



CIVIL ENGINEERING ★ DEVELOPMENT CONSULTING ★ PROJECT MANAGEMENT

**EDWARDS AQUIFER
WATER POLLUTION ABATEMENT & SEWAGE COLLECTION SYSTEM PLAN
for
BROADSTONE – LA FRONTERA PHASE 2**

Prepared for:

Austin Auro, LP
10210 N. Central Expressway
Suite 300
Dallas, Texas 75231

Prepared by:

Malone/Wheeler, Inc.
5113 Southwest Parkway
Suite 260
Austin, Texas 78735

October 2020



Water Pollution Abatement Plan Checklist

- **Edwards Aquifer Application Cover Page (TCEQ-20705)**
- **General Information Form (TCEQ-0587)**
 - Attachment A - Road Map
 - Attachment B - USGS / Edwards Recharge Zone Map
 - Attachment C - Project Description
- **Geologic Assessment Form (TCEQ-0585)**
 - Attachment A - Geologic Assessment Table (TCEQ-0585-Table)
 - Comments to the Geologic Assessment Table
 - Attachment B - Soil Profile and Narrative of Soil Units
 - Attachment C - Stratigraphic Column
 - Attachment D - Narrative of Site Specific Geology
 - Site Geologic Map(s)
 - Table or list for the position of features' latitude/longitude (if mapped using GPS)
- **Water Pollution Abatement Plan Application Form (TCEQ-0584)**
 - Attachment A - Factors Affecting Water Quality
 - Attachment B - Volume and Character of Stormwater
 - Attachment C - Suitability Letter from Authorized Agent (if OSSF is proposed)
 - Attachment D - Exception to the Required Geologic Assessment (if requesting an exception)
 - Site Plan
- **Temporary Stormwater Section (TCEQ-0602)**
 - Attachment A - Spill Response Actions
 - Attachment B - Potential Sources of Contamination
 - Attachment C - Sequence of Major Activities
 - Attachment D - Temporary Best Management Practices and Measures
 - Attachment E - Request to Temporarily Seal a Feature, if sealing a feature
 - Attachment F - Structural Practices
 - Attachment G - Drainage Area Map
 - Attachment H - Temporary Sediment Pond(s) Plans and Calculations
 - Attachment I - Inspection and Maintenance for BMPs
 - Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices
- **Permanent Stormwater Section (TCEQ-0600)**
 - Attachment A - 20% or Less Impervious Cover Waiver, if project is multi-family residential, a school, or a small business and 20% or less impervious cover is proposed for the site
 - Attachment B - BMPs for Upgradient Stormwater

Attachment C - BMPs for On-site Stormwater

Attachment D - BMPs for Surface Streams

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

Attachment F - Construction Plans

Attachment G - Inspection, Maintenance, Repair and Retrofit Plan

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

Attachment I - Measures for Minimizing Surface Stream Contamination

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

Organized Sewage Collection System Plan Checklist

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

Attachment J - Schedule of Interim and Permanent Soil Stabilization Practices

- **Agent Authorization Form (TCEQ-0599), if application submitted by agent**
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Texas Commission on Environmental Quality

Edwards Aquifer Application Cover Page

Our Review of Your Application

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

Administrative Review

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

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

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

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

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

Technical Review

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

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

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

Mid-Review Modifications

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

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

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

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

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

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

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

1. Regulated Entity Name: Broadstone La Frontera Ph.2					2. Regulated Entity No.: RN 110870185				
3. Customer Name: Austin Auro, LP					4. Customer No.: CN 605709567				
5. Project Type: (Please circle/check one)	New <input checked="" type="checkbox"/>	Modification			Extension		Exception		
6. Plan Type: (Please circle/check one)	WPAP <input checked="" type="checkbox"/>	CZP <input type="checkbox"/>	SCS <input checked="" type="checkbox"/>	UST <input type="checkbox"/>	AST <input type="checkbox"/>	EXP <input type="checkbox"/>	EXT <input type="checkbox"/>	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential <input checked="" type="checkbox"/>		Non-residential			8. Site (acres):		14.21	
9. Application Fee:	\$7,608.50		10. Permanent BMP(s):			Off-site Biofiltration Pond Permit No. 11001753			
11. SCS (Linear Ft.):	2,217		12. AST/UST (No. Tanks):			N/A			
13. County:	Williamson		14. Watershed:			Rattan Creek			

Application Distribution

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

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

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

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

Austin Auro, LP

Print Name of Customer/Authorized Agent

Edouard Hanks, Jr Vice President

Signature of Customer/Authorized Agent

Date

9/25/2020

PRA No 24 Inc operations of Austin Auro GP, LLC registered partner

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: Austin Auro, LP

Date: 9/25/2020

Signature of Customer/Agent:


Nolan Auro, Jr. Vice President

PRA No 2, Inc
manager of
Austin Auro GP, LLC
the general partner

Project Information

1. Regulated Entity Name: Broadstone - La Frontera Ph 2
2. County: Williamson
3. Stream Basin: Rattan Creek
4. Groundwater Conservation District (If applicable): N/A
5. Edwards Aquifer Zone:
 Recharge Zone
 Transition Zone
6. Plan Type:
 WPAP
 SCS
 Modification
 AST
 UST
 Exception Request

7. Customer (Applicant):

Contact Person: Scott Morway

Entity: Austin Auro LP

Mailing Address: 10210 N. Central Expressway, Suite 300

City, State: Dallas, Texas

Zip: 75231

Telephone: 972-385-4152

FAX: N/A

Email Address: smorway@providentrealty.net

8. Agent/Representative (If any):

Contact Person: Dan Brown, P.E.

Entity: Malone Wheeler Inc. F-786

Mailing Address: 5113 Southwest Parkway, Suite 260

City, State: Austin, TX

Zip: 78735

Telephone: 512-899-0601

FAX: 512-899-0655

Email Address: danb@malonewheeler.com

Project Location:

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

9. 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.

3118 CR 172 Round Rock, Texas 78681

10. **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.
11. **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.

12. **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: Please notify us 15 days prior...

13. **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

14. 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

15. 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.

16. 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

17. 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.
18. 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)
19. 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.
20. 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.

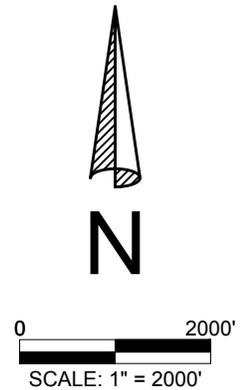
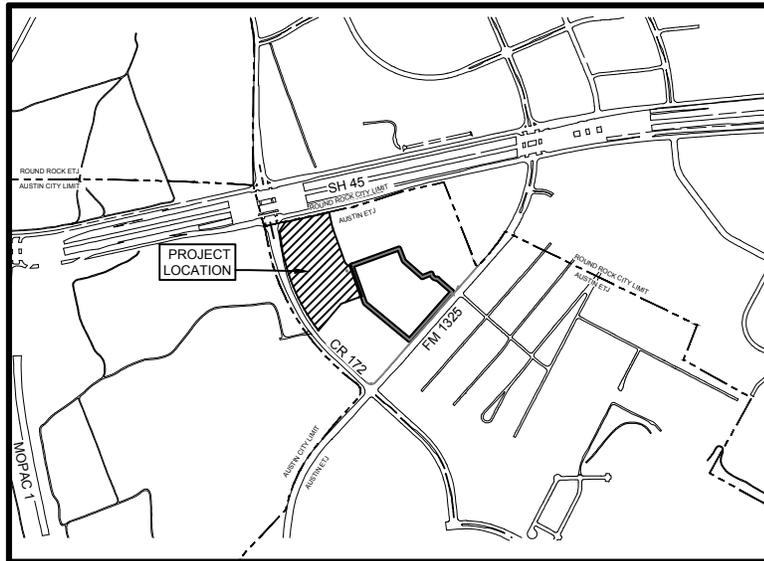
**GENERAL INFORMATION FORM
ATTACHMENT "A"**

ROAD MAP

BROADSTONE – LA FRONTERA PHASE 2

BROADSTONE - LA FRONTERA PHASE 2 ROAD MAP

3118 CR 172
ROUND ROCK, TEXAS 78681



CIVIL ENGINEERING ★ DEVELOPMENT CONSULTING ★ PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

**GENERAL INFORMATION FORM
ATTACHMENT "B"**

USGS QUADRANGLE MAP

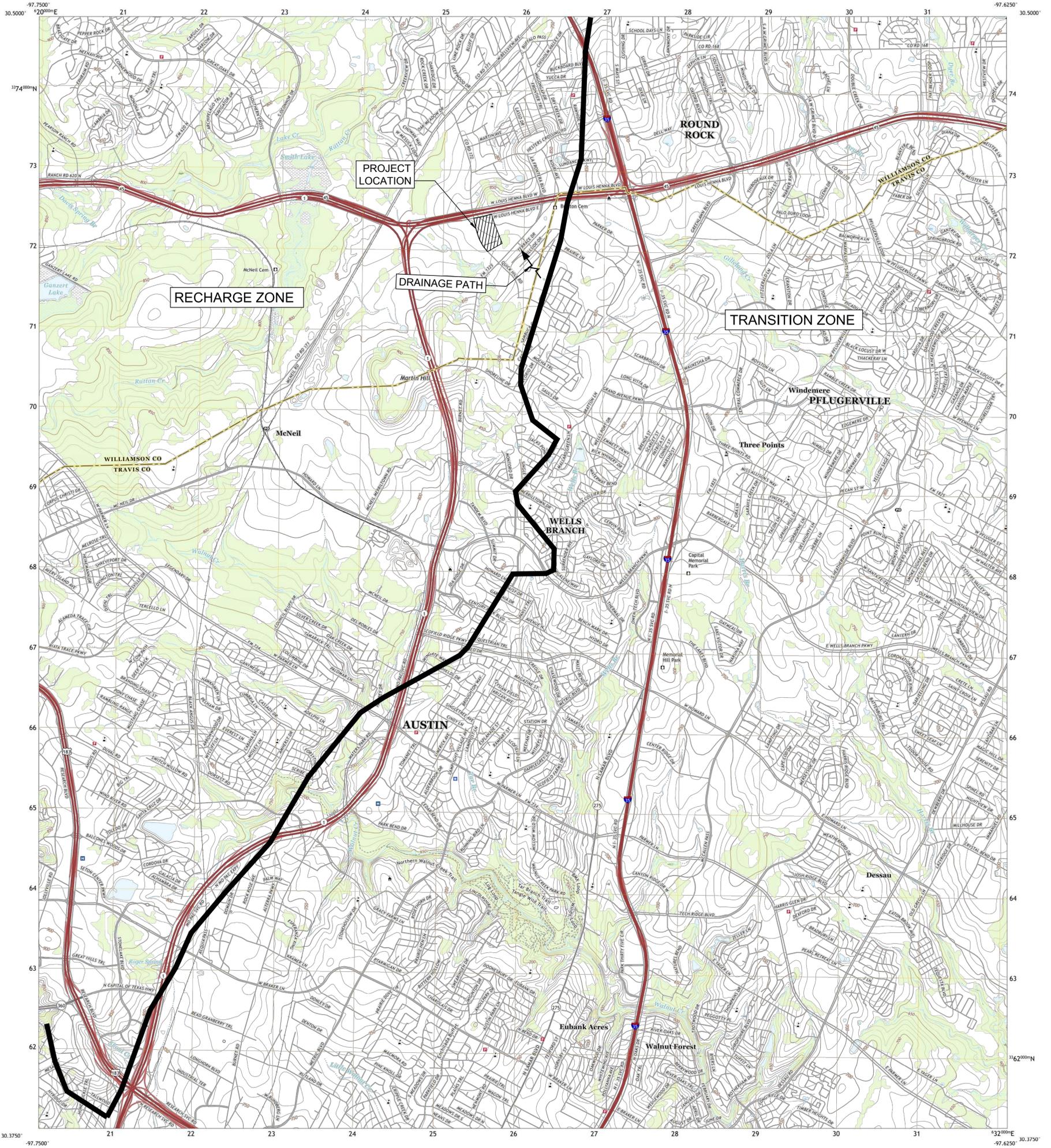
BROADSTONE – LA FRONTERA PHASE 2



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



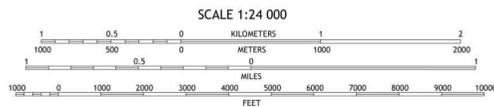
PFLUGERVILLE WEST QUADRANGLE
TEXAS
7.5-MINUTE SERIES



Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid-Universal Transverse Mercator, Zone 14R
This map is not a legal document. Boundaries may be
generalized for this map scale. Private lands within government
reservations may not be shown. Obtain permission before
entering private lands.

Imagery.....NAIP, September 2016 - November 2016
Roads.....U.S. Census Bureau, 2015
Names.....GNS, 1979 - 2018
Hydrography.....National Hydrography Dataset, 2000 - 2018
Contours.....National Elevation Dataset, 2002
Boundaries.....Multiple sources; see metadata file 2016 - 2017
Wetlands.....FWS National Wetlands Inventory 1982



CONTOUR INTERVAL 10 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
This map was produced to conform with the
National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.18



QUADRANGLE LOCATION

1	2	3
4	5	6
7	8	9

ADJOINING QUADRANGLES

- 1 Leander
- 2 Round Rock
- 3 Hutto
- 4 Jollyville
- 5 Pflugerville East
- 6 Austin West
- 7 Austin East
- 8 Manor

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
	State Route

PFLUGERVILLE WEST, TX
2019

**GENERAL INFORMATION FORM
ATTACHMENT "C"**

PROJECT DESCRIPTION

BROADSTONE – LA FRONTERA PHASE 2

SITE AREA

The Broadstone - La Frontera Phase 2 multifamily project is located on 14.21 acres, on the East side of CR 172 at the intersection of CR 172 and SH 45 North. This project is situated over the Edward's Aquifer Recharge Zone. This project is part of an overall project area that shares a regional offsite water quality pond. This offsite pond is currently being constructed under TCEQ Permit No.11001753.

OFF-SITE AREAS

Off-site runoff from the existing hospital is being routed around the site through an existing drainage channel that shall remain. This runoff is discharged into the offsite biofiltration water quality pond designed by Kimley-Horn under TCEQ Permit No. 11001753.

IMPERVIOUS COVER

The pond design has the assumed impervious cover for this site at 70%, the project proposes 59.69% of impervious cover therefore, the water quality pond designed by Kimley-Horn accommodates the increase in TSS load associated with the proposed improvement.

PERMANENT BMP

The water quality pond is located southwest of the property within Lot 4 Block B of the Auro Subdivision. This biofiltration water quality pond is designed for the overall 50-acre Auro Subdivision, these water quality plans and calculations are included in the attached construction plans prepared by Kimley-Horn.

PROPOSED SITE USE

This project shall consist of 339 multifamily units within 9 three-story buildings, 1 single story club house, 24 detached parking garages, 24 attached parking garages, associated driveway, and on-grade parking and utilities.

SITE HISTORY/ PREVIOUS DEVELOPMENT

The tract is undeveloped.

AREAS TO BE DEMOLISHED

No demolition is proposed.

One well is documented in this Geologic Assessment, this well is not located within the boundary of this project. A separate WPAP is submitted for the larger off-site area and is in review under TCEQ Permit No. 11001753.

Geologic Assessment

Texas Commission on Environmental Quality

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

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

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

Signature

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

Print Name of Geologist: James Killian

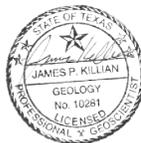
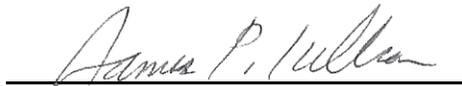
Telephone: 512-328-2430

Date: 30 August 2013

Fax: _____

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

Signature of Geologist:



Regulated Entity Name: 50-acre tract - Forest Park Hospital; SH 45 and CR 172; Austin, Williamson County, Texas

Project Information

1. Date(s) Geologic Assessment was performed: 30 August 2013

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)
HeC2 - Heiden clay eroded, 3 to 5% slopes	D	4 to 6
HeD2 - Heiden clay eroded, 5 to 8% slopes	D	4 to 6
HsE - Heiden extremely stony clay, 3 to 12% slopes	D	4 to 6

Soil Name	Group*	Thickness(feet)
HuB - Houston Black clay, 1 to 3% slopes	D	4 to 6

** Soil Group Definitions (Abbreviated)*

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

6. **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.
7. **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.
8. **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'

Applicant's Site Plan Scale: 1" = 100'

Site Geologic Map Scale: 1" = 100'

Site Soils Map Scale (if more than 1 soil type): 1" = 400'

9. Method of collecting positional data:

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

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

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

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

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

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

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

There are 1 (#) wells present on the project site and the locations are shown and labeled. (Check all of the following that apply.)

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

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

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

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

Administrative Information

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

ATTACHMENT A – Geologic Assessment Table

See attached TCEQ-0585 Table.

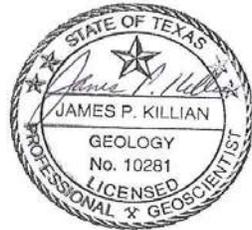
GEOLOGIC ASSESSMENT TABLE						PROJECT NAME: Forest Park Hospital; SH 45 & CR 172; Austin, Texas														
LOCATION			FEATURE CHARACTERISTICS										EVALUATION		PHYSICAL SETTING					
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10		11		12
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	DIP (DEG)	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY	CATCHMENT AREA (ACRES)		TOPOGRAPHY	
						X	Y	Z									<40	>40		<1.6
F-1	30.47708982	-97.69252774	SH	20	Kdr	2	2	6	--		--	--	C,F,O	12	32	X		X		Hillside
M-1	30.47360978	-97.69012817	MB	30	Kdr	0.3	0.3	--	--		--	--	--	5	35	X		X		Hillside
M-2	30.47361149	-97.6895632	MB	30	Kdr	2	2	6	--		--	--	--	5	35	X		X		Hillside
M-3	30.47442206	-97.68869842	MB	30	Kdr	2	2	6	--		--	--	--	5	35	X		X		Hillside
M-4	30.47522673	-97.68784112	MB	30	Kdr	2	2	6	--		--	--	--	5	35	X		X		Hillside

* DATUM:

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

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

12 TOPOGRAPHY	
Cliff, Hilltop, Hillside, Drainage, Floodplain, Streambed	



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

James P. Killian

Date : August 30, 2013

Sheet 1 of 1



PHOTO 1
View of natural geologic feature
F-1, facing southeast



PHOTO 2
Closeup view of geologic feature
F-1, facing east



PHOTO 3
View of manmade feature M-1
private water well area, facing
southwest



PHOTO 4
View of geologic feature F-1 after excavation, facing southeast



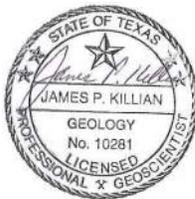
PHOTO 5
Closeup view of geologic feature F-1 after excavation

ATTACHMENT B – Stratigraphic Column

See attached Stratigraphic Column.

Geologic Unit	Hydrologic Unit	Approx. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
			868	0
Buda Limestone (Kbu)	Confining Unit	45		
Del Rio Formation (Kdr)	Confining Unit	50	823	45
Georgetown Formation (Kgt)	Edwards Aquifer	80	773	95
Edwards Formation (Ked)	Edwards Aquifer	250	693	175
			443	425

Note: Unit elevation and thickness given with respect to a ground surface elevation of 868 ft on the northeast side of the project site.



ATTACHMENT C - SITE GEOLOGY

See attached narrative of geology.

TCEQ GEOLOGIC ASSESSMENT ADDITIONAL COMMENTS

1.0 INTRODUCTION AND METHODOLOGY

This report and the planned abatement measures are intended to fulfill Texas Commission on Environmental Quality (TCEQ) reporting requirements (TCEQ, 1999). This geologic assessment includes a review of the site for potential aquifer recharge and documentation of general geologic characteristics for the subject site. Horizon conducted the necessary field and literature studies according to TCEQ Instructions to Geologists for completing Geologic Assessments within the Edwards Aquifer Recharge Zone (TCEQ, 2004).

Horizon walked transects spaced 50 feet apart and mapped the location of features using a Sub-foot accurate Trimble Geo HX handheld GPS and posted processed data utilizing GPS Pathfinder Office software, topographic maps, and aerial photographs. Horizon also searched the area immediately surrounding any potential recharge features encountered to look for additional features.

The Geologic Assessment Table in Appendix C provides a description of any features that meet the TCEQ definition of potential recharge features (TCEQ, 2004). Features that do not meet the TCEQ definition, which include surface weathering, karren, or animal burrows, were evaluated in the field and omitted from this report. When necessary, Horizon removed loose rocks and soil (by hand) to preliminarily assess each feature's subsurface extent while walking transects. However, labor-intensive excavation was not conducted.

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

2.0 ENVIRONMENTAL SETTING

2.1 LAND USE

The current use of the subject site is undeveloped rangeland with local electrical, sewer, and water utilities. Surrounding land use is predominantly residential, undeveloped, and/or commercial (Appendix A – Figure 1).

2.2 TOPOGRAPHY AND SURFACE WATER

This site is located within the Brushy Creek Watershed (COA, 1998). Surface elevations vary from a minimum of approximately 826 feet above mean sea level (amsl) at the southwest side to a maximum of approximately 868 feet amsl at the northeast side. Surface runoff on the subject site flows southwest by overland sheet flow toward an unnamed drainage located in the southwest corner of the site. Thereafter, this drainage path flows westward offsite about 7,500 feet into Rattan Creek, which eventually empties into Lake Creek and Brushy Creek (Appendix A, Figures 2 and 3).

2.3 EDWARDS AQUIFER ZONE

As shown on Appendix A, Figure 2, the subject site is found within the Edwards Aquifer Recharge Zone, as mapped by the TCEQ Recharge Zone Boundary Maps (TCEQ, 2013).

2.4 SURFACE SOILS

Mapping by the Natural Resources Conservation Service (NRCS, 2013) shows 4 soil mapping units within the subject site (Appendix A, Figure 4) associated with the soil series described below. Generally, the soil series are similar in their physical, chemical, and engineering properties, with the principal exception being rock fragment content and thickness.

The Heiden series is represented by 3 mapping units at the subject site: Heiden clay, eroded (HeC2 and HeD2), and extremely stony clay (HsE) are deep, well-drained, and slowly permeable soils that formed as a residual soil over limestone substrate. The series is commonly dark brownish gray, about 4 to 6 feet thick. Permeability is slow and available water holding capacity is moderate.

Houston Black clay (HuB) occurs throughout most of the subject site. It consists of deep, moderately well-drained clay that is dark gray to dark grayish brown. Permeability is very slow and available water holding capacity is high.

2.5 GEOLOGY

A review of existing literature shows most of the site is underlain by the Del Rio Formation (Kdr), which consists of greenish-gray to olive brown calcareous, pyritic, and fossiliferous clay (UT-BEG, 1981). Its thickness ranges between 40 to 70 feet. Underlying the Del Rio clay is the Georgetown Formation, which consists of limestone and marl. The thickness of the Georgetown Formation ranges between 30 to 80 feet. At the eastern corner of the site, mapping indicates an outcrop of the overlying Buda Limestone, which consists of a dark gray to brown argillaceous, hard limestone and a thickness of up to 45 feet. In general, the rock strata beneath the site dip to the southeast at about 20 to 30 feet per mile.

No evidence of geologic faulting was observed at the site; however, mapping indicates an inactive normal fault located near the center of the site and another fault about 0.5 miles northwest of the site (UT-BEG, 1981). A normal fault is an inclined fault in which the hanging wall appears to have slipped downward relative to the footwall.

Table 2 depicts the stratigraphic relationship and approximate thicknesses of the uppermost geologic unit found at the subject site.

TABLE 2 – GEOLOGIC STRATIGRAPHIC COLUMN

Geologic Period	Hydrologic Unit	Geologic Unit	Geologic Member	Approximate Thickness (feet)	Description
Upper Cretaceous	Confining Unit	Buda Limestone (Kbu)	--	45	Limestone, fine-grained, bioclastic, commonly glauconitic, pyritiferous, hard, massive, poorly bedded to nodular, thinner bedded and argillaceous near upper contact, light gray to pale orange; weathers dark gray to brown; burrows filled with chalky marl, abundant pelecypods. No cave development.
Lower Cretaceous	Confining Unit	Del Rio Formation (Kdr)	--	50	Clay, calcareous and gypsiferous, pyrite common, blotchy, medium gray, weathers light gray to yellowish gray; some thin lenticular beds of highly calcareous siltstone: marine megafossils include abundant <i>Exogyra arietina</i> and other pelecypods. No cave development.
Lower Cretaceous	Edwards Aquifer	Georgetown Formation (Kgt)	--	80	Limestone and marl; mostly limestone, fine grained, argillaceous, nodular, light gray; hard, brittle, thick bedded, white; some shale, marly, soft, light gray to yellowish gray; marine megafossils include <i>Kingena wacoensis</i> and <i>Gryphaea washitaensis</i> . Low cave development.
Lower Cretaceous	Edwards Aquifer	Edwards Formation (Ked)	--	250	Gray to light brownish gray, thin to medium-bedded, dense, dolomite, dolomitic limestone, and limestone containing rudists (long, conical bivalves). Gray to black chert is common. Low to moderate cave development.

2.6 WATER WELLS

A search was made for water wells on and within 0.5 miles of the subject site. A review of the records of the TCEQ and the Texas Water Development Board (TWDB) revealed no water wells at the subject site. However, 1 private water well (M-1) was found at the south-central portion of site and has apparently been used to water livestock. A small aboveground watering tank is located immediately south of the well. The well appeared to be in good working condition with appropriate surface completion (i.e., cemented, steel, [8-inch diameter] casing about 2 feet above surface grade).

According to the TWDB, 4 water wells exist within 0.5 miles of the subject site (TWDB, 2013). Water wells No. 5835202, 5835213, 5835223, and 5835224 are reported to be completed in the Edwards Aquifer at total depths ranging from 150 to 300 feet. Appendix A, Figure 2, shows the TWDB water well locations.

The results of this survey do not preclude the existence of an abandoned well. Abandoned wells must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation, 16 Texas Administrative Code (TAC), Chapter 76, and effective 3 January 1999. A plugging report must be submitted (by a licensed water well driller) to the Texas Department of Licensing and Regulation, Water Well Driller's Program, Austin, Texas. If a well is intended for use, it must comply with 16 TAC §76.

2.7 GEOLOGIC AND MANMADE FEATURES

A field survey of the project site was conducted by a licensed Horizon geologist on 30 August 2013. One natural geologic feature (F-1) was identified within the subject site.

Geologic feature F-1 is a small upland sinkhole measuring approximately 8.0 feet long x 6.0 feet wide x 2 feet deep with apparent drainage portal openings located along its rock-laden floor. These openings were partially filled with dark brown, loose, slightly plastic, clayey soil and organic matter. No air flow conductivity was noted at any opening. Probing with a steel rod encountered firmer clay soil and cobbles about 1 foot below the sinkhole floor.

On 11 September 2013, feature F-1 was excavated by Horizon staff to bedrock (~7 feet below the surface). No drainage portals and/or solutioned voids were found along the excavated wall and floor areas. Based on the results of the excavation, this feature has a low infiltration rate and minimal catchment (<0.1 acres) area for surface water runoff. This feature is therefore evaluated as non-sensitive for aquifer point recharge capability.

Three manmade features (M-2 to M-4), identified as sanitary sewer manholes, were found at the subject site. These manholes and their associated underground sewer line are maintained by the City of Austin and appeared to be in good working condition. As stated

previously, 1 private water well (MM-1) was found at the site and is also considered a manmade feature.

A map detailing site geology and the location of the natural and manmade features is provided in Appendix B. Further information pertaining to the natural and manmade features is provided in the geologic assessment table (Appendix C).

3.0 CONCLUSIONS AND RECOMMENDATIONS

One natural geologic feature and 4 manmade features were identified at the subject site. All of the features were evaluated for their potential to be significant pathways for fluid movement into the Edwards Aquifer. The geologic assessment table (Appendix C) summarizes this evaluation and grades each feature's sensitivity total point value. Those with a point value of 40 or higher are deemed to be sensitive groundwater recharge features and should be protected during site development pursuant to TCEQ rules for protection of the Edwards Aquifer (30 TAC 213).

All of the geologic and manmade features have been evaluated as non-sensitive for groundwater recharge capability and would therefore not require TCEQ protective setback buffers for protection of the Edwards Aquifer. However, if development is necessary at F-1, the placement of compactable, fine-grained soil, in appropriate lifts, to bring the ground surface to proposed grade is recommended. No further action is recommended for the remaining non-sensitive features.

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

Because the project site is located over the Edwards Aquifer Recharge Zone, it is possible that subsurface voids underlie the site. The nature of the sub-grade is fault influenced, which can result with variable-sized voids in materials that may otherwise not be noted as void or cave forming. If any subsurface voids are encountered during proposed development, construction should halt immediately so a geologist may assess potential for the void(s) to provide meaningful recharge to the Edwards Aquifer.

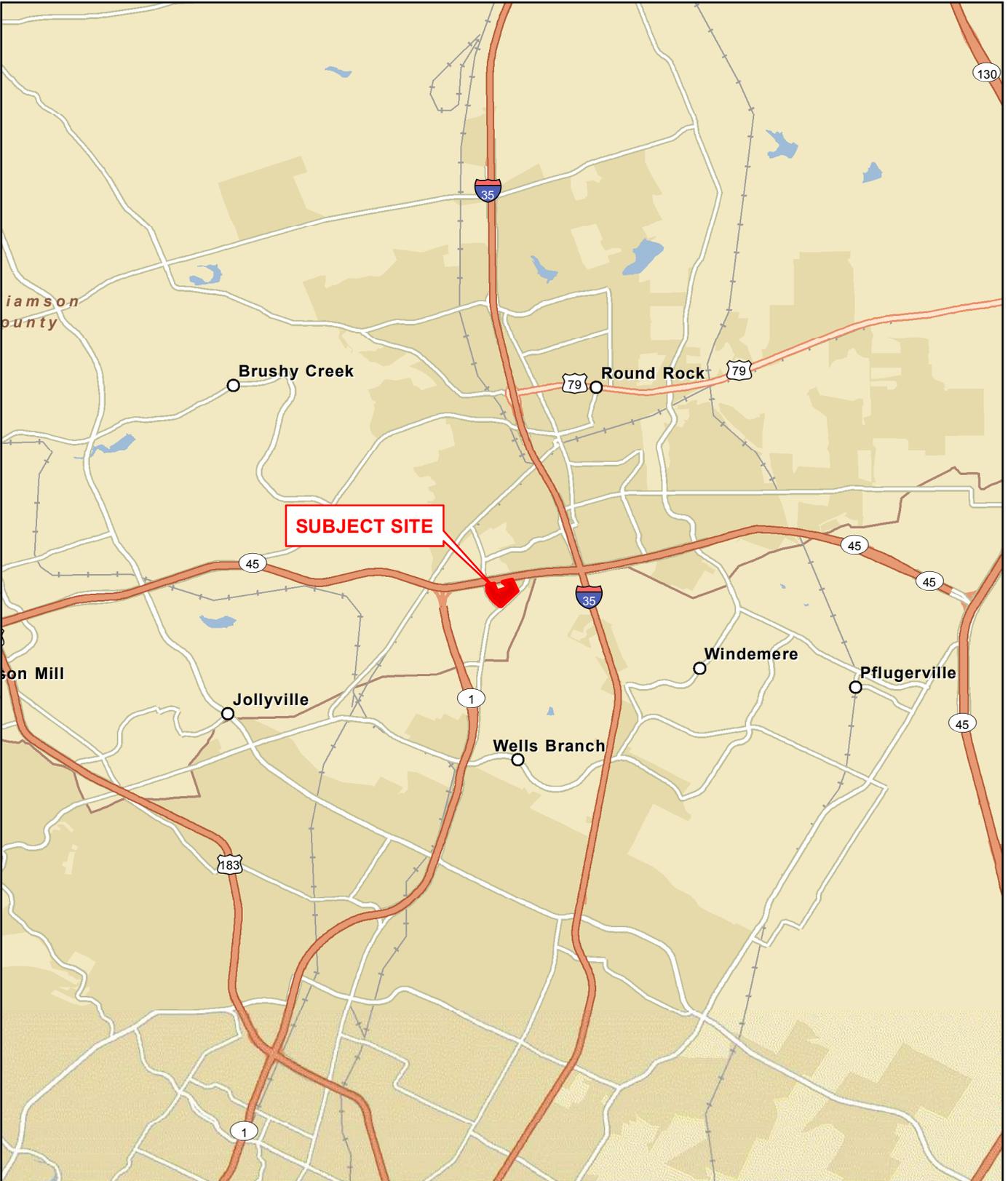
4.0 REFERENCES

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- (UT-BEG) The University of Texas at Austin Bureau of Economic Geology; C.V. Proctor, Jr., T.E. Brown, J.H. McGowen, N.B. Waechter, and V.E. Barnes. *Geologic Atlas of Texas*, Austin Sheet. Francis Luther Whitney Memorial Edition. 1974; revised 1981.

Werchan, L.E., and J.L. Coker. 1983. Soil survey of Williamson County, Texas. Soil Conservation Service, US Department of Agriculture, Washington, D.C.

ATTACHMENT D - SITE GEOLOGIC MAPS

See attached Site Geologic maps.

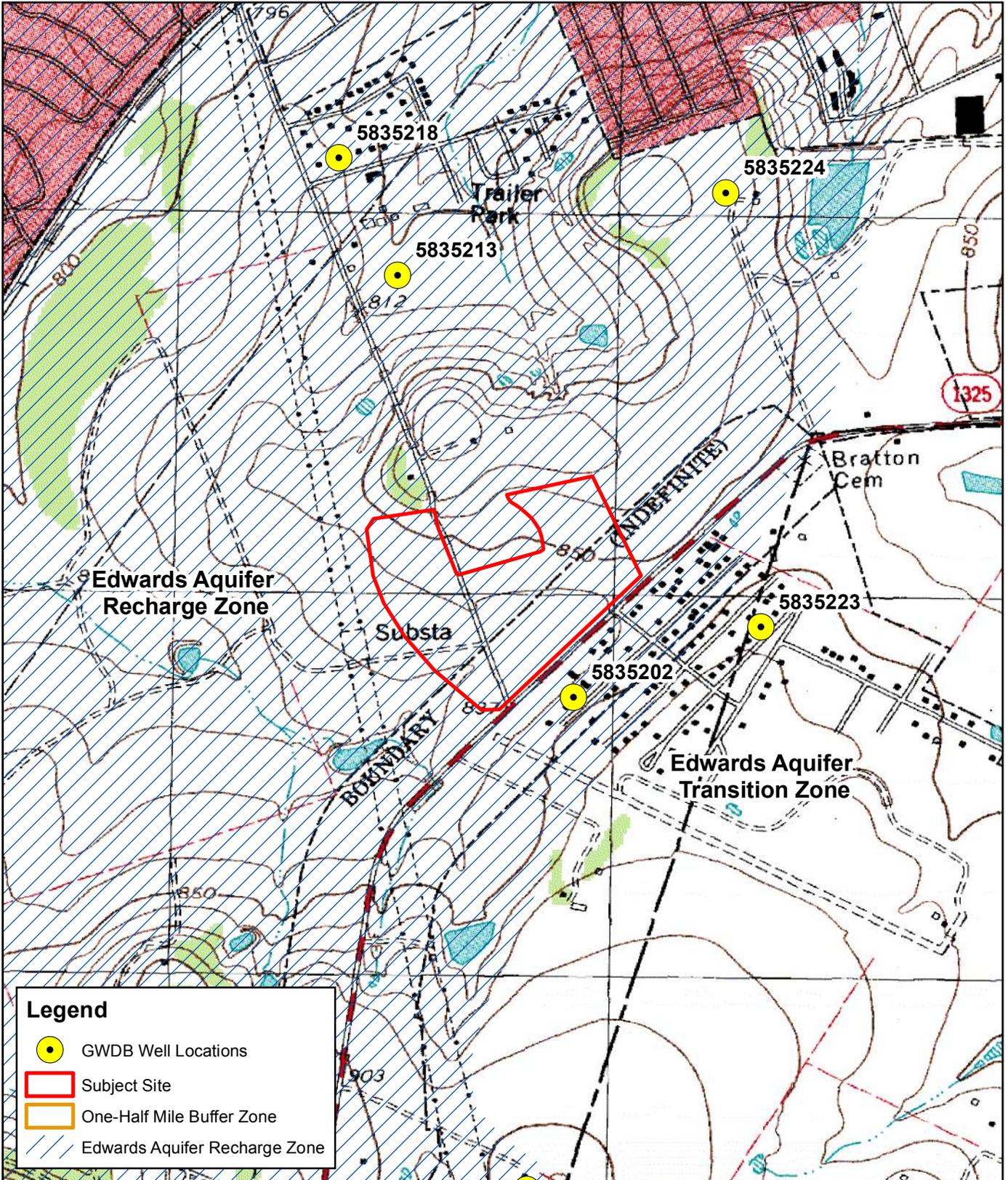


MAP SOURCE: ESRI, 2012.

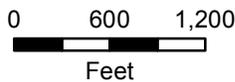


APPENDIX A, FIGURE 1

VICINITY MAP
FOREST PARK HOSPITAL
AUSTIN,
WILLIAMSON COUNTY, TEXAS



MAP SOURCE: USGS, 1987; COA, 2008; TWDB, 2013.



APPENDIX A, FIGURE 2

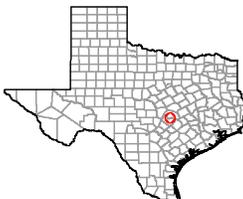
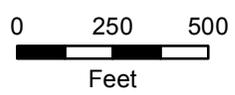
TOPOGRAPHY AND
HYDROGEOLOGY MAP
FOREST PARK HOSPITAL
AUSTIN,
WILLIAMSON COUNTY, TEXAS



Legend

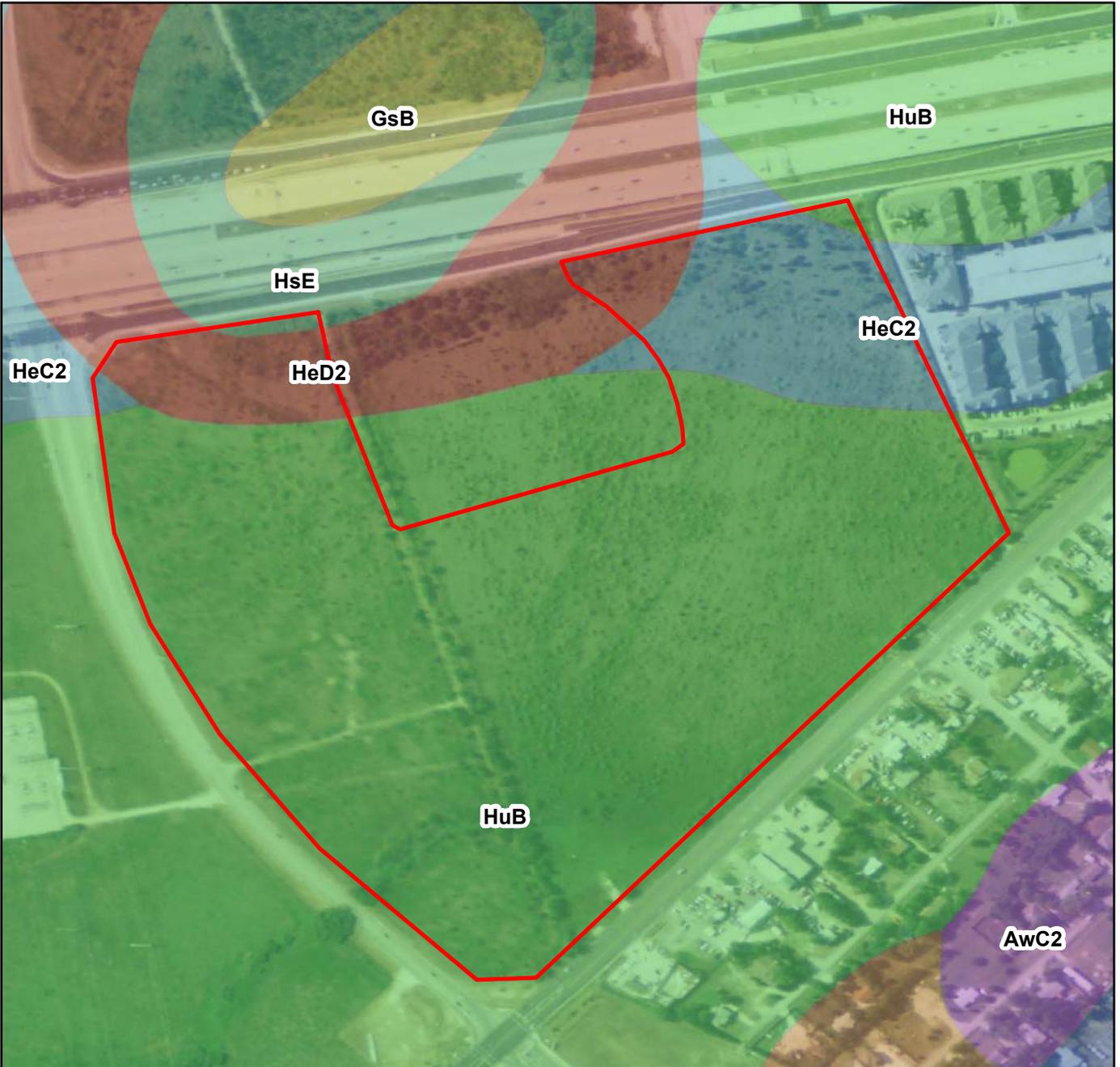
- 2-Foot Contours
- Subject Site

MAP SOURCE: COA, 2003; USDA, 2012.



APPENDIX A, FIGURE 3

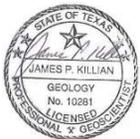
SITE TOPOGRAPHY MAP
 FOREST PARK HOSPITAL
 AUSTIN,
 WILLIAMSON COUNTY, TEXAS



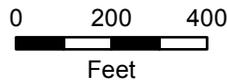
Legend

 Subject Site	 HsE - Heiden extremely stony clay, 3-12% slopes
 AwC2 - Austin-Whitewright complex, 1-5% slopes	 HuA - Houston Black clay, 0-1% slopes
 GsB - Georgetown stony clay loam, 1-3% slopes	 HuB - Houston Black clay, 1-3% slopes
 HeC2 - Heiden clay, 3-5% slopes	 HuC2 - Houston Black clay, 3-5% slopes
 HeD2 - Heiden clay, 5-8% slopes	

MAP SOURCE: USDA, 2012; NRCS, 2013.

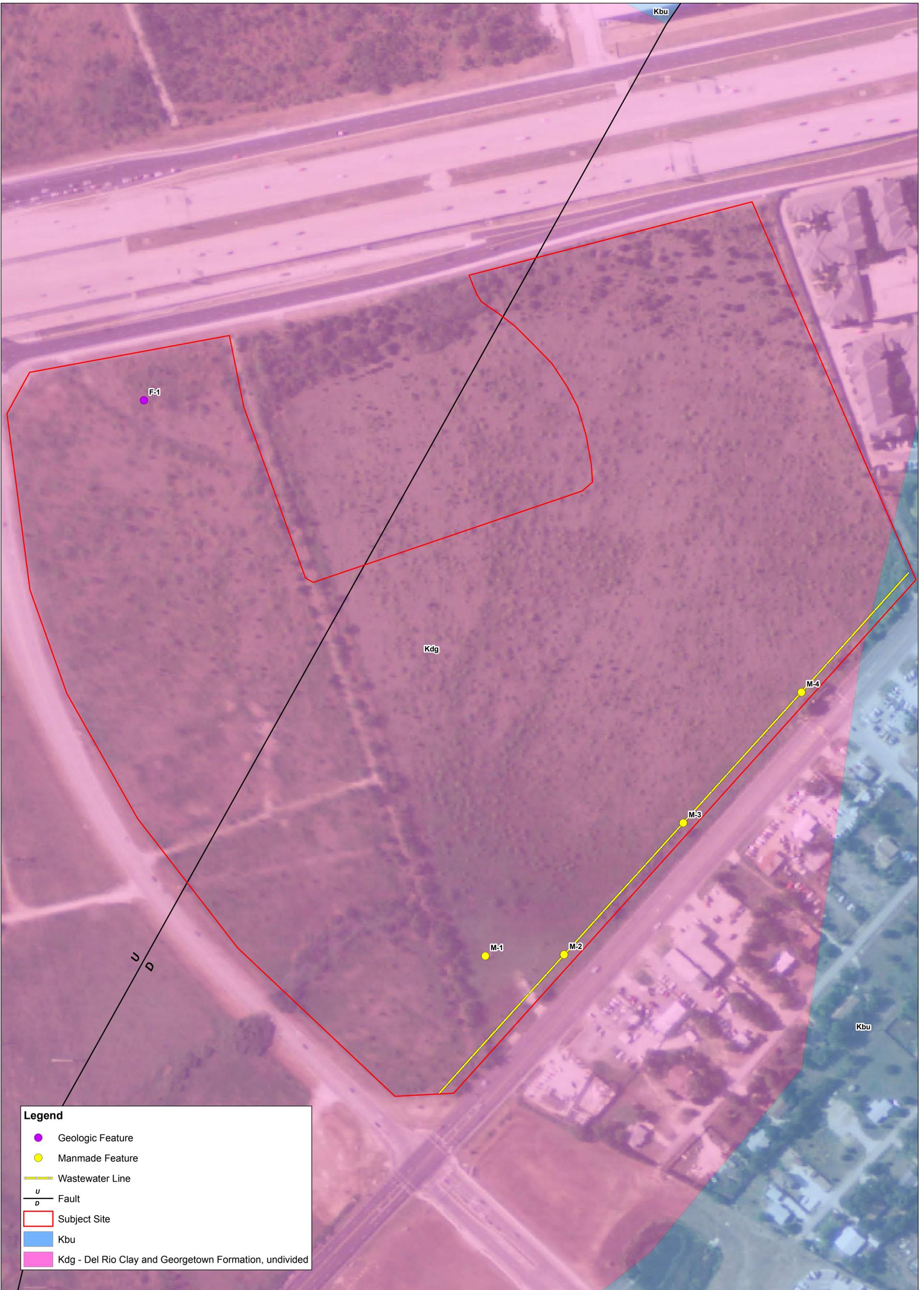


Horizon
Environmental Services, Inc.



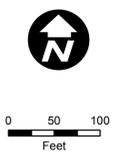
APPENDIX A, FIGURE 4

SURFACE SOILS MAP
FOREST PARK HOSPITAL
AUSTIN,
WILLIAMSON COUNTY, TEXAS



MAP SOURCE: UT-BEG, 1996; USGS, 2006; USDA, 2012.

Horizon
Environmental Services, Inc.



APPENDIX B
SITE GEOLOGIC MAP
FOREST PARK HOSPITAL
AUSTIN,
WILLIAMSON COUNTY, TEXAS

Water Pollution Abatement Plan Application

Texas Commission on Environmental Quality

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

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

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

Signature

To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. This **Water Pollution Abatement Plan Application Form** is hereby submitted for TCEQ review and Executive Director approval. The form was prepared by:

Print Name of Customer/Agent: Austin Auro, LP

Date: 9/25/2022

Signature of Customer/Agent:



Julian Hovess Jr
Vice President
PRA No 2, Inc
manager of
Austin Auro GP, LLC
the sole partner

Regulated Entity Name: Broadstone-La Frontera Phase 2

Regulated Entity Information

1. The type of project is:

- Residential: Number of Lots: _____
- Residential: Number of Living Unit Equivalents: 169.5
- Commercial
- Industrial
- Other: _____

2. Total site acreage (size of property): 14.21

3. Estimated projected population: 509

4. The amount and type of impervious cover expected after construction are shown below:

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops	140,131	÷ 43,560 =	3.22
Parking Garages	6,118	÷ 43,560 =	0.14
Other paved surfaces	222,304	÷ 43,560 =	5.10
Total Impervious Cover	368,553	÷ 43,560 =	8.46

Total Impervious Cover $\frac{8.46}{14.21} \div \text{Total Acreage}$ $\frac{14.21}{14.21} \times 100 = 59.69\%$ **Impervious Cover**

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

For Road Projects Only

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

7. Type of project:

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

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

- Concrete
- Asphaltic concrete pavement
- Other: _____

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

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

$L \times W = \text{_____ Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} = \text{_____ acres.}$

10. Length of pavement area: _____ feet.

Width of pavement area: _____ feet.

$L \times W = \text{_____ Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} = \text{_____ acres.}$

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

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

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

<u>100</u> % Domestic	<u>42,385</u> Gallons/day
<u>0</u> % Industrial	<u>0</u> Gallons/day
<u>0</u> % Commingled	<u>0</u> Gallons/day
TOTAL gallons/day <u>42,385*</u>	

*(This total is based on 0.5 LUE's per unit, as well as an assumed 3.5 LUE's for the Club House)

15. Wastewater will be disposed of by:

On-Site Sewage Facility (OSSF/Septic Tank):

Attachment C - Suitability Letter from Authorized Agent. An on-site sewage facility will be used to treat and dispose of the wastewater from this site. The appropriate licensing authority's (authorized agent) written approval is attached. It states that the land is suitable for the use of private sewage facilities and will meet or exceed the requirements for on-site sewage facilities as specified under 30 TAC Chapter 285 relating to On-site Sewage Facilities.

Each lot in this project/development is at least one (1) acre (43,560 square feet) in size. The system will be designed by a licensed professional engineer or registered sanitarian and installed by a licensed installer in compliance with 30 TAC Chapter 285.

Sewage Collection System (Sewer Lines):

Private service laterals from the wastewater generating facilities will be connected to an existing SCS.

Private service laterals from the wastewater generating facilities will be connected to a proposed SCS.

The SCS was previously submitted on _____.

The SCS was submitted with this application.

The SCS will be submitted at a later date. The owner is aware that the SCS may not be installed prior to Executive Director approval.

The sewage collection system will convey the wastewater to Brushy Creek Regional WW Treatment Plant. The treatment facility is:

- Existing.
 Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 50'.

18. 100-year floodplain boundaries: *The 100 year flood plain is located at the SW corner of Site Plan

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

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

The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): _____

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

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

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

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

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

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

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

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

21. Geologic or manmade features which are on the site:

All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.

No sensitive geologic or manmade features were identified in the Geologic Assessment.

Attachment D - Exception to the Required Geologic Assessment. A request and justification for an exception to a portion of the Geologic Assessment is attached.

22. The drainage patterns and approximate slopes anticipated after major grading activities.
23. Areas of soil disturbance and areas which will not be disturbed.
24. Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. Locations where soil stabilization practices are expected to occur.
26. Surface waters (including wetlands).
 N/A
27. Locations where stormwater discharges to surface water or sensitive features are to occur.
 There will be no discharges to surface water or sensitive features.
28. Legal boundaries of the site are shown.

Administrative Information

29. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
30. Any modification of this WPAP will require Executive Director approval, prior to construction, and may require submission of a revised application, with appropriate fees.

WATER POLLUTION ABATEMENT PLAN APPLICATION ATTACHMENT "A"

FACTORS AFFECTING WATER QUALITY

BROADSTONE – LA FRONTERA PHASE 2

The factors that could affect surface water quality attributable to the construction of the site consist of the following:

1. Erosion due to soil disturbance during clearing and grubbing excavation, embankment, trenching and backfilling utilities, final grading.
2. Use and handling of asphaltic pavement
3. Use and handling of Portland cement concrete
4. Heavy rains during construction
5. Storage of equipment on-site
6. Fueling and maintenance of equipment on-site
7. Accidental spills of minor amounts of petroleum based products such as paint, glue and sealants during construction
8. Storage of construction materials on-site
9. Waste generation, storage and disposal

Temporary Best Management Practices

These factors associated with the construction of the various improvements are kept in check through the Temporary Best Management Practices.

Permanent Best Management Practices

After construction of the various improvements, and the site is restored and revegetated, the factors that could affect water quality consist of the following:

1. Pollutants associated with runoff from parking and paved areas.
2. Pollutants associated with roof runoff.
3. Pollutants associated with runoff from maintained vegetation.
4. Litter.

For all factors, pollutant effects will be reduced by treatment from the offsite permanent sedimentation/filtration pond that will capture and treat the runoff.

**WATER POLLUTION ABATEMENT PLAN
APPLICATION
ATTACHMENT "B"**

VOLUME AND CHARACTER OF STORM WATER

BROADSTONE – LA FRONTERA PHASE 2

Runoff from this project will consist of stormwater runoff typical to multifamily projects which consists of runoff from roofs, driveways and parking. This runoff will be conveyed to the off-site biofiltration water quality pond via roof drains and underground storm sewer.

Biofiltration water quality pond is designed by Kimley-Horn and currently being constructed under approved TCEQ Permit No. 11001753.

**WATER POLLUTION ABATEMENT PLAN
APPLICATION
ATTACHMENT "C"**

SUITABILITY LETTER FROM AUTHORIZED AGENT

BROADSTONE – LA FRONTERA PHASE 2

N/A

**WATER POLLUTION ABATEMENT PLAN
APPLICATION
ATTACHMENT “D”**

EXCEPTION TO THE REQUIRED GEOLOGIC ASSESSMENT

BROADSTONE – LA FRONTERA PHASE 2

N/A

Organized Sewage Collection System Application

Texas Commission on Environmental Quality

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

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

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

Regulated Entity Name: Broadstone-La Frontera 2

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

Customer Information

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

Contact Person: Scott Morway

Entity: Austin Auro LP

Mailing Address: 10210 N. Central Expressway, Suite 300

City, State: Dallas, Texas

Zip: 75231

Telephone: 972-385-4152

Fax: N/A

Email Address: smorway@providentrealty.net

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

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

Contact Person: Dan Brown, P.E.

Texas Licensed Professional Engineer's Number: 98337

Entity: Malone/Wheeler Inc. Firm No. 786

Mailing Address: 5113 Southwest Pkwy, Suite 260

City, State: Austin, Texas

Zip: 78735

Telephone: 512-899-0601

Fax: 512-899-0655

Email Address: eduardoa@malonewheeler.com; danb@malonewheeler.com

Project Information

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

- Residential: Number of single-family lots:
 Multi-family: Number of residential units: 339
 Commercial
 Industrial
 Off-site system (not associated with any development)
 Other: _____

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

100 % Domestic 42,385 gallons/day
0 % Industrial 0 gallons/day
0 % Commingled 0 gallons/day

Total gallons/day: 42,385*

*(This total is based on 0.5 LUE's per unit, as well as an assumed 3.5 LUE's for the Club House)

6. Existing and anticipated infiltration/inflow is 3067 gallons/day. This will be addressed by:
The system is sized to accommodate infiltration and inflow into the system.

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

- The WPAP application for this development was approved by letter dated _____. A copy of the approval letter is attached.
 The WPAP application for this development was submitted to the TCEQ on 10/12, but has not been approved. Being submitted concurrently with SCS application.
 A WPAP application is required for an associated project, but it has not been submitted.
 There is no associated project requiring a WPAP application.

8. Pipe description:

Table 1 - Pipe Description

<i>Pipe Diameter (Inches)</i>	<i>Linear Feet (1)</i>	<i>Pipe Material (2)</i>	<i>Specifications (3)</i>
6"	1168	PVC - SDR 26	ASTM 3034/2241
8"	502	PVC - SDR 26	ASTM 3034/2241
12"	547	PVC - SDR 26	ASTM 3034/2241

Total Linear Feet: 2,217

- (1) Linear feet – Include stub-outs and double service connections. Do not include private service laterals.
 (2) Pipe Material – If PVC, state SDR value.
 (3) Specifications – ASTM / ANSI / AWWA specification and class numbers should be included.

9. The sewage collection system will convey the wastewater to the Brushy Creek WW Treatment Plant. The treatment facility is:

- Existing
- Proposed

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

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

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

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

Alignment

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

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

- Attachment B – Justification and Calculations for Deviation in Straight Alignment without Manholes.** A justification for deviations from straight alignment in this sewage collection system without manholes with documentation from pipe manufacturer allowing pipe curvature is attached.
- For curved sewer lines, all curved sewer line notes (TCEQ-0596) are included on the construction plans for the wastewater collection system.

Manholes and Cleanouts

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

Table 2 – Manholes and Cleanouts

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
WWL – A	34 of 59	1+00.00	CO
WWL – A	34 of 59	2+12.82	MH
WWL – A	34 of 59	3+20.80	MH
WWL – A	34 of 59	3+90.78	MH
WWL – A	34 of 59	5+35.92	MH
WWL – A	34 of 59	6+47.75	MH
WWL – A	34 of 59	8+07.13	MH
WWL – A	34 of 59	9+67.40	MH

<i>Line</i>	<i>Shown on Sheet</i>	<i>Station</i>	<i>Manhole or Clean-out?</i>
WWL – A	34 of 59	12+31.67	MH
WWL – B	36 of 59	1+00.00	MH
WWL – B	36 of 59	2+82.54	MH
WWL – B	36 of 59	3+44.56	MH
WWL – BLDG 1	35 of 59	1+33.58	CO
WWL – BLDG 2	35 of 59	1+31.46	CO
WWL – BLDG 3	36 of 59	1+00.00	MH
WWL – BLDG 3	36 of 59	1+23.77	CO
WWL – BLDG 4	36 of 59	1+00.00	MH
WWL – BLDG 4	36 of 59	1+48.98	CO
WWL – BLDG 5	36 of 59	1+00.00	MH
WWL – BLDG 5	36 of 59	1+64.83	MH
WWL – BLDG 5	36 of 59	3+38.32	CO
WWL – BLDG 5	36 of 59	4+26.70	CO
WWL – BLDG 5	36 of 59	4+54.45	CO
WWL – BLDG 6	35 of 59	1+00.00	MH
WWL – BLDG 6	35 of 59	1+58.76	CO
WWL – BLDG 7	35 of 59	1+00.00	MH
WWL – BLDG 7	35 of 59	2+67.21	CO
WWL – BLDG 8	35 of 59	1+00.00	MH
WWL – BLDG 8	35 of 59	1+40.71	CO
WWL – BLDG 9	35 of 59	1+00.00	MH
WWL – BLDG 9	35 of 59	1+31.95	CO
WWL – CLUB	35 of 59	1+63.58	CO

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

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

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

- Attachment C – Justification for Variance from Maximum Manhole Spacing.** The maximum spacing between manholes on this project (for each pipe diameter used) is greater than listed in the table above. A justification for any variance from the maximum spacing is attached, and must include a letter from the entity which will operate and maintain the system stating that it has the capability to maintain lines with manhole spacing greater than the allowed spacing.
17. All manholes will be monolithic, cast-in-place concrete.
- The use of pre-cast manholes is requested for this project. The manufacturer's specifications and construction drawings, showing the method of sealing the joints, are attached.

Site Plan Requirements

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

18. The Site Plan must have a minimum scale of 1" = 400'.
Site Plan Scale: 1" = 50'.
19. The Site Plan must include the sewage collection system general layout, including manholes with station numbers, and sewer pipe stub outs (if any). Site plan must be overlain by topographic contour lines, using a contour interval of not greater than ten feet and showing the area within both the five-year floodplain and the 100-year floodplain of any drainage way.
20. Lateral stub-outs:
- The location of all lateral stub-outs are shown and labeled.
- No lateral stub-outs will be installed during the construction of this sewer collection system.

21. Location of existing and proposed water lines:

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

22. 100-year floodplain:

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

*To be clear there is going to be a modification to the 100-yr flood plain. WW MH at Station 2+12 of WWL-A will no longer be within the 100-yr floodplain after the modification. There is a portion of the line that will be, and is described in Table 3.

Table 3 - 100-Year Floodplain

<i>Line</i>	<i>Sheet</i>	<i>Station</i>
WWL-A	34 of 59	1+00.00 to 1+46.27
	of	to
	of	to
	of	to

23. 5-year floodplain:

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

Table 4 - 5-Year Floodplain

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

24. Legal boundaries of the site are shown.

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

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

26. All existing or proposed water line crossings and any parallel water lines within 9 feet of sewer lines are listed in the table below. These lines must have the type of pressure rated pipe to be installed shown on the plan and profile sheets. Any request for a variance from the required pressure rated piping at crossings must include a variance approval from 30 TAC Chapter 290.
- There will be no water line crossings.
- There will be no water lines within 9 feet of proposed sewer lines.

Table 5 - Water Line Crossings

<i>Line</i>	<i>Station or Closest Point</i>	<i>Crossing or Parallel</i>	<i>Horizontal Separation Distance</i>	<i>Vertical Separation Distance</i>
WWL – A	3+41.48	Crossing		3.73'
WWL – A	3+44.58	Crossing		3.48'
WWL – A	9+27.70	Crossing		2.77'
WWL – A	9+30.70	Crossing		2.75'
WWL – A	9+96.79	Crossing		1.85'
WWL – A	10+01.04	Crossing		2.04'
WWL – A	11+64.91	Crossing		1.46'
WWL – A	11+67.92	Crossing		1.44'
WWL – A	12+09.51	Crossing		2.27'
WWL – B	1+12.61	Crossing		4.83'
WWL – B	1+15.65	Crossing		1.00'
WWL – BLDG 4	1+20.24	Crossing		3.08'
WWL – BLDG 4	1+23.24	Crossing		2.13'
WWL – BLDG 8	1+12.50	Crossing		1.54'

27. Vented Manholes:

- No part** of this sewer line is within the 100-year floodplain and vented manholes are not required by 30 TAC Chapter 217.
- A portion** of this sewer line is within the 100-year floodplain and vented manholes will be provided at less than 1,500 foot intervals. These water-tight manholes are listed in the table below and labeled on the appropriate profile sheets.
- A portion** of this sewer line is within the 100-year floodplain and an alternative means of venting shall be provided at less than 1500 feet intervals. A description of the alternative means is described on the following page.
- A portion** of this sewer line is within the 100-year floodplain; however, there is no interval longer than 1500 feet located within. No vented manholes will be used.

Table 6 - Vented Manholes

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

28. Drop manholes:

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

Table 7 - Drop Manholes

<i>Line</i>	<i>Manhole</i>	<i>Station</i>	<i>Sheet</i>
WWL – B	4' Drop Manhole	3+44.56	36 of 59

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

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

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

- The placement and markings of all lateral stub-outs are shown and labeled.
- No lateral stub-outs are to be installed during the construction of this sewage collection system. This SCS is a private on-site project with private service lines going to buildings. Therefore, this does not seem applicable.

31. Minimum flow velocity (From Appendix A)

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

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

- Assuming pipes are flowing full, all slopes are designed to produce maximum flows of less than or equal to 10 feet per second for this system/line.

- Attachment D – Calculations for Slopes for Flows Greater Than 10.0 Feet per Second.** Assuming pipes are flowing full, some slopes produce flows which are greater than 10 feet per second. These locations are listed in the table below. Calculation is below:

Given: $n = 0.013$; $S = 0.1259$; $R_h = 0.125$

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S} = \frac{1.49}{0.013} \times 0.125^{0.67} \times \sqrt{0.1259} = 10.0968 \approx 10.1 \frac{ft}{sec}$$

The calculations on attachment D show the velocity exceed 10 fps. However, this occurs in a 32 linear foot line, that is a lateral service line from building 9, and not a main trunk line of the system.

Table 8 - Flows Greater Than 10 Feet per Second

<i>Line</i>	<i>Profile Sheet</i>	<i>Station to Station</i>	<i>FPS</i>	<i>% Slope</i>	<i>Erosion/Shock Protection</i>
BLDG 9	35 of 59	1+00 to 1+31.95	10.1	12.59	N/A

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

Concrete encasement shown on appropriate Plan and Profile sheets for the locations listed in the table above.

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

N/A

The calculations on attachment D show the velocity exceed 10 fps. However, this occurs in a 32 linear foot line, that is a lateral service line from building 9, and not a main trunk line of the system.

Administrative Information

34. The final plans and technical specifications are submitted for TCEQ review. Each sheet of the construction plans and specifications are dated, signed, and sealed by the Texas Licensed Professional Engineer responsible for the design on each sheet.

35. Standard details are shown on the detail sheets, which are dated, signed, and sealed by the Texas Licensed Professional Engineer, as listed in the table below:

Table 9 - Standard Details

<i>Standard Details</i>	<i>Shown on Sheet</i>
Lateral stub-out marking [Required]	N/A
Manhole, showing inverts comply with 30 TAC §217.55(l)(2) [Required]	56 of 59
Alternate method of joining lateral to existing SCS line for potential future connections [Required]	N/A
Typical trench cross-sections [Required]	56 of 59
Bolted manholes [Required]	57 of 59
Sewer Service lateral standard details [Required]	N/A
Clean-out at end of line [Required, if used]	57 of 59
Baffles or concrete encasement for shock/erosion protection [Required, if flow velocity of any section of pipe >10 fps]	N/A
Detail showing Wastewater Line/Water Line Crossing [Required, if crossings are proposed]	33-36 of 59
Mandrel detail or specifications showing compliance with 30 TAC §217.57(b) and (c) [Required, if Flexible Pipe is used]	58 of 59

Standard Details	Shown on Sheet
Drop manholes [Required, if a pipe entering a manhole is more than 24 inches above manhole invert]	56 of 59

- 36. All organized sewage collection system general construction notes (TCEQ-0596) are included on the construction plans for this sewage collection system.
- 37. All proposed sewer lines will be sufficiently surveyed/staked to allow an assessment prior to TCEQ executive director approval. If the alignments of the proposed sewer lines are not walkable on that date, the application will be deemed incomplete and returned.
 - Survey staking was completed on this date: Please contact us 10 days prior to site visit so that we can have the area staked prior to your visit. This is being requested to avoid disturbance of the stakes.
- 38. Submit one (1) original and one (1) copy of the application, plus additional copies as needed for each affected incorporated city, groundwater conservation district, and county in which the project will be located. The TCEQ will distribute the additional copies to these jurisdictions. The copies must be submitted to the appropriate regional office.
- 39. Any modification of this SCS application will require TCEQ approval, prior to construction, and may require submission of a revised application, with appropriate fees.

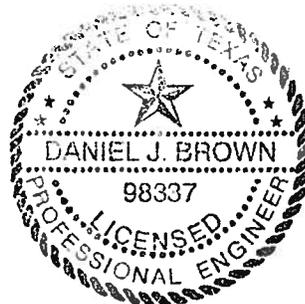
Signature

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

Print Name of Licensed Professional Engineer: Dan Brown, P.E.

Date: 10-11-20

Place engineer's seal here:



Signature of Licensed Professional Engineer:

[Handwritten signature in blue ink]

Appendix A-Flow Velocity Table

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

Table 10 - Slope Velocity

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

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

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

Figure 1 - Manning's Formula

Where:

v = velocity (ft/sec)
n = Manning's roughness coefficient (0.013)
Rh = hydraulic radius (ft)
S = slope(ft/ft)

ORGANIZED SEWAGE COLLECTION SYSTEM

**APPLICATION
ATTACHMENT "A"**

SCS ENGINEERING REPORT

BROADSTONE – LA FRONTERA PHASE 2

**ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
ENGINEERING DESIGN REPORT**

FOR

BROADSTONE-LA FRONTERA PHASE 2

Prepared for:

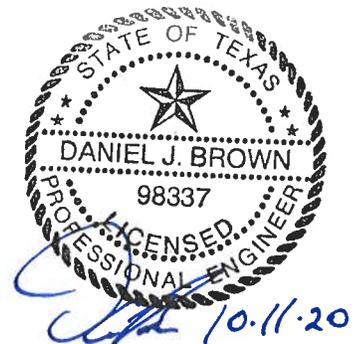
Austin Auro, LP
10210 N. Central Expressway, Suite 300
Dallas, TX 75231

Prepared by:

Malone/Wheeler, Inc.
5113 Southwest Parkway
Suite 260
Austin, Texas 78735
Firm Registration No. F-786



CIVIL ENGINEERING * DEVELOPMENT CONSULTING * PROJECT MANAGEMENT



October 2020
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Appendix

- A. Project Location Map
- B. Wastewater Flow Calculations
- C. TCEQ SCS General Construction Notes

A. SITE DESCRIPTION

1. Project Name: Broadstone – La Frontera Phase 2
2. Location: 3118 CR 172 Round Rock, Texas 78681
3. Treatment Facility: Brushy Creek Regional WW Treatment Plant
4. Project Summary: The wastewater portion of the project consists of the installation of approximately 2,217 linear feet of 6", 8", and 12" wastewater pipes.

B. CAPACITY DESIGN

1. Basis for Average Flow: The average flow used for design of the collection system is based on Living Unit Equivalents (LUE). An LUE is defined as the typical flow that would be produced by a single family residence located in a typical subdivision.
2. Peak Flow Factor: The following equation is used to calculate the peak flow factor. A peak flow factor of at least 4 must be used.

Average Daily Flow, $F = \text{LUE} * 245 \text{ gpd}$

$$\text{Peak Flow Factor, PFF} = \frac{18 + (0.0206 * F)^{0.50}}{4 + (0.0206 * F)^{0.50}}$$

3. Flow/Capacity Analysis:

6" PVC Wastewater Pipe

The maximum flow of the pipe was calculated using the lowest design slope (0.85%) proposed for the 6" WW pipe:

$$Q_{\text{max}} \text{ (from Appendix B)} = 11 \text{ gpm}$$

$$\text{Pipe Size} = 6 \text{ in.}, n = 0.013$$

For the specified pipe at the design slope of 0.85%, the

$$\text{Line Capacity } (Q_{\text{full}}) = (1.49/n) * A * R^{2/3} * S^{1/2} = 232.17 \text{ gpm}$$

$$Q_{\text{max}} = 11 \text{ gpm} < Q_{\text{full}} = 232.17 \text{ gpm}$$

Therefore, the line is of sufficient size to carry the peak flows.

8" PVC Wastewater Pipe

The maximum flow of the pipe was calculated using the lowest design slope (0.5%) proposed for the 8" WW pipe:

$$Q_{\max} \text{ (from Appendix B)} = 52.7 \text{ gpm}$$

$$\text{Pipe Size} = 8 \text{ in.}, n = 0.013$$

For the specified pipe at the design slope of 0.5%, the

$$\text{Line Capacity } (Q_{\text{full}}) = (1.49/n) * A * R^{2/3} * S^{1/2} = 383.49 \text{ gpm}$$

$$Q_{\max} = 52.7 \text{ gpm} < Q_{\text{full}} = 383.49 \text{ gpm}$$

Therefore, the line is of sufficient size to carry the peak flows.

12" PVC Wastewater Pipe

The maximum flow of the pipe was calculated using the lowest design slope (0.5%) proposed for the 12" WW pipe:

$$Q_{\max} \text{ (from Appendix B)} = 109.5 \text{ gpm}$$

$$\text{Pipe Size} = 12 \text{ in.}, n = 0.013$$

For the specified pipe at the design slope of 0.5%, the

$$\text{Line Capacity } (Q_{\text{full}}) = (1.49/n) * A * R^{2/3} * S^{1/2} = 1130.67 \text{ gpm}$$

$$Q_{\max} = 109.5 \text{ gpm} < Q_{\text{full}} = 1130.67 \text{ gpm}$$

Therefore, the line is of sufficient size to carry the peak flows.

4. Minimum/Maximum Slopes: All pipes must be designed with a slope that will provide a minimum velocity of at least 2 ft/s and a maximum velocity of at least 10 ft/s when flowing full.

Minimum Slopes:

$$6" \text{ pipe, } S = 0.85\%, n = 0.013, V = 2.63 \text{ ft/s} \qquad 2 \text{ ft/s} \leq 2.63 \text{ ft/s} < 10 \text{ ft/s}$$

$$8" \text{ pipe, } S = 0.50\%, n = 0.013, V = 2.45 \text{ ft/s} \qquad 2 \text{ ft/s} \leq 2.45 \text{ ft/s} < 10 \text{ ft/s}$$

$$12" \text{ pipe, } S = 0.50\%, n = 0.013, V = 3.21 \text{ ft/s} \qquad 2 \text{ ft/s} \leq 3.21 \text{ ft/s} < 10 \text{ ft/s}$$

Maximum Slopes:

6" pipe, S = 12.59%, n = 0.013, V = 10.14 ft/s	2 ft/s ≤ 10.1 ft/s > 10 ft/s*
8" pipe, S = 1.05%, n = 0.013, V = 3.55 ft/s	2 ft/s ≤ 3.55 ft/s < 10 ft/s
12" pipe, S = 0.68%, n = 0.013, V = 3.74 ft/s	2 ft/s ≤ 3.74 ft/s < 10 ft/s

*All pipes maintain at least a minimum of 2 ft/sec velocity when flowing full. The 6" service lateral line for building 9 exceeds the 10 ft/sec velocity when flowing full. The velocity when flowing full was calculated to be **10.1 ft/sec**. This line consists of 32 linear feet out of the total 2,217 linear feet of pipe being proposed (1.44 %). The slope of the service lateral for building 9 is dictated by the depth of the trunk line which services multiple other buildings. Considering the above information, we are asking for an exception for the service lateral for building 9.

C. STRUCTURAL COMPONENTS

1. Type of Pipe:

	6" SDR-26	8" SDR-26	12" SDR-26
Product Standard:	ASTM 3034	ASTM 3034	ASTM 3034
	ASTM D1784 Cell Class	ASTM D1784 Cell Class	ASTM D1784 Cell Class
Pipe Compound:	12454	12454	12454
Gasket:	ASTM F1336	ASTM F477	ASTM F477
Integral Bell Joint:	ASTM D3212	ASTM D3212	ASTM D3212
Pipe Stiffness:	ASTM D2412, F/ΔY = 115 psi	ASTM D2412, F/ΔY = 115 psi	ASTM D2412, F/ΔY = 115 psi
Installation:	ASTM D2321	ASTM D2321	ASTM D2321
Tensile Strength:	7000 psi	7000 psi	7000 psi
Modulus of Elasticity:	400000 psi	400000 psi	400000 psi
Nominal Inside Diameter:	5.793	7.754	11.538
Average Outside Diameter:	6.275 inches	8.4 inches	12.5 inches
Wall Thickness:	0.241 inches	0.323 inches	0.481 inches
Approximate Weight:	2.36 lbs/ft	4.24 lbs/ft	12.56 lbs/ft

2. Pipe Bedding Class:

The pipe bedding class must comply with ASTM D2321 class IA, IB, II or III for materials and densification. No sand bedding will be allowed. A Class I material (crushed rock) is assumed to be used.

$E_b = 1000 \text{ psi}$

3. Manholes:

Manholes are provided at all changes in size, grade and alignment of pipe. The maximum distance between manholes is 264 feet, which is less than the maximum spacing requirement of 500 feet allowed for 6" – 12" pipes. All manholes will be coated per City of Austin standard specifications. Item number WW-511, from the City's Standard Products list, includes several products which will achieve the design life and corrosion protection required.

4. Buckling Analysis:

a) Allowable Buckling Pressure

$$R_w = 1 - 0.33 * (h_w / h) \quad (1)$$

$$B' = \frac{1}{1 + 4 * e^{-0.065H}} \quad (2)$$

$$I = (t^3 / 12) * (\text{inches}^4 / \text{Linch}) \quad (3)$$

$$q_a = 0.4 * [32 * R_w * B' * E_b * (E * I / D^3)]^{1/2} \quad (4)$$

q_a = allowable buckling pressure, pounds per square inch (psi)

h = height of soil surface above top of pipe in inches (in)

h_w = height of water surface above top of pipe in inches (in) (groundwater elevation)

R_w = Water buoyancy factor

H = Depth of burial in feet (ft) from ground surface to crown of pipe

B' = Empirical coefficient of elastic support

E_b = Modulus of soil reaction for the bedding material (psi)

E = Modulus of elasticity of the pipe material (psi)

I = Moment of inertia of the pipe wall cross section per linear inch of pipe, $\text{inch}^4 / \text{linear inch}$ = inch^3 . For solid wall pipe, I can be calculated with Equation 3. If the pipe used is not solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

t = Pipe structural wall thickness (in)

D = Mean pipe diameter (in)

6" SDR-26 ASTM D3034

H = Deepest bury depth = 9 ft

h = 108 in

$h_w = 108$ in (GWT assumed to be at the ground surface)

$$I = t^3/12 = (0.241)^3/12 = 0.00116 \text{ in}^4/\text{in}$$

$$R_w = 1 - 0.33 * (h_w/h) = 0.67$$

$$B' = 1 / (1 + 4e^{-0.065H}) = 1 / (1 + 4(e^{-0.065(9)})) = 0.310$$

$$q_a = 0.4 * [32 * 0.67 * 0.310 * 1000 * (400,000 * 0.00116 / 5.793^3)]^{1/2}$$

$$q_a = 50.38 \text{ psi}$$

8" SDR-26 ASTM D3034

H = Deepest bury depth = 8.5 ft

h = 102 in

$h_w = 102$ in (GWT assumed to be at the ground surface)

$$I = t^3/12 = (0.323)^3/12 = 0.00281 \text{ in}^4/\text{in}$$

$$R_w = 1 - 0.33 * (h_w/h) = 0.67$$

$$B' = 1 / (1 + 4e^{-0.065H}) = 1 / (1 + 4(e^{-0.065(8.5)})) = 0.303$$

$$q_a = 0.4 * [32 * 0.67 * 0.303 * 1000 * (400,000 * 0.00281 / 7.754^3)]^{1/2}$$

$$q_a = 50.06 \text{ psi}$$

12" SDR-26 ASTM D3034

H = Deepest bury depth = 9 ft

h = 108 in

$h_w = 108$ in (GWT assumed to be at the ground surface)

$$I = t^3/12 = (0.481)^3/12 = 0.00927 \text{ in}^4/\text{in}$$

$$R_w = 1 - 0.33 * (h_w/h) = 0.67$$

$$B' = 1/(1+4e^{-0.065H}) = 1/(1+(4)(e^{-0.065(9)})) = 0.310$$

$$q_a = 0.4 * [32 * 0.67 * 0.310 * 1000 * (400,000 * 0.00927 / 11.538^3)]^{1/2}$$

$$q_a = 50.67 \text{ psi}$$

b) Calculate pressure applied to pipe under installed conditions

$$W_c = \gamma_s * H * (D+t) / 144$$

$$q_p = \gamma_w * h_w + R_w * (W_c / D) + L_i$$

q_p = pressure applied to pipe under installed conditions (psi)

γ_w = 0.0361 pounds per cubic inch (pci), specific weight of water

γ_s = specific weight of soil in pounds per cubic foot (pcf)

W_c = vertical soil load on the pipe per unit length in pounds per linear inch (lb/in)

L_i = Live load = 0 (All bury depths are greater than 3 feet)

6" SDR-26 ASTM D3034

$$W_c = (120 \text{ pcf}) * (9 \text{ ft}) * ((5.793 + 0.241) / 144) = 45.26 \text{ lb/in}$$

$$q_p = (0.0361 \text{ pci}) * (108) + (0.67) * (45.26 / 5.793) + 0 = 9.13 \text{ psi}$$

$$q_p = 9.13 \text{ psi}$$

$q_p < q_a$ The buckling pressure under installed condition is less than the allowable buckling
 9.13 < 50.38, pressure of the specified pipe

8" SDR-26 ASTM D3034

$$W_c = (120 \text{ pcf}) * (8.5 \text{ ft}) * ((7.754 + 0.323) / 144) = 57.21 \text{ lb/in}$$

$$q_p = (0.0361 \text{ pci}) * (102) + (0.67) * (57.21 / 7.754) + 0 = 8.63 \text{ psi}$$

$$q_p = 8.63 \text{ psi}$$

$q_p < q_a$ The buckling pressure under installed condition is less than the allowable buckling
 8.63 < 50.06, pressure of the specified pipe

12" SDR-26 ASTM D3034

$$W_c = (120 \text{ pcf}) * (9 \text{ ft}) * ((11.538 + 0.481) / 144) = 90.14 \text{ lb/in}$$

$$q_p = (0.0361 \text{ pci}) * (108) + (0.67) * (90.14 / 11.538) + 0 = 9.13 \text{ psi}$$

$$q_p = 9.13 \text{ psi}$$

$q_p < q_a$ The buckling pressure under installed condition is less than the allowable buckling pressure of the specified pipe
 $9.13 < 50.67,$

5. Wall Crushing:

Wall crushing due to compressive stress can be calculated from the compressive stress formula, as referenced in Plastic Pipe Design Manual published by Vylon Pipe, Page 14.

6" SDR-26 ASTM D3034

D_o = outside pipe diameter, in. = 6.275 in.

P_c = compressive stress, lb/in², = T/A, for typical PVC pipe assume 4000 psi.

A = surface area of the pipe wall, in²/ft = 0.241 in²/ft

γ_s = specific weight of soil in pounds per cubic foot (pcf) = 120 pcf

P_y = vertical soil pressure, lb/in² = $\gamma_s * H / 144$

T = wall thrust = $(P_y D_o) / 2$

H = depth of burial in feet (ft) from ground surface to crown of pipe

Substituting the Thrust equation into the compressive strength equation:

$$P_c = P_y D_o / 2A$$

Substitute the equation for P_y shown above

$$P_c = [(\gamma_s * H / 144) * D_o] / 2A$$

Solving for H, the equation becomes:

$$H = (288 * P_c * A) / (\gamma_s * D_o)$$

$$H = [(288) * (4000) * (0.241)] / (120 * 6.275)$$

$$H_a = 368.70 \text{ ft}$$

$H_p < H_a$ The proposed maximum depth (H_p) is less than the maximum allowable depth (H_a) before the wall crushing would occur.
 $9 < 368.70,$

8" SDR-26 ASTM D3034

D_o = outside pipe diameter, in. = 8.400 in.

P_c = compressive stress, lb/in², = T/A, for typical PVC pipe assume 4000 psi.

A = surface area of the pipe wall, in²/ft = 0.323 in²/ft

γ_s = specific weight of soil in pounds per cubic foot (pcf) = 120 pcf

P_v = vertical soil pressure, lb/in² = $\gamma_s * H / 144$

T = wall thrust = ($P_v D_o$)/2

H = depth of burial in feet (ft) from ground surface to crown of pipe

$H = (288 * P_c * A) / (\gamma_s * D_o)$

$$H = [(288) * (4000) * (0.323)] / (120 * 8.4) =$$

$$H_a = 369.14 \text{ ft}$$

$H_p < H_a$ The proposed maximum depth (H_p) is less than the maximum allowable depth (H_a)
8.5 < 369.14, before the wall crushing would occur.

12" SDR-26 ASTM D3034

D_o = outside pipe diameter, in. = 12.5 in.

P_c = compressive stress, lb/in², = T/A, for typical PVC pipe assume 4000 psi.

A = surface area of the pipe wall, in²/ft = 0.481 in²/ft

γ_s = specific weight of soil in pounds per cubic foot (pcf) = 120 pcf

P_v = vertical soil pressure, lb/in² = $\gamma_s * H / 144$

T = wall thrust = ($P_v D_o$)/2

H = depth of burial in feet (ft) from ground surface to crown of pipe

$H = (288 * P_c * A) / (\gamma_s * D_o)$

$$H = [(288) * (4000) * (0.481)] / (120 * 12.5) =$$

$$H_a = 369.41 \text{ ft}$$

$H_p < H_a$ The proposed maximum depth (H_p) is less than the maximum allowable depth (H_a)
9 < 369.41, before the wall crushing would occur.

6. Deflection Analysis:

a) Zeta factor:

Leonhard's Zeta Factor can be calculated using Equation 7.37 of the UNI-BELL Handbook of PVC PIPE, 3rd Edition.

$$Zeta = \frac{1.44}{f + (1.44 - f) * (E_b / E_n')}$$

$$f = \frac{b/d_a - 1}{1.154 + 0.444*(b/d_a - 1)}$$

6" SDR-26 ASTM D3034 PVC

f = pipe/trench width coefficient

b = trench width = 22 in for 6" Wastewater Pipe

d_a = pipe diameter = 6.275 in for 6" Wastewater Pipe

E_b = modulus of soil reaction for the bedding material (psi) = 1000

E_n = modulus of soil reaction for the in-situ soil (psi) = 1000

$$f = ((22/6.275)-1) / (1.154 + (0.444*(22/6.275)-1)) = 1.105$$

$$zeta = 1.44 / [1.105 + (1.44-1.105)*(1000/1000)]$$

$$zeta = 1.0$$

8" SDR-26 ASTM D3034 PVC

f = pipe/trench width coefficient

b = trench width = 26 in for 8" Wastewater Pipe

d_a = pipe diameter = 8.400 in for 8" Wastewater Pipe

E_b = modulus of soil reaction for the bedding material (psi) = 1000

E_n = modulus of soil reaction for the in-situ soil (psi) = 1000

$$f = ((26/8.4)-1) / (1.154 + (0.444*(26/8.4)-1)) = 1.005$$

$$zeta = 1.44 / [1.005 + (1.44-1.005)*(1000/1000)]$$

$$zeta = 1.0$$

12" SDR-26 ASTM D3034 PVC

f = pipe/trench width coefficient

b = trench width = 26 in for 8" Wastewater Pipe

d_a = pipe diameter = 8.400 in for 8" Wastewater Pipe

E_b = modulus of soil reaction for the bedding material (psi) = 1000

E_n = modulus of soil reaction for the in-situ soil (psi) = 1000

$$f = ((26/8.4)-1) / (1.154 + (0.444*(26/8.4)-1)) = 1.005$$

$$zeta = 1.44 / [1.005 + (1.44-1.005)*(1000/1000)]$$

$$zeta = 1.0$$

b) Pipe Stiffness

Using equation 7.1, from the Uni-Bell Handbook of PVC Pipe, 3rd Edition.

$$P_s = \frac{EI}{0.149*r^3}$$

P_s = Pipe Stiffness (psi)

E = modulus of elasticity (psi)

I = Moment of inertia of the pipe wall cross section per linear inch of pipe, $\text{inch}^4/\text{lineal inch}$ = inch^3 . For solid wall pipe, I can be calculated with Equation 3. If the pipe used is no solid wall pipe (for example a pipe with a ribbed cross section), the proper moment of inertia formula must be obtained from the manufacturer.

r = mean radius (in)

6" SDR-26 ASTM D3034 PVC

$$P_s = (400000*0.00116) / (0.149*2.896^3) = 128.21 \text{ psi}$$

8" SDR-26 ASTM D3034 PVC

$$P_s = (400000*0.00281) / (0.149*3.877^3) = 129.45$$

12" SDR-26 ASTM D3034 PVC

$$P_s = (400000*0.00927) / (0.149*5.769^3) = 129.61$$

c) Pipe Stiffness to Soil Stiffness Factor Ratio (P_s / SSF)

The Pipe Stiffness to Soil Stiffness Factor must be greater than 0.15

P_s = Pipe Stiffness (psi)

E_b = modulus of soil reaction for the bedding material = 1000 psi

$zeta = 1.0$

$\text{SSF} = \text{soil stiffness factor } (0.061*zeta*E_b) = 61$

6" SDR-26 ASTM D3034 PVC

$$P_s/\text{SSF} = 128.21/61 = 2.10 > 0.15$$

8" SDR-26 ASTM D3034 PVC

$$P_s/SSF = 129.45/61 = 2.12 > 0.15$$

12" SDR-26 ASTM D3034 PVC

$$P_s/SSF = 129.61/61 = 2.12 > 0.15$$

d) Predicted Pipe Deflection

Using Equation 7.11 from the Uni-Bell Handbook of PVC Pipe, 3rd Edition.

$$\frac{\% \Delta Y}{D} = \frac{D_L K P (100)}{0.149 P_s + 0.061 E'}$$

$$P = \gamma_s * H / 144$$

% $\Delta Y/D$ = Predicted % vertical deflection under load

P = Prism Load (psi)

K = Bedding angle constant. Assumed to be 0.1

E' = Modulus of soil reaction = 1000 psi

D_L = Deflection lag factor = 1.5

γ_s = Unit weight of soil = 120 pcf

H = Depth of burial (ft) from ground surface to crown of pipe

6" SDR-26 ASTM D3034 PVC

$$P = (120 * 9) / 144 = 7.5 \text{ psi}$$

$$\% \Delta Y/D = (1.5)(0.1)(7.5)(100) / [(0.149 * 128.21) + (0.061 * 1000)] = 1.40\%$$

8" SDR-26 ASTM D3034 PVC

$$P = (120 * 8.5) / 144 = 7.08 \text{ psi}$$

$$\% \Delta Y/D = (1.5)(0.1)(7.08)(100) / [(0.149 * 129.45) + (0.061 * 1000)] = 1.32\%$$

12" SDR-26 ASTM D3034 PVC

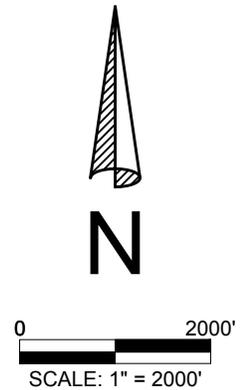
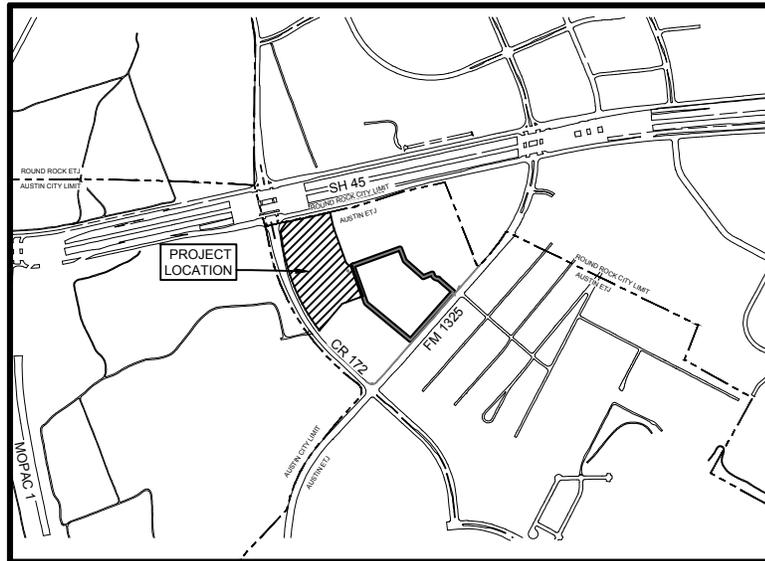
$$P = (120 * 9) / 144 = 7.5 \text{ psi}$$

$$\% \Delta Y/D = (1.5)(0.1)(7.5)(100) / [(0.149 * 129.61) + (0.061 * 1000)] = 1.40\%$$

APPENDIX A – PROJECT LOCATION MAP

BROADSTONE - LA FRONTERA PHASE 2 LOCATION MAP

3118 CR 172
ROUND ROCK, TEXAS 78681



CIVIL ENGINEERING ★ DEVELOPMENT CONSULTING ★ PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

APPENDIX B – WASTEWATER FLOW CALCULATIONS

BROADSTONE - LA FRONTERA PHASE 2

WASTEWATER CALCULATIONS

1 LUE = 245 gpd

AVERAGE DRY WEATHER FLOW

F = LUEs x 245/1440 gpm

PEAK FLOW FACTOR (>= 4)

PFF = $[(18+(0.0206 \times F)^{0.5})/(4+(0.0206 \times F)^{0.5})]$

PEAK DRY WEATHER FLOW (gpm)

Qpdwf = PFF X F

INFLOW / INFILTRATION

(I/I) = 750 gal./day/acre = 0.521 gpm/acre

PEAK WET WEATHER FLOW (gpm)

Qpwwf = Qpdwf + I/I

WASTEWATER LINE	STATION FROM	STATION TO	LUEs	AVERAGE DRY WEATHER FLOW F (gpm)	PEAK FLOW FACTOR PFF	PEAK DRY WEATHER FLOW Qpdwf (gpm)	INFLOW / INFILTRATION I/I (gpm)	PEAK WET WEATHER FLOW Qpwwf (gpm)	PIPE SIZE (IN)	PIPE SLOPE (%)	PEAK DRY WEATHER VELOCITY Vpdwf (ft/s)	PEAK DRY WEATHER DEPTH d _{pdwf} (ft)	PEAK WET WEATHER VELOCITY Vpwwf (ft/s)	PEAK WET WEATHER DEPTH d _{pwwf} (ft)
A	1+00.00	2+12.82	173.0	29.43	4.00	117.7	2.13	119.9	12	0.68	2.32	0.20	2.33	0.20
A	2+12.82	3+07.11	173.0	29.43	4.00	117.7	2.08	119.8	12	0.57	2.17	0.21	2.19	0.21
A	3+07.11	3+20.80	158.0	26.88	4.00	107.5	2.00	109.5	12	0.57	2.12	0.20	2.13	0.20
A	3+20.80	3+90.78	158.0	26.88	4.00	107.5	1.98	109.5	12	0.50	2.02	0.21	2.03	0.21
A	3+90.78	4+60.81	119.0	20.25	4.01	81.3	1.68	82.9	12	0.54	1.91	0.18	1.92	0.18
A	4+60.81	5+35.92	101.0	17.18	4.05	69.5	1.64	71.2	12	0.54	1.83	0.17	1.84	0.17
A	5+35.92	6+23.33	77.0	13.10	4.10	53.7	1.48	55.2	12	0.50	1.65	0.15	1.66	0.15
A	6+23.33	6+47.75	73.5	12.51	4.11	51.3	1.41	52.8	12	0.50	1.62	0.15	1.64	0.15
A	6+47.75	8+07.13	73.5	12.51	4.11	51.3	1.39	52.7	8	0.50	1.70	0.16	1.72	0.17
A	8+07.13	9+67.40	30.0	5.10	4.24	21.6	1.28	22.9	8	0.95	1.65	0.09	1.69	0.09
A	9+67.40	12+31.67	15.0	2.55	4.31	11.0	0.55	11.5	6	1.51	1.65	0.06	1.68	0.07
B	1+00.00	2+82.54	39.0	6.64	4.20	27.9	0.31	28.2	8	1.05	1.85	0.10	1.86	0.10
B	2+82.54	3+44.56	12.0	2.04	4.33	8.8	0.16	9.0	6	1.00	1.34	0.06	1.35	0.06
CLUB HOUSE	1+00.00	1+63.58	3.5	0.60	4.41	2.6	0.00	2.6	6	7.59	1.88	0.02	1.88	0.02
BLDG 1	1+00.00	1+33.58	18.0	3.06	4.29	13.1	0.00	13.1	6	10.51	3.44	0.04	3.44	0.04
BLDG 2	1+00.00	1+31.46	15.0	2.55	4.31	11.0	0.00	11.0	6	10.41	3.26	0.04	3.26	0.04
BLDG 3	1+00.00	1+23.77	27.0	4.59	4.25	19.5	0.00	19.5	6	11.60	4.00	0.05	4.00	0.05
BLDG 4	1+00.00	1+48.98	12.0	2.04	4.33	8.8	0.00	8.8	6	1.00	1.34	0.06	1.34	0.06
BLDG 5	1+00.00	4+54.45	24.0	4.08	4.26	17.4	0.00	17.4	6	1.94	2.07	0.08	2.07	0.08
BLDG 6	1+00.00	1+58.76	15.0	2.55	4.31	11.0	0.00	11.0	6	8.51	3.03	0.04	3.03	0.04
BLDG 7	1+00.00	2+67.21	15.0	2.55	4.31	11.0	0.00	11.0	6	0.85	1.35	0.07	1.35	0.07
BLDG 8	1+00.00	1+40.71	25.5	4.34	4.26	18.5	0.00	18.5	6	11.55	3.94	0.05	3.94	0.05
BLDG 9	1+00.00	1+31.95	18.0	3.06	4.29	13.1	0.00	13.1	6	12.59	3.67	0.04	3.67	0.04

APPENDIX C – TCEQ SCS GENERAL CONSTRUCTION NOTES

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

Edwards Aquifer Protection Program Construction Notes – Legal Disclaimer

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

1. This Organized Sewage Collection System (SCS) must be constructed in accordance with 30 Texas Administrative Code (TAC) §213.5(c), the Texas Commission on Environmental Quality’s (TCEQ) Edwards Aquifer Rules and any local government standard specifications.
2. All contractors conducting regulated activities associated with this proposed regulated project must be provided with copies of the SCS plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors must be required to keep on-site copies of the plan and the approval letter.
3. A written notice of construction must be submitted to the presiding TCEQ regional office at least 48 hours prior to the start of any regulated activities. This notice must include:
 - the name of the approved project;
 - the activity start date; and
 - the contact information of the prime contractor.
4. Any modification to the activities described in the referenced SCS application following the date of approval may require the submittal of an SCS application to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval.
5. Prior to beginning any construction activity, all temporary erosion and sedimentation (E&S) control measures must be properly installed and maintained in accordance with the manufacturers specifications. These controls must remain in place until the disturbed areas have been permanently stabilized.
6. If any sensitive features are discovered during the wastewater line trenching activities, all regulated activities near the sensitive feature must be suspended immediately. The applicant must immediately notify the appropriate regional office of the TCEQ of the feature discovered. A geologist’s assessment of the location and extent of the feature discovered must be reported to that regional office in writing and the applicant must submit a plan for ensuring the structural integrity of the sewer line or for modifying the proposed collection system alignment around the feature. The regulated activities near the sensitive feature may not proceed until the

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

7. Sewer lines located within or crossing the 5-year floodplain of a drainage way will be protected from inundation and stream velocities which could cause erosion and scouring of backfill. The trench must be capped with concrete to prevent scouring of backfill, or the sewer lines must be encased in concrete. All concrete shall have a minimum thickness of 6 inches.
8. Blasting procedures for protection of existing sewer lines and other utilities will be in accordance with the National Fire Protection Association criteria. Sand is not allowed as bedding or backfill in trenches that have been blasted. If any existing sewer lines are damaged, the lines must be repaired and retested.
9. All manholes constructed or rehabilitated on this project must have watertight size on size resilient connectors allowing for differential settlement. If manholes are constructed within the 100-year floodplain, the cover must have a gasket and be bolted to the ring. Where gasketed manhole covers are required for more than three manholes in sequence or for more than 1500 feet, alternate means of venting will be provided. Bricks are not an acceptable construction material for any portion of the manhole.

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

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

10. Where water lines and new sewer line are installed with a separation distance closer than nine feet (i.e., water lines crossing wastewater lines, water lines paralleling wastewater lines, or water lines next to manholes) the installation must meet the requirements of 30 TAC §217.53(d) (Pipe Design) and 30 TAC §290.44(e) (Water Distribution).
11. Where sewers lines deviate from straight alignment and uniform grade all curvature of sewer pipe must be achieved by the following procedure which is recommended by the pipe manufacturer: _____.

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

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

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

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

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

13. Trenching, bedding and backfill must conform with 30 TAC §217.54. The bedding and backfill for flexible pipe must comply with the standards of ASTM D-2321, Classes IA, IB, II or III. Rigid pipe bedding must comply with the requirements of ASTM C 12 (ANSI A 106.2) classes A, B or C.
14. Sewer lines must be tested from manhole to manhole. When a new sewer line is connected to an existing stub or clean-out, it must be tested from existing manhole to new manhole. If a stub or clean-out is used at the end of the proposed sewer line, no private service attachments may be connected between the last manhole and the cleanout unless it can be certified as conforming with the provisions of 30 TAC §213.5(c)(3)(E).
15. All sewer lines must be tested in accordance with 30 TAC §217.57. The engineer must retain copies of all test results which must be made available to the executive director upon request. The engineer must certify in writing that all wastewater lines have passed all required testing to the appropriate regional office within 30 days of test completion and prior to use of the new collection system. Testing method will be:
 - (a) For a collection system pipe that will transport wastewater by gravity flow, the design must specify an infiltration and exfiltration test or a low-pressure air test. A test must conform to the following requirements:
 - (1) *Low Pressure Air Test.*
 - (A) A low pressure air test must follow the procedures described in American Society For Testing And Materials (ASTM) C-828, ASTM C-924, or ASTM F-1417 or other procedure approved by the executive director, except as to testing times as required in Table C.3 in subparagraph (C) of this paragraph or Equation C.3 in subparagraph (B)(ii) of this paragraph.
 - (B) For sections of collection system pipe less than 36 inch average inside diameter, the following procedure must apply, unless a pipe is to be tested as required by paragraph (2) of this subsection.
 - (i) A pipe must be pressurized to 3.5 pounds per square inch (psi) greater than the pressure exerted by groundwater above the pipe.
 - (ii) Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge is computed from the following equation:

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

Where:

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

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

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

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

- (D) An owner may stop a test if no pressure loss has occurred during the first 25% of the calculated testing time.
- (E) If any pressure loss or leakage has occurred during the first 25% of a testing period, then the test must continue for the entire test duration as outlined above or until failure.
- (F) Wastewater collection system pipes with a 27 inch or larger average inside diameter may be air tested at each joint instead of following the procedure outlined in this section.
- (G) A testing procedure for pipe with an inside diameter greater than 33 inches must be approved by the executive director.

(2) *Infiltration/Exfiltration Test.*

- (A) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch of diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of a pipe at an upstream manhole.
- (B) An owner shall use an infiltration test in lieu of an exfiltration test when pipes are installed below the groundwater level.
- (C) The total exfiltration, as determined by a hydrostatic head test, must not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of a pipe at an upstream manhole, or at least two feet above existing groundwater level, whichever is greater.
- (D) For construction within a 25-year flood plain, the infiltration or exfiltration must not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at the same minimum test head as in subparagraph (C) of this paragraph.
- (E) If the quantity of infiltration or exfiltration exceeds the maximum quantity specified, an owner shall undertake remedial action in order to reduce

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

- (b) If a gravity collection pipe is composed of flexible pipe, deflection testing is also required. The following procedures must be followed:
 - (1) For a collection pipe with inside diameter less than 27 inches, deflection measurement requires a rigid mandrel.
 - (A) *Mandrel Sizing.*
 - (i) A rigid mandrel must have an outside diameter (OD) not less than 95% of the base inside diameter (ID) or average ID of a pipe, as specified in the appropriate standard by the ASTMs, American Water Works Association, UNI-BELL, or American National Standards Institute, or any related appendix.
 - (ii) If a mandrel sizing diameter is not specified in the appropriate standard, the mandrel must have an OD equal to 95% of the ID of a pipe. In this case, the ID of the pipe, for the purpose of determining the OD of the mandrel, must equal be the average outside diameter minus two minimum wall thicknesses for OD controlled pipe and the average inside diameter for ID controlled pipe.
 - (iii) All dimensions must meet the appropriate standard.
 - (B) *Mandrel Design.*
 - (i) A rigid mandrel must be constructed of a metal or a rigid plastic material that can withstand 200 psi without being deformed.
 - (ii) A mandrel must have nine or more odd number of runners or legs.
 - (iii) A barrel section length must equal at least 75% of the inside diameter of a pipe.
 - (iv) Each size mandrel must use a separate proving ring.
 - (C) *Method Options.*
 - (i) An adjustable or flexible mandrel is prohibited.
 - (ii) A test may not use television inspection as a substitute for a deflection test.
 - (iii) If requested, the executive director may approve the use of a deflectometer or a mandrel with removable legs or runners on a case-by-case basis.
 - (2) For a gravity collection system pipe with an inside diameter 27 inches and greater, other test methods may be used to determine vertical deflection.
 - (3) A deflection test method must be accurate to within plus or minus 0.2% deflection.
 - (4) An owner shall not conduct a deflection test until at least 30 days after the final backfill.
 - (5) Gravity collection system pipe deflection must not exceed five percent (5%).
 - (6) If a pipe section fails a deflection test, an owner shall correct the problem and conduct a second test after the final backfill has been in place at least 30 days.

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

- (a) All manholes must pass a leakage test.
- (b) An owner shall test each manhole (after assembly and backfilling) for leakage, separate and independent of the collection system pipes, by hydrostatic exfiltration testing, vacuum testing, or other method approved by the executive director.
 - (1) Hydrostatic Testing.

- (A) The maximum leakage for hydrostatic testing or any alternative test methods is 0.025 gallons per foot diameter per foot of manhole depth per hour.
- (B) To perform a hydrostatic exfiltration test, an owner shall seal all wastewater pipes coming into a manhole with an internal pipe plug, fill the manhole with water, and maintain the test for at least one hour.
- (C) A test for concrete manholes may use a 24-hour wetting period before testing to allow saturation of the concrete.

(2) Vacuum Testing.

- (A) To perform a vacuum test, an owner shall plug all lift holes and exterior joints with a non-shrink grout and plug all pipes entering a manhole.
- (B) No grout must be placed in horizontal joints before testing.
- (C) Stub-outs, manhole boots, and pipe plugs must be secured to prevent movement while a vacuum is drawn.
- (D) An owner shall use a minimum 60 inch/lb torque wrench to tighten the external clamps that secure a test cover to the top of a manhole.
- (E) A test head must be placed at the inside of the top of a cone section, and the seal inflated in accordance with the manufacturer's recommendations.
- (F) There must be a vacuum of 10 inches of mercury inside a manhole to perform a valid test.
- (G) A test does not begin until after the vacuum pump is off.
- (H) A manhole passes the test if after 2.0 minutes and with all valves closed, the vacuum is at least 9.0 inches of mercury.

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

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

**ORGANIZED SEWAGE COLLECTION SYSTEM
APPLICATION
ATTACHMENT "B"**

**JUSTIFICATION & CALCULATIONS FOR DEVIATION IN STRAIGHT
ALIGNMENT**

BROADSTONE-LA FRONTERA PHASE 2

N/A

ORGANIZED SEWAGE COLLECTION SYSTEM

**APPLICATION
ATTACHMENT "C"**

**JUSTIFICATION FOR VARIANCE FROM MAXIMUM MANHOLE
SPACING**

BROADSTONE-LA FRONTERA PHASE 2

N/A

ORGANIZED SEWAGE COLLECTION SYSTEM

APPLICATION ATTACHMENT "D"

CALCULATIONS FOR SLOPES FOR FLOWS GREATER THAN 10.0 FEET PER SECOND

BROADSTONE-LA FRONTERA PHASE 2

Given: $n = 0.013$; $S = 0.1259$; $R_h = 0.125$

$$v = \frac{1.49}{n} \times R_h^{0.67} \times \sqrt{S} = \frac{1.49}{0.013} \times 0.125^{0.67} \times \sqrt{0.1259} = 10.0968$$

$$v \approx 10.1 \frac{ft}{sec}$$

Please note the 32 linear foot lateral wastewater service line from BLDG 9 is not a main trunk line of the system.

APPENDIX P-1 - EROSION CONTROL NOTES

- 1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS, TREE/NATURAL AREA PROTECTIVE FENCING, AND CONDUCT "PRE-CONSTRUCTION" TREE FERTILIZATION (IF APPLICABLE) PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. THE PLACEMENT OF EROSION/SEDIMENTATION CONTROLS SHALL BE IN ACCORDANCE WITH THE ENVIRONMENTAL CRITERIA MANUAL AND THE APPROVED EROSION AND SEDIMENTATION CONTROL PLAN. THE COA ESC PLAN SHALL BE CONSIDERED AND USED AS THE BASIS FOR A TPEES REQUIRED SWPPP. IF A SWPPP IS REQUIRED, IT SHALL BE AVAILABLE FOR REVIEW BY THE CITY OF AUSTIN ENVIRONMENTAL INSPECTOR AT ALL TIMES DURING CONSTRUCTION, INCLUDING AT THE PRE-CONSTRUCTION MEETING. THE CHECKLIST BELOW CONTAINS THE BASIC ELEMENTS THAT SHALL BE REVIEWED FOR PERMIT APPROVAL BY COA EV PLAN REVIEWERS AS WELL AS COA EV INSPECTORS.
- PLAN SHEETS SUBMITTED TO THE CITY OF AUSTIN MUST SHOW THE FOLLOWING:
DIRECTION OF FLOW DURING GRADING OPERATIONS.
LOCATION, DESCRIPTION, AND CALCULATIONS FOR OFF-SITE FLOW DIVERSION STRUCTURES.
AREAS THAT WILL NOT BE DISTURBED, NATURAL FEATURES TO BE PRESERVED.
DELINEATION OF CONTRIBUTING DRAINAGE AREA TO EACH PROPOSED BMP (E.G., SILT FENCE, SEDIMENT BASIN, ETC.).
LOCATION AND TYPE OF E&S BMPs FOR EACH PHASE OF DISTURBANCE.
CALCULATIONS FOR BMPs AS REQUIRED.
LOCATION AND DESCRIPTION OF TEMPORARY STABILIZATION MEASURES.
LOCATION OF ON-SITE SPOILS, DESCRIPTION OF HANDLING AND DISPOSAL OF BORROW MATERIALS, AND DESCRIPTION OF ON-SITE PERMANENT SPOILS DISPOSAL AREAS, INCLUDING SIZE, DEPTH OF FILL AND REVEGETATION PROCEDURES.
DESCRIBE SEQUENCE OF CONSTRUCTION AS IT PERTAINS TO ESC INCLUDING THE FOLLOWING ELEMENTS:
1. INSTALLATION SEQUENCE OF CONTROLS (E.G. PERIMETER CONTROLS, THEN SEDIMENT BASINS, THEN TEMPORARY STABILIZATION, THEN PERMANENT, ETC.)
2. PROJECT PHASING IF REQUIRED (LOC GREATER THAN 25 ACRES)
3. SEQUENCE OF GRADING OPERATIONS AND NOTATION OF TEMPORARY STABILIZATION MEASURES TO BE USED
4. SCHEDULE FOR CONVERTING TEMPORARY BASINS TO PERMANENT WO CONTROLS
5. SCHEDULE FOR REMOVAL OF TEMPORARY CONTROLS
6. ANTICIPATED MAINTENANCE SCHEDULE FOR TEMPORARY CONTROLS
-CATEGORIZE EACH BMP UNDER ONE OF THE FOLLOWING AREAS OF BMP ACTIVITY AS DESCRIBED BELOW:
3.1 MINIMIZE DISTURBED AREA AND PROTECT NATURAL FEATURES AND SOIL
3.2 CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT
3.3 STABILIZE SOILS
3.4 PROTECT SLOPES
3.5 PROTECT STORM DRAIN INLETS
3.6 ESTABLISH PERIMETER CONTROLS AND SEDIMENT BARRIERS
3.7 RETAIN SEDIMENT ON-SITE AND CONTROL DEWATERING PRACTICES
3.8 ESTABLISH STABILIZED CONSTRUCTION EXITS
3.9 ANY ADDITIONAL BMPs
-NOTE THE LOCATION OF EACH BMP ON YOUR SITE MAP(S).
-FOR ANY STRUCTURAL BMPs, YOU SHOULD PROVIDE DESIGN SPECIFICATIONS AND DETAILS AND REFER TO THEM.
-FOR MORE INFORMATION, SEE CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL 1.4.

- 3. THE PLACEMENT OF TREE/NATURAL AREA PROTECTIVE FENCING SHALL BE IN ACCORDANCE WITH THE CITY OF AUSTIN STANDARD NOTES FOR TREE AND NATURAL AREA PROTECTION AND THE APPROVED GRADING/TREE AND NATURAL AREA PLAN.

- 4. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER/PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS. TREE/NATURAL AREA PROTECTION MEASURES AND "PRE-CONSTRUCTION" TREE FERTILIZATION (IF APPLICABLE) PRIOR TO BEGINNING ANY SITE PREPARATION WORK. THE OWNER OR OWNER'S REPRESENTATIVE SHALL NOTIFY THE DEVELOPMENT SERVICES DEPARTMENT, 512-974-2278 OR BY EMAIL AT ds@cityofaustin.gov AT LEAST THREE DAYS PRIOR TO THE MEETING DATE. COA APPROVED ESC PLAN AND TPEES SWPPP (IF REQUIRED) SHOULD BE REVIEWED BY COA EV INSPECTOR AT THIS TIME.

- 5. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER, ENVIRONMENTAL SPECIALIST OR CITY ARBORIST AS APPROPRIATE. MAJOR REVISIONS MUST BE APPROVED BY AUTHORIZED COA STAFF. MINOR CHANGES TO BE MADE AS FIELD REVISIONS TO THE EROSION AND SEDIMENTATION CONTROL PLAN MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT CONTROL INADEQUACIES.

- 6. THE CONTRACTOR IS REQUIRED TO PROVIDE A CERTIFIED INSPECTOR THAT IS EITHER A LICENSED ENGINEER (OR PERSON DIRECTLY SUPERVISED BY THE LICENSED ENGINEER) OR CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC OR CPESC - IT), CERTIFIED EROSION, SEDIMENT AND STORMWATER - INSPECTOR (CESSWI OR CESSWI - IT) OR CERTIFIED INSPECTOR OF SEDIMENTATION AND EROSION CONTROLS (CISEC OR CISEC - IT). CERTIFICATION TO INSPECT THE CONTROLS AND FENCES AT WEEKLY OR BI-WEEKLY INTERVALS AND AFTER ONE-HALF (1/2) INCH OR GREATER RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROL(S) MUST BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES OR ONE-THIRD (1/3) OF THE INSTALLED HEIGHT OF THE CONTROL, WHICHEVER IS LESS.

- 7. PRIOR TO FINAL ACCEPTANCE BY THE CITY, HAUL ROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR TEMPORARY CONTRACTOR ACCESS MUST BE REMOVED. ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSSED OF IN APPROVED SPOIL DISPOSAL SITES.

- 8. ALL WORK MUST STOP IF A VOID IN THE ROCK SUBSTRATE IS DISCOVERED WHICH IS ONE SQUARE FOOT IN TOTAL AREA. BLOWS AIR FROM WITHIN THE SUBSTRATE AND/OR CONSISTENTLY RECEIVES WATER DURING ANY RAIN EVENT. AT THIS TIME IT IS THE RESPONSIBILITY OF THE PROJECT MANAGER TO IMMEDIATELY CONTACT A CITY OF AUSTIN ENVIRONMENTAL INSPECTOR FOR FURTHER INVESTIGATION. IN ADDITION, IF THE PROJECT SITE IS LOCATED WITHIN THE EDWARDS AQUIFER, THE PROJECT MANAGER MUST NOTIFY THE TRAVIS COUNTY BALCONES CANYONS/ANDALUSIA CONSERVATION PRESERVE (BCCP) BY EMAIL AT bccp@traviscountytx.gov. CONSTRUCTION ACTIVITIES WITHIN 50 FEET OF THE VOID MUST STOP.

- 9. TEMPORARY AND PERMANENT EROSION CONTROL: ALL DISTURBED AREAS SHALL BE RESTORED AS NOTED BELOW:
A. ALL DISTURBED AREAS TO BE REVEGETATED ARE REQUIRED TO PLACE A MINIMUM OF SIX (6) INCHES OF TOPSOIL (SEE STANDARD SPECIFICATION ITEM NO. 601S.3(A)). DO NOT ADD TOPSOIL WITHIN THE CRITICAL ROOT ZONE OF EXISTING TREES.

- TOPSOIL SALVAGED FROM THE EXISTING SITE IS ENCOURAGED FOR USE, BUT IT SHOULD MEET THE STANDARDS SET FORTH IN 601S.

- AN OWNER/ENGINEER MAY PROPOSE USE OF ON-SITE SALVAGED TOPSOIL WHICH DOES NOT MEET THE CRITERIA OF STANDARD SPECIFICATION 601S BY PROVIDING A SOIL ANALYSIS AND A WRITTEN STATEMENT FROM A QUALIFIED PROFESSIONAL IN SOILS, LANDSCAPE ARCHITECTURE, OR AGRONOMY INDICATING THE ON-SITE TOPSOIL WILL PROVIDE AN EQUIVALENT GROWTH MEDIA AND SPECIFYING WHAT, IF ANY, SOIL AMENDMENTS ARE REQUIRED.

- SOIL AMENDMENTS SHALL BE WORKED INTO THE EXISTING ON-SITE TOPSOIL WITH A DISC OR TILLER TO CREATE A WELL-BLENDED MATERIAL.

THE VEGETATIVE STABILIZATION OF AREAS DISTURBED BY CONSTRUCTION SHALL BE AS FOLLOWS:

TEMPORARY VEGETATIVE STABILIZATION:

- 1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING SHALL BE WITH OR INCLUDE A COOL SEASON COVER CROP (WESTERN WHEATGRASS (PASCOPYRUM SMITHII) AT 5.6 POUNDS PER ACRE, OATS (AVENA SATIVA) AT 4.0 POUNDS PER ACRE, CEREAL RYE GRASS (SECALE CEREALE) AT 4.5 POUNDS PER ACRE. CONTRACTOR MUST ENSURE THAT ANY SEED APPLICATION REGION OR COVER CROP DOES NOT UTILIZE ANNUAL RYEGRASS (LOLIUM MULTIFLORUM) OR PERENNIAL RYEGRASS (LOLIUM PERENNE). COOL SEASON COVER CROPS ARE NOT PERMANENT EROSION CONTROL.

- 2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 45 POUNDS PER ACRE OR A NATIVE PLANT SEED MIX CONFORMING TO ITEM 604S OR 609S.
A. FERTILIZER SHALL BE APPLIED ONLY IF WARRANTED BY A SOIL TEST AND SHALL CONFORM TO ITEM NO. 606S. FERTILIZER FERTILIZATION SHOULD NOT OCCUR WHEN RAINFALL IS EXPECTED OR DURING SOIL PLANT GROWTH OR DORMANCY. CHEMICAL FERTILIZER WILL NOT BE APPLIED IN THE CRITICAL WATER QUALITY ZONE.
B. HYDROMULCH SHALL COMPLY WITH TABLE 1, BELOW.

- C. TEMPORARY EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 1/2 INCHES HIGH WITH A MINIMUM OF 95% TOTAL COVERAGE SO THAT ALL AREAS OF A SITE THAT RELY ON VEGETATION FOR TEMPORARY STABILIZATION ARE UNIFORMLY VEGETATED, AND PROVIDED THERE ARE NO BARE SPOTS LARGER THAN 10 SQUARE FEET.

- D. WHEN REQUIRED, NATIVE PLANT SEEDING SHALL COMPLY WITH REQUIREMENTS OF THE CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL, AND STANDARD SPECIFICATION 604S OR 609S.

TABLE 1: HYDROMULCHING FOR TEMPORARY VEGETATIVE STABILIZATION

Table with 5 columns: MATERIAL, DESCRIPTION, LONGEVITY, TYPICAL APPLICATIONS, APPLICATION RATES. Rows include 100% OR ANY BLEND OF WOOD, CELLULOSE, STRAW, AND/OR COTTON PAPER OR PLANT MATERIAL/NATURAL FIBERS (EXCEPT NO MULCH SHALL EXCEED 30% PAPER).

PERMANENT VEGETATIVE STABILIZATION:

- 1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING IS CONSIDERED TO BE TEMPORARY STABILIZATION ONLY. IF COOL SEASON COVER CROPS EXIST WHERE PERMANENT VEGETATIVE STABILIZATION IS DESIRED, THE GRASSES SHALL BE MOVED TO A HEIGHT OF LESS THAN ONE-HALF (1/2) INCH AND THE AREA SHALL BE RE-SEEDING IN ACCORDANCE WITH TABLE 2 BELOW. ALTERNATIVELY, THE COOL SEASON COVER CROP CAN BE MIXED WITH BERMUDA GRASS OR NATIVE SEED AND INSTALLED TOGETHER, UNDERSTANDING THAT GERMINATION OF WARM-SEASON SEED TYPICALLY REQUIRES SOIL TEMPERATURES OF 60 TO 70 DEGREES.

- 2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 45 POUNDS PER ACRE WITH A PURITY OF 95% AND A MINIMUM PURE LIVE SEED (PLS) OF 0.83. BERMUDA GRASS IS A WARM SEASON GRASS AND IS CONSIDERED PERMANENT EROSION CONTROL. PERMANENT VEGETATIVE STABILIZATION CAN ALSO BE ACCOMPLISHED WITH A NATIVE PLANT SEED MIX CONFORMING TO ITEM 604S OR 609S.

- A. FERTILIZER USE SHALL FOLLOW THE RECOMMENDATION OF A SOIL TEST. SEE ITEM 606S, FERTILIZER. APPLICATIONS OF FERTILIZER (AND PESTICIDE) ON CITY OWNED AND MANAGED PROPERTY REQUIRES THE YEARLY SUBMITTAL OF A PESTICIDE AND FERTILIZER APPLICATION RECORD, ALONG WITH A CURRENT COPY OF THE APPLICATOR'S LICENSE. FOR CURRENT COPY OF THE RECORD TEMPLATE CONTACT THE CITY OF AUSTIN'S IPM COORDINATOR.

- B. HYDROMULCH SHALL COMPLY WITH TABLE 2, BELOW.

- C. WATER THE SEEDED AREAS IMMEDIATELY AFTER INSTALLATION TO ACHIEVE GERMINATION AND A HEALTHY STAND OF PLANTS THAT CAN ULTIMATELY SURVIVE WITHOUT SUPPLEMENTAL WATER. APPLY THE WATER UNIFORMLY TO THE PLANTED AREAS WITHOUT CAUSING DISPLACEMENT OR EROSION OF THE MATERIALS OR SOIL. MAINTAIN THE SEEDBED IN A MOIST CONDITION FAVORABLE FOR PLANT GROWTH. ALL WATERING SHALL COMPLY WITH CITY CODE CHAPTER 6-4 (WATER CONSERVATION), AT RATES AND FREQUENCIES DETERMINED BY A LICENSED IRRIGATOR OR OTHER QUALIFIED PROFESSIONAL, AND AS ALLOWED BY THE AUSTIN WATER UTILITY AND CURRENT WATER RESTRICTIONS AND WATER CONSERVATION INITIATIVES.

- D. PERMANENT EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 1/2 INCHES HIGH WITH A MINIMUM OF 95 PERCENT FOR THE NON-NATIVE MIX, AND 95 PERCENT COVERAGE FOR THE NATIVE MIX SO THAT ALL AREAS OF A SITE THAT RELY ON VEGETATION FOR STABILITY MUST BE UNIFORMLY VEGETATED, AND PROVIDED THERE ARE NO BARE SPOTS LARGER THAN 10 SQUARE FEET.

- E. WHEN REQUIRED, NATIVE PLANT SEEDING SHALL COMPLY WITH REQUIREMENTS OF THE CITY OF AUSTIN ENVIRONMENTAL CRITERIA MANUAL, ITEMS 604S AND 609S.

TABLE 2: HYDROMULCHING FOR PERMANENT VEGETATIVE STABILIZATION

Table with 5 columns: MATERIAL, DESCRIPTION, LONGEVITY, TYPICAL APPLICATIONS, APPLICATION RATES. Rows include BONDED FIBER MATRIX (BFM) 10% TACKIFIER and FIBER REINFORCED MATRIX (FRM).

- 10. DEVELOPER INFORMATION:
OWNER AUSTIN AURO LP
PHONE #
ADDRESS 10210 N. CENTRAL EXPRESSWAY, SUITE 300, DALLAS, TX 75231

- OWNER'S REPRESENTATIVE RESPONSIBLE FOR PLAN ALTERATIONS: DANIEL J. BROWN
PHONE # 512-899-0601

- PERSON OR FIRM RESPONSIBLE FOR EROSION/SEDIMENTATION CONTROL MAINTENANCE: CONTRACTOR
PHONE #

- PERSON OR FIRM RESPONSIBLE FOR TREE/NATURAL AREA PROTECTION MAINTENANCE: CONTRACTOR
PHONE #

- 11. THE CONTRACTOR SHALL NOT DISPOSE OF SURPLUS EXCAVATED MATERIAL FROM THE SITE WITHOUT NOTIFYING THE DEVELOPMENT SERVICES DEPARTMENT AT 512-974-2278 AT LEAST 48 HOURS PRIOR WITH THE LOCATION AND A COPY OF THE PERMIT ISSUED TO RECEIVE THE MATERIAL.

SOURCE: RULE NO. R161-15.13, 1-4-2016; RULE NO. R161-17.03, 3-2-2017.

APPENDIX P-4: - STANDARD SEQUENCE OF CONSTRUCTION

THE FOLLOWING SEQUENCE OF CONSTRUCTION SHALL BE USED FOR ALL DEVELOPMENT. THE APPLICANT IS ENCOURAGED TO PROVIDE ANY ADDITIONAL DETAILS APPROPRIATE FOR THE PARTICULAR DEVELOPMENT.

- 1. TEMPORARY EROSION AND SEDIMENTATION CONTROLS ARE TO BE INSTALLED AS INDICATED ON THE APPROVED SITE PLAN OR SUBDIVISION CONSTRUCTION PLAN AND IN ACCORDANCE WITH THE EROSION SEDIMENTATION CONTROL PLAN (ESC) AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) THAT IS REQUIRED TO BE POSTED ON THE SITE. INSTALL TREE PROTECTION, INITIATE TREE MITIGATION MEASURES AND CONDUCT "PRE - CONSTRUCTION" TREE FERTILIZATION (IF APPLICABLE).
2. THE ENVIRONMENTAL PROJECT MANAGER OR SITE SUPERVISOR MUST CONTACT THE DEVELOPMENT SERVICES DEPARTMENT, ENVIRONMENTAL INSPECTION, AT 512-974-2278, 72 HOURS PRIOR TO THE SCHEDULED DATE OF THE REQUIRED ON-SITE PRE-CONSTRUCTION MEETING.
3. THE ENVIRONMENTAL PROJECT MANAGER, AND/OR SITE SUPERVISOR, AND/OR DESIGNATED RESPONSIBLE PARTY, AND THE GENERAL CONTRACTOR SHALL NOTIFY THE EROSION AND SEDIMENTATION CONTROL PLAN (ESC) AND STORMWATER POLLUTION PREVENTION PLAN (SWPPP) POSTED ON THE SITE. TEMPORARY EROSION AND SEDIMENTATION CONTROLS WILL BE REVISED, IF NEEDED, TO COMPLY WITH CITY INSPECTOR'S DIRECTIVES, AND REVISED CONSTRUCTION SCHEDULE RELATIVE TO THE WATER QUALITY PLAN REQUIREMENTS AND THE EROSION PLAN. SHARED PONDS ARE PERMITTED UNDER CS-2014-0150.01.18

- 4. ROUGH GRADE THE POND(S) AT 100% PROPOSED CAPACITY. EITHER THE PERMANENT OUTLET STRUCTURE OR A TEMPORARY OUTLET MUST BE CONSTRUCTED PRIOR TO DEVELOPMENT OF EMBANKMENT OR EXCAVATION THAT LEADS TO PONDING CONDITIONS. THE OUTLET SYSTEM MUST CONSIST OF A SUMP PIT OUTLET AND AN EMERGENCY SPILLWAY MEETING THE REQUIREMENTS OF THE DRAINAGE CRITERIA MANUAL AND/OR THE ENVIRONMENTAL CRITERIA MANUAL, AS REQUIRED. THE OUTLET SYSTEM SHALL BE PROTECTED FROM EROSION AND SHALL BE MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION UNTIL INSTALLATION OF THE PERMANENT WATER QUALITY PONDS. THE OFF-SITE POND MAY BE CONSTRUCTED PRIOR TO THE SITE WORK ASSOCIATED WITH THIS SITE PLAN. WATER QUALITY PLAN OR CONTROLS WILL BE REQUIRED TO BE CLEANED OUT SHOULD SEDIMENT BE CONVEYED TO THE CONSTRUCTED POND FROM THIS PROJECT.

- 5. TEMPORARY EROSION AND SEDIMENTATION CONTROLS WILL BE INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE EROSION SEDIMENTATION CONTROL PLAN (ESC) AND STORM WATER POLLUTION PREVENTION PLAN (SWPPP) POSTED ON THE SITE.

- 6. BEGIN SITE CLEARING/CONSTRUCTION (OR DEMOLITION) ACTIVITIES.

- 7. IN THE BARTON SPRINGS ZONE, THE ENVIRONMENTAL PROJECT MANAGER OR SITE SUPERVISOR WILL SCHEDULE A MID-CONSTRUCTION CONFERENCE TO COORDINATE CHANGES IN THE CONSTRUCTION SCHEDULE AND EVALUATE EFFECTIVENESS OF THE EROSION CONTROL PLAN AFTER POSSIBLE CONSTRUCTION ALTERATIONS TO THE SITE. PARTICIPANTS SHALL INCLUDE THE CITY INSPECTOR, PROJECT ENGINEER, GENERAL CONTRACTOR AND ENVIRONMENTAL PROJECT MANAGER OR SITE SUPERVISOR. THE ANTICIPATED COMPLETION DATE AND FINAL CONSTRUCTION SEQUENCE AND INSPECTION SCHEDULE WILL BE COORDINATED WITH THE APPROPRIATE CITY INSPECTOR.

- 8. PERMANENT WATER QUALITY PONDS OR CONTROLS WILL BE CLEANED OUT AND FILTER MEDIA WILL BE INSTALLED PRIOR TO CONCURRENTLY WITH REVEGETATION OF SITE. THE OFF-SITE POND MAY BE CONSTRUCTED PRIOR TO THE SITE WORK ASSOCIATED WITH THIS SITE PLAN. WATER QUALITY PLAN OR CONTROLS WILL BE REQUIRED TO BE CLEANED OUT SHOULD SEDIMENT BE CONVEYED TO THE CONSTRUCTED POND FROM THIS PROJECT.

- 9. COMPLETE CONSTRUCTION AND START REVEGETATION OF THE SITE AND INSTALLATION OF LANDSCAPING.

- 10. UPON COMPLETION OF THE SITE CONSTRUCTION AND REVEGETATION OF A PROJECT SITE, THE DESIGN ENGINEER SHALL SUBMIT AN ENGINEER'S LETTER OF CONCURRENCE BEARING THE ENGINEER'S SEAL, SIGNATURE, AND DATE TO THE DEVELOPMENT SERVICES DEPARTMENT INDICATING THAT CONSTRUCTION, INCLUDING REVEGETATION, IS COMPLETE AND IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLANS. AFTER RECEIVING THIS LETTER, A FINAL INSPECTION WILL BE SCHEDULED BY THE APPROPRIATE CITY INSPECTOR.

- 11. UPON COMPLETION OF LANDSCAPE INSTALLATION OF A PROJECT SITE, THE LANDSCAPE ARCHITECT SHALL SUBMIT A LETTER OF CONCURRENCE TO THE DEVELOPMENT SERVICES DEPARTMENT INDICATING THAT THE REQUIRED LANDSCAPING IS COMPLETE AND IN SUBSTANTIAL CONFORMITY WITH THE APPROVED PLANS. AFTER RECEIVING THIS LETTER, A FINAL INSPECTION WILL BE SCHEDULED BY THE APPROPRIATE CITY INSPECTOR.

- 12. AFTER A FINAL INSPECTION HAS BEEN CONDUCTED BY THE CITY INSPECTOR AND WITH APPROVAL FROM THE CITY INSPECTOR, REMOVE THE TEMPORARY EROSION AND SEDIMENTATION CONTROLS AND COMPLETE ANY NECESSARY FINAL REVEGETATION RESULTING FROM REMOVAL OF THE CONTROLS. CONDUCT ANY MAINTENANCE AND REHABILITATION OF THE WATER QUALITY PONDS OR CONTROLS.

- 13. NO STRUCTURE SHALL BE OCCUPIED UNTIL THE WATER QUALITY CONTROL AND DETENTION FACILITY AND ASSOCIATED INFRASTRUCTURE HAVE BEEN CONSTRUCTED, INSPECTED, AND ACCEPTED BY THE CITY OF AUSTIN.

Source: Rule No. R161-17.03, 3-2-2017.

FIRE DEPARTMENT

- 1. THE ROUND ROCK FIRE DEPARTMENT REQUIRES FINAL ASPHALT OR CONCRETE PAVEMENT ON REQUIRED ACCESS ROADS PRIOR TO THE START OF COMBUSTIBLE CONSTRUCTION. ANY OTHER METHOD OF PROVIDING "ALL-WEATHER DRIVING CAPABILITIES" SHALL BE REQUIRED TO BE DOCUMENTED AND APPROVED AS AN ALTERNATE METHOD OF CONSTRUCTION IN ACCORDANCE WITH THE APPLICABLE RULES FOR TEMPORARY ROADS OUTLINED IN THE CITY OF AUSTIN FIRE PROTECTION CRITERIA MANUAL.
2. FACILITIES, BUILDINGS OR PORTIONS OF BUILDINGS HEREAFTER CONSTRUCTED SHALL BE ACCESSIBLE TO FIRE DEPARTMENT APPARATUS BY WAY OF AN APPROVED FIRE APPARATUS ACCESS ROAD, ALL EMERGENCY ACCESS ROADWAYS AND FIRE LANES, INCLUDING PAVEMENT/DECORATIVE PAVING, SHALL BE ENGINEERED AND INSTALLED AS REQUIRED TO SUPPORT THE AXLE LOADS OF EMERGENCY VEHICLES AND SHALL BE SURFACED SO AS TO PROVIDE ALL-WEATHER DRIVING CAPABILITIES. A LOAD CAPACITY SUFFICIENT TO MEET THE REQUIREMENTS FOR HS-20 LOADING (16 KIPS/WHEEL) AND A TOTAL VEHICLE LIVE LOAD OF 80,000 POUNDS IS CONSIDERED COMPLIANT WITH THIS REQUIREMENT.
3. FIRE LANES DESIGNATED ON SITE PLANS SHALL BE REGISTERED WITH THE CITY OF ROUND ROCK FIRE DEPARTMENT AND INSPECTED FOR FINAL APPROVAL.
4. THE MINIMUM VERTICAL CLEARANCE REQUIRED FOR EMERGENCY VEHICLE ACCESS ROADS OR DRIVES IS 14 FEET FOR THE FULL WIDTH OF THE ROADWAY OR DRIVEWAY.
5. A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS EXCEPT AS OTHERWISE REQUIRED OR APPROVED.

APPENDIX P-2 - CITY OF AUSTIN STANDARD NOTES FOR TREE AND NATURAL AREA PROTECTION

- 1. ALL TREES AND NATURAL AREAS SHOWN ON PLAN TO BE PRESERVED SHALL BE PROTECTED DURING CONSTRUCTION WITH TEMPORARY FENCING.
2. PROTECTIVE FENCES SHALL BE ERECTED ACCORDING TO CITY OF AUSTIN STANDARDS FOR TREE PROTECTION.
3. PROTECTIVE FENCES SHALL BE INSTALLED PRIOR TO THE START OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING), AND SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROJECT.
4. EROSION AND SEDIMENTATION CONTROL BARRIERS SHALL BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILD-UP WITHIN TREE DRIP LINES.
5. PROTECTIVE FENCES SHALL SURROUND THE TREES OR GROUP OF TREES, AND WILL BE LOCATED AT THE OUTERMOST LIMIT OF BRANCHES (DRIP LINE) FOR NATURAL AREAS, PROTECTIVE FENCES SHALL FOLLOW THE LIMIT OF CONSTRUCTION LINE, IN ORDER TO PREVENT THE FOLLOWING:
A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC OR STORAGE OF EQUIPMENT OR MATERIALS;
B. ROOT ZONE DISTURBANCES DUE TO GRADE CHANGES (GREATER THAN 6 INCHES CUT OR FILL), OR TRENCING NOT REVIEWED AND AUTHORIZED BY THE CITY ARBORIST;
C. WOUNDS TO EXPOSED ROOTS, TRUNK OR LIMBS BY MECHANICAL EQUIPMENT;
D. OTHER ACTIVITIES DETRIMENTAL TO TREES SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING, AND FIRES.

- 6. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIP LINES MAY BE PERMITTED IN THE FOLLOWING CASES:
A. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT, ERECT THE FENCE APPROXIMATELY 2 TO 4 FEET BEYOND THE AREA DISTURBED;
B. WHERE PERMEABLE PAVING IS TO BE INSTALLED WITHIN A TREE'S DRIP LINE, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA (PRIOR TO SITE GRADING) SO THAT THIS AREA IS GRADED SEPARATELY PRIOR TO PAVING INSTALLATION TO MINIMIZE ROOT DAMAGE;
C. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE TO ALLOW 6 TO 10 FEET OF WORK SPACE BETWEEN THE FENCE AND THE BUILDING;
D. WHERE THERE ARE SEVERE SPACE CONSTRAINTS DUE TO TRACT SIZE, OR OTHER SPECIAL REQUIREMENTS, CONTACT THE CITY ARBORIST AT 974-1876 TO DISCUSS ALTERNATIVES.

- SPECIAL NOTE: FOR THE PROTECTION OF NATURAL AREAS, NO EXCEPTIONS TO INSTALLING FENCES AT THE LIMIT OF CONSTRUCTION LINE WILL BE PERMITTED.

- 7. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN 4 FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED CONFRANKING TO A HEIGHT OF 8 FT (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE REDUCED FENCING PROVIDED.

- 8. TREES APPROVED FOR REMOVAL SHALL BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.

- 9. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL, BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN 2 DAYS, COVER THEM WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.

- 10. ANY TRENCING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.

- 11. NO LANDSCAPE TOPSOIL DRESSING GREATER THAN 4 INCHES SHALL BE PERMITTED WITHIN THE DRIP LINE OF TREES. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.

- 12. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.).

- 13. ALL FINISHED PRUNING SHALL BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES AVAILABLE ON REQUEST FROM THE CITY ARBORIST).

- 14. DEVIATIONS FROM THE ABOVE NOTES MAY BE CONSIDERED ORDINANCE VIOLATIONS IF THERE IS SUBSTANTIAL NON-COMPLIANCE OR IF A TREE SUSTAINS DAMAGE AS A RESULT.

STANDARD SITE PLAN NOTES - ORDINANCE REQUIREMENTS

- 1. ALL IMPROVEMENTS SHALL BE MADE IN ACCORDANCE WITH THE RELEASED SITE PLAN. ANY ADDITIONAL IMPROVEMENTS WILL REQUIRE A SITE PLAN AMENDMENT AND APPROVAL FROM THE PLANNING AND DEVELOPMENT REVIEW DEPARTMENT.
2. APPROVAL OF THIS SITE PLAN DOES NOT INCLUDE BUILDING AND FIRE CODE APPROVAL, NOR BUILDING PERMIT APPROVAL.
3. ALL SIGNS MUST COMPLY WITH THE REQUIREMENTS OF THE LAND DEVELOPMENT CODE (CHAPTER 25-10).
4. ADDITIONAL ELECTRIC EASEMENTS MAY BE REQUIRED AT A LATER DATE.
5. WATER AND WASTEWATER SERVICE WILL BE PROVIDED BY THE CITY OF AUSTIN.
6. ALL EXISTING STRUCTURES SHOWN TO BE REMOVED WILL REQUIRE A DEMOLITION PERMIT FROM THE CITY OF AUSTIN DEVELOPMENT SERVICES DEPARTMENT.
7. FOR DRIVEWAY CONSTRUCTION: THE OWNER IS RESPONSIBLE FOR ALL COSTS FOR RELOCATION OF, OR DAMAGE TO UTILITIES.
8. FOR CONSTRUCTION WITHIN THE RIGHT-OF-WAY, A R.O.W. EXCAVATION PERMIT IS REQUIRED.

COMPATIBILITY

- 1. HIGHLY REFLECTIVE MATERIALS WILL NOT BE USED. MATERIALS MAY NOT EXCEED 20% REFLECTIVITY. THIS REQUIREMENT SHALL NOT APPLY TO SOLAR PANELS OR TO COPPER OR PAINTED METAL ROOFS.
2. THE NOISE LEVEL OF MECHANICAL EQUIPMENT WILL NOT EXCEED 70 D.B.A. AT THE PROPERTY LINE ADJACENT TO RESIDENTIAL USES.
3. ALL EXTERIOR LIGHTING SHALL BE HOODED OR SHIELDED FROM THE VIEW OF ADJACENT RESIDENTIAL USES.
4. ALL EXTERIOR LIGHTING SHALL BE HOODED OR SHIELDED FROM THE VIEW OF ADJACENT RESIDENTIAL PROPERTY.
5. EXTERIOR LIGHTING ABOVE THE SECOND FLOOR IS PROHIBITED WHEN ADJACENT TO RESIDENTIAL PROPERTY.
6. ALL DUMPSTERS AND ANY PERMANENTLY PLACED REFUSE RECEPTACLES WILL BE LOCATED AT A MINIMUM OF TWENTY (20) FEET FROM A PROPERTY USED OR ZONED AS SF-5 OR MORE RESTRICTIVE.

SPECIAL CONSTRUCTION TECHNIQUES ECM 3.5.4(D)

- 1. PRIOR TO EXCAVATION WITHIN TREE DRIP LINES OR THE REMOVAL OF TREES ADJACENT TO OTHER TREES THAT ARE TO REMAIN, MAKE A CLEAN CUT BETWEEN THE DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT TO MINIMIZE ROOT DAMAGE.
2. IN CRITICAL ROOT ZONE AREAS THAT CANNOT BE PROTECTED DURING CONSTRUCTION WITH FENCING AND WHERE HEAVY VEHICULAR TRAFFIC IS ANTICIPATED, COVER THOSE AREAS WITH A MINIMUM OF 12 INCHES OF ORGANIC MULCH TO MINIMIZE SOIL COMPACTION. IN AREAS WITH HIGH SOIL PLASTICITY GEOTEXTILE FABRIC, PER STANDARD SPECIFICATION 620S, SHOULD BE PLACED UNDER THE MULCH TO PREVENT EXCESSIVE MIXING OF THE SOIL AND MULCH. ADDITIONALLY, MATERIAL SUCH AS PLYWOOD AND METAL SHEETS, COULD BE REQUIRED BY THE CITY ARBORIST TO MINIMIZE ROOT IMPACTS FROM HEAVY EQUIPMENT. ONCE THE PROJECT IS COMPLETED, ALL MATERIALS SHOULD BE REMOVED, AND THE MULCH SHOULD BE REDUCED TO A DEPTH OF 3 INCHES.
3. PERFORM ALL GRADING WITHIN CRITICAL ROOT ZONE AREAS BY HAND OR WITH SMALL EQUIPMENT TO MINIMIZE ROOT DAMAGE.
4. WATER ALL TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. SPRAY TREE CROWNS WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION ON THE LEAVES.
5. WHEN INSTALLING CONCRETE ADJACENT TO THE ROOT ZONE OF A TREE, USE A PLASTIC VAPOR BARRIER BEHIND THE CONCRETE TO PROHIBIT LEACHING OF LIME INTO THE SOIL.

AUSTIN ENERGY NOTES

- 1. AUSTIN ENERGY HAS THE RIGHT TO PRUNE AND/OR REMOVE TREES, SHRUBBERY AND OTHER OBSTRUCTIONS TO THE EXTENT NECESSARY TO KEEP THE EASEMENTS CLEAR. AUSTIN ENERGY WILL PERFORM ALL TREE WORK IN COMPLIANCE WITH CHAPTER 25-5, SUBCHAPTER B OF THE CITY OF AUSTIN LAND DEVELOPMENT CODE.
2. THE OWNER/DEVELOPER OF THIS SUBDIVISION LOT SHALL PROVIDE AUSTIN ENERGY WITH ANY EASEMENT AND/OR ACCESS REQUIRED, IN ADDITION TO THOSE INDICATED, FOR THE INSTALLATION AND ONGOING MAINTENANCE OF OVERHEAD AND UNDERGROUND ELECTRICAL FACILITIES. THESE EASEMENTS AND/OR ACCESS ARE REQUIRED TO PROVIDE ELECTRIC SERVICE TO THE BUILDING AND WILL NOT BE LOCATED SO AS TO CAUSE THE SITE TO BE OUT OF COMPLIANCE WITH CHAPTER 25-8 OF THE CITY OF AUSTIN LAND DEVELOPMENT CODE.
3. THE OWNER SHALL BE RESPONSIBLE FOR INSTALLATION OF TEMPORARY EROSION CONTROL, REVEGETATION AND TREE PROTECTION. IN ADDITION, THE OWNER SHALL BE RESPONSIBLE FOR ANY INITIAL TREE PRUNING AND TREE REMOVAL THAT IS WITHIN TEN FEET OF THE CENTER LINE OF THE PROPOSED OVERHEAD ELECTRICAL FACILITIES DESIGNED TO PROVIDE ELECTRIC SERVICE TO THIS PROJECT. THE OWNER SHALL INCLUDE AUSTIN ENERGY'S WORK WITHIN THE LIMITS OF CONSTRUCTION FOR THIS PROJECT.
4. THE OWNER OF THE PROPERTY IS RESPONSIBLE FOR MAINTAINING CLEARANCES REQUIRED BY THE NATIONAL ELECTRIC SAFETY CODE, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS, CITY OF AUSTIN RULES AND REGULATIONS AND TEXAS STATE LAWS PERTAINING TO CLEARANCES WHEN WORKING IN CLOSE PROXIMITY TO OVERHEAD POWER LINES AND EQUIPMENT. AUSTIN ENERGY WILL NOT RENDER ELECTRIC SERVICE UNLESS REQUIRED CLEARANCES ARE MAINTAINED. ALL COSTS INCURRED BECAUSE OF FAILURE TO COMPLY WITH THE REQUIRED CLEARANCES WILL BE CHARGED TO THE OWNER.

APPENDIX P-6 - REMEDIAL TREE CARE NOTES AERATION AND SUPPLEMENTAL NUTRIENT REQUIREMENTS FOR TREES WITHIN CONSTRUCTION AREAS

AS A COMPONENT OF AN EFFECTIVE REMEDIAL TREE CARE PROGRAM PER ENVIRONMENTAL CRITERIA MANUAL SECTION 3.5.4, PRESERVED TREES WITHIN THE LIMITS OF CONSTRUCTION MAY REQUIRE SOIL AERATION AND SUPPLEMENTAL NUTRIENTS. SOIL AND/OR FOLIAR ANALYSIS SHOULD BE USED TO DETERMINE THE NEED FOR SUPPLEMENTAL NUTRIENTS. THE CITY ARBORIST MAY REQUIRE THESE ANALYSES AS PART OF A COMPREHENSIVE TREE CARE PLAN. SOIL PH SHALL BE CONSIDERED WHEN DETERMINING THE FERTILIZATION COMPOSITION AS SOIL PH INFLUENCES THE TREE'S ABILITY TO UPTAKE NUTRIENTS FROM THE SOIL. IF ANALYSES INDICATE THE NEED FOR SUPPLEMENTAL NUTRIENTS, THEN HUMATE/NUTRIENT SOLUTIONS WITH MICROORGANISMS COMPONENTS ARE HIGHLY RECOMMENDED. IN ADDITION, SOIL ANALYSES MAY BE NEEDED TO DETERMINE IF ORGANIC MATERIAL OR BENEFICIAL MICROORGANISMS ARE NEEDED TO IMPROVE SOIL HEALTH. MATERIALS AND METHODS ARE TO BE APPROVED BY THE CITY ARBORIST (512-974-1876) PRIOR TO APPLICATION. THE OWNER OR GENERAL CONTRACTOR SHALL SELECT A FERTILIZATION CONTRACTOR AND ENSURE COORDINATION WITH THE CITY ARBORIST.

PRE-CONSTRUCTION TREATMENT SHOULD BE APPLIED IN THE APPROPRIATE SEASON, IDEALLY THE SEASON PRECEDING THE PROPOSED CONSTRUCTION. MINIMALLY, AREAS TO BE TREATED INCLUDE THE ENTIRE CRITICAL ROOT ZONE OF TREES AS DEFINED ON THE CITY APPROVED PLANS. TREATMENT SHOULD INCLUDE, BUT NOT LIMITED TO, FERTILIZATION, SOIL TREATMENT, MULCHING, AND PROPER PRUNING.

POST-CONSTRUCTION TREATMENT SHOULD OCCUR DURING FINAL REVEGETATION OR AS DETERMINED BY A QUALIFIED ARBORIST AFTER CONSTRUCTION. CONSTRUCTION ACTIVITIES OFTEN RESULT IN A REDUCTION IN SOIL MACRO AND MICRO PORES AND AN INCREASE IN SOIL BULK DENSITY. TO AMELIORATE THE DEGRADED SOIL CONDITIONS, AERATION VIA MICRO PORES AND AIR INJECTED INTO THE SOIL IS NEEDED OR BY OTHER METHODS AS APPROVED BY THE CITY ARBORIST. THE PROPOSED NUTRIENT MIX SPECIFICATIONS AND SOIL AND/OR FOLIAR ANALYSIS RESULTS NEED TO BE PROVIDED TO AND APPROVED BY THE CITY ARBORIST PRIOR TO APPLICATION (FAX # 512-974-3010). CONSTRUCTION WHICH WILL BE COMPLETED IN LESS THAN 90 DAYS MAY USE MATERIALS AT 1/2 RECOMMENDED RATES. ALTERNATIVE ORGANIC FERTILIZER MATERIALS ARE AN ACCEPTABLE ALTERNATIVE WITHIN 90 DAYS OF CONSTRUCTION. IF FERTILIZATION IS PERFORMED, THE CONTRACTOR SHALL PROVIDE DOCUMENTATION OF THE WORK PERFORMED TO THE CITY ARBORIST. PLANNING AND DEVELOPMENT REVIEW DEPARTMENT, P.O. BOX 1088, AUSTIN, TX 78767. THIS NOTE SHOULD BE REFERENCED AS ITEM #1 IN THE SEQUENCE OF CONSTRUCTION.

SPECIAL NOTES:

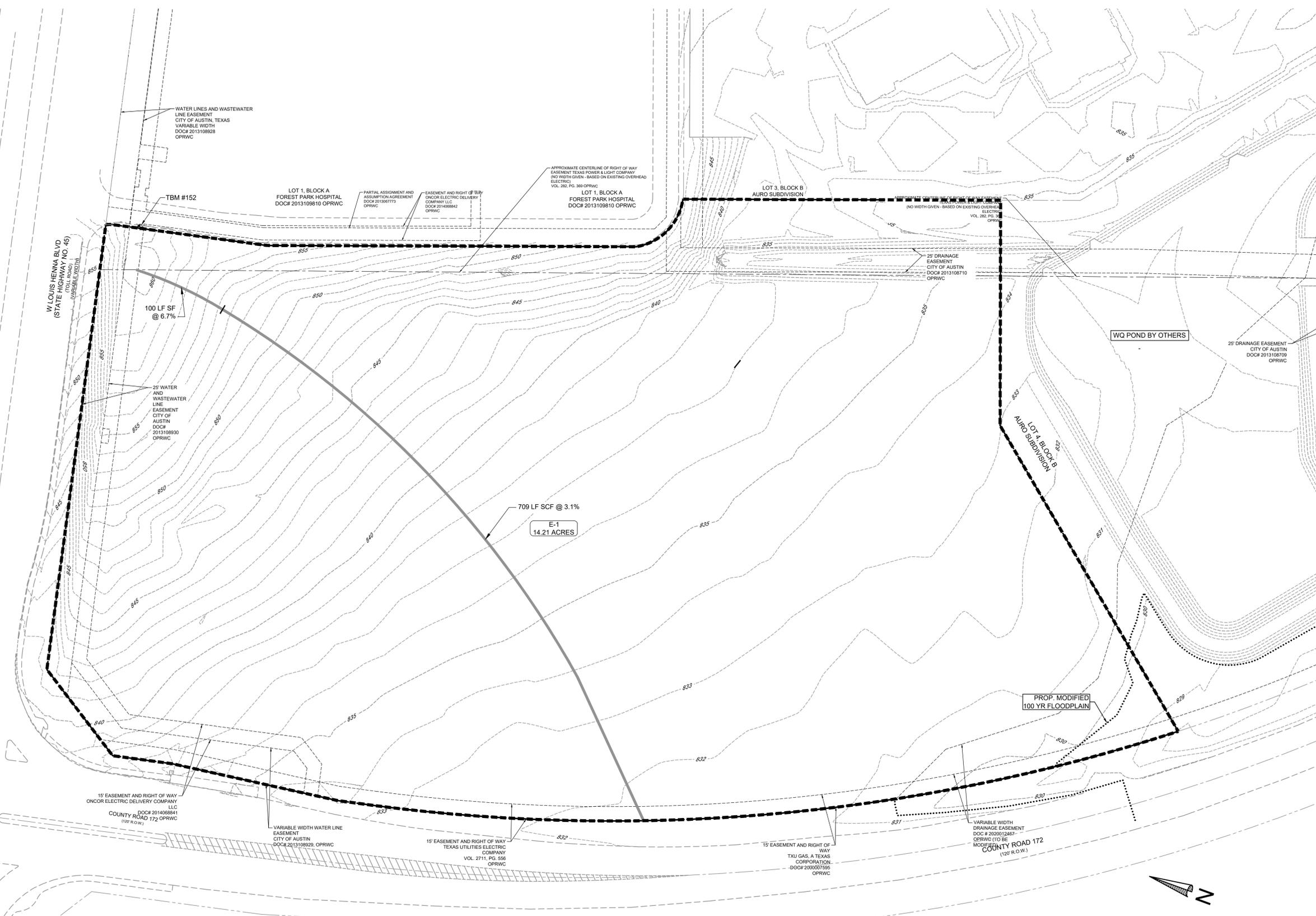
- 1. CONSTRUCTION OF SITE IMPROVEMENTS SHALL BE IN ACCORDANCE WITH CITY OF AUSTIN STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED.
2. EARTHWORK AND PAVEMENT CONSTRUCTION SHALL BE IN ACCORDANCE WITH GEOTECHNICAL DATA REPORT FOR THE SITE.

GENERAL CONSTRUCTION NOTES

- 1. ALL RESPONSIBILITY FOR THE ADEQUACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF AUSTIN MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
2. CONTRACTOR SHALL CALL THE ONE CALL CENTER (1-800-344-8377) FOR UTILITY LOCATIONS PRIOR TO ANY WORK IN CITY EASEMENTS OR STREET R.O.W.
3. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION INSPECTION DIVISION OF THE CITY'S ONE STOP SHOP (OSS) AT 974-6360 OR 974-7034 AT LEAST 24 HOURS PRIOR TO THE INSTALLATION OF ANY DRAINAGE FACILITY WITHIN A DRAINAGE EASEMENT OR STREET R.O.W. THE METHOD OF PLACEMENT AND COMPACTION OF BACKFILL IN THE CITY'S R.O.W. MUST BE APPROVED PRIOR TO THE START OF BACKFILL OPERATIONS.
4. FOR SLOPES OR TRENCHES GREATER THAN FIVE FEET IN DEPTH, A NOTE MUST BE ADDED STATING: "ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS OF THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION." (OSHA STANDARDS MAY BE PURCHASED FROM THE GOVERNMENT PRINTING OFFICE; INFORMATION AND RELATED REFERENCE MATERIALS MAY BE PURCHASED FROM OSHA, 611 EAST 6TH STREET, AUSTIN TEXAS.)
5. ALL SITE WORK MUST ALSO COMPLY WITH ENVIRONMENTAL REQUIREMENTS.
6. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENTS AND PRIOR TO THE FOLLOWING, THE ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DRAINAGE, FILTRATION AND DETENTION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS:
RELEASE OF THE CERTIFICATE OF OCCUPANCY BY THE PLANNING AND DEVELOPMENT REVIEW DEPARTMENT (INSIDE THE CITY LIMITS); OR
INSTALLATION OF AN ELECTRIC OR WATER METER (IN THE FIVE-MILE ETJ).
7. RETAINING WALLS OVER FOUR FEET IN HEIGHT, MEASURED FROM THE BOTTOM OF THE FOOTING TO THE TOP OF THE WALL, SHALL BE ENGINEERED AND WILL REQUIRE A SEPARATE PERMIT (UNIFORM BUILDING CODE 106.2.5).
8. A PRE-CONSTRUCTION MEETING WITH THE ENVIRONMENTAL INSPECTOR IS REQUIRED PRIOR TO ANY SITE DISTURBANCE.

DEVELOPER INFORMATION

F:\LAFRONTERA\PROJECTS\19-021-AUS-LA FRONTERA MF - PH2\DRAWINGS\PLANS\EXISTING DRAINAGE AREA MAP.DWG, 10/09/2020, MW

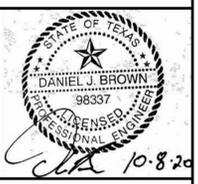


NO.	DATE	REVISION	BY

BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

EXISTING DRAINAGE AREA MAP

MALONE WHEELER
 CIVIL ENGINEERING & DEVELOPMENT CONSULTING & PROJECT MANAGEMENT
 5113 Southwest Pkwy, Suite 280
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MW
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/7/2020

SHEET 08
OF 59

RATIONAL METHOD - COA Drainage Criteria and Design Standards
Drainage Area Calculations

City of Austin intensity-duration-frequency curves

	2 Yr	5 Yr	10 Yr	25 Yr	100 Yr
a	54.767	62.981	70.82	82.936	118.30
b	11.651	10.477	10.306	10.746	13.185
c	0.8116	0.7820	0.7725	0.7634	0.7736

	2-YR	10-YR	25-YR	100-YR
DEVELOPED				
Asphaltic	0.73	0.77	0.88	0.95
Concrete	0.75	0.8	0.88	0.97
GRASS, Good Cond.				
Avg. 2-7%	0.29	0.32	0.39	0.46
PASTURE-RANGE				
Avg. 2-7%	0.33	0.4	0.42	0.49

DEVELOPED CONDITIONS - DRAINAGE CALCULATIONS

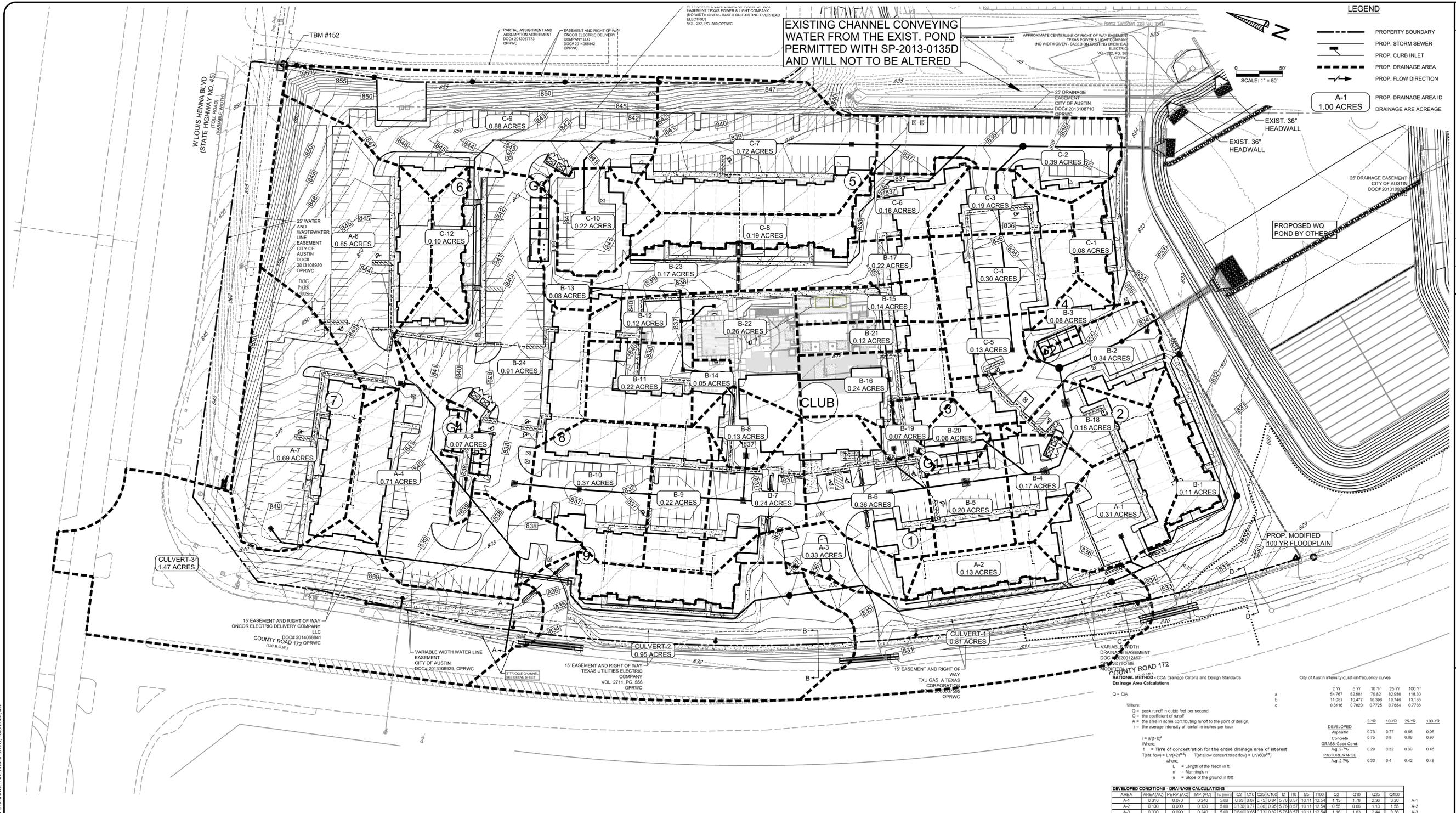
AREA	AREA(A)	PERV.(A)	IMP.(A)	C ₁ (A)	C ₂	C ₁₀	C ₂₅	C ₁₀₀	I ₂	I ₅	I ₁₀	I ₂₅	I ₁₀₀	Q ₂	Q ₅	Q ₁₀	Q ₂₅	Q ₁₀₀
E-1	14.210	14.210	0.000	24.59	0.33	0.40	0.42	0.49	3.01	4.54	5.46	7.13	14.13	25.83	32.56	49.62		

- NOTES:**
- EXISTING DRAINAGE AREA E1 IS A PORTION OF AN OVERALL UNDEVELOPED DRAINAGE AREA THAT IN DEVELOPED CONDITIONS IS DESIGNED TO BE CONVEYED TO AN OFFSITE SHARED WATER QUALITY AND DETENTION POND.
 - FOR EXISTING DRAINAGE CALCULATIONS SEE KIMLEY-HORN SHEET "PROPOSED DRAINAGE AREA MAP" THAT INCLUDES BOTH EXISTING AND PROPOSED CALCULATIONS FOR PURPOSES OF THE OFFSITE POND. THIS OFFSITE POND IS DESIGNED AND BEING PERMITTED UNDER C8-2014-0150.01-1B.
 - SEE SHEETS 10 - 11 FOR KIMLEY-HORN DRAINAGE AREA MAPS WHICH ARE INCLUDED IN THE AURO CIVIL SITE DEVELOPMENT PLANS, C8-2014-0150.01.1B.



0 50'
 SCALE: 1" = 50'

- LEGEND**
- PROPERTY BOUNDARY
 - EXIST. STORM SEWER
 - EXIST. CURB INLET
 - EXIST. DRAINAGE AREA
 - EXIST. FLOW DIRECTION
 - E-1 1.00 ACRES EXIST. DRAINAGE AREA ID
 - DRAINAGE AREA ACREAGE



LEGEND

	PROPERTY BOUNDARY
	PROP. STORM SEWER
	PROP. CURB INLET
	PROP. DRAINAGE AREA
	PROP. FLOW DIRECTION
	PROP. DRAINAGE AREA ID
	DRAINAGE AREA ACREAGE

BY	
REVISION	
DATE	
NO.	

BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

PROPOSED DRAINAGE AREA MAP

RATIONAL METHOD - COA Drainage Criteria and Design Standards

City of Austin Intensity-Duration-Frequency Curves

Intensity (in/hr)	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
0.8110	0.7620	0.7225	0.7634	0.7736	

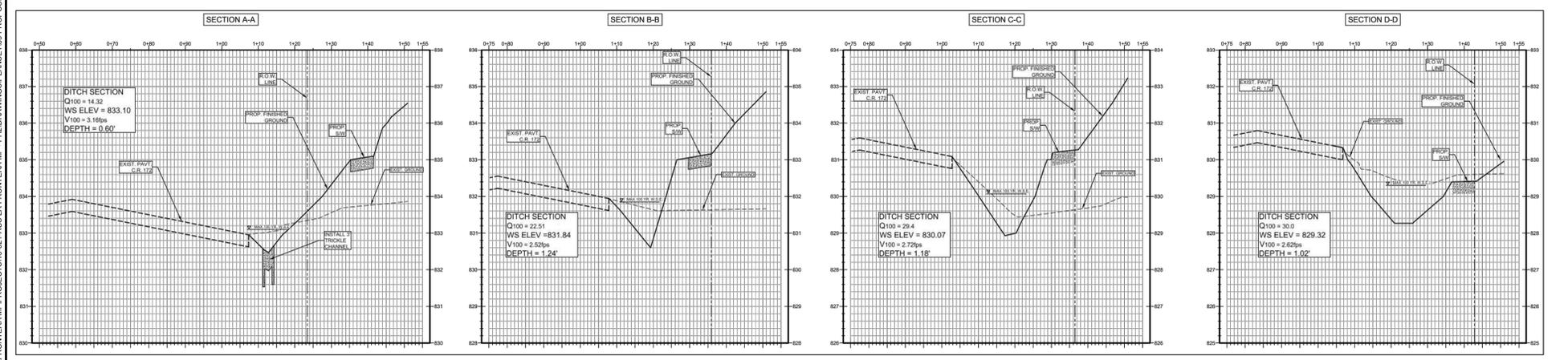
Where:
 Q = peak runoff in cubic feet per second
 C = the coefficient of runoff
 A = the area in acres contributing runoff to the point of design
 I = the average intensity of rainfall in inches per hour

$I = a/b^c$
 Where:
 I = Time of concentration for the entire drainage area of interest (Ishet flow) = $Ln(42.5^2)$ (Ishetlow concentrated flow) = $Ln(800.5^2)$
 where:
 L = Length of the reach in ft
 n = Manning's n
 S = Slope of the ground in ft/ft

	2-Yr	10-Yr	25-Yr	100-Yr
DEVELOPED Asphaltic	0.73	0.77	0.88	0.95
DEVELOPED Concrete	0.75	0.8	0.88	0.97
PASTURE/RANGE Avg. 2-7%	0.29	0.32	0.39	0.46
PASTURE/RANGE Avg. 2-7%	0.33	0.4	0.42	0.49

DEVELOPED CONDITIONS - DRAINAGE CALCULATIONS

AREA	AREA (AC)	PERCENT IMP. (AC)	IMP. (AC)	C1 (10)	C2 (25)	C10 (10)	I (10)	Q1 (10)	Q2 (10)	Q25 (10)	Q100 (10)						
A-1	0.310	0.070	0.240	5.00	0.83	0.87	0.78	0.84	5.78	6.57	10.11	12.54	1.13	1.78	2.38	3.28	A-1
A-2	0.130	0.000	0.130	5.00	0.730	0.77	0.86	0.95	5.78	6.57	10.11	12.54	0.95	0.86	1.13	1.55	A-2
A-3	0.330	0.060	0.270	5.00	0.810	0.85	0.93	1.02	5.78	6.57	10.11	12.54	1.16	1.63	2.41	3.39	A-3
A-4	0.710	0.150	0.560	5.00	0.837	0.87	0.78	0.85	5.78	6.57	10.11	12.54	2.60	4.11	5.48	7.54	A-4
A-6	0.880	0.380	0.500	5.00	0.844	0.88	0.86	0.74	5.78	6.57	10.11	12.54	2.88	4.22	5.88	7.82	A-6
A-7	0.690	0.230	0.460	5.00	0.840	0.83	0.77	0.72	5.78	6.57	10.11	12.54	2.34	3.79	4.92	6.87	A-7
A-8	0.070	0.050	0.020	5.00	0.416	0.45	0.53	0.63	5.78	6.57	10.11	12.54	0.17	0.27	0.37	0.53	A-8
B-1	0.110	0.000	0.110	5.00	0.730	0.77	0.86	0.95	5.78	6.57	10.11	12.54	0.46	0.73	0.96	1.31	B-1
B-2	0.390	0.080	0.310	5.00	0.820	0.86	0.78	0.85	5.78	6.57	10.11	12.54	1.28	2.01	2.57	3.66	B-2
B-3	0.080	0.040	0.040	5.00	0.510	0.55	0.63	0.71	5.78	6.57	10.11	12.54	0.23	0.37	0.51	0.71	B-3
B-4	0.110	0.030	0.080	5.00	0.650	0.69	0.78	0.85	5.78	6.57	10.11	12.54	0.84	1.01	1.34	1.84	B-4
B-5	0.200	0.010	0.190	5.00	0.760	0.75	0.84	0.93	5.78	6.57	10.11	12.54	0.82	1.28	1.89	2.32	B-5
B-6	0.300	0.070	0.230	5.00	0.644	0.68	0.71	0.85	5.78	6.57	10.11	12.54	1.34	2.11	2.80	3.86	B-6
B-7	0.240	0.040	0.200	5.00	0.650	0.69	0.78	0.85	5.78	6.57	10.11	12.54	0.91	1.43	1.90	2.61	B-7
B-8	0.190	0.020	0.170	5.00	0.660	0.69	0.69	0.72	5.78	6.57	10.11	12.54	0.42	0.66	0.89	1.24	B-8
B-9	0.220	0.010	0.210	5.00	0.710	0.75	0.84	0.93	5.78	6.57	10.11	12.54	0.90	1.41	1.87	2.56	B-9
B-10	0.310	0.080	0.230	5.00	0.658	0.70	0.78	0.87	5.78	6.57	10.11	12.54	1.40	2.21	2.93	4.04	B-10
B-11	0.220	0.080	0.140	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.33	0.54	0.75	1.03	B-11
B-12	0.120	0.070	0.050	5.00	0.470	0.51	0.59	0.69	5.78	6.57	10.11	12.54	0.33	0.52	0.71	1.00	B-12
B-13	0.080	0.020	0.060	5.00	0.455	0.49	0.57	0.64	5.78	6.57	10.11	12.54	0.21	0.34	0.46	0.65	B-13
B-14	0.190	0.050	0.140	5.00	0.640	0.67	0.74	0.83	5.78	6.57	10.11	12.54	0.33	0.54	0.75	1.03	B-14
B-15	0.140	0.060	0.080	5.00	0.541	0.58	0.66	0.74	5.78	6.57	10.11	12.54	0.44	0.69	0.93	1.30	B-15
B-16	0.240	0.040	0.200	5.00	0.650	0.70	0.78	0.87	5.78	6.57	10.11	12.54	0.91	1.43	1.90	2.61	B-16
B-17	0.120	0.020	0.100	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.32	0.54	0.75	1.03	B-17
B-18	0.190	0.020	0.170	5.00	0.681	0.73	0.81	0.90	5.78	6.57	10.11	12.54	0.71	1.11	1.47	2.02	B-18
B-19	0.070	0.030	0.040	5.00	0.541	0.58	0.66	0.74	5.78	6.57	10.11	12.54	0.22	0.36	0.47	0.65	B-19
B-20	0.080	0.030	0.050	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.24	0.38	0.51	0.71	B-20
B-21	0.120	0.010	0.110	5.00	0.660	0.73	0.81	0.90	5.78	6.57	10.11	12.54	0.48	0.75	1.00	1.37	B-21
B-22	0.300	0.080	0.220	5.00	0.678	0.71	0.78	0.87	5.78	6.57	10.11	12.54	0.86	1.37	1.83	2.56	B-22
B-23	0.170	0.010	0.160	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.33	0.54	0.75	1.03	B-23
B-24	0.910	0.160	0.750	5.00	0.630	0.66	0.74	0.83	5.78	6.57	10.11	12.54	3.42	5.30	7.15	9.86	B-24
C-1	0.080	0.030	0.050	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.34	0.53	0.70	0.95	C-1
C-2	0.160	0.050	0.110	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.42	0.66	0.89	1.24	C-2
C-3	0.190	0.020	0.170	5.00	0.684	0.73	0.81	0.90	5.78	6.57	10.11	12.54	0.75	1.16	1.56	2.14	C-3
C-4	0.300	0.030	0.270	5.00	0.658	0.70	0.78	0.87	5.78	6.57	10.11	12.54	1.16	1.86	2.47	3.39	C-4
C-5	0.130	0.010	0.120	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.30	0.50	0.69	0.94	C-5
C-6	0.190	0.050	0.140	5.00	0.646	0.68	0.75	0.84	5.78	6.57	10.11	12.54	0.43	0.69	0.94	1.32	C-6
C-7	0.720	0.180	0.540	5.00	0.614	0.65	0.74	0.83	5.78	6.57	10.11	12.54	2.54	4.02	5.36	7.41	C-7
C-8	0.160	0.000	0.160	5.00	0.610	0.61	0.69	0.72	5.78	6.57	10.11	12.54	0.40	0.62	0.85	1.19	C-8
C-9	0.880	0.000	0.880	5.00	0.480	0.51	0.59	0.67	5.78	6.57	10.11	12.54	2.43	3.68	5.23	7.41	C-9
C-10	0.220	0.040	0.180	5.00	0.650	0.69	0.77	0.86	5.78	6.57	10.11	12.54	0.82	1.30	1.72	2.41	C-10
CULVERT-1	0.810	0.450	0.360	5.00	0.486	0.53	0.61	0.69	5.78	6.57	10.11	12.54	2.26	3.61	4.91	6.89	CULVERT-1
CULVERT-2	0.950	0.510	0.440	5.00	0.484	0.53	0.61	0.69	5.78	6.57	10.11	12.54	2.70	4.30	5.84	8.19	CULVERT-2
CULVERT-3	1.470	0.500	0.970	5.00	0.574	0.61	0.69	0.78	5.78	6.57	10.11	12.54	4.86	7.69	10.31	14.32	CULVERT-3

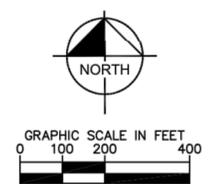
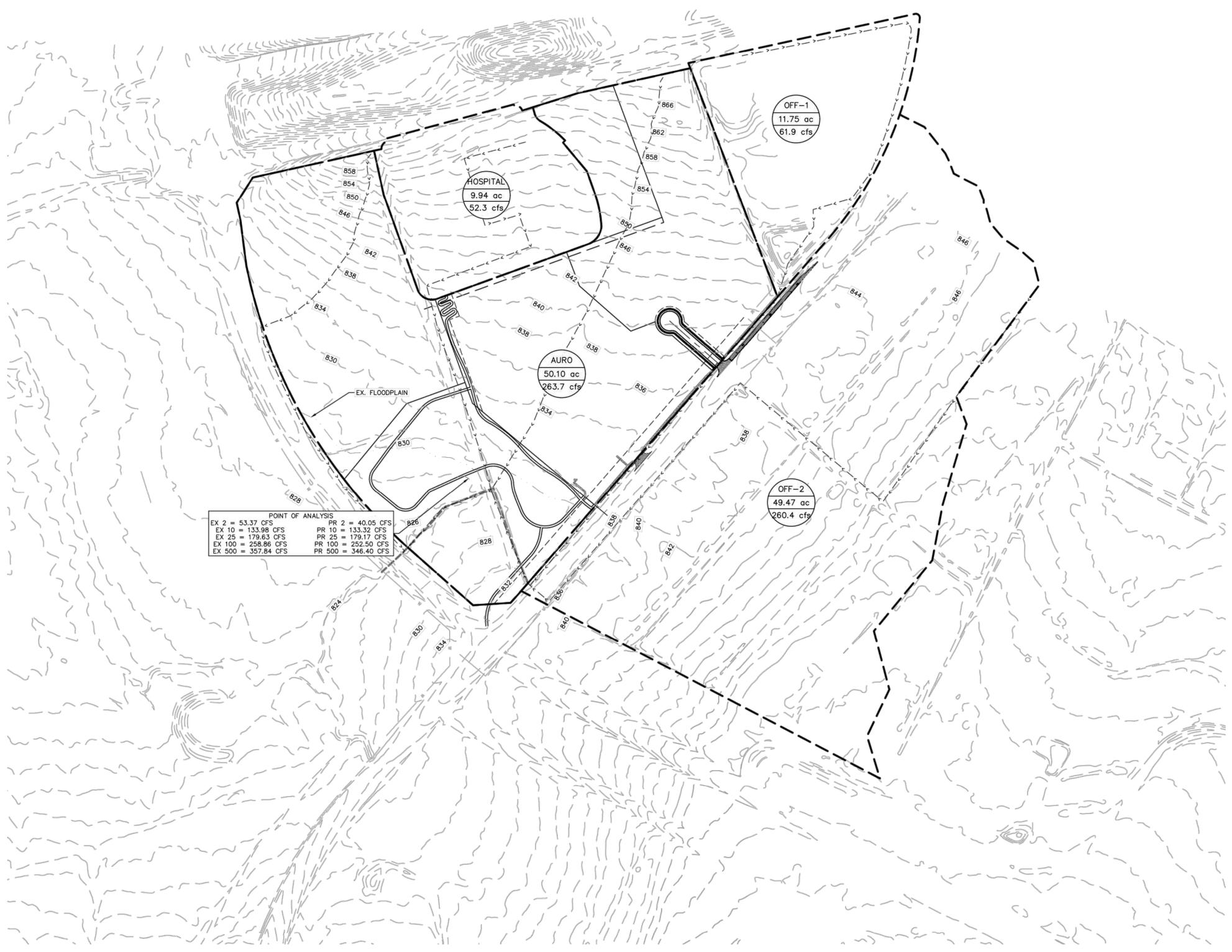


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 Firm Registration No. F-786

DESIGN BY: MW
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

SHEET 09 OF 59

Plotted By: Randolpbh, joshua Date: September 24, 2020 02:21:32pm File Path: K:\SAU_Civil\084492107_Auro_MultiFamily\Cad\Plan_Sheets\11_EXISTING DRAINAGE AREA MAP.dwg
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LEGEND	
	AREA DESIGNATOR
	AREA IN ACRES
	Q100 FLOW IN CFS
	PROPERTY LINE
	EXISTING STORM DRAIN LINE
	PROPOSED DRAINAGE DIVIDE
	EXISTING CONTOUR
	TIME OF CONCENTRATION PATH

NOTES:
 1. EXISTING TOPOGRAPHY INFORMATION PER CITY OF AUSTIN GEOGRAPHIC INFORMATION SYSTEMS.

FOR INFORMATION PURPOSES ONLY!

BENCHMARKS

BM #151 $\frac{1}{4}$ " SET IN CONCRETE SIDEWALK AT THE NORTH CORNER OF THE INTERSECTION OF C.R. 172 AND F.M. 1325 3.5" SOUTHWEST OF A CROSSWALK SIGN AND 10.3" SOUTH OF AN ELECTRIC MANHOLE ELEV.=838.35' (NAVD'88)

 BM #152 $\frac{1}{4}$ " SET IN CONCRETE AT THE EAST CORNER OF A TRANSFORMER PAD 51.7" SOUTHEAST OF THE BACK OF SIDEWALK ON THE SOUTH R.O.W. OF S.H. 45 AND 13.6" NORTHWEST OF A LIGHTPOLE ELEV.=860.83' (NAVD'88)

SITE PLAN APPROVAL SHEET 8 OF 39
 FILE NUMBER **CB-2014-0150.01.1B** APPLICATION DATE **3/18/2019**
 APPROVED BY COMMISSION ON _____ UNDER SECTION _____ OF CHAPTER _____ OF THE CITY OF AUSTIN CODE.
 EXPIRATION DATE (25-5-81, LDC) _____ CASE MANAGER **LARTHUR**
 PROJECT EXPIRATION DATE (ORD.#970905-A) _____ DWPZ _____ DIZZ _____

 Director, Development Services Department
 RELEASED FOR GENERAL COMPLIANCE: _____ ZONING **ETJ**
 Rev. 1 _____ Correction 1 _____
 Rev. 2 _____ Correction 2 _____
 Rev. 3 _____ Correction 3 _____

Final plat must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.



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



 2600 VIA FORTUNA, TERRACE I SUITE 300 AUSTIN, TX 78749 PHONE: 512-646-2237 FAX: 512-646-2237 © 2019 KIMLEY-HORN AND ASSOCIATES, INC. TPE Firm No. 928		9/23/2020 KHA PROJECT 064492107 DATE SEPTEMBER 2020 SCALE: AS SHOWN DESIGNED BY: JIR,DM DRAWN BY: DM,JIR CHECKED BY: LWC	EXISTING DRAINAGE AREA MAP	AURO CITY OF AUSTIN WILLIAMSON COUNTY, TEXAS	09/24/20 1 UPDATED SHEET NUMBERING No. _____ REVISIONS _____ DATE _____ BY _____
SHEET NUMBER 8 OF 40					1

File Path: K:\SAU_CVA_064492107_Auro Multi-Family\CD\Plan_Sheets\12_PROPOSED DRAINAGE AREA MAP.dwg
 Plotted By: Randolpb, joshua Date: September 24, 2020 02:23:55pm
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POINT OF ANALYSIS

EX 2 = 53.37 CFS	PR 2 = 40.05 CFS
EX 10 = 133.98 CFS	PR 10 = 133.32 CFS
EX 25 = 179.63 CFS	PR 25 = 179.17 CFS
EX 100 = 258.96 CFS	PR 100 = 252.50 CFS
EX 500 = 357.84 CFS	PR 500 = 346.40 CFS

LOT 2, BLOCK "A"
TRAVESIA SECTION 1
CABINET DD,
SLIDES 328-332
BMC V, LLC
DOCUMENT NO. 210082816

APPENDIX Q-2

IMPERVIOUS COVER ALLOWED AT 70% X GROSS SITE AREA = 35.07 ACRES

ALLOWABLE IMPERVIOUS COVER BREAKDOWN BY SLOPE CATEGORY
TOTAL PROPOSED ACREAGE 15-25% = 1.7402 ACRES X 10% = 0.174 ACRES

PROPOSED TOTAL IMPERVIOUS COVER
TOTAL PROPOSED IMPERVIOUS COVER = 0.806 ACRES = 1.6%

PROPOSED IMPERVIOUS COVER ON SLOPES

0-15%	0.806 ACRES TOTAL I.C. =	1.6%
	0.495 ACRES BUILDING/OTHER I.C. =	61.4% OF CATEGORY
	0.311 ACRES DRIVEWAYS/ROADWAYS I.C. =	38.6% OF CATEGORY
15-25%	0 ACRES TOTAL I.C. =	0%
25-35%	0 ACRES TOTAL I.C. =	0%
OVER 35%	0 ACRES TOTAL I.C. =	0%
TOTAL SITE AREA = 50.1 ACRES		

WQ DETENTION DESIGN: ALLOTTED I.C. PER LOT

LOT	WQ / DETENTION - MAX ALLOTTED I.C. PERCENT	ACRES	LOT SIZE
1	63%	6.70	10.562
2	70%	2.11	3.014
3	65%	7.92	12.18
4	0%	0.00	10.14
5	65%	9.23	14.206

FOR INFORMATION PURPOSES ONLY!

SITE PLAN APPROVAL SHEET 9 OF 39
 FILE NUMBER CB-2014-0150.01.1B APPLICATION DATE 3/18/2019
 APPROVED BY COMMISSION ON UNDER SECTION OF CHAPTER OF THE CITY OF AUSTIN CODE.
 EXPIRATION DATE (25-5-81, LDC) CASE MANAGER LARTHUR
 PROJECT EXPIRATION DATE (ORD.0970905-A) DWPZ_DDDZ

Director, Development Services Department
 RELEASED FOR GENERAL COMPLIANCE: ZONING/ETJ
 Rev. 1 Correction 1
 Rev. 2 Correction 2
 Rev. 3 Correction 3

Final plat must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.

BENCHMARKS

BM #151 1/2" SET IN CONCRETE SIDEWALK AT THE NORTH CORNER OF THE INTERSECTION OF C.R. 172 AND F.M. 1325 3.5' SOUTH OF A CROSSWALK SIGN AND 10.3' SOUTH OF AN ELECTRIC MANHOLE ELEV.=836.35' (NAVD/88)

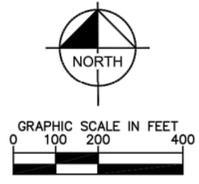
BM #152 1/2" SET IN CONCRETE AT THE EAST CORNER OF A TRANSFORMER PAD 51.7' SOUTH OF THE BACK OF SIDEWALK ON THE SOUTH R.O.W. OF S.H. 45 AND 13.6' NORTHWEST OF A LIGHTPOLE ELEV.=860.83' (NAVD/88)



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

SHEET NUMBER
9 OF 40

NOTES:
 1. EXISTING TOPOGRAPHY INFORMATION PER CITY OF AUSTIN GEOGRAPHIC INFORMATION SYSTEMS.



LEGEND

X-1	AREA DESIGNATOR
9.9 ac	AREA IN ACRES
5.5 cfs	Q100 FLOW IN CFS
---	PROPERTY LINE
---	EXISTING STORM DRAIN LINE
---	PROPOSED DRAINAGE DIVIDE
---	EXISTING CONTOUR
---	TIME OF CONCENTRATION PATH

Auro Multi-Family

Detention Pond Tables

Elevation (Ft.)	Area (Sq. Ft.)	Volume (Cu. Ft.)	Cumulative Volume (Cu. Ft.)
829.50	123,469.00	-	-
830.00	135,959.47	64,857.12	64,857.12
831.00	142,493.50	139,226.49	204,083.60
832.00	148,986.50	145,740.00	349,823.60
833.00	154,655.42	151,820.96	501,644.56

Storm-Stage-Storage-Flow

Storm	Elevation (Ft.)	Storage (Cu. Ft.)	Flow (cfs.)
2 yr.	830.89	188,735.0	40.05
10 yr.	831.44	267,387.0	133.32
25 yr.	831.65	296,962.0	179.17
100 yr.	831.95	341,700.0	252.50
500 yr.	832.29	392,834.0	346.40

Stage-Outlet Flow

Elevation (Ft.)	Flow (cfs.)
829.5	0.00
830	0.00
830.5	0.00
831	50.91
831.5	144.00
832.0	264.54
832.35	362.34
832.5	418.62
833.0	671.4
833.5	988.73
834.0	1,356.19

DETENTION POND 24 HR DRAWDOWN CALCULATIONS

WQ Pond	Area (sq. ft.)	Storage (cu. ft.)	Flows (cfs.)	Drawdown Time (hrs.)
832.5	151,821.0	75,201.9	418.62	0.15
832	148,986.5	145,740.0	264.54	0.64
831	142,493.5	139,226.5	50.91	3.47
830	135,959.5	64,857.1	4.88	9.50
829.5	123,469.0	-	4.60	13.76
TOTAL				13.76

AURO Multi-Family Subdivision

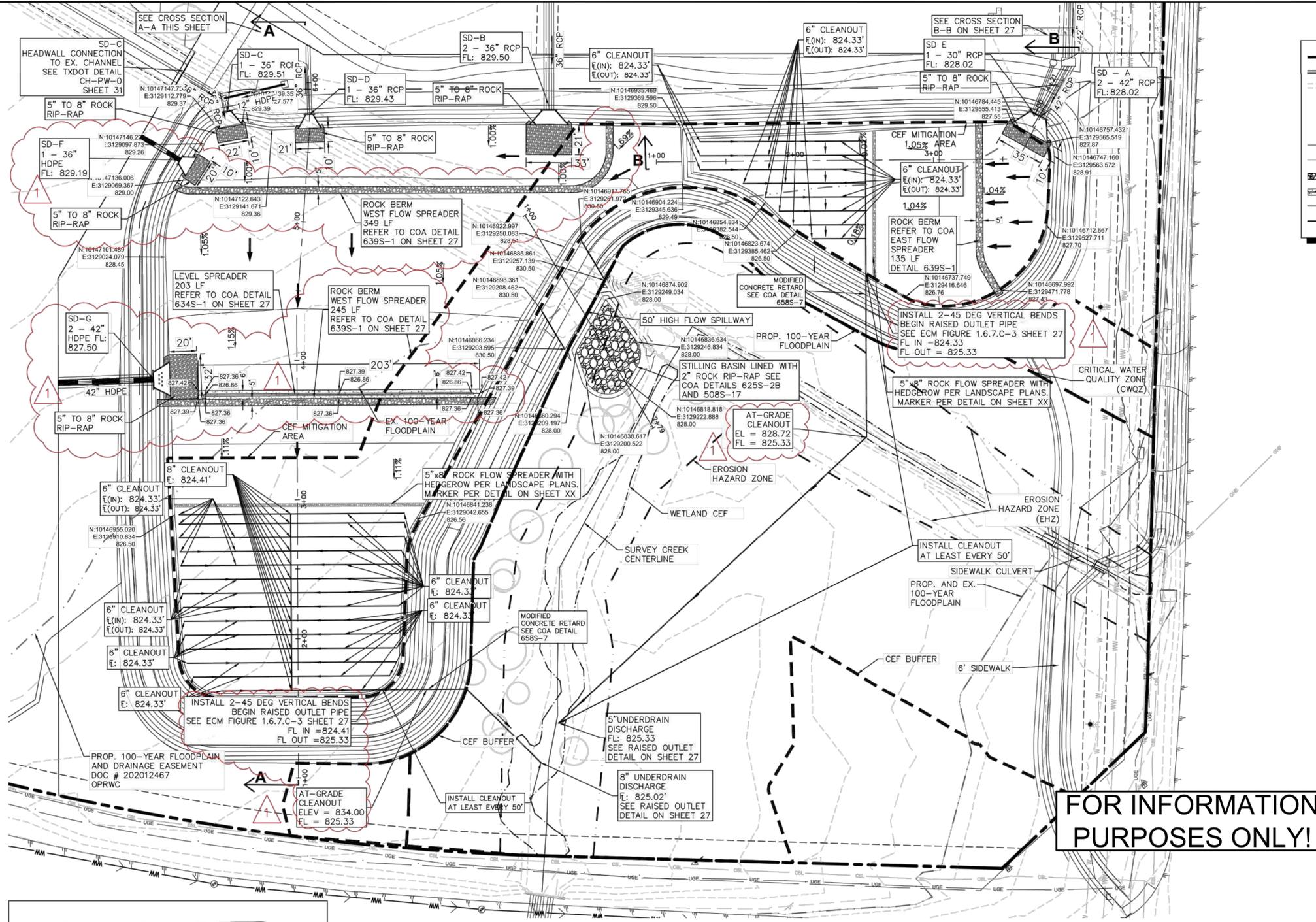
Existing Conditions

DRAINAGE AREA (Sq. Ft.)	Sheet Flow				Shallow Concentrated Flow				Channel Flow				Actual	Design		
	W	S	L	T _c	W	S	L	T _c	W	S	L	T _c			V	T _c
AURO	0.21	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7
OFF-1	0.02	0.01	300	2.3	0.00	0.01	300	2.3	0.00	0.01	300	2.3	0.00	0.01	300	2.3
OFF-2	0.2	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7

Proposed Conditions

DRAINAGE AREA (Sq. Ft.)	Sheet Flow				Shallow Concentrated Flow				Channel Flow				Actual	Design		
	W	S	L	T _c	W	S	L	T _c	W	S	L	T _c			V	T _c
AURO	0.21	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7
OFF-1	0.02	0.01	300	2.3	0.00	0.01	300	2.3	0.00	0.01	300	2.3	0.00	0.01	300	2.3
OFF-2	0.2	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7	0.00	0.01	300	15.7

Plotted By: Randojoshua Date: September 24, 2020 02:42:00pm File Path: K:\SAU_Civil\084492107 Auro Multifamily\Coord\Plan Sheets\WQ Pond_Plan.dwg
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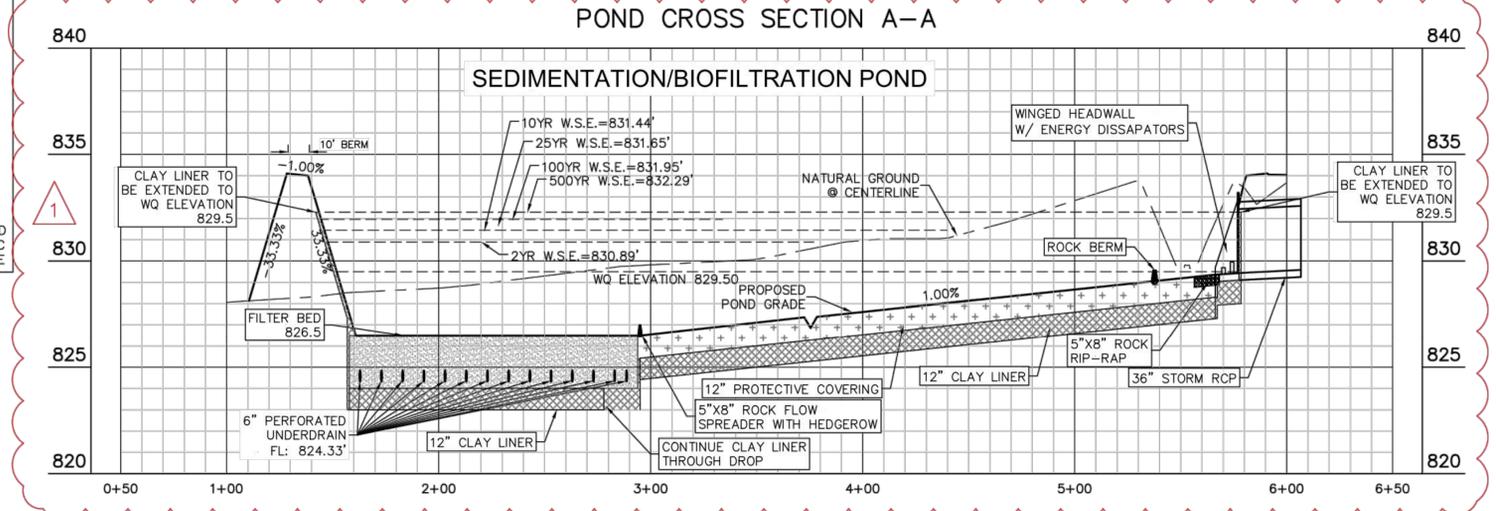
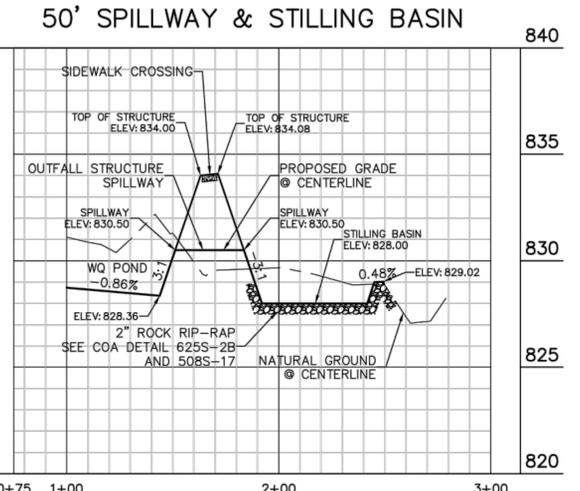
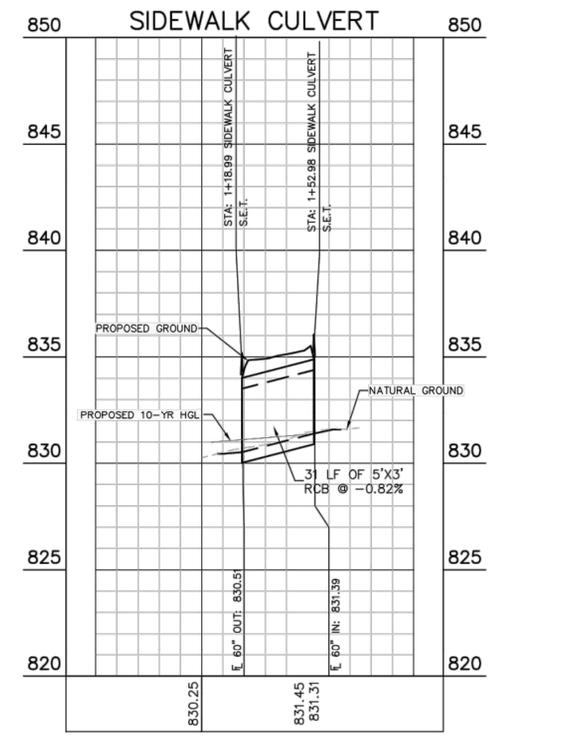


LEGEND

- PROPERTY LINE
- PROPOSED STORM DRAIN LINE
- EXISTING STORM DRAIN LINE
- PROPOSED CLEANOUTS
- PROPOSED STORM DRAIN HEADWALL
- PROPOSED FLOW DIRECTION
- PROPOSED CONTOUR
- EXISTING CONTOUR
- GABION WALL
- TRICKLE CHANNEL
- EXISTING 100-YEAR FLOODPLAIN
- PROPOSED 100-YEAR FLOODPLAIN

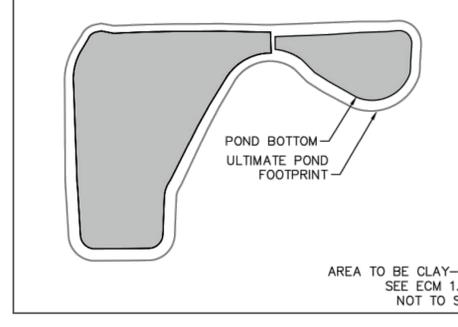
NOTES:

- ALL POND BOTTOMS, SIDE SLOPES AND EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH CITY OF AUSTIN STANDARD SPECIFICATIONS.
- THE BOTTOM OF THE SEDIMENTATION BASIN MUST BE AT LEAST 2 INCHES HIGHER THAN THE TOP OF THE FILTRATION BASIN.



CEF BUFFER MITIGATION TABLE

DESCRIPTION	AREA
UNIMPACTED CEF BUFFER	3.95 AC
IMPACTED CEF BUFFER	1.66 AC
CEF MITIGATION AREA	1.66 AC



FOR INFORMATION PURPOSES ONLY!

SITE PLAN APPROVAL SHEET 26 OF 39
 FILE NUMBER: C8-2014-0150.01.1B APPLICATION DATE: 3/18/2019
 APPROVED BY COMMISSION ON _____ UNDER SECTION _____ OF CHAPTER _____ OF THE CITY OF AUSTIN CODE.
 EXPIRATION DATE (25-5-81, LDC) _____ CASE MANAGER: LARTHUR
 PROJECT EXPIRATION DATE (ORD.#970905-A) _____ DWPZ: DDZ

Director, Development Services Department
 RELEASED FOR GENERAL COMPLIANCE: _____ ZONING: ETJ
 Rev. 1 _____ Correction 1
 Rev. 2 _____ Correction 2
 Rev. 3 _____ Correction 3

Final plat must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.

KIMLEY-HORN & ASSOCIATES, INC.
 2600 VIA FORTUNA, TERRACE I SUITE 300 AUSTIN, TX
 PHONE: 512-646-2237
 78749
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 TBPE Firm No. 928

DATE: _____
 REVISIONS: _____
 BY: _____

KHA PROJECT 064492107
 DATE SEPTEMBER 2020
 SCALE: AS SHOWN
 DESIGNED BY: JIR, DM
 DRAWN BY: DM, JIR
 CHECKED BY: LWC

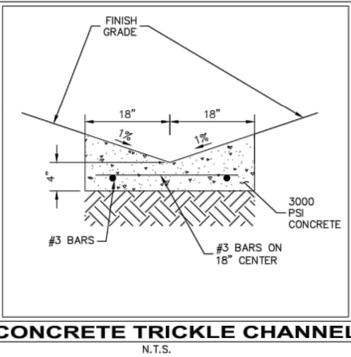
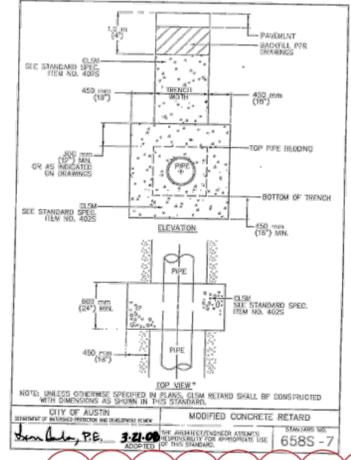
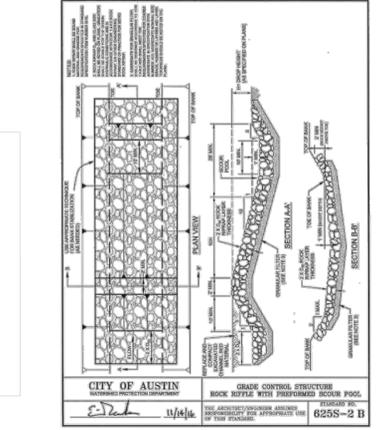
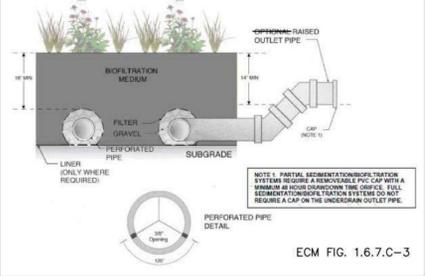
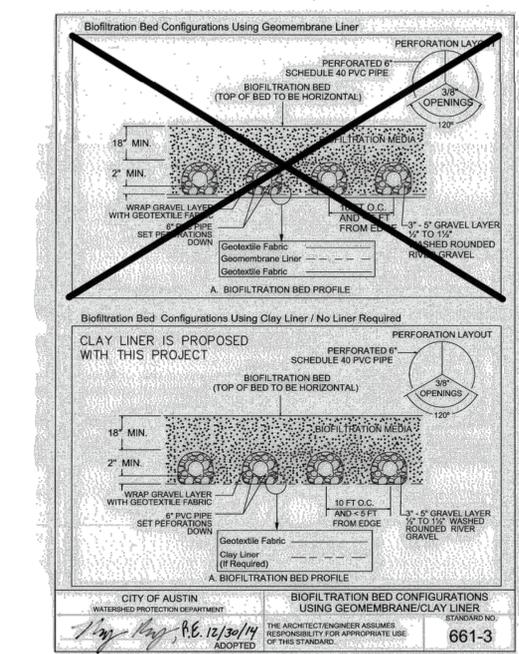
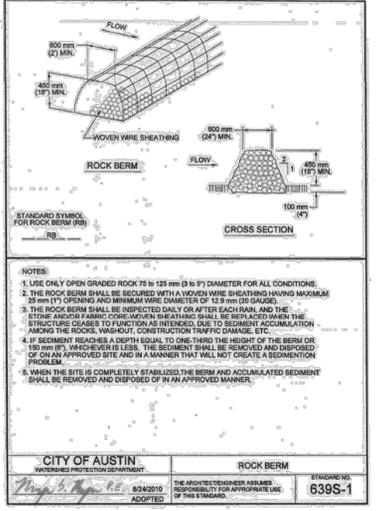
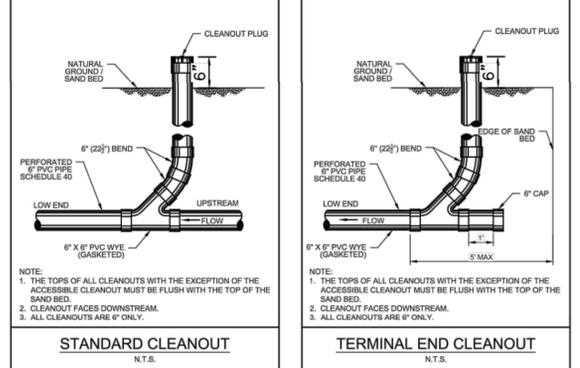
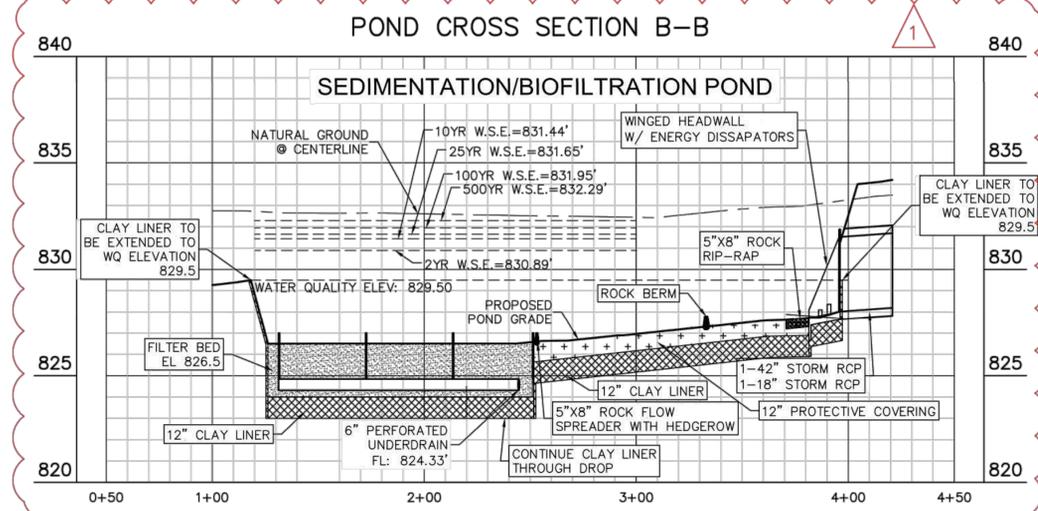
PRIVATE WQ POND PLAN

AURO
 CITY OF AUSTIN
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
26 OF 40

BROADSTONE - LA FRONTERA PHASE 2 SP-2019-0583D SHEET 12 OF 59 C8-2014-0150.01.1B

PLOTTED BY: RANDOLPH, DASHUA DATE: SEPTEMBER 24, 2020 02:42:26 PM FILE PATH: K:\SAU_CWA_064492107_Auro_MultiFamily\Cad\Plan_Sheets_POND_PLAN.dwg
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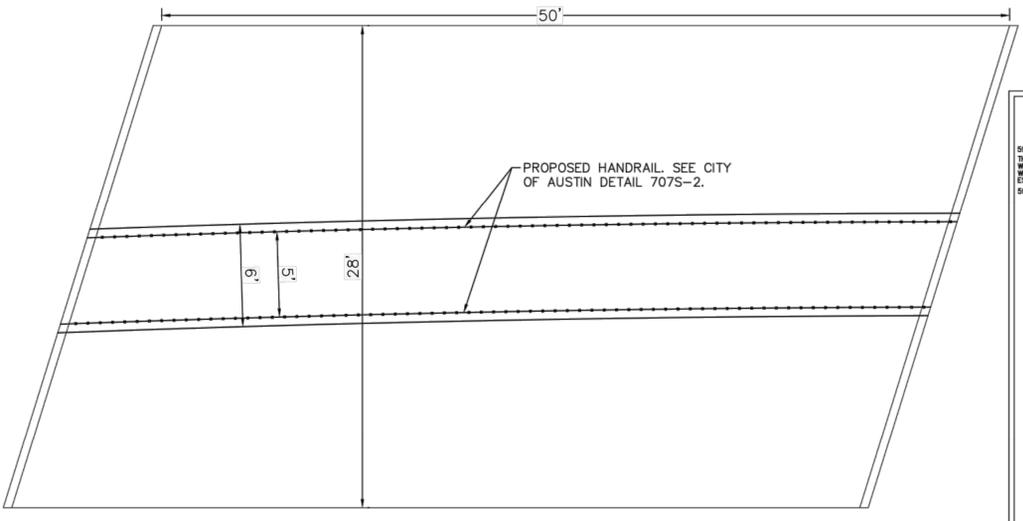
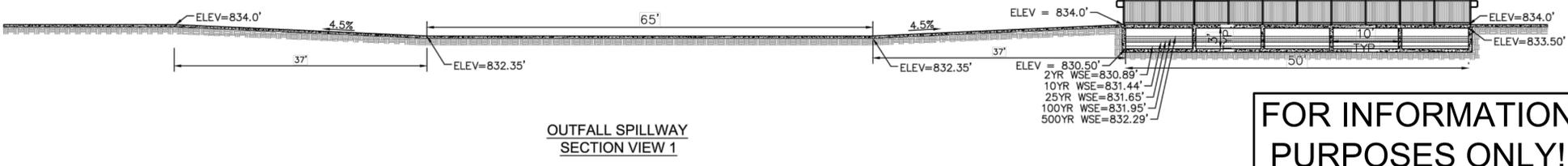
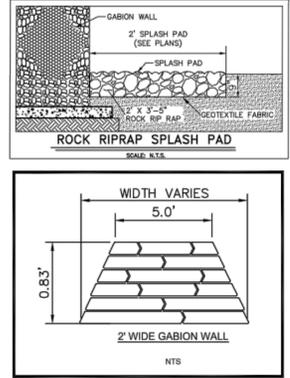
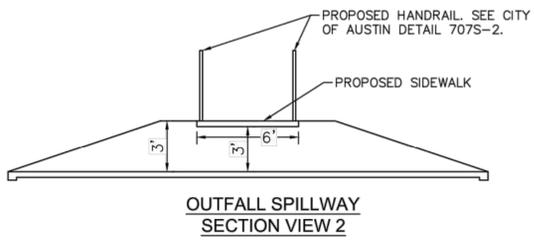


WQ POND FLOW SPREADER CALCULATIONS

EAST FLOW SPREADER		WEST FLOW SPREADER	
Q100	84.73 CFS	Q100	242.67 CFS
Weir Coeff.	3.17 FT ^{1/2} /S	Weir Coeff.	3.33 FT ^{1/2} /S
Crest Length	346 FT	Crest Length	346 FT
Discharge Velocity	1.98 FPS	Discharge Velocity	1.98 FPS

DETENTION POND DOWNSTREAM STILLING BASIN CALCULATIONS

INFLOW		OUTFLOW	
Q100	346.34 CFS	Q100	346.34 CFS
Weir Coeff.	3.33 FT ^{1/2} /S	Weir Coeff.	3.33 FT ^{1/2} /S
Crest Length	48 FT	Crest Length	61.5 FT
Discharge Velocity	3.33 FPS	Discharge Velocity	3.1 FPS



GABION WALL NOTES

5945 DESCRIPTION
THIS ITEM SHALL INCLUDE FURNISHING, ASSEMBLING, FILLING, AND TYPING ROCK-FILLED WIRE MESH COMPARTMENTS (GABIONS) AND REVEY MATRESSES IN ACCORDANCE WITH THE UNDERGRADING AND DIMENSIONS SHOWN ON THE DRAWINGS OR OTHERWISE ESTABLISHED IN THE FIELD BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.

5945.2 MATERIALS

(1) GABION AND REVEY MATRESSES WIRE
GABION WIRE SHALL BE GALVANIZED STEEL, CLASS 3 OR A COATING, SOFT TENSILE STRENGTH CONFORMING TO ASTM A 641, AND SHALL SPECIFICALLY MEET THE REQUIREMENTS GIVEN BELOW FOR GABIONS (12 GAUGE WIRE) AND/OR MATRESSES (13.5 GAUGE WIRE) AS CALLED OUT IN DRAWINGS. PVC COATING OF WIRE MAY BE FURNISHED OR EXTENDED ONTO THE WIRE. GALVANIZATION OF WELDED WIRE SHALL BE PERFORMED EITHER BEFORE OR AFTER WELDING.

CHARACTERISTIC	GABIONS	REVEY MATRESSES
WIRE GAUGE	12 GAUGE	13.5 GAUGE
MAX. TENSILE STRENGTH (ASTM A 641)	70,000 PSI (483 MPa)	70,000 PSI (483 MPa)
NOMINAL WIRE DIAMETER (ASTM A 641)	0.108 INCH (2.7 mm)	0.098 INCH (2.5 mm)
MINIMUM DIAMETER (ASTM A 641, TABLE 3)	0.102 INCH (2.6 mm)	0.092 INCH (2.3 mm)
GALVANIZED, ZINC (ASTM A 641, TABLE 1)	0.80 OZ/68 (245 g/68)	0.70 OZ/68 (210 g/68)

(2) GABION MESH
WIRE MESH SHALL BE OF A UNIFORM NONWELDING, DOUBLE TWIST HEXAGONAL PATTERN, NOMINALLY OF DIMENSIONS 3.0 INCHES BY 3.0 INCHES (76 mm BY 76 mm). GALVANIZED WIRE SHALL BE TO GAUGE NOMINAL DIAMETER OF 12 GAUGE (3.17 mm). STRENGTH OF WELDS SHALL BE TO GAUGE NOMINAL DIAMETER OF 13.5 GAUGE (3.43 mm). STRENGTH OF WELDS SHALL BE TO GAUGE NOMINAL DIAMETER OF 13.5 GAUGE (3.43 mm).

(3) REVEY MATRESSES
(A) WOVEN MESH
WOVEN MESH SHALL BE OF A UNIFORM NONWELDING, DOUBLE TWIST HEXAGONAL PATTERN, NOMINALLY OF DIMENSIONS 3.0 INCHES BY 3.0 INCHES (76 mm BY 76 mm). GALVANIZED WIRE SHALL BE TO GAUGE NOMINAL DIAMETER OF 12 GAUGE (3.17 mm). STRENGTH OF WELDS SHALL BE TO GAUGE NOMINAL DIAMETER OF 13.5 GAUGE (3.43 mm).

(4) PVC COATING
SEE CITY OF AUSTIN STANDARD SPECIFICATIONS ITEM NO 5945 GABIONS AND REVEY MATRESSES.

(5) STONE
(A) GABION BASKET STONES
STONE SHALL BE DURABLE AND OF SUITABLE QUALITY TO ENSURE PERMANENCE IN THE STRUCTURE. THE STONE USED TO FILL THE GABION BASKETS SHALL BE A CLEAN, SOUND, AND DURABLE ROCK MEETING THE FOLLOWING REQUIREMENTS: IT SHALL HAVE A WEARING LOSS LESS THAN 20% WHEN THE GABION IS TESTED WITH THE LOS ANGELES ABRASION MACHINE IN ACCORDANCE WITH ASTM TEST METHOD C136. (FROST TEST METHOD) SHALL BE CONDUCTED IN ACCORDANCE WITH ASTM TEST METHOD C136. THE GABION ROCK SHALL NOT BE COVERED WITH A LAYER OF MUD OR OTHER MATERIALS. THE GABION ROCK SHALL BE WELL GRADED TO PRODUCE A DENSE, FILL, ANGULAR IN TEXTURE, WHILE MEETING THE FOLLOWING QUALITY REQUIREMENTS:

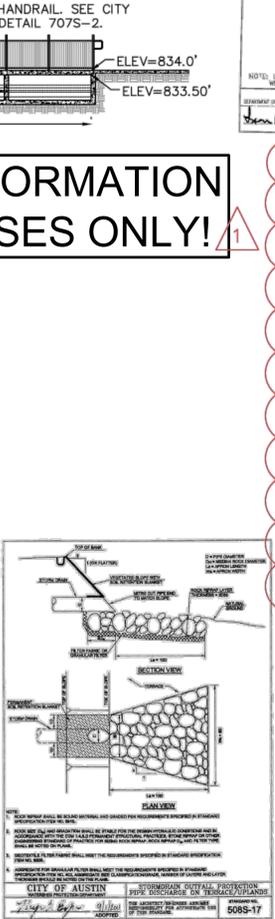
SIZE SIZE	PERCENT BY WEIGHT (MASS) PASSING EACH NOMINAL SIZE
US (90)	15
8 INCH (200 mm)	100
4 INCH (100 mm)	0-5
3 INCH (75 mm)	0

(B) THE MINIMUM UNIT WEIGHT (DWT MASS) OF A ROCKFILLED GABION SHALL BE 125 LBS (56.7 KG) PER CUBIC YARD (0.765 CU M). VERIFICATION OF UNIT WEIGHT (MASS) SHALL BE PERFORMED WHEN ORDERED BY THE ENGINEER, BY CONSTRUCTING A TEST GABION WITH MATERIALS SUPPLIED FOR CONSTRUCTION WITH THE SAME EFFORT AND METHOD INTENDED FOR PRODUCTION GABIONS.

(6) CONNECTIONS
SEE CITY OF AUSTIN STANDARD SPECIFICATIONS ITEM NO 5945 GABIONS AND REVEY MATRESSES.

(7) FASTENER SYSTEM
SEE CITY OF AUSTIN STANDARD SPECIFICATIONS ITEM NO 5945 GABIONS AND REVEY MATRESSES.

(8) PANEL TO PANEL JOINT STRENGTH
SEE CITY OF AUSTIN STANDARD SPECIFICATIONS ITEM NO 5945 GABIONS AND REVEY MATRESSES.



FOR INFORMATION PURPOSES ONLY!

LEVEL SPREADER

GENERAL NOTES
1. LEVEL SPREADERS SHALL BE INSTALLED UNDER THE DIRECTION AND SUPERVISION OF THE ENGINEER.
2. CONSTRUCTION SHALL BE ON ZERO PERCENT GRADE TO INSURE UNIFORM SPREADING OF SEDIMENT-FREE ROOFS CONVERTING CHANNEL FLOW TO SHEET FLOW.
3. LEVEL SPREADERS SHALL BE CONSTRUCTED ON UNDISTURBED SOIL (NOT ON FILL).
4. A WAITING EXPOSURE STOP SHALL BE PLACED VERTICALLY AND AT LEAST 100 FT (30 M) UP-SLOPE IN A GULLY, TRENCH, OR CUT-BACK AND PARALLEL WITH THE TOP OF THE SPREADER. THE EXPOSURE STOP SHALL BE CONSTRUCTED TO BE AT LEAST 18 INCHES (457 MM) DEEP AND 18 INCHES (457 MM) WIDE. THE EXPOSURE STOP SHALL BE CONSTRUCTED TO BE AT LEAST 18 INCHES (457 MM) DEEP AND 18 INCHES (457 MM) WIDE. THE EXPOSURE STOP SHALL BE CONSTRUCTED TO BE AT LEAST 18 INCHES (457 MM) DEEP AND 18 INCHES (457 MM) WIDE.
5. THE EXPOSURE STOP SHALL BE PROTECTED BY PLACING 3 STRIPS OF 3/4 INCH (19 mm) THICK PROTECTIVE MATERIALS. SEE STANDARD SPECIFICATIONS FOR PROTECTIVE MATERIALS.
6. THE EXPOSURE STOP SHALL NOT EXCEED A 1% GRADE FOR AT LEAST 5 FT.
7. STORM RUNOFF CONVERTED TO SHEET FLOW SHALL OVERTOP STABILIZED AREAS. WATER SHALL NOT BE RECONSTRUCTED IMMEDIATELY BELOW THE POINT OF DISCHARGE.
8. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED.

CITY OF AUSTIN WATER RESOURCES DEPARTMENT
STANDARD NO. 6345-1

SITE PLAN APPROVAL SHEET 27 OF 39
FILE NUMBER: C8-2014-0150.01.1B APPLICATION DATE: 3/18/2019
APPROVED BY COMMISSION ON UNDER SECTION OF CHAPTER OF THE CITY OF AUSTIN CODE.
EXPIRATION DATE (25-5-81, LDC) CASE MANAGER: LARTHUR
PROJECT EXPIRATION DATE (ORD. 097005-A) DWPZ: DJDZ

Director, Development Services Department
RELEASED FOR GENERAL COMPLIANCE: ZONING/ETJ
Rev. 1 Correction 1
Rev. 2 Correction 2
Rev. 3 Correction 3

Final plan must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.

Kimley-Horn
2600 VIA FORTUNA, TERRACE I SUITE 300 AUSTIN, TX 78749
PHONE: 512-646-2237
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STATE OF TEXAS
LUKE W. CARROLL
125677
LICENSED PROFESSIONAL ENGINEER

9/23/2020
KHA PROJECT 064492107
DATE: SEPTEMBER 2020
SCALE: AS SHOWN
DESIGNED BY: JIR, DM
DRAWN BY: DM, JIR
CHECKED BY: LWC

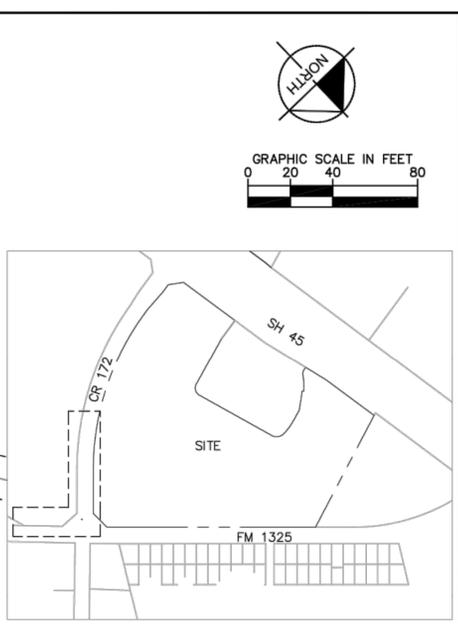
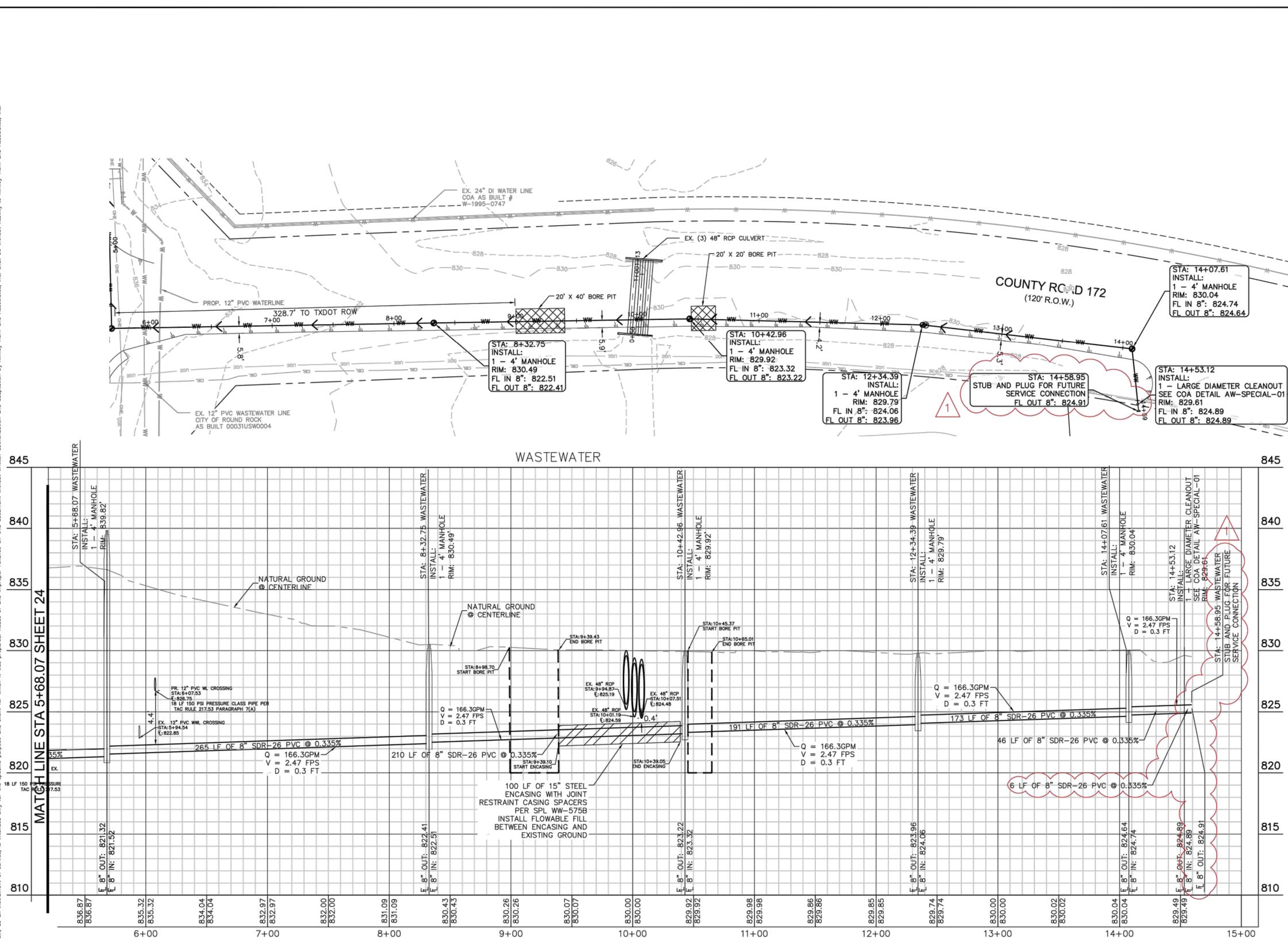
AURO
CITY OF AUSTIN
WILLIAMSON COUNTY, TEXAS

PRIVATE WQ DETENTION POND DETAILS

SHEET NUMBER
27 OF 40

BROADSTONE - LA FRONTERA PHASE 2 SP-2019-0583D SHEET 13 OF 59 C8-2014-0150.01.1B

File Path: K:\SAU_CVA_06492107_Auro_MultiFamily_Cod_Vol_Sheets_WASTEWATER_P&P.dwg
 Date: September 24, 2020 02:40:09pm
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LOCATION MAP
 NTS

NOTE:
 1. CONTRACTOR SHALL KEEP ALL MUD AND DIRT OFF FM 1325, OR WILL CLEAN AND SWEEP BY COB.

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

THIS PROJECT HAS REQUESTED A WAIVER FROM 2.9.4.B.5 OF THE CITY OF AUSTIN UTILITY CRITERIA MANUAL WHICH REQUIRES A MINIMUM SLOPE OF 0.005 FT./FT. (0.5 PERCENT GRADE) FOR EIGHT (8) INCH MAINS WITHIN THE SERVICE AREA OF THE CITY OF AUSTIN

REVIEWED BY: SHWETHA PANDURANGI, P.E. DATE:

FOR INFORMATION PURPOSES ONLY!

BENCHMARKS
 BM #151 (12") SET IN CONCRETE SIDEWALK AT THE NORTH CORNER OF THE INTERSECTION OF C.R. 172 AND F.M. 1325 3.5' SOUTHWEST OF A CROSSWALK SIGN AND 10.3' SOUTH OF AN ELECTRIC MANHOLE ELEV.=836.35' (NAV/D98)
 BM #152 (12") SET IN CONCRETE AT THE EAST CORNER OF A TRANSFORMER PAD 51.7' SOUTHEAST OF THE BACK OF SIDEWALK ON THE SOUTH R.O.W. OF S.H. 45 AND 13.6' NORTHWEST OF A LIGHTPOLE ELEV.=860.83' (NAV/D98)

SITE PLAN APPROVAL SHEET OF 39
 FILE NUMBER: CB-2014-0150.01.1B APPLICATION DATE: 3/18/2019
 APPROVED BY COMMISSION ON _____ UNDER SECTION _____ OF CHAPTER _____ OF THE CITY OF AUSTIN CODE.
 EXPIRATION DATE (25-5-81, LDC) _____ CASE MANAGER: LARTHUR
 PROJECT EXPIRATION DATE (ORD.0970905-A) _____ DWPZ: _____ DDZ: _____

Director, Development Services Department
 RELEASED FOR GENERAL COMPLIANCE: _____ ZONING: ETJ
 Rev. 1 _____ Correction 1
 Rev. 2 _____ Correction 2
 Rev. 3 _____ Correction 3

Final plat must be recorded by the Project Expiration Date, if applicable. Subsequent Site Plans which do not comply with the Code current at the time of filing, and all required Building Permits and/or a notice of construction (if a building permit is not required), must also be approved prior to the Project Expiration Date.

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

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

1 REMOVED WML - A, ADDED WW PLUG 08/24/20
 UPDATED SHEET NUMBERING

Kimley-Horn
 2600 VIA FORTUNA, TERRACE I SUITE 300 AUSTIN, TX 78749
 PHONE: 512-646-2237
 FAX: 512-646-2237
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 TBP# Firm No. 928

STATE OF TEXAS
 LUKE W. CARAWAY
 LICENSED PROFESSIONAL ENGINEER
 125677
 9/23/2020

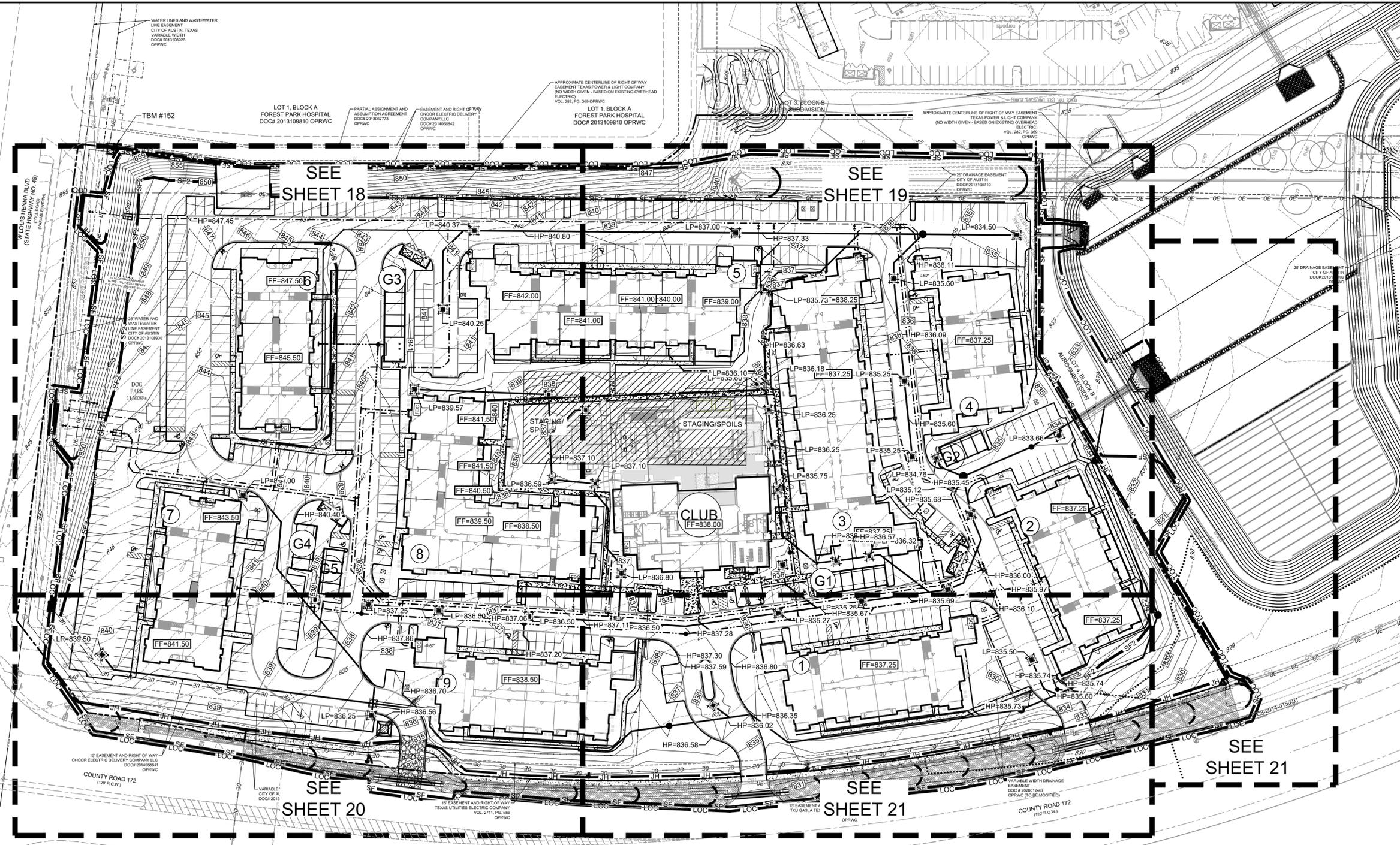
KHA PROJECT: 064492107
 DATE: SEPTEMBER 2020
 SCALE: AS SHOWN
 DESIGNED BY: JRM, DMJ
 DRAWN BY: DM, JIR
 CHECKED BY: LWC

WASTEWATER PLAN & PROFILE (2 OF 2)

AURO
 CITY OF AUSTIN
 WILLIAMSON COUNTY, TEXAS

SHEET NUMBER
25 OF 40

BROADSTONE - LA FRONTERA PHASE 2 SP-2019-0583D SHEET 16 OF 59 C8-2014-0150.01.1B



SEE SHEET 18

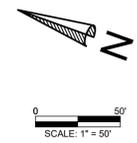
SEE SHEET 19

SEE SHEET 20

SEE SHEET 21

SEE SHEET 21

- NOTES:**
- IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY RE-VEGETATION, MULCH, TARP OR RE-VEGETATION MATTING. [ECM 1.4.4.B.3, SECTION 5.1.]
 - ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON-SITE TO KEEP PROJECT IN-COMPLIANCE WITH THE CITY OF AUSTIN RULES AND REGULATIONS. [LDC 25-8-183]
 - CONTRACTOR SHALL DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING AS PER ECM 1.4.5(A), OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
 - THE CONTRACTOR WILL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY. [ECM 1.4.D.4]



NO.	DATE	REVISION	BY

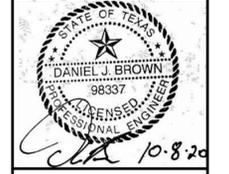
BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

OVERALL EROSION & SEDIMENTATION PLAN

MALONE WHEELER
 SINCE INC. 1995

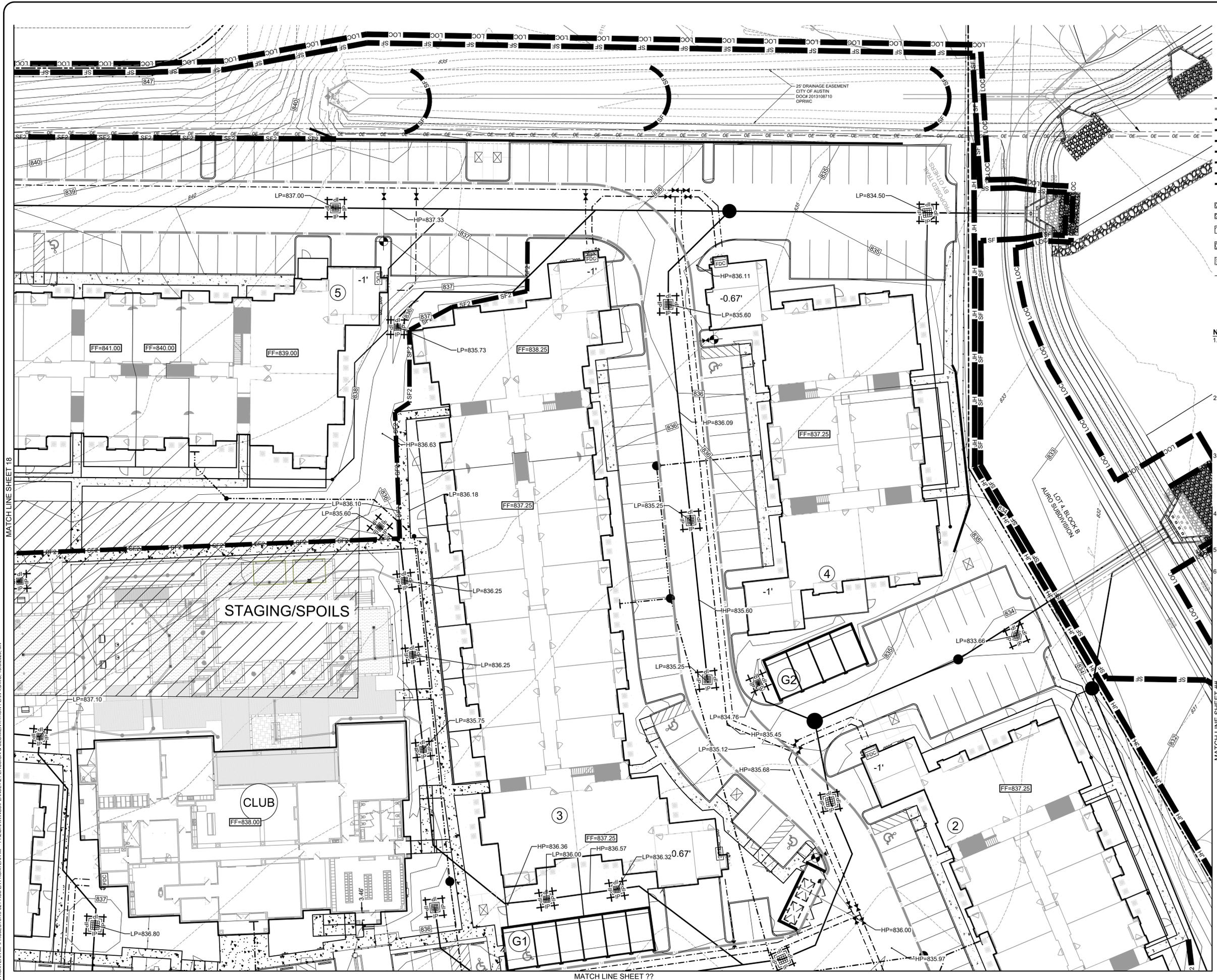
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 280
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MV
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

SHEET 17
 OF 59



0 20'
SCALE: 1" = 20'

LEGEND

- PROPERTY BOUNDARY
- PLAT BOUNDARY
- LOC LIMITS OF CONSTRUCTION
- SF SILT FENCE
- SF2 SILT FENCE PHASE 2
- JH SILT FENCE W/ J HOOKS
- IP INLET PROTECTION
- TP TREE PROTECTION
- ML MULCH LOG
- RB ROCK BERM
- SB SPREADER BERM
- RR ROCK RIP RAP
- CS CONTRACTOR'S STAGING / SPOILS AREA
- SCE STABILIZED CONSTRUCTION ENTRANCE
- ESC ESC MATTING
- PFG PROPOSED FINISHED GRADE
- TR TREE TO REMAIN
- TRB TREE TO BE REMOVED

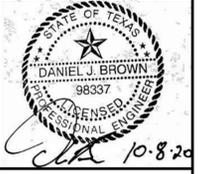
- NOTES:**
- IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY RE-VEGETATION, MULCH, TARP OR RE-VEGETATION MATTING. [ECM 1.4.4.B.3, SECTION 5, I.]
 - ENVIRONMENTAL INSPECTOR HAS THE AUTHORITY TO ADD AND/OR MODIFY EROSION/SEDIMENTATION CONTROLS ON-SITE TO KEEP PROJECT IN COMPLIANCE WITH THE CITY OF AUSTIN RULES AND REGULATIONS. [LDC 25-6-183]
 - CONTRACTOR SHALL DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING AS PER ECM 1.4.5(A), OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
 - THE CONTRACTOR WILL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY. [ECM 1.4.D.4]
 - ESC MATTING SHALL BE PER COA OR APPROVED EQUAL.
 - SF2 (PHASE 2 SILT FENCE) AND ESC MATTING SHALL BE IMMEDIATELY AFTER ROUGH GRADING IS COMPLETE IN THAT AREA.

BY	
REVISION	
DATE	
NO.	

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

DETAILED EROSION & SEDIMENTATION PLAN

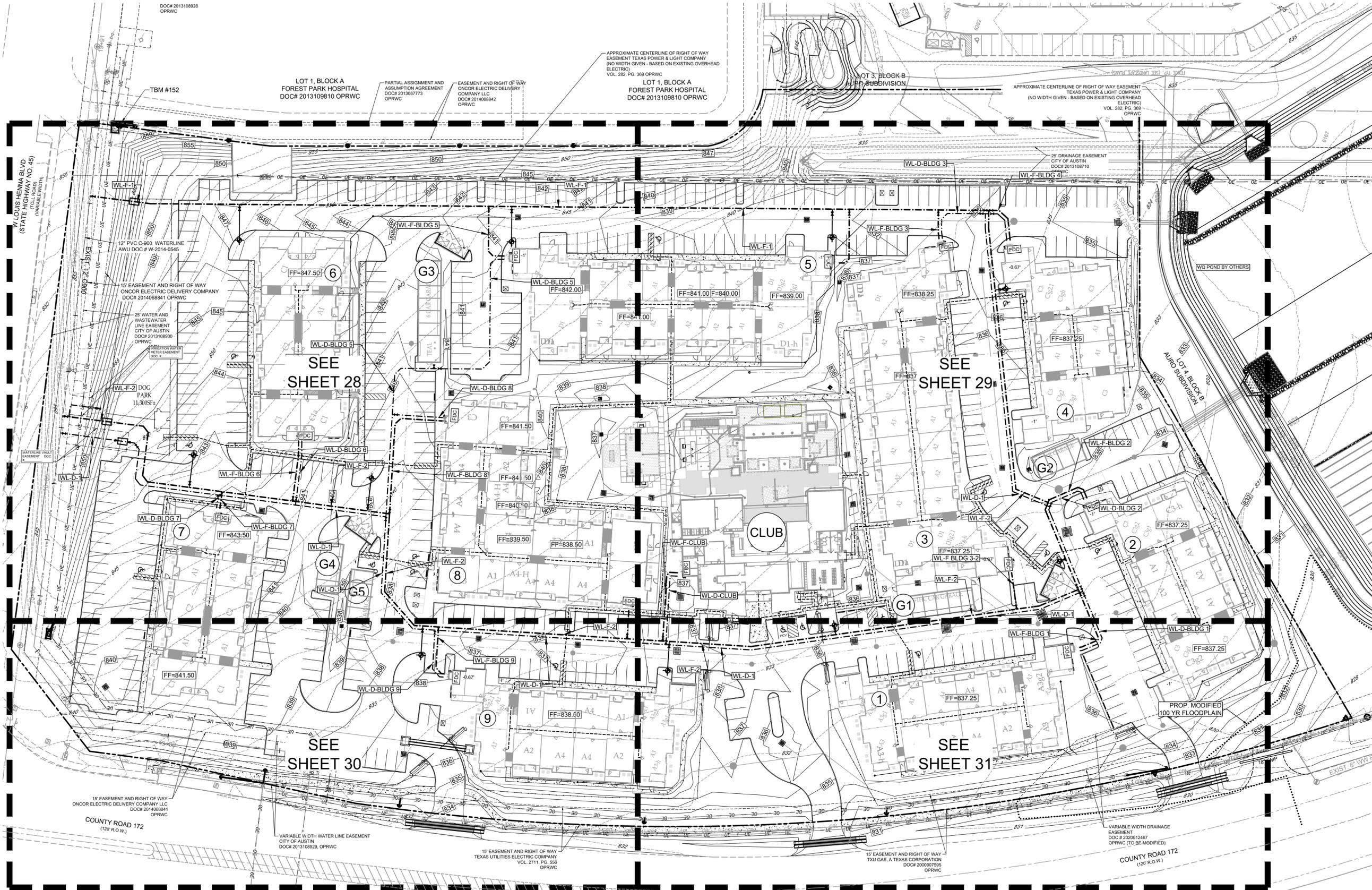
MALONE WHEELER
 SINCE INC. 1995
 CIVIL ENGINEERING & DEVELOPMENT CONSULTING & PROJECT MANAGEMENT
 5113 Southwest Pkwy, Suite 260
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MV
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

F:\LAFRONTERA MFP\Projects\19-021-AUS-LA FRONTERA MF - PH2\Drawings\Plans\SET1 EROSION & SEDIMENTATION PLAN 4.DWG - 10/2/2020, MV

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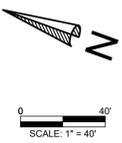


TCEQ CROSSING NOTE:

1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 6 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.

NOTE:

1. A PERMIT MUST BE OBTAINED FROM THE FIRE MARSHAL'S OFFICE FOR A DRIVING SURFACE CAPABLE OF SUPPORTING THE IMPOSED LOAD OF FIRE APPARATUS WEIGHING AT LEAST 75,000 POUNDS. FIRE APPARATUS ROADS MUST BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF FIRE APPARATUS AND SHALL BE SURFACED SO AS TO PROVIDE ALL WEATHER DRIVING CAPABILITIES. APPROVED ACCESS ROAD SURFACES INCLUDE ASPHALT, CONCRETE OR OTHER APPROVED DRIVING SURFACE CAPABLE OF SUPPORTING THE IMPOSED LOAD. THE FIRE APPARATUS ACCESS ROAD MUST BE IN PLACE PRIOR TO COMBUSTIBLES BEING BROUGHT ON-SITE.



NO.	DATE	REVISION	BY

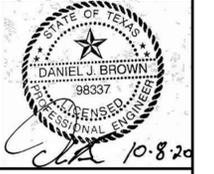
BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

OVERALL WATER PLAN

MALONE WHEELER
 SINCE INC. 1995

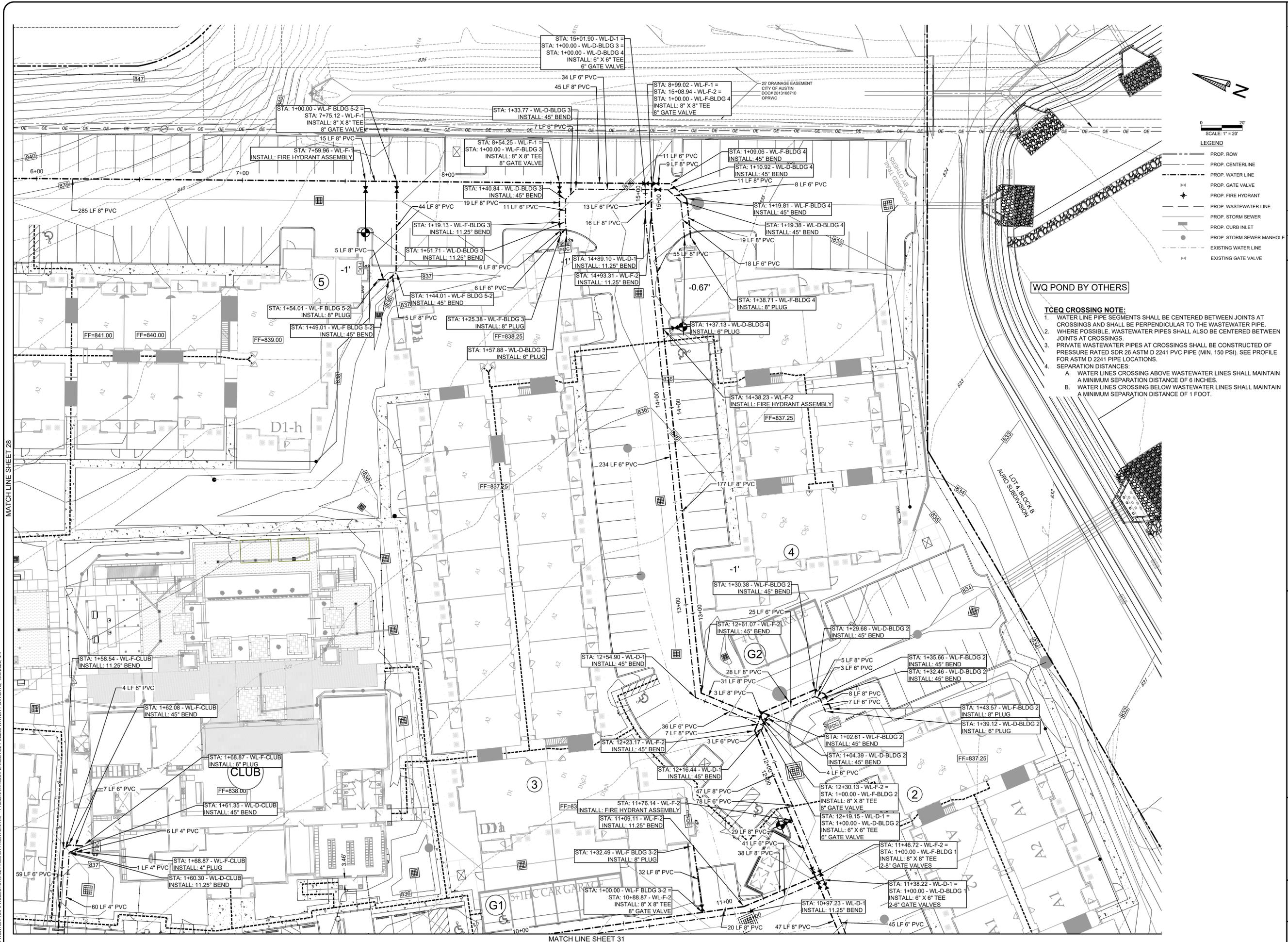
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 260
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MW
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/7/2020

SHEET 27
 OF 59



SCALE: 1" = 20'

- LEGEND**
- PROP. ROW
 - PROP. CENTERLINE
 - PROP. WATER LINE
 - PROP. WASTEWATER LINE
 - PROP. STORM SEWER
 - PROP. CURB INLET
 - PROP. STORM SEWER MANHOLE
 - EXISTING WATER LINE
 - EXISTING GATE VALVE

WQ POND BY OTHERS

- TCEQ CROSSING NOTE:**
1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
 2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
 3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
 4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 8 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.

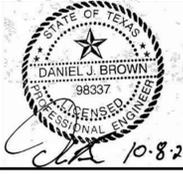
MATCH LINE SHEET 28

MATCH LINE SHEET 31

BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

DETAILED WATER PLAN 2

MALONE WHEELER
 CIVIL ENGINEERING & DEVELOPMENT CONSULTING & PROJECT MANAGEMENT
 SINCE INC. 1995
 5113 Southwest Pkwy, Suite 260
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MW
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/7/2020

SHEET 29
 OF 59

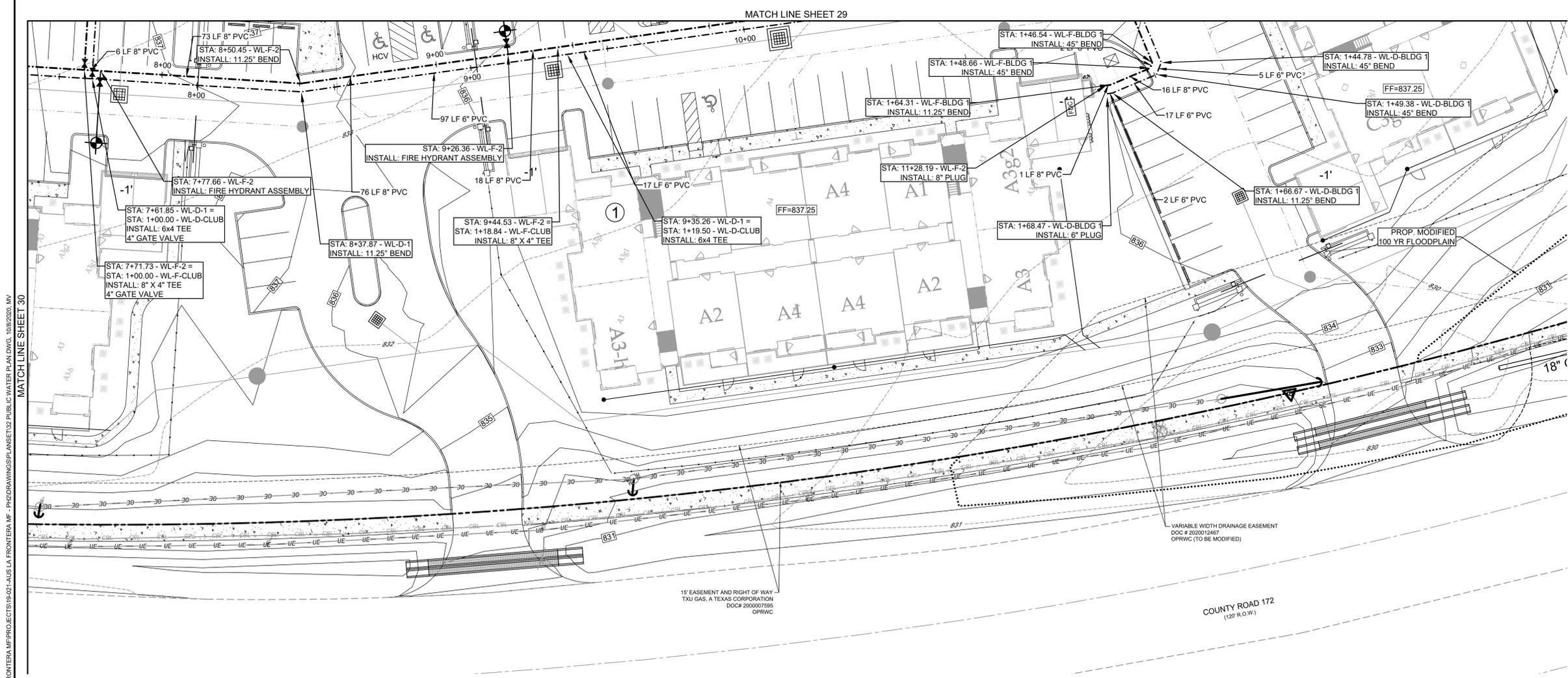


SCALE: 1" = 20'

LEGEND

- PROP. ROW
- PROP. CENTERLINE
- PROP. WATER LINE
- PROP. GATE VALVE
- PROP. FIRE HYDRANT
- PROP. WASTEWATER LINE
- PROP. STORM SEWER
- PROP. CURB INLET
- PROP. STORM SEWER MANHOLE
- EXISTING WATER LINE
- EXISTING GATE VALVE

- TCEQ CROSSING NOTE:**
1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
 2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
 3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
 4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 6 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.



F:\LAFRONTIERA MFP\PROJECTS\19-021-AUS LA FRONTERA MFP - PH2\DRAWINGS\PLANS\SET02 PUBLIC WATER PLAN.DWG, 10/06/2020, MW

MATCH LINE SHEET 29

MATCH LINE SHEET 30

15' EASEMENT AND RIGHT OF WAY
TXU GAS, A TEXAS CORPORATION
DOC# 200007595
OPRWC

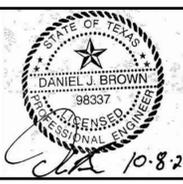
VARIABLE WIDTH DRAINAGE EASEMENT
DOC # 2020072467
OPRWC (TO BE MODIFIED)

COUNTY ROAD 172
(120' R.O.W.)

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

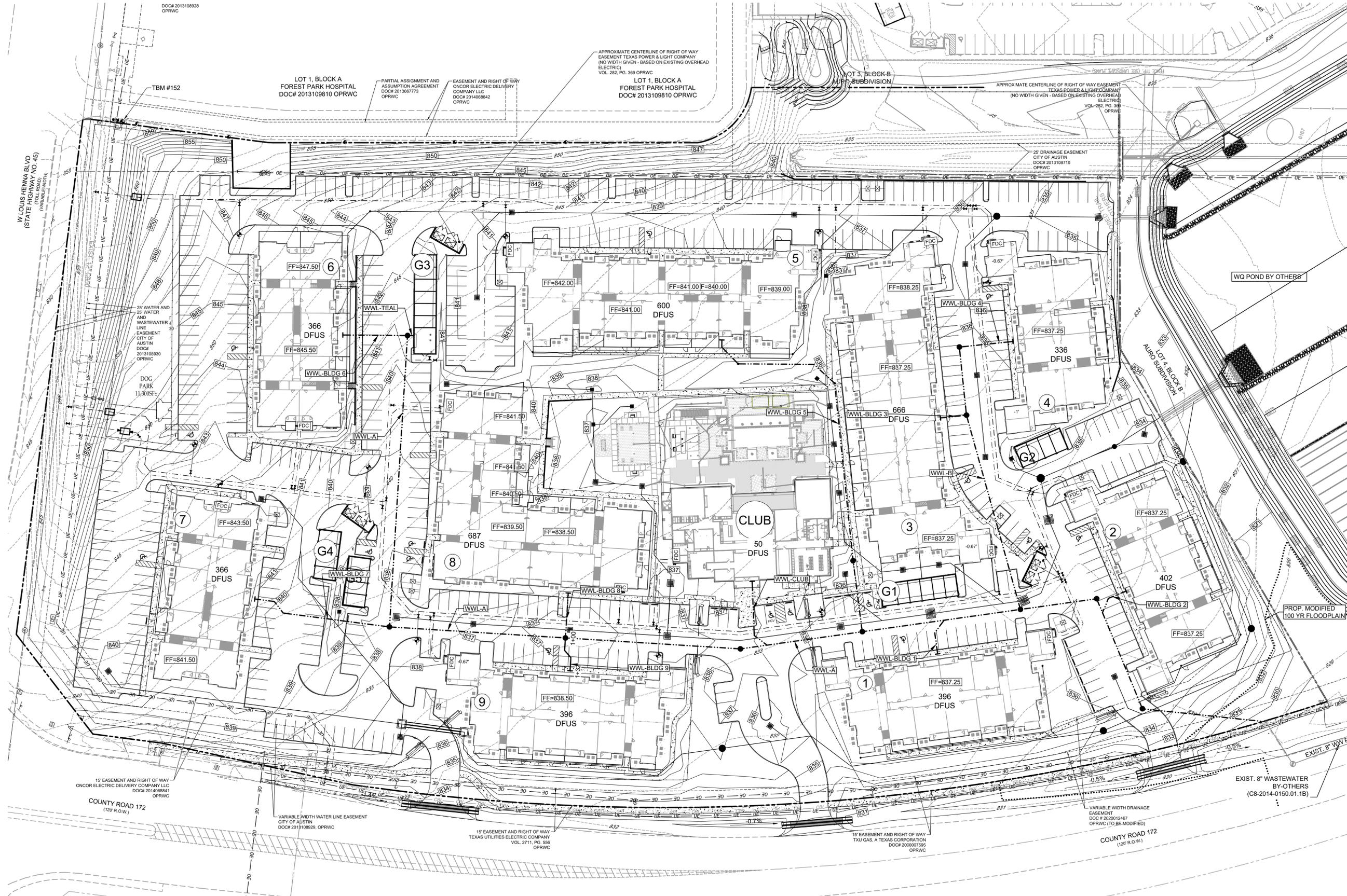
DETAILED WATER PLAN 4

MALONE WHEELER
SINCE INC., 1995
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



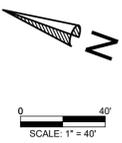
DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/7/2020

SHEET 31
OF 59



TCEQ CROSSING NOTE:

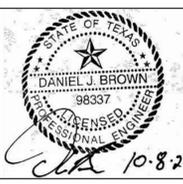
1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 6 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.



BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

OVERALL WASTEWATER PLAN

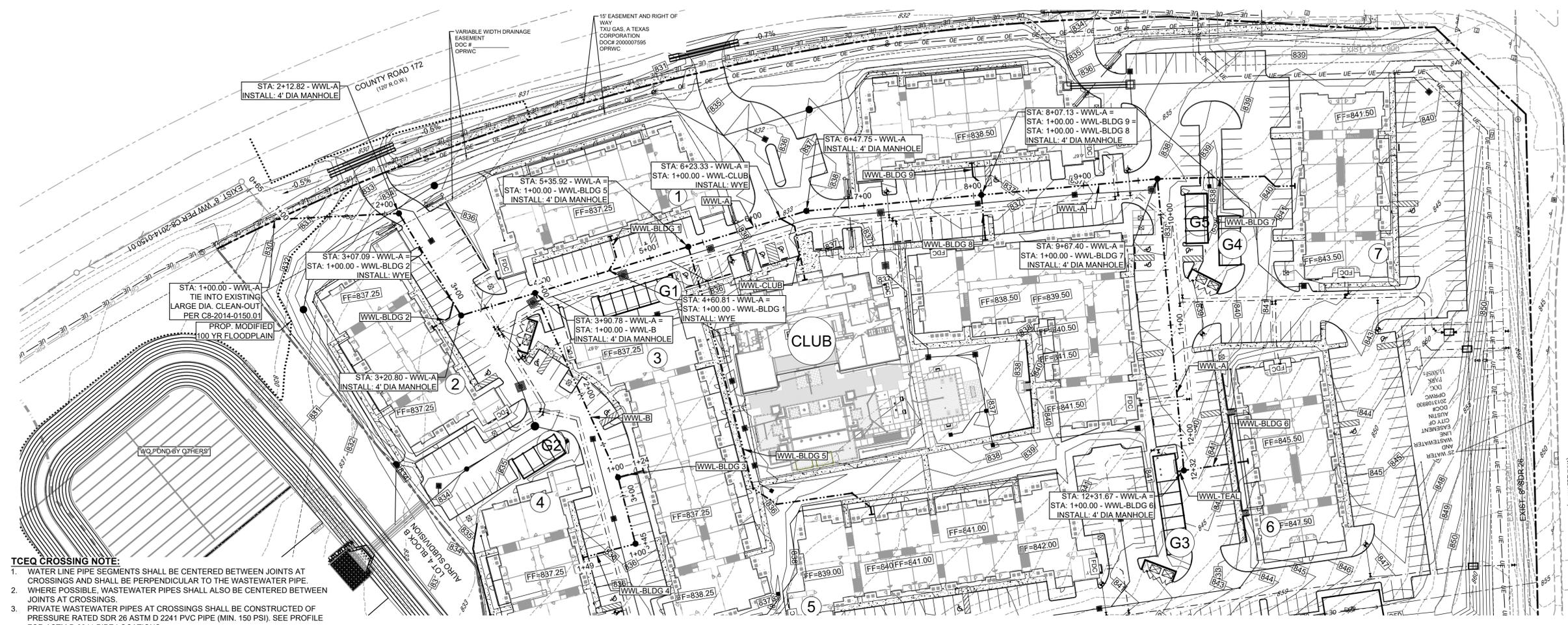
MALONE WHEELER
 SINCE INC. 1995
 CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
 5113 Southwest Parkway, Suite 260
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



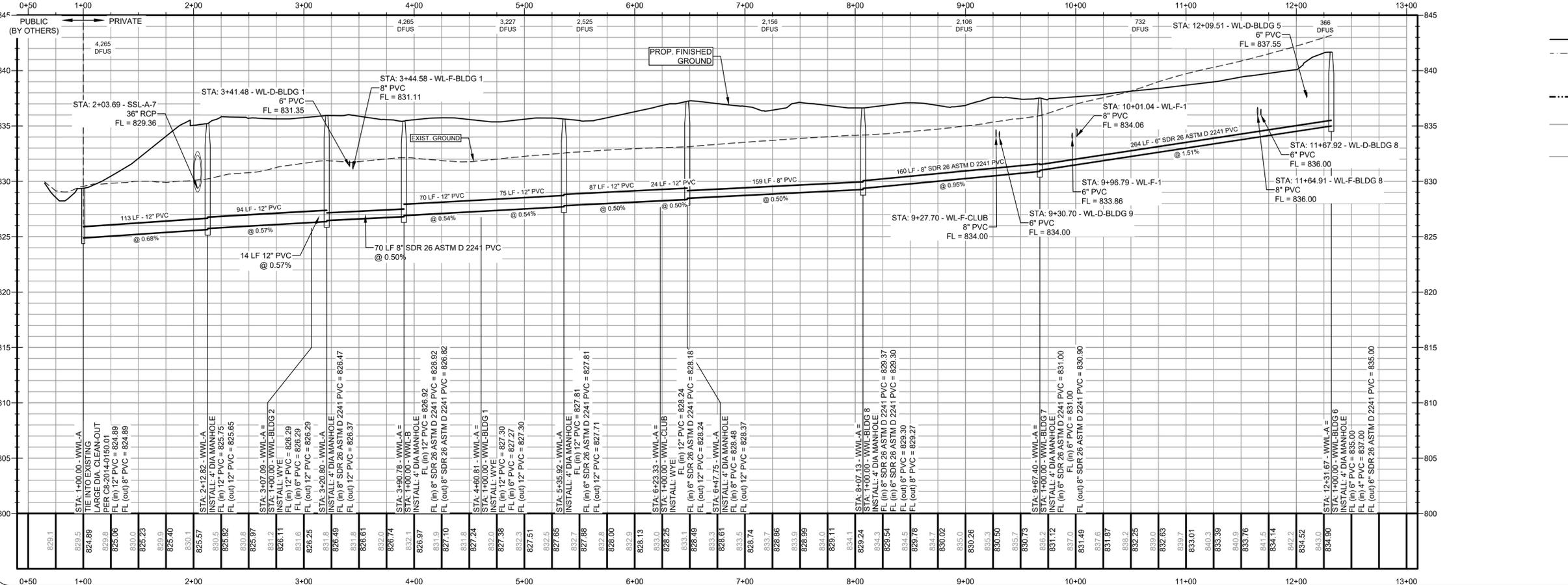
DESIGN BY: MV
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

SHEET 33
 OF 59

NO.	DATE	REVISION	BY



- TCEQ CROSSING NOTE:**
1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
 2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
 3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
 4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 6 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.



LEGEND

- PROP. ROW
- - - PROP. WATER LINE
- PROP. GATE VALVE
- PROP. FIRE HYDRANT
- - - PROP. WASTEWATER LINE
- PROP. WASTEWATER MANHOLE
- PROP. STORM SEWER
- PROP. GRATE INLET
- PROP. CURB INLET
- PROP. STORM SEWER MANHOLE

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

WASTEWATER PLAN & PROFILE 1

BY: _____
REVISION: _____
DATE: _____
NO. _____

1/11 LOUIS HENNA BLVD
(STATE HIGHWAY NO. 45)
(TOLL ROAD)
(HUMBLE MOUTH)

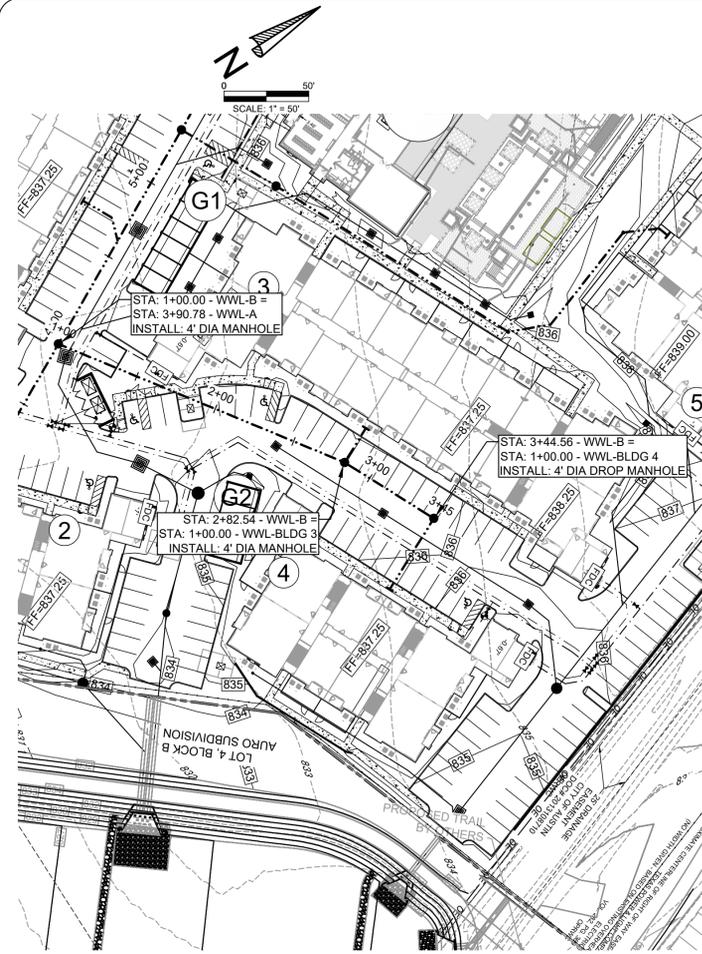
MALONE WHEELER
SINCE INC. 1995
CIVIL ENGINEERING* DEVELOPMENT CONSULTING* PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 280
Austin, Texas 78725
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

STATE OF TEXAS
DANIEL J. BROWN
REGISTERED PROFESSIONAL ENGINEER
98337
10-8-20

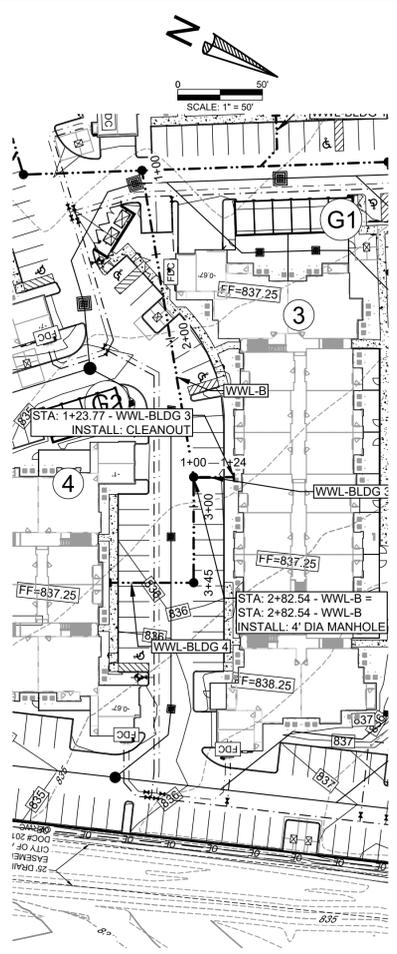
DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

SHEET 34
OF 59

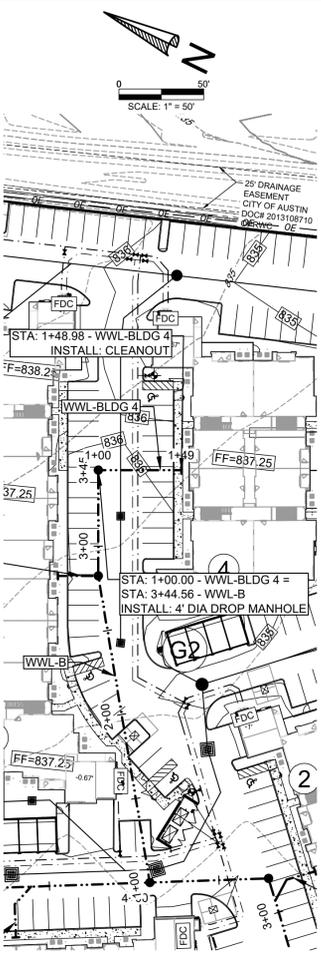
BROADSTONE - LA FRONTERA PHASE 2 SP-2019-0583D



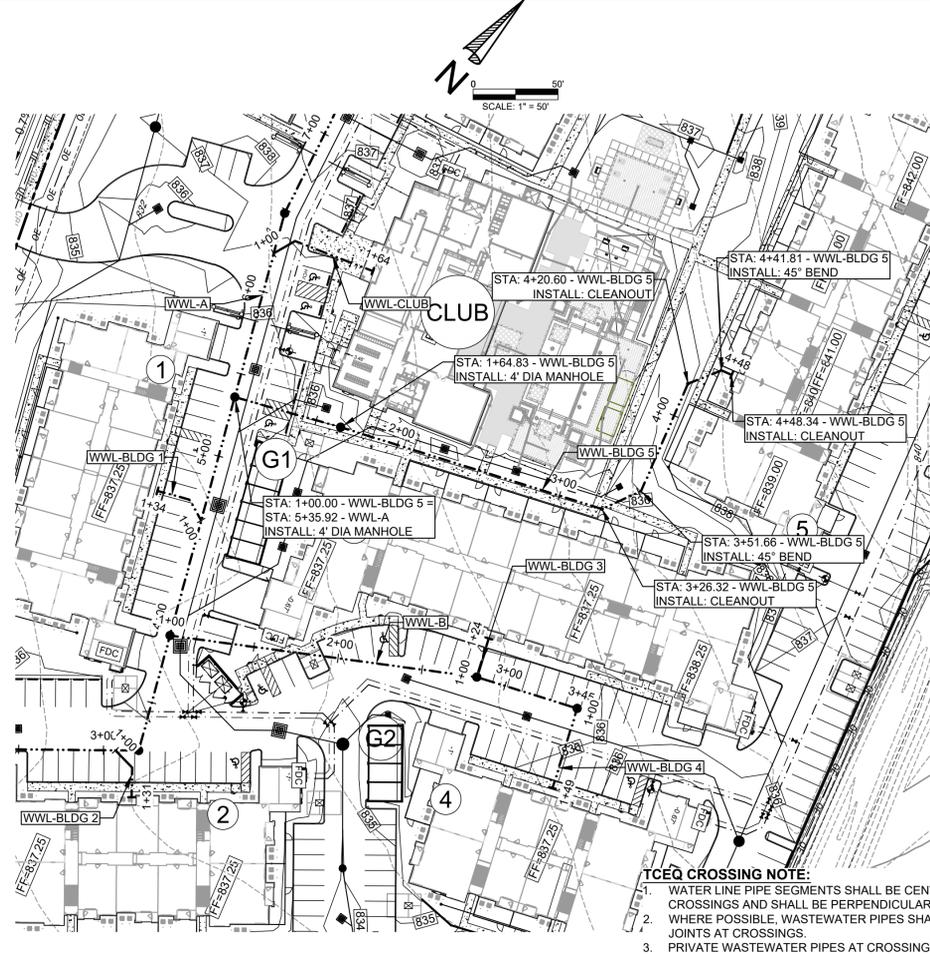
WWL-B



WWL-BLDG 3



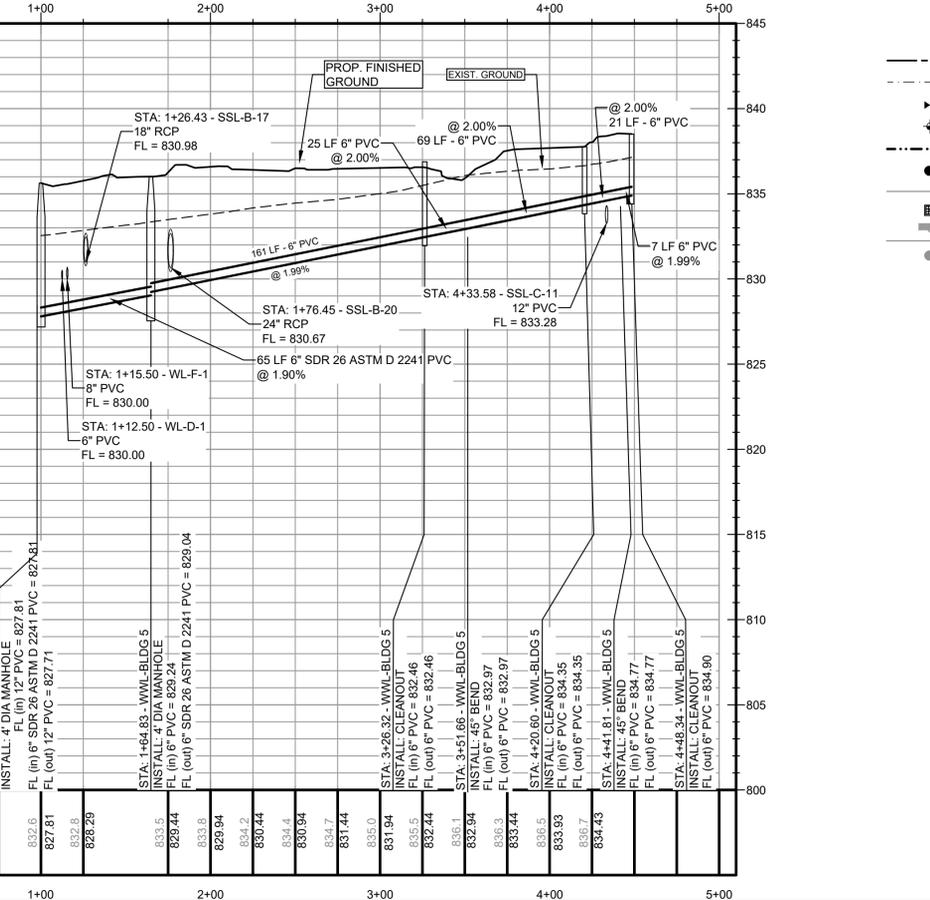
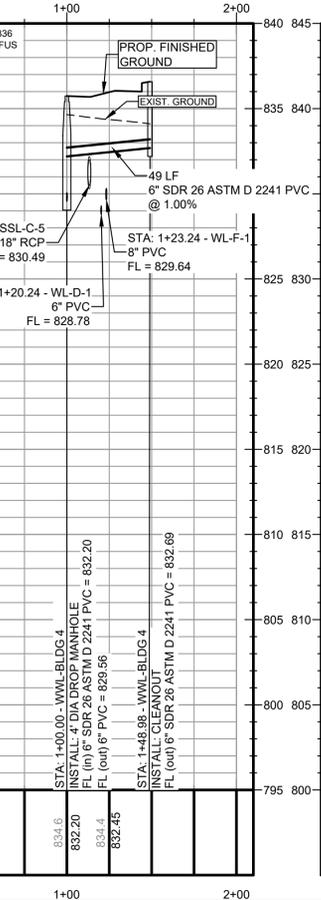
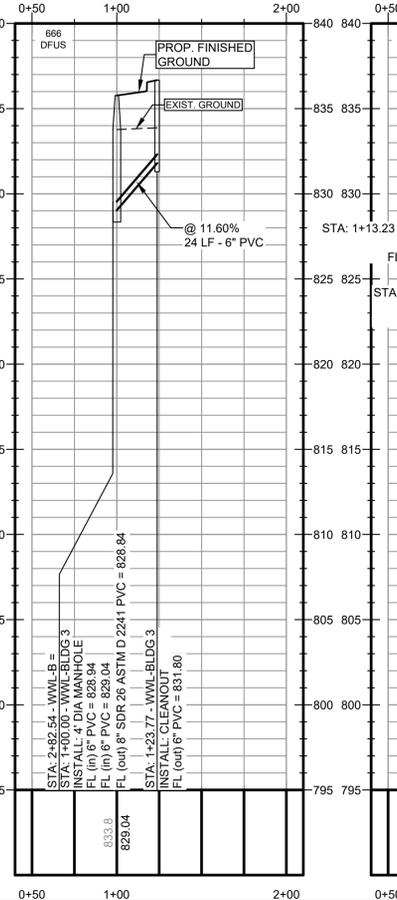
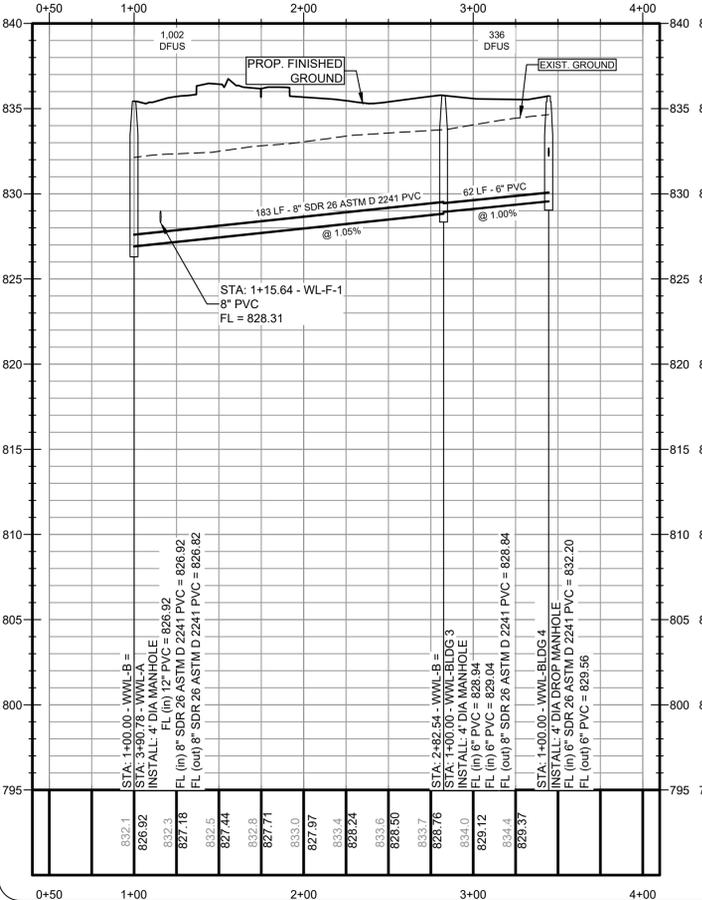
WWL-BLDG 4



WWL-BLDG 5

TCEQ CROSSING NOTE:

1. WATER LINE PIPE SEGMENTS SHALL BE CENTERED BETWEEN JOINTS AT CROSSINGS AND SHALL BE PERPENDICULAR TO THE WASTEWATER PIPE.
2. WHERE POSSIBLE, WASTEWATER PIPES SHALL ALSO BE CENTERED BETWEEN JOINTS AT CROSSINGS.
3. PRIVATE WASTEWATER PIPES AT CROSSINGS SHALL BE CONSTRUCTED OF PRESSURE RATED SDR 26 ASTM D 2241 PVC PIPE (MIN. 150 PSI). SEE PROFILE FOR ASTM D 2241 PIPE LOCATIONS.
4. SEPARATION DISTANCES:
 - A. WATER LINES CROSSING ABOVE WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 6 INCHES.
 - B. WATER LINES CROSSING BELOW WASTEWATER LINES SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE OF 1 FOOT.



LEGEND

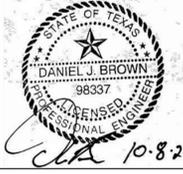
- PROP. ROW
- - - PROP. WATER LINE
- - - PROP. GATE VALVE
- - - PROP. FIRE HYDRANT
- - - PROP. WASTEWATER LINE
- PROP. WASTEWATER MANHOLE
- PROP. STORM SEWER
- PROP. GRATE INLET
- PROP. CURB INLET
- PROP. STORM SEWER MANHOLE

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NO.	DATE	REVISION

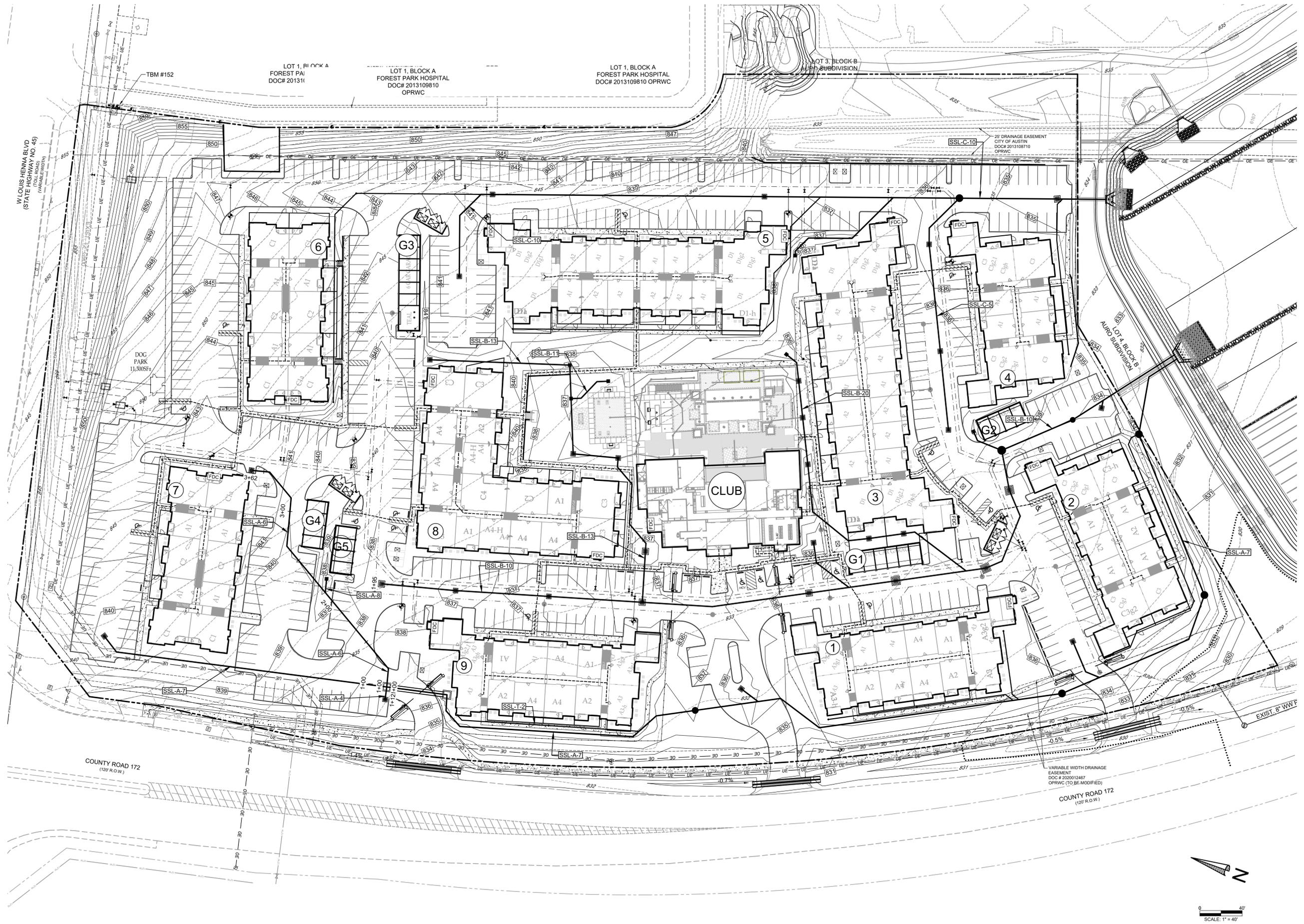
BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

WASTEWATER PLAN & PROFILE 3



DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

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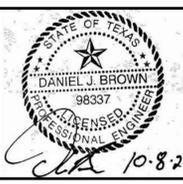


NO.	DATE	REVISION	BY

BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

OVERALL STORM PLAN

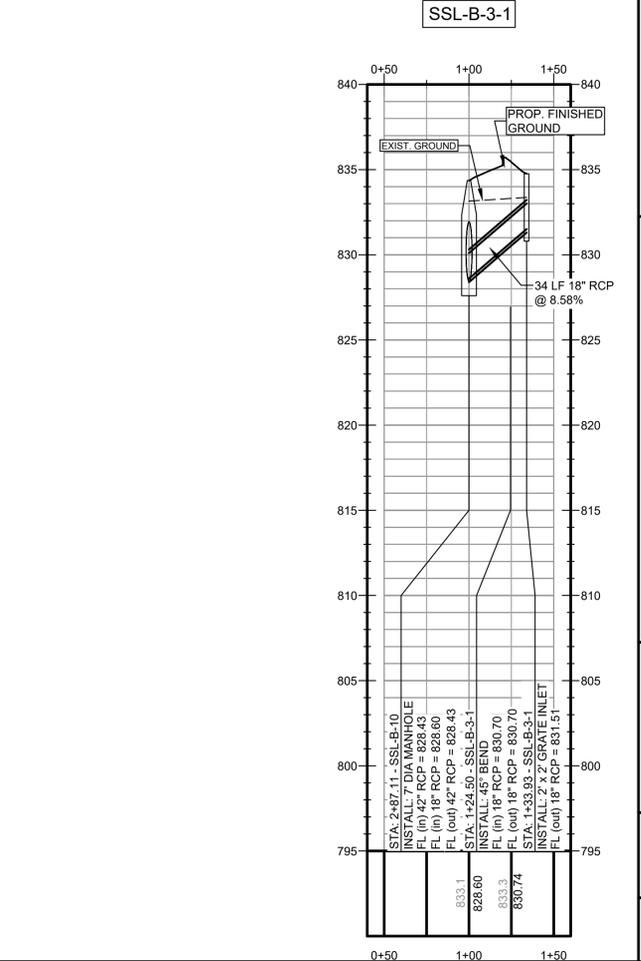
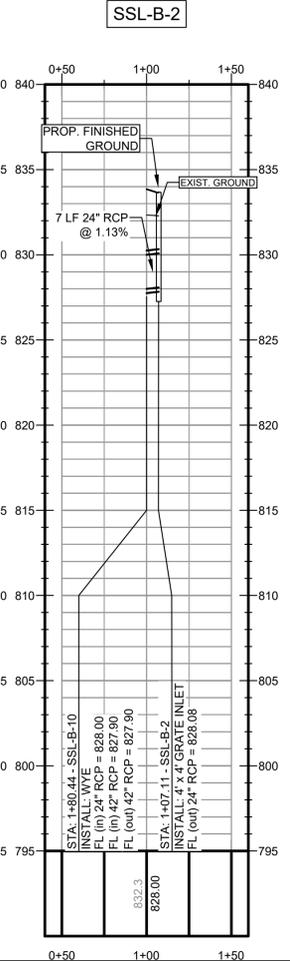
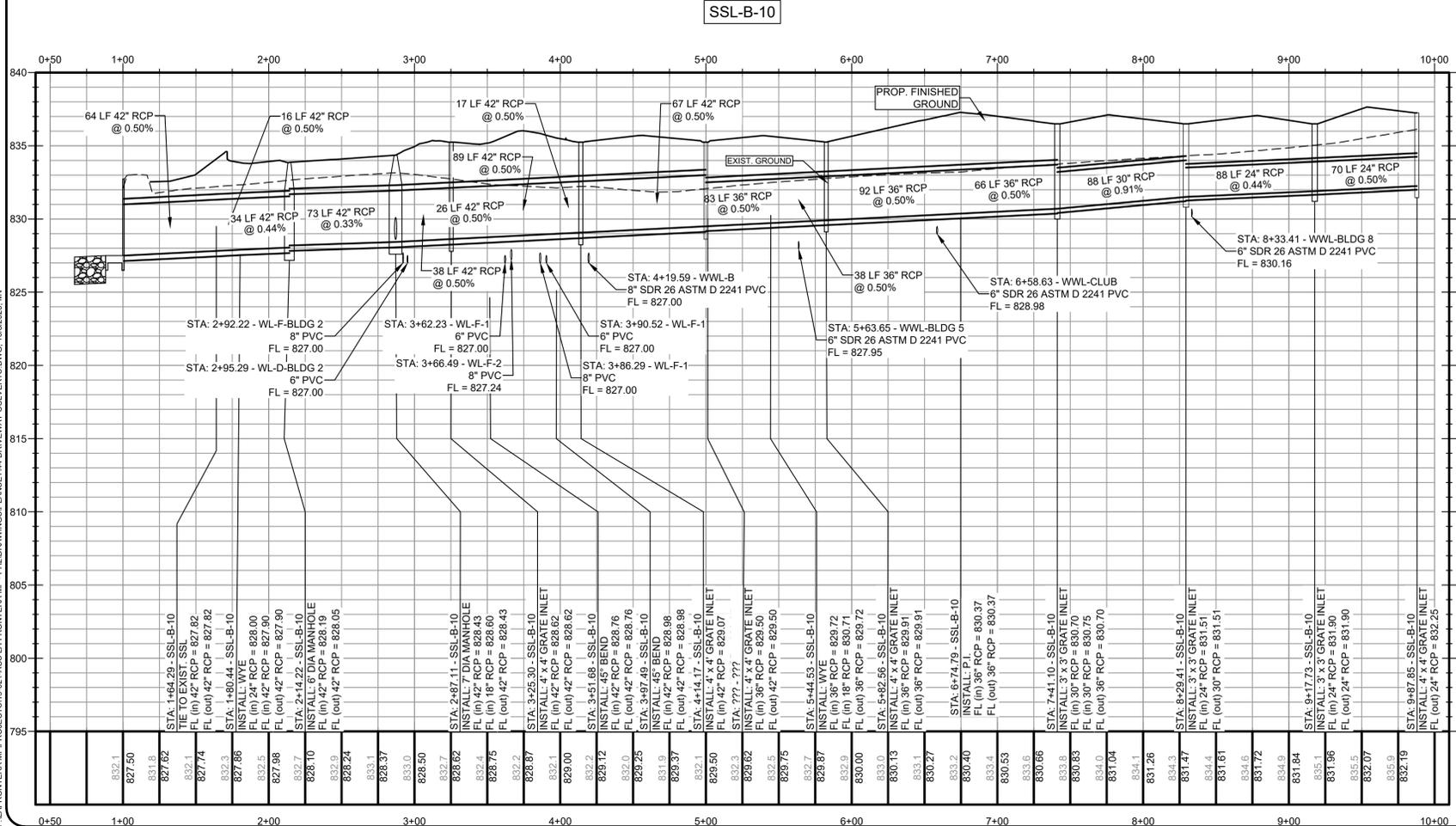
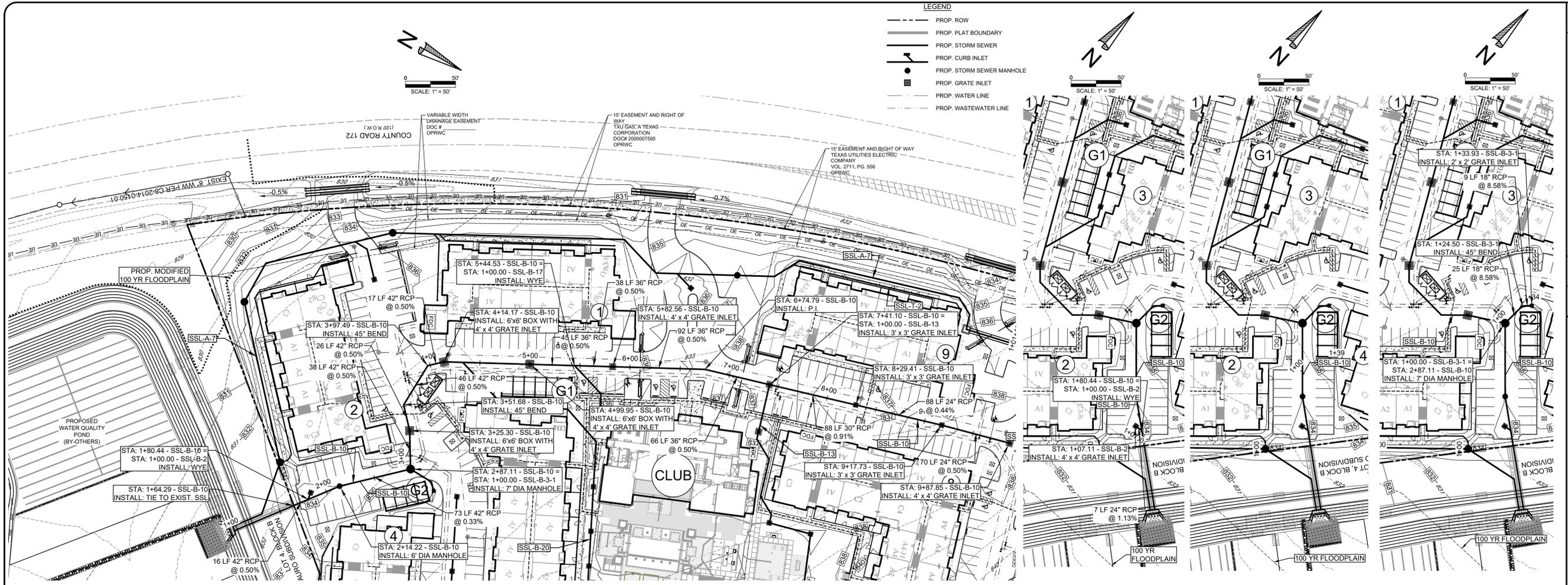
MALONE WHEELER
 SINCE INC. 1995
 CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
 5113 Southwest Pkwy, Suite 280
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MV
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

SHEET 37
OF 59

F:\LAFRONTA MFP\Projects\19-021-AUS-LA FRONTERA MF - PH2\Drawings\Plans\Set4\DRIVEWAY CULVERTS.dwg, 10/2/2020, 1:56:13 PM, MWV



BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

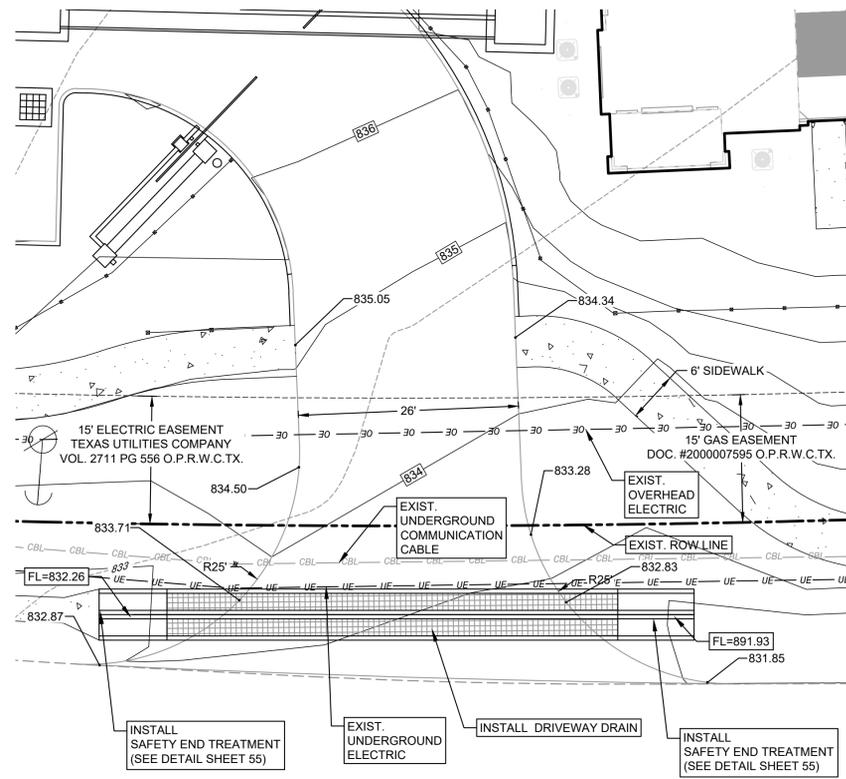
STORM PLAN & PROFILE 3

MALONE WHEELER
SINCE INC. 1995
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

SHEET 40
OF 59

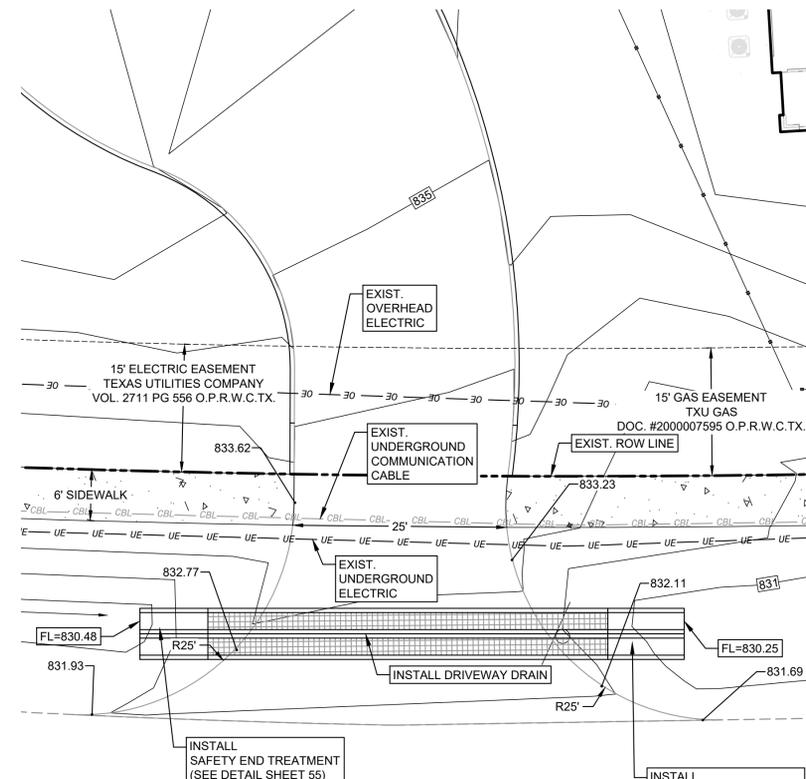
BROADSTONE - LA FRONTERA PHASE 2 SP-2019-0583D



CULVERT 10-YR ANALYSIS	
DISCHARGE	6.2 CFS
HW ELEV	832.92 FT
VELOCITY	2.83 F/S
DS DEPTH	0.9 FT
NORMAL DEPTH	0.5 FT

C.R. 172
(120' ROW)

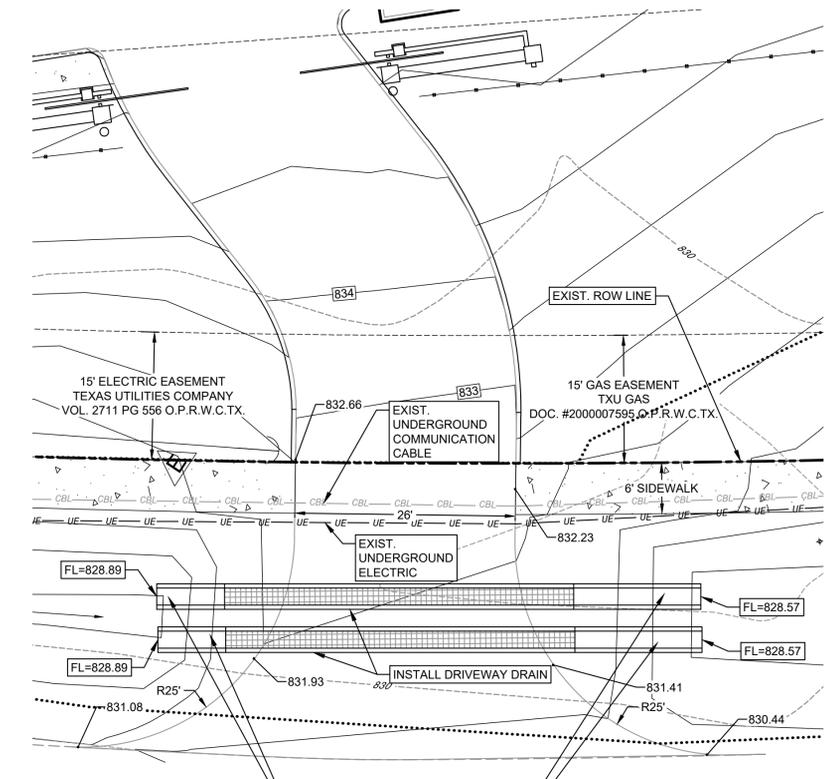
CULVERT 3



CULVERT 10-YR ANALYSIS	
DISCHARGE	9.55 CFS
HW ELEV	831.37 FT
VELOCITY	3.19 F/S
DS DEPTH	1.2 FT
NORMAL DEPTH	.75 FT

C.R. 172
(120' ROW)

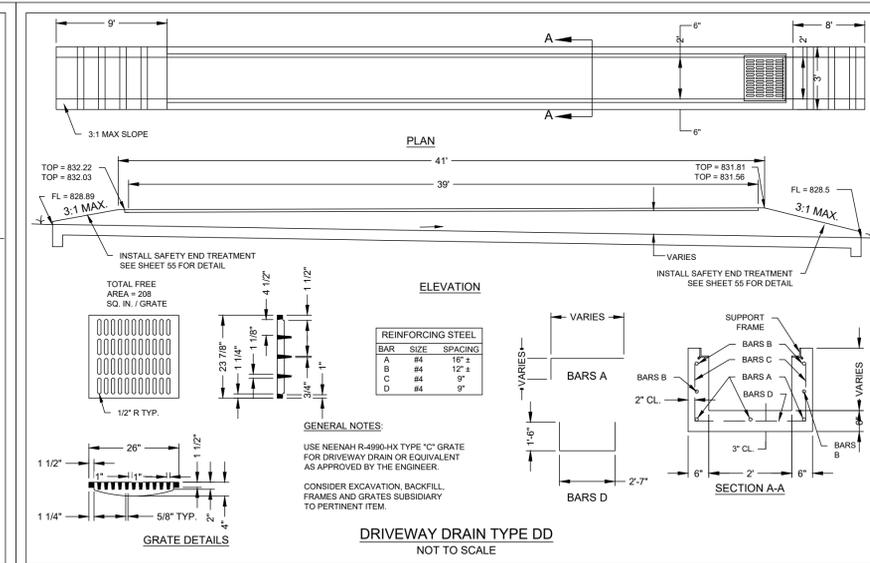
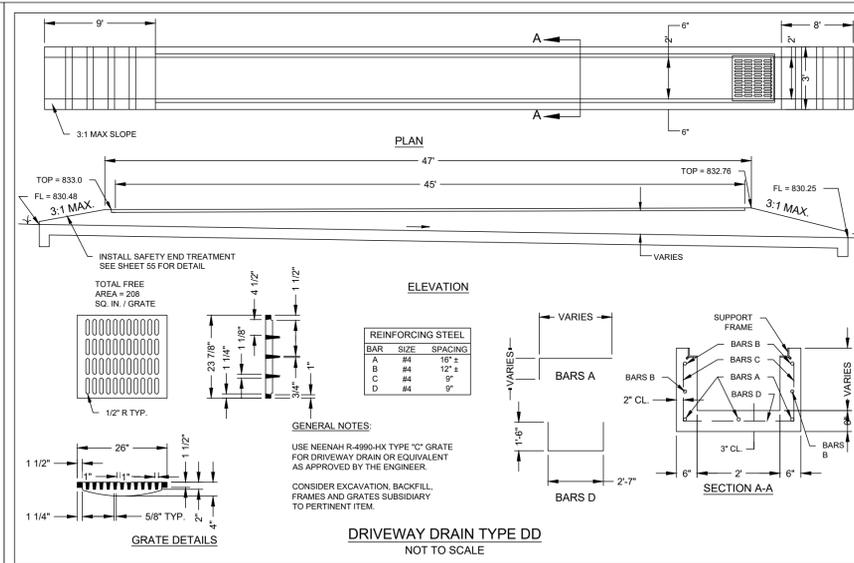
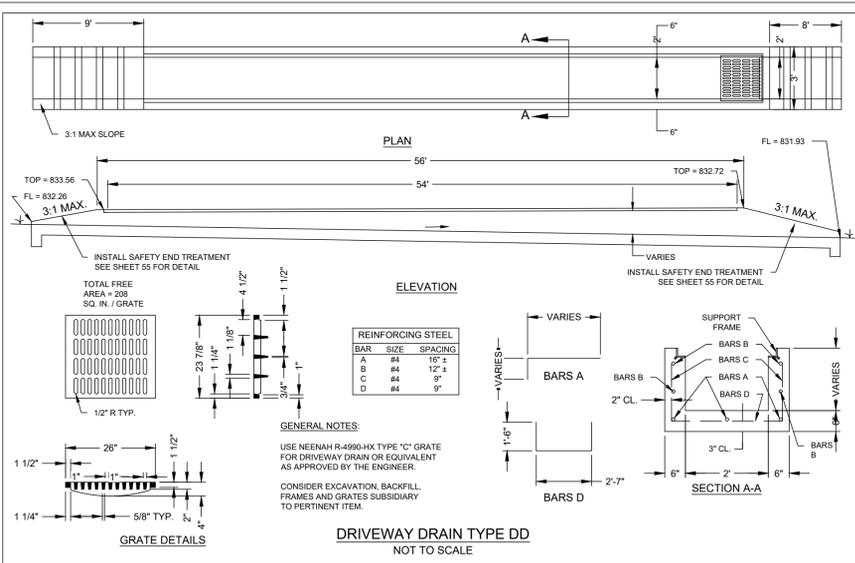
CULVERT 2



CULVERT 10-YR ANALYSIS	
DISCHARGE	13.16 CFS
HW ELEV	830.0 FT
VELOCITY	4.65 F/S
DS DEPTH	1.05 FT
NORMAL DEPTH	0.9 FT

C.R. 172
(120' ROW)

CULVERT 1



NO.	DATE	REVISION	BY

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

DRIVEWAY CULVERTS

MALONE WHEELER
SINCE INC. 1995
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 280
Arlam, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

STATE OF TEXAS
DANIEL J. BROWN
REGISTERED PROFESSIONAL ENGINEER
No. 98337
10-8-20

DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

SHEET 44
OF 59

DOC# 2013108929
OPRWC

LOT 1, BLOCK A
FOREST PARK HOSPITAL
DOC# 2013109810 OPRWC

PARTIAL ASSIGNMENT AND
ASSUMPTION AGREEMENT
DOC# 2013067773
OPRWC

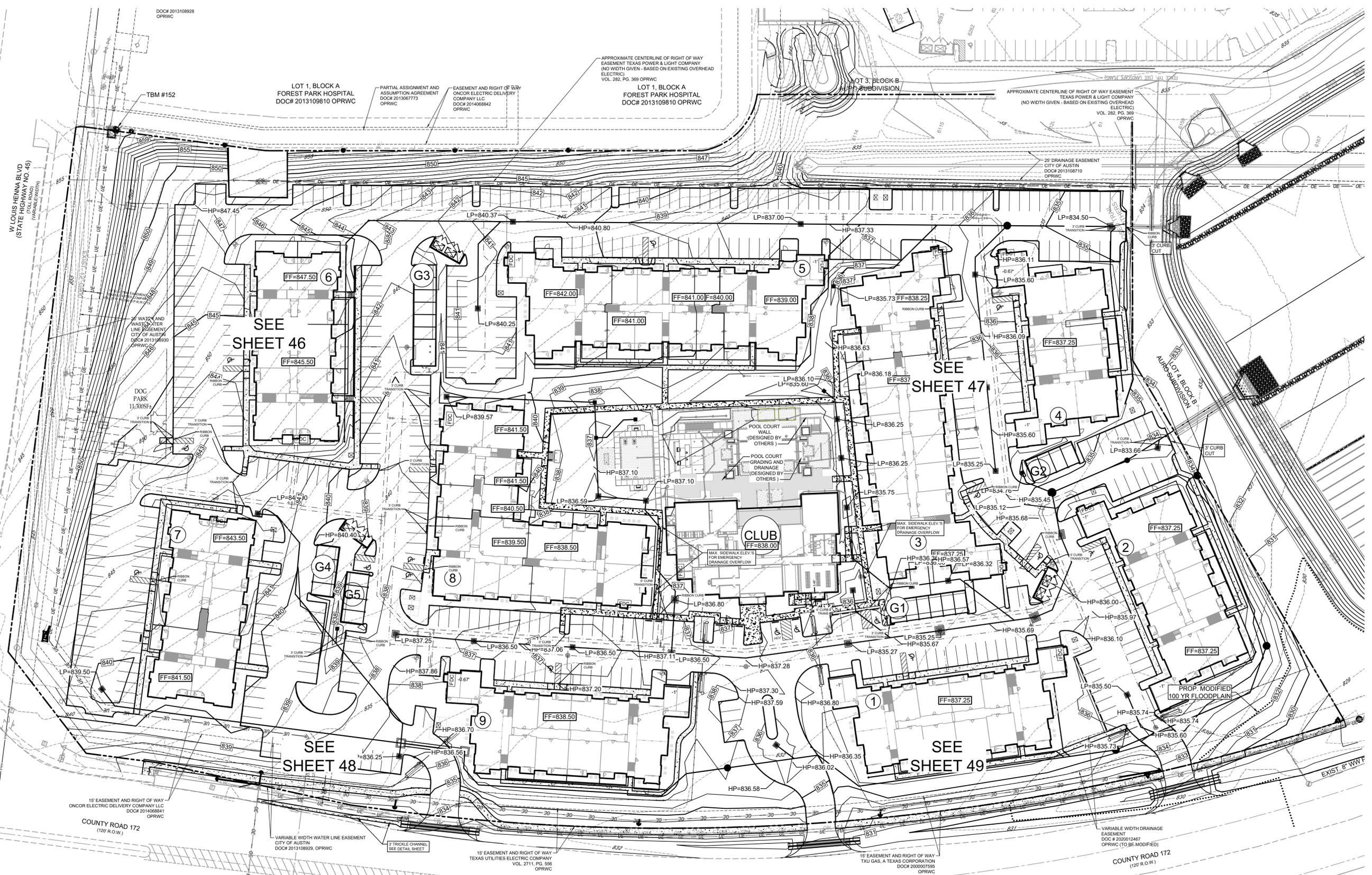
EASEMENT AND RIGHT OF WAY
ONCOR ELECTRIC DELIVERY
COMPANY LLC
DOC# 2014068842
OPRWC

APPROXIMATE CENTERLINE OF RIGHT OF WAY
EASEMENT TEXAS POWER & LIGHT COMPANY
(NO WIDTH GIVEN - BASED ON EXISTING OVERHEAD
ELECTRIC)
VOL. 282, PG. 369 OPRWC

LOT 1, BLOCK A
FOREST PARK HOSPITAL
DOC# 2013109810 OPRWC

LOT 3, BLOCK B
SUBDIVISION

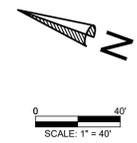
APPROXIMATE CENTERLINE OF RIGHT OF WAY EASEMENT
TEXAS POWER & LIGHT COMPANY
(NO WIDTH GIVEN - BASED ON EXISTING OVERHEAD
ELECTRIC)
VOL. 282, PG. 369
OPRWC



- LEGEND**
- PROP. PROPERTY LINE
 - - - - - EXIST. GROUND CONTOUR
 - 350 — PROP. FINISHED CONTOUR
 - 930.00 — PROP. ELEV. PAVEMENT
 - S930.00 — PROP. ELEV. SIDEWALK
 - G930.00 — PROP. ELEV. GROUND
 - T930.00 — PROP. ELEV. TOP OF CURB
 - PROP. STORM SEWER
 - PROP. GRATE INLET
 - PROP. WASTEWATER
 - PROP. WATER

NOTE:

- ALL SPOT ELEVATIONS ARE GROUND/PAVEMENT UNLESS NOTED OTHERWISE.
- WALL ELEVATIONS ARE FOR GRADING PURPOSES ONLY AND A STRUCTURAL DESIGN IS REQUIRED BY OTHERS.
- SEE SITE PLAN FOR CURB CUT LOCATIONS FOR DRAINAGE PURPOSES.



NO.	DATE	REVISION	BY

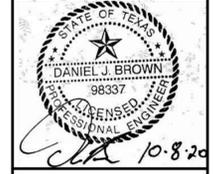
BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

OVERALL GRADING PLAN

MALONE WHEELER
SINCE INC. 1995

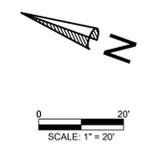
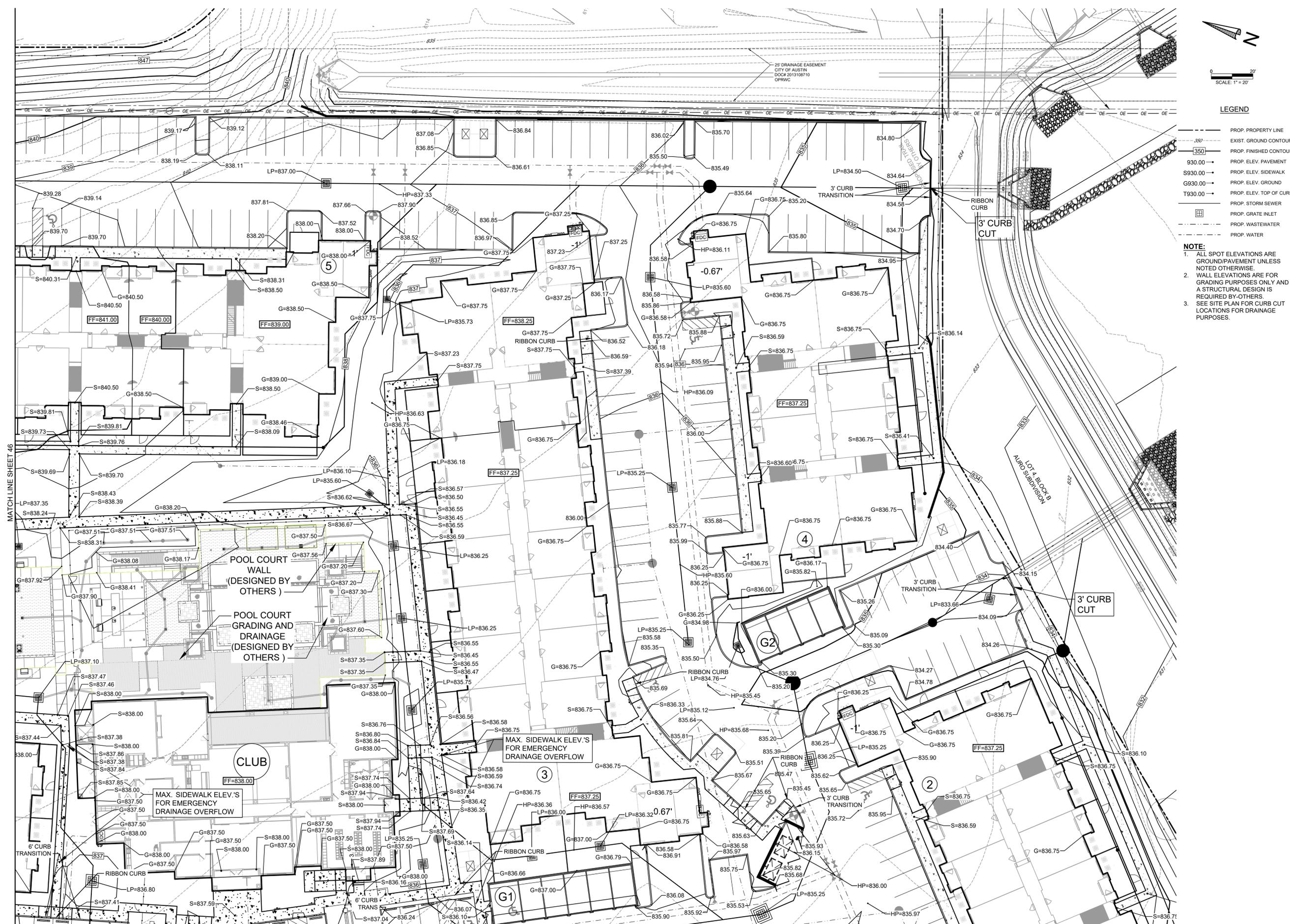
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 280
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

SHEET 45
OF 59



LEGEND

- PROP. PROPERTY LINE
- - - - - EXIST. GROUND CONTOUR
- 350 --- PROP. FINISHED CONTOUR
- 930.00 --- PROP. ELEV. PAVEMENT
- S930.00 --- PROP. ELEV. SIDEWALK
- G930.00 --- PROP. ELEV. GROUND
- T930.00 --- PROP. ELEV. TOP OF CURB
- PROP. STORM SEWER
- PROP. GRATE INLET
- PROP. WASTEWATER
- PROP. WATER

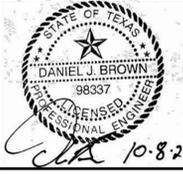
- NOTE:**
1. ALL SPOT ELEVATIONS ARE GROUND/PAVEMENT UNLESS NOTED OTHERWISE.
 2. WALL ELEVATIONS ARE FOR GRADING PURPOSES ONLY AND A STRUCTURAL DESIGN IS REQUIRED BY OTHERS.
 3. SEE SITE PLAN FOR CURB CUT LOCATIONS FOR DRAINAGE PURPOSES.

NO.	DATE	REVISION

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

DETAILED GRADING PLAN

MALONE WHEELER
SINCE INC. 1995
CIVIL ENGINEERING & DEVELOPMENT CONSULTING & PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 280
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/2/2020

SHEET 47
OF 59

F:\LaFrontera MF\Projects\19-021-AUS-La Frontera MF - Ph2\Drawings\Plans\Set49 GRADING PLAN 4.DWG, 10/8/2020, MW

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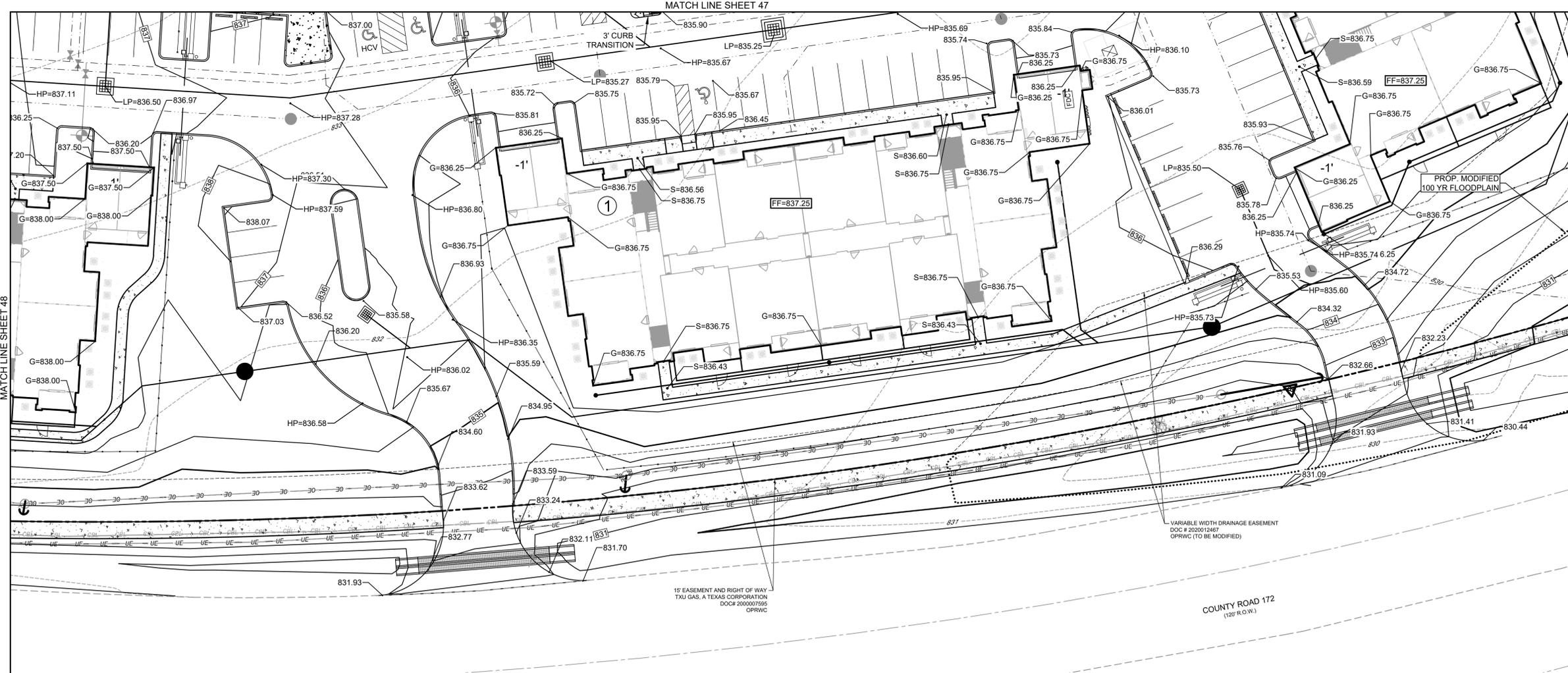


SCALE: 1" = 20'

LEGEND

- PROP. PROPERTY LINE
- - - - - EXIST. GROUND CONTOUR
- (350)--- PROP. FINISHED CONTOUR
- 930.00 → PROP. ELEV. PAVEMENT
- S930.00 → PROP. ELEV. SIDEWALK
- G930.00 → PROP. ELEV. GROUND
- T930.00 → PROP. ELEV. TOP OF CURB
- PROP. STORM SEWER
- PROP. WASTEWATER
- PROP. WATER

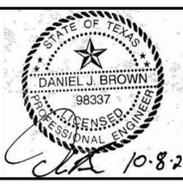
- NOTE:**
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BROADSTONE - LA FRONTERA PHASE 2
 3118 CR 172 ROUND ROCK, TEXAS 78681

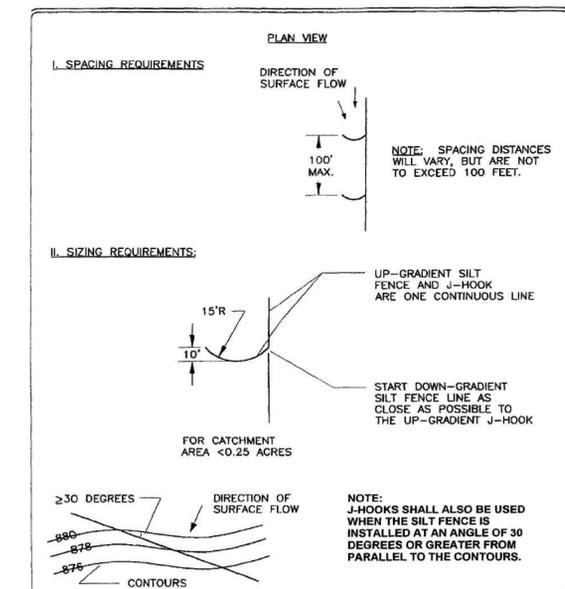
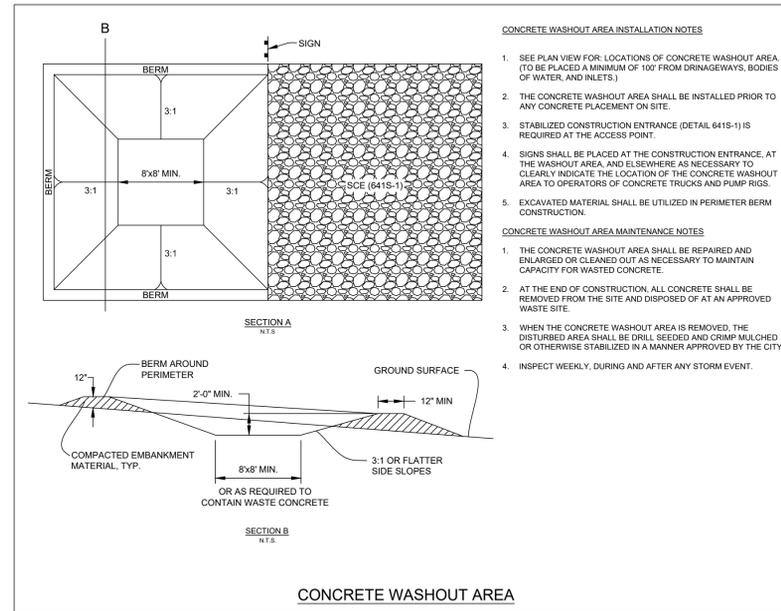
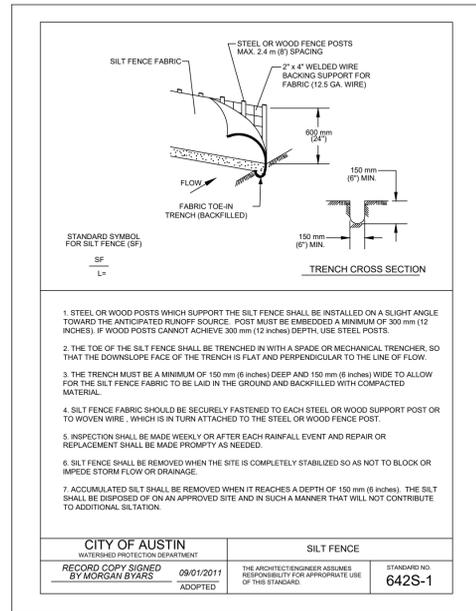
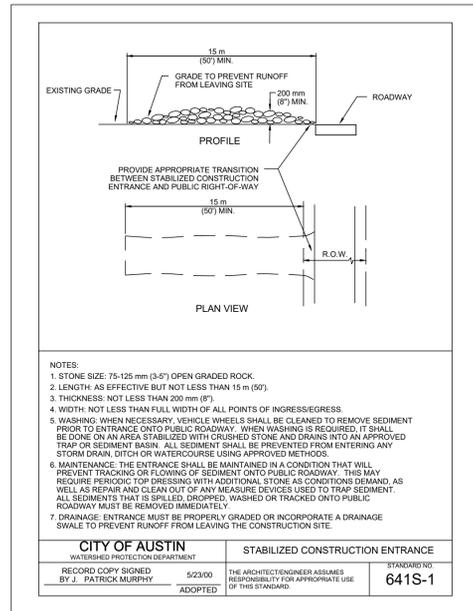
DETAILED GRADING PLAN

MALONE WHEELER
 SINCE INC. 1995
 CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
 5113 Southwest Pkwy, Suite 260
 Austin, Texas 78735
 Phone: (512) 899-0601 Fax: (512) 899-0655
 Firm Registration No. F-786



DESIGN BY: MV
 CHECKED BY: DB
 APPROVED BY: DB
 DATE: 10/2/2020

SHEET 49
 OF 59



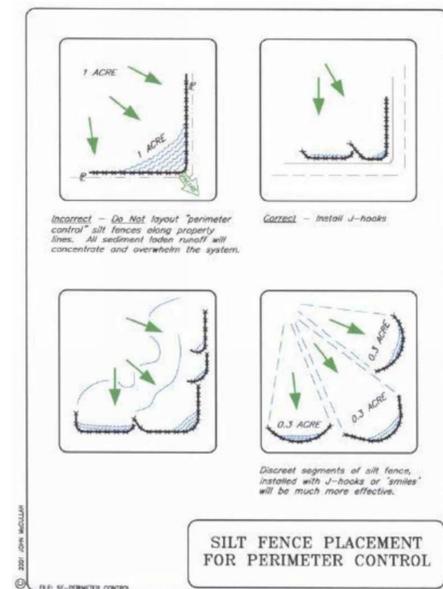
NOTES:

1. MATERIAL - THE FABRIC MUST CORRESPOND TO THE FOLLOWING REQUIREMENTS:

PROPERTY	TEST METHOD	ASTM	REQUIREMENTS
FABRIC WEIGHT	D 3778		≥ 3.0 OUNCES/SQUARE YARD PAD
ULTRAVIOLET (UV) RADIATION STABILITY	D 4355		70% STRENGTH RETAIN MIN. AFTER 500 HOURS IN XENON ARC DEVICE
MULLEN BURST STRENGTH	D 3786		≥ 120 POUND PER SQUARE INCH
WATER FLOW RATE	D 4491		≥ 275 GALLONS/MINUTE/SQUARE FEET

2. THIS MATERIAL SHOULD HAVE A MAXIMUM EXPECTED USEFUL LIFE OF APPROXIMATELY EIGHTEEN (18) MONTHS. THE INLET PROTECTION DEVICES SHOULD BE CONSTRUCTED IN A MANNER THAT PREVENTS CONSTRUCTION ACTIVITIES. THEY SHOULD ALSO BE CONSTRUCTED SUCH THAT ANY PONDING OF STORM WATER WILL NOT CAUSE EXCESSIVE OR FLOODING (IE. <4 INCHES OF STANDING WATER) OR DAMAGE TO THE STRUCTURE OR ADJACENT AREAS.
3. COVERAGE - THE FABRIC/WIRE SHOULD COMPLETELY COVER THE OPENING OF THE INLET AND DEVICES SHOULD BE INSTALLED WITHOUT PROTRUDING PARTS THAT COULD BE A TRAFFIC HAZARD OR FORESTRY HAZARD. WHERE SECTIONS OF THE FABRIC OVERLAP, THEY SHALL OVERLAP AT LEAST (3) INCHES.
4. THE INLET FILTER SHALL BE ATTACHED IN A WAY THAT THEY CAN EASILY BE REMOVED AND ARE NOT SECURED OR ATTACHED BY THE USE OF SAND BAGS. THE INLET FILTER MUST BE REMOVED UPON COMPLETION OF WORK. IF REMOVAL DAMAGES THE CONCRETE CURB, THE CURB MUST BE REPAIRED IMMEDIATELY.
5. DAILY INSPECTION SHALL BE MADE BY THE CONTRACTOR AND SILT ACCUMULATIONS MUST BE REMOVED WHEN THE DEPTH REACHES 50 MM (2 INCHES) OR ONE THIRD THE HEIGHT OF THE INLET THROAT, AND DISPOSED OF IN A MANNER WHICH WILL NOT CAUSE ADDITIONAL SILTATION.
6. CONTRACTOR SHALL MONITOR THE PERFORMANCE OF INLET PROTECTION DURING EACH RAINFALL EVENT AND IMMEDIATELY REMOVE THE INLET PROTECTION IF THE STORMWATER BEGINS TO OVERFLOW THE CURB.
7. INLET PROTECTIONS SHALL BE REMOVED AS SOON AS THE SOURCE OF SEDIMENT HAS ACHIEVED FINAL STABILIZATION CONDITIONS.

CITY OF AUSTIN WATERSHED PROTECTION DEPARTMENT		FILTER DIKE CURB INLET PROTECTION	
RECORD COPY SIGNED BY MARI VIGOR	10/30/09	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 628S-2



NO.	DATE	REVISION	BY

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

EROSION CONTROL DETAILS

MALONE WHEELER
SINCE INC., 1995

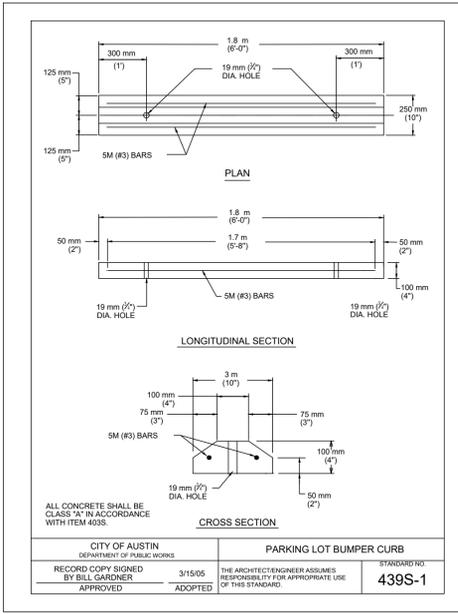
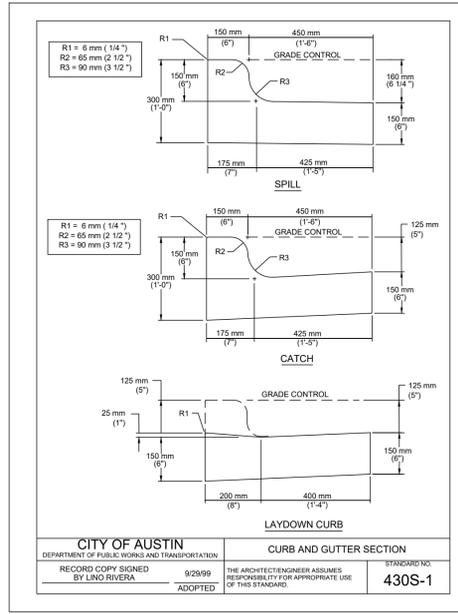
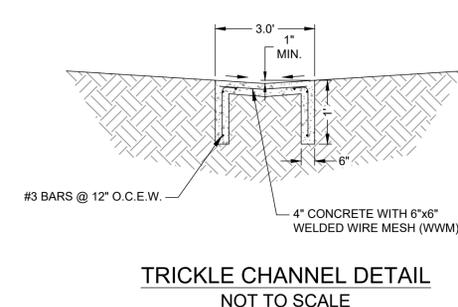
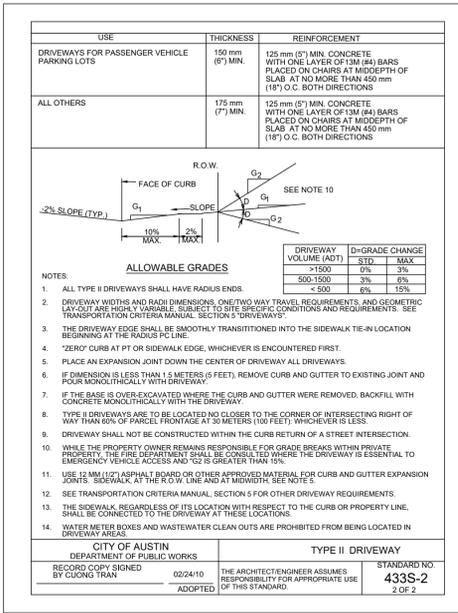
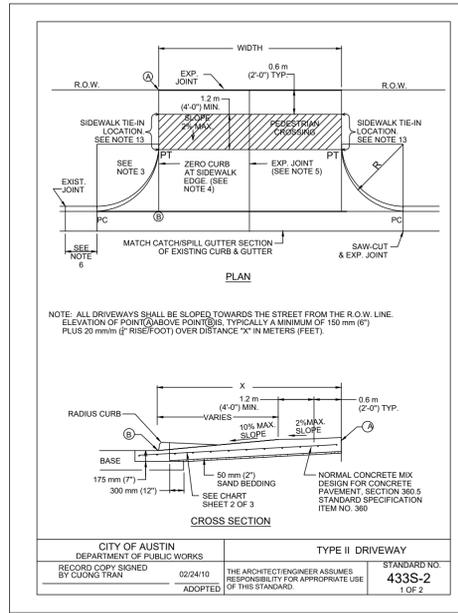
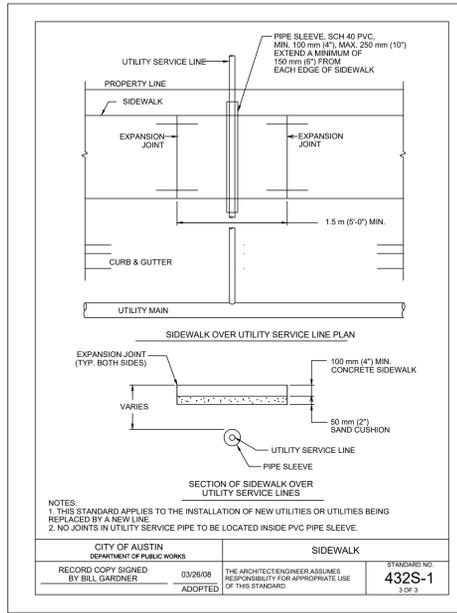
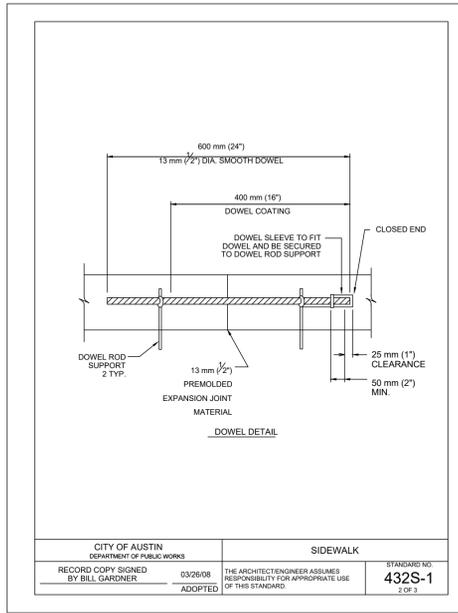
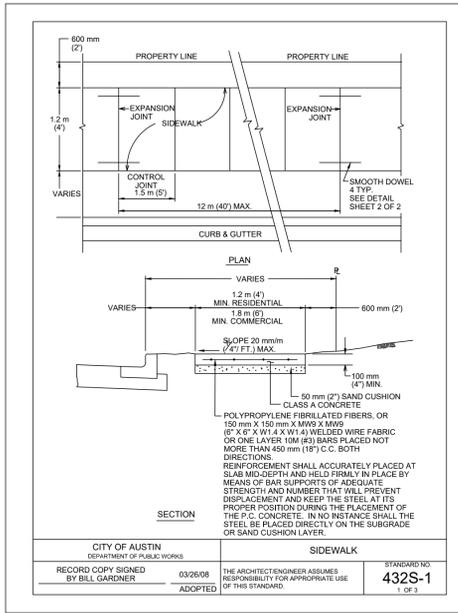
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 280
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

STATE OF TEXAS
DANIEL J. BROWN
98337
LICENSED PROFESSIONAL ENGINEER

DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020

SHEET 51 OF 59



NO.	DATE	REVISION

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

PAVING DETAILS

MALONE WHEELER
SINCE INC. 1995

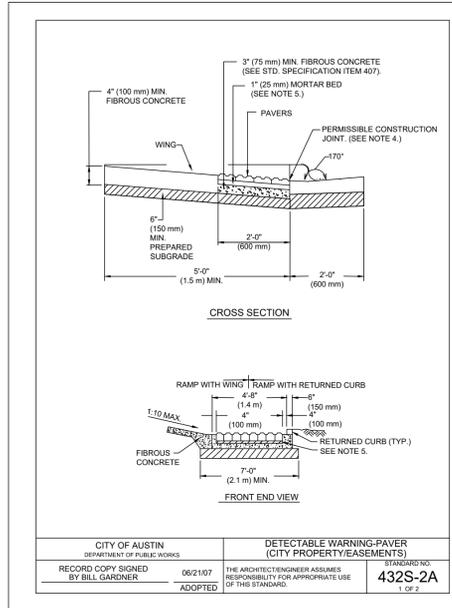
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786

STATE OF TEXAS
DANIEL J. BROWN
98337
LICENSED PROFESSIONAL ENGINEER

DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020

SHEET 52
OF 59

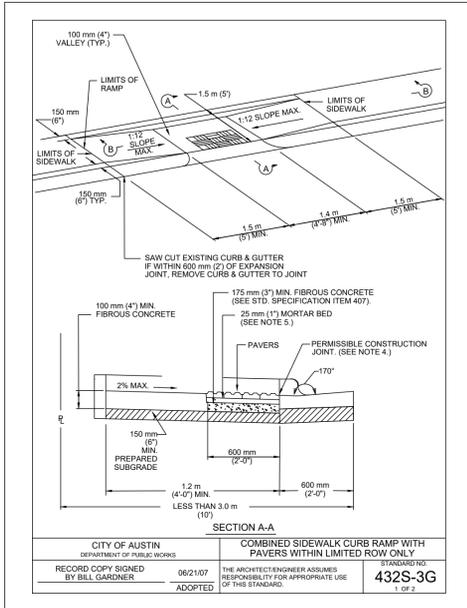


CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	DETECTABLE WARNING-PAVER (CITY PROPERTY/EASEMENTS)	STANDARD NO. 432S-2A
RECORD COPY SIGNED BY BILL GARDNER	06/21/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
		1 OF 2

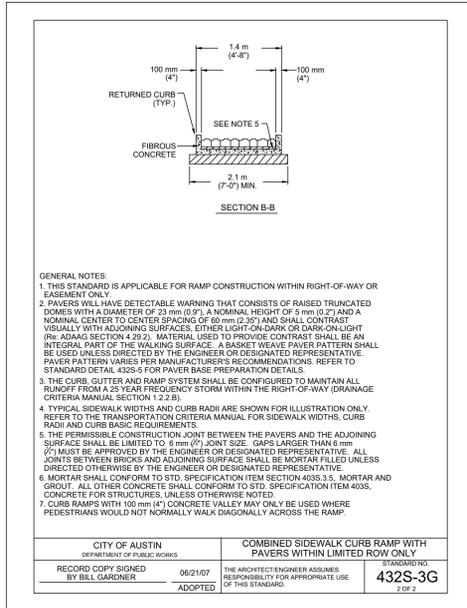
GENERAL NOTES:

- THIS STANDARD IS APPLICABLE FOR RAMP CONSTRUCTION ON CITY PROPERTY AND EASEMENT AREAS ONLY.
- PAVERS ARE REQUIRED FOR ALL CURB RAMP INSTALLATIONS.
- PAVERS WILL HAVE DETECTABLE WARNING THAT CONSISTS OF RAISED TRUNCATED DOMES WITH A DIAMETER OF 3/8" (9.5 MM), A NOMINAL HEIGHT OF 0.2" (5 MM) AND A NOMINAL CENTER TO CENTER SPACING OF 2.35" (59.5 MM) AND SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES. EITHER LIGHT ON DARK OR DARK ON LIGHT (REF. ADRAG SECTION 4.29.2). MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. PAVES PATTERN SHALL BE BASKET WEAVE UNLESS DIRECTED OTHERWISE BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.
- TYPICAL SIDEWALK WIDTHS AND CURB RADII ARE SHOWN FOR ILLUSTRATION ONLY. REFER TO THE TRANSPORTATION CRITERIA MANUAL FOR SIDEWALK WIDTHS, CURB RADII AND CURB BASIS.
- THE PERMISSIBLE CONSTRUCTION JOINT BETWEEN THE PAVERS AND THE ADJOINING SURFACE SHALL BE LIMITED TO 2" (50 MM) JOINT SIZE. GAPS LARGER THAN 2" (50 MM) MUST BE APPROVED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. ALL JOINTS BETWEEN BRICKS AND ADJOINING SURFACE SHALL BE MORTAR FILLED UNLESS DIRECTED OTHERWISE BY THE ENGINEER OR DESIGNATED REPRESENTATIVE.
- MORTAR SHALL CONFORM TO STD. SPECIFICATION ITEM SECTION 403S.3.5, MORTAR AND GROUT. ALL OTHER CONCRETE SHALL CONFORM TO STD. SPECIFICATION ITEM 403S. CONCRETE FOR STRUCTURES, UNLESS OTHERWISE NOTED.
- CURB RAMPS WITH RETURNED CURB MAY ONLY BE USED WHERE PEDESTRIANS WOULD NOT NORMALLY WALK DIAGONALLY ACROSS THE RAMP.

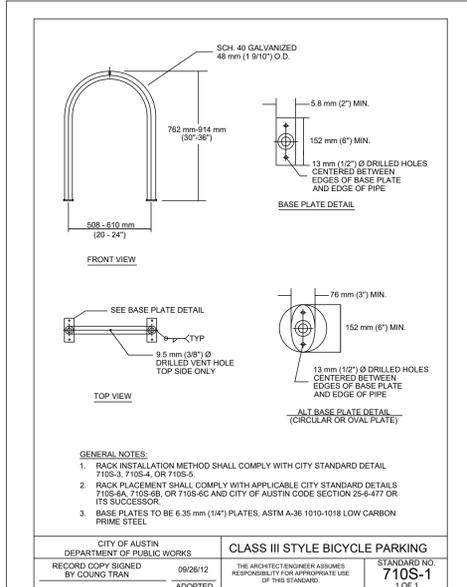
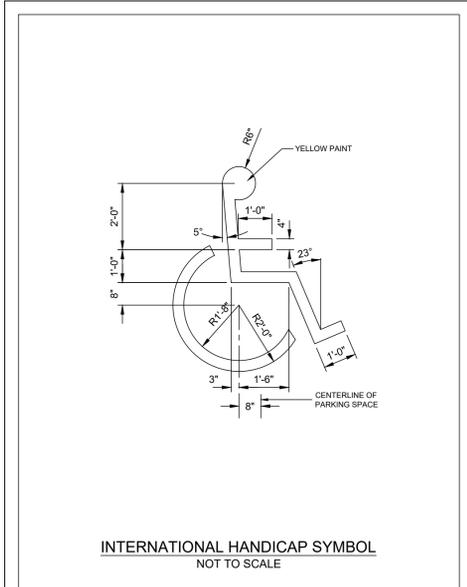
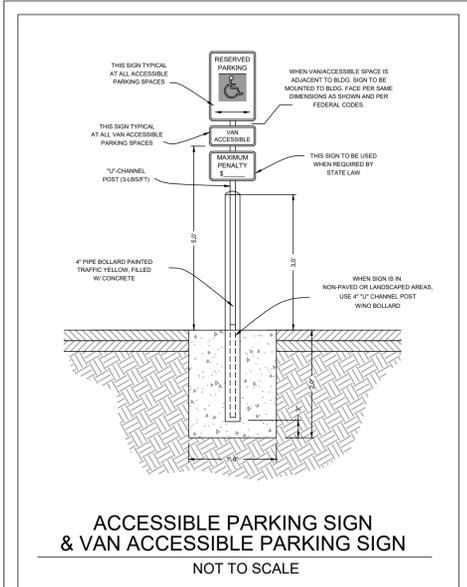
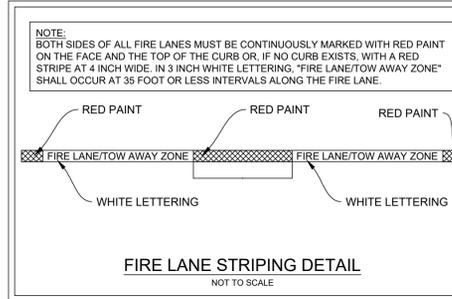
CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	DETECTABLE WARNING-PAVER (CITY PROPERTY/EASEMENTS)	STANDARD NO. 432S-2A
RECORD COPY SIGNED BY BILL GARDNER	06/21/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
		2 OF 2



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	COMBINED SIDEWALK CURB RAMP WITH PAVERS WITHIN LIMITED ROW ONLY	STANDARD NO. 432S-3G
RECORD COPY SIGNED BY BILL GARDNER	06/21/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
		1 OF 2



CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	COMBINED SIDEWALK CURB RAMP WITH PAVERS WITHIN LIMITED ROW ONLY	STANDARD NO. 432S-3G
RECORD COPY SIGNED BY BILL GARDNER	06/21/07 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
		2 OF 2

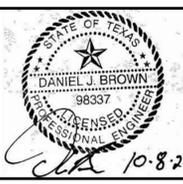


CITY OF AUSTIN DEPARTMENT OF PUBLIC WORKS	CLASS III STYLE BICYCLE PARKING	STANDARD NO. 710S-1
RECORD COPY SIGNED BY COUNG TRAN	09/26/12 ADOPTED	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.
		1 OF 1

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

PAVING DETAILS

MALONE WHEELER
SINCE INC. 1995
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020

SHEET 53
OF 59

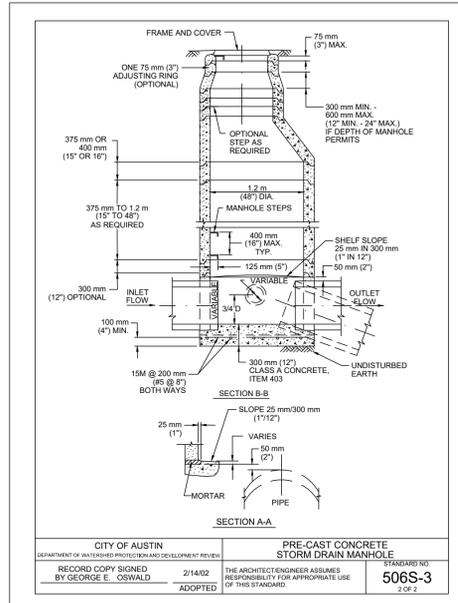
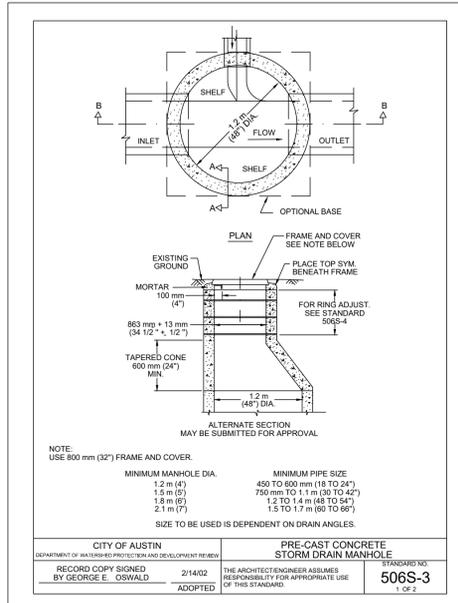
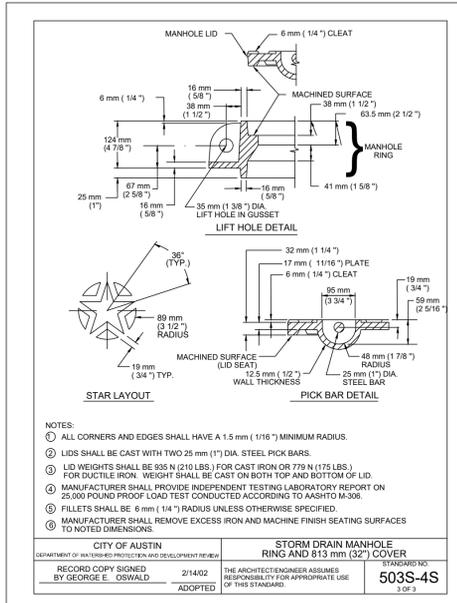
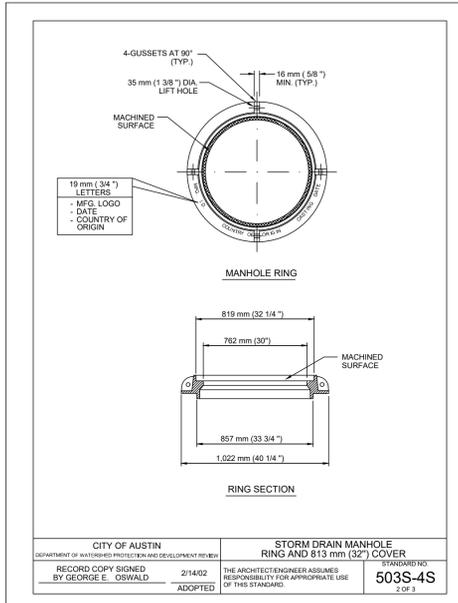
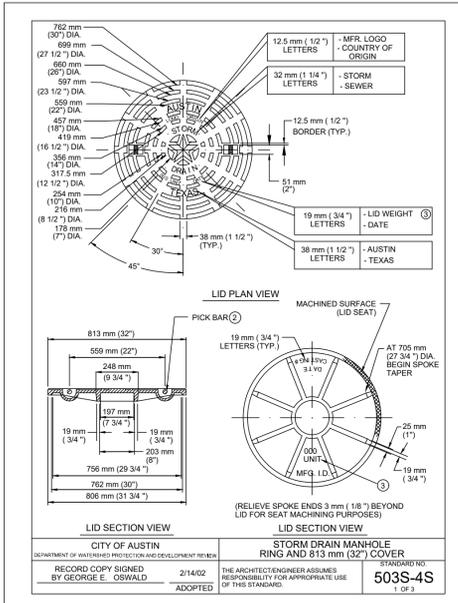


TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL

Values for one Pipe

SIZE (mm)	W	X	Y	L	Reinforcing Steel (mm)	Reinforcing Steel (mm)	Reinforcing Steel (mm)	Reinforcing Steel (mm)	
12"	4'-1 1/2"	2'-6"	2'-10 1/2"	3'-3 3/4"	84	0.8	1'-9"	20	0.2
15"	5'-5 3/4"	3'-7 1/2"	3'-10 1/2"	4'-5"	120	0.9	2'-8"	32	0.3
18"	6'-4 1/2"	4'-8 1/2"	4'-11 1/2"	5'-7 1/2"	137	1.1	3'-5"	43	0.4
21"	7'-3 1/2"	5'-9 1/2"	6'-2 1/2"	7'-0 1/2"	154	1.3	4'-2 1/2"	50	0.5
24"	8'-2 1/2"	6'-10 1/2"	7'-3 1/2"	8'-3 1/2"	171	1.5	5'-0"	56	0.6
27"	9'-1 1/2"	7'-11 1/2"	8'-4 1/2"	9'-7 1/2"	188	1.7	5'-8 1/2"	63	0.7
30"	10'-0 1/2"	8'-12 1/2"	9'-5 1/2"	10'-10 1/2"	205	1.9	6'-6 1/2"	70	0.8
33"	10'-10 1/2"	9'-1 1/2"	10'-6 1/2"	11'-9 1/2"	222	2.1	7'-4 1/2"	77	0.9
36"	11'-8 1/2"	10'-11 1/2"	11'-7 1/2"	12'-8 1/2"	239	2.3	8'-2 1/2"	84	1.0
42"	13'-7 1/2"	13'-0 1/2"	14'-9 1/2"	16'-0 1/2"	294	2.8	10'-0"	97	1.3
48"	15'-6 1/2"	15'-0 1/2"	16'-10 1/2"	18'-3 1/2"	350	3.4	11'-8 1/2"	111	1.7
54"	17'-5 1/2"	16'-8 1/2"	18'-11 1/2"	20'-6 1/2"	406	4.0	13'-6 1/2"	125	2.1
60"	19'-4 1/2"	17'-6 1/2"	19'-10 1/2"	22'-9 1/2"	462	4.6	15'-4 1/2"	139	2.5
66"	21'-3 1/2"	18'-4 1/2"	21'-2 1/2"	24'-2 1/2"	518	5.2	17'-2 1/2"	153	2.9
72"	23'-2 1/2"	19'-2 1/2"	23'-0 1/2"	26'-0 1/2"	574	5.8	19'-0 1/2"	167	3.3
78"	25'-1 1/2"	20'-0 1/2"	24'-8 1/2"	27'-8 1/2"	630	6.4	20'-8 1/2"	181	3.7
84"	27'-0 1/2"	20'-8 1/2"	25'-6 1/2"	29'-6 1/2"	686	7.0	22'-6 1/2"	195	4.1
90"	28'-8 1/2"	21'-6 1/2"	26'-4 1/2"	31'-4 1/2"	742	7.6	24'-4 1/2"	209	4.5
96"	30'-7 1/2"	22'-4 1/2"	27'-2 1/2"	33'-2 1/2"	798	8.2	26'-2 1/2"	223	4.9
102"	32'-6 1/2"	23'-2 1/2"	28'-0 1/2"	35'-0 1/2"	854	8.8	28'-0 1/2"	237	5.3
108"	34'-5 1/2"	24'-0 1/2"	28'-8 1/2"	36'-8 1/2"	910	9.4	29'-8 1/2"	251	5.7
114"	36'-4 1/2"	24'-8 1/2"	29'-6 1/2"	38'-6 1/2"	966	10.0	31'-6 1/2"	265	6.1
120"	38'-3 1/2"	25'-6 1/2"	30'-4 1/2"	40'-4 1/2"	1022	10.6	33'-4 1/2"	279	6.5
126"	40'-2 1/2"	26'-4 1/2"	31'-2 1/2"	42'-2 1/2"	1078	11.2	35'-2 1/2"	293	6.9
132"	42'-1 1/2"	27'-2 1/2"	32'-0 1/2"	44'-0 1/2"	1134	11.8	37'-0 1/2"	307	7.3
138"	44'-0 1/2"	28'-0 1/2"	32'-8 1/2"	45'-8 1/2"	1190	12.4	38'-8 1/2"	321	7.7
144"	45'-8 1/2"	28'-8 1/2"	33'-6 1/2"	47'-6 1/2"	1246	13.0	40'-6 1/2"	335	8.1
150"	47'-7 1/2"	29'-6 1/2"	34'-4 1/2"	49'-4 1/2"	1302	13.6	42'-4 1/2"	349	8.5
156"	49'-6 1/2"	30'-4 1/2"	35'-2 1/2"	51'-2 1/2"	1358	14.2	44'-2 1/2"	363	8.9
162"	51'-5 1/2"	31'-2 1/2"	36'-0 1/2"	53'-0 1/2"	1414	14.8	46'-0 1/2"	377	9.3
168"	53'-4 1/2"	32'-0 1/2"	36'-8 1/2"	54'-8 1/2"	1470	15.4	47'-8 1/2"	391	9.7
174"	55'-3 1/2"	32'-8 1/2"	37'-6 1/2"	56'-6 1/2"	1526	16.0	49'-6 1/2"	405	10.1
180"	57'-2 1/2"	33'-6 1/2"	38'-4 1/2"	58'-4 1/2"	1582	16.6	51'-4 1/2"	419	10.5
186"	59'-1 1/2"	34'-4 1/2"	39'-2 1/2"	60'-2 1/2"	1638	17.2	53'-2 1/2"	433	10.9
192"	61'-0 1/2"	35'-2 1/2"	40'-0 1/2"	62'-0 1/2"	1694	17.8	55'-0 1/2"	447	11.3
198"	62'-8 1/2"	36'-0 1/2"	40'-8 1/2"	63'-8 1/2"	1750	18.4	56'-8 1/2"	461	11.7
204"	64'-7 1/2"	36'-8 1/2"	41'-6 1/2"	65'-6 1/2"	1806	19.0	58'-6 1/2"	475	12.1
210"	66'-6 1/2"	37'-6 1/2"	42'-4 1/2"	67'-4 1/2"	1862	19.6	60'-4 1/2"	489	12.5
216"	68'-5 1/2"	38'-4 1/2"	43'-2 1/2"	69'-2 1/2"	1918	20.2	62'-2 1/2"	503	12.9
222"	70'-4 1/2"	39'-2 1/2"	44'-0 1/2"	71'-0 1/2"	1974	20.8	64'-0 1/2"	517	13.3
228"	72'-3 1/2"	40'-0 1/2"	44'-8 1/2"	72'-8 1/2"	2030	21.4	65'-8 1/2"	531	13.7
234"	74'-2 1/2"	40'-8 1/2"	45'-6 1/2"	74'-6 1/2"	2086	22.0	67'-6 1/2"	545	14.1
240"	76'-1 1/2"	41'-6 1/2"	46'-4 1/2"	76'-4 1/2"	2142	22.6	69'-4 1/2"	559	14.5
246"	78'-0 1/2"	42'-4 1/2"	47'-2 1/2"	78'-2 1/2"	2198	23.2	71'-2 1/2"	573	14.9
252"	79'-8 1/2"	43'-2 1/2"	48'-0 1/2"	80'-0 1/2"	2254	23.8	73'-0 1/2"	587	15.3
258"	81'-7 1/2"	44'-0 1/2"	48'-8 1/2"	81'-8 1/2"	2310	24.4	74'-8 1/2"	601	15.7
264"	83'-6 1/2"	44'-8 1/2"	49'-6 1/2"	83'-6 1/2"	2366	25.0	76'-6 1/2"	615	16.1
270"	85'-5 1/2"	45'-6 1/2"	50'-4 1/2"	85'-4 1/2"	2422	25.6	78'-4 1/2"	629	16.5
276"	87'-4 1/2"	46'-4 1/2"	51'-2 1/2"	87'-2 1/2"	2478	26.2	80'-2 1/2"	643	16.9
282"	89'-3 1/2"	47'-2 1/2"	52'-0 1/2"	89'-0 1/2"	2534	26.8	82'-0 1/2"	657	17.3
288"	91'-2 1/2"	48'-0 1/2"	52'-8 1/2"	90'-8 1/2"	2590	27.4	83'-8 1/2"	671	17.7
294"	93'-1 1/2"	48'-8 1/2"	53'-6 1/2"	92'-6 1/2"	2646	28.0	85'-6 1/2"	685	18.1
300"	95'-0 1/2"	49'-6 1/2"	54'-4 1/2"	94'-4 1/2"	2702	28.6	87'-4 1/2"	699	18.5
306"	96'-8 1/2"	50'-4 1/2"	55'-2 1/2"	96'-2 1/2"	2758	29.2	89'-2 1/2"	713	18.9
312"	98'-7 1/2"	51'-2 1/2"	56'-0 1/2"	98'-0 1/2"	2814	29.8	91'-0 1/2"	727	19.3
318"	100'-6 1/2"	52'-0 1/2"	56'-8 1/2"	99'-8 1/2"	2870	30.4	92'-8 1/2"	741	19.7
324"	102'-5 1/2"	52'-8 1/2"	57'-6 1/2"	101'-6 1/2"	2926	31.0	94'-6 1/2"	755	20.1
330"	104'-4 1/2"	53'-6 1/2"	58'-4 1/2"	103'-4 1/2"	2982	31.6	96'-4 1/2"	769	20.5
336"	106'-3 1/2"	54'-4 1/2"	59'-2 1/2"	105'-2 1/2"	3038	32.2	98'-2 1/2"	783	20.9
342"	108'-2 1/2"	55'-2 1/2"	60'-0 1/2"	107'-0 1/2"	3094	32.8	100'-0 1/2"	797	21.3
348"	110'-1 1/2"	56'-0 1/2"	60'-8 1/2"	108'-8 1/2"	3150	33.4	101'-8 1/2"	811	21.7
354"	112'-0 1/2"	56'-8 1/2"	61'-6 1/2"	110'-6 1/2"	3206	34.0	103'-6 1/2"	825	22.1
360"	113'-8 1/2"	57'-6 1/2"	62'-4 1/2"	112'-4 1/2"	3262	34.6	105'-4 1/2"	839	22.5
366"	115'-7 1/2"	58'-4 1/2"	63'-2 1/2"	114'-2 1/2"	3318	35.2	107'-2 1/2"	853	22.9
372"	117'-6 1/2"	59'-2 1/2"	64'-0 1/2"	116'-0 1/2"	3374	35.8	109'-0 1/2"	867	23.3
378"	119'-5 1/2"	60'-0 1/2"	64'-8 1/2"	117'-8 1/2"	3430	36.4	110'-8 1/2"	881	23.7
384"	121'-4 1/2"	60'-8 1/2"	65'-6 1/2"	119'-6 1/2"	3486	37.0	112'-6 1/2"	895	24.1
390"	123'-3 1/2"	61'-6 1/2"	66'-4 1/2"	121'-4 1/2"	3542	37.6	114'-4 1/2"	909	24.5
396"	125'-2 1/2"	62'-4 1/2"	67'-2 1/2"	123'-2 1/2"	3598	38.2	116'-2 1/2"	923	24.9
402"	127'-1 1/2"	63'-2 1/2"	68'-0 1/2"	125'-0 1/2"	3654	38.8	118'-0 1/2"	937	25.3
408"	129'-0 1/2"	64'-0 1/2"	68'-8 1/2"	126'-8 1/2"	3710	39.4	119'-8 1/2"	951	25.7
414"	130'-8 1/2"	64'-8 1/2"	69'-6 1/2"	128'-6 1/2"	3766	40.0	121'-6 1/2"	965	26.1
420"	132'-7 1/2"	65'-6 1/2"	70'-4 1/2"	130'-4 1/2"	3822	40.6	123'-4 1/2"	979	26.5
426"	134'-6 1/2"	66'-4 1/2"	71'-2 1/2"	132'-2 1/2"	3878	41.2	125'-2 1/2"	993	26.9
432"	136'-5 1/2"	67'-2 1/2"	72'-0 1/2"	134'-0 1/2"	3934	41.8	127'-0 1/2"	1007	27.3
438"	138'-4 1/2"	68'-0 1/2"	72'-8 1/2"	135'-8 1/2"	3990	42.4	128'-8 1/2"	1021	27.7
444"	140'-3 1/2"	68'-8 1/2"	73'-6 1/2"	137'-6 1/2"	4046	43.0	130'-6 1/2"	1035	28.1
450"	142'-2 1/2"	69'-6 1/2"	74'-4 1/2"	139'-4 1/2"	4102	43.6	132'-4 1/2"	1049	28.5
456"	144'-1 1/2"	70'-4 1/2"	75'-2 1/2"	141'-2 1/2"	4158	44.2	134'-2 1/2"	1063	28.9
462"	146'-0 1/2"	71'-2 1/2"	76'-0 1/2"	143'-0 1/2"	4214	44.8	136'-0 1/2"	1077	29.3
468"	147'-8 1/2"	72'-0 1/2"	76'-8 1/2"	144'-8 1/2"	4270	45.4	137'-8 1/2"	1091	29.7
474"	149'-7 1/2"	72'-8 1/2"	77'-6 1/2"	146'-6 1/2"	4326	46.0	139'-6 1/2"	1105	30.1
480"	151'-6 1/2"	73'-6 1/2"	78'-4 1/2"	148'-4 1/2"	4382	46.6	141'-4 1/2"	1119	30.5
486"	153'-5 1/2"	74'-4 1/2"	79'-2 1/2"	150'-2 1/2"	4438	47.2	143'-2 1/2"	1133	30.9
492"	155'-4 1/2"	75'-2 1/2"	80'-0 1/2"	152'-0 1/2"	4494	47.8	145'-0 1/2"	1147	31.3
498"	157'-3 1/2"	76'-0 1/2"	80'-8 1/2"	153'-8 1/2"	4550	48.4	146'-8 1/2"	1161	31.7
504"	159'-2 1/2"	76'-8 1/2"	81'-6 1/2"	155'-6 1/2"	4606	49.0	148'-6 1/2"	1175	32.1
510"	161'-1 1/2"	77'-6 1/2"	82'-4 1/2"	157'-4 1/2"	4662	49.6	150'-4 1/2"	1189	32.5
516"	163'-0 1/2"	78'-4 1/2"	83'-2 1/2"	159'-2 1/2"	4718	50.2	152'-2 1/2"	1203	32.9
522"	164'-8 1/2"	79'-2 1/2"	84'-0 1/2"	161'-0 1/2"	4774	50.8	154'-0 1/2"	1217	33.3
528"	166'-7 1/2"	80'-0 1/2"	84'-8 1/2"	162'-8 1/2"	4830	51.4	155'-8 1/2"	1231	33.7
534"	168'-6 1/2"	80'-8 1/2"	85'-6 1/2"	164'-6 1/2"	4886	52.0	157'-6 1/2"	1245	34.1
540"	170'-5 1/2"	81'-6 1/2"	86'-4 1/2"	166'-4 1/2"	4942	52.6	159'-4 1/2"	1259	34.5
546"	172'-4 1/2"	82'-4 1/2"	87'-2 1/2"	168'-2 1/2"	4998	53.2	161'-2 1/2"	1273	34.9
552"	174'-3 1/2"	83'-2 1/2"	88'-0 1/2"	170'-0 1/2"	5054	53.8	163'-0 1/2"	1287	35.3
558"	176'-2 1/2"	84'-0 1/2"	88'-8 1/2"	171'-8 1/2"	5110	54.4	164'-8 1/2"	1301	35.7
564"	178'-1 1/2"	84'-8 1/2"	89'-6 1/2"	173'-6 1/2"	5166	55.0	166'-6 1/2"	1315	36.1
570"	180'-0 1/2"	85'-6 1/2"	90'-4 1/2"	175'-4 1/2"	5222	55.6	168'-4 1/2"	1329	36.5
576"	181'-8 1/2"	86'-4 1/2"	91'-2 1/2"</						

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER
(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

ISOMETRIC VIEW OF TYPICAL INSTALLATION

SIDE ELEVATION OF CAST-IN-PLACE CONCRETE
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

SECTION A-A
SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION B-B
(Cross pipes not shown for clarity.)

SECTION C-C
CROSS PIPE DETAILS

SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR

SECTION A-A
SHOWING CROSS PIPE WITH BOLTED ANCHOR

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY)(6)	Pipe Culvert Spa - G	Single Barrel - 01	Multi-Barrel - 01	02	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0'-9"	N/A	2'-1"	1'-9"	3 or more pipe culverts	3" Std (3,500' O.D.)
15"	0.7	0'-11"	N/A	2'-5"	2'-2"		
18"	0.8	1'-2"	N/A	2'-10"	2'-8"		
21"	0.9	1'-4"	N/A	3'-2"	3'-1"		
24"	0.9	1'-7"	N/A	3'-6"	3'-2"	3 or more pipe culverts	3 1/2" Std (4,000' O.D.)
27"	1.0	1'-8"	N/A	3'-10"	3'-11"		
30"	1.1	1'-10"	N/A	4'-2"	4'-4"		
33"	1.2	1'-11"	4'-2"	4'-5"	4'-8"		
36"	1.3	2'-1"	4'-5"	4'-9"	5'-1"	All pipe culverts	4" Std (4,500' O.D.)
42"	1.5	2'-4"	4'-11"	5'-5"	5'-10"		
48"	1.7	2'-7"	5'-5"	6'-0"	6'-2"		
54"	2.0	3'-0"	5'-11"	6'-9"	7'-0"		
60"	2.2	3'-3"	6'-5"	7'-4"	8'-3"	All pipe culverts	5" Std (5,563' O.D.)
66"	2.4	3'-3"	6'-11"	7'-10"	8'-9"		
72"	2.7	3'-4"	7'-5"	8'-5"	9'-4"		

① The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
 ② Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
 ③ Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
 ④ Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
 ⑤ Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
 ⑥ Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:
 Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
 Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, or B), ASTM A500 (Gr B), or API 5LX52.
 Provide ASTM A307 bolts and nuts.
 Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:
 Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 300-2r, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.
 Safety end treatments (SET) shown herein are intended for use in those installations where out-of-control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.
 Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".
 Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

TEXAS DEPARTMENT OF TRANSPORTATION Bridge Division Standard

SAFETY END TREATMENT FOR 12" DIA TO 72" DIA PIPE CULVERTS TYPE II - PARALLEL DRAINAGE

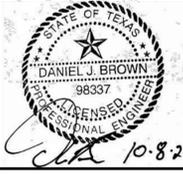
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REV	DESCRIPTION	DATE	BY	CHECKED
01	ISSUED FOR CONSTRUCTION	10/1/2020	MW	DB

BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

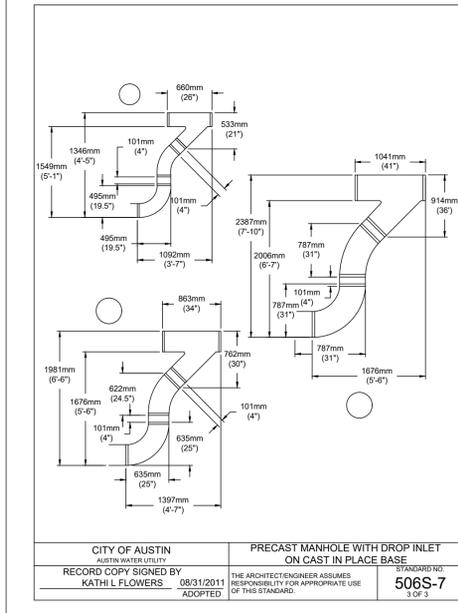
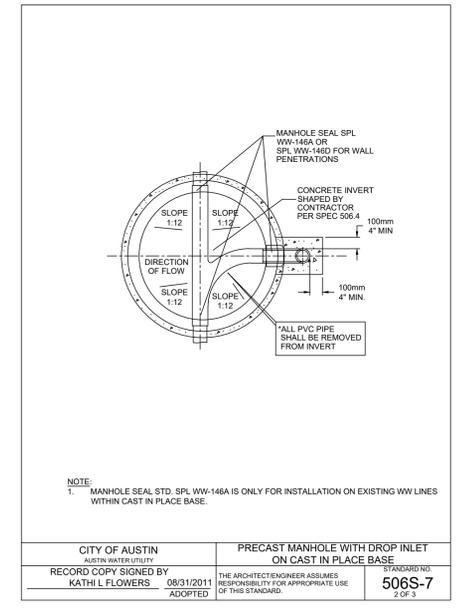
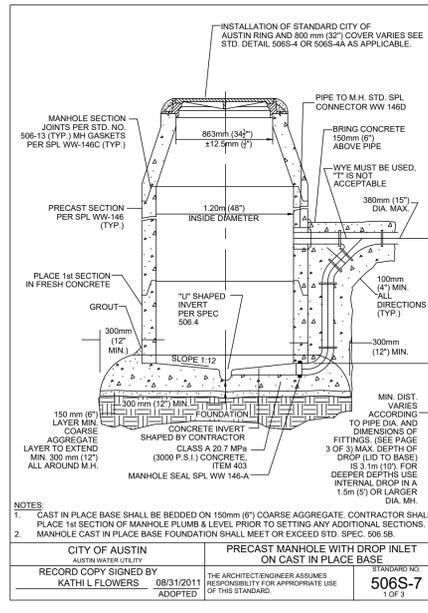
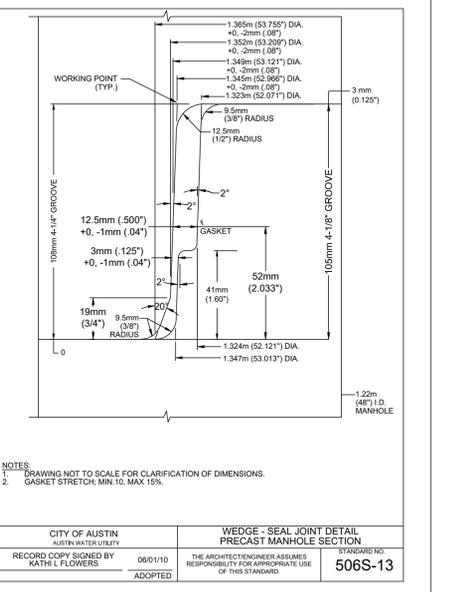
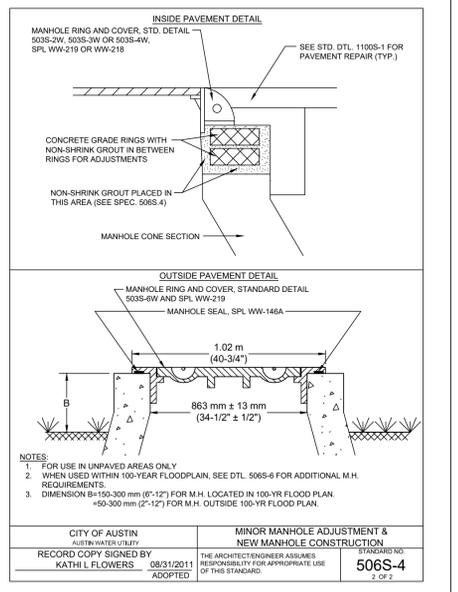
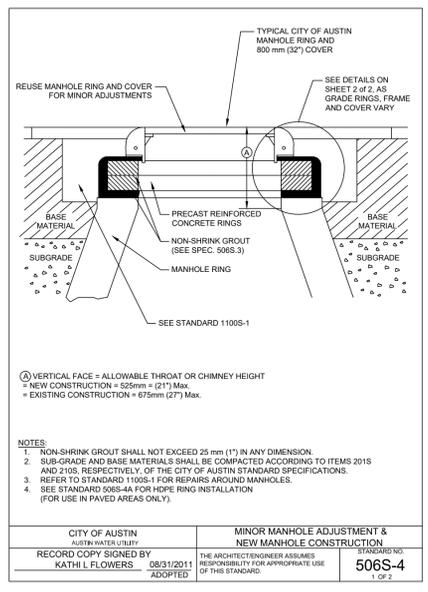
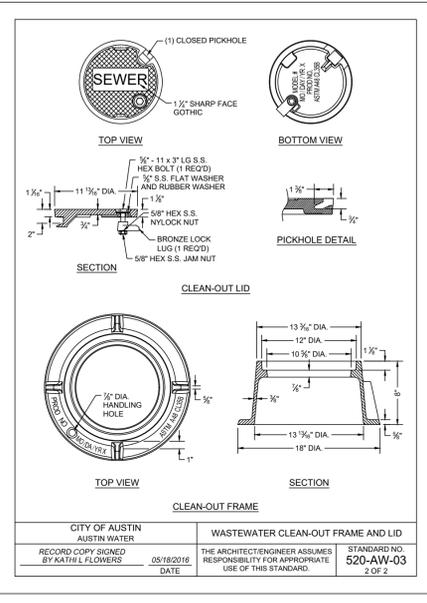
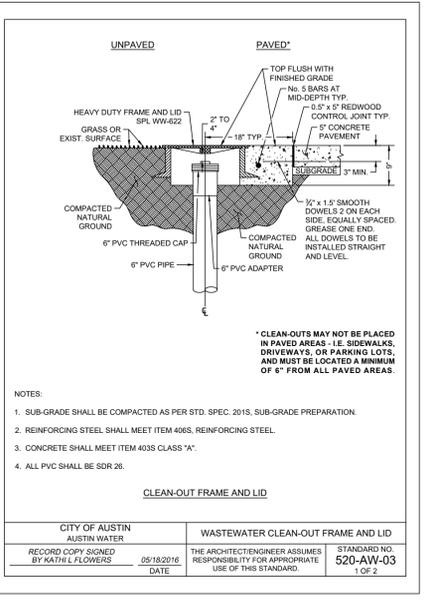
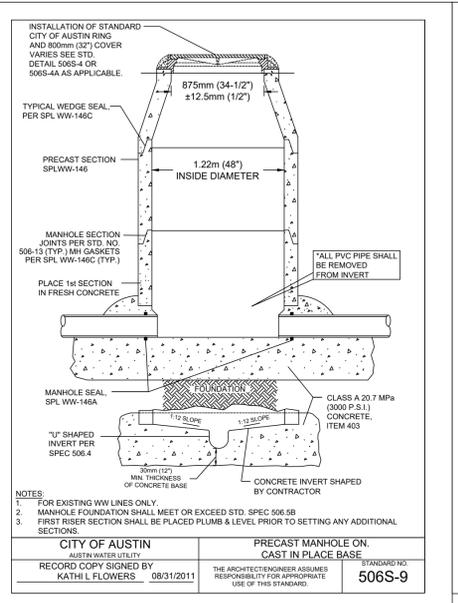
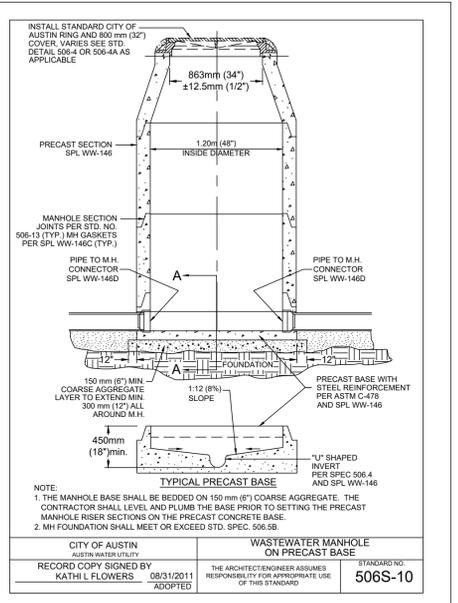
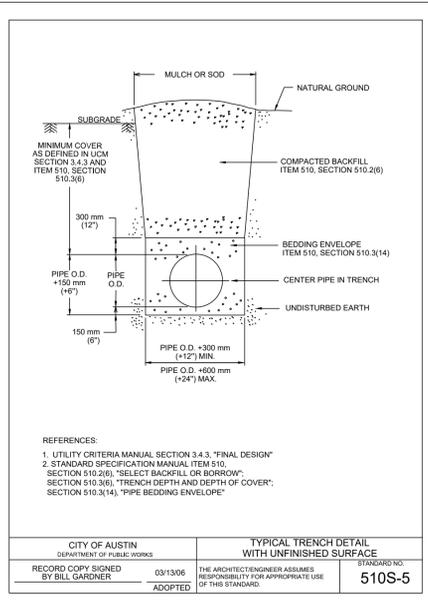
STORM DETAILS

MALONE WHEELER
SINCE INC., 1995
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MW
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020

SHEET 55 OF 59

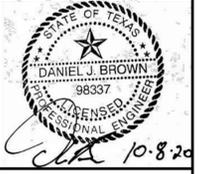


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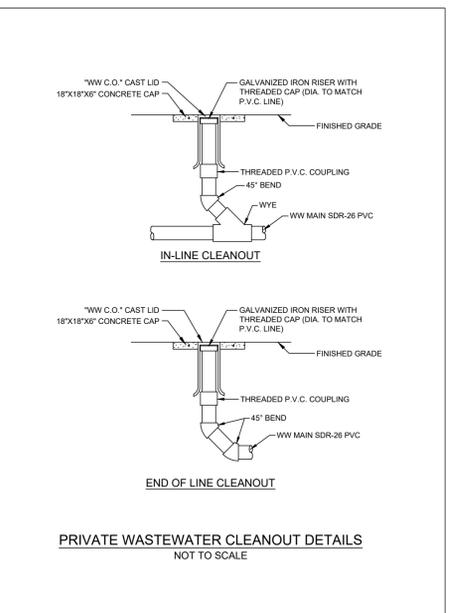
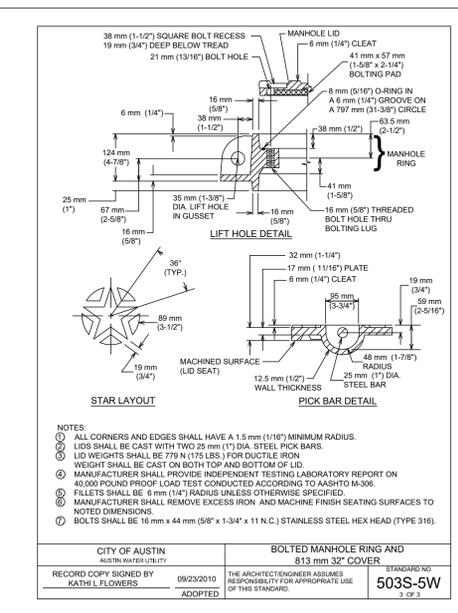
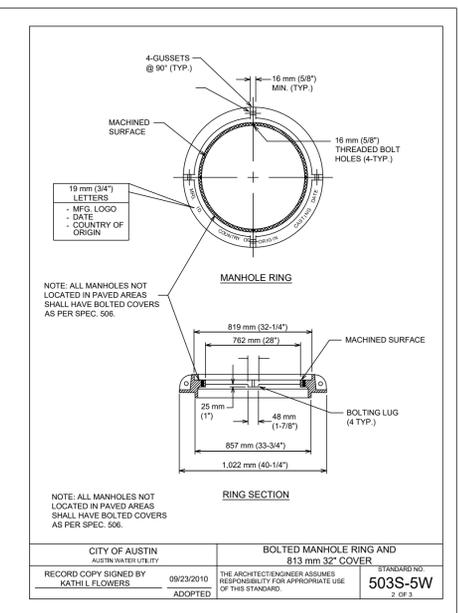
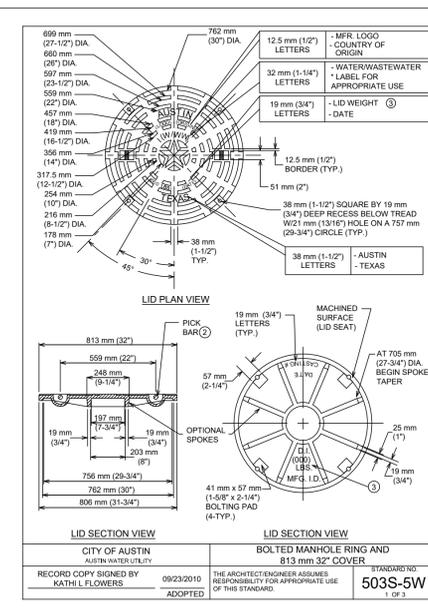
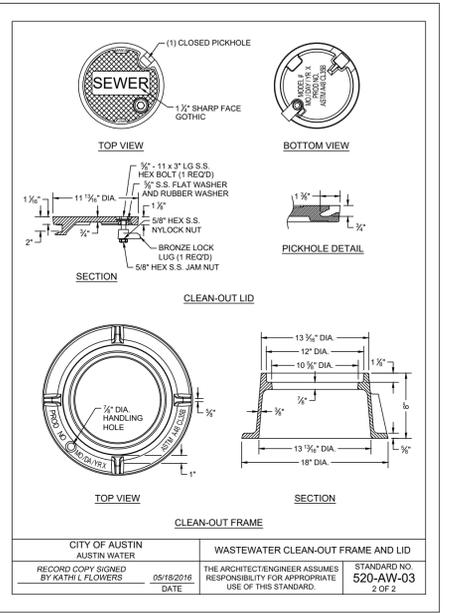
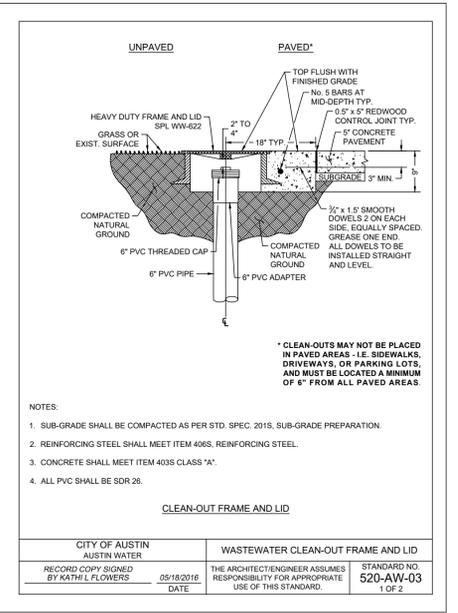
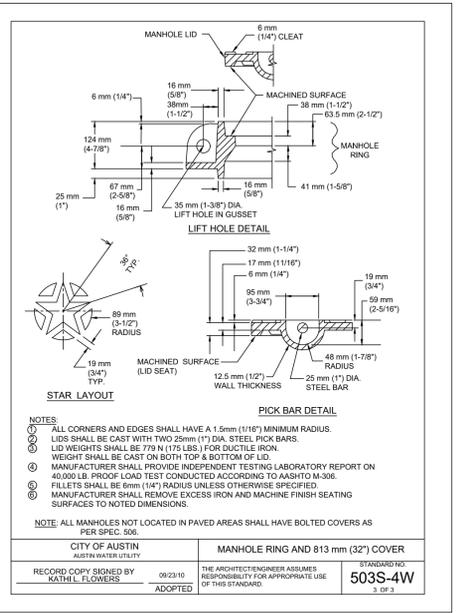
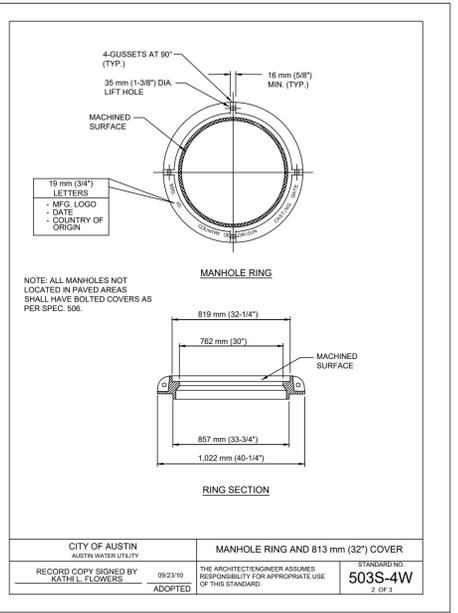
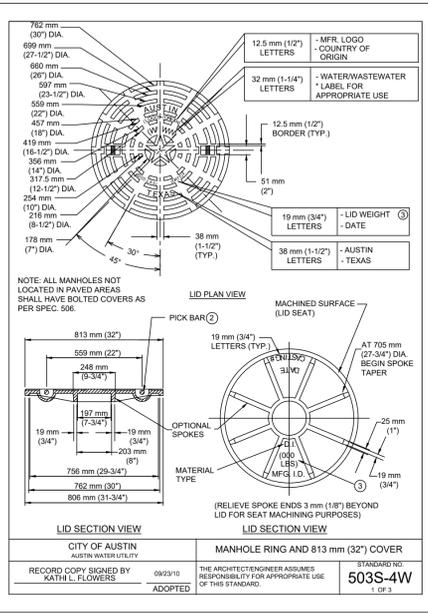
BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

WASTEWATER DETAILS

MALONE WHEELER
SINCE INC. 1985
CIVIL ENGINEERING & DEVELOPMENT CONSULTING PROJECT MANAGEMENT
5113 Southwest Pkwy, Suite 260
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020



BROADSTONE - LA FRONTERA PHASE 2
3118 CR 172 ROUND ROCK, TEXAS 78681

WASTEWATER DETAILS

MALONE WHEELER
SINCE INC. 1985
CIVIL ENGINEERING • DEVELOPMENT CONSULTING • PROJECT MANAGEMENT

5113 Southwest Pkwy, Suite 280
Austin, Texas 78735
Phone: (512) 899-0601 Fax: (512) 899-0655
Firm Registration No. F-786



DESIGN BY: MV
CHECKED BY: DB
APPROVED BY: DB
DATE: 10/1/2020

SHEET 57
OF 59

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.

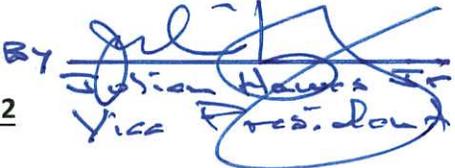
Signature

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: Austin Auro, LP

Date: 10/09/2020

Signature of Customer/Agent:

By Austin Auro G PLLC
its general partner
By PRA GP No 2, Inc
its manager
By 
Justin Hawks Sr
Vice Pres. Auro

Regulated Entity Name: Broadstone - La Frontera Phase 2

Project Information

Potential Sources of Contamination

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

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

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

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

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

- Aboveground storage tanks with a cumulative storage capacity between 250 gallons and 499 gallons will be stored on the site for less than one (1) year.
- Aboveground storage tanks with a cumulative storage capacity of 500 gallons or more will be stored on the site. An Aboveground Storage Tank Facility Plan application must be submitted to the appropriate regional office of the TCEQ prior to moving the tanks onto the project.
- Fuels and hazardous substances will not be stored on the site.
- 2. **Attachment A - Spill Response Actions.** A site specific description of the measures to be taken to contain any spill of hydrocarbons or hazardous substances is attached.
- 3. Temporary aboveground storage tank systems of 250 gallons or more cumulative storage capacity must be located a minimum horizontal distance of 150 feet from any domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
- 4. **Attachment B - Potential Sources of Contamination.** A description of any activities or processes which may be a potential source of contamination affecting surface water quality is attached.

Sequence of Construction

- 5. **Attachment C - Sequence of Major Activities.** A description of the sequence of major activities which will disturb soils for major portions of the site (grubbing, excavation, grading, utilities, and infrastructure installation) is attached.
 - For each activity described, an estimate (in acres) of the total area of the site to be disturbed by each activity is given.
 - For each activity described, include a description of appropriate temporary control measures and the general timing (or sequence) during the construction process that the measures will be implemented.
- 6. Name the receiving water(s) at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project: Rattan Creek

Temporary Best Management Practices (TBMPs)

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

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

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

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

11. **Attachment H - Temporary Sediment Pond(s) Plans and Calculations.** Temporary sediment pond or basin construction plans and design calculations for a proposed temporary BMP or measure have been prepared by or under the direct supervision of a Texas Licensed Professional Engineer. All construction plans and design information must be signed, sealed, and dated by the Texas Licensed Professional Engineer. Construction plans for the proposed temporary BMPs and measures are attached.
- N/A
12. **Attachment I - Inspection and Maintenance for BMPs.** A plan for the inspection of each temporary BMP(s) and measure(s) and for their timely maintenance, repairs, and, if necessary, retrofit is attached. A description of the documentation procedures, recordkeeping practices, and inspection frequency are included in the plan and are specific to the site and/or BMP.
13. All control measures must be properly selected, installed, and maintained in accordance with the manufacturer's specifications and good engineering practices. If periodic inspections by the applicant or the executive director, or other information indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations.
14. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain).
15. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake will be provided that can indicate when the sediment occupies 50% of the basin volume.
16. Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges (e.g., screening outfalls, picked up daily).

Soil Stabilization Practices

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

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

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

Administrative Information

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

WPAP - TEMPORARY STORMWATER ATTACHMENT "A"

SPILL RESPONSE ACTIONS

BROADSTONE – LA FRONTERA PHASE 2

Fuel and hazardous substances will not be stored on-site. Sources of spills would include accidents during refueling operations or damage to mechanical equipment. In addition to general care and good "housekeeping" practices, the following practices will be followed for accidental spill prevention and cleanup:

1. Site and construction personnel will be required to be aware of manufacturer's recommended methods for spill cleanup, the location of information, and the cleanup supplies.
2. Materials and equipment necessary for spill cleanup will be kept on-site in an accessible location known to site personnel.
3. All spills will be cleaned up immediately upon discovery.
4. All spill response actions shall comply with 30 TAC 327, Spill Prevention and Control, Texas Commission on Environmental Quality.

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "B"**

POTENTIAL SOURCE OF CONTAMINANTS

BROADSTONE – LA FRONTERA PHASE 2

The materials or substances listed below are expected to be used on-site during construction.

1. Concrete and concrete products
2. Asphaltic products
3. Petroleum-based products
4. Paints
5. Fertilizers
6. Lumber

The following procedures are potential sources of contamination:

1. Earth grading
2. Installation of asphalt and concrete
3. Moving/storage of soil
4. Construction traffic
5. Trenching for underground utilities

**WPAP - TEMPORARY STORMWATER
TEMPORARY STORMWATER
ATTACHMENT "C"**

SEQUENCE OF MAJOR ACTIVITIES

BROADSTONE – LA FRONTERA PHASE 2

1. Clear & Grub (Area = 14.93 acres)
2. Rough Grade (Area = 14.93 acres)
3. Install Utility Service & Connections & Storm Sewer System (Area = 0.81 acres)
4. Base & Paving Application (Area = 4.69 acres)
5. Restoration of Site (Area = 5.67 acres)
6. Building Construction (Area = 3.33 acres)

Protected fences shall be put in place according to City of Austin standards for tree protection prior to the start of any site preparation work. Fences shall be maintained throughout all phases of the construction project.

During the installation of utilities and base and paving application, the contractor shall use dust control measures such as irrigation trucks and mulching. Contractor will clean up spoils that migrate onto the roads a minimum of once daily.

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "D"**

TEMPORARY BEST MANAGEMENT PRACTICES

BROADSTONE – LA FRONTERA PHASE 2

Inlet protection will be installed to stop the pollution of stormwater runoff by preventing soil and debris from entering storm drain drop inlets. Silt fences will be utilized to retain stormwater runoff and keep soil on the disturbed land, rather than letting it be washed off into natural water bodies. Silt fences downstream of disturbed areas shall be installed per the plan(s), maintained, and regularly inspected throughout the duration of all major construction activities until revegetation is complete. The revegetation shall be deemed complete when coverage is 85% on slopes of 0-5% and 95% on areas exceeding 5% slope with no bare areas greater than ten (10) square feet.

In addition to the installation of silt fencing, a stabilized construction entrance will be provided for all traffic accessing the site and a concrete washout will be provided. Tree protection will also be provided as needed.

WPAP - TEMPORARY STORMWATER
ATTACHMENT "E"
REQUEST TO TEMPORARILY SEAL A FEATURE
BROADSTONE – LA FRONTERA PHASE 2

N/A

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "F"**

STRUCTURAL PRACTICES

BROADSTONE – LA FRONTERA PHASE 2

The following structural controls and procedures will be utilized on this project to limit runoff discharge of pollutants:

1. A stabilized construction entrance will be used for all traffic accessing the site.
2. Silt fence and inlet protection will be installed downstream of all disturbed areas and remain in place until final site stabilization is achieved.
3. A concrete washout will be in place for concrete trucks exiting the site.

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "G"**

DRAINAGE AREA MAP

BROADSTONE – LA FRONTERA PHASE 2

See attached construction plans for Drainage Area Maps sheets 8-11.

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "H"**

TEMPORARY SEDIMENT POND(S) PLANS & CALCULATIONS

BROADSTONE – LA FRONTERA PHASE 2

The permanent BMP will be in place and functional at the time this project breaks ground. Therefore, temporary sediment ponds are not applicable.

WPAP - TEMPORARY STORMWATER ATTACHMENT "I"

INSPECTION AND MAINTENANCE OF BMPs

BROADSTONE – LA FRONTERA PHASE 2

Erosion and Sediment Control Inspection and Maintenance Practices

1. The Contractor will inspect the control measures weekly and within 24 hours after rainfall events of ½-inch or more.
2. Temporary construction entrances should be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. All sediment spilled, dropped washed or tracked onto public rights-of-way should be removed immediately by contractor.
3. Repairs will be made to damaged areas as soon as practicable after damage is discovered but no later than seven days after the inspection.
4. Build-up sediment will be removed once it has reached maximum depth of six inches.
5. Temporary and permanent seeding shall be irrigated or sprinkled in a manner that will not erode topsoil, and at sufficient quantity and intervals to achieve restoration requirements. Irrigation shall occur at ten-day intervals during the first two months. Rainfall of ½-inch or more shall postpone watering schedule by one week.
6. The Contractor will be responsible for ensuring maintenance of the erosion and sedimentation controls. The Owner (and/or qualified agents) and Contractor shall be independently responsible for inspection of the controls, and for required record keeping (see sample inspection and maintenance report).
7. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize off-site impacts.

See attached sample inspection and maintenance report.

**WPAP - TEMPORARY STORMWATER
ATTACHMENT "J"**

**SCHEDULE OF INTERIM AND PERMANENT
SOIL STABILIZATION PRACTICES**

BROADSTONE – LA FRONTERA PHASE 2

The area of disturbance is confined to that necessary to build the facilities. No temporary vegetation is proposed. As many trees and natural areas as possible have been preserved. All pervious areas disturbed shall be revegetated.

Soil Stabilization Practice	Schedule of Implementation
Silt fences	Prior to and throughout site development
Stabilized Construction Entrance	Prior to and throughout site development
Concrete Wash Out	Prior to and throughout site development
Temporary Stabilization	Temporary stabilization of disturbed areas must be initiated whenever any earth disturbing activities have temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days.
Permanent Restoration and Revegetation	Permanent stabilization of disturbed areas must be initiated whenever earth disturbing activities have permanently ceased

TO BE MADE AVAILABLE UPON REQUEST

PROJECT NAME: BROADSTONE - LA FRONTERA PHASE 2

OWNER/OPERATOR: AUSTIN AURO, LP

INSPECTOR: _____

SIGNATURE: _____

BMP TYPE	LOCATION	CONTROL MEASURE	CURRENT CONDITION	CORRECTIVE ACTION TO BE TAKEN	CORRECTION CODE

DATE OF LAST RAINFALL:
AMOUNT OF LAST RAINFALL:
DATE OF INSPECTION:
CONTRACTOR:
DATE RECEIVED:

ADDITIONAL NOTES:

CHANGES REQUIRED

REASONS FOR CHANGES:

CONDITION CODES:
01 - TO BE FIXED OR REPLACED WITHIN 24 HRS
02 - TO BE FIXED OR REPLACED WITHIN 48 HRS
03 - TO BE FIXED OR REPLACED PRIOR TO NEXT INSPECTION
04 - SEE ADDITIONAL NOTES

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

Signature: _____

Date: _____

Permanent BMP is designed by **Kimley-Horn** and is being constructed under **TCEQ Permit No. 11001753**
(please see attached letter)

Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(ii), (E), and (5), Effective June 1, 1999

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

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

Signature

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

Print Name of Customer/Agent: Austin Auro, LP

Date: 9/25/2020

Signature of Customer/Agent:



Jolien Haines, Jr.
Vice President
PRA No 2, Inc.
manager of
Austin Auro GP LLC
the general partner

Regulated Entity Name: Broadstone - La Frontera Phase 2

Permanent Best Management Practices (BMPs)

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

- Permanent BMPs and measures must be implemented to control the discharge of pollution from regulated activities after the completion of construction.
 N/A Offsite Permanent BMP is designed by Kimley-Horn and is currently being constructed under **TCEQ Permit No. 11001753**
- These practices and measures have been designed, and will be constructed, operated, and maintained to insure that 80% of the incremental increase in the annual mass loading of total suspended solids (TSS) from the site caused by the regulated activity is removed. These quantities have been calculated in accordance with technical guidance prepared or accepted by the executive director.
 The TCEQ Technical Guidance Manual (TGM) was used to design permanent BMPs and measures for this site.

A technical guidance other than the TCEQ TGM was used to design permanent BMPs and measures for this site. The complete citation for the technical guidance that was used is: City of Austin Environmental Criteria Manual

N/A

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

N/A **Certification will be provided by Kimley-Horn**

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

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

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

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

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

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

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

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

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

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

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

Responsibility for Maintenance of Permanent BMP(s)

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

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

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 6, 2020

Mr. Julian Hawes, Jr.
Austin Auro LP
10210 N. Central Expressway, 300
Dallas, Texas

Re: Edwards Aquifer, Williamson County

NAME OF PROJECT: Austin Auro, located NE OF CR 172 AND FM 1325, Austin ETJ, Texas

TYPE OF PLAN: Request for Approval of a Water Pollution Abatement Plan (WPAP)
30 Texas Administrative Code (TAC) Chapter 213 Edwards Aquifer

Edwards Aquifer Protection Program ID No. 11001753; Regulated Entity No. RN110870185

Dear Mr. Hawes:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the request for approval of a WPAP Application for the above-referenced project submitted to the Austin Regional Office by Kimley-Horn and Associates, Inc. on behalf of Austin Auro LP on October 9, 2019. Final review was completed after additional materials were received on December 20, 2019 and January 2, 2020. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas Licensed Professional Engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed and dated by a Texas Licensed Professional Engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Edwards Aquifer Protection Plan. A motion for reconsideration must be filed no later than 23 days after the date of this approval letter. *This approval expires two (2) years from the date of this letter unless, prior to the expiration date, more than 10 percent of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed development will have a site area of approximately 50.1 acres. It will include the construction of sidewalks, a waterline, two water quality ponds, and detention. The total impervious cover of the site will be approximately 0.73 acres (1.45%). The water quality ponds will be sized to treat 25.84 acres of impervious cover; an Edwards Aquifer Protection Plan shall be submitted to the Austin Regional Office prior to the construction of said impervious cover.

TCEQ Region 11 • P.O. Box 13087 • Austin, Texas 78711-3087 • 512-339-2929 • Fax 512-339-3795

Austin Headquarters: 512-239-1000 • tceq.texas.gov • How is our customer service? tceq.texas.gov/customersurvey

No wastewater is generated by this project. In addition to the described activities, temporary erosion and sedimentation controls will be installed prior to commencing site disturbance.

PERMANENT POLLUTION ABATEMENT MEASURES

To prevent the pollution of stormwater runoff originating on-site or upgradient of the site and potentially flowing across and off the site after construction, two partial sedimentation/biofiltration basins (East Water Quality Pond and West Water Quality Pond), designed using the technical guidance document, City of Austin Environmental Criteria Manual, will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 631 pounds of TSS generated from the 0.73 acres of impervious cover. The East Water Quality Pond and West Water Quality Ponds are designed to treat 25.84 acres of impervious cover for an anticipated future project. The approved measures meet the required 80 percent removal of the increased load in TSS caused by the project.

GEOLOGY

According to the Geologic Assessment (GA) included with the application, the surficial geologic unit present at the site has been identified as the Del Rio Clay and Georgetown Formation, undivided. There were no sensitive recharge features identified within the GA. During the TCEQ site assessment conducted on December 11, 2019, the site was found to be generally as described.

STANDARD CONDITIONS

1. Pursuant to Chapter 7 Subchapter C of the Texas Water Code, any violations of the requirements in 30 TAC Chapter 213 may result in administrative penalties.
2. The holder of the approved Edwards Aquifer protection plan must comply with all provisions of 30 TAC Chapter 213 and all best management practices and measures contained in the approved plan. Additional and separate approvals, permits, registrations and/or authorizations from other TCEQ Programs (i.e., Stormwater, Water Rights, UIC) can be required depending on the specifics of the plan.
3. In addition to the rules of the Commission, the applicant may also be required to comply with state and local ordinances and regulations providing for the protection of water quality.

Prior to Commencement of Construction:

4. Within 60 days of receiving written approval of an Edwards Aquifer Protection Plan, the applicant must submit to the Austin Regional Office, proof of recordation of notice in the county deed records, with the volume and page number(s) of the county deed records of the county in which the property is located. A description of the property boundaries shall be included in the deed recordation in the county deed records. A suggested form (Deed Recordation Affidavit, TCEQ-0625) that you may use to deed record the approved WPAP is enclosed.
5. All contractors conducting regulated activities at the referenced project location shall be provided a copy of this notice of approval. At least one complete copy of the approved WPAP and this notice of approval shall be maintained at the project location until all regulated activities are completed.

6. Modification to the activities described in the referenced WPAP application following the date of approval may require the submittal of a plan to modify this approval, including the payment of appropriate fees and all information necessary for its review and approval prior to initiating construction of the modifications.
7. The applicant must provide written notification of intent to commence construction, replacement, or rehabilitation of the referenced project. Notification must be submitted to the Austin Regional Office no later than 48 hours prior to commencement of the regulated activity. Written notification must include the date on which the regulated activity will commence, the name of the approved plan and program ID number for the regulated activity, and the name of the prime contractor with the name and telephone number of the contact person. The executive director will use the notification to determine if the approved plan is eligible for an extension.
8. Temporary erosion and sedimentation (E&S) controls, i.e., silt fences, rock berms, stabilized construction entrances, or other controls described in the approved WPAP, must be installed prior to construction and maintained during construction. Temporary E&S controls may be removed when vegetation is established and the construction area is stabilized. If a water quality pond is proposed, it shall be used as a sedimentation basin during construction. The TCEQ may monitor stormwater discharges from the site to evaluate the adequacy of temporary E&S control measures. Additional controls may be necessary if excessive solids are being discharged from the site.

During Construction:

9. During the course of regulated activities related to this project, the applicant or agent shall comply with all applicable provisions of 30 TAC Chapter 213, Edwards Aquifer. The applicant shall remain responsible for the provisions and conditions of this approval until such responsibility is legally transferred to another person or entity.
10. This approval does not authorize the installation of temporary aboveground storage tanks on this project. If the contractor desires to install a temporary aboveground storage tank for use during construction, an application to modify this approval must be submitted and approved prior to installation. The application must include information related to tank location and spill containment.
11. If any sensitive feature (caves, solution cavities, sink holes, etc.) is discovered during construction, all regulated activities near the feature must be suspended immediately. The applicant or his agent must immediately notify the Austin Regional Office of the discovery of the feature. Regulated activities near the feature may not proceed until the executive director has reviewed and approved the methods proposed to protect the feature and the aquifer from potentially adverse impacts to water quality. The plan must be sealed, signed, and dated by a Texas Licensed Professional Engineer.
12. If sediment escapes the construction site, the sediment must be removed at a frequency sufficient to minimize offsite impacts to water quality (e.g., fugitive sediment in street being washed into surface streams or sensitive features by the next rain). Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50 percent. Litter, construction debris, and construction chemicals shall be prevented from becoming stormwater discharge pollutants.
13. All water wells, including injection, dewatering, and monitoring wells must be in compliance with the requirements of the Texas Department of Licensing and Regulation under Title 16

TAC Chapter 76 (relating to Water Well Drillers and Pump Installers) and all other locally applicable rules, as appropriate.

14. Intentional discharges of sediment laden water are not allowed. If dewatering becomes necessary, the discharge will be filtered through appropriately selected best management practices. These may include vegetated filter strips, sediment traps, rock berms, silt fence rings, etc.
15. The following records shall be maintained and made available to the executive director 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.
16. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.
17. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

18. A Texas Licensed Professional Engineer must certify in writing that the permanent BMPs or measures were constructed as designed. The certification letter must be submitted to the Austin Regional Office within 30 days of site completion.
19. The applicant shall be responsible for maintaining the permanent BMPs after construction until such time as the maintenance obligation is either assumed in writing by another entity having ownership or control of the property (such as without limitation, an owner's association, a new property owner or lessee, a district, or municipality) or the ownership of the property is transferred to the entity. The regulated entity shall then be responsible for maintenance until another entity assumes such obligations in writing or ownership is transferred. A copy of the transfer of responsibility must be filed with the executive director through Austin Regional Office within 30 days of the transfer. A copy of the transfer form (TCEQ-10263) is enclosed.
20. Upon legal transfer of this property, the new owner(s) is required to comply with all terms of the approved Edwards Aquifer protection plan. If the new owner intends to commence any new regulated activity on the site, a new Edwards Aquifer protection plan that specifically addresses the new activity must be submitted to the executive director. Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.
21. An Edwards Aquifer protection plan approval or extension will expire and no extension will be granted if more than 50 percent of the total construction has not been completed within ten years from the initial approval of a plan. A new Edwards Aquifer protection plan must be submitted to the Austin Regional Office with the appropriate fees for review and approval by the executive director prior to commencing any additional regulated activities.

Mr. Julian Hawes, Jr.

Page 5

January 6, 2020

22. At project locations where construction is initiated and abandoned, or not completed, the site shall be returned to a condition such that the aquifer is protected from potential contamination.

This action is taken under authority delegated by the Executive Director of the Texas Commission on Environmental Quality. If you have any questions or require additional information, please contact Ms. Jade Mendiola, of the Edwards Aquifer Protection Program of the Austin Regional Office at (512) 339-2929.

Sincerely,



Robert Sadler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

RCS/jkm

Enclosure: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

**Deed Recordation Affidavit
Edwards Aquifer Protection Plan**

THE STATE OF TEXAS §

County of _____ §

BEFORE ME, the undersigned authority, on this day personally appeared _____ who, being duly sworn by me, deposes and says:

- (1) That my name is _____ and that I own the real property described below.
- (2) That said real property is subject to an EDWARDS AQUIFER PROTECTION PLAN which was required under the 30 Texas Administrative Code (TAC) Chapter 213.
- (3) That the EDWARDS AQUIFER PROTECTION PLAN for said real property was approved by the Texas Commission on Environmental Quality (TCEQ) on _____.

A copy of the letter of approval from the TCEQ is attached to this affidavit as Exhibit A and is incorporated herein by reference.

- (4) The said real property is located in _____ County, Texas, and the legal description of the property is as follows:

LANDOWNER-AFFIANT

SWORN AND SUBSCRIBED TO before me, on this __ day of _____, _____.

NOTARY PUBLIC

THE STATE OF _____ §

County of _____ §

BEFORE ME, the undersigned authority, on this day personally appeared _____ 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 __ day of _____, _____.

NOTARY PUBLIC

Typed or Printed Name of Notary

MY COMMISSION EXPIRES: _____

**Change in Responsibility for Maintenance
on Permanent Best Management Practices and Measures**

The applicant is no longer responsible for maintaining the permanent best management practice (BMP) and other measures. The project information and the new entity responsible for maintenance is listed below.

Customer: _____

Regulated Entity Name: _____

Site Address: _____

City, Texas, Zip: _____

County: _____

Approval Letter Date: _____

BMPs for the project: _____

New Responsible Party: _____

Name of contact: _____

Mailing Address: _____

City, State: _____ Zip: _____

Telephone: _____ FAX: _____

Signature of New Responsible Party Date

I acknowledge and understand that I am assuming full responsibility for maintaining all permanent best management practices and measures approved by the TCEQ for the site, until another entity assumes such obligations in writing or ownership is transferred.

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "A"**

20% OR LESS IMPERVIOUS COVER WAIVER

BROADSTONE – LA FRONTERA PHASE 2

N/A

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "B"**

BMPs FOR UPGRADIENT STORMWATER

BROADSTONE – LA FRONTERA PHASE 2

Upgradient runoff will be diverted around the proposed water quality pond via an earthen channel along CR 172 to an existing culvert beneath CR 172. Upgradient runoff will not be treated for water quality.

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "C"**

BMPs FOR ON-SITE STORMWATER

BROADSTONE – LA FRONTERA PHASE 2

BMP's for on-site stormwater include the following:

Temporary BMPs:

1. Silt Fence
2. Stabilized Construction Entrances
3. Concrete Washout Areas
4. Inlet Protection

Permanent BMPs:

Water quality is provided by an off-site biofiltration pond designed by Kimley-Horn, and currently being constructed under TCEQ permit No. 11001753.

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "D"**

BMPs FOR SURFACE STREAMS

BROADSTONE - LA FRONTERA PHASE 2

The geologic assessment determined that no sensitive geologic features nor surface streams are present on site therefore, permanent BMPs for surface streams are not required.

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "E"**

REQUEST TO SEAL FEATURES

BROADSTONE – LA FRONTERA PHASE 2

N/A

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "F"**

CONSTRUCTION PLANS

BROADSTONE – LA FRONTERA PHASE 2

See the attached construction plans prepared by Kimley-Horn and approved by TCEQ under Permit No. 11001753.

**ATTACHMENT G – Inspection, Maintenance, Repair
and Retrofit Plan**

Inspection, Maintenance, Repair and Retrofit Plan

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

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

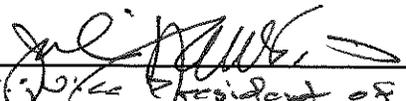
Disposal of accumulated silt shall be accomplished following Texas Commission on Environmental Quality guidelines and specifications.

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

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

Responsible Party: Austin Auro LP
Mailing Address: 10210 N Central Expressway, Suite 300
City, State: Dallas, Texas Zip: 75231
Telephone: (972) 385-4151 Fax: _____

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

Signature of Responsible Party  Date 10/3/19
Julian Haas Jr. Vice President of PRAGPNO2, Inc.;
Manager of Austin Auro GP LLC; the General Partner of
This Maintenance Plan is based on TCEQ Maintenance Guidelines. Austin Auro LP

By:  Date 10/1/2019
Luke Caraway, P.E.

Chapter 3.5.10 of the TCEQ “Edwards Aquifer Technical Guidance Manual” is attached. This explains all of the routine and non-routine maintenance and inspections associated with bioretention ponds.

3.5.10 Bioretention

The primary maintenance requirement for bioretention areas is that of inspection and repair or replacement of the treatment area's components. Generally, this involves nothing more than the routine periodic maintenance that is required of any landscaped area. Plants that are appropriate for the site, climatic, and watering conditions should be selected for use in the bioretention cell. Appropriately selected plants will aid in reducing fertilizer, pesticide, water, and overall maintenance requirements. Bioretention system components should blend over time through plant and root growth, organic decomposition, and the development of a natural soil horizon. These biologic and physical processes over time will lengthen the facility's life span and reduce the need for extensive maintenance.

Routine maintenance should include a semi-annual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation. Diseased vegetation should be treated as needed using preventative and low-toxic measures to the extent possible. BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water. Routine inspections for areas of standing water within the BMP and corrective measures to restore proper infiltration rates are necessary to prevent creating mosquito and other vector habitat. In addition, bioretention BMPs are susceptible to invasion by aggressive plant species such as cattails, which increase the chances of standing water and subsequent vector production if not routinely maintained. In order to maintain the treatment area's appearance it may be necessary to prune and weed. Furthermore, mulch replacement is suggested when erosion is evident or when the site begins to look unattractive. Specifically, the entire area may require mulch replacement every two to three years, although spot mulching may be sufficient when there are random void areas.

New Jersey's Department of Environmental Protection states in their bioretention systems standards that accumulated sediment and debris removal (especially at the inflow point) will normally be the primary maintenance function. Other potential tasks include replacement of dead vegetation, soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the underdrain, and repairing overflow structures. Other recommended maintenance guidelines include:

- ***Inspections.*** BMP facilities should be inspected at least twice a year (once during or immediately following wet weather) to evaluate facility operation. During each inspection, erosion areas inside and downstream of the BMP must be identified and repaired or revegetated immediately.

3-95

- ***Sediment Removal.*** Remove sediment from the facility when sediment depth reaches 3 inches or when the sediment interferes with the health of vegetation or ability of the facility to meet required drawdown times. Sediment removal should be performed at least every 2 years.

- **Drain Time.** When the drain time exceeds 72 hours as observed in the observation well, the filter media should be removed and replaced with more permeable material.
- **Vegetation.** All dead and diseased vegetation considered beyond treatment shall be removed and replaced during semi-annual inspections. Diseased trees and shrubs should be treated during inspections. Remulch any bare areas by hand whenever needed. Replace mulch annually in the spring, or more frequently if needed, in landscaped areas of the basin where grass or groundcover is not planted. Grass areas in and around bioretention facilities must be mowed at least twice annually to limit vegetation height to 18 inches. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.
- **Debris and Litter Removal.** Debris and litter will accumulate in the facility and should be removed during regular mowing operations and inspections.
- **Filter Underdrain.** Clean underdrain piping network to remove any sediment buildup every 5 years, or as needed to maintain design drawdown time.

**WPAP - PERMANENT STORMWATER SECTION
ATTACHMENT "H"**

PILOT SCALE FIELD TESTING PLAN

BROADSTONE – LA FRONTERA PHASE 2

N/A

WPAP - PERMANENT STORMWATER SECTION APPLICATION ATTACHMENT "I"

MEASURES FOR MINIMIZING SURFACE STREAM CONTAMINATION

BROADSTONE – LA FRONTERA PHASE 2

During construction this project will use silt fencing, inlet protection, stabilized construction entrance, and concrete washout area to minimize impacts of potential downstream water quality degradation.

Once the site is constructed and developed, the biofiltration water quality pond designed by Kimley-Horn, and currently being constructed under approved TCEQ Permit No. 11001753, will be the permanent BMP.

In addition, required maintenance of the site will minimize impact to downstream areas.

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

I Julian Howes, Jr VP of PRA GP NO2, Inc.
Print Name

manager of the Austin Auro GP LLC the general partner
Title - Owner/President/Other

of Austin Auro LP
Corporation/Partnership/Entity Name

have authorized Dan Brown, P.E.
Print Name of Agent/Engineer

of Malone Wheeler Inc. F-786
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:

[Signature]
Applicant's Signature
Julian Hayes Jr
Vice President

10/14/19
Date

THE STATE OF TEXAS §

County of DALLAS §

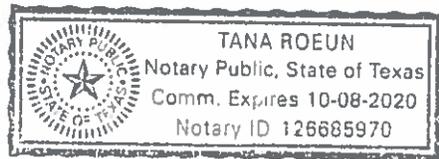
BEFORE ME, the undersigned authority, on this day personally appeared JULIAN HAYES known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledged to me that (s)he executed same for the purpose and consideration therein expressed.

GIVEN under my hand and seal of office on this 14 day of OCTOBER, 2019.

[Signature]
NOTARY PUBLIC

TANA ROEUN
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 10-8-20



Application Fee Form

Texas Commission on Environmental Quality

Name of Proposed Regulated Entity: Broadstone - La Frontera Phase 2

Regulated Entity Location: 3118 CR 172 Round Rock, Texas 78681

Name of Customer: Austin Auro LP

Contact Person: Scott Morway Phone: 972-385-4152

Customer Reference Number (if issued): CN 605709567

Regulated Entity Reference Number (if issued): RN 110870185

Austin Regional Office (3373)

Hays Travis Williamson

San Antonio Regional Office (3362)

Bexar Medina Uvalde

Comal Kinney

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

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

Site Location (Check All That Apply):

Recharge Zone Contributing Zone Transition Zone

Type of Plan	Size	Fee Due
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	Acres	\$
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	14.21 Acres	\$ 6,500
Sewage Collection System	2,217 L.F.	\$ 1,108.50
Lift Stations without sewer lines	Acres	\$
Underground or Aboveground Storage Tank Facility	Tanks	\$
Piping System(s)(only)	Each	\$
Exception	Each	\$
Extension of Time	Each	\$

Signature: [Signature] Date: 9/25/2020

Julia Housley, Jr Vice President
PRA & P&ID Inc
manager of Austin Auro & P&ID, the general partner

Application Fee Schedule

Texas Commission on Environmental Quality

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	Fee
Exception Request	\$500

Extension of Time Requests

Project	Fee
Extension of Time Request	\$150



TCEQ Use Only

TCEQ Core Data Form

For detailed instructions 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 605709567		RN 110870185

SECTION II: Customer Information

4. General Customer Information		5. Effective Date for Customer Information Updates (mm/dd/yyyy)		00/10/2019	
<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>		
Austin Auro LP					
7. TX SOS/CPA Filing Number		8. TX State Tax ID (11 digits)		9. Federal Tax ID (9 digits)	
0802631063		32062630903		81-5087557	
10. DUNS Number (if applicable)					
11. Type of Customer:		<input type="checkbox"/> Corporation		<input type="checkbox"/> Individual	
Government: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> Other		<input type="checkbox"/> Partnership: <input type="checkbox"/> General <input checked="" type="checkbox"/> Limited		<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 checked="" 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 checked="" type="checkbox"/> Owner		<input type="checkbox"/> Operator		<input 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:	10210 N Central Expressway, Suite 300				
	City	Dallas	State	TX	ZIP
				75231	ZIP + 4
16. Country Mailing Information (if outside USA)			17. E-Mail Address (if applicable)		
			smorway@providentrealty.net		
18. Telephone Number		19. Extension or Code		20. Fax Number (if applicable)	
(972) 385-4152				() -	

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 checked="" type="checkbox"/> New Regulated Entity <input type="checkbox"/> Update to Regulated Entity Name <input type="checkbox"/> Update to Regulated Entity Information	
The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC.)	
22. Regulated Entity Name (Enter name of the site where the regulated action is taking place.)	
Broadstone - La Frontera Phase 2	

23. Street Address of the Regulated Entity: <i>(No PO Boxes)</i>	3118 CR 172						
	City	Round Rock	State	TX	ZIP	78681	ZIP + 4
24. County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:									
26. Nearest City	Austin				State	TX	Nearest ZIP Code	78681	
27. Latitude (N) In Decimal:	30.476410			28. Longitude (W) In Decimal:	-97.692849				
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds				
29. Primary SIC Code (4 digits)	6513		30. Secondary SIC Code (4 digits)			31. Primary NAICS Code (5 or 6 digits)	531311	32. Secondary NAICS Code (5 or 6 digits)	
33. What is the Primary Business of this entity? <i>(Do not repeat the SIC or NAICS description.)</i>									
Land management									
34. Mailing Address:	10210 N Central Expressway, Suite 300								
	City	Dallas	State	TX	ZIP	75231	ZIP + 4		
35. E-Mail Address:									
36. Telephone Number			37. Extension or Code			38. Fax Number <i>(if applicable)</i>			
(972) 385-4152						() -			

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
		Separate WPAP permitted by others		
<input type="checkbox"/> Municipal Solid Waste	<input type="checkbox"/> New Source Review Air	<input type="checkbox"/> OSSF	<input type="checkbox"/> Petroleum Storage Tank	<input type="checkbox"/> PWS
<input type="checkbox"/> Sludge	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Title V Air	<input type="checkbox"/> Tires	<input type="checkbox"/> Used Oil
<input type="checkbox"/> Voluntary Cleanup	<input type="checkbox"/> Waste Water	<input type="checkbox"/> Wastewater Agriculture	<input type="checkbox"/> Water Rights	<input type="checkbox"/> Other:

SECTION IV: Preparer Information

40. Name:	Malone Wheeler Inc. , Dan Brown, P.E.	41. Title:	Civil Engineer
42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(512) 899-0601		(512) 899-0655	danb@malonewheeler.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:	Austin Auro LP	Job Title:	
Name (In Print):	Julian Hauer Jr. , Vice President	Phone:	(773) 385-4136
Signature:		Date:	9/25/2020

*PRAGP 002 Jur
manager of Austin Auro LP LLC, the general partner*