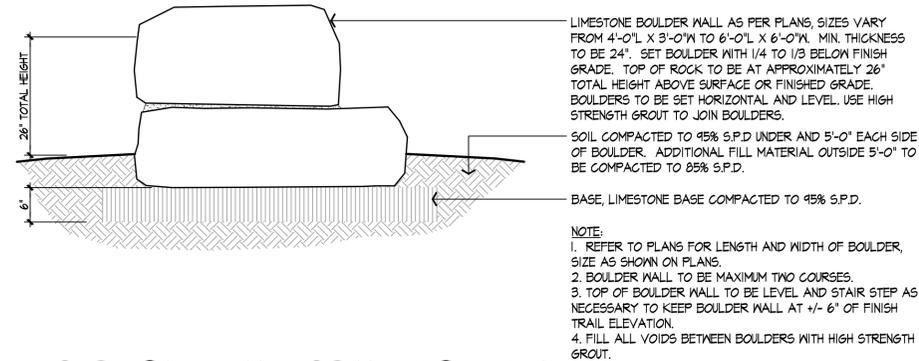
Tdg terra design group, inc.

2015 ne loop 410
san antonio, texas 78217
210.220.1400
wheard@terradesigns.com

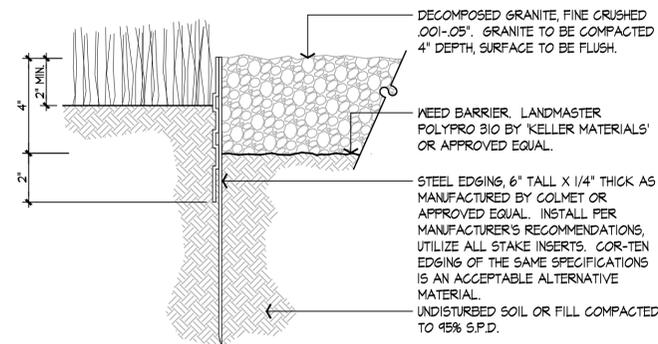
P.LK FRIESE/NIXON DRIVE AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS/PLANS/BASE NIXON/PLEASANT DRAINAGE 3.1.23 DWG. --- TDS MONO FULL.CTB 10/4/2023 3:11 PM



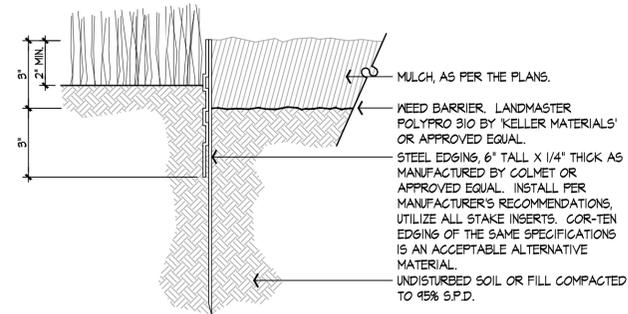
7 SECTION: BOULDER INSTALLATION
Scale: 3/4" = 1'-0"



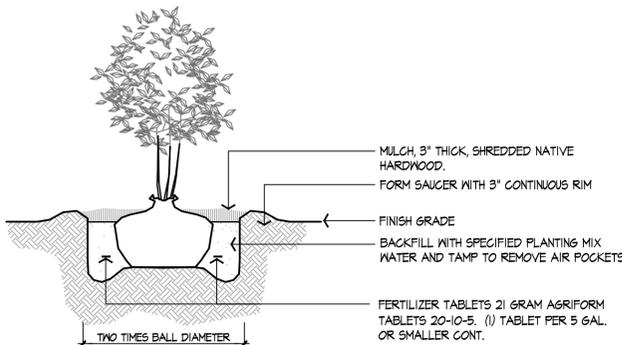
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Scale: 3/4" = 1'-0"



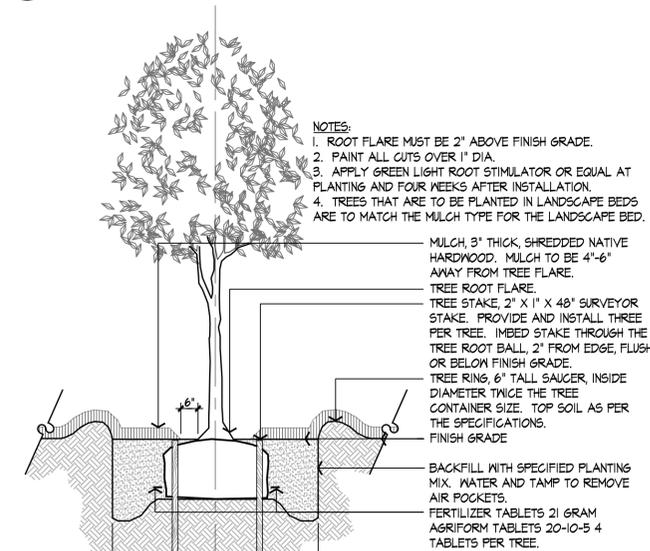
9 SECTION: DECOMPOSED GRANITE
Scale: 3/4" = 1'-0"



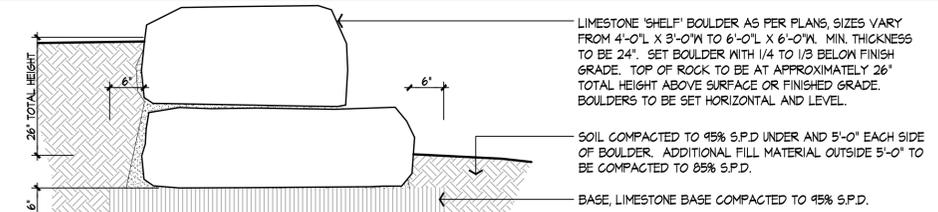
4 SECTION: STEEL EDGING
Scale: 3" = 1'-0"



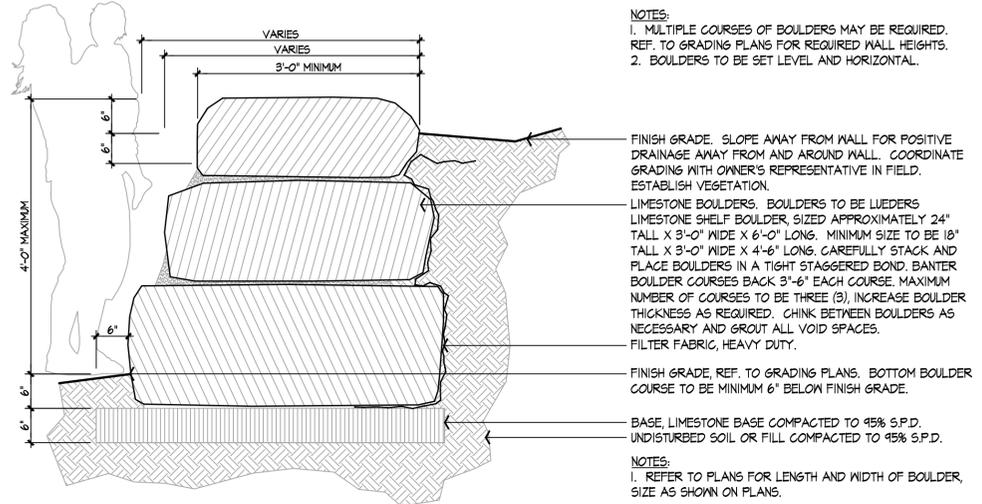
5 SECTION: SHRUB PLANTING
Scale: Not To Scale



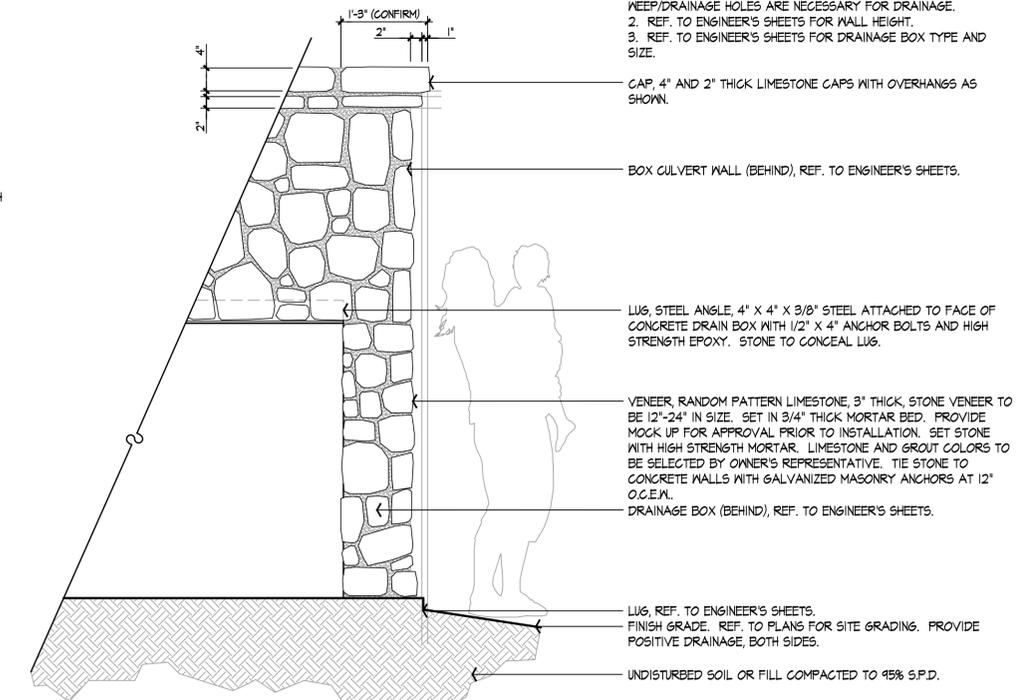
6 SECTION: TREE PLANTING
Scale: N.T.S.



1 SECTION: LANDSCAPE BOULDER
Scale: 3/4" = 1'-0"



2 SECTION: LANDSCAPE WALL (LESS THAN 4'-0")
Scale: 3/4" = 1'-0"



3 ELEVATION: DRAINAGE BOX WALL
Scale: 3/4" = 1'-0"

Tdg terra design group, inc.
2015 ne loop 410
san antonio, texas 78217
210.220.1400
wheard@terradesigns.com

REV. NO.	DATE	BY	REVISION DESCRIPTION
1	10/04/2023	WH	PREVIOUSLY PROPOSED PLANTING, CRUSHED LIMESTONE CHANGED TO BROWN MULCH.

100% SUBMITTAL



Walter H. Heard

CITY OF ROLLINGWOOD, TEXAS
PUBLIC WORKS
DEPARTMENT

PROPOSED DRAINAGE IMPROVEMENTS
NIXON/PLEASANT DRAINAGE IMPROVEMENTS

LANDSCAPE DETAILS

ROLLINGWOOD TEXAS
K-FRIESE + ASSOCIATES
PUBLIC PROJECT ENGINEERING
1120 S. Capital of Texas Highway
CityView 2, Suite 100
Austin, Texas 78746
P - 512.338.1704 F - 512.338.1784
TBPE Firm #6535
www.kfriese.com

NOTES	NAME	DATE
SURVEY BY		
DRAWN BY		
DESIGNED BY		
CHECKED BY		
REVIEWED BY		

LD01 1 OF 1

PLK FRIESE/NIXON DRIVE AND PLEASANT DRIVE DRAINAGE IMPROVEMENTS/UP/LANDSCAPE IMPROVEMENTS/NIXON/PLEASANT DRAINAGE 31.23.DWG. --- TDC MONO FULL.CTX 10/4/2023 3:11 PM ESPERANZA, OROZCO

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: Richard V. Klar, P.G.

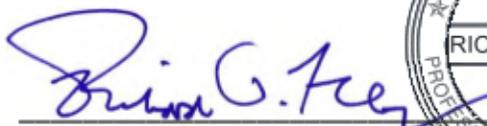
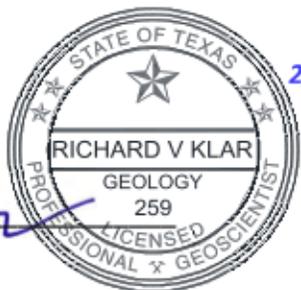
Telephone: 210-699-9090

Date: February 16, 2024

Fax: 210-699-6426

Representing: Raba Kistner, Inc., TBPG Firm #50220 / TBPE Firm #3257 for K Friese + Associates (Name of Company and TBPG or TBPE registration number)

Signature of Geologist:


 2/21/24

Regulated Entity Name: City of Rollingwood Nixon/Pleasant Drainage Improvements

Project Information

1. Date(s) of Geologic Assessment was performed: February 8, 2024

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)
Tarrant soils and Urban Land, 5-18% slopes (TeE)	C	~0-1.0 foot
Urban Land and Brackett soils, 1-12% slopes (UuE)	C	~0-1.5 feet

**Soil Group Definitions (Abbreviated)*

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

6. **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thickness 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” = 50’

9. Method of collecting positional data:

- Global Positioning System (GPS) technology.
- Other method(s). Please describe method of data collection: ____

10. The project site boundaries are clearly shown and labeled on the Site Geologic Map.

11. Surface geologic units are shown and labeled on the Site Geologic Map.

12. Geologic or manmade features were discovered on the project site during the field investigation. They are shown and labeled on the Site Geologic Map and are described in the attached Geologic Assessment Table.

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

13. The Recharge Zone boundary is shown and labeled, if appropriate.

14. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.): If applicable, the information must agree with Item No. 20 of the WPAP Application Section.

There are 2 (#) test holes 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

- 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.

ATTACHMENTS

ATTACHMENT A

GEOLOGIC ASSESSMENT TABLE (TCEQ-0585-TABLE)

COMMENTS TO GEOLOGIC ASSESSMENT TABLE

SOIL PROFILE

SITE SOILS MAP

GEOLOGIC ASSESSMENT TABLE						PROJECT NAME: <i>City of Rollingwood Nixon/Pleasant Drainage Improvements</i> <i>Rollingwood, Travis County, Texas (RKI Project No. ASF24-017-00)</i>													
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								<40	≥40		
NP-1	30°16'40.14"N	97°47'5.87"W	MB (W)	30	Ked	830	2.0	~4-6					F / X	6	36	✓		✓	Hillside, Floodplain
NP-2	30°16'39.76"N	97°47'10.38"W	MB (WW)	30	Ked	477	2.0	~8-10					F / X	8	38	✓		✓	Hillside
NP-3	30°16'41.15"N	97°47'11.64"W	MB (G)	30	Ked	497	2.0	~2-4					F / X	6	36	✓		✓	Hillside
NP-4	30°16'40.00"N	97°47'10.26"W	MB (GEO, B-2)	30	Ked	0.3	0.3	15.0					X	6	36	✓		✓	Hillside
NP-5	30°16'41.18"N	97°47'12.07"W	MB (GEO, B-3)	30	Ked	0.3	0.3	15.0					Y	6	36	✓		✓	Hillside

*** DATUM: NAD 83**

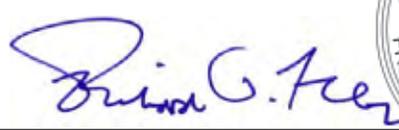
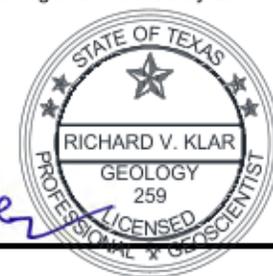
Features: W = potable water; WW = wastewater; G = natural gas; GEO = geotechnical boring, boring name

Formation: Ked = Edwards Limestone

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: Granular bedding materials for utility lines (Features NP-1 through NP-3).
Y	Other materials: All test holes were plugged to ground surface using site-derived (clay) soil cuttings with granular bentonite and capped with asphalt.
12 TOPOGRAPHY	
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed	

I have read, I understood, and I have followed the Texas Natural Resource Conservation Commission'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 213.

Date: February 21, 2024

Sheet 1 of 1

COMMENTS TO GEOLOGIC ASSESSMENT TABLE
City of Rollingwood Nixon/Pleasant Drainage Improvements
Rollingwood, Travis County, Texas

The locations of the following features are indicated on the *Site Geologic Map* provided as **Attachment D** of this report. The utility line locations (i.e., potable water, wastewater, and natural gas) were plotted based on plans provided by the project engineer (K Friese + Associates (K Friese), 2023).

Manmade Features in Bedrock (MB)

Feature NP-1 (Water Utility Trench)



Feature NP-1 consists of trenches for an existing 6-inch potable water line owned by the City of Rollingwood. The location of this line is based on review of existing demolition and protection plan sheets (K Friese, 2023), field reconnaissance, and observed flagging, stakes, and fire hydrants. On the basis our observations and review of the plans, it is inferred that the trenches hosting the utility line are installed 4-6 feet or more into the Edwards Limestone (Ked). The trench extends along the north side of Nixon Drive. In addition the trench begins at Hatley Drive, follows the channel and then to the northwest along Pleasant Drive. The length of the utility trench within the

assessment area is estimated on the order of 830 linear feet.

Feature NP-2 (Wastewater Utility Trench)

Feature NP-2 consists of a trench for a wastewater line owned by Austin City of Rollingwood. The location of this trench is based on review of an existing demolition and protection plan map (K Friese, 2023), field reconnaissance, and observed manholes. On the basis of our observations and review of the plans, the trench hosting the wastewater utility line is installed 6-8 feet or more into the Ked. The trench extends along the south side of Nixon Drive and the center of Pleasant Drive. The length of the utility trench within the assessment area is estimated on the order of 477 linear feet.

Feature NP-3 (Natural Gas Utility Trench)



Feature NP-3 consists of a trench for a natural gas line owned by Austin Energy. The location of this trench was identified based on an existing demolition and protection plan sheets (K Friese, 2023), field reconnaissance, and a gas line marker and meter. On the basis of our observations and review of the plan, it is inferred that the trench hosting the utility line is installed 4-6 feet or more into the Ked formation. The trench extends along the north side of Nixon Drive and the south side of Pleasant Drive. The length of the utility trench within the assessment area is estimated on the order of 497 linear feet.

Feature NP-4 and NP-5 (Plugged Geotechnical Test Holes):

Features NP-4 and NP-5 consist of plugged geotechnical test holes installed on December 20, 2020 by **Raba Kistner, Inc. (RKI)** to support the proposed improvements (*Project No. AAA20-086-00*). Two borings were drilled within the assessment area to depths of approximately 15 feet below the existing ground surface using a truck-mounted drilling rig. According to boring log data, these borings were completed in the roadways, which encountered asphaltic pavement ranging from 2 to 4-inches thick and 7-inches of flexible base. Soil conditions generally consisted of a medium dense to very dense tan clayey sand and hard tan sandy lean clay with limestone fragments ranging from 2.75 to 5 feet thick, underlain by 9 to 11.5 feet of highly weathered tan limestone with reddish-brown clay layers and ferrous staining. Shallow groundwater was not observed during drilling operations. Based on the referenced geotechnical boring logs the borings were effectively plugged and abandoned following completion of drilling activities using soil cuttings with granular bentonite, and capped with asphalt.

SOIL PROFILE
City of Rollingwood Nixon/Pleasant Drainage Improvements
Rollingwood, Travis County, Texas

SOIL SERIES	THICKNESS ON SITE	DESCRIPTION
Tarrant	~0-1.0 foot	<i>Tarrant soils and Urban land, 5 to 18 percent slopes (TeE):</i> This soil type occupies ridges overlying limestone and consists of shallow to very shallow, well-drained, stony, clayey soils. Large limestone rocks cover 25 to 85 percent of the surface. Tarrant soils have a surface layer of very stony to extremely flaggy grayish-brown clay or clay loam, about 8 inches thick, that overlies limestone. Stones are on the surface and in the soil. Trenching for utility lines is slow and difficult, and blasting is often necessary. Soil characteristics that affect urban development are shrink-swell potential as it affects foundations and paving; corrosivity as it affects uncoated steel; and percolation rate as it affects septic systems.
Urban	~0-1.5 feet	<i>Urban land and Brackett soils, 1 to 12 percent slopes (UuE):</i> This soil occurs on narrow ridges and side slopes consisting of approximately 40% Urban land, 35% Brackett soil, and 25% other soils. Brackett soils have a surface layer of light brownish-gray gravelly clay loam approximately 6 inches thick. The subsurface layer is light yellowish-brown clay loam approximately 12 inches thick. The underlying material is soft limestone. Typically Urban Land is mostly occupied by dwellings, driveways, sidewalks, adjoining streets, swimming pools and parking areas. Approximately 75% of soils not covered by structures have been leveled for construction, with 2 to 3 feet of deep of cuts spread over adjoining surfaces and 2 to 4 inches of other soil materials added to the surface layer.

The preceding table was prepared on the basis of information provided in the Soils Survey of Travis County, Texas (January 1974) in addition to field observations. As presented on the attached ***Site Soils Map***, native soils mapped within the northwest portion of the project area consist of Tarrant soils and Urban land, 5 to 18 percent slopes (TeE) and the southeast portion is mapped as Urban land and Brackett soils, 1 to 12% slopes (UuE). All soils mapped are classified as Group C soils, which are described as having a low capacity to transmit infiltrating precipitation. Soils were not exposed owing impervious cover and the presence of landscaping and past development.

The geotechnical report prepared by **RKI** (2021) was reviewed to evaluate soil and rock conditions within the project area, which were generally found to consist of a surficial layer very dense tan clayey sand and hard tan sandy lean clay with limestone fragments to depths of 2.75 to 5 feet underlain by highly weathered tan limestone with reddish-brown clay layers and ferrous staining.

ATTACHMENT B

STRATIGRAPHIC COLUMN

STRATIGRAPHIC COLUMN
City of Rollingwood Nixon/Pleasant Drainage Improvements
Rollingwood, Travis County, Texas

STRATIGRAPHIC FORMATION	THICKNESS	DESCRIPTION
Edwards Limestone (Ked)	10-295 feet	<p><i>None of the following members were exposed at the PROJECT owing to extensive urban development.</i></p> <p>Gray to tan, hard, dense, thick-to thinly-bedded, fine-grained limestone with a soft dolomitic limestone zone near the middle.</p> <p><i>Inferred to directly underly the PROJECT.</i></p>
<i>Member 4</i>	<i>40 feet</i>	
<i>Member 3</i>	<i>10-15</i>	
<i>Member 2</i>	<i>40 feet</i>	
<i>Member 1</i>	<i>200 feet</i>	<p>Light gray to tan, fine- to medium-grained, hard, thin- to thick-bedded limestone; chert nodules in lower third.</p> <p>Gray-brown, thin- to medium-bedded, porous, dolomite, dolomitic, limestone, and limestone; chert is common with solution collapsed zone at the top.</p>

Note: Stratigraphic Column adapted from the Environmental Geology of the Austin Area: an aid to urban planning, Garner and Young, 1976.

ATTACHMENT C

NARRATIVE OF SITE SPECIFIC GEOLOGY

SITE GEOLOGY NARRATIVE
City of Rollingwood Nixon/Pleasant Drainage Improvements
Rollingwood, Travis County, Texas

Introduction

The following is a project-specific discussion of existing geological conditions and potential recharge features identified for the City of Rollingwood storm sewer and channel improvements project. The subject improvements will include construction of curb inlets and storm sewer headwalls, relocation of the water line along Pleasant Drive, in addition to the installation of a 24-inch reinforced concrete pipe (RCP) and a 5 x 4 foot box culvert. Approximately 350 linear feet of channel grading improvements with rock walls and rock riprap is also proposed.

This geologic assessment was performed by **Raba Kistner, Inc. (RKI)** for K Friese + Associates pursuant to applicable Edwards Aquifer Protection Program Rules as specified in *Title 30 of the Texas Administrative Code, Section 213 (30 TAC §213, effective April 24, 2008)*. This report is in the format required by the Texas Commission on Environmental Quality (TCEQ) for the Geologic Assessment portion of the referenced Water Pollution Abatement Plan (WPAP) submittal and was prepared in accordance with the revised *Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zones (TCEQ-0585)*, which are applicable to submittals received by the TCEQ after October 1, 2004.

This geologic assessment report documents conditions observed by **RKI** within the Project boundaries on February 8, 2024.

Site Description

Site Location. The site area comprises approximately 0.96 acres and is located in Rollingwood, Travis County, Texas (hereinafter referred to as PROJECT). The PROJECT is fully developed as a residential neighborhood with residential lots, driveways, and paved roadways, in addition to an earthen drainage channel. Based on review of official maps published by the TCEQ, the PROJECT is fully located within the Edwards Aquifer Recharge Zone (EARZ). As such, the performance of a geologic assessment is required to facilitate planned construction activities in accordance with applicable provisions set forth in the Edwards Aquifer Protection Program (EAPP) rules.

Topography and Drainage. Topographic contours on the U.S. Geological Survey (USGS, 2013) 7.5-minute topographic map (i.e. Austin West Quadrangle) were reviewed to evaluate the general surface conditions and drainage patterns are depicted on the **Site Geologic Map**. The PROJECT consists of gently sloping hilltop topography, exhibiting a maximum elevation near the northwest corner of the assessment boundary of approximately 575 feet relative to mean sea level (msl), which slopes to a minimum elevation of 560 feet msl along the southwest corner. The primary surface drainage pattern for the PROJECT is to the south/southeast toward an earthen drainage channel, which is located south of Nixon Drive between Pleasant Cove and Hatley Drive. The runoff contained within the drainage easement ultimately discharges approximately 0.46 miles to the east to Lady Bird Lake / Colorado River. A review of the Flood Insurance

Rate Map (FIRM 48453C0445K, FEMA, January 22, 2020) indicates that a portion of the PROJECT (i.e., surrounding the earthen drainage channel) is within the designated 100-year floodplain.

Historical Property Use. Although research pertaining to past operations and historical land use activities within the project area was beyond the scope of this assessment, historical aerial imagery was reviewed to evaluate historical land use and the presence of lineations that could indicate the presence of faulting. The following aerial photographs were reviewed using Google Earth™: 1995, 2002, 2003, 2006-2009, and 2011-2023. These photographs depict the PROJECT generally as it is today, with the exception of the 2023 aerial photograph depicted additional construction to the residential lot located at the northwest corner of Pleasant Drive and Nixon Drive (i.e., 301 Pleasant Drive).

Classification of Recharge Features: As further described herein, no naturally-occurring recharge features attributed to karstification of limestone terrain and/or surface erosional processes were identified within PROJECT boundaries. Features identified and discussed below include five manmade features (i.e., potable water, wastewater, and natural gas utility lines, in addition to plugged test holes). The significance of these features was assessed using definitions and guidance provided in *Instructions to Geologists (TCEQ-0585-Instructions, revised October 1, 2004)*. All features within the PROJECT that met the criteria presented in this reference were mapped. The characteristics of all mapped features and the assessments of these features, as defined by the TCEQ, are presented in the attached **Geologic Assessment Table (TCEQ-0585-Table)**.

Stratigraphy

As presented in the attached **Stratigraphic Column**, information pertaining to the lithologies and thickness of geologic units underlying the PROJECT was primarily taken from the *Environmental Geology of the Austin Area: an aid to urban planning (Garner and Young, 1976)* published by the Bureau of Economic Geology at the University of Texas, the geologic formation underlying the PROJECT is underlain by the Edwards Limestone (Ked). The Ked comprises the uppermost part of the Fredericksburg Group. No bedrock exposures were identified within the drainage channel present at the PROJECT or within the surrounding neighborhood owing to soil cover, impervious cover, and landscaping improvements. Boring logs described very dense tan clayey sand and hard tan sandy lean clay with limestone fragments ranging from approximately 2.75 to 5 feet thick, underlain by highly weathered tan limestone with reddish-brown clay layers and ferrous staining to approximately 11.5 feet.

Structure

This project area is located within the northern portion of Balcones Fault Zone and, as such, possesses a distinct structural trend. In the PROJECT vicinity, this zone is characterized by primarily northeast–southwest trending normal faults. Locally, large scale normal faulting is expressed with the upthrown sides of the normal fault blocks to the northwest and the downthrown sides to the southeast. As a result of this larger-scale, regional faulting, minor internal fault sequences and fractures exist throughout this zone, which follow the same structural trend and accommodate localized displacement.

No faults are mapped within the PROJECT, and no evidence of faulting (e.g., lineations, changes in soil type and vegetation, fractured rock outcrops, etc.) was observed during site reconnaissance activities

adjacent to the assessment area. The nearest mapped normal fault (Garner and Young, 1976) is located approximately 600 feet to the southeast from the southeast corner of the PROJECT along Hatley Drive.

Karst Features

The results of field mapping activities did not reveal the presence of any features within PROJECT boundaries that could be attributed to karstification of the underlying limestone terrain.

Manmade Features

As presented on the *Site Geologic Map*, a total of five manmade features were identified that may potentially serve to enhance the transmission of surface runoff to the subsurface. The features consist of potable water, wastewater, and natural gas utility trenches, in addition to plugged geotechnical test holes which meet the criteria for assessment as manmade features in bedrock. Information regarding the locations of the existing utility trenches were gleaned from a base map provided by K Friese on January 30, 2023, field observations of stakes, hydrants, manway access points or valves, and review of the Geotechnical Engineering Report (RKI, 2021). The specific utility trench features identified are listed below:

Feature NP-1 consists of a potable water utility line owned by the City of Rollingwood.

Feature NP-2 consists of a wastewater utility line owned by the City of Rollingwood.

Feature NP-3 consists of a natural gas utility line owned by Austin Energy.

Although not directly observable, it is inferred that the trenches for these subgrade installations are backfilled in accordance with standard construction practices that include the use of structural fill soils (e.g., base course materials, limestone gravel, compacted clay soils, etc.) overlain by native or fill soils, depending upon location and surface improvements. The trenches were not observed in conjunction with any naturally-occurring recharge features. Although the backfilled trenches may exhibit somewhat greater relative infiltration rate than the surrounding soil/rock strata underlying the project boundaries, these manmade features are collectively classified as not sensitive, having a low potential of preferentially transmitting fluids into the Edwards Aquifer. This classification is based upon the point assignment criteria presented in the *Geologic Assessment Table (TCEQ-0585)* and professional judgment.

Features NP-4 and NP-5 consist of plugged geotechnical test holes installed by RKI in December 2020, to evaluate engineering characteristic to develop pavement recommendations. These were reportedly installed to depths of approximately 15 feet. No shallow groundwater was observed during drilling operations. These features are collectively classified as not sensitive as they have been plugged and no longer exist.

Potential for Fluid Migration to the Edwards Aquifer

Based on our review of PROJECT geology, topography and drainage conditions, in addition to the results of our detailed mapping efforts, the overall potential for fluid movement (i.e. surface-derived flow) to the Edwards Aquifer via infiltration is considered to be low. The following assessment findings support this conclusion.

- The majority of the PROJECT contains soil cover defined as Group C, which are described as having low capacity to transmit infiltrating precipitation.
- There were no naturally-occurring recharge features attributed to karstification of limestone bedrock or erosional processes identified as a result of field reconnaissance mapping efforts throughout the PROJECT including the drainage channel.
- Manmade features present at the PROJECT, are collectively classified as not sensitive based on consideration of construction/plugging details and application of point assignment criteria and professional judgment.

References

Barnes, V. L., 1974, Revised 1983, Geologic Atlas of Texas Austin Sheet; Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas.

Google Earth™, January 1995, April 2002, March 2003, April 2006, February 2007, February 2008, November 2009, March 2011, August 2012, October 2013, October 2014, July 2015, February 2016, February 2017, January 2018, November 2019, April 2020, June 2021, March 2022, and June 2023.

Garner, L. E., and Young, K. P., 1976, *Environmental Geology of the Austin Area: an aid to urban planning*, The University of Texas at Austin, Bureau of Economic Geology, Report of Investigations RI 86.

K Friese + Associates, 2023, *Nixon Pleasant TCEQ Exception Request.pdf* provided to **RKI** via email correspondence on January 30, 2024.

National Flood Insurance Program, 2020, Flood Insurance Rate Map, Travis County, Texas and Incorporated Areas; Federal Emergency Management Agency, Map 48453C0445K.

TCEQ Edwards Aquifer Protection Program, 1998, Edwards Aquifer Recharge Zone Map, Austin West Quadrangle; TNRCC, September 1998.

Texas Water Development Board, Water Data Interactive (WDI) Groundwater Data Viewer, <https://www2.twdb.texas.gov/apps/WaterDataInteractive/GroundwaterDataViewer/?map=sdr>, accessed February 13, 2024.

Travis County TNR Web Map
https://geo.traviscountytexas.gov/Html5Viewer/index.html?viewer=TNR_Map_Viewer.TNR_Web_Map,
accessed February 13, 2024.

United States Geological Survey (USGS), 2013, Austin West Quadrangle; USGS, Denver, Colorado.

United States Department of Agriculture (USDA), 1974, Soil Survey of Travis County, Texas; USDA / Soil Conservation Service / Texas Agricultural Experiment Station.

United States Department of Agriculture (USDA), 1986, Urban Hydrology for Small Watersheds; USDA / Natural Resource Conservation Service, Technical Release (TR-) 55, June 1986.

ATTACHMENT D

FEATURE POSITION TABLE (GPS COORDINATES)

SITE GEOLOGIC MAP

FEATURE POSITION TABLE
City of Rollingwood Nixon/Pleasant Drainage Improvements
Rollingwood, Travis County, Texas
RKI Project No. ASF24-017-00

Feature Designation	Feature Type	Date Collected	North Latitude	West Longitude	UTM Northing (meters)	UTM Easting (meters)
NP-1	Manmade feature in bedrock (Potable Water Line)	2/8/2024	30°16'40.14"N	97°47'5.87"W	3350195	616864
NP-2	Manmade feature in bedrock (Wastewater Line)	2/8/2024	30°16'39.76"N	97°47'10.38"W	3350182	616744
NP-3	Manmade feature in bedrock (Natural Gas Line)	2/8/2024	30°16'41.15"N	97°47'11.64"W	3350225	616710
NP-4	Manmade feature in bedrock (Plugged Geotechnical Test Hole)	12/29/2020	30°16'40.00"N	97°47'10.26"W	3350190	616747
NP-5	Manmade feature in bedrock (Plugged Geotechnical Test Hole)	12/29/2020	30°16'41.18"N	97°47'12.07"W	3350225	616698

- Notes:**
1. Geographic coordinates are presented Degrees, Minutes, Decimal Seconds
 2. Reference Datum is NAD 83.
 3. Data were collected utilizing a *Garmin GPS 60cx Global Positioning System* .
 4. Horizontal Accuracy: RMS Value < 3 meter ground resolution.
 5. GPS data were collected by Richard Sample (RKI Project Professional).
 6. GPS coordinates for the test holes were taken from the geotechnical borings logs prepared by **Raba Kistner, Inc.**, Project No. AAA20-086-00.
 7. GPS coordinates correlate to the points on the map for each feature.

Recharge and Transition Zone Exception Request Form

Texas Commission on Environmental Quality

30 TAC §213.9 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 **Recharge and Transition Zone Exception Request Form** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Geoffrey Elfers, PE

Date: 2/22/2024

Signature of Customer/Agent:



Regulated Entity Name: City of Rollingwood

Exception Request

- Attachment A - Nature of Exception.** A narrative description of the nature of each exception requested is attached. All provisions of 30 TAC §213 Subchapter A for which an exception is being requested have been identified in the description.
- Attachment B - Documentation of Equivalent Water Quality Protection.** Documentation demonstrating equivalent water quality protection for the Edwards Aquifer is attached.

Administrative Information

- 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.
- The applicant understands that no exception will be granted for a prohibited activity in Chapter 213.
- The applicant understands that prior approval under this section must be obtained from the executive director for the exception to be authorized.

ATTACHMENT A NATURE OF EXCEPTION

The Project is an exception for the requirement for a Water Pollution Abatement Plan for the following reasons:

1. The project involves the installation of underground utilities consisting of proposed storm sewer with minimal surface level improvements.
2. The project site has been previously developed as single family residential.
3. The minor surface level improvements, consisting of the installation of 4 new curb inlets, 2 headwalls, and channel improvements consisting of grading, rock walls, and stone riprap will result in a negligible increase to impervious cover.
4. Conveyance patterns will be unaltered; runoff currently conveyed with roadways to an existing channel will now be conveyed within storm sewer to the same improved channel. The project will result in no adverse impact to water quality.

ATTACHMENT B EQUIVALENT WATER QUALITY PROTECTION

Development of the Project will enhance water quality protection to the Edwards Aquifer over the existing condition for the following reasons:

- After completion of the project, vegetation will be reestablished over any pervious areas disturbed by construction.
- The improved drainage conveyance will remove surface runoff from portions of Pleasant Drive thereby reducing the propensity of trash and debris flowing downstream.
- Stone riprap and channel improvements will reduce the likelihood of erosion and sediment transport.
- Channel grading will improve the conveyance of the channel reducing the existing inundation limits along the channel thereby reducing the likelihood of contaminants coming into contact with surface water.

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: Geoffrey Elfers, PE

Date: 2/22/2024

Signature of Customer/Agent:



Regulated Entity Name: City of Rollingwood

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: asphalt products, chemical additives, gasoline

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: Lady Bird Lake (Segment NO.1403)

Temporary Best Management Practices (TBMPs)

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

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

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

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

Soil Stabilization Practices

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

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

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

Administrative Information

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

ATTACHMENT A SPILL RESPONSE ACTIONS

Spill prevention, control, clean-up, and reporting shall comply with TCEQ regulations 30 TAC, Chapter 327 – Spill Prevention and Control, which is attached, as well as any local regulations. The contractor will implement proper spill prevention measures and maintain appropriate spill response equipment on site. In the event of a hazardous materials spill, the safety of on-site personnel is the most important consideration. Once the safety of personnel is secured, the second priority becomes stopping the source of the spill. If it is safe to do so, the source of the spill will be stopped and the spill will be contained using items such as sandbags, berms or absorbent rolls.

If during the construction of the project (Temporary Stormwater Management) a hazardous substance or hydrocarbon spill of greater than 250 gallons occurs within the project limits, the contractor is to try to stop the spill from continuing, contact the local fire department, and the Engineer. If the spill is caused by the roadway contractor, the roadway contractor will be responsible for the proper clean-up of the spill as well as notifying the TCEQ Spill Reporting Hotline (1-800-832-8224). If a spill occurs within the project limits but is caused by a third party (someone from the traveling public driving through the project), the contractor and/or the Engineer shall immediately contact local law enforcement, the fire department, and the TCEQ Spill Reporting Hotline. The local fire department will immediately respond to the spill and secure the scene (stop the spill and prevent it from spreading). The City of Rollingwood will work with the responsible party to facilitate the clean-up of the spill on the City of Rollingwood property.

ATTACHMENT B POTENTIAL SOURCES OF CONTAMINATION

The potential sources of storm water pollution from the proposed project are displaced soil from the construction site from activities such as clearing/grubbing, grading, excavation, filling, and placement of asphalt and roadway base. Other potential sources of contamination include wastewater from portable bathrooms, litter generated during the construction process, de-watering from excavations, construction vehicles tracking onto roads, and construction products and waste. There are also hazardous construction materials including fuel and use of asphaltic products and petroleum products from the operation of construction equipment on site, all of which are potential sources of contamination.

The primary storm water contaminant expected to be generated during the construction project is the entrained solids (soil particles) which will affect the turbidity of the runoff. During this project, disturbed soils will result from:

1. Site preparation
2. Roadway excavation and fill grading
3. Trenching for storm sewer construction and associated minor utility relocations.
4. Placement of roadway base and pavement
5. Imported soil for fill and top-soil

Increased sediment loading in the storm water can be attributed to: a) direct impingement of rain onto disturbed soil areas, sand, gravel and rock areas where rains dislodge or entrain particles; b) erosion of disturbed soil areas; c) the transfer of soils and particulate matter via equipment or vehicle tires onto non-disturbed areas where they are washed downstream into the Project's storm sewers or outfall channel.

There is a potential for hydrocarbon contamination in the form of oil and grease from equipment, construction vehicles, and fuel spillage on the site. Oil and grease are typically released into the environment because of equipment failure or maintenance operations. Release of fuel can result from on-site fueling operations or from leakage of temporary fuel storage tanks. Most construction equipment operates hydraulically; there is a potential that the release of hydraulic fluids may occur due to equipment malfunction or damage. The clean-up and containment of any fuels, hydraulic fluids, hydrocarbons, or other hazardous substances released on site will be the responsibility of the contractor.

Entrained solids in runoff during the construction phase will be largely contained by temporary BMPs such as mulch socks, sediment control fence, and stabilized construction exits, as shown in the Erosion Control Layouts included in *0587-Attachment C.1 Construction Plans (Sht 38-39)*.

ATTACHMENT C SEQUENCE OF MAJOR ACTIVITIES

The general order of construction activities is included within the construction plans in the General Notes, Construction Notes and Construction Access and Sequencing plan sheets, found in *0587-Attachment C.1 Construction Plans (Sht 2, 3 & 7)*. Temporary control measures include sediment control fence, mulch socks, rock berms, and stabilized construction exits. Temporary control measures will be installed first in the sequence of construction and removed after all site work is complete and vegetation has been established.

For construction activity, an estimate of the total area to be disturbed is shown below:

1. Installation of temporary erosion and sedimentation controls: 0.96 ac (total site)
2. Clearing, grubbing and excavation: 0.96 ac
3. Channel regrading and installation of rock walls, stone riprap: 0.36 ac
4. Storm sewer installation, reconstruction of roadway base, driveways, and surface paving: 0.60 ac
5. Site restoration: 0.96 ac
6. Seeding, re-vegetation: 0.64 ac
7. Removal of temporary erosion and sedimentation controls: 0.96 ac (total site)

ATTACHMENT D TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

Temporary BMPs will be installed before any construction activities begin and shall be removed after all construction work and re-vegetation is complete. Refer to *0602-Attachment C: Sequence of Construction* for more information on construction activities and sequence. Refer to *0587-Attachment C.1 Construction Plans (Sht 38-39)* for the proposed erosion and sedimentation control construction plan sheets showing the location and types of temporary BMPs proposed for the project.

BMPs for onsite flows will prevent pollution of surface streams by filtering pollutant ridden water. These BMPs include silt fence, mulch socks, rock berms, and stabilized construction exits. Immediately following the placement of topsoil, seeding will be implemented to stabilize areas disturbed during construction.

ATTACHMENT F STRUCTURAL PRACTICES

Temporary structural practices used to limit runoff discharge pollutants include silt fence, mulch socks, rock berms, and stabilized construction exits.

The TCEQ general guidelines included in Section 1.2 to Section 1.4 of RG-348 must be followed for installation and maintenance of temporary structural erosion and sediment control BMPs. Additional guidelines can also be found on the Erosion Control Layouts included in *0587-Attachment C.1 Construction Plans (Sht 38-39)*.

ATTACHMENT G DRAINAGE AREA MAP

The project drainage area map is included in *0587-Attachment C.1 Construction Plans (Sht 11)*.

ATTACHMENT I INSPECTION AND MAINTENANCE FOR BMPS

All erosion and sediment control measures will be maintained in effective operating condition by following the Project maintenance procedures. The general maintenance and inspection requirements are included on the Erosion Control Layouts included in *0587-Attachment C.1 Construction Plans (Sht 38-39)*. The maintenance plan for temporary BMPs meets the maintenance guidance provided in RG-348.

The Contractor shall install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place or the disturbed area has been adequately stabilized as approved in accordance with contract documents including Part II, Section F.6 of TPDES General Permit No. TXR150000.

Maintenance, repairs, or retrofits will adhere to the project standards and details for the BMP. Damaged portions of BMPs shall be removed and replaced as needed to adhere to the contract documents. BMPs that cannot be adequately repaired or retrofitted to meet project requirements shall be removed and replaced in entirety in accordance with the contract documents.

ATTACHMENT J

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

The general order of construction activities is shown below. The project phasing of construction activities, including time frame information and interim and permanent stabilization measures are included in the General Notes – Construction Access and Sequencing Notes included in *0587-Attachment C.1 Construction Plans (Sht 3)*. Erosion control plans detailing temporary storm water BMPs are provided in *0587-Attachment C.1 Construction Plans (Sht 38-39)*. Temporary control measures include silt fence, mulch socks, rock berms, and construction exits and will be installed first in the sequence of construction and removed after all site work is complete and vegetation has been established.

Installation of temporary erosion controls

1. Notice of Intent/SWPPP Controls
 - a. Install erosion and sediment control measures in accordance with the Erosion Control Plans / SW3P
2. Construct stabilized construction exits

Site Clearing, Grading, and Channel Improvements

3. Clearing, grubbing, and grading in the locations of proposed improvements.
4. Perform channel grading. Install associated rock walls and stone riprap proceeding from downstream to upstream.

Storm Sewer Installation.

5. Construct proposed storm sewer and new inlets from downstream to upstream.
6. Backfill trenches and restore pavement structures.
7. Perform milling, overlay, and driveway reconstruction as indicated on the plans.

Site Restoration, Seeding and Re-vegetation

8. Seeding and revegetation of disturbed soils outside of the paving limits.
9. Complete landscaping design per plan.

Removal of SWPPP Controls

10. Remove erosion and sediment control measures and stabilized construction exits upon revegetation/ restoration of all disturbed areas.
11. Notice of Termination.

Records will be kept at the project site to document dates when:

- major grading activities occur;
- construction activities temporarily cease;
- construction activities permanently cease; and
- soil stabilization measures are initiated.

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

I Ashley Wayman
Print Name

City Administrator
Title - Owner/President/Other

of City of Rollingwood
Corporation/Partnership/Entity Name

have authorized Geoffrey Elfers, PE
Print Name of Agent/Engineer

of K Friese + 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:

Ashley Wayman
Applicant's Signature

02/20/2024
Date

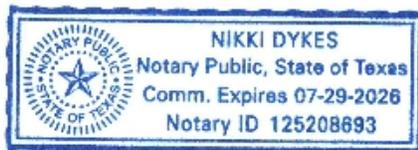
THE STATE OF Texas §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Ashley Wayman 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 20 day of February, 2024

Nikki Dykes
NOTARY PUBLIC



Nikki Dykes
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 7/29/2026

Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: City of Rollingwood Drainage Improvements

Regulated Entity Location: City of Rollingwood

Name of Customer: City of Rollingwood

Contact Person: Geoffrey Elfers

Phone: 512.967.4482

Customer Reference Number (if issued): CN 600674691

Regulated Entity Reference Number (if issued): RN 111870267

Austin Regional Office (3373)

Hays

Travis

Williamson

San Antonio Regional Office (3362)

Bexar

Medina

Uvalde

Comal

Kinney

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

Austin Regional Office

San Antonio Regional Office

Mailed to: TCEQ - Cashier

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Revenues Section

Mail Code 214

P.O. Box 13088

Austin, TX 78711-3088

12100 Park 35 Circle

Building A, 3rd Floor

Austin, TX 78753

(512)239-0357

Site Location (Check All That Apply):

Recharge Zone

Contributing Zone

Transition Zone

<i>Type of Plan</i>	<i>Size</i>	<i>Fee Due</i>
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	\$
Sewage Collection System	L.F.	\$
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	1 Each	\$ 500
Extension of Time	Each	\$

Signature: 

Date: 2/22/2024

Application Fee Schedule

Texas Commission on Environmental Quality

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

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

Extension of Time Requests

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



TCEQ 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.)		
<input checked="" type="checkbox"/> New Permit, Registration or Authorization (Core Data Form should be submitted with the program application.)		
<input type="checkbox"/> Renewal (Core Data Form should be submitted with the renewal form)	<input type="checkbox"/> Other	
2. Customer Reference Number (if issued)	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number (if issued)
CN 600674691		RN 111870267

SECTION II: Customer Information

4. General Customer Information		5. Effective Date for Customer Information Updates (mm/dd/yyyy)		
<input type="checkbox"/> New Customer		<input checked="" type="checkbox"/> Update to Customer Information		<input type="checkbox"/> Change in Regulated Entity Ownership
<input type="checkbox"/> Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)				
The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).				
6. Customer Legal Name (If an individual, print last name first: eg: Doe, John)			<i>If new Customer, enter previous Customer below:</i>	
City of Rollingwood				
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:	<input type="checkbox"/> Corporation	<input type="checkbox"/> Individual	Partnership: <input type="checkbox"/> General <input type="checkbox"/> Limited	
Government: <input checked="" type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other	<input type="checkbox"/> Sole Proprietorship		<input type="checkbox"/> Other:	
12. Number of Employees		13. Independently Owned and Operated?		
<input checked="" type="checkbox"/> 0-20 <input type="checkbox"/> 21-100 <input type="checkbox"/> 101-250 <input type="checkbox"/> 251-500 <input type="checkbox"/> 501 and higher		<input type="checkbox"/> Yes <input type="checkbox"/> No		
14. Customer Role (Proposed or Actual) – as it relates to the Regulated Entity listed on this form. Please check one of the following				
<input type="checkbox"/> Owner		<input type="checkbox"/> Operator		<input checked="" type="checkbox"/> Owner & Operator
<input type="checkbox"/> Occupational Licensee		<input type="checkbox"/> Responsible Party		<input type="checkbox"/> Voluntary Cleanup Applicant <input type="checkbox"/> Other:
15. Mailing Address:	City of Rollingwood			
	403 Nixon Drive			
	City	Rollingwood	State	TX
	ZIP	78746	ZIP + 4	
16. Country Mailing Information (if outside USA)			17. E-Mail Address (if applicable)	
			gelfers@kfriese.com	
18. Telephone Number		19. Extension or Code		20. Fax Number (if applicable)
(512) 338-1704				() -

SECTION III: Regulated Entity Information

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

23. Street Address of the Regulated Entity: <i>(No PO Boxes)</i>							
	City		State		ZIP		ZIP + 4
24. County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	Storm sewer constructed from 303 Pleasant Drive to and across 303 Nixon Drive to an existing earthen channel..							
26. Nearest City	Rollingwood				State	TX	Nearest ZIP Code	78746
27. Latitude (N) In Decimal:	30.2777			28. Longitude (W) In Decimal:	97.7862			
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds			
30	16	39.78	97	47	10.36			
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)				
1611		237310						
33. What is the Primary Business of this entity? <i>(Do not repeat the SIC or NAICS description.)</i>								
City Roadway								
34. Mailing Address:	City of West Lake Hills							
	911 Westlake Drive							
	City	Rollingwood	State	TX	ZIP	78746	ZIP + 4	
35. E-Mail Address:	gelfers@kfriese.com							
36. Telephone Number	37. Extension or Code			38. Fax Number <i>(if applicable)</i>				
(512) 967-4482				() -				

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

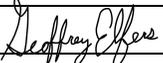
<input type="checkbox"/> Dam Safety	<input type="checkbox"/> Districts	<input checked="" type="checkbox"/> Edwards Aquifer	<input type="checkbox"/> Emissions Inventory Air	<input type="checkbox"/> Industrial Hazardous Waste
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source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

SECTION IV: Preparer Information

40. Name:	Geoffrey Elfers, PE		41. Title:	Senior Engineer
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address	
(512) 338-1704		() -	gelfers@kfriese.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:	K Friese + Associates	Job Title:	Senior Engineer
Name <i>(In Print)</i> :	Geoff Elfers	Phone:	(512) 338- 1704
Signature:		Date:	2/22/2024