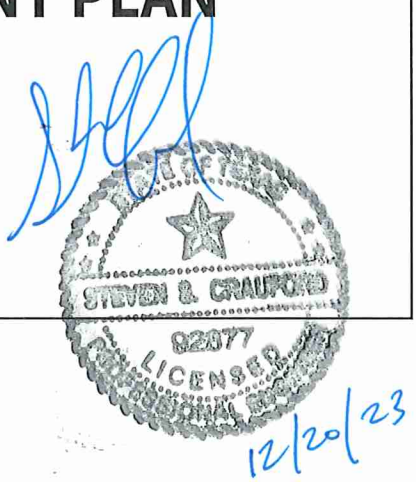
KISSING TREE PHASE 6C

WATER POLLUTION ABATEMENT PLAN APPLICATION



DECEMBER 2023

PAPE-DAWSON ENGINEERS

Transportation | Water Resources | Land Development | Surveying | Environmental

KISSING TREE PHASE 6C

WATER POLLUTION ABATEMENT PLAN APPLICATION

December 2023

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: Kissing Tree Phase 6C						**2. Regulated Entity No.:** 111587408			
3. Customer Name: Carma Paso Robles, LLC						**4. Customer No.:** CN603437310			
5. Project Type: (Please circle/check one)	New		Modification			Extension		Exception	
6. Plan Type: (Please circle/check one)	WPAP	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification	Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			**8. Site (acres):**			21.809
9. Application Fee:	$4,000.00		**10. Permanent BMP(s):**			N/A			
11. SCS (Linear Ft.):	N/A		**12. AST/UST (No. Tanks):**			N/A			
13. County:	Hays		**14. Watershed:**			Willow Springs Creek and Cottonwood 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.)	✓	___	___
Region (1 req.)	✓	___	___
County(ies)	✓	___	___
Groundwater Conservation District(s)	✓ Edwards Aquifer Authority ___ Barton Springs/ Edwards Aquifer ___Hays Trinity ___Plum Creek	___Barton Springs/ Edwards Aquifer	NA
City Jurisdiction	___Austin ___Buda ___Dripping Springs ___Kyle ___Mountain City ✓ San Marcos ___Wimberley ___Woodcreek	___Austin ___Bee Cave ___Pflugerville ___Rollingwood ___Round Rock ___Sunset Valley ___West Lake Hills	___Austin ___Cedar Park ___Florence ___Georgetown ___Jerrell ___Leander ___Liberty Hill ___Pflugerville ___Round Rock

San Antonio Region					
County:	**Bexar**	**Comal**	**Kinney**	**Medina**	**Uvalde**
Original (1 req.)	___	___	___	___	___
Region (1 req.)	___	___	___	___	___
County(ies)	___	___	___	___	___
Groundwater Conservation District(s)	___ Edwards Aquifer Authority ___Trinity-Glen Rose	___Edwards Aquifer Authority	___Kinney	___EAA ___Medina	___EAA ___Uvalde
City(ies) Jurisdiction	___Castle Hills ___Fair Oaks Ranch ___Helotes ___Hill Country Village ___Hollywood Park ___San Antonio (SAWS) ___Shavano Park	___Bulverde ___Fair Oaks Ranch ___Garden Ridge ___New Braunfels ___Schertz	NA	___San Antonio ETJ (SAWS)	NA

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review. Steven Crauford, P.E.
Print Name of Customer/Authorized Agent
Signature of Customer/Authorized Agent Date 12/20/23

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

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: Steven Crauford, P.E.

Date: December 20 , 2023

Signature of Customer/Agent:

Project Information

1. Regulated Entity Name: Kissing Tree Phase 6C
2. County: Hays
3. Stream Basin: Willow Springs Creek and Cottonwood Creek
4. Groundwater Conservation District (If applicable): Edwards Aquifer Authority
5. Edwards Aquifer Zone:

   ☒ Recharge Zone
   ☐ Transition Zone

6. Plan Type:

   ☒ WPAP
   ☐ SCS
   ☒ Modification
   ☐ AST
   ☐ UST
   ☐ Exception Request

7. Customer (Applicant):

Contact Person: Chad Matheson
Entity: Carma Paso Robles, LLC
Mailing Address: 9600 North Mopac Expressway, Suite 750
City, State: Austin, TX Zip: 78759
Telephone: (512) 391-1342 FAX: _____
Email Address: chad.matheson@brookfieldpropertiesdevelopment.com

8. Agent/Representative (If any):

Contact Person: Steven Crauford, P.E.
Entity: Pape-Dawson Engineers, Inc.
Mailing Address: 10801 North Mopac Expressway, Building 3, Suite 200
City, State: Austin, TX Zip: 78759
Telephone: (512) 454-8711 FAX: (512) 459-8867
Email Address: scrauford@pape-dawson.com

9. Project Location:

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

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

From TCEQ's Austin Office, travel approximately 1 mile southeast on Park 35 Circle to I-35 South. Travel South on I-35 South approximately 42.8 miles to exit #200 towards I-35 Frontage Road in San Marcos. Exit I-35 South and travel approximately 0.6 miles on the frontage road and turn right on Centerpoint Road. Travel approximately 0.6 miles on Centerpoint Road. From the intersection of W. Centerpoint Road and Hunter Road, travel along W. Centerpoint road for approximately 1.25 miles and the site will be located on your right.

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

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

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

13. ☒ **The TCEQ must be able to inspect the project site or the application will be returned.** Sufficient survey staking is provided on the project to allow TCEQ regional staff to locate the boundaries and alignment of the regulated activities and the geologic or manmade features noted in the Geologic Assessment.

☐ Survey staking will be completed by this date: _____

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

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

15. Existing project site conditions are noted below:

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

Prohibited Activities

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

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

(2) New feedlot/concentrated animal feeding operations, as defined in 30 TAC §213.3;

(3) Land disposal of Class I wastes, as defined in 30 TAC §335.1;

(4) The use of sewage holding tanks as parts of organized collection systems; and

(5) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41(b), (c), and (d) of this title (relating to Types of Municipal Solid Waste Facilities).

(6) New municipal and industrial wastewater discharges into or adjacent to water in the state that would create additional pollutant loading.

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

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

(2) Land disposal of Class I wastes, as defined in 30 TAC §335.1; and

(3) New municipal solid waste landfill facilities required to meet and comply with Type I standards which are defined in §330.41 (b), (c), and (d) of this title.

Administrative Information

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

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

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

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

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

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

ATTACHMENT A

KISSING TREE PHASE 6C

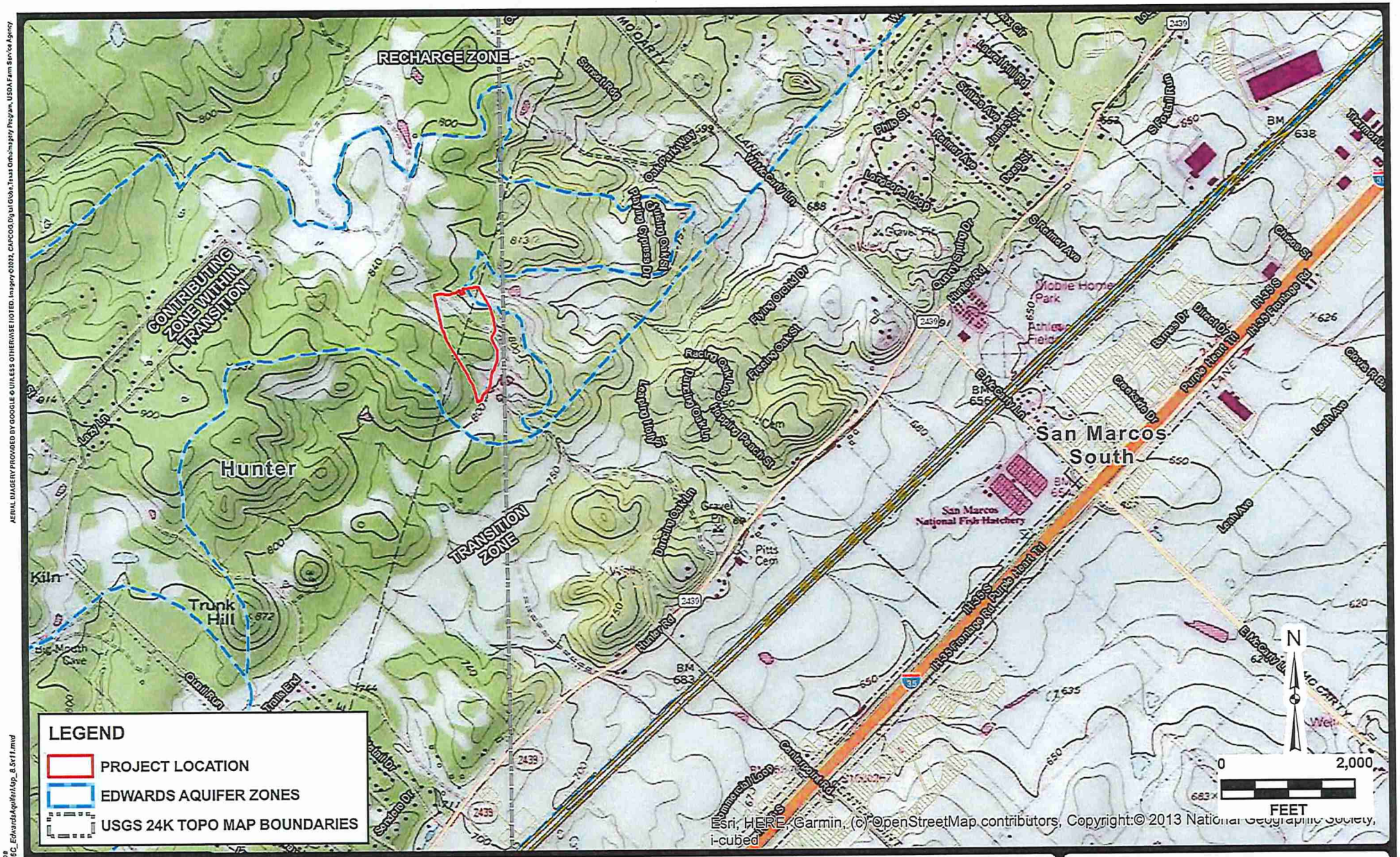
SAN MARCOS, TX

PROJECT LOCATION MAP

JOB NO.	50848-61
DATE	OCT 2022
DESIGNER	JB
CHECKED	JB
DRAWN	CR
SHEET	-

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY. BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

ATTACHMENT B



LEGEND

- PROJECT LOCATION
- EDWARDS AQUIFER ZONES
- USGS 24K TOPO MAP BOUNDARIES

JOB NO.	50848-61
DATE	OCT 2022
DESIGNER	JB
CHECKED	JB
DRAWN	CR
SHEET	-

KISSING TREE PHASE 6C

SAN MARCOS, TX

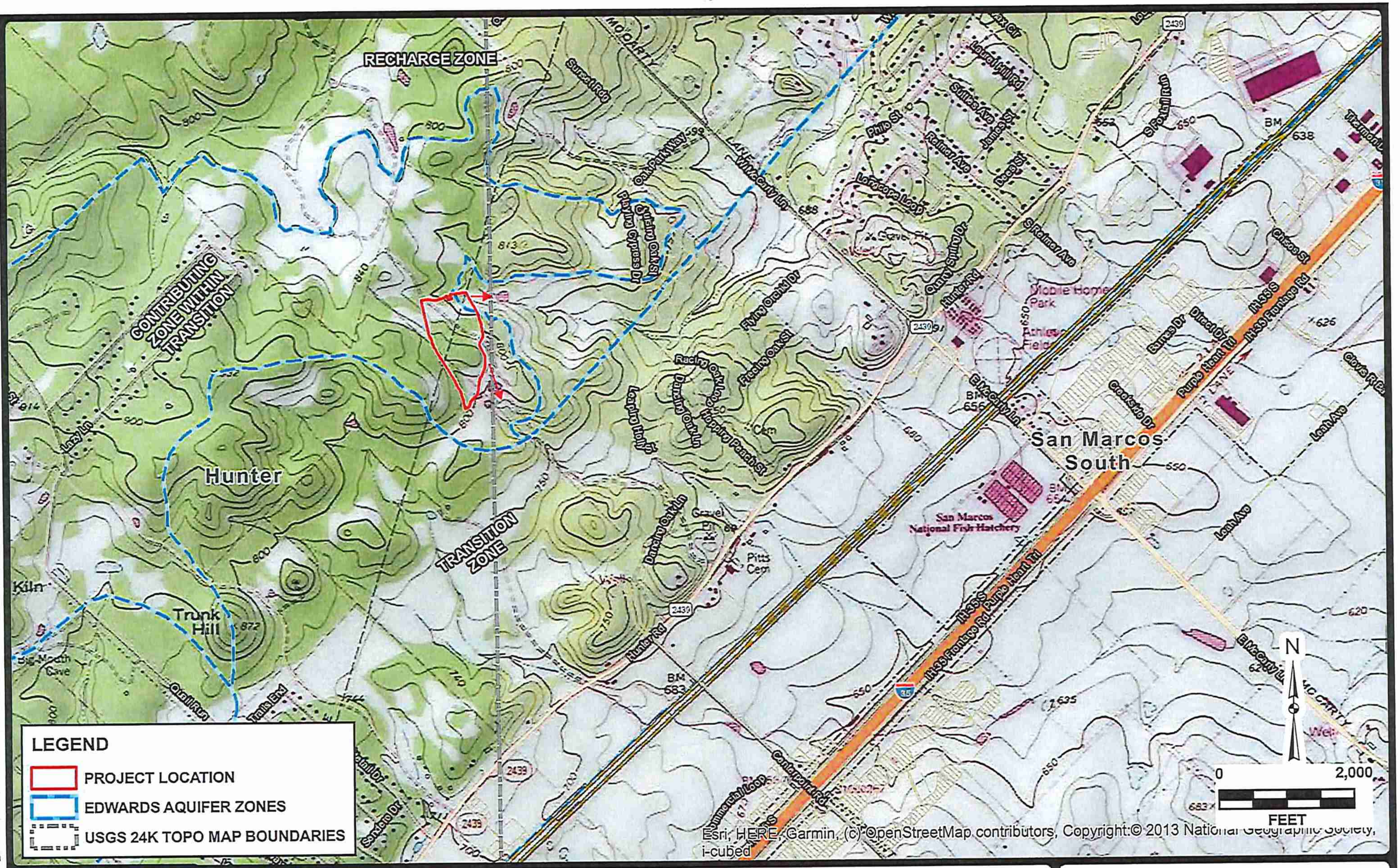
EAZ MAP

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS

10801 N MOPAC EXPY. BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711

TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801



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JOB NO.	50848-61
DATE	OCT 2022
DESIGNER	JB
CHECKED	JB DRAWN CR
SHEET	-

KISSING TREE PHASE 6C

SAN MARCOS, TX
EAZ FLOW MAP

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY. BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

Date: Sep 25, 2022 7:18:13 PM User: croe
File: H:\Projects\508\48\61\GIS\KissingTreePh6C_EdwardsAquiferMapwithFlowArrows_8.5x11.mxd

ATTACHMENT C

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

PROJECT DESCRIPTION

Kissing Tree Phase 6C is located on approximately 21.809 acres northwest of the Centerpoint Road and Hunter Road intersection, within the city limits of San Marcos in Hays County, Texas. The project limits are located over the Edwards Aquifer Recharge Zone and Contributing Zone. Under this Water Pollution Abatement Plan (WPAP), it is proposed to permit the 21.809-acre project limits as fully within the Edwards Aquifer Recharge Zone.

All portions of wastewater mains and services proposed in Kissing Tree Phase 6C are located outside of the Recharge Zone limits, therefore a Sewage Collection System (SCS) Application is not required.

Kissing Tree Phase 6C is proposed for single-family residential development. This site is undeveloped. As shown in the geologic assessment provided there is one (1) naturally occurring geologic feature (G28). G28 was identified as a fault and is evaluated as non-sensitive. Please refer to the site geologic map provided with the geologic assessment for additional information.

Kissing Tree Phase 6C is within the Paso Robles Planned Development District within the city limits of San Marcos. Under this zoning ordinance, Kissing Tree Phase 6C is required to treat to a Total Suspended Solids (TSS) removal of 85% within the Edwards Aquifer Recharge and Contributing Zones as opposed to the normal 80% TSS removal within the Edwards Aquifer Recharge and Contributing Zones as required by TCEQ. Therefore, permanent BMPs and associated sizing calculations have been adjusted to remove the required 85% TSS as required by the Paso Robles Planned Development District.

Construction activities proposed within the Kissing Tree Phase 6C WPAP include clearing, grading, excavation, installation of utilities and drainage improvements, streets and 74 homes with associated driveways. Kissing Tree Phase 6C consists of approximately 21.809 acres with approximately 7.24 acres of proposed impervious cover. There is no existing impervious cover on site.

One (1) proposed batch detention pond, two (2) existing batch detention ponds 5.3 and 7.13 permitted with Kissing Tree W. Centerpoint Road Phase 3A (EAPP ID No. 11002734), one (1) existing batch detention pond 7.9 permitted with Kissing Tree Phase 6A (EAPP ID No. 11002542), and one (1) fifteen-foot (15') wide engineered vegetative filter strip (VFS) are proposed as the permanent best Management Practices (PBMPs) for this site. There is no offsite area that drains onto the project site. All PBMPs have been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 85% of the increase in TSS from the site (80% TSS removal calculations, as required by TCEQ, are shown on this application).

Batch Detention Pond 7.14 is designed and proposed with Kissing Tree Phase 6C currently under review with this application. Batch Detention Pond 7.14 is an earthen pond with side slopes at 3:1 with the exception of maintenance access which is at 4:1 slope. This batch detention pond treats 4.29 acres and provides overtreatment for 0.054 acres from the Kissing Tree Phase 6C 21.809-acre project limits. The 4.29 acres within the 21.809-acre project limits is treated to 85% TSS removal under the requirements of the Paso Robles Planning Development District (80% TSS removal calculations, as required by TCEQ, are shown on this application).

Batch Detention Ponds 5.3 and 7.13 were designed and permitted with Kissing Tree W. Centerpoint Road Phase 3A (EAPP ID No. 11002734). Batch Detention Ponds 5.3 and 7.13 are earthen ponds with side slopes at 3:1 with the exception of maintenance access ramps which are at 4:1 slope. Batch detention pond 5.3 treats 2.21 acres from the Kissing Tree Phase 6C 21.809-acre project limits. Batch detention pond 7.13 treats 0.43 acres from the Kissing Tree Phase 6C 21.809-acre project limits. The 0.43 acres within the 21.809-acre project limits is treated to 85% TSS removal under the requirements of the Paso Robles Planning Development District (80% TSS removal calculations, as required by TCEQ, are shown on this application).

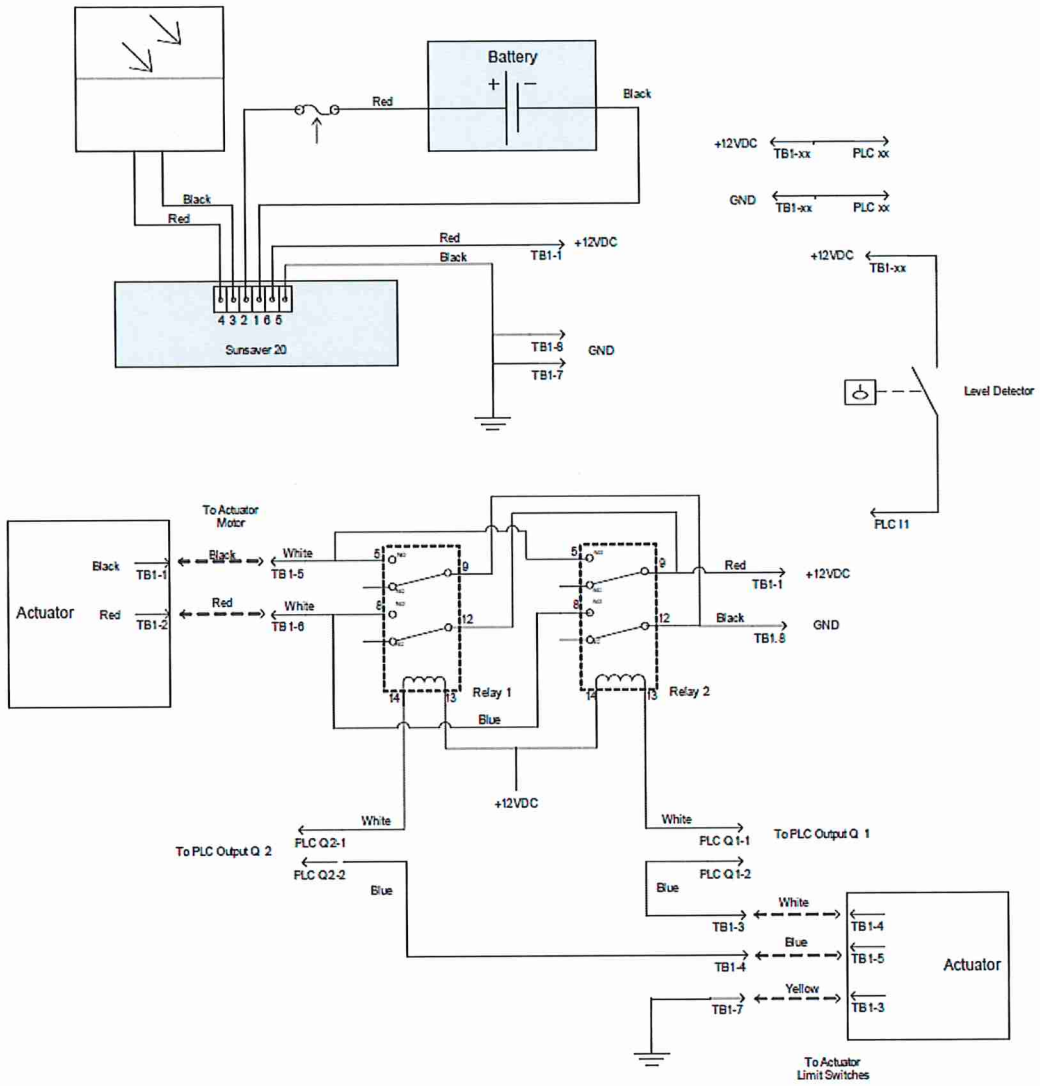
Batch Detention Pond 7.9 was designed and permitted with Kissing Tree Phase 6A (EAPP ID No. 11002542). The batch detention Pond (Batch Detention Pond 7.9) is an earthen pond with side slopes at 3:1 with the exception of maintenance access which is at 4:1 slope. This batch detention pond treats 0.10 acres from the Kissing Tree Phase 6C 21.809-acre project limits. The 0.10 acres within the 21.809-acre project limits is treated to 85% TSS removal under the requirements of the Paso Robles Planning Development District (80% TSS removal calculations, as required by TCEQ, are shown on this application).

A fifteen-foot (15') wide engineered vegetative filter strip (VFS) is designed with Kissing Tree Phase 6C and proposed with this application to treat 0.16 acres of impervious cover within the Kissing Tree Phase 6C 21.809-acre project limits.

The following is a summary of the batch detention pond controller components.

Batch Detention Pond Controller Information		
Component	**Description**	**Voltage**
Power System	Solar Charged 12 VDC Battery (Model MK Powered 8GU1) (Or approved equal)	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch (Or approved equal)	
Valve Type	Keystone 3" Butterfly Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	

The following is a circuit diagram of the controller:



The logic controller will provide a test sequence. The system will be solar powered and will be equipped with a backup battery. The system will be equipped with an on/off/reset switch. The butterfly valve will be equipped with a manual hand crank for physical override if necessary in the event of a spill or for maintenance purposes. The system will be equipped with a clearly visible external indicator to indicate if a cycle is in progress without having to open the parts enclosure.

The logic controller cycle overview is as follows:

Case 1: A single rain event fills the batch detention basin. The basin holds the diverted storm water for the detention time and the releases the water. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 2: A single rain event occurs, but does not completely fill the batch detention basin. The basin holds the water for the detention period, and then releases it. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 3: A single rain event fills the batch detention basin under the trip point of the level sensor. The level sensor does not trip. The captured water is held until it infiltrates / evaporates or is joined by storm water from a subsequent storm.

Case 4: Begins the same as Case 1. During the drawdown period, one or more additional rain events occur causing additional water to enter the batch detention basin. The valve remains open and the additional water volume is drained. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Case 5: Begins the same as Case 2. During the drawdown period, one or more additional rain events can occur causing additional water to enter the basin. The valve remains open and the additional water volume is drained. Once the batch detention basin is empty, a delay of 2 hours is started to allow the basin to completely drain, and then a close signal is sent to the actuator to close the valve.

Safety Precautions:

The system will be equipped with an alarm system that is clearly visible to indicate a system malfunction. A sign shall be posted with phone numbers of the owner and appropriate TCEQ regional office.

FIELD NOTES

FOR

A 21.809 ACRE TRACT OF LAND SITUATED IN THE JOHN WILLIAMS SURVEY, ABSTRACT NO. 471 IN THE CITY OF SAN MARCOS, TEXAS, BEING OUT OF THE REMNANT PORTION OF A CALLED 465.867 ACRE TRACT RECORDED IN VOLUME 3122, PAGE 356 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS, AND BEING OUT OF THE REMNANT PORTION OF A CALLED 301.926 ACRE TRACT (SAVE AND EXCEPT 5.036 ACRES) RECORDED IN VOLUME 3390, PAGE 411 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS. SAID 21.809 ACRE TRACT BEING MORE FULLY DESCRIBED AS FOLLOWS, WITH BEARINGS BASED ON THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH-CENTRAL ZONE FROM THE NORTH AMERICAN DATUM OF 1983 NAD 83 (NA2011) EPOCH 2010.00.

COMMENCING at a ½" iron rod with yellow cap marked "Pape-Dawson" found on the south corner of a Lot 48, Block S, Paso Robles, Phase 4F, a subdivision according to the plat recorded in County Filing No. 21060323 of the Plat Records of Hays County, Texas, said point being the west corner of Lot 47, Block S of said Paso Robles, phase 4F, same being on a northeast boundary line of the Remnant Portion of said 301.926-acre tract,

THENCE S 49°32'19" W departing the southwest boundary line of said Paso Robles, Phase 4F, through the interior of the Remnant Portion of said 301.926-acre tract, a distance of **300.48 feet** to a calculated point for the northeast corner and **POINT OF BEGINNING** hereof;

THENCE, continuing through the interior of the Remnant Portion of said 301.926-acre tract, and in part, though the interior of the Remnant Portion of said 465.867-acre tract, the following twenty-eight (28) courses and distances:

1. **S 28°42'03" E**, a distance of **359.11 feet** to a calculated angle point hereof,
2. **S 18°33'30" E**, a distance of **165.03 feet** to a calculated angle point hereof,
3. **S 06°59'56" E**, a distance of **193.78 feet** to a calculated angle point hereof,
4. **S 26°49'13" W**, a distance of **134.87 feet** to a calculated angle point hereof,
5. **S 26°30'57" E**, a distance of **211.16 feet** to a calculated angle point hereof,
6. **S 01°17'05" W**, a distance of **144.93 feet** to a calculated angle point hereof,
7. **S 20°11'10" W**, a distance of **174.58 feet** to a calculated point of non-tangent curvature hereof,

8. along the arc of a curve to the left, having a radius of 120.60 feet, a central angle of 19°25'52", a chord bearing and distance of S 26°39'26" W, 40.71 feet, an arc length of 40.90 feet to a calculated point of compound curvature hereof,

9. along the arc of a curve to the left, having a radius of 342.21 feet, a central angle of 12°41'48", a chord bearing and distance of S 10°35'36" W, 75.68 feet, an arc length of 75.83 feet to a calculated point of reverse curvature hereof,

10. along the arc of a curve to the right, having a radius of 691.60 feet, a central angle of 09°48'12", a chord bearing and distance of S 09°08'48" W, 118.19 feet, an arc length of 118.33 feet to a calculated point of compound curvature hereof,

11. along the arc of a curve to the right, having a radius of 106.27 feet, a central angle of 38°41'59", a chord bearing and distance of S 33°23'53" W, 70.42 feet, an arc length of 71.78 feet to a calculated point of non-tangency hereof,

12. S 40°26'10" W, a distance of 61.35 feet to a calculated angle point hereof,

13. S 51°55'00" W, a distance of 38.93 feet to a calculated angle point hereof,

14. S 15°29'18" W, a distance of 82.89 feet to a calculated angle point hereof,

15. S 62°13'19" W, a distance of 33.58 feet to a calculated angle point hereof,

16. S 82°13'28" W, a distance of 30.03 feet to a calculated point of non-tangent curvature and the southernmost corner hereof, from which a ½" iron rod with yellow cap marked "Pape-Dawson" found on the northeast corner of Lot 2, Block L, Paso Robles, Phase 4B-1, a subdivision according to the plat recorded in County Filing No. 20022471 of Hays County, Texas, bears, S 38°37'27" W, a distance of 497.08 feet,

17. along the arc of a curve to the left, having a radius of 990.00 feet, a central angle of 22°37'09", a chord bearing and distance of N 19°05'06" W, 388.30 feet, an arc length of 390.83 feet to a calculated point of non-tangency hereof,

18. N 30°23'41" W, a distance of 509.68 feet to a calculated point of tangent curvature hereof,

19. along the arc of a curve to the right, having a radius of 1435.00 feet, a central angle of 17°27'31", a chord bearing and distance of N 21°39'55" W, 435.57 feet, an arc length of 437.26 feet to a calculated point of tangency hereof,

20. N 12°56'10" W, a distance of 410.92 feet to a calculated angle point hereof,

21. **N 76°41'04" E**, a distance of **102.00 feet** to a calculated angle point hereof,

22. **S 79°45'53" E**, a distance of **115.33 feet** to a calculated angle point hereof,

23. **N 73°16'07" E**, a distance of **135.36 feet** to a calculated angle point hereof,

24. **N 54°12'46" E**, a distance of **53.82 feet** to a calculated point of non-tangent curvature hereof,

25. along the arc of a curve to the left, having a **radius** of **275.00 feet**, a **central angle** of **15°56'58"**, a **chord bearing** and **distance** of **S 22°45'14" E, 76.31 feet**, an **arc length** of **76.55 feet** to a calculated point of non-tangent hereof,

26. **N 59°01'16" E**, a distance of **50.00 feet** to a calculated point of non-tangent curvature hereof,

27. along the arc of a curve to the right, having a **radius** of **224.96 feet**, a **central angle** of **17°19'43"**, a **chord bearing** and **distance** of **N 22°00'39" W, 67.78 feet**, an **arc length** of **68.04 feet** to a calculated point of non-tangent hereof, and

28. **N 81°18'17" E**, a distance of **230.49 feet** to the **POINT OF BEGINNING** and containing 21.809 acres in the City of San Marcos, Hays County, Texas. Said tract being described in accordance with an exhibit prepared by Pape-Dawson Engineers, Inc. under job number 50848-61.

PREPARED BY: Pape-Dawson Engineers, Inc.
DATE: September 26, 2022
JOB No.: 50848-61
DOC.ID.: H:\Survey\CIVIL\50848-61\Exhibits\WORD\FN50848-61_21.809Ac_WPAP.docx
TBPE Firm Registration #470
TBPLS Firm Registration #100288-01

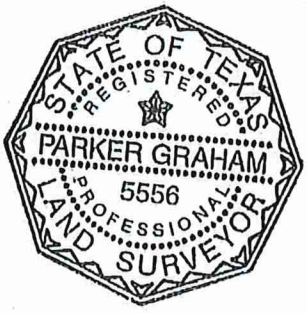
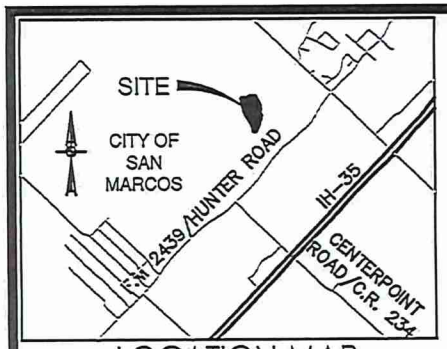
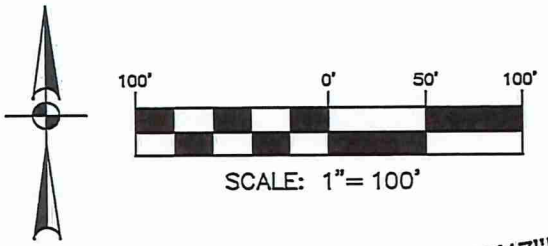


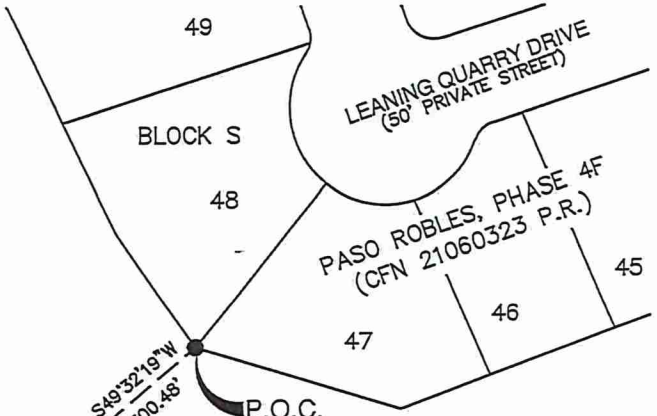
EXHIBIT OF

A 21.809 ACRE TRACT OF LAND SITUATED IN THE JOHN WILLIAMS SURVEY, ABSTRACT NO. 471 IN THE CITY OF SAN MARCOS, TEXAS, BEING OUT OF THE REMNANT PORTION OF A CALLED 465.867 ACRE TRACT RECORDED IN VOLUME 3122, PAGE 356 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS, AND BEING OUT OF THE REMNANT PORTION OF A CALLED 301.926 ACRE TRACT (SAVE AND EXCEPT 5.036 ACRES) RECORDED IN VOLUME 3390, PAGE 411 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS.



LOCATION MAP
NOT-TO-SCALE

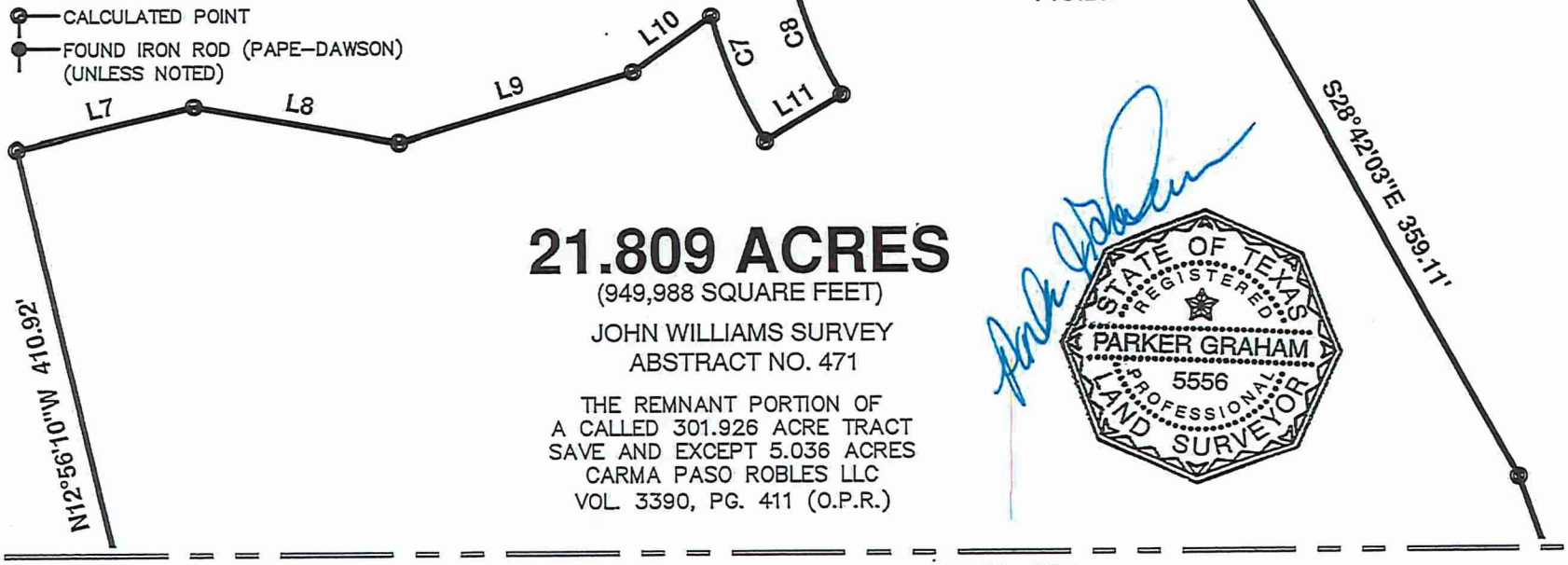




LEGEND:

O.P.R. OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
P.R. PLAT RECORDS OF HAYS COUNTY, TEXAS
CFN COUNTY FILING NUMBER
P.O.B. POINT OF BEGINNING
P.O.C. POINT OF COMMENCEMENT

CALCULATED POINT
FOUND IRON ROD (PAPE–DAWSON) (UNLESS NOTED)



21.809 ACRES

(949,988 SQUARE FEET)

JOHN WILLIAMS SURVEY
ABSTRACT NO. 471

THE REMNANT PORTION OF
A CALLED 301.926 ACRE TRACT
SAVE AND EXCEPT 5.036 ACRES
CARMA PASO ROBLES LLC
VOL. 3390, PG. 411 (O.P.R.)

MATCHLINE - SEE SHEET 2 OF 5

NOTES:

1. THE PROFESSIONAL SERVICES PROVIDED HEREWITH INCLUDE THE PREPARATION OF A FIELD NOTE DESCRIPTION.
2. THE BEARINGS ARE BASED ON THE TEXAS COORDINATE SYSTEM ESTABLISHED FOR THE SOUTH CENTRAL ZONE FROM THE NORTH AMERICAN DATUM OF 1983 NAD 83 (NA2011) EPOCH 2010.00.
3. ADJOINERS SHOWN FOR INFORMATIONAL PURPOSES ONLY.

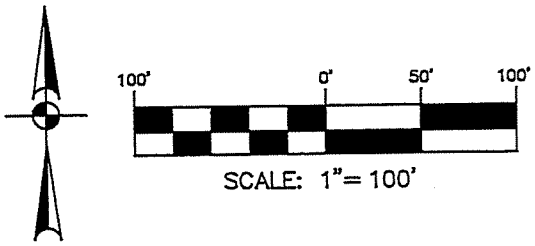
SEPTEMBER 26, 2022

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

Date: Sep 23, 2022, 9:20am User ID: DRodriguez
File: H:\Survey\CIVIL\50848-61\Exhibits\EX50848-61_21.809Ac_WPAP.dwg

EXHIBIT OF

A 45.80 ACRE TRACT OF LAND SITUATED IN THE JOHN WILLIAMS SURVEY, ABSTRACT NO. 471 IN THE CITY OF SAN MARCOS, TEXAS, BEING OUT OF THE REMNANT PORTION OF A CALLED 465.867 ACRE TRACT RECORDED IN VOLUME 3122, PAGE 356 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS, AND BEING OUT OF THE REMNANT PORTION OF A CALLED 301.926 ACRE TRACT (SAVE AND EXCEPT 5.036 ACRES) RECORDED IN VOLUME 3390, PAGE 411 OF THE OFFICIAL RECORDS OF HAYS COUNTY, TEXAS.



MATCHLINE - SEE SHEET 1 OF 5

21.809 ACRES

(949,988 SQUARE FEET)

JOHN WILLIAMS SURVEY
ABSTRACT NO. 471

THE REMNANT PORTION OF
A CALLED 301.926 ACRE TRACT
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CARMA PASO ROBLES LLC
VOL. 3390, PG. 411 (O.P.R.)

C9

S18°33'30"E
165.03'

S06°59'56"E 193.78'

S26°49'13"W
134.87'

MATCHLINE - SEE SHEET 3 OF 5

THE REMNANT PORTION OF
A CALLED 465.867 ACRE TRACT
CARMA PASO ROBLES LLC
VOL. 3122, PG. 356 (O.P.R.)

LEGEND:

O.P.R. OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
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CFN COUNTY FILING NUMBER
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CALCULATED POINT
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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

SEPTEMBER 26, 2022

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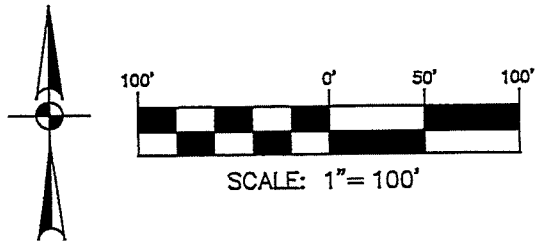

MATCHLINE - SEE SHEET 2 OF 5

THE REMNANT PORTION OF
A CALLED 301.926 ACRE TRACT
SAVE AND EXCEPT 5.036 ACRES
CARMA PASO ROBLES LLC
VOL. 3390, PG. 411 (O.P.R.)

21.809 ACRES
(949,988 SQUARE FEET)

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VOL. 3122, PG. 356 (O.P.R.)

TRACT LINE

N30°23'41"W 509.68'

S26°30'57"E 211.16'

S01°17'05"W 144.93'

MATCHLINE - SEE SHEET 4 OF 5

LEGEND:

O.P.R. OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS
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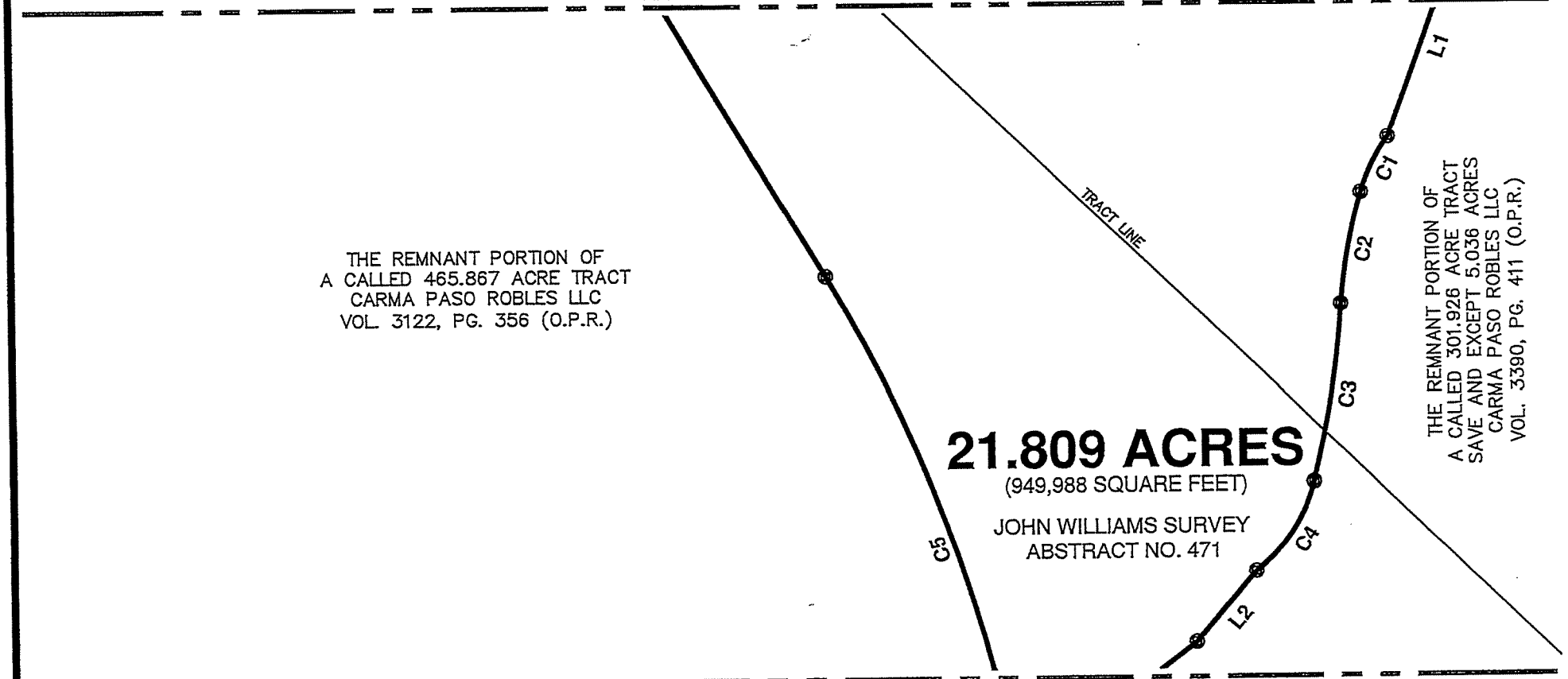
100' 0' 50' 100'

SCALE: 1"= 100'

MATCHLINE - SEE SHEET 2 OF 5



MATCHLINE - SEE SHEET 5 OF 5

LEGEND:

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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

JOB No.:

Date: Sep 23, 2022, 9:20am User ID: DRodriguez
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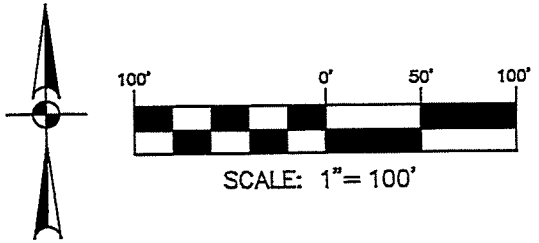


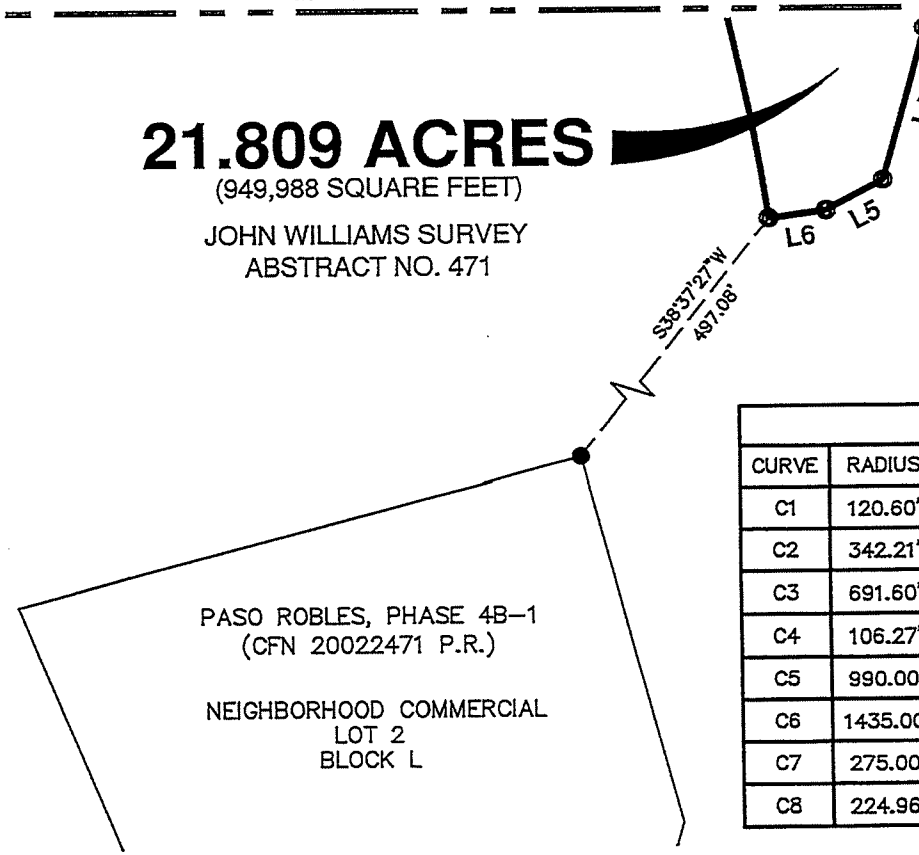
MATCHLINE - SEE SHEET 4 OF 5

LINE TABLE		
LINE	BEARING	LENGTH
L1	S20°11'10"W	174.58'
L2	S40°26'10"W	61.35'
L3	S51°55'00"W	38.93'
L4	S15°29'18"W	82.89'
L5	S62°13'19"W	33.58'
L6	S82°13'28"W	30.03'
L7	N76°41'04"E	102.00'
L8	S79°45'53"E	115.33'
L9	N73°16'07"E	135.36'
L10	N54°12'46"E	53.82'
L11	N59°01'16"E	50.00'

21.809 ACRES

(949,988 SQUARE FEET)

JOHN WILLIAMS SURVEY
ABSTRACT NO. 471



THE REMNANT PORTION OF
A CALLED 465.867 ACRE TRACT
CARMA PASO ROBLES LLC
VOL. 3122, PG. 356 (O.P.R.)

CURVE TABLE					
CURVE	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
C1	120.60'	19°25'52"	S26°39'26"W	40.71'	40.90'
C2	342.21'	12°41'48"	S10°35'36"W	75.68'	75.83'
C3	691.60'	9°48'12"	S09°08'48"W	118.19'	118.33'
C4	106.27'	38°41'59"	S33°23'53"W	70.42'	71.78'
C5	990.00'	22°37'09"	N19°05'06"W	388.30'	390.83'
C6	1435.00'	17°27'31"	N21°39'55"W	435.57'	437.26'
C7	275.00'	15°56'58"	S22°45'14"E	76.31'	76.55'
C8	224.96'	17°19'43"	N22°00'39"W	67.78'	68.04'

LEGEND:

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P.R. PLAT RECORDS OF HAYS COUNTY, TEXAS
CFN COUNTY FILING NUMBER
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10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

SEPTEMBER 26, 2022

SHEET 5 OF 5
JOB No.: 50848-61

Date: Sep 23, 2022, 9:20am User ID: DRodriguez
File: H:\Survey\CIVIL\50848-61\Exhibits\EX50848-61_21.809Ac_WPAP.dwg

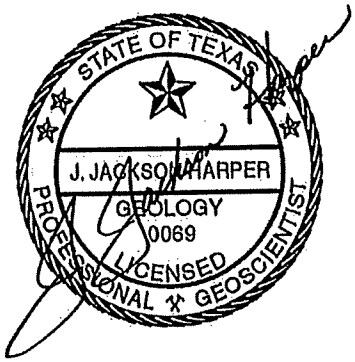
GEOLOGIC ASSESSMENT

J. Jackson Harper, P.G.
Geological & Hydrogeological Consulting

GEOLOGIC ASSESSMENT FOR KISSING TREE NORTH, SAN MARCOS, TEXAS

Prepared for:

Brookfield Residential Properties, Inc.
11501 Alterra Parkway, Suite 100
Austin, Texas 78758



Project No. 21001
27 January 2021

403 N. Lake Hills Drive • Austin, Texas 78733-3115 • Tel: 512.243.8671 • Email: jackson@jjhgeo.com

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

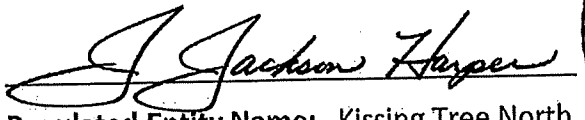
To the best of my knowledge, the responses to this form accurately reflect all information requested concerning the proposed regulated activities and methods to protect the Edwards Aquifer. My signature certifies that I am qualified as a geologist as defined by 30 TAC Chapter 213.

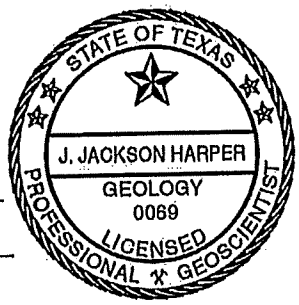
Print Name of Geologist: J. Jackson Harper, P.G. Telephone: (512) 243-8671

Date: 01/27/2021 Fax: ---

Representing: J. Jackson Harper, P.G. (TBPG License #69)

Signature of Geologist:





Regulated Entity Name: Kissing Tree North

Project Information

1. Date(s) Geologic Assessment was performed: 01/13/2021 - 01/22/2021
2. Type of Project:
   - ☒ WPAP
   - ☒ SCS
   - ☐ AST
   - ☐ UST
3. Location of Project:
   - ☒ Recharge Zone
   - ☒ Transition Zone
   - ☒ Contributing Zone within the Transition Zone

4. ☒ **Attachment A - Geologic Assessment Table.** Completed Geologic Assessment Table (Form TCEQ-0585-Table) is attached.

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

Table 1 – Soil Units, Infiltration Characteristics and Thickness

Soil Name	Group	Thickness(feet)
(CrD) Comfort-Rock outcrop complex, 1- 8% slopes	D	0-1
(DeB) Denton silty clay, 1-3% slopes	D	0-1
(MEC) Medlin-Eckrant association, 1-8 % slopes	D	1-3
(MED) Medlin-Eckrant association, 8-30 % slopes	D	1-3

** Soil Group Definitions (Abbreviated)*
A. Soils having a high infiltration rate when thoroughly wetted.
B. Soils having a moderate infiltration rate when thoroughly wetted.
C. Soils having a slow infiltration rate when thoroughly wetted.
D. Soils having a very slow infiltration rate when thoroughly wetted.

6. ☒ **Attachment B – Stratigraphic Column.** A stratigraphic column showing formations, members, and thicknesses is attached. The outcropping unit, if present, should be at the top of the stratigraphic column. Otherwise, the uppermost unit should be at the top of the stratigraphic column.

7. ☒ **Attachment C – Site Geology.** A narrative description of the site specific geology including any features identified in the Geologic Assessment Table, a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure(s), and karst characteristics is attached.

8. ☒ **Attachment D – Site Geologic Map(s).** The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1": 400'
   Applicant's Site Plan Scale: 1" = 300'
   Site Geologic Map Scale: 1" = 300'
   Site Soils Map Scale (if more than 1 soil type): 1" = 300' (Attachment E)

9. Method of collecting positional data:
   ☒ Global Position 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 not 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

13. ☒ 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 — **PROJECT NAME: Kissing Tree North, San Marcos, TX**

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 (degrees)	LONGITUDE (degrees)	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEG)	DOM	DENSITY (NO/FT)	APERTURE (FEET)	INFILL	RELATIVE INFILTRATION RATE	TOTAL	SENSITIVITY		CATCHMENT AREA (ACRES)		TOPOGRAPHY
						X	Y	Z		10						<40	≥40	<1.6	≥1.6	
G04	29.859319 N	98.003983 W	O	5	Kp	4	1	0.5			--	--	F	5	10	X		X		Hillside
G07	29.857154 N	98.003985 W	MB(Pond)	30	Kgl	200	100	5			--	--	F	5	35	X			X	Streambed
G08	29.855815 N	97.999020 W	MB(Pond)	30	Kgl	200	160	5					F	5	35	X			X	Streambed
G10	29.844497 N	98.000021 W	MB(Pond)	30	Kdr-Kgl	260	170	5					F	5	35	X			X	Streambed
G11	29.843800 N	98.000388 W	MB(Pond)	30	Kdr-Kgl	125	90	5					F	5	35	X			X	Streambed
G15	29.854849 N	97.998568 W	MB(Well)	30	Kgl-Kp?	1	1	230?					O	5	35	X		X		Hillside
G26	29.852828 N	98.000380 W	F	20	Kp-Kbu	8000+	?	?	N45°E	10	--	--	F	10	30	X			X	Hillside/Strmbd
G28	29.844815 N	98.000677 W	F	20	Kp-Kbu	8000+	?	?	N45°E	10	--	--	F	10	30	X			X	Hillside/Strmbd
G29	29.843533 N	97.995194 W	F	20	Kp-Kau	11000+	?	?	N55°E	10	--	--	F	10	30	X			X	Hillside/Strmbd

*DATUM WGS 1984 (G1150)

2A	TYPE	2B PTS
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, silicks, 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, 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.

STATE OF TEXAS
J. JACKSON HARPER
GEOLOGY
0089
LICENSED
PROFESSIONAL GEOSCIENTIST

J. Jackson Harper, P.G.

Date 01/27/2021
Sheet 1 of 1

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

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G04

Latitude:	29.859319° N	Northing:	13861340.9 ft
Longitude:	98.003963° W	Easting:	2284214.9 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Other natural bedrock feature (uplifted bedrock slab)
Formation:	Person Fm. (limestone)
Dimensions:	4 ft L x 1 ft W x 0.5 ft H
Trend:	None
Infiltration Rate:	Low
Watershed:	0.003 ac
Setting:	Hillside
Date Found	09/09/2007 (revisited 01/13/2021)

G04 is small bedrock slab that was uplifted by root action. Loose earth downslope of the feature are signs that small animals have tried to burrow under the slab. The feature showed no indications of change when revisited after 14 years. G04 is judged to be a non-sensitive feature, and no further action is recommended.

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G07

Latitude:	29.857154° N	Northing:	13860552.5 ft
Longitude:	98.003985° W	Easting:	2284213.0 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Manmade feature in bedrock (impoundment)
Formation:	Georgetown Fm. (limestone)
Dimensions:	200 ft L x 100 ft W x 1-5 ft D
Trend:	None
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Streambed
Date Found	09/09/2007 (revisited 01/13/2021)

G07 is a former livestock tank formed by shallow excavation to obtain sufficient material to form a dam across a small drainage. Exposed ground on the southeast (upstream) side of the pond and the dam materials indicate the pond was excavated into the clays and marly limestone of the Georgetown Formation. The pond holds water and there are no indications of rapid infiltration to the underling bedrock. G07 is judged to be a non-sensitive feature, and no further action is recommended.

View of impoundment G07 from the north side.

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G08

Latitude:	29.855815° N	Northing:	13860079.0 ft
Longitude:	97.999020° W	Easting:	2285791.0 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Manmade feature in bedrock (impoundment)
Formation:	Georgetown Fm. (limestone)
Dimensions:	280 ft L x 160 ft W x 1-5 ft D
Trend:	None
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Streambed
Date Found	09/10/2007 (revisited 01/13/2021)

G07 is a former livestock tank formed by shallow excavation to obtain sufficient material to form a dam across a small drainage. Exposed ground on the north (upstream) side of the pond and the dam materials indicate the pond was excavated into the clays and marly limestone of the Georgetown Formation. The pond holds water and there are no indications of rapid infiltration to the underling bedrock. G08 is judged to be a non-sensitive feature, and no further action is recommended.

View of Impoundment G08 from the north side.

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G10

Latitude:	29.844497° N	Northing:	13855960.9 ft
Longitude:	98.000021° W	Easting:	2285508.8 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Manmade feature in bedrock (impoundment)
Formation:	Georgetown Fm. (limestone)
Dimensions:	260 ft L x 170 ft W x 1-5 ft D
Trend:	None
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Streambed
Date Found	September 2007 (revisited 01/20/2021)

G10 is a former livestock tank formed by shallow excavation to obtain sufficient material to form a dam across a small drainage. Exposed ground on the periphery of the pond and the dam materials indicate the pond was excavated into the clays of the Del Rio Formation. The pond holds water and there are no indications of rapid infiltration to the underling bedrock. G10 is judged to be a non-sensitive feature, and no further action is recommended.

View of Impoundment G10 from the northeast side.

Feature G11

Latitude:	29.843800° N	Northing:	13855706.4 ft
Longitude:	98.000388° W	Easting:	2285394.7 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Manmade feature in bedrock (impoundment)
Formation:	Georgetown Fm. (limestone)
Dimensions:	280 ft L x 160 ft W x 1-5 ft D
Trend:	None
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Streambed
Date Found	September 2007 (revisited 01/20/2021)

G11 is a former livestock tank formed by shallow excavation to obtain sufficient material to form a dam across a small drainage. Exposed ground on the periphery of the pond and the dam materials indicate the pond was excavated into clays of the Del Rio Formation. The pond holds water and there are no indications of rapid infiltration to the underling bedrock. G11 is judged to be a non-sensitive feature, and no further action is recommended.

View of impoundment G10 from the west side.

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G15

Latitude:	29.854849° N	Northing:	13859730.1 ft
Longitude:	97.998568° W	Easting:	2285938.8 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Manmade feature in bedrock (water well)
Formation:	Georgetown Fm. (limestone) to Person Fm. (limestone)
Dimensions:	1 ft Ø x 240(?) ft D (see comments below)
Trend:	None
Infiltration Rate:	Low
Watershed:	0.01 ac
Setting:	Hillside
Date Found	December 2008 (revisited 01/14/2021)

G15 is a drilled water well adjacent to an old, abandoned home site. It was likely used for domestic and livestock purposes. When first observed in 2008, the space between the borehole and the 6-inch diameter steel casing was open. Circa 2009, the annulus was sealed with cement to an unknown depth. When revisited in 2021, the seal was intact and acting to prevent surface runoff from entering the well bore. It was observed that approximately 220 ft of pump discharge pipe was lying on the ground near the well (see photo background), which suggests the well may be on the order of at least 230 ft deep. Since current Kissing Tree development plans call for the site of G15 to become a paved street, the well needs to be properly plugged prior to site clearing and construction. Per Texas rules, plugging shall be done as follows: (1) plugging must be performed by a Texas-licensed water well driller with the proper equipment and qualifications; (2) remove all removable well casing; (3) remove all surface completion materials and equipment; and (4) plug the well by pressure cementing the well annulus with cement from the bottom of the well to ground surface.

View of well G15 from the east side

ATTACHMENT A (Cont'd)
FEATURE DESCRIPTIONS

Feature G26

Latitude:	29.852826° N	Northing:	13858975.2 ft
Longitude:	98.000380° W	Easting:	2285350.6 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Fault
Formation:	Person Fm. (limestone) – Buda Fm. (limestone)
Dimensions:	8,000+ ft L. Undetermined width and vertical displacement
Trend:	N 45° E
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Hillsides and streambed crossings
Date Found	Reported in literature

G26 is a fault reported in the geologic literature (Hanson and Small, 1995). . Its location at Kissing Tree is considered to be suspect, since it the reported surface trace does not exhibit any obvious surface expression or indication of rapid infiltration of surface runoff. G26 is judged to be a non-sensitive feature, and no further action is proposed.

Feature G28

Latitude:	29.844815° N	Northing:	13856074.8 ft
Longitude:	98.000677° W	Easting:	2285300.0 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Fault
Formation:	Person Fm. (limestone) – Buda Fm. (limestone)
Dimensions:	8,000+ ft L. Undetermined width and vertical displacement
Trend:	N 45° E
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Hillsides and streambed crossings
Date Found	Reported in literature

G28 is a fault reported in the geologic literature (Hanson and Small, 1995). . Its location at Kissing Tree is considered to be suspect, since it the reported surface trace does not exhibit any obvious surface expression or indication of rapid infiltration of surface runoff. G28 is judged to be a non-sensitive feature, and no further action is recommended.

Feature G29

Latitude:	29.843533° N	Northing:	13855623.3 ft
Longitude:	97.995194° W	Easting:	2287042.1 ft
Datum:	WGS 1984 (G1150)	Datum:	NAD 1983
Coord. System:	Geographic	Coord. System:	TX State Plane - South Central Zone

Type:	Fault
Formation:	Person Fm. (limestone) – Austin Group (chalk & limestone)
Dimensions:	11,000+ ft L. Undetermined width and vertical displacement
Trend:	N 55° E
Infiltration Rate:	Low
Watershed:	>1.6 ac
Setting:	Hillsides and streambed crossings
Date Found	Reported in literature

G28 is a fault reported in the geologic literature (Hanson and Small, 1995) as is also known as the San Marcos Springs fault. Its location at Kissing Tree is considered to be suspect, since it the reported surface trace does not exhibit any obvious surface expression or indication of rapid infiltration of surface runoff. G29 is judged to be a non-sensitive feature, and no further action is recommended.

Stratigraphic Unit		Hydrologic Unit	Approx. Max. Thickness at Project Site (ft)	Elevation (ft msl)	Depth (ft)
Group	Formation				
				755	0
Austin Group (Kau)			70		
				685	70
Eagle Ford Group (Kef)			30		
				655	100
	Buda Formation (Kbu)		50		
				605	150
	Del Rio Formation (Kdr)		50		
				555	200
	Georgetown Formation (Kgt)		30		
				525	230
Edwards Group	Person Formation (Kp)	Edwards Aquifer	260		
				265	490
	Kainer Formation (Kk)		180		
				85	670

Note: Section is representative of conditions at the southernmost edge of Kissing Tree North, where the Austin Group crops out at the ground surface. Occurrences, elevations, and thicknesses of these geologic units vary elsewhere, due to erosion and faulting.

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Geological & Hydrogeological Consulting

ATTACHMENT B

STRATIGRAPHIC COLUMN

KISSING TREE NORTH
SAN MARCOS, TEXAS

ATTACHMENT C

SITE GEOLOGY

Introduction

This report presents a geologic assessment of Kissing Tree North, which includes approximately 241 acres (ac) of the overall Kissing Tree community. The area assessed includes a main portion of approximately 234 ac and a nearby 7-ac portion of the existing community golf course (Attachment D).

The purpose of the geologic assessment was to identify sensitive geologic or manmade features where a potential for hydraulic interconnectedness between the surface and the Edwards aquifer exists and rapid infiltration to the subsurface may occur. The assessment was conducted in accordance with guidelines of the Texas Commission on Environmental Quality (TCEQ, 2004). It included a review of published and open-file information on the geology and ground water resources of the project area, examination of aerial imagery and topographic maps of the site, and field surveys of the project site. Lastly, this report supersedes previous geologic assessments covering Kissing Tree North (Harper; 2008, 2009) and should be relied upon when preparing the water pollution abatement plan (WPAP) and the sewage collection system (SCS) plan for Kissing Tree North.

Assessment Methodology and Scope

Available information from the Bureau of Economic Geology (BEG), U. S. Geological Survey (USGS), Texas Water Development Board (TWDB), TCEQ, and the Edwards Aquifer Authority (EEA) was reviewed to characterize the general geological and ground water conditions near the project site. Aerial imagery of the project site obtained from the Texas Natural Resources Information Service (TNRIS) and the Capital Area Council of Governments (CAPGOG) was examined for evidence of faults or fractures that might assist interpreting geological and hydrogeological conditions at the site.

Jackson Harper conducted a walking field survey of the Kissing Tree North areas between 13 and 22 January 2021. The survey entailed walking parallel transects spaced approximately 50 ft apart across the target area. Loose rock and soil were moved and/or excavated by hand, as needed, to assess suspected recharge features, but no labor- or time-intensive excavations were performed or needed.

Site Description

Physiography and Topography

Kissing Tree North is on the eastern edge of the Edwards Plateau physiographic province of Texas (Wermund, 1996) and can be characterized as a moderately-sloped upland formed on alternating beds of hard and soft limestone, and clay.

The whole of Kissing Tree North is in the San Marcos River watershed. The southernmost 15 percent of the main portion drains southeastward via an unnamed tributary to Cottonwood Creek. The northernmost 32 percent drains northward to an offsite, unnamed tributary of Purgatory Creek. The remainder of the main area and the separate 7 ac drain eastward and then northeastward via two unnamed tributaries to Willow Springs Creek. No part of the assessment area is within a 100-year flood hazard area, as mapped by the Federal Emergency Management Agency (FEMA, 2017).

Elevations within the assessment area vary between elevations of about 720 ft and 855 ft above mean sea level (msl). The lowest elevations occur where the larger drainages exit the eastern side of Kissing Tree North (e.g., 720, 730, and 745 ft msl). The highest elevations (e.g., 825, 830, 835, 845, and 855 ft msl) occur on scattered hilltops throughout the main portion of Kissing Tree North. Slopes within area are highly variable (e.g. 5 to 45 percent and average approximately 5 to 10 percent.

ATTACHMENT C

SITE GEOLOGY

Geology

The geology of the project site is characterized by a sequence of Cretaceous-age marine limestone, marl, and clay strata that is on the order of 1,000 ft thick. The normally gentle (20 ft/mi), monoclinic, southeastward dip of the strata was altered during Miocene time by extensive faulting. En echelon, normal, high-angle faults are the dominant faults and trend N 45° E to N 60° E across the region and the site. The San Marcos Springs and Comal Springs faults are the most prominent of these and are reported to at the southeast margin and 4,000 ft southeast, respectively of Kissing Tree North. Antithetic faults that trend north or east occur between the dominant faults. The result is a complex network of fault blocks with variable displacement. Attachment B is a stratigraphic column that shows the vertical sequence and thicknesses of the formal stratigraphic units occurring in Kissing Tree North. Attachment D shows the surface distribution of these units, together with two, reported inferred fault. From oldest to youngest, the stratigraphic units within Kissing Tree north are briefly described below.

- Kainer Formation (Kk) – Varies from mudstone to miliolid grainstone to crystalline limestone. The Kainer is not exposed at the surface, but is part of the Edwards aquifer, together with the overlying Person and Georgetown formations. The Kainer is approximately 300 ft thick in the assessment area.

- The Person Formation (Kp) – Ranges from mudstone to layers of locally intensely burrowed mudstone to grainstone to crystalline limestone. The Person is approximately 170 ft thick in the assessment area, and is exposed in the northernmost part of Kissing Tree North.

- Georgetown Formation (Kgt) – Overlies the Edwards Group and approximately 30 ft thick. It is generally a marly, nodular limestone. The limestone is fossiliferous and is noted for its content of ammonites and brachiopods. The unit occurs widely over the assessed area.

- Del Rio Clay (Kdr) – Dark bluish green to yellowish brown, gypsiferous clay, that is noted for its very high shrink-swell potential. It has a maximum thickness of approximately 47 ft and occurs widely within the assessment area.

- Buda Limestone (Kbu) – Dense, variably nodular limestone and buff, light-gray mudstone. It is approximately 22 ft thick in the assessment area. This unit caps some of the hilltops in the main portion of Kissing Tree North.

- Eagle Ford Group (Kef) – Overlies the Buda Formation and consists of thin, fissile, beds of brown, sandy shale and clayey limestone. Some layers emit a petroliferous odor when broken. The Eagle Ford is approximately 30 ft thick in the assessment area, but is not exposed at the surface within Kissing Tree North.

- Austin Group (Kau) – Overlies the Eagle Ford Group and consists of chalky, variably marly, generally fossiliferous limestone. It is approximately 70 ft thick in the assessment area and is reported to occur on the eastern edge of Kissing Tree North.

Surface Soils

Mapping by the Natural Resources Conservation Service (NRCS, 2018) identifies three soil mapping units within the project site: Comfort-Rock outcrop with 1-8% slopes (CrD); Denton silty clay, 1-3% slopes (DeB); Medlin-Eckrant association, 1-8% slopes (MEC); and Medlin-Eckrant association, 8-30% slopes (MED). The NRCS mapping is shown on Attachment E, and a few characteristic properties of these soils are listed below.

ATTACHMENT C

SITE GEOLOGY

Soil Series:	Comfort
Unified Soil Classification	CH, CL, GC, SC
USDA Texture:	Stony to very stony clay
Thickness:	36+ inches (observed at site)
Liquid limit	41-68
Plasticity index	21-40
Clay fraction	35-75%
Saturated hydraulic conductivity	$4.2x10^{-5}$ - $1.4x10^{-4}$ cm/sec
Shrink swell potential	Moderate to High (linear extensibility = 3.0-8.9%)
Hydrologic soil group	D

Soil Series:	Denton
Unified Soil Classification:	CH, CL, GC
USDA Texture:	Silty to gravelly clay
Thickness:	24 inches (observed at site)
Liquid limit:	31-70
Plasticity index:	11-41
Clay fraction:	27-57%
Saturated hydraulic conductivity:	$4.2x10^{-5}$ – $4.00x10^{-4}$ cm/sec
Shrink swell potential:	Moderate to very high (linear extensibility = 2.1-9.0%)
Hydrologic soil group:	D

Soil Series:	Medlin
Unified Soil Classification:	CH, CL
USDA Texture:	Clay to silty clay.
Thickness:	80+ inches (NRCS typical thickness)
Liquid limit:	45-79
Plasticity index:	26-54
Clay fraction:	40-60%
Saturated hydraulic conductivity:	$1x10^{-6}$ - $4.2x10^{-5}$ cm/sec
Shrink swell potential:	High (linear extensibility = 6.0-8.9%)
Hydrologic soil group:	D

Soil Series:	Eckrant
Unified Soil Classification:	CH, CL, SC, GC
USDA Texture:	Stony to very stony clay.
Thickness:	18 inches (NRCS typical thickness
Liquid limit:	44-73
Plasticity index:	25-45
Clay fraction:	40-60%
Saturated hydraulic conductivity:	$1.40x10^{-4}$ - $4x10^{-4}$ cm/sec
Shrink swell potential:	Moderate (linear extensibility = 3.0-5.9%)
Hydrologic soil group:	D

Fluid Movement to the Edwards Aquifer

Although the Georgetown Formation is not known to yield water in the project area, it is formally considered part of the Edwards aquifer, together with the Person and Kalner formations (Attachment B).

No other geologic units at the surface or in the shallow subsurface at the site transmit or produce significant amounts of ground water.

Ground water in the Edwards aquifer derives chiefly from precipitation that infiltrates the outcrop of the aquifer. Recharge of the aquifer occurs mainly through post-depositional fractures, faults, and dissolution features such as caves, sinkholes, solution cavities, and solution-enlarged bedding planes scattered across the upland terrain. Attachment D shows where the Edwards aquifer's recharge zone (as delineated by TCEQ (2005) occurs within and near the assessment area. Based on the low permeability of the geologic units that crop out across most of Kissing Tree North, significant recharge is not expected to occur there. Recharge would seem to be more likely to occur where the Person Formation is exposed at the northern end of Kissing Tree North. However, a noticeable lack of dissolution features and rock fracturing suggests this is not the case.

Water infiltrating the surface soil flows laterally along bedrock bedding planes and vertically through bedrock joints and dissolution features to an unconfined water table. Ground water in the project area generally moves northeastward (i.e., parallel to the major faults) towards points of discharge along the San Marcos River (e.g., San Marcos Springs). However, the myriad of faults produces complex flow paths.

Available records (EAA, 2008; Harper, 2008; Harper 2009; TWDB, 2019) indicate the existence of approximately 35 active and unused water wells within one-half mile of Kissing Tree North. These are residential wells northeast of Kissing Tree community and along McCarty Lane. All are known or believed to have been completed in the Edwards aquifer.

Finding and Recommendations

Geologic assessment features G26, G28, and G29 are faults reported in the geologic literature (Hanson and Small, 1995). Their locations within Kissing Tree North are considered to be suspect, since they have no obvious surface expression, and there are no indications of rapid infiltration of surface runoff along their reported trends. These faults are judged to be non-sensitive features, and no further action is recommended.

Features G07, G09, G10, and G11 are shallow manmade surface impoundments situated on low permeability clay and/or marly limestone. All of these are judged to be non-sensitive, and no further action is recommended.

Feature G04 is an instance of a small slab of broken limestone uplifted by tree roots, and small animals burrowed have under its uplifted edge. However, surface runoff cannot infiltrate deeper than the bedrock slab. Similar surface, erosional features were encountered throughout Kissing Tree North. All were inspected, and none were determined to be recharge features.

Lastly, G15 is an unused water well adjacent to an old, demolished house in the northeast part of Kissing Tree North. Since the location is planned to be a paved street, the well needs to be properly plugged properly plugged and abandoned. The well's description in Attachment A explains the appropriate steps.

This geologic assessment does not preclude the possibility of finding additional surface recharge features, subsurface voids, or wells during project construction. If any suspect feature is encountered, it should not be disturbed further until a determination is made of its sensitivity and need for protection.

ATTACHMENT C

SITE GEOLOGY

Appropriate actions to be taken when a suspect feature is found include prompt notice to TCEQ, investigation of the feature, and implementation of appropriate protective measures.

References

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Natural Resources Conservation Service (NRCS), 2019. Soil survey geographic (SSURGO) database for Hays County, Texas, U. S. Department of Agriculture, Washington, D.C. [URL: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm]

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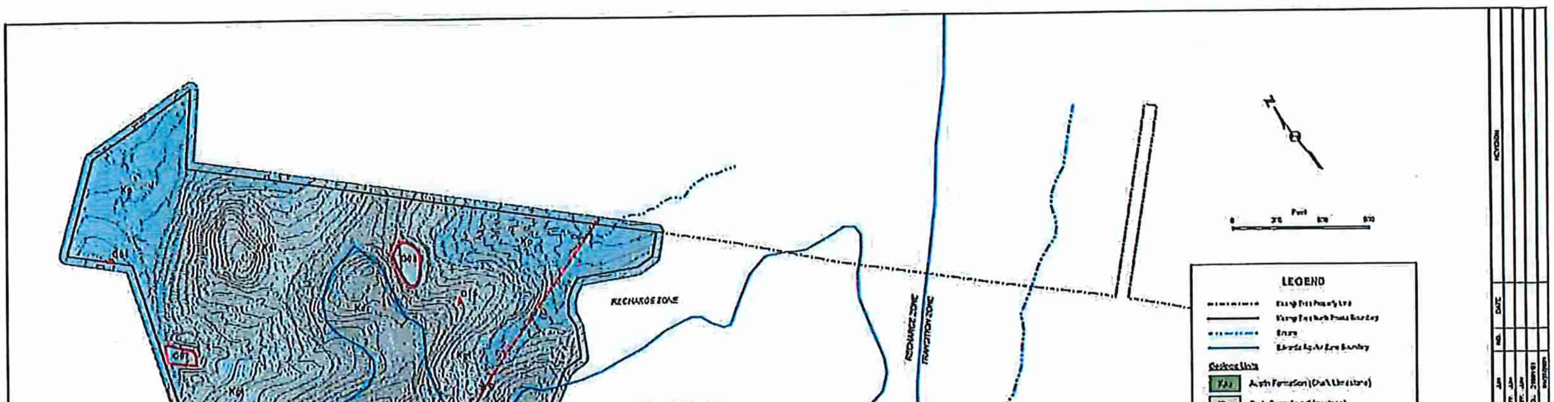
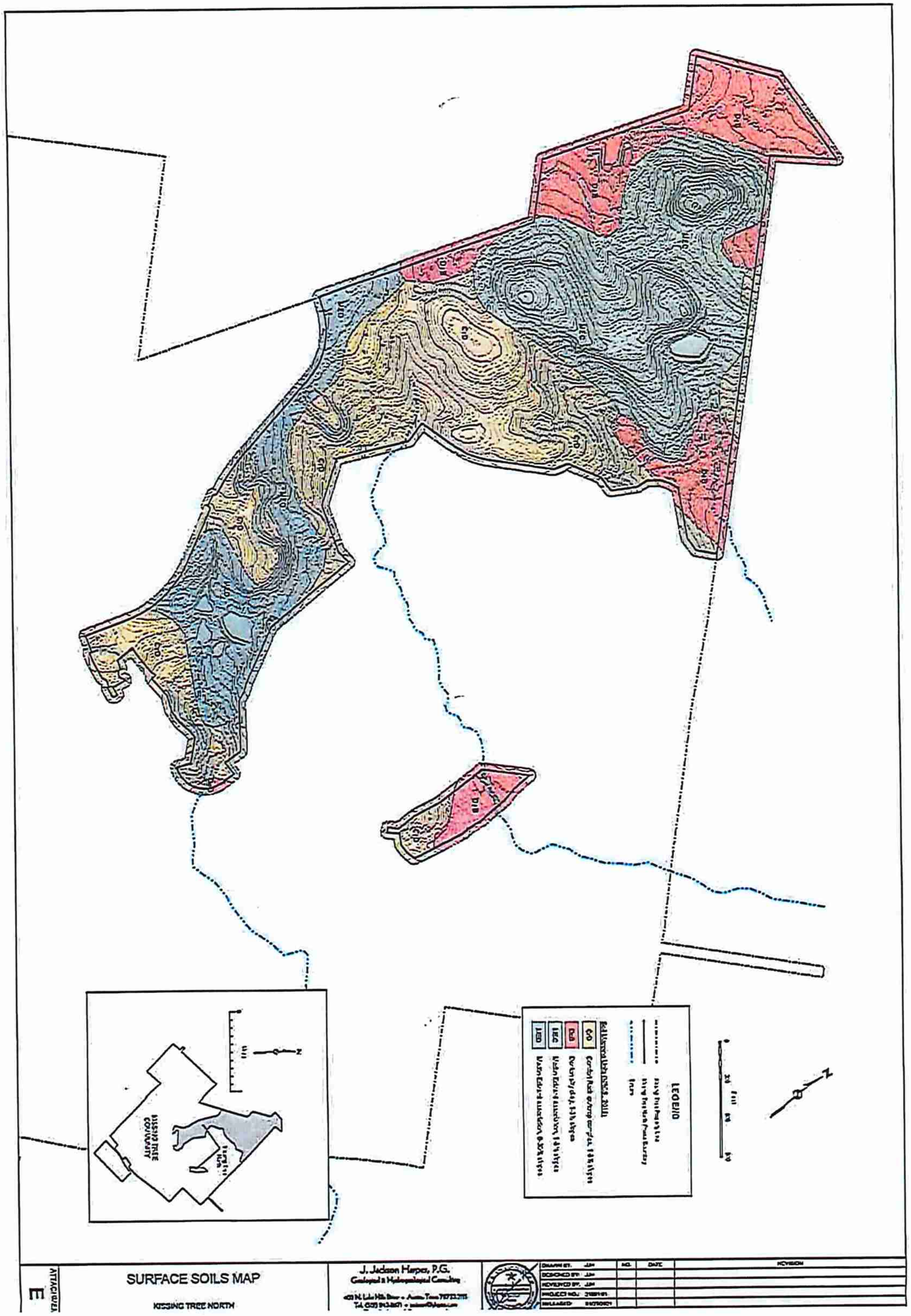

LEGEND
RECHARGE ZONE
CONTRIBUTING ZONE WITHIN THE TRANSITION ZONE
TRANSITION ZONE
SITE GEOLOGY MAP
D


LEGEND
Soil Mapping Units (NRCS, 2011)
CrD
Comfort-Rock outcrop complex, 1-8% slopes
DeB
Denton silty clay, 1-3% slopes
MEC
Medlin-Eckrant association, 1-8% slopes
MED
Medlin-Eckrant association, 8-30% slopes
KISSING TREE COMMUNITY
SURFACE SOILS MAP
KISSING TREE NORTH
J. Jackson Harper, P.G.
Geological & Hydrogeological Consulting
ATTACHMENT
E

Modification of a Previously Approved Contributing Zone Plan

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Transition Zone and Relating to 30 TAC 213.4(j), 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 **Modification of a Previously Approved Contributing Zone Plan** is hereby submitted for TCEQ review and executive director approval. The request was prepared by:

Print Name of Customer/Agent: Steven Crauford, P.E.

Date: 12 / 20 / 2023

Signature of Customer/Agent:

Project Information

1. Current Regulated Entity Name: Kissing Tree Phase 6C
   Original Regulated Entity Name: Kissing Tree Phase 6C
   Assigned Regulated Entity Number(s) (RN): 111587408
   Edwards Aquifer Protection Program ID Number(s): 11003305
   ☒ The applicant has not changed and the Customer Number (CN) is: 603437310
   ☐ The applicant or Regulated Entity has changed. A new Core Data Form has been provided.

2. ☒ **Attachment A: Original Approval Letter and Approved Modification Letters**. A copy of the original approval letter and copies of any modification approval letters are attached.

3. A modification of a previously approved plan is requested for (check all that apply):

☒ Any physical or operational modification of any best management practices or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;
☐ Any change in the nature or character of the regulated activity from that which was originally approved;
☐ A change that would significantly impact the ability to prevent pollution of the Edwards Aquifer and hydrologically connected surface water; or
☐ Any development of land previously identified in a contributing zone plan as undeveloped.

4. ☒ Summary of Proposed Modifications (select plan type being modified). If the approved plan has been modified more than once, copy the appropriate table below, as necessary, and complete the information for each additional modification.

CZP Modification Summary	***Approved Project***	***Proposed Modification***
Acres	21.809	21.809
Type of Development	Single-Family Residential	Single-Family Residential
Number of Residential Lots	65	74
Impervious Cover (acres)	7.08	7.24
Impervious Cover (%)	32.46 %	33.20 %
Permanent BMPs	2 Proposed, 3 Existing	2 Proposed, 3 Existing
Other	____	____

AST Modification Summary	***Approved Project***	***Proposed Modification***
Number of ASTs	____	____
Other	____	____

UST Modification Summary	***Approved Project***	***Proposed Modification***
Number of USTs	____	____
Other	____	____

5. ☒ **Attachment B: Narrative of Proposed Modification.** A detailed narrative description of the nature of the proposed modification is attached. It discusses what was approved,

including previous modifications, and how this proposed modification will change the approved plan.

6. ☒ **Attachment C: Current Site Plan of the Approved Project**. A current site plan showing the existing site development (i.e., current site layout) at the time this application for modification is attached. A site plan detailing the changes proposed in the submitted modification is required elsewhere.
   - ☒ The approved construction has not commenced. The original approval letter and any subsequent modification approval letters are included as Attachment A to document that the approval has not expired.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was constructed as approved.
   - ☐ The approved construction has commenced and has been completed. Attachment C illustrates that the site was **not** constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was constructed as approved.
   - ☐ The approved construction has commenced and has **not** been completed. Attachment C illustrates that, thus far, the site was **not** constructed as approved.

7. ☐ Acreage has not been added to or removed from the approved plan.
   ☒ Acreage has been added to or removed from the approved plan and is discussed in *Attachment B: Narrative of Proposed Modification*.

8. ☒ 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

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

January 6, 2023

Mr. Chad Matheson
Carma Paso Robles, LLC
9600 N. Mopac Expy., Ste. 750
Austin, Texas 78759

Re: Edwards Aquifer, Hays County

NAME OF PROJECT: Kissing Tree Phase 6C; located south of Wild Honeysuckle Way and Dancing Oak Lane; San Marcos, 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. 11003305; Regulated Entity No. RN111587408

Dear Mr. Chad Matheson:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the above-referenced project submitted to the Austin Regional Office by Pape-Dawson Engineers, Inc. on behalf of Carma Paso Robles, LLC on October 11, 2022. Final review of the WPAP was completed after additional material was received on January 3, 3022. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) were selected, 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.*

BACKGROUND

A letter dated September 3, 2021 (EAPP ID No. 11002542) approved the construction of a batch detention basin (Basin 7.9). Two other batch detention basins (Basin 5.3 and Basin 7.13) were approved by letter dated December 29, 2021 (EAPP ID No. 11002734).

PROJECT DESCRIPTION

The proposed residential project will have an area of approximately 21.81 acres. It will include 65 home sites, drives, streets, clearing, grading, excavation, utility installation, water quality facilities, and associated appurtenances. The impervious cover will be 7.08 acres (32.5 percent). Project wastewater will be disposed of by conveyance to the existing San Marcos Wastewater Treatment Plant.

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, one proposed batch detention basin (Basin 7.14), one proposed engineered vegetative filter strip, and three existing batch detention basins (Basin 5.3, Basin 7.9, and Basin 7.13), designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices (2005), will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project is 6,355 pounds of TSS generated from the 7.08 acres of impervious cover. 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 included with the application, the site is surficially characterized by Del Rio Formation (Kdr) and Georgetown Formation (Kgt). No sensitive features were identified. The TCEQ site assessment conducted on November 8, 2022, revealed the site to be generally as described.

SPECIAL CONDITIONS

I. All permanent pollution abatement measures shall be operational prior to occupancy of the facility.

II. All sediment and/or media removed from the water quality basin during maintenance activities shall be properly disposed of according to 30 TAC 330 or 30 TAC 335, as applicable.

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.
9. All borings with depths greater than or equal to 20 feet must be plugged with non-shrink grout from the bottom of the hole to within three (3) feet of the surface. The remainder of the hole must be backfilled with cuttings from the boring. All borings less than 20 feet must be backfilled with cuttings from the boring. All borings must be backfilled or plugged within four (4) days of completion of the drilling operation. Voids may be filled with gravel.

<u>During Construction:</u>

10. 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.
11. 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. Refer to Standard Condition No. 6, above.
12. 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.

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. 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.
15. 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.
16. 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.
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.

<u>After Completion of Construction:</u>

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.
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 James "Bo" Slone, P.G. of the Edwards Aquifer Protection Program of the Austin Region office at (512) 339-2929.

Sincerely,

Lillian Butler

Lillian Butler, Section Manager
Edwards Aquifer Protection Program
Texas Commission on Environmental Quality

LIB/jcs

Enclosure: Deed Recordation Affidavit, Form TCEQ-0625
Change in Responsibility for Maintenance of Permanent BMPs, Form TCEQ-10263

Cc: Mr. Steven Crauford, P.E., Pape-Dawson Engineers, Inc.

ATTACHMENT B

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

Attachment B – **NARRATIVE** of Proposed Modification

On January 6, 2023, the Texas Commission on Environmental Quality approved the Kissing Tree Phase 6C WPAP Application (EAPP ID No. 11003305). The approved WPAP application provided water quality treatment for 65 single-family residences and associated supporting infrastructure. A total of 7.08 acres of new impervious cover was permitted under the approved application and was to be treated by one (1) proposed batch detention basin, one (1) proposed engineered vegetative filter strip, and three (3) existing batch detention basins. The overall site acreage in this totaled 21.81 acres.

The proposed modification to the Water Pollution Abatement (WPAP) application leaves one (1) proposed batch detention basin, one (1) proposed engineered vegetative filter strip, and three (3) existing batch detention basins, and the overall site acreage of 21.81 acres unchanged. Under this proposed modification, the total number of single-family residences increased to 74 and the overall impervious cover introduced and treated by this modification application increased to 7.24 acres. The total number of single-family lots increased by 9 and the proposed impervious cover increased by approximately 0.16 acres.

The proposed disturbed acreage for the entire project site is 15.83 acres. However the maximum proposed disturbed acreage within one basin is 8.75 acres, since this is less than 10 acres, Attachment H for Temporary Sediment Pond and Calculations in the Temporary Stormwater section is not required.

The site is located within the city limits of San Marcos in Hays County, Texas. The project limits are located over the Edwards Aquifer Recharge Zone and Contributing Zone. Under this Water Pollution Abatement Plan (WPAP), it is proposed to permit the 21.81-acre project limits as fully within the Edwards Aquifer Recharge Zone. As shown in the geologic assessment provided there is one (1) naturally occurring geologic feature (G28). G28 was identified as a fault and is evaluated as non-sensitive. Please refer to the site geologic map provided with the geologic assessment for additional information.

WPAP APPLICATION

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.

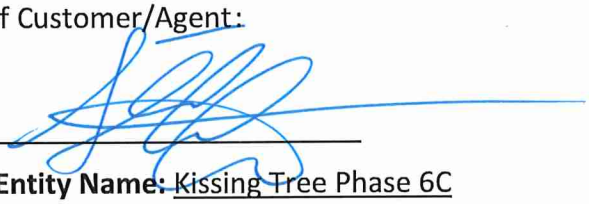
Signature

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: Steven Crauford, P.E.

Date: December 29 2023

Signature of Customer/Agent:



Regulated Entity Name: Kissing Tree Phase 6C

Regulated Entity Information

1. The type of project is:

   ☒ Residential: Number of Lots:74
   ☐ Residential: Number of Living Unit Equivalents:_____
   ☐ Commercial
   ☐ Industrial
   ☐ Other:_____

2. Total site acreage (size of property):21.809

3. Estimated projected population:167

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	210,678	÷ 43,560 =	4.84
Parking		÷ 43,560 =	
Other paved surfaces	104,716	÷ 43,560 =	2.40
Total Impervious Cover	315,394	÷ 43,560 =	7.24

Total Impervious Cover 7.24 **÷ Total Acreage** 21.809 **X 100 =** 33.20**% Impervious Cover**

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

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

For Road Projects Only

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

7. Type of project:

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

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

   ☐ Concrete
   ☐ Asphaltic concrete pavement
   ☐ Other: _____

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

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

10. Length of pavement area: _____ feet.

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

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

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

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

100% Domestic	16,700Gallons/day
_____% Industrial	_____Gallons/day
_____% Commingled	_____Gallons/day
TOTAL gallons/day 16,700	

15. Wastewater will be disposed of by:

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

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

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

☐ Sewage Collection System (Sewer Lines):

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

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

☐ The SCS was previously submitted on_____.

☐ The SCS was submitted with this application.

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

☒ The sewage collection system will convey the wastewater to the San Marcos (name) Treatment Plant. The treatment facility is:

☒ Existing.
☐ Proposed.

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

Site Plan Requirements

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

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

Site Plan Scale: 1" = 100'.

18. 100-year floodplain boundaries:

☐ Some part(s) of the project site is located within the 100-year floodplain. The floodplain is shown and labeled.
☒ No part of the project site is located within the 100-year floodplain.
The 100-year floodplain boundaries are based on the following specific (including date of material) sources(s): Federal Emergency Management Administration Flood Hazard Boundary Map, community panel number 48209C0476F and 48209C0457F, effective date September 2, 2005

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

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

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

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

☐ The wells are not in use and have been properly abandoned.
☐ The wells are not in use and will be properly abandoned.
☐ The wells are in use and comply with 16 TAC §76.

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

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

☒ All sensitive geologic or manmade features identified in the Geologic Assessment are shown and labeled.
☐ No sensitive geologic or manmade features were identified in the Geologic Assessment.

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

22. ☒ The drainage patterns and approximate slopes anticipated after major grading activities.
23. ☒ Areas of soil disturbance and areas which will not be disturbed.
24. ☒ Locations of major structural and nonstructural controls. These are the temporary and permanent best management practices.
25. ☒ Locations where soil stabilization practices are expected to occur.
26. ☐ Surface waters (including wetlands).

    ☒ N/A
27. ☐ Locations where stormwater discharges to surface water or sensitive features are to occur.

    ☒ There will be no discharges to surface water or sensitive features.
28. ☒ Legal boundaries of the site are shown.

Administrative Information

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

ATTACHMENT A

FACTORS AFFECTING WATER QUALITY

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site during construction include:

- Soil erosion due to the clearing of the site;
- Oil, grease, fuel and hydraulic fluid contamination from construction equipment and vehicle drippings;
- Hydrocarbons from asphalt paving operations;
- Miscellaneous trash and litter from construction workers and material wrappings;
- Concrete truck washout
- Potential overflow/spills from portable toilets

Potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the site after development include:

- Oil, grease, fuel and hydraulic fluid contamination from vehicle drippings;
- Dirt and dust which may fall off vehicles; and
- Miscellaneous trash and litter.

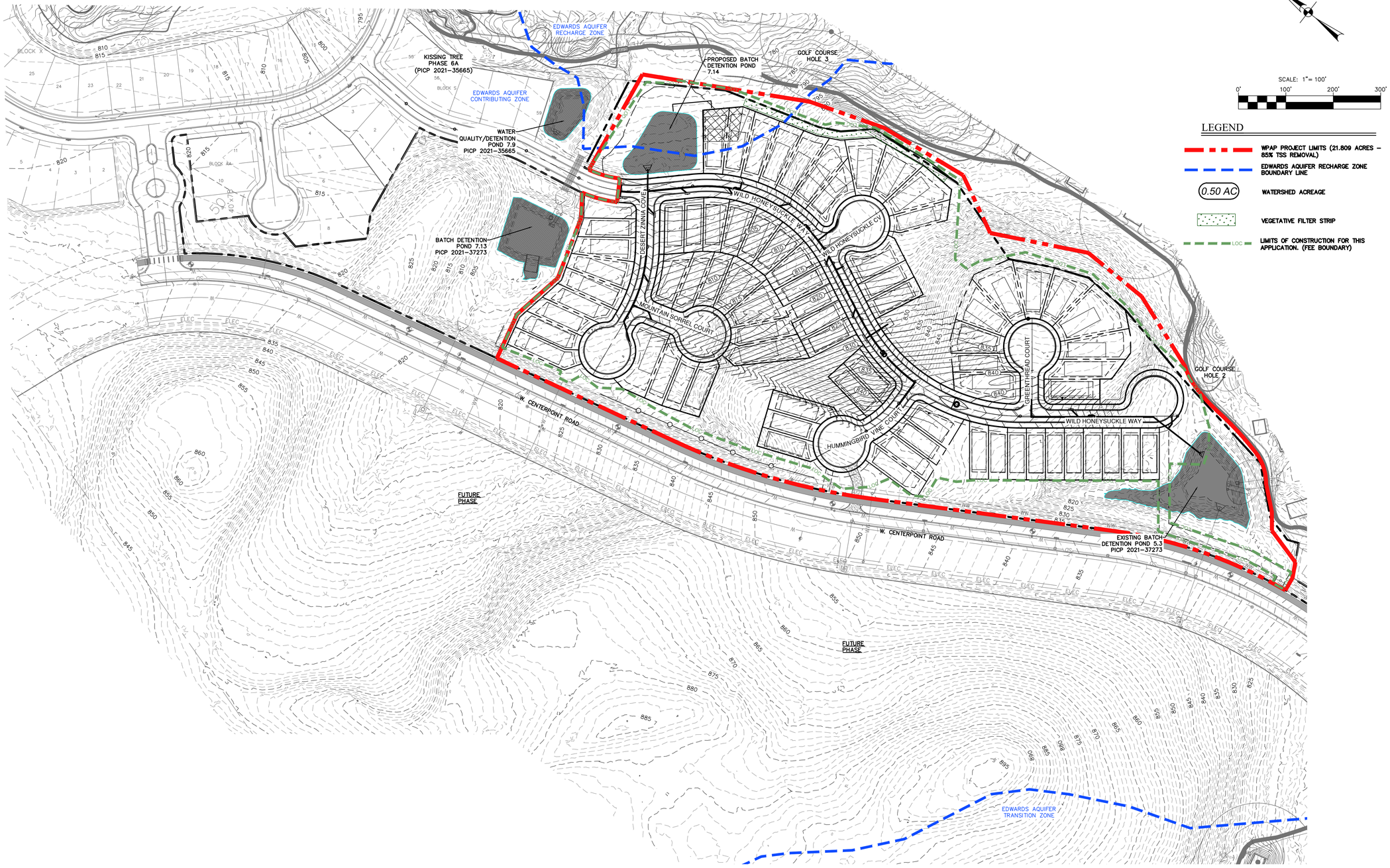
ATTACHMENT B

VOLUME AND CHARACTER OF STORMWATER

The 100-year pre-developed runoff coefficient is 0.46. The 100-year pre-development peak flow for Basin 5 is 432 cfs. Stormwater runoff will increase as a result of this development. For a 100-year storm event, the project will generate approximately 79 cfs from Batch Detention Pond 5-2 and 193 cfs from Batch Detention Pond 5-3 with a watershed post-development 100-year flow of 355 cfs for Basin 5 and a 100-year runoff coefficient of 0.66.

The 100-year pre-development peak flow for Basin 7 is 1,731 cfs. Stormwater runoff will increase as a result of this development. For a 100-year storm event, the project will generate approximately 191 cfs from Batch Detention Pond 7-13 with a watershed post-development 100-year flow of 1,252 cfs for Basin 7 and a 100-year runoff coefficient of 0.66. Values are based on the Rational Method using runoff coefficients per the City of San Marcos Criteria Manual. Stormwater runoff from the development can be characterized as overland, shallow-concentrated, and channelized flow from proposed single family residential development.

SITE PLAN



NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
SITE PLAN

CITY JOB No. 2022-XXXXXX
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN OH
SHEET 1 OF 1

PICP 2023-46402

TEMPORARY STORMWATER

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: Steven Crauford, P.E.

Date: December 20, 2023

Signature of Customer/Agent:

_____

Regulated Entity Name: Kissing Tree Phase 6C

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: Diesel Fuel, Gasoline, Etc.

   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: Willow Springs Creek and Cottonwood Creek

Temporary Best Management Practices (TBMPs)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

☒ N/A

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

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

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

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

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

Soil Stabilization Practices

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

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

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

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

Administrative Information

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

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

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

ATTACHMENT A

Spill Response Actions

In the event of an accidental leak or spill:

- Spill must be contained and cleaned up immediately.
- Spills will not be merely buried or washed with water.
- Contractor shall take action to contain spill. Contractor may use sand or other absorbent material stockpiled on site to absorb spill. Absorbent material should be spread over the spill area to absorb the spilled product.
- In the event of an uncontained discharge the contractor shall utilize onsite equipment to construct berms downgradient of the spill with sand or other absorbent material to contain and absorb the spilled product.
- Spill containment/absorbent materials along with impacted media must be collected and stored in such a way so as not to continue to affect additional media (soil/water). Once the spill has been contained, collected material should be placed on poly or plastic sheeting until removed from the site. The impacted media and cleanup materials should be covered with plastic sheeting and the edges weighed down with paving bricks or other similarly dense objects as the material is being accumulated. This will prevent the impacted media and cleanup materials from becoming airborne in windy conditions or impacting runoff during a rain event. The stockpiled materials should not be located within an area of concentrated runoff such as along a curb line or within a swale.
- Contaminated soils and cleanup materials will be sampled for waste characterization. When the analysis results are known the contaminated soils and cleanup materials will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.
- The contractor will be required to notify the owner, who will in turn contact TCEQ to notify them in the event of a significant hazardous/reportable quantity spill. Additional notifications as required by the type and amount of spill will be conducted by owner or owner's representative.

In the event of an accidental significant or hazardous spill:

- The contractor will be required to report significant or hazardous spills in reportable quantities as soon as possible and within 24 hours to:
  - the National Response Center at (800) 424-8802
  - the Edwards Aquifer Authority at (210) 222-2204
  - the TCEQ Regional Office (512) 339-2929 (if during business hours: 8 AM to 5 PM) or
  - the State Emergency Response Center (800) 832-8224 (if after hours)
  - reportable quantities can be found at the following link: https://www.tceq.texas.gov/response/spills/spill_rq.html

- Contaminated soils will be sampled for waste characterization. When the analysis results are known the contaminated soils will be removed from the site and disposed in a permitted landfill in accordance with applicable regulations.

Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 1.4.16. Contractor shall review this section.

ATTACHMENT B

POTENTIAL SOURCES OF CONTAMINATION

Potential Source
- Asphalt products used on this project.

Preventative Measure
- After placement of asphalt, emulsion or coatings, the contractor will be responsible for immediate cleanup should an unexpected rain occur. For the duration of the asphalt product curing time, the contractor will maintain standby personnel and equipment to contain any asphalt wash-off should an unexpected rain occur. The contractor will be instructed not to place asphalt products on the ground within 48 hours of a forecasted rain.

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

Preventative Measure
- Vehicle maintenance when possible will be performed within the construction staging area.
- Construction vehicles and equipment shall be checked regularly for leaks and repaired immediately.

Potential Source
- Accidental leaks or spills of oil, petroleum products and substances listed under 40 CFR parts 110, 117, and 302 used or stored temporarily on site.

Preventative Measure
- Contractor to incorporate into regular safety meetings, a discussion of spill prevention and appropriate disposal procedures.

- Contractor's superintendent or representative overseer shall enforce proper spill prevention and control measures.
- Hazardous materials and wastes shall be stored in covered containers and protected from vandalism.
- A stockpile of spill cleanup materials shall be stored on site where it will be readily accessible.

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

Preventive Measure
- Trash containers will be placed throughout the site to encourage proper trash disposal.

Potential Source
- Construction debris.

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

Potential Source
- Spills/Overflow of waste from portable toilets

Preventative Measure
- Portable toilets will be placed away from high traffic vehicular areas and storm drain inlets.
- Portable toilets will be placed on a level ground surface.
- Portable toilets will be inspected regularly for leaks and will be serviced and sanitized at time intervals that will maintain sanitary conditions.

ATTACHMENT C

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

SEQUENCE OF MAJOR ACTIVITIES

The sequence of major activities which disturb soil during construction on this site are listed below.

1) Set erosion controls – 2,467 LF of silt fence
2) Clear and grub – 15.83 acres
3) Pond Excavation – 0.36 acres
4) Rough grade roadway – 2.79 acres
5) Rough grade lots – 12.68 acres
6) Trench utilities – 7,650 LF
7) Install water, wastewater, and storm – 7,650 LF
8) Install sub base/base for road/parking areas – 2.79 acres
9) Pave roadway/parking areas – 2.79 acres
10) Pond Completion – 0.36 acres
11) Site cleanup – 21.81 acres
12) Remove erosion controls – 2,467 LF of silt fence

ATTACHMENT D

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

Please see the Erosion Control sheets included in the Construction Plans Section for TBMP layout and the responses below for more details.

Site preparation, which is the initiation of all activity on the project, will disturb the largest amount of soil. Therefore, before any of this work can begin, the clearing and grading contractor will be responsible for the installation of all on-site control measures. The methodology for pollution prevention of on-site stormwater will include: (1) erection of silt fences along the downgradient boundary of construction activities for temporary erosion and sedimentation controls, (2) installation of rock berms downgradient from areas of concentrated stormwater flow for temporary erosion control, (3) installation of stabilized construction entrance/exit(s) to reduce the dispersion of sediment from the site, and (4) installation of construction staging area(s).

Prior to the initiation of construction, all previously installed control measures will be repaired or reestablished for their designed or intended purpose. This work, which is the remainder of all activities on the project, may also disturb additional soil. The construction contractor will be responsible for the installation of all remaining on-site control measures that includes installation of the concrete truck washout pit(s), as construction phasing warrants.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter the aquifer, surface streams and/or sensitive features that may exist downstream of the site.

Inlet protection will be installed and utilized to reduce the dispersion of sediment from entering the storm sewer system during construction activities.

Temporary measures are intended to provide a method of slowing the flow of runoff from the construction site in order to allow sediment and suspended solids to settle out of the runoff. By containing the sediment and solids within the site, they will not enter the aquifer, surface streams and/or sensitive features that may exist downstream of the site.

BMP measures utilized in this plan are intended to allow stormwater to continue downstream after passing through the BMPs. This will allow stormwater runoff to continue downgradient to streams or

features that may exist downstream of the site. Features discovered during construction will be reported and assessed in accordance with applicable regulations.

ATTACHMENT F

STRUCTURAL PRACTICES

The following structural measures will be installed prior to the initiation of site preparation activities:

- Erection of silt fences along the downgradient boundary of construction activities and rock berms for secondary protection, as located on the Erosion Control sheets and illustrated on the Construction Details - Erosion Controls sheet.
- Installation of stabilized construction entrance/exit(s) and construction staging area(s), as located on the Erosion Control sheets and illustrated on the Construction Details - Erosion Controls sheet.

The following structural measures will be installed at the initiation of construction activities or as appropriate based on the construction sequencing:

- Installation of inlet protection, as required and located on the Erosion Control sheets and illustrated on the Construction Details - Erosion Controls sheet.
- Installation of concrete truck washout pit(s), as required and located on the Erosion Control sheets and illustrated on the Construction Details - Erosion Controls sheet.
- Installation of rock berm, as required and located on the Erosion Control sheets and illustrated on the Construction Details – Erosion Controls sheet.

ATTACHMENT G

WATER QUALITY POND VOLUME SUMMARY		
POND	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)
POND 5.3	42,339	44,038
POND 7.9	17,790	18,585
POND 7.13	41,714	45,265
POND 7.14	36,764	38,306

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- WPAP OVERTREATMENT AREA (85% TSS REMOVAL)
- VEGETATIVE FILTER STRIP (HATCHING LIMITS TO BE A DEFINED VEGETATIVE FILTER STRIP EASEMENT)
- 0.50 AC — WATERSHED ACREAGE
- WPAP PROJECT LIMITS (21.81 ACRES – 85% TSS REMOVAL)
- EDWARDS AQUIFER RECHARGE ZONE BOUNDARY LINE

EDWARDS AQUIFER RECHARGE ZONE
EDWARDS AQUIFER CONTRIBUTING ZONE
EDWARDS AQUIFER TRANSITION ZONE
KISSING TREE PHASE 6A (PICP 2021-35665)
WATER QUALITY POND 7.14
0.054 ACRES OVERTREATED BY POND 7.14
GOLF COURSE HOLE 3
15' ENGINEERED VEGETATIVE FILTER STRIP '1'
WATER QUALITY/DETENTION POND 7.9 PICP 2021-35665
0.12 ACRES OF IMPERVIOUS COVER TREATED BY POND 7.9
BATCH DETENTION POND 7.13 PICP 2021-37273
EXISTING BATCH DETENTION POND 5.3 PICP 2021-37273
GOLF COURSE HOLE 2
WILD HONEYSUCKLE WAY
WILD HONEYSUCKLE CV
DESERT ZINNIA COVE
MOUNTAIN SORREL COURT
GREENTHREAD COURT
HUMMINGBIRD VINE COURT
W. CENTERPOINT ROAD
0.67
7.33
10.33
20.38
20.38
18.39

Kissing Tree, Phase 6C: Water Quality Treatment Summary									
PBMP	Total Watershed Area (ac.)	Number of Homes	I.C. from Homes (ac.)	I.C. from Streets (ac.)	I.C. from Water Tower (ac.)	Total I.C. (ac.)	PBMP	80% TSS Removal Required (lb.)	TSS Removal Provided (lb.)
Existing Batch Detention Pond 5.3*	18.39	47.5	3.62	3.89	-	7.51	Existing Batch Detention Pond 5.3*	6,741	7,221
TOTAL BASIN 5	--	**48**	**3.62**	**3.89**	**-**	**7.51**	**TOTAL BASIN 5**	**6,741**	**7,221**
Existing Batch Pond 7.9**	7.33	13.5	1.29	1.21	-	2.50	Existing Batch Pond 7.9**	2,244	2,475
Overtreatment provided by Batch Detention Pond 7.9 from impervious cover greater than 72 ft in depth from Kissing Tree Phase 6A	-	-	0.09	-	-	0.09	Overtreatment provided by Batch Detention Pond 7.9 from impervious cover greater than 72 ft in depth from Kissing Tree Phase 6A	81	-
Existing Batch Detention Pond 7.13*	20.38	25	2.01	3.80	0.41	6.23	Existing Batch Detention Pond 7.13*	5,592	6,132
Proposed Batch Detention Pond 7.14	10.33	39	2.6	1.69	-	4.29	Proposed Batch Detention Pond 7.14	3851	4,350
Overtreatment provided by Proposed Batch Detention Pond 7.14	-	1	0.054	-	-	0.054	Overtreatment provided by Proposed Batch Detention Pond 7.14	48	-
Vegatative Filter Strip "1"	0.67	3	0.16	-	-	0.16	Vegatative Filter Strip "1"	144	163
TOTAL BASIN 7	--	**81.5**	**6.2**	**6.7**		**13.3**	**TOTAL BASIN 7**	**11,960**	**13,120**

*** Designed and constructed with Kissing Tree W. Centerpoint Road Phase 3A (PICP 2021-37273)**
**** Designed and constructed with Kissing Tree Phase 6A (PICP 2021-35665)**

Project/Impervious Cover Source	Net Impervious Cover Treated in Pond 5.3 Permitted with Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	Net Impervious Cover Treated in Pond 7.9 Permitted with Kissing Tree, Phase 6A (PICP 2021-35665)	Net Impervious Cover Treated in Pond 7.13 Permitted with Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	Net Impervious Cover Treated in Pond 7.14 This Project	Net Impervious Cover Treated in VFS "1" This Project
Kissing Tree, Phase 6A (PICP 2021-35665)	-	2.4	-	-	-
Golf Course	-	-	-	-	-
Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	0.71	-	1.52	-	-
Kissing Tree, Trunk Hill Water Facility (PICP 2022-41287)	-	-	0.41	-	-
Kissing Tree, W. Centerpoint Rd. Phase 3B (PICP 2022-41389)	0.63	-	1.79	-	-
Kissing Tree, Phase P6 & P7 (This Project)	2.21	0.10	0.43	4.29	0.16
Kissing Tree, Phase 16A Cottages	2.12	-	2.08	-	-
Kissing Tree, Phase P19 Cottages	1.84	-	-	-	-
Total IC for Detention Calculations **					
Total IC for Water Quality Treatment Calculations	7.51	2.50	6.23	4.29	0.16

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

WATER QUALITY TREATMENT SUMMARY 1 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 31 OF 64

PICP 2023-46402

BATCH DETENTION POND "5.3"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	5.3	
Total drainage basin/outfall area =	18.39	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	7.51	acres
Post-development impervious fraction within drainage basin/outfall area =	0.41	
$L_{M\ THIS\ BASIN}$ =	6741	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	18.39	acres
A_I =	7.51	acres
A_P =	10.88	acres
L_R =	7980	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	7221	lbs.
F =	0.90	

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

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	35283	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	7057	
Total Capture Volume (required water quality volume(s) x 1.20) =	42339	cubic feet

BATCH DETENTION POND "7.9"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.9	
Total drainage basin/outfall area =	7.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.50	acres
Post-development impervious fraction within drainage basin/outfall area =	0.34	
$L_{M\ THIS\ BASIN}$ =	2244	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	7.33	acres
A_I =	2.50	acres
A_P =	4.83	acres
L_R =	2676	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	2475	lbs.
F =	0.92	

Treatment provided for 2.50 acres of impervious cover treated by the pond and overtreatment for 0.09 acres impervious cover
2244 + (27.2 * 0.09 * 33) =2325

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

Rainfall Depth =	2.00	inches
Post Development Runoff Coefficient =	0.28	
On-site Water Quality Volume =	14825	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	2965	
Total Capture Volume (required water quality volume(s) x 1.20) =	17790	cubic feet

BATCH DETENTION POND "7.13"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.13	
Total drainage basin/outfall area =	20.38	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.23	acres
Post-development impervious fraction within drainage basin/outfall area =	0.31	
$L_{M\ THIS\ BASIN}$ =	5592	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	20.38	acres
A_I =	6.23	acres
A_P =	14.15	acres
L_R =	6703	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	6132	lbs.
F =	0.91	

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

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.26	
On-site Water Quality Volume =	34761	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6952	
Total Capture Volume (required water quality volume(s) x 1.20) =	41714	cubic feet

NO. | REVISION | DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
WATER QUALITY TREATMENT
SUMMARY 2 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 32 OF 64

Date: Dec 15, 2023, 2:24pm User ID: bennett
File: H:\Projects\50848\48\61\301 Construction Documents\Civil\WQ-50848-61_TCEQ_Submittal ONLY.dwg

PROPOSED BATCH DETENTION POND "7.14"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

Page 3-29 Equation 3.3: L_M = 27.2(A_N x P)

where:
- $L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
- A_N = Net increase in impervious area for the project
- P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.14	
Total drainage basin/outfall area =	10.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.29	acres
Post-development impervious fraction within drainage basin/outfall area =	0.42	
$L_{M\ THIS\ BASIN}$ =	3851	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	10.33	acres
A_I =	4.29	acres
A_P =	6.04	acres
L_R =	4555	lbs

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

Overtreatment for 0.054 AC of Impervious Cover Treated to 80% TSS Removal

Desired $L_{M\ THIS\ BASIN}$ =	4350	lbs.	(27.2 * 0.054 * 33)	=	48	+ 3,806	=	3,854
F =	0.95							

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

Rainfall Depth =	2.60	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	30637	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6127	
Total Capture Volume (required water quality volume(s) x 1.20) =	36764	cubic feet

VEGETATIVE FILTER STRIP "1"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

Page 3-29 Equation 3.3: L_M = 27.2(A_N x P)

where:
- $L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
- A_N = Net increase in impervious area for the project
- P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	0	

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

Drainage Basin/Outfall Area No. =	VFS "1"	
Total drainage basin/outfall area =	0.67	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.16	acres
Post-development impervious fraction within drainage basin/outfall area =	0.24	
$L_{M\ THIS\ BASIN}$ =	144	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Vegetated Filter Strips	
Removal efficiency =	85	percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.67	acres
A_I =	0.16	acres
A_P =	0.51	acres
L_R =	163	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	163	lbs.
F =	1.00	

DATE | NO. | REVISION

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
WATER QUALITY TREATMENT
SUMMARY 3 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 33 OF 64

Date: Dec 15, 2023, 2:24pm User ID: jbennett
File: H:\Projects\50848\61\301 Construction Documents\Civil\WQ-50848-61_TCEQ Submittal ONLY.dwg

PICP 2023-46402

ATTACHMENT I

INSPECTIONS & MAINTENANCE

Designated and qualified person(s) shall inspect Pollution Control Measures weekly and within 24 hours after a storm event. An inspection report that summarizes the scope of the inspection, names and qualifications of personnel conducting the inspection, date of the inspection, major observations, and actions taken as a result of the inspection will be recorded and maintained as part of Storm Water TPDES data for a period of three years after the Notice of Termination (NOT) has been filed. A copy of the Inspection Report Form is provided in this Storm Water Pollution Prevention Plan.

As a minimum, the inspector shall observe: (1) significant disturbed areas for evidence of erosion, (2) storage areas for evidence of leakage from the exposed stored materials, (3) structural controls (rock berm outlets, silt fences, drainage swales, etc.) for evidence of failure or excess siltation (over 6 inches deep), (4) vehicle exit point for evidence of off-site sediment tracking, (5) vehicle storage areas for signs of leaking equipment or spills, (6) concrete truck rinse-out pit for signs of potential failure, (7) embankment, spillways, and outlet of sediment basin (where applicable) for erosion damage, and (8) sediment basins (where applicable) for evidence that basin has accumulated 50% of its volume in silt. Deficiencies noted during the inspection will be corrected and documented within seven calendar days following the inspection or before the next anticipated storm event if practicable. Temporary sediment basins and permanent basins will be inspected until final stabilization of 70% within the basin watershed is achieved.

BMP inspection and maintenance requirements from sections 1.3 and 1.4 of TCEQ's Technical Guidance Manual are detailed below.

Temporary Construction Entrance/Exit

- The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
- All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
- When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

- When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
- All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

Silt Fence

- Inspect all fencing weekly, and after any rainfall.
- Remove sediment when buildup reaches 6 inches.
- Replace any torn fabric or install a second line of fencing parallel to the torn section.
- Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.
- When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

Rock Berms

- Inspection should be made weekly and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made.
- Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.
- Repair any loose wire sheathing.
- The berm should be reshaped as needed during inspection.
- The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.

- The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

Inlet Protection

- Inspection should be made weekly and after each rainfall. Repair or replacement should be made promptly as needed by the contractor.
- Remove sediment when buildup reaches a depth of 3 inches. Removed sediment should be deposited in a suitable area and in such a manner that it will not erode.
- Check placement of device to prevent gaps between device and curb.
- Inspect filter fabric and patch or replace if torn or missing. 1-100
- Structures should be removed and the area stabilized only after the remaining drainage area has been properly stabilized.

Sediment Basins

- Inspection should be made weekly and after each rainfall. Check the embankment, spillways, and outlet for erosion damage, and inspect the embankment for piping and settlement. Repair should be made promptly as needed by the contractor.
- Trash and other debris should be removed after each rainfall to prevent clogging of the outlet structure.
- Accumulated silt should be removed, and the basin should be re-graded to its original dimensions at such point that the capacity if the impoundment has been reduced to 75% of its original storage capacity.
- The removed sediment should be stockpiled or redistributed in areas that are protected from erosion.

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Application

Pollution Prevention Measure	Inspected in Compliance	Corrective Action Required	
		Description (use additional sheet if necessary)	Date Completed
Best Management Practices			
Natural vegetation buffer strips			
Temporary vegetation			
Permanent vegetation			
Sediment control basin			
Silt fences			
Rock berms			
Gravel filter bags			
Drain inlet protection			
Other structural controls			
Vehicle exits (off-site tracking)			
Material storage areas (leakage)			
Equipment areas (leaks, spills)			
Concrete washout pit (leaks, failure)			
General site cleanliness			
Trash receptacles			
Evidence of Erosion			
Site preparation			
Roadway or parking lot construction			
Utility construction			
Drainage construction			
Building construction			
Major Observations			
Sediment discharges from site			
BMPs requiring maintenance			
BMPs requiring modification			
Additional BMPs required			

_____ **A brief statement describing the qualifications of the inspector is included in this SWP3.**

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

"I further certify I am an authorized signatory in accordance with the provisions of 30 TAC §305.128."0

Inspector's Name _____ Inspector's Signature _____ Date _____

PROJECT MILESTONE DATES

Date when major site grading activities begin:

Construction Activity	*Date*
Installation of BMPs	

Dates when construction activities temporarily or permanently cease on all or a portion of the project:

Construction Activity	Date

Dates when stabilization measures are initiated:

Stabilization Activity	Date
Removal of BMPs	

ATTACHMENT J

SCHEDULE OF INTERIM AND PERMANENT SOIL STABILIZATION PRACTICES

Interim on-site stabilization measures, which are continuous, will include minimizing soil disturbances by exposing the smallest practical area of land required for the shortest period of time and maximizing use of natural vegetation. As soon as practical, all disturbed soil will be stabilized via permanent revegetation. Details, such as installation, irrigation, and maintenance are provided below.

Installation:

- Final grading must be completed prior to seeding, minimizing all steep slopes. In addition, all necessary erosion structures such as dikes, swales, diversions, should also be installed.
- Seedbed should be well pulverized, loose, and uniform.
- Fertilizer should be applied at the rate of 40 pounds of nitrogen and 40 pounds of phosphorus per acre, which is equivalent to about 1.0 pounds of nitrogen and phosphorus per 1000 square feet. Compost can be used instead of fertilizer and applied at the same time as the seed.

Irrigation:

- Temporary irrigation should be provided according to the schedule described below, or to replace moisture loss to evapotranspiration (ET), whichever is greater. Significant rainfall (on-site rainfall of ½" or greater) may allow watering to be postponed until the next scheduled irrigation.

Time Period	Irrigation Amount and Frequency
Within 2 hours of installation	Irrigate entire root depth, or to germinate seed
During the next 10 business days	Irrigate entire root depth every Monday, Wednesday, and Friday
During the next 30 business days or until Substantial Completion	Irrigate entire root depth a minimum of once per week, or as necessary to ensure vigorous growth
During the next 4 months or until Final Acceptance of the Project	Irrigate entire root depth once every two weeks, or as necessary to ensure vigorous growth

Inspection and Maintenance Guidelines:

- Permanent vegetation should be inspected weekly and after each rain event to locate and repair any erosion.
- Erosion from storms or other damage should be repaired as soon as practical by regrading the area and applying new seed.
- If the vegetated cover is less than 80%, the area should be reseeded.

Stabilization measures will be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and except as provided below, will be initiated no more than fourteen (14) days after the construction activity in that portion of the site has temporarily or permanently ceased. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within twenty-one (21) days, temporary stabilization measures do not have to be initiated on that portion of site. In areas experiencing droughts where the initiation of stabilization measures by the 14th day after construction activity has temporarily or permanently ceased is precluded by seasonably arid conditions, stabilization measures must be initiated as soon as practicable.

PERMANENT STORMWATER

Permanent Stormwater Section

Texas Commission on Environmental Quality

for Regulated Activities on the Edwards Aquifer Recharge Zone and Relating to 30 TAC §213.5(b)(4)(C), (D)(Ii), (E), and (5), Effective June 1, 1999

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

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

Signature

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

Print Name of Customer/Agent: Steven Crauford, P.E.

Date: October 3, 2022

Signature of Customer/Agent

Regulated Entity Name: Kissing Tree Phase 6C

Permanent Best Management Practices (BMPs)

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

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

   ☐ N/A

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

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

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

☐ N/A

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

   ☐ N/A

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

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

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

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

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

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

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

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

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

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

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

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

☐ N/A

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

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

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

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

☒ Design calculations (TSS removal calculations)
☒ TCEQ construction notes
☒ All geologic features
☒ All proposed structural BMP(s) plans and specifications

☐ N/A

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

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

    ☐ N/A

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

    ☒ N/A

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

    ☐ N/A

Responsibility for Maintenance of Permanent BMP(s)

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

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

    ☐ N/A

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

    ☐ N/A

ATTACHMENT B

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

BMP's for Upgradient Storm

No surface water, groundwater, or stormwater originates upgradient from the site and flows across the site.

ATTACHMENT C

BMPs for Onsite Stormwater

One (1) batch detention pond, three (3) existing batch detention ponds and one (1) existing detention pond permitted with Kissing Tree W. Centerpoint Road Phase 3A, and one (1) fifteen-foot (15') wide engineered vegetative filter strips (VFS) are proposed as the permanent best Management Practices (PBMPs) for this site. All PBMPs have been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 85% of the increase in Total Suspended Solids (TSS) from the site.

ATTACHMENT D

BMPs for Surface Streams

One (1) batch detention pond, three (3) existing batch detention ponds and one (1) existing detention pond permitted with Kissing Tree W. Centerpoint Road Phase 3A, and one (1) fifteen-foot (15') wide engineered vegetative filter strips (VFS) are proposed as the permanent best Management Practices (PBMPs) for this site. All PBMPs have been designed in accordance with the TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) to remove 85% of the increase in Total Suspended Solids (TSS) from the site. Runoff from impervious cover areas will be treated by the PBMPs prior to its discharge downstream into the Willow Springs Creek.

ATTACHMENT F

Attachment F – Construction Plans

See attached drawing set for relevant construction plans and design drawings for Kissing Tree Phase 6C.

REVISIONS				
No.	Revision Description	Prepared by: (Date)	Reviewed by: (Date)	

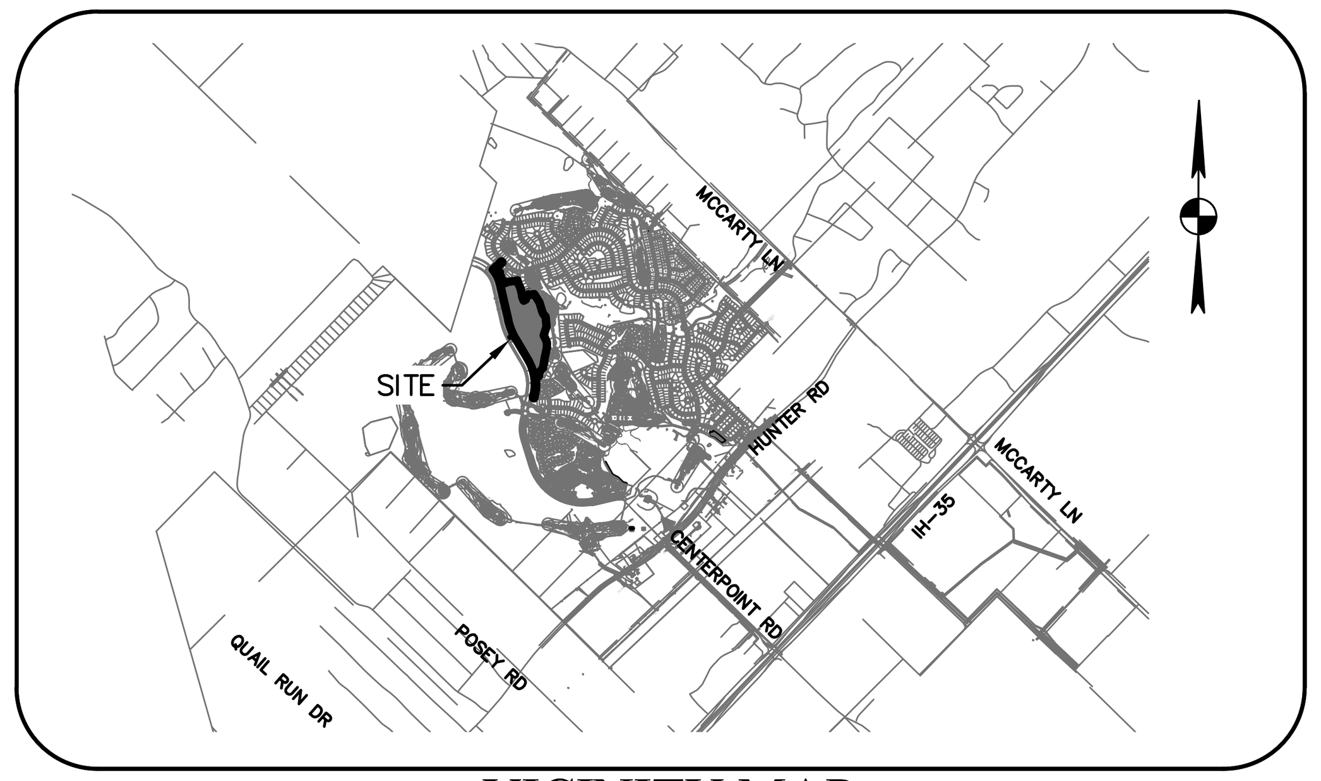
CITY OF SAN MARCOS

KISSING TREE PHASE 6C

STREETS, DRAINAGE, WATER & WASTEWATER CONSTRUCTION PLANS

PICP PERMIT NO. 2023-46402
WPP2 PERMIT NO. 2023-46403
December 18, 2023

SAN MARCOS



VICINITY MAP
NOT TO SCALE

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE ASSOCIATED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

THE PROPOSED IMPROVEMENTS ARE LOCATED WITHIN THE EDWARDS AQUIFER CONTRIBUTING ZONE. PERMANENT WATER QUALITY MEASURES ARE PROVIDED IN ACCORDANCE WITH SECTION III. G. OF THE PASO ROBLES PDD.

NO PORTION OF THE PROPOSED IMPROVEMENTS ARE LOCATED WITHIN THE WATER QUALITY BUFFER ZONE PER CITY OF SAN MARCOS CODE.

NO PORTION OF THE PROPOSED IMPROVEMENTS ARE LOCATED WITHIN THE 1% ANNUAL CHANCE FLOODPLAIN PER FEMA PANEL NO. 48209C0459F DATED 09/02/2005 AND 48209C0478F DATED 09/02/2005.

THIS PROJECT FALLS UNDER TPDES PERMIT # TXR TXR15326N, TXR15907N AND IS SUBJECT TO TPDES REGULATIONS.

UPON COMPLETION OF THE PROPOSED STORMWATER DETENTION AND/OR WATER QUALITY STRUCTURAL CONTROL(S), AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED STRUCTURAL CONTROL(S) WAS INSPECTED (INCLUDING DATE AND TIME OF THE INSPECTION) AND CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS.

ANY SUCH STRUCTURAL CONTROL(S) BUILT WITHIN THE CITY OF SAN MARCOS MUST MAINTAIN COMPLIANCE WITH THE CITY'S MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) AND APPLICABLE MS4 ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY, A CITY EASEMENT MUST BE SHOWN AROUND ALL STRUCTURAL CONTROL(S) INCLUDING A MAINTENANCE COVENANT WITHIN THE CITY LIMITS

THIS DEVELOPMENT WILL FOLLOW THE MOST CURRENT CITY OF SAN MARCOS SPECIFICATIONS AT THE TIME OF PLAN APPROVAL.

CONTACT INFORMATION FOR COORDINATION AND EMERGENCY

1. CITY OF SAN MARCOS DEPARTMENT OF ENVIRONMENT & ENGINEERING: 512-393-8130
2. CITY OF SAN MARCOS ENGINEERING INSPECTION SERVICES: 512-393-8130
3. ELECTRIC UTILITY: PEDERNALES ELECTRIC COOPERATIVE, 512-262-2161
4. WATER UTILITY: CITY OF SAN MARCOS, 512-393-8010
5. CABLE UTILITY: TIME WARNER CABLE, 512-805-2555
6. TELEPHONE UTILITY: CENTURYLINK, 512-754-5699
7. NATURAL GAS UTILITY: CENTERPOINT ENERGY, 800-427-7142
8. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ): 512-339-2929
9. TEXAS DEPARTMENT OF TRANSPORTATION: N/A
10. RAILROAD: N/A

THE FOLLOWING INFRASTRUCTURE IS PUBLIC:

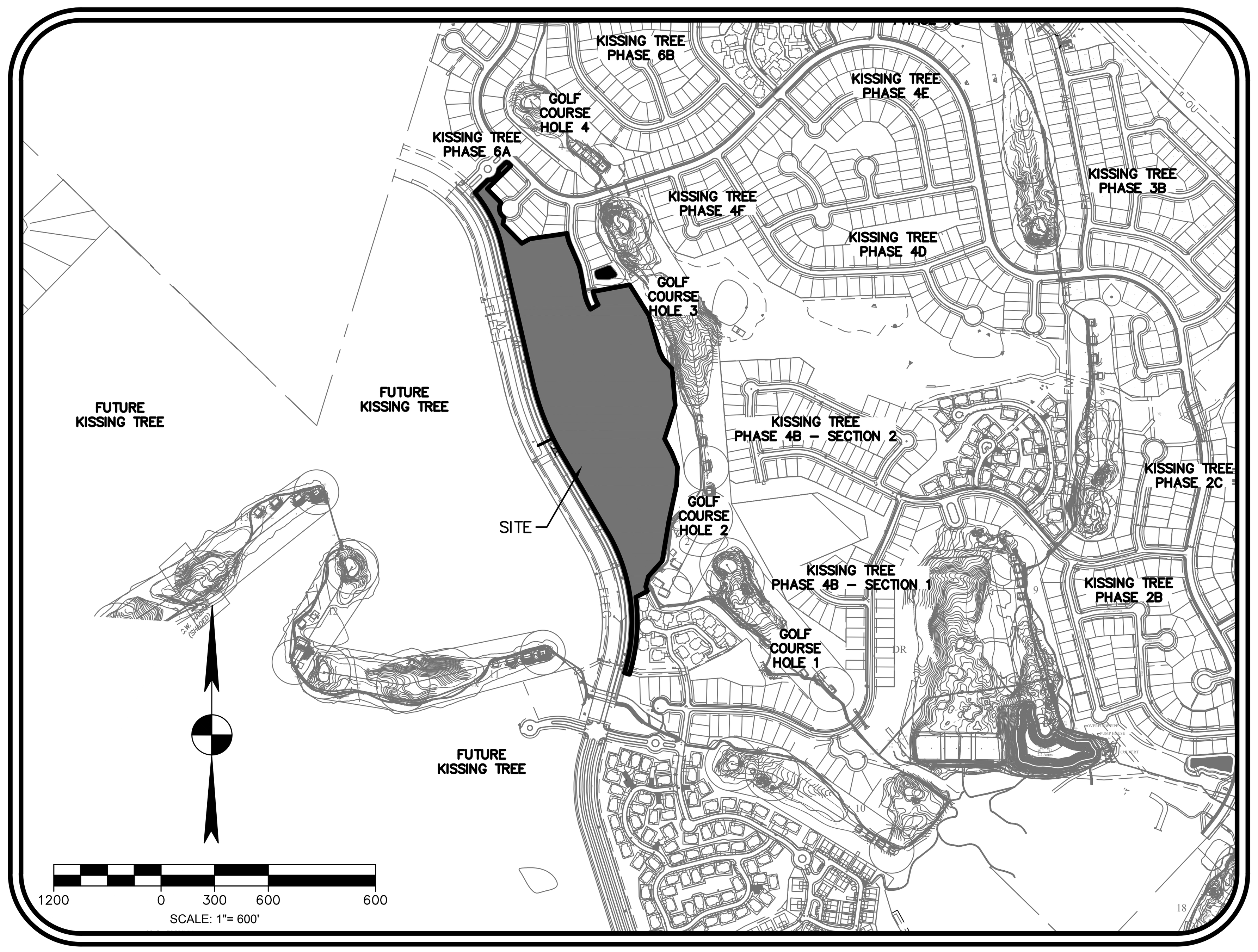
* WATER LINES
* WASTEWATER LINES

THE FOLLOWING INFRASTRUCTURE IS PRIVATE:

* STREET AND PEDESTRIAN INFRASTRUCTURE
* DRY UTILITIES AND STREET LIGHTS
* STORM SEWER AND DRAINAGE FACILITIES

SITE LOCATED WITHIN GOLDEN CHEEK WARBLER HABITAT

A PORTION OF THIS CONSTRUCTION SITE IS LOCATED WITHIN GOLDEN CHEEK WARBLER HABITAT. CERTAIN REQUIREMENTS MUST BE MET WHEN WORKING IN GOLDEN CHEEK WARBLER HABITAT. SEE SHEET 09 FOR LOCATION OF HABITAT AND SPECIFIC REQUIREMENTS.



OWNER:
CARMA PASO ROBLES, LLC
9600 NORTH MOPAC EXPRESSWAY
SUITE 750
AUSTIN, TX 78759
(512) 391-1330

ENGINEER:
PAPE-DAWSON ENGINEERS
10801 NORTH MOPAC EXPRESSWAY
BLDG 3, STE 200
AUSTIN, TX 78759
(512) 454-8711 FAX (512) 459-8867

LANDSCAPE ARCHITECT:
RVI
1611 WEST 5th STREET
SUITE 175
AUSTIN, TX 78703
(512) 480-0032

Sheet List Table

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12	WILD HONEYSUCKLE WAY – STA 21+00 TO END
13	GREENHEAD COURT & HUMMINGBIRD VINE COURT – STA 1+00 TO END
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SUBMITTED BY:

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER

12/18/23

PAPE-DAWSON ENGINEERS
STEVEN S. CRAUFORD, P.E. # 92677
SENIOR PROJECT MANAGER

DATE

PAPE-DAWSON ENGINEERS

AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

SAN MARCOS, TEXAS

KISSING TREE - PHASE 6C

DATE: Dec 18, 2023, 10:43AM USER ID: JBENNETT
File: H:\PROJECTS\508\48\61\301 CONSTRUCTION DOCUMENTS\CIVIL\TS50848-61.DWG

CITY OF SAN MARCOS
DEVELOPMENT SERVICES
CONSTRUCTION REQUIREMENTS AND NOTES

Revised Date: **01-01-2022**

The following City of San Marcos (COSM) requirements supersede, as a minimum requirement, any and all non "redline" comments, specifications, or details listed on the plan.

Plan Review and Revisions

1. The owner, contractor and representatives are responsible for complying with the most current local, state and federal laws, rules and ordinances.
2. The COSM review does not authorize any violations of details, specification, standard products ordinances or laws of the COSM. No code violations listed, drawn, or described in this plan, and/or otherwise installed, manufactured or built, are "approved" by the COSM.
3. A copy of COSM approved plans and any approved revisions bearing a review seal from the COSM must be available on-site at all times.
4. During construction, plan changes or revisions must be uploaded into MyPermitNow for staff review prior to the changes being made. Final Certificate of Occupancy or Certificate of Acceptance will NOT be issued until all changes have been documented and approved.
5. COSM adopted codes with local amendments:

   International Building Code -2015
   International Energy Code - 2009/2015
   International Plumbing Code-2015
   National Electric Code -2014
   International Mechanical Code-2015
   International Fire Code -2015
   International Fuel Gas Code-2015
   San Marcos Land Development Code (as amended)
   Smart Code (as amended)
   Code SMTX (as amended)
   International Property Maintenance Code-2015
   International Swimming Pool and Spa Code-2015

Accessory-Permits and Activities

1. Neither the review of these plans, nor the issuance of a Building or Site Plan Permit, authorizes accessory permits. The owner is responsible for completing the following accessory permits or activities: (verify with the department or division listed below, even if depicted within this plan by the design professional):

   - Addressing (Permit Center)
   - Assignment of Building Numbers (Permit Center)
   - Controlled Access Gates (Fire Prevention)
   - Any Fire Protection System [fire alarm, sprinkler, hood system] (Fire Prevention)
   - Any Storage Tanks (Fire Prevention)
   - High Piled Combustible Stock (Fire Prevention)
   - Any Sign and/or Sign Standard (Permit Center)
   - Irrigation (Permit Center)
   - Fence (Permit Center)
   - On-Site Sewage Facilities (OSSF's) (Code Compliance)
   - Commercial Swimming pools, spa, & Public Interactive Water Feature (PIWF's) (Permit Center/Code Compliance)
   - Backflow Prevention Devices (Water Department)
   - Street Closure/Traffic Control Plans (Public - Services-Transportation Division)
   - Right of Way "ROW" (Public Services-Transportation Division)
   - EPA or TCEQ permits (State/Permit Center)
   - Floodplain Permit (Permit Center)

2. Any portion of work, including, but not limited to, traffic control, which lies in Texas Department of Transportation (TxDOT), Union Pacific Railroad (UPRR) or County property or right of way, shall be permitted and approved by that authority. All required permits shall be secured by the owner or contractor from COSM and any other appropriate authority. A copy of all permit must be on site and available to City Inspector on request.
3. Contractor shall notify the Engineering Department (512-393-8130) and setup a consultation with Engineering Inspector at least 2 weeks before connection with the City water/wastewater system.
4. Contractor shall submit a road closure permit application and setup a consultation with Engineering Inspector Engineering Department (512-393-8130) at least 2 weeks before any lane or road closure.

General Construction Notes

1. Pre-Construction Meeting - Site and/or Building contractor(s) is/are responsible for scheduling a pre-construction meeting with COSM inspector(s) by contacting the Permit Center (512-805-2630) prior to any site work, including demolition. For Public

Improvement Construction Projects (PICP's) contact the Engineering Department at (512-393-8130) at capital_imp_info@sanmarcostx.gov.

2. Site Requirements - The general contractor, owner, and subcontractors are responsible for maintaining a safe and clean work site.
3. Any reference in this section to water, wastewater, electric or other public utility is meant to refer to the utility of certification or Authority Having Jurisdiction.
4. Pre-Construction Video - A video in Windows media format or equivalent of the complete site conditions for all **Public Improvement Construction Projects** (and as requested for Site Plan Projects) is required prior to construction. Provide a copy to the COSM upon request.
5. Inspections - Inspections can be scheduled with the respective divisions by contacting them at:

Building Inspections	www.mypermitnow.org
Fire Prevention/Inspections	www.mypermitnow.org
Site Final Inspections	sitefinal@sanmarcostx.gov
Engineering Inspections	512-393-8130
PICP Inspections	512-393-8130
Code Compliance	512-393-8440 (Food, Pool permits, etc...)

6. Trash - Approved trash containment must be provided for each lot under construction. Commercial solid waste haulers servicing construction sites must hold a permit from the Community Enhancement Initiatives Manager and are subject to commercial solid waste hauler fees.
7. Open Burning - Burning is prohibited in the COSM limits.
8. Blasting - Blasting is prohibited in the COSM limits.
9. Construction Noise-Construction noise, declared a nuisance under COSM ordinance, is not permitted between 9:00 p.m. and 7:00 a.m.
10. Weekend and Holiday work - Weekend and Holiday work is not allowed within a public right- of- way without prior approval.
11. Facilities - Maintained portable bathroom facilities must be provided with a minimum of one bathroom unit per one and two family residential lots. All construction sites are required to provide one bathroom unit per ten construction persons on the job.
12. Access - Temporary access driveways on the job site (aka stabilized construction entrances/exits) must comply with the current City detail, including curb protection. No

mud, rock, or debris permitted on any off site roadway. The general contractor and/or owner are responsible for immediately removing any debris on roadways caused by construction.

13. Combustible Construction -An all-weather surfaced roadway and working fire hydrant(s) are required to be installed on property prior to the construction of combustible material. Road base alone is not acceptable.
14. Safety - The general contractor, subcontractors and the owner are responsible for maintaining a safe construction operation at all times. All federal OSHA and state details, as well as local codes, shall be adhered to during the construction phase.
15. Address - The site, separate buildings, electrical disconnects, and/or temporary construction trailers must have an address visible from the street or roadway.
16. Required Postings - All COSM and State permits must be posted facing the street or roadway (where practical). Permanent marker is not an approved marking device.
17. Form Survey Requirements - Prior to requesting a foundation inspection by the Building Inspector, a Form Survey must be completed by a State Registered Land Surveyor validating building location to COSM setback requirements.
18. Floodplain Elevation Certificates - Where and when required, a "Building Under Construction" Elevation Certificate must be completed by a State Registered Land Surveyor (or State Registered Engineer or Architect) on FEMA form expiring Nov 2018 and submitted to the Permit Center at least 36 hours prior to foundation pouring to allow time for review and acceptance. A Land Surveyor's "Finished Construction" Elevation Certificate must also be submitted to and accepted by the Floodplain Administrator before Temporary "Certificate of Occupancy" will be issued.
19. If any geologic or manmade environmental feature is discovered during construction, notify Texas Commission on Environmental Quality (TCEQ) and the COSM Development Services within 24 hours or as soon as practicable. The contractor is required to provide compliance documentation as applicable.
20. EPA/TCEQ - Any required EPA or TCEQ permit(s) is/are separate permit(s) and the responsibility of the contractor. Provide a copy of such permit(s) to the Permit Center.
21. Abandoned wells must be capped or properly abandoned according to the Administrative Rules of the Texas Department of Licensing and Regulation (TDLR), 16 Texas Administrative Code (TAC), Chapter 76. A plugging report must be submitted (by a licensed water well driller) to the TDLR Water Well Drillers Program, Austin Texas. If a well is intended for use, it must comply with 16 TAC.
22. Any tree 9" in diameter or larger at 4.5' above natural grade is considered "regulated". Please refer to the LDC and technical manuals for tree survey, preservation and

mitigation requirements. Also refer to the Design & Construction Guide for the tables and tree protection standard details as noted in #25.

23. All product submittals for Public Improvements Construction Projects shall be submitted to the COSM (after approval by the Design Engineer) in PDF format and approved by the COSM prior to construction.
24. Prior to COSM acceptance of the project, all graded and disturbed areas are to be at least 70% re-vegetated with no large bare areas (greater than 3' diameter) in accordance with COSM and project specifications.
25. On the COSM's Design & Construction Guide webpage, located under Engineering & Capital Improvements, the following documents can be found: These Development Construction Requirements and Notes, Detail Design Criteria, Specifications and Details, Standard Product List, Modification to Austin/TxDOT Standard Specifications, Tree Preservation and Mitigation Tables, Landscape Calculation Table, Parking Table.
26. TX 811(811) must be used to locate all existing utilities for the contractor. Once locates are provided, it is the contractor's responsibility to retain these locations. Repeat locates within 14 days will be charged to the contractor.
27. Appropriate erosion controls and tree protection measures shall be in place prior to any site disturbance.
28. Fire extinguisher is required on all construction sites. Minimum of one per site, per floor at each stairwell or each storage shed. 2A10BC minimum size (5lbs).
29. Standpipe system required for any construction over 30 feet in height. Required to maintained within one floor of top construction floor. Approved lighted stairway access required.
30. Construction site required to be kept clean, travel paths clear and stored combustible pile spread out.
31. Fire watches are required to be approved prior to implementing (does not apply for hot work). (Fire Prevention at 512-393-8480)
32. Hot work permit(s) required as per Chapter 38 of Fire Code.
33. If building is designed with an automatic sprinkler system, the system must be installed, inspected and operational before occupying building (includes furniture and staff).
34. All work in the right-of-way or COSM easement will be constructed and restored in accordance to current COSM details and specifications.

Public Rights-of-Way

1. Where there is a conflict between the drawings and the COSM specifications and details, the more stringent shall apply. In no case is a contractor or owner authorized to construct, build or develop in contrast with adopted COSM codes, standards or details.
2. Location of existing lines is approximate. The contractor shall verify the location and elevation of utilities prior to beginning construction. Conflicts with the proposed work should be brought to the attention of the Engineer of Record and the project inspector immediately. It shall be the contractor's responsibility to repair any damages made as a result of construction at the contractor's expense.
3. The contractor shall not attempt to determine locations by scaling from plans. While every attempt has been made to prepare these plans to scale, the Engineer of record should be consulted if clarifications are needed.
4. Emergency Telephone Numbers (numbers may change - contractor should verify numbers)

Tx 811 (formerly DigTess)	811
Police - Fire - EMS	911
TX DOT	512-353-1061
Century Telephone	512-754-5223
Southwestern Bell	1-800-464-7928
Gas Company	1-800-427-7142
Spectrum	855-578-5500
Grande	800-218-5725
University	512-245-2108 (and/or) 512-245-2508
Pedernales Electric	888-554-4732
Bluebonnet Electric	800-949-4414
SM Electric Utilities	512-393-8313
SM Water/WW Utilities	512-393-8010

5. The contractor is responsible for acquiring any temporary construction easements for the project. Documentation shall be provided to the Permit Center.
6. The contractor shall be responsible for relocating any COSM water and wastewater utility lines and service taps where required. The contractor shall be responsible for relocating any COSM traffic facilities where required at the contractor's expense.
7. Contractor shall keep driveways open and accessible during construction. Underground utilities crossing commercial driveways shall be installed such that a minimum 10' traffic lane is kept open at all times. Spoilage material shall not be mounded more than 18" high adjacent to a driveway or intersection.

8. No construction operation relative to installation of utilities, including stockpiling of excavated materials, shall be permitted within the limits of existing pavements carrying traffic on state highways or COSM roads and streets unless specifically authorized in writing by the respective Authority Having Jurisdiction.
9. The contractor shall develop and submit a traffic control plan, which will show both daytime and nighttime operations during various phases of construction. The plan must be submitted to mypermitnow.org for review at least 14 days before construction begins. The plan must be approved before construction begins. The contractor shall designate a person who will be accessible on a 24- hour basis and responsible for the maintenance of the traffic control devices. This 24-hour contact number must be posted visible to the street on the job site and provided to the Public Services-Transportation Division. The contractor is responsible for furnishing the traffic control devices described in the plan and all costs associated with installation, maintenance and removal.
10. Any damage caused to any existing COSM water/wastewater, or storm sewer infrastructure will be repaired by the contractor to the satisfaction of the COSM at the contractor's expense prior to the Certificate of Occupancy or Certificate of Acceptance being issued.
11. When work is performed on private property or easements, all lawn grass, shrubbery, flowers, site utilities (including irrigation systems), trees and fences in the way of the work shall be removed, protected and replaced to their original condition and position upon completion of the work. All property monuments disturbed during construction shall be restored by a Registered Professional Land Surveyor at the contractor's expense.
12. The contractor must provide a Proof of Destination and truck route documents for trucks used to deliver or remove material or spoils from the job site upon request by inspectors.
13. All valves, manholes, SMEU electrical facilities and other appurtenances must remain accessible to COSM crews AT ALL TIMES during construction. These appurtenances shall also be raised to final grade, if within the project limits.
14. All assets constructed within the COSM's right-of-way must be submitted to the COSM with GPS coordinates at the end of each project. Coordinates will be submitted for all assets (including directional changes, valves, manholes, format, on the NAO 1983 State Plane Texas South Central FIPS 4204 Feet Coordinate System. All coordinates will be submitted in grid units. The required file type for coordinate data submission is *txt format.
15. The right-of-way will be kept clean at all times. Daily and sometimes more frequent sweeping may be required. A citation will be issued if the right-of-way is not kept clean.

Do NOT wash, sweep or otherwise cause construction soil or debris to be deposited into any storm water drainage or conveyance system.

16. The Owner shall coordinate temporary relocation of mailboxes with the San Marcos Postmaster. Final location shall be in accordance with the local post office requirements.
17. All permanent pavement markings should be Type I and Type II per COSM specifications and details.
18. Any traffic changes, including signs, signals and/or pavement markings shall be the responsibility of the contractor.
19. All Material Testing shall follow the schedule below:

CITY OF SAN MARCOS TESTING SCHEDULE	
Description:	*Rate:
Soils:	
Standard Proctor- Trench Backfill	Per Material Source
Standard Proctor-Raw Subgrade	Per Material Source or Street
Densities - Trench Backfill**	Per 200 LF Pipe per lift
Densities -Cement Stabilizer	Per 200 LF Pipe
Backfill Densities - Raw Subgrade**	Per 100 LF Street per lift
Densities-Driveways	Per 5 Driveways
Base:	
Sieve Analysis	Per 300 LF Street
Atterbergs Limits	Per 300 LF Street
Modified Proctor	Per Material Change
Densities of Compacted Base**	Per 300 LF Street per lift
Wet Ball Mill Test	Per Material Source
Triaxial Test	Per Material Source
Hot-Mix Asphalt Concrete:	
(HMAC): Extraction, Sieve	Per 500 Tons or Day
Analysis	Per 500 Tons or Day
Lab Density & Stability	Per 500 Tons or Day
Theoretical Density (Rice Method)	Continuous as Needed
Temperature -During Lay-Down	Per 300 LF Street
Thickness - In Place	Per 300 LF Street
%Air Voids-In Place	Per 300 LF Street
% Theoretical Density - In Place	
Concrete: (Unconfined Compression, 7, 14 & 28 Day):	
Curb and Gutter	Per 1000 LF C&G
Sidewalk	Per 4000 SF

Driveway	Per 2500 SF
Curb Inlets	Per 10 Inlets
Air, Slump & Compression - In Place	Per exposed structure
Slump & Compression -In Place	Per underground structure

* The above testing rates are only anticipated guidelines. The COSM reserves the right to require at owner's expense additional testing at the COSM's discretion.
** Testing must be conducted during backfill operations
*** Density will be per COSM details.

Erosion Control and Stormwater Management

1. It is unlawful for any general contractor, subcontractor or owner to allow or cause to be allowed, erosion of material from a construction site.
2. Appropriate erosion controls and tree protection measures shall be in place prior to any site disturbance. Site work permitted by a Site Plan Permit and/or a Demolition Permit cannot begin until erosion control and tree protection measures are in place.
3. All construction-related vehicle parking and activity (including employee personal vehicles and delivery vehicles) must be located within the Limits of Construction, with appropriate controls, or designated parking/access on APPROVED surfaces outside the Limits of Construction.
4. Certain erosion control measures identified by the COSM are to be employed to prevent erosion; however, these are only minimum standards. See construction details on Design & Construction Guide webpage, located under Engineering & Capital Improvements.
5. In the event of unusual site conditions, proximity to any water bodies and/or weather related events, more stringent requirements may be necessary (on-site or off) to maintain erosion and sedimentation control.
6. The owner or their designee is responsible for all changes, upgrades and continued maintenance of all erosion control and storm water management features at all times.
7. Erosion control measures and storm water management practices will be inspected by the COSM prior to and during the construction process:

   Engineering Inspections is responsible for the inspection of Public Improvements Construction Projects (PICP) and infrastructure in the ROW to the property line or easement, excluding sidewalks and drive ways as noted under the driveway and sidewalk section.

   Planning/Development Services is responsible for the inspection of all residential and commercial construction.

8. All designs to prevent the erosion of soil and the transport of sediment and debris from the construction site, or surrounding areas disturbed by construction shall, be maintained by the contractor during construction.
9. All streets adjacent to the project site must be kept clean of mud, rocks, trash, and building debris at all times. Daily or more frequent sweeping may be necessary, including the street center/turn lane and gutters. During muddy conditions, clean vehicle tires before leaving the site and/or remove mud, dust and dirt from public streets regularly throughout the day; sweep roads as soon as possible. Or prevent vehicles from leaving the site during muddy conditions. Migration of material or sediment from the site will require daily cleanup of paved streets and of drainage areas impacted by onsite or offsite construction. The contractor is required to take any necessary measures to prevent the migration of dust into the air due to construction activities.
10. All storm drain inlets within 200 feet of any permitted construction area must be protected per City detail (refer to #4 above).
11. Dewatering operations must use SWPPP-specified methods only. If such methods are only general or not applicable, pump from the top of the pool of water (rather than the bottom) and discharge to a vegetated, upland area (away from waterbodies or drainage) or use another type of filtration prior to discharge EVERY TIME. Refer to the EPA 2017 Construction General Permit, Section 2.4, as applicable.
12. The contractor or owner must have a designated person responsible for continuous (24 hours a day/7 days a week) monitoring of erosion control measures to ensure compliance with all federal, state, and local laws and regulations.
13. Do NOT wash, sweep or otherwise cause construction soil or debris to be deposited into any storm water drainage or conveyance system.
14. COSM MS4- Projects with a disturbed area of 1 to <5 acres must submit a signed, certified Small Construction Site Notice (CSN) to the COSM through MyPermitNow prior to construction activity starting. Projects with disturbed area of 5+ acres must submit a signed, certified Notice of Intent (NOI) to TCEQ; they must also submit the signed certified NOi and Large CSN received from TCEQ to the COSM through MyPermitNow prior to construction activity starting. COSM is the MS4 operator; these submissions to the COSM meet the required initial notification to the MS4 operator. CSN must be displayed at a construction site in public view prior to the commencement of construction activities.
15. Contractor shall provide qualified personnel to perform SWPPP inspections on projects equal to 1 acre or greater. Qualified personnel shall have CISEC, CESSWI, or equivalent certification approved by the MS4.

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

GENERAL NOTES 1 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 02 OF 64

Date: Dec 18, 2023, 10:41am User ID: jbennett
File: H:\Projects\50848\61\301 Construction Documents\Civil\DN50848-61.dwg

PICP 2023-46402

16. Qualified personnel shall inspect the construction site at least once every seven calendar days. A project-specific SWPPP must be prepared in accordance with the requirements of the Construction General Permit and shall be designed and signed by a licensed professional engineer (Texas) with competence in this area as required by Texas Engineering Practice Act Section 137 and/or a Certified Professional in Erosion and Sedimentation Control (CPESC). The SWPPP must be onsite at all times and shall be made available to the City of San Marcos upon request.

Water Utility Notes - *The requirements stated in most current version of the Water Distribution System Design Criteria Technical Manual shall supersede these notes if they conflict.*

1. All taps to the COSM water system for private property shall be metered.
2. When a tap is proposed on an existing Asbestos Cement (AC) pipe the contractor will replace the AC pipe segment with an approve PVC pipe per City Standard Product List (SPL). If the proposed tap is less than 24 inches from an AC pipe joint the replacement of the AC pipe will require addition segments to ensure adequate tap and joint separation. New pipe will be connected to the existing AC pipe with and wide range coupling adaptor per City SPL.
3. A list of accepted metering devices can be found on the engineering webpage under SPL WW-144. All metering devices shall be located on public right-of-way in easement.
4. All water utility lines leading to private property (except some authorized small domestic water lines) shall be provided with a testable back flow prevention device approved by the AWWA and the COSM. See detail.
5. The back-flow prevention device must be located as close as possible to the public right-of- way on private property.
6. A backflow prevention device with a low-flow indicator is required on all dedicated fire lines as per COSM details.
7. Any bypass to a backflow prevention device must have a testable back flow prevention device at least equivalent to the primary line approved by the AWWA and the COSM.
8. It is the responsibility of the owner and contractor to verify the type and size of the backflow prevention device with the COSM's Water Services (512)393-8010, for the property served, prior to construction.
9. Accepted Metering Devices - See Standard Product List WW-144

10. Accepted Utility Line Types (verify use with Inspector).

Use	Pipe Material	[1]Pipe Sizes	[2]SPL
Service lines	Copper Tubing	1"	WW-613
Service lines	Polyethylene Tubing	1"	WW-65
Service lines	PVC	2"	WW-587
Service lines	PVC	4", 6", 8", 12"	WW-308
Fire Hydrant Lead	DI	6"	WW-27
[3]Distribution lines	PVC	8" or 12"	WW-308 or WW-308A
[3]Distribution lines	DI	8" or 12"	WW-27 or WW-27F
Transmission lines	PVC	16" or 24"	WW-308C
Transmission lines	DI	16" or 24"	WW-27 or WW-27F

Note 1
If the required pipe size is not listed; then install the next larger size listed and reduce to the needed size at the meter per the COSM details. See COSM details for more information.

Note 2
The COSM Standard Products List (SPL) can be found on the engineering webpage.

Note 3
The minimum distribution system line size is eight (8) inches, with the exception of short Cul-de-Sacs as indicated in the City's Water Distribution System Design Criteria Technical Manual

11. Private property fire hydrants shall be RED - Public fire hydrants shall be factory coated aluminum based silver paint. No pre-owned hydrants permitted.
12. All utility lines shall be tested after all appurtenances (hydrants, sampling ports, valves, etc.) are installed complete in place and located at final grade. All utility lines shall be tested from gate valve to gate valve at 200 psi for 10 minutes and @ 150 psi for 2 hours. A fire line dedicated for a fire protection system shall be tested @ 200 psi for 2 hrs.
13. **A licensed underground installer certified by the Texas Commission on Fire Protection must perform underground fire line installation (Fire Sprinkler System)**. Most plumbers and utility contractors do not meet this criteria! Please verify before construction.
14. COSM to be given 48-hour notice (required) prior to all testing of utility lines. COSM inspection required for all utility lines.

    Public

- All utility taps, line installations, extensions, or adaptations in the public right-of-way, up to and including the metering device, for all Public Improvement Construction Projects will be inspected by the Engineering Inspector.

Private

- All domestic water line installations, extensions, or adaptations on public or private property for all Site Plan Permits, including the valve, and meter will be inspected by a Building Inspector.
- Private utility lines utilized by any fire protection system (fire line), or utility combo line will be inspected by the Fire Prevention Office.
- All backflow prevention devices will be reviewed by the Backflow Prevention Manager (Public Services-Water Division) prior to installation.

15. All backflow prevention devices must be tested by a State licensed/certified back flow prevention assembly tester. Test reports shall be on a form as prescribed by the COSM-Public Services Water Division. All testers submitting inspection results must be registered prior to testing devices by the -Public Services Water Division. A copy of the test results are to be submitted to the COSM-Public Services Water Division and the COSM Inspector prior to activation of water service. A copy of the backflow test is to be attached to the back-flow prevention device that was inspected and/or tested.
16. All water lines leading to private property must provide a bacteriological test to the inspector noted in the inspections section above. All bacteriological samplings must be certified within 20 days of project acceptance. On all dead-end lines and lines not yet tied into a water system, an automatic flush valve shall be installed with an approved water meter. After the pressure tests and bacteriological samples have passed, the Contractor must give notice to the Engineering Inspector for activation of the device.
17. Fire hydrants must be placed or moved to finished elevation after installation per detail 511S-17-SM. Finished elevation is 18" to 24" from the center of the lowest connection to the adjacent grade.
18. Fire hydrant is rejoined within 100 feet of the Fire Department Connection (FDC) is building is equipped with a fire sprinkler system.
19. Fire hydrants are required to have a clear area of 5 feet. No plants, trees or obstacles allowed except as impact protection outline by Fire Code
20. Fire hydrants are required to be marked with a blue reflective marker in the roadway 6" to 10" off center of the roadway towards the hydrant. On corner lot installation, both roadways are required to be marked.

21. The underground contractor must submit a report (on company letterhead) to fireplan@sanmarcostx.gov indicating that the fire line is complete and has been flushed of all debris.
22. All fire hydrants that have not been inspected or flushed are considered "out of service" and are required to have a black plastic wrap covering the hydrant.
23. COSM will not perform the tie-in of a public service line to a private line.
24. It is the responsibility of the owner or contractor to tie to the COSM's line from the right-of-way or public easement to the private property line. It is the licensed plumber/utility contractor responsibility to maintain proper slope and connection of system to the public connection.
25. Fire hydrants capable of producing the required GPM (based on construction type) must be located within 500 foot of the most remote portion of the building using accessible surfaced roadway for measurement.
26. Fire hydrants must be operational prior to beginning combustible construction.
27. All valves in a COSM right-of-way will be operated by COSM personnel only. The contractor may not operate any COSM owned valve. The general contractor will be fined if a water valve is operated without express written consent of the Water Utility, regardless of who operated the valve.
28. Only temporary water meters approved by the COSM are authorized for use on any fire hydrant (public or private).
29. Temporary meters may be relocated from one hydrant to another only by Water-Waste/Water personnel.
30. A fine will be imposed on operators using fire hydrants without meters, with unapproved meters, or failing to use approved backflow prevention or air gap protection.
31. Thrust blocks are not permitted. All fittings shall be mechanically restrained. Bell joints shall be mechanically restrained in accordance with the Engineer of Record's specifications based on site conditions. A joint restraint table, sealed by the Engineer of Record must be submitted with each set of plans. If a joint restraint table is not available, all joints must be mechanically restrained.
32. The service address must be posted and visible (as per COSM specifications) from the street prior to the installation of the meter as per Chapter 38 of local ordinances.

33. Disinfection sample taps shall be installed at proper locations (not more than 1000-foot intervals) along public water lines.

Wastewater Utility Notes - *The requirements stated in most current version of the Wastewater Collection System Design Criteria Technical Manual shall supersede these notes if they conflict.*

1. **Required Equipment** - The following are the acceptable materials for the type of lines or connections shown:

   Public Sewer Lines - SDR 26 in the COSM right of way (as a minimum). See SPL WW227 &WW-227A

   Private Sewer Lines - Schedule 40 or SDR 26 Approved connections - See SPL WW-354

2. **Inspection**

   Engineering Inspections is responsible for inspection of all utility taps, line installations, extensions, and adaptations on all Public Improvement Construction Projects. See 510.3(26) Quality Testing for Installed Pipe-of the Modifications of Austin Specifications for more details.

   - 4-psi minimum pressure test on lines
   - Lines must be flushed immediately prior to the TV test
   - TV test on all public lines (copy of video to Engineering Inspections)
   - Mandrel test required 30 days after installation

   Building Inspections is responsible for inspection of all utility taps, service laterals, and private lines on all Site Preparation Projects and all residential and commercial construction.

   - Low-pressure air test with 5 PSI on all lines
   - Force mains; 5 psi over working pressure with minimum of 50 psi, for 1 hour

3. All sewer lines shall be tested after all appurtenances are located at final grade.
3. All services must be six inch minimum and must have clean-outs; dual services shall have clean- outs on each line located no less than six feet apart at the property line. See detail 520s- 1-SM & 520S-3-SM for more details and TCEQ specifications.

4. **All manholes to be cored (not chiseled) and lined with products from the Standard Products List**. See specification 506.5F. Pipe connection to existing manholes and junction boxes for more details.
5. All manholes shall be tested per specification 506.6 prior to lining. All manholes are to be lined per SPL 511.
6. The COSM will not perform the tie-in of lines to privately owned and maintained lines or clean- outs. It is the licensed plumber/utility contractor responsibility to maintain proper slope, connection and drainage of system to the public connection.
7. Pipe stub-outs must be provided and located in manholes to facilitate future expansion.
8. All commercial property must have a wastewater sampling port installed per the COSM's sample port detail 520-4B-SM, and wastewater collection system standard design criteria. The wastewater sampling port must not be located in a drive-thru, traffic lane, or driveway access area.

Driveways and Sidewalks

1. All sidewalks and driveway approaches will be inspected by the COSM.

   Engineering Inspections will inspect the following items:

   - All Commercial project driveway approaches and sidewalks
   - Any new, extension or addition to a drive on a existing property (Driveway Permit or Infill New Residential)
   - All new subdivision work inclusive of the street, curb, curb cut ramps to a public street, sidewalk and driveway access installed during initial construction prior to COSM acceptance of subdivision
   - All Public Improvement Construction Projects

   Building Inspections will inspect the following:

   - All sidewalk construction and driveway access in development "build-out" after acceptance of subdivision by the COSM.

2. Meters, valves, or other obstructions are not permitted in sidewalks or driveways. All meters must be located in a public right-of-way or easement given by the property owner (and legally recorded).
3. Meters and other utility obstructions must be relocated by and at the expense of the own e r or contractor.

4. Driveway access grade at sidewalk cannot exceed 2%.
5. All sidewalks and driveways shall meet applicable TAS standards.

Public Street Construction

1. All new street construction in public right-of-way and easements will be inspected by the Engineering Inspectors.
2. All street lights shown on the approved construction plans shall be active prior to project acceptance. If street light service is to be in the COSM's name, contact San Marcos Electric Utility, (512) 393-8300
3. Flexible Base & Sub-grade: Will follow the City specification noted in the 200: Series Subgrade & Base Construction.
4. Cutback Asphaltic material (Prime Coat) shall be applied to the completed base course and allowed to set 24 hours before paving the roadway. An Emulsified Asphalt Tack Coat can be used in lieu of the prime coat and/or placed on the prime coat.
5. Asphalt must be at a temperature between 250° F and 350° F when discharged from the mixer and compacted using steel-wheel rollers, vibratory rollers and pneumatic-tire rollers.
6. The contractor or their testing technician shall check the density of the compacted asphalt at regular intervals. Samples of the asphalt shall be taken as the asphalt leaves the hopper of the paving machine before compaction and cores shall be taken at these sampling locations. A minimum of 3 samples shall be taken daily unless the total volume is determined to be small enough to warrant taking only one sample.

Electric Utility Notes

1. Electrical service will be provided in accordance with SMEU "Rules and Regulations" and "Line Extension Policy" within the PUC designated SMEU service area.
2. Electric Service in San Marcos Electric Utility (SMEU) Service Territory:

   A. For non-emergency service, Contact SMEU 48 hours in advance to schedule electric service connection for new service or disconnection/reconnection for modified service.

      i. For Emergency Electric Service contractors may disconnect and reconnect temporary electric service without advanced notice. Contractor must contact SMEU within 24 hours to make permanent electric service connection.

   B. SMEU must receive notification from the COSM Electrical Inspector that the Customer's electrical installation has passed final electrical inspections before electric service is connected by SMEU personnel.

   C. SMEU has the right to deny service connection for any identified electrical hazard.

1. For plan review of projects requiring electric service from San Marcos Electric Utility (SMEU), a minimum of the following items must be provided to SMEU by the property owner or contractor: a completed Electric Service Application, a set of customer drawings including plat drawings showing all easements, scaled elevation drawings for any structures that exceed a single story, and a total connected load estimate (including service voltage requirements). Contact San Marcos Electric Utility at 512-393-8300 for detailed plan review submittal requirements.
3. All services shall have a single disconnecting means in an approved location on the exterior or outside of the building served.
4. All electric disconnecting means and meters shall be assessable.
5. At the time of Phase 2 inspection, the meter sockets shall be labeled with 1" x 2" digitally printed vinyl stickers. Disconnect panel(s) shall be labeled with 2" x 4" digitally printed vinyl stickers. Panel must have address numbers, number of panel (ex. 2 of 4) and location of next disconnect panel. Both doors and meter socket must have permanent labeling affixed before SMEU will install meters. SMEU may deny meter connection if the required labeling is not present.
6. Panel and socket markings are not allowed to be paint or marker.
7. The service mast shall have at least two points of attachment to the building. One point of attachment must be within 12 inches of the service equipment. The service equipment may not be used to meet this requirement.
8. If electric overhead power lines exist in the project area, Texas Law Article 1435c, prohibits all activities in which persons or equipment may come within six (6) feet of energized overhead power lines and Federal Regulations, Title 29, Part 1910.180(i) and Part 1926.550(a)(15) require a minimum of 10 feet from these facilities. Where Contractor must work near overhead power lines, contact the service provider for the lines to be de-energized and/or moved at Contractor's expense. For non-emergency work, contact SMEU 48 hours in advance to schedule lines to be de-energized or moved.
9. Contact the local service provider for information on their specific installation requirements

   San Marcos Electric Utility(SMEU) 512-393-8300
   Pedernales Electric Cooperative 888-554-4732 #7525

   Bluebonnet Electric Cooperative 800-842-7708
   (Ask for Lockhart engineering dept.)

NOTE: This document is not meant or designed to be an all-inclusive document. The function of this 'requirements' document is to provide information on issues identified by the COSM inspection staff based on daily field operations and common issues. It is the intent of this document to facilitate the construction process in common overlapping areas between COSM departments and divisions and private contractors. In all cases, contractors, subcontractors and owners are responsible for knowing and utilizing the state, federal, or COSM codes and laws where applicable. No code violations are "approved". COSM signed or reviewed plans are not authorization to violate codes, laws, or ordinances. A copy of plans bearing a seal from Building Inspections and/or the Permit Center is required to be available on-site at all times. Any changes or revisions to these plans must first be submitted to the COSM by the design professional for review and written authorization. A review seal from the COSM must be affixed to these revised plans and they must be available on- site at all times.

ADDITIONAL NOTES

1. WHEN A DEVELOPMENT IN THE RECHARGE ZONE OR TRANSITION ZONE INCLUDES ANY EXCAVATION, THE PERSON PERFORMING THE DEVELOPMENT MUST EITHER ENGAGE A QUALIFIED GEOLOGIST TO INSPECT THE EXCAVATION, OR NOTIFY THE ENGINEERING DIRECTOR TO ARRANGE FOR INSPECTION OF THE EXCAVATION BY CITY PERSONNEL. THE INSPECTION WILL BE FOR THE PURPOSE OF DETERMINING WHETHER THE EXCAVATION HAS UNCOVERED ANY GEOLOGIC OR MANMADE FEATURE THAT PRESENTS A POSSIBLE AVENUE FOR RECHARGE TO THE AQUIFER. THE INSPECTION WILL BE MADE EITHER UPON COMPLETION OF THE EXCAVATION, IF IT IS IN A SINGLE, DEFINED AREA, OR IN SEGMENTS, IF THE EXCAVATION IS LINEAR, OR IS IN MULTIPLE LOCATIONS, OR IS ACCOMPLISHED OVER AN EXTENDED PERIOD OF TIME. THE EXCAVATION MAY BE TEMPORARILY BACKFILLED BEFORE INSPECTION, BUT INSPECTION MUST OCCUR WITH THE FULL EXCAVATION UNCOVERED BEFORE PERMANENT BACKFILLING IS PERFORMED. IF AN INSPECTION REVEALS THAT ONE OR MORE SUCH FEATURES HAS BEEN UNCOVERED, THE PERSON PERFORMING THE DEVELOPMENT MUST:
   a. IMMEDIATELY NOTIFY THE ENGINEERING DIRECTOR;
   b. UTILIZE TEMPORARY BMPS TO PREVENT POLLUTION FROM ENTERING THE AQUIFER THROUGH THE FEATURES; AND
   c. NOT PERFORM ANY FURTHER WORK IN THE EXCAVATION UNTIL AN APPLICATION FOR AN AMENDMENT TO THE APPROVED WATERSHED PROTECTION PLAN (PHASE 1, PHASE 2, OR QUALIFIED, AS APPLICABLE), FOR A DEVELOPMENT IN THE RECHARGE ZONE, OR AN APPLICATION FOR APPROVAL OF A SITE PREPARATION PERMIT, FOR A DEVELOPMENT IN THE TRANSITION ZONE, IS SUBMITTED TO AND APPROVED BY THE ENGINEERING DIRECTOR.
2. IF A NEW SENSITIVE FEATURE, OR ANY SOLUTION OPENING, CAVE, SINKHOLE, OR SIMILAR FEATURE, IS ENCOUNTERED ON A SITE IN THE RECHARGE ZONE OR TRANSITION ZONE DURING THE CONSTRUCTION PROCESS FOR A DEVELOPMENT, OR IF A PREVIOUSLY KNOWN SENSITIVE FEATURE IS FOUND IN THE COURSE OF CONSTRUCTION TO BE LARGER OR MORE EXTENSIVE THAN PREVIOUSLY NOTED IN THE GEOLOGIC ASSESSMENT OF THE SITE, THE HOLDER OR THE HOLDER'S DESIGNATED REPRESENTATIVE MUST:
   a. IMMEDIATELY SUSPEND ALL EXCAVATION AND CONSTRUCTION ACTIVITIES WITHIN 50 FEET OF THE FEATURE, MEASURED HORIZONTALLY;
   b. IMMEDIATELY NOTIFY THE ENGINEERING DIRECTOR OF THE DISCOVERY; AND
   c. RETAIN A QUALIFIED GEOLOGIST TO INSPECT THE FEATURE AND MAKE A RECOMMENDATION TO THE ENGINEERING DIRECTOR BASED ON THE RELATIVE SENSITIVITY OF THE FEATURE.
3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST CITY OF SAN MARCOS SPECIFICATIONS.

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

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KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

GENERAL NOTES 2 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 03 OF 64

Date: Dec 18, 2023, 10:41am User ID: Jbennett
File: H:\Projects\50848\48\61\301 Construction Documents\Civil\CN50848--61.dwg

PICP 2023-46402

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. TAC § 213.10 (relating to Enforcement). Such violations may also be subject to civil penalties and injunction. The following/listed "construction notes" in no way represent an approved exception by the 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 parralleling 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: N/A.

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

    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 XX OF XX. (For potential future laterals).

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

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

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

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

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

(1) *Low Pressure Air Test.*

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

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

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

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

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

Where:

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

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

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

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

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

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

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

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

(2) *Infiltration/Exfiltration Test.*

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

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

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

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

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

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

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

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

(A) *Mandrel Sizing.*

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

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

(iii) All dimensions must meet the appropriate standard.

(B) *Mandrel Design.*

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

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

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

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

(C) *Method Options.*

(i) An adjustable or flexible mandrel is prohibited.

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

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

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

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

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

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

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

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

(a) All manholes must pass a leakage test.

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

(1) Hydrostatic Testing.

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

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

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

(2) Vacuum Testing.

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

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

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

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

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

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

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

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

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

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

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

Texas Commission on Environmental Quality
Contributing Zone Plan
General Construction Notes

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

2. All contractors conducting regulated activities associated with this project should be provided with complete copies of the approved Contributing Zone Plan (CZP) and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractor(s) should keep copies of the approved plan and approval letter on-site.

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

4. 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. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. These controls must remain in place until the disturbed areas have been permanently stabilized.

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

6. Sediment must be removed from the sediment traps or sedimentation basins when it occupies 50% of the basin's design capacity.

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

8. All excavated material that will be stored on-site must have proper E&S controls.

9. If portions of the site will have a cease in construction activity lasting longer than 14 days, soil

stabilization in those areas shall be initiated as soon as possible prior to the 14th day of inactivity. If activity will resume prior to the 21st day, stabilization measures are not required. If drought conditions or inclement weather prevent action by the 14th day, stabilization measures shall be initiated as soon as possible.

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

11. The holder of any approved CZP must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:

A. any physical or operational modification of any best management practices (BMPs) or structure(s), including but not limited to temporary or permanent ponds, dams, berms, silt fences, and diversionary structures;

B. any change in the nature or character of the regulated activity from that which was originally approved;

C. any change that would significantly impact the ability to prevent pollution of the Edwards Aquifer; or

D. any development of land previously identified as undeveloped in the approved contributing zone plan.

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

NO. REVISION DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

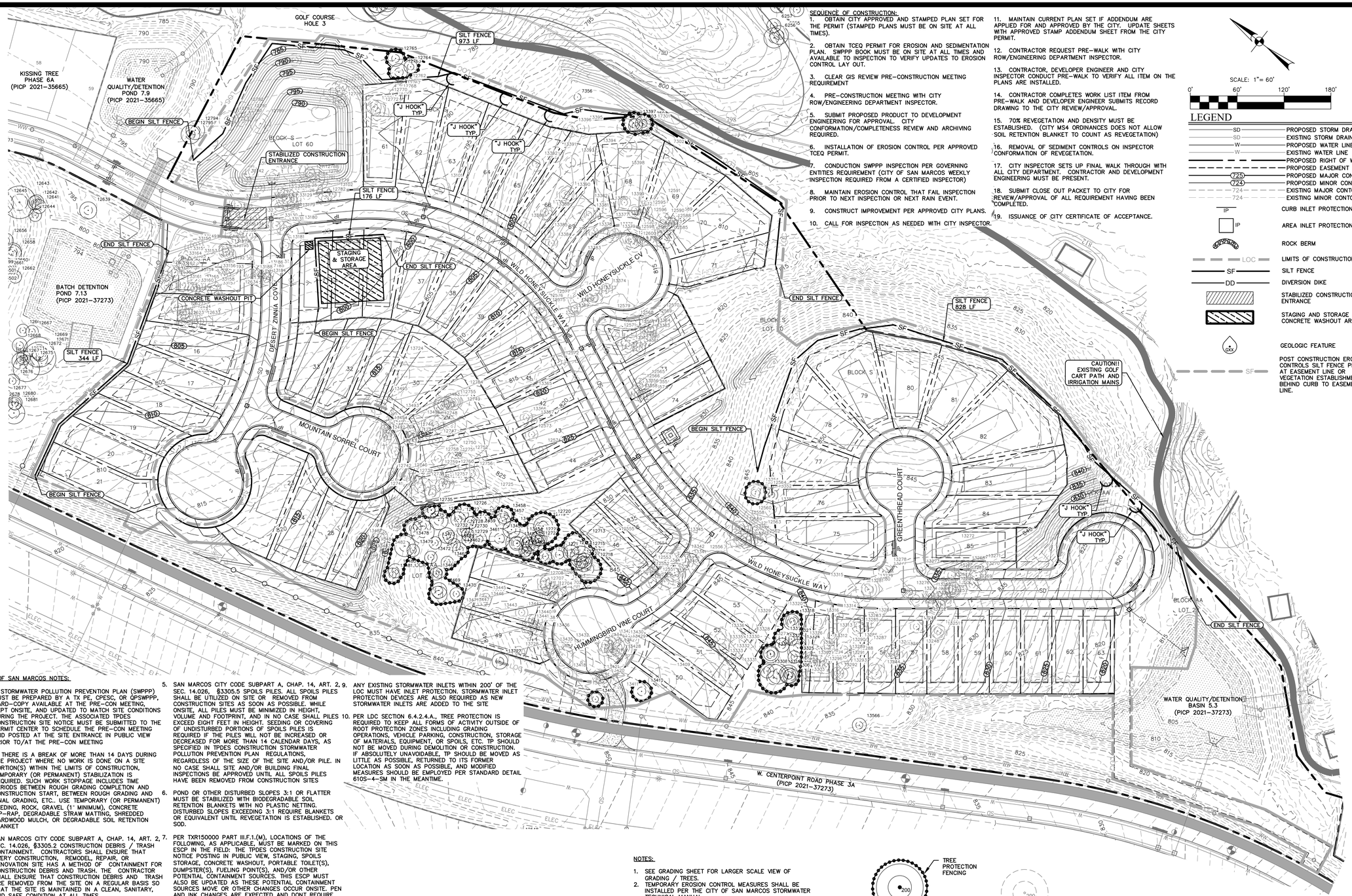
KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

GENERAL NOTES 3 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 04 OF 64

Date: Dec 18, 2023, 10:41am User ID: jbennett
File: H:\Projects\5084\48\61\301 Construction Documents\Civil\2h50848-61.dwg

PICP 2023-46402



SCALE: 1"= 60'

0' 60' 120' 180'

LEGEND

SD	PROPOSED STORM DRAIN
SD	EXISTING STORM DRAIN
W	PROPOSED WATER LINE
W	EXISTING WATER LINE
	PROPOSED RIGHT OF WAY
	PROPOSED EASEMENT
725	PROPOSED MAJOR CONTOUR
724	PROPOSED MINOR CONTOUR
724	EXISTING MAJOR CONTOUR
724	EXISTING MINOR CONTOUR
IP	CURB INLET PROTECTION
IP	AREA INLET PROTECTION
	ROCK BERM
LOC	LIMITS OF CONSTRUCTION
SF	SILT FENCE
DD	DIVERSION DIKE
	STABILIZED CONSTRUCTION ENTRANCE
	STAGING AND STORAGE AREA/ CONCRETE WASHOUT AREA
	GEOLOGIC FEATURE
SF	POST CONSTRUCTION EROSION CONTROLS SILT FENCE PLACED AT EASEMENT LINE OR VEGETATION ESTABLISHMENT BEHIND CURB TO EASEMENT LINE.

SEQUENCE OF CONSTRUCTION:

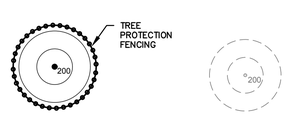
1. OBTAIN CITY APPROVED AND STAMPED PLAN SET FOR THE PERMIT (STAMPED PLANS MUST BE ON SITE AT ALL TIMES).
2. OBTAIN TCEQ PERMIT FOR EROSION AND SEDIMENTATION PLAN. SWPPP BOOK MUST BE ON SITE AT ALL TIMES AND AVAILABLE TO INSPECTION TO VERIFY UPDATES TO EROSION CONTROL LAY OUT.
3. CLEAR GIS REVIEW PRE-CONSTRUCTION MEETING REQUIREMENT
4. PRE-CONSTRUCTION MEETING WITH CITY ROW/ENGINEERING DEPARTMENT INSPECTOR.
5. SUBMIT PROPOSED PRODUCT TO DEVELOPMENT ENGINEERING FOR APPROVAL. CITY CONFORMATION/COMPLETENESS REVIEW AND ARCHIVING REQUIRED.
6. INSTALLATION OF EROSION CONTROL PER APPROVED TCEQ PERMIT.
7. CONDUCTION SWPPP INSPECTION PER GOVERNING ENTITIES REQUIREMENT (CITY OF SAN MARCOS WEEKLY INSPECTION REQUIRED FROM A CERTIFIED INSPECTOR)
8. MAINTAIN EROSION CONTROL THAT FAIL INSPECTION PRIOR TO NEXT INSPECTION OR NEXT RAIN EVENT.
9. CONSTRUCT IMPROVEMENT PER APPROVED CITY PLANS.
10. CALL FOR INSPECTION AS NEEDED WITH CITY INSPECTOR.
11. MAINTAIN CURRENT PLAN SET IF ADDENDUM ARE APPLIED FOR AND APPROVED BY THE CITY. UPDATE SHEETS WITH APPROVED STAMP ADDENDUM SHEET FROM THE CITY PERMIT.
12. CONTRACTOR REQUEST PRE-WALK WITH CITY ROW/ENGINEERING DEPARTMENT INSPECTOR.
13. CONTRACTOR, DEVELOPER ENGINEER AND CITY INSPECTOR CONDUCT PRE-WALK TO VERIFY ALL ITEM ON THE PLANS ARE INSTALLED.
14. CONTRACTOR COMPLETES WORK LIST ITEM FROM PRE-WALK AND DEVELOPER ENGINEER SUBMITS RECORD DRAWING TO THE CITY REVIEW/APPROVAL.
15. 70% REVEGETATION AND DENSITY MUST BE ESTABLISHED. (CITY MS4 ORDINANCES DOES NOT ALLOW SOIL RETENTION BLANKET TO COUNT AS REVEGETATION)
16. REMOVAL OF SEDIMENT CONTROLS ON INSPECTOR CONFORMATION OF REVEGETATION.
17. CITY INSPECTOR SETS UP FINAL WALK THROUGH WITH ALL CITY DEPARTMENT. CONTRACTOR AND DEVELOPMENT ENGINEERING MUST BE PRESENT.
18. SUBMIT CLOSE OUT PACKET TO CITY FOR REVIEW/APPROVAL OF ALL REQUIREMENT HAVING BEEN COMPLETED.
19. ISSUANCE OF CITY CERTIFICATE OF ACCEPTANCE.

CITY OF SAN MARCOS NOTES:

1. A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) MUST BE PREPARED BY A TX PE, CPESC, OR QPSWPPP, HARD-COPY AVAILABLE AT THE PRE-CON MEETING, KEPT ONSITE, AND UPDATED TO MATCH SITE CONDITIONS DURING THE PROJECT. THE ASSOCIATED TPDES CONSTRUCTION SITE NOTICE MUST BE SUBMITTED TO THE PERMIT CENTER TO SCHEDULE THE PRE-CON MEETING AND POSTED AT THE SITE ENTRANCE IN PUBLIC VIEW PRIOR TO/AT THE PRE-CON MEETING
2. IF THERE IS A BREAK OF MORE THAN 14 DAYS DURING THE PROJECT WHERE NO WORK IS DONE ON A SITE PORTION(S) WITHIN THE LIMITS OF CONSTRUCTION, TEMPORARY (OR PERMANENT) STABILIZATION IS REQUIRED. SUCH WORK STOPPAGE INCLUDES TIME PERIODS BETWEEN ROUGH GRADING COMPLETION AND CONSTRUCTION START, BETWEEN ROUGH GRADING AND FINAL GRADING, ETC.. USE TEMPORARY (OR PERMANENT) SEEDING, ROCK, GRAVEL (1" MINIMUM), CONCRETE RIP-RAP, DEGRADABLE STRAW MATTING, SHREDDED HARDWOOD MULCH, OR DEGRADABLE SOIL RETENTION BLANKET
3. SAN MARCOS CITY CODE SUBPART A, CHAP. 14, ART. 2, SEC. 14.026, §3305.2 CONSTRUCTION DEBRIS / TRASH CONTAINMENT. CONTRACTORS SHALL ENSURE THAT EVERY CONSTRUCTION, REMODEL, REPAIR, OR RENOVATION SITE HAS A METHOD OF CONTAINMENT FOR CONSTRUCTION DEBRIS AND TRASH. THE CONTRACTOR SHALL ENSURE THAT CONSTRUCTION DEBRIS AND TRASH ARE REMOVED FROM THE SITE ON A REGULAR BASIS SO THAT THE SITE IS MAINTAINED IN A CLEAN, SANITARY, AND SAFE CONDITION AT ALL TIMES
4. SAN MARCOS CITY CODE SUBPART A, CHAP. 14, ART. 2, SEC. 14.026, §3305.4 STREET CLEANING. ADJACENT STREETS TO THE CONSTRUCTION SITE SHALL BE MAINTAINED AND FREE OF DIRT, MUD, ROCKS AND OTHER CONSTRUCTION DEBRIS AT ALL TIMES. DIRT, GRAVEL, ETC., SHALL NOT BE SWEPT, WASHED, OR OTHERWISE DEPOSITED INTO UNPROTECTED STORM WATER CONVEYANCE SYSTEMS
5. SAN MARCOS CITY CODE SUBPART A, CHAP. 14, ART. 2, SEC. 14.026, §3305.5 SPOILS PILES. ALL SPOILS PILES SHALL BE UTILIZED ON SITE OR REMOVED FROM CONSTRUCTION SITES AS SOON AS POSSIBLE WHILE ONSITE, ALL PILES MUST BE MINIMIZED IN HEIGHT, VOLUME AND FOOTPRINT, AND IN NO CASE SHALL PILES EXCEED EIGHT FEET IN HEIGHT. SEEDING OR COVERING OF UNDISTURBED PORTIONS OF SPOILS PILES IS REQUIRED IF THE PILES WILL NOT BE INCREASED OR DECREASED FOR MORE THAN 14 CALENDAR DAYS, AS SPECIFIED IN TPDES CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN REGULATIONS, REGARDLESS OF THE SIZE OF THE SITE AND/OR PILE. IN NO CASE SHALL SITE AND/OR BUILDING FINAL INSPECTIONS BE APPROVED UNTIL ALL SPOILS PILES HAVE BEEN REMOVED FROM CONSTRUCTION SITES
6. POND OR OTHER DISTURBED SLOPES 3:1 OR FLATTER MUST BE STABILIZED WITH BIODEGRADABLE SOIL RETENTION BLANKETS WITH NO PLASTIC NETTING. DISTURBED SLOPES EXCEEDING 3:1 REQUIRE BLANKETS OR EQUIVALENT UNTIL REVEGETATION IS ESTABLISHED. OR SOD.
7. PER TXR150000 PART III.F.1.(M), LOCATIONS OF THE FOLLOWING, AS APPLICABLE, MUST BE MARKED ON THIS ESCP IN THE FIELD: THE TPDES CONSTRUCTION SITE NOTICE POSTING IN PUBLIC VIEW, STAGING, SPOILS STORAGE, CONCRETE WASHOUT, PORTABLE TOILET(S), DUMPSTER(S), FUELING POINT(S), AND/OR OTHER POTENTIAL CONTAINMENT SOURCES. THIS ESCP MUST ALSO BE UPDATED AS THESE POTENTIAL CONTAINMENT SOURCES MOVE OR OTHER CHANGES OCCUR ONSITE. PEN AND INK CHANGES ARE EXPECTED AND DONT REQUIRE RESUBMITTAL; JUST DATE AND INITIAL.
8. HAVE A CISEC, CESSM, OR QCIS CONDUCT WEEKLY SWPPP EROSION CONTROL INSPECTIONS AND DOCUMENT PER CITY CODE SECTIONS 86.523 AND 86.529(B)(9) OR 86.529(C)(10). MAINTAIN ALL EROSION CONTROL MEASURES AND ADDRESS ALL IDENTIFIED CORRECTIVE ACTIONS PER CITY CODE SECTION 86.529(C)(11)
9. ANY EXISTING STORMWATER INLETS WITHIN 200' OF THE LOC MUST HAVE INLET PROTECTION. STORMWATER INLET PROTECTION DEVICES ARE ALSO REQUIRED AS NEW STORMWATER INLETS ARE ADDED TO THE SITE
10. PER LDC SECTION 6.4.2.4.A., TREE PROTECTION IS REQUIRED TO KEEP ALL FORMS OF ACTIVITY OUTSIDE OF ROOT PROTECTION ZONES INCLUDING GRADING OPERATIONS, VEHICLE PARKING, CONSTRUCTION, STORAGE OF MATERIALS, EQUIPMENT, OR SPOILS, ETC. TP SHOULD NOT BE MOVED DURING DEMOLITION OR CONSTRUCTION. IF ABSOLUTELY UNAVOIDABLE, TP SHOULD BE MOVED AS LITTLE AS POSSIBLE, RETURNED TO ITS FORMER LOCATION AS SOON AS POSSIBLE, AND MODIFIED MEASURES SHOULD BE EMPLOYED PER STANDARD DETAIL 610S-4-SM IN THE MEANTIME.

NOTES:

1. SEE GRADING SHEET FOR LARGER SCALE VIEW OF GRADING / TREES.
2. TEMPORARY EROSION CONTROL MEASURES SHALL BE INSTALLED PER THE CITY OF SAN MARCOS STORMWATER TECHNICAL MANUAL.
3. REVEGETATION WITHIN CITY EASEMENTS TO BE COMPLETED PER CITY SPECIFICATIONS.
4. CONTRACTOR SHALL INSTALL SILT FENCE BEHIND ALL ADA RAMPS



PROTECTED TREES (SEE COSM DETAIL 610S-2-SM, SHEET 44)

REMOVED TREES

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
EROSION CONTROL PLAN

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 07 OF 64

Date: Dec 18, 2023, 10:38am User ID: jbennett
File: H:\Projects\50848\48\81\301 Construction Documents\Civil\EC50848-61.dwg

PICP 2023-46402

SCALE: 1"= 60'

0' 60' 120' 180'

LEGEND

- PROPOSED DRAINAGE AREA BOUNDARY
- SD — STORM DRAIN LINE
- STORM DRAIN INLET
- FLOW DIRECTION
- A1.1 — DRAINAGE AREA DESIGNATION
- A1.1 — EXISTING DRAINAGE AREA DESIGNATION
- SHEET FLOW
- SHALLOW CONCENTRATED FLOW
- CHANNELIZED FLOW

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS

AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS

10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711

TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

DRAINAGE AREA MAP

CITY JOB No.	2023-46402
JOB NO.	50848-61
DATE	December 18, 2023
DESIGNER	
CHECKED	SC DRAWN
SHEET	22 OF 64

Date: Dec 18, 2023, @ 4:37pm User ID: Jennett
File: K:\Projects\50848\48\61\301 Construction Documents\Civil\00_DA50848-61.dwg

PICP 2023-46402

KISSING TREE PHASE 6C

D.A.	AREA (SF)	AREA (AC)	# homes	L. Street	IC	PC	%IC	25 year Pervious C	25 year Pervious PC * C	25 year Impervious C	25 year Impervious IC * C	25 year Weighted C	100 year Pervious C	100 year Pervious PC * C	100 year Impervious C	100 year Impervious IC * C	100 year Weighted C
A1.1	15,246	0.35	1	356	0.18	0.17	50.20%	0.39	0.07	0.87	0.15	0.63	0.46	0.08	0.96	0.17	0.71
A1.2	26,049	0.60	2	756	0.37	0.23	61.04%	0.39	0.09	0.87	0.32	0.68	0.46	0.11	0.96	0.35	0.77
A1.3	15,982	0.37	0	0	0.00	0.37	0.00%	0.39	0.14	0.87	0.00	0.39	0.46	0.17	0.96	0.00	0.46
A1.4	23,784	0.55	2	48	0.15	0.40	26.67%	0.39	0.16	0.87	0.13	0.52	0.46	0.18	0.96	0.14	0.59
A1.5	15,594	0.36	0	390	0.15	0.20	42.94%	0.39	0.08	0.87	0.13	0.60	0.46	0.09	0.96	0.15	0.67
A1.6	16,640	0.38	3	122	0.23	0.15	61.23%	0.39	0.06	0.87	0.20	0.68	0.46	0.07	0.96	0.22	0.77
A1.7	41,469	0.95	4.5	470	0.44	0.51	46.19%	0.39	0.20	0.87	0.38	0.61	0.46	0.24	0.96	0.42	0.69
A1.8	20,038	0.46	3	133	0.20	0.26	44.48%	0.39	0.10	0.87	0.18	0.60	0.46	0.12	0.96	0.20	0.68
A1.9	22,390	0.51	3	407	0.32	0.19	62.69%	0.39	0.07	0.87	0.28	0.69	0.46	0.09	0.96	0.31	0.77
A1.10	11,369	0.26	1.5	106	0.13	0.13	50.15%	0.39	0.05	0.87	0.11	0.63	0.46	0.06	0.96	0.13	0.71
A1.11	19,776	0.45	3	133	0.24	0.22	52.27%	0.39	0.08	0.87	0.21	0.64	0.46	0.10	0.96	0.23	0.72
A1.12	21,519	0.49	4	101	0.29	0.20	59.26%	0.39	0.08	0.87	0.25	0.67	0.46	0.09	0.96	0.28	0.76
A2.1	15,594	0.36	0.5	241	0.11	0.25	29.99%	0.39	0.10	0.87	0.09	0.53	0.46	0.12	0.96	0.10	0.61
A2.2	85,987	1.97	7.0	389	0.58	1.40	29.28%	0.39	0.54	0.87	0.50	0.53	0.46	0.64	0.96	0.55	0.61
A2.3	30,710	0.71	2	598	0.32	0.39	44.83%	0.39	0.15	0.87	0.27	0.61	0.46	0.18	0.96	0.30	0.68
A2.4	6,142	0.14	0.0	143	0.04	0.10	31.43%	0.39	0.04	0.87	0.04	0.54	0.46	0.04	0.96	0.04	0.62
A3.1	23,945	0.55	2.0	780	0.44	0.11	79.71%	0.39	0.04	0.87	0.38	0.77	0.46	0.05	0.96	0.42	0.86
A3.2	11,979	0.28	1	253	0.14	0.13	52.28%	0.39	0.05	0.87	0.13	0.64	0.46	0.06	0.96	0.14	0.72
D1.1	31,071	0.71	4	339	0.37	0.35	51.58%	0.39	0.14	0.87	0.32	0.64	0.46	0.16	0.96	0.35	0.72
D1.2	28,619	0.66	2.50	689	0.38	0.28	57.37%	0.39	0.11	0.87	0.33	0.67	0.46	0.13	0.96	0.36	0.75
D1.3A	46,261	1.06	4	581	0.44	0.62	41.57%	0.39	0.24	0.87	0.38	0.59	0.46	0.29	0.96	0.42	0.67
D1.3B	18,382	0.42	0.5	551	0.31	0.11	74.16%	0.39	0.04	0.87	0.27	0.75	0.46	0.05	0.96	0.30	0.83
D1.3	64,643	1.48	4.50	1132	0.75	0.73	50.84%	0.39	0.28	0.87	0.66	0.63	0.46	0.34	0.96	0.72	0.71
C2.1A	6,098	0.14	0	154	0.05	0.09	34.09%	0.39	0.04	0.87	0.04	0.55	0.46	0.04	0.96	0.05	0.63
C2.1B	15,115	0.35	1.5	164	0.15	0.20	42.90%	0.39	0.08	0.87	0.13	0.60	0.46	0.09	0.96	0.14	0.67
C2.1	21,214	0.49	1.5	318	0.20	0.29	40.37%	0.39	0.11	0.87	0.17	0.58	0.46	0.13	0.96	0.19	0.66

DRAINAGE AREA	INLET NUMBER	AREA (acres)	COMPOSITE C C_{25}	COMPOSITE C C_{100}	$A \cdot C_{25}$	$A \cdot C_{100}$	SHEET FLOW Length (ft)	SHEET FLOW Manning's (n)	SHEET FLOW Slope ft/ft	SHEET FLOW Tc (min)	SHALLOW CONCENTRATED FLOW Length (ft)	SHALLOW CONCENTRATED FLOW Paved/ Unpaved	SHALLOW CONCENTRATED FLOW Slope ft/ft	SHALLOW CONCENTRATED FLOW Tc (min)	CHANNELIZED FLOW Length (ft)	CHANNELIZED FLOW Manning's (n)	CHANNELIZED FLOW Slope ft/ft	CHANNELIZED FLOW Velocity ft/s	CHANNELIZED FLOW Tc (min)	Cumulative Tc (min)	INTENSITY I 25yr (in/hr)	INTENSITY I 100yr (in/hr)	DISCHARGE Q 25 (cfs)	DISCHARGE Q 100 (cfs)
A1.1	A1.1	0.35	0.63	0.71	0.22	0.25	20	0.24	0.036	2.7	32	U	0.032	0.2	55	0.02	0.052	6.6	0.1	5.00	11.4	14.7	2.5	3.7
A1.2	A1.2	0.60	0.68	0.77	0.41	0.46	25	0.24	0.056	2.7	13	U	0.025	0.1	151	0.02	0.068	7.5	0.3	5.00	11.4	14.7	4.7	6.7
A1.3	A1.3	0.37	0.39	0.46	0.14	0.17	42	0.24	0.022	6.0	42	U	0.180	0.1	125	0.02	0.100	9.1	0.2	6.36	10.6	13.6	1.5	2.3
A1.4	A1.4	0.55	0.52	0.59	0.28	0.32	41	0.24	0.044	4.5	214	U	0.081	0.8	25	0.02	0.067	7.5	0.1	5.31	11.2	14.4	3.2	4.7
A1.5	A1.5	0.36	0.60	0.67	0.21	0.24	41	0.24	0.049	4.3	0	U	0.000	0.0	321	0.02	0.069	7.6	0.7	5.00	11.4	14.7	2.4	3.6
A1.6	A1.6	0.38	0.68	0.77	0.26	0.29	44	0.24	0.028	5.7	109	U	0.020	0.8	63	0.02	0.074	7.8	0.1	6.61	10.5	13.4	2.7	3.9
A1.7	A1.7	0.95	0.61	0.69	0.58	0.66	25	0.24	0.052	2.8	24	U	0.031	0.1	201	0.02	0.015	3.5	0.9	5.00	11.4	14.7	6.6	9.7
A1.8	A1.8	0.46	0.60	0.68	0.28	0.31	62	0.24	0.035	6.8	131	U	0.029	0.8	42	0.02	0.077	8.0	0.1	7.72	9.9	12.7	2.8	4.0
A1.9	A1.9	0.51	0.69	0.77	0.36	0.40	52	0.24	0.033	6.1	105	U	0.050	0.5	23	0.02	0.066	7.4	0.1	6.62	10.5	13.4	3.7	5.3
A1.10	A1.10	0.26	0.63	0.71	0.16	0.19	26	0.24	0.056	2.6	0	U	0.000	0.0	79	0.02	0.042	5.9	0.2	5.00	11.4	14.7	1.9	2.7
A1.11	A1.11	0.45	0.64	0.72	0.29	0.33	47	0.24	0.057	4.5	125	U	0.020	0.9	47	0.02	0.040	5.8	0.1	5.55	11.1	14.2	3.2	4.7
A1.12	A1.12	0.49	0.67	0.76	0.33	0.37	32	0.24	0.062	3.2	143	U	0.015	1.2	24	0.02	0.010	2.9	0.1	5.00	11.4	14.7	3.8	5.5
A2.1	A2.1	0.36	0.53	0.61	0.19	0.22	57	0.24	0.039	6.1	36	U	0.070	0.1	25	0.02	0.034	5.3	0.1	6.34	10.6	13.6	2.0	3.0
A2.2	A2.2	1.97	0.53	0.61	1.05	1.20	22	0.24	0.055	2.5	259	U	0.093	0.9	155	0.02	0.057	6.9	0.4	5.00	11.4	14.7	11.9	17.6
A2.3	A2.3	0.71	0.61	0.68	0.43	0.48	71	0.24	0.081	5.4	127	U	0.026	0.8	231	0.02	0.058	6.9	0.6	6.81	10.4	13.3	4.4	6.4
A2.4	A2.4	0.14	0.54	0.62	0.08	0.09	31	0.24	0.043	3.6	0	U	0.000	0.0	113	0.02	0.042	5.9	0.3	5.00	11.4	14.7	0.9	1.3
A3.1	A3.1	0.55	0.77	0.86	0.42	0.47	45	0.24	0.054	4.4	130	U	0.011	1.3	77	0.02	0.012	3.2	0.4	6.13	10.7	13.8	4.6	6.5
A3.2	A3.2	0.28	0.64	0.72	0.18	0.20	34	0.24	0.020	5.3	0	U	0.000	0.0	203	0.02	0.007	2.4	1.4	6.69	10.4	13.4	1.8	2.7
D1.1	D1.1	0.71	0.64	0.72	0.45	0.51	27	0.24	0.017	4.7	94	U	0.022	0.7	151	0.02	0.052	6.6	0.4	5.73	10.9	14.1	5.0	7.2
D1.2	D1.2	0.66	0.67	0.75	0.44	0.49	26	0.24	0.015	4.8	82	U	0.020	0.6	254	0.02	0.058	6.9	0.6	5.99	10.8	13.9	4.7	6.8
D1.3A	D1.3A	1.06	0.59	0.67	0.63	0.71	39	0.24	0.052	4.0	191	U	0.067	0.8	134	0.02	0.036	5.5	0.4	5.20	11.3	14.5	7.1	10.3
D1.3B	D1.3B	0.42	0.75	0.83	0.31	0.35	44	0.24	0.046	4.7	80	U	0.031	0.5	419	0.02	0.051	6.5	1.1	6.20	10.7	13.7	3.4	4.8
D1.3	D1.3	1.48	0.63	0.71	0.94	1.06	-	-	-	-	-	-	-	-	-	-	-	-	-	6.20	10.7	13.7	10.1	14.6
C2.1A	C2.1A	0.14	0.55	0.63	0.08	0.09	19	0.24	0.020	3.3	0	U	0.000	0.0	138	0.02	0.005	2.0	1.1	5.00	11.4	14.7	0.9	1.3
C2.1B	C2.1B	0.35	0.60	0.67	0.21	0.23	53	0.24	0.053	5.1	178	U	0.028	1.1	97	0.02	0.005	2.0	0.8	7.00	10.3	13.2	2.1	3.1
C2.1	C2.1	0.49	0.58	0.66	0.28	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-	7.00	10.3	13.2	2.9	4.2

STREET FLOW AND INLET CALCULATIONS
100 YEAR STORM

Inlet No.	Inlet Type	Drainage Area	Q 100 (cfs)	Q pass (cfs)	Q total (cfs)	STREET CAPACITY Street Width F-F (ft)	Crown Type	Curb Height (ft)	Gutter Slope (%)	a (ft)	Yo (ft)	Crown Height (ft)	Ponded Width (+) (ft)	Ponded Width (-) (ft)	INLET ON GRADE CAPACITY Eo	S'w	Sx	Se	LT	L	E	Qi	Qpass (cfs)	Pass to Inlet #	SUMP INLET CAPACITY Qtotal (cfs)	CURB (with Depression) Length (ft)	d (ft)	d (ft) (d ≤ h + a)	AREA (without Depression) Length (ft)	h (ft)	d (ft) (d ≤ h)	do (ft) Orifice (d ≥ 1.4h)
A1.1	G-1	0.35	3.7	0.0	3.7	26	P	0.33	5.51%	0.65	0.28	0.33	8.14	8.14	0.42	0.43	0.03	0.21	13.3	10	0.92	3.36	0.3	A1.2	-	-	-	-	-	-	-
A1.2	G-1	0.60	6.7	0.3	7.0	26	P	0.33	7.37%	0.65	0.34	0.33	FULL	FULL	0.28	0.43	0.03	0.15	23.6	20	0.97	6.79	0.2	A1.4	-	-	-	-	-	-	-
A1.3	G-1	0.37	2.3	0.0	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		2.3	-	-	-	16.0	0.50	0.1	0.1
A1.4	G-1	0.55	4.7	0.2	4.9	26	P	0.33	7.37%	0.65	0.30	0.33	8.96	8.96	0.39	0.43	0.03	0.19	17.2	10	0.79	3.89	1.0	A1.6	-	-	-	-	-	-	-
A1.5	G-1	0.36	3.6	0.0	3.6	26	P	0.33	7.37%	0.65	0.27	0.33	7.36	7.36	0.46	0.43	0.03	0.22	13.8	10	0.90	3.21	0.3	A1.9	-	-	-	-	-	-	-
A1.6	G-1	0.38	3.9	1.0	5.0	26	P	0.33	7.37%	0.65	0.30	0.33	9.02	9.02	0.38	0.43	0.03	0.19	17.3	10	0.79	3.91	1.0	A1.8	-	-	-	-	-	-	-
A1.7	G-1	0.95	9.7	0.0	9.7	26	P	0.33	1.47%	0.65	0.49	0.33	FULL	FULL	0.28	0.43	0.03	0.15	16.6	20	1.00	9.67	0.0		-	-	-	-	-	-	-
A1.8	G-1	0.46	4.0	1.0	5.0	26	P	0.33	7.10%	0.65	0.30	0.33	9.25	9.25	0.38	0.43	0.03	0.19	17.4	10	0.78	3.95	1.1	A1.11	-	-	-	-	-	-	-
A1.9	G-1	0.51	5.3	0.3	5.7	26	P	0.33	6.60%	0.65	0.32	0.33	10.58	10.58	0.34	0.43	0.03	0.17	19.0	10	0.74	4.20	1.5	A1.10	-	-	-	-	-	-	-
A1.10	G-1	0.26	2.7	1.5	4.2	26	P	0.33	2.90%	0.65	0.33	0.33	FULL	FULL	0.28	0.43	0.03	0.15	14.4	10	0.88	3.72	0.5	A3.2	-	-	-	-	-	-	-
A1.11	G-1	0.45	4.7	1.1	5.7	26	P	0.33	2.50%	0.65	0.38	0.33	FULL	FULL	0.28	0.43	0.03	0.15	15.7	20	1.00	5.74	0.0	A1.12	-	-	-	-	-	-	-
A1.12	G-1	0.49	5.5	0.0	5.5	26	P	0.33	0.50%	0.65	0.48	0.33	FULL	FULL	0.28	0.43	0.03	0.15	9.5	10	1.00	5.49	0.0	A3.1	-	-	-	-	-	-	-
A2.1	G-1	0.36	3.0	0.0	3.0	26	P	0.33	3.40%	0.65	0.29	0.33	8.31	8.31	0.41	0.43	0.03	0.20	10.7	10	0.99	2.95	0.0	A2.3	-	-	-	-	-	-	-
A2.2	G-1	1.97	17.6	0.0	17.6	26	P	0.33	4.35%	0.65	0.50	0.33	FULL	FULL	0.28	0.43	0.03	0.15	29.6	20	0.87	15.28	2.3	A2.3	-	-	-	-	-	-	-
A2.3	G-1	0.71	6.4	2.3	8.8	26	P	0.33	4.00%	0.65	0.40	0.33	FULL	FULL	0.28	0.43	0.03	0.15	21.5	20	0.99	8.68	0.1	A2.4	-	-	-	-	-	-	-
A2.4	G-1	0.14	1.3	0.1	1.4	26	P	0.33	4.33%	0.65	0.21	0.33	5.25	5.25	0.59	0.43	0.03	0.28	6.8	10	1.00	1.35	0.0		-	-	-	-	-	-	-
A3.1	G-1	0.55	6.5	0.0	6.5	26	P	0.33	0.50%	0.65	0.51	0.33	FULL	FULL	0.81	0.43	0.03	0.38	5.8	20	1.00	6.50	0.0		-	-	-	-	-	-	-
A3.2	G-1	0.28	2.7	0.5	3.1	26	P	0.33	0.50%	0.65	0.40	0.33	FULL	FULL	1.00	0.43	0.03	0.46	3.8	10	1.00	3.15	0.0		-	-	-	-	-	-	-
D1.1	G-1	0.71	7.2	0.0	7.2	26	P	0.33	6.15%	0.65	0.35	0.33	FULL	FULL	0.76	0.43	0.03	0.36	13.2	20	1.00	7.21	0.0		-	-	-	-	-	-	-
D1.2	G-1	0.66	6.8	1.6	8.4	26	P	0.33	5.90%	0.65	0.37	0.33	FULL	FULL	0.69	0.43	0.03	0.33	14.7	10	0.87	7.31	1.1	D1.3A	-	-	-	-	-	-	-
D1.3A	G-1	1.06	10.3	3.8	14.1	26	P	0.33	3.43%	0.65	0.48	0.33	FULL	FULL	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
D1.3B	G-1	0.42	4.8	0.0	4.8	26	P	0.33	5.10%	0.65	0.31	0.33	10.20	10.20	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
D1.3	G-1	1.48	14.6	0.0	14.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		14.6	10.0	0.6	0.63	-	-	-
C2.1A	G-1	0.14	1.3	0.0	1.3	26	P	0.33	0.50%	0.65	0.30	0.33	9.05	9.05	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
C2.1B	G-1	0.35	3.1	0.0	3.1	26	P	0.33	7.37%	0.65	0.26	0.33	6.83	6.83	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
C2.1	G-1	0.49	4.2	0.0	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		4.2	10.0	0.3	0.28	-	-	-

STREET FLOW AND INLET CALCULATIONS
25 YEAR STORM

Inlet No.	Inlet Type	Drainage Area	Q 25 (cfs)	Q pass (cfs)	Q total (cfs)	STREET CAPACITY Street Width F-F (ft)	Crown Type	Curb Height (ft)	Gutter Slope (%)	a (ft)	Yo (ft)	Crown Height (ft)	Ponded Width (ft)	INLET ON GRADE CAPACITY Eo	S'w	Sx	Se	LT	L	E	Qi	Qpass (cfs)	Pass to Inlet #	SUMP INLET CAPACITY Qtotal (cfs)	CURB (with Depression) Length (ft)	d (ft)	d (ft) (d ≤ h + a)	AREA (without Depression) Length (ft)	h (ft)	d (ft) (d ≤ h)	do (ft) Orifice (d ≥ 1.4h)
A1.1	G-1	0.35	2.5	0.0	2.5	26	P	0.33	5.51%	0.65	0.25	0.33	6.63	0.50	0.43	0.03	0.24	10.4	10	1.00	2.51	0.0	A1.2		-	-	-	-	-	-	-
A1.2	G-1	0.60	4.7	0.0	4.7	26	P	0.33	7.37%	0.65	0.29	0.33	8.65	0.40	0.43	0.03	0.20	16.5	20	1.00	4.66	0.0		-	-	-	-	-	-	-	-
A1.3	G-1	0.37	1.5	0.0	1.5	-	-	-	-	-	-	-	FALSE	-	-	-	-	-	-	-	-	0.0	-		1.5	-	-	-	16.0	0.50	0.1	0.1
A1.4	G-1	0.55	3.2	0.0	3.2	26	P	0.33	7.37%	0.65	0.26	0.33	6.92	0.48	0.43	0.03	0.23	12.8	10	0.94	2.96	0.2	A1.6		-	-	-	-	-	-	-	-
A1.5	G-1	0.36	2.4	0.0	2.4	26	P	0.33	7.37%	0.65	0.24	0.33	6.08	0.53	0.43	0.03	0.26	10.8	10	0.99	2.41	0.0	A1.9		-	-	-	-	-	-	-	-
A1.6	G-1	0.38	2.7	0.2	2.9	26	P	0.33	7.37%	0.65	0.25	0.33	6.66	0.49	0.43	0.03	0.24	12.2	10	0.96	2.80	0.1	A1.8		-	-	-	-	-	-	-	-
A1.7	G-1	0.95	6.6	0.0	6.6	26	P	0.33	1.47%	0.65	0.43	0.33	FULL	0.28	0.43	0.03	0.15	14.2	20	1.00	6.63	0.0			-	-	-	-	-	-	-	-
A1.8	G-1	0.46	2.8	0.1	2.9	26	P	0.33	7.10%	0.65	0.25	0.33	6.67	0.49	0.43	0.03	0.24	12.0	10	0.96	2.78	0.1	A1.11		-	-	-	-	-	-	-	-
A1.9	G-1	0.51	3.7	0.0	3.7	26	P	0.33	6.60%	0.65	0.28	0.33	7.81	0.43	0.43	0.03	0.21	14.0	10	0.90	3.35	0.4	A1.10		-	-	-	-	-	-	-	-
A1.10	G-1	0.26	1.9	0.4	2.3	26	P	0.33	2.90%	0.65	0.27	0.33	7.42	0.45	0.43	0.03	0.22	8.6	10	1.00	2.26	0.0	A3.2		-	-	-	-	-	-	-	-
A1.11	G-1	0.45	3.2	0.1	3.3	26	P	0.33	2.50%	0.65	0.31	0.33	10.08	0.35	0.43	0.03	0.18	11.1	20	1.00	3.33	0.0			-	-	-	-	-	-	-	-
A1.12	G-1	0.49	3.8	0.0	3.8	26	P	0.33	0.50%	0.65	0.43	0.33	FULL	0.28	0.43	0.03	0.15	8.1	10	1.00	3.80	0.0			-	-	-	-	-	-	-	-
A2.1	G-1	0.36	2.0	0.0	2.0	26	P	0.33	3.40%	0.65	0.25	0.33	6.72	0.49	0.43	0.03	0.24	8.3	10	1.00	2.03	0.0			-	-	-	-	-	-	-	-
A2.2	G-1	1.97	11.9	0.0	11.9	26	P	0.33	4.35%	0.65	0.44	0.33	FULL	0.28	0.43	0.03	0.15	25.1	20	0.94	11.25	0.7	A2.3		-	-	-	-	-	-	-	-
A2.3	G-1	0.71	4.4	0.7	5.1	26	P	0.33	4.00%	0.65	0.33	0.33	FULL	0.28	0.43	0.03	0.15	17.2	20	1.00	5.11	0.0	A2.4		-	-	-	-	-	-	-	-
A2.4	G-1	0.14	0.9	0.0	0.9	26	P	0.33	4.33%	0.65	0.18	0.33	4.35	0.68	0.43	0.03	0.32	5.2	10	1.00	0.87	0.0			-	-	-	-	-	-	-	-
A3.1	G-1	0.55	4.6	0.0	4.6	26	P	0.33	0.50%	0.65	0.45	0.33	FULL	0.28	0.43	0.03	0.15	8.8	20	1.00	4.55	0.0			-	-	-	-	-	-	-	-
A3.2	G-1	0.28	1.8	0.0	1.8	26	P	0.33	0.50%	0.65	0.34	0.33	FULL	0.28	0.43	0.03	0.15	6.0	10	1.00	1.84	0.0			-	-	-	-	-	-	-	-
D1.1	G-1	0.71	5.0	0.0	5.0	26	P	0.33	6.15%	0.65	0.31	0.33	9.67	0.36	0.43	0.03	0.18	16.9	20	1.00	4.97	0.0			-	-	-	-	-	-	-	-
D1.2	G-1	0.66	4.7	0.5	5.2	26	P	0.33	5.90%	0.65	0.32	0.33	10.26	0.34	0.43	0.03	0.17	17.5	10	0.78	4.08	1.1	D1.3A		-	-	-	-	-	-	-	-
D1.3A	G-1	1.06	7.1	1.9	8.9	26	P	0.33	3.43%	0.65	0.41	0.33	FULL	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
D1.3B	G-1	0.42	3.4	0.0	3.4	26	P	0.33	5.10%	0.65	0.28	0.33	7.92	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
D1.3	G-1	1.48	10.1	0.0	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			10.1	10.0	0.5	0.5	-	-	-	-
C2.1A	G-1	0.14	0.9	0.0	0.9	26	P	0.33	0.50%	0.65	0.26	0.33	7.18	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
C2.1B	G-1	0.35	2.1	0.0	2.1	26	P	0.33	7.37%	0.65	0.23	0.33	5.70	-	-	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-
C2.1	G-1	0.49	2.9	0.0	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			2.9	10.0	0.2	0.2	-	-	-	-

NOTE:
WEIGHTED C VALUE BASED ON GOOD CONDITION WITH AVERAGE SLOPE BETWEEN 2% AND 7%

NO. REVISION DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
DRAINAGE AREA CALCULATIONS

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 23 OF 64

Date: Dec 18, 2023, 9:57am User ID: jbennett
File: H:\Projects\50848\48161\301 Construction Documents\Civil\DD_DA50848-61.dwg

WATER QUALITY POND VOLUME SUMMARY		
POND	VOLUME REQUIRED (CF)	VOLUME PROVIDED (CF)
POND 5.3	42,339	44,038
POND 7.9	17,790	18,585
POND 7.13	41,714	45,265
POND 7.14	36,764	38,306

SCALE: 1"= 100'

0' 100' 200' 300'

LEGEND

- WPAP OVERTREATMENT AREA (85% TSS REMOVAL)
- VEGETATIVE FILTER STRIP (HATCHING LIMITS TO BE A DEFINED VEGETATIVE FILTER STRIP EASEMENT)
- 0.50 AC — WATERSHED ACREAGE
- WPAP PROJECT LIMITS (21.81 ACRES – 85% TSS REMOVAL)
- EDWARDS AQUIFER RECHARGE ZONE BOUNDARY LINE

EDWARDS AQUIFER RECHARGE ZONE
EDWARDS AQUIFER CONTRIBUTING ZONE
EDWARDS AQUIFER TRANSITION ZONE
KISSING TREE PHASE 6A (PICP 2021-35665)
WATER QUALITY POND 7.14
0.054 ACRES OVERTREATED BY POND 7.14
GOLF COURSE HOLE 3
15' ENGINEERED VEGETATIVE FILTER STRIP '1'
WATER QUALITY/DETENTION POND 7.9 PICP 2021-35665
0.12 ACRES OF IMPERVIOUS COVER TREATED BY POND 7.9
BATCH DETENTION POND 7.13 PICP 2021-37273
EXISTING BATCH DETENTION POND 5.3 PICP 2021-37273
GOLF COURSE HOLE 2
WILD HONEYSUCKLE WAY
WILD HONEYSUCKLE CV
DESERT ZINNIA COVE
MOUNTAIN SORREL COURT
GREENTHREAD COURT
HUMMINGBIRD VINE COURT
W. CENTERPOINT ROAD
0.67
7.33
10.33
20.38
20.38
18.39

Kissing Tree, Phase 6C: Water Quality Treatment Summary									
PBMP	Total Watershed Area (ac.)	Number of Homes	I.C. from Homes (ac.)	I.C. from Streets (ac.)	I.C. from Water Tower (ac.)	Total I.C. (ac.)	PBMP	80% TSS Removal Required (lb.)	TSS Removal Provided (lb.)
Existing Batch Detention Pond 5.3*	18.39	47.5	3.62	3.89	-	7.51	Existing Batch Detention Pond 5.3*	6,741	7,221
TOTAL BASIN 5	--	**48**	**3.62**	**3.89**	**-**	**7.51**	**TOTAL BASIN 5**	**6,741**	**7,221**
Existing Batch Pond 7.9**	7.33	13.5	1.29	1.21	-	2.50	Existing Batch Pond 7.9**	2,244	2,475
Overtreatment provided by Batch Detention Pond 7.9 from impervious cover greater than 72 ft in depth from Kissing Tree Phase 6A	-	-	0.09	-	-	0.09	Overtreatment provided by Batch Detention Pond 7.9 from impervious cover greater than 72 ft in depth from Kissing Tree Phase 6A	81	-
Existing Batch Detention Pond 7.13*	20.38	25	2.01	3.80	0.41	6.23	Existing Batch Detention Pond 7.13*	5,592	6,132
Proposed Batch Detention Pond 7.14	10.33	39	2.6	1.69	-	4.29	Proposed Batch Detention Pond 7.14	3851	4,350
Overtreatment provided by Proposed Batch Detention Pond 7.14	-	1	0.054	-	-	0.054	Overtreatment provided by Proposed Batch Detention Pond 7.14	48	-
Vegatative Filter Strip "1"	0.67	3	0.16	-	-	0.16	Vegatative Filter Strip "1"	144	163
TOTAL BASIN 7	--	**81.5**	**6.2**	**6.7**		**13.3**	**TOTAL BASIN 7**	**11,960**	**13,120**

*** Designed and constructed with Kissing Tree W. Centerpoint Road Phase 3A (PICP 2021-37273)**
**** Designed and constructed with Kissing Tree Phase 6A (PICP 2021-35665)**

Project/Impervious Cover Source	Net Impervious Cover Treated in Pond 5.3 Permitted with Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	Net Impervious Cover Treated in Pond 7.9 Permitted with Kissing Tree, Phase 6A (PICP 2021-35665)	Net Impervious Cover Treated in Pond 7.13 Permitted with Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	Net Impervious Cover Treated in Pond 7.14 This Project	Net Impervious Cover Treated in VFS "1" This Project
Kissing Tree, Phase 6A (PICP 2021-35665)	-	2.4	-	-	-
Golf Course	-	-	-	-	-
Kissing Tree, W. Centerpoint Rd. Phase 3A (PICP 2021-37273)	0.71	-	1.52	-	-
Kissing Tree, Trunk Hill Water Facility (PICP 2022-41287)	-	-	0.41	-	-
Kissing Tree, W. Centerpoint Rd. Phase 3B (PICP 2022-41389)	0.63	-	1.79	-	-
Kissing Tree, Phase P6 & P7 (This Project)	2.21	0.10	0.43	4.29	0.16
Kissing Tree, Phase 16A Cottages	2.12	-	2.08	-	-
Kissing Tree, Phase P19 Cottages	1.84	-	-	-	-
Total IC for Detention Calculations **					
Total IC for Water Quality Treatment Calculations	7.51	2.50	6.23	4.29	0.16

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

WATER QUALITY TREATMENT SUMMARY 1 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 31 OF 64

PICP 2023-46402

BATCH DETENTION POND "5.3"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	5.3	
Total drainage basin/outfall area =	18.39	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	7.51	acres
Post-development impervious fraction within drainage basin/outfall area =	0.41	
$L_{M\ THIS\ BASIN}$ =	6741	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	18.39	acres
A_I =	7.51	acres
A_P =	10.88	acres
L_R =	7980	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	7221	lbs.
F =	0.90	

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

Rainfall Depth =	1.70	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	35283	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	7057	
Total Capture Volume (required water quality volume(s) x 1.20) =	42339	cubic feet

BATCH DETENTION POND "7.9"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.9	
Total drainage basin/outfall area =	7.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	2.50	acres
Post-development impervious fraction within drainage basin/outfall area =	0.34	
$L_{M\ THIS\ BASIN}$ =	2244	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	7.33	acres
A_I =	2.50	acres
A_P =	4.83	acres
L_R =	2676	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	2475	lbs.
F =	0.92	

Treatment provided for 2.50 acres of impervious cover treated by the pond and overtreatment for 0.09 acres impervious cover
2244 + (27.2 * 0.09 * 33) =2325

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

Rainfall Depth =	2.00	inches
Post Development Runoff Coefficient =	0.28	
On-site Water Quality Volume =	14825	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	2965	
Total Capture Volume (required water quality volume(s) x 1.20) =	17790	cubic feet

BATCH DETENTION POND "7.13"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

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

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.13	
Total drainage basin/outfall area =	20.38	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	6.23	acres
Post-development impervious fraction within drainage basin/outfall area =	0.31	
$L_{M\ THIS\ BASIN}$ =	5592	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Batch Detention
Removal efficiency = 91 percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	20.38	acres
A_I =	6.23	acres
A_P =	14.15	acres
L_R =	6703	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	6132	lbs.
F =	0.91	

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

Rainfall Depth =	1.80	inches
Post Development Runoff Coefficient =	0.26	
On-site Water Quality Volume =	34761	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6952	
Total Capture Volume (required water quality volume(s) x 1.20) =	41714	cubic feet

NO. | REVISION | DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
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10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
WATER QUALITY TREATMENT
SUMMARY 2 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 32 OF 64

Date: Dec 15, 2023, 2:24pm User ID: bennett
File: H:\Projects\50848\48\61\301 Construction Documents\Civil\WQ-50848-61_TCEQ_Submittal ONLY.dwg

PROPOSED BATCH DETENTION POND "7.14"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

Page 3-29 Equation 3.3: L_M = 27.2(A_N x P)

where:
- $L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
- A_N = Net increase in impervious area for the project
- P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.14	
Total drainage basin/outfall area =	10.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.29	acres
Post-development impervious fraction within drainage basin/outfall area =	0.42	
$L_{M\ THIS\ BASIN}$ =	3851	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	10.33	acres
A_I =	4.29	acres
A_P =	6.04	acres
L_R =	4555	lbs

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

Overtreatment for 0.054 AC of Impervious Cover Treated to 80% TSS Removal

Desired $L_{M\ THIS\ BASIN}$ =	4350	lbs.	(27.2 * 0.054 * 33)	=	48	+ 3,806	=	3,854
F =	0.95							

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

Rainfall Depth =	2.60	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	30637	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6127	
Total Capture Volume (required water quality volume(s) x 1.20) =	36764	cubic feet

VEGETATIVE FILTER STRIP "1"

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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where:
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- A_N = Net increase in impervious area for the project
- P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	0	

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

Drainage Basin/Outfall Area No. =	VFS "1"	
Total drainage basin/outfall area =	0.67	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	0.16	acres
Post-development impervious fraction within drainage basin/outfall area =	0.24	
$L_{M\ THIS\ BASIN}$ =	144	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Vegetated Filter Strips	
Removal efficiency =	85	percent

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

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

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

A_C =	0.67	acres
A_I =	0.16	acres
A_P =	0.51	acres
L_R =	163	lbs

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

Desired $L_{M\ THIS\ BASIN}$ =	163	lbs.
F =	1.00	

DATE | NO. | REVISION

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/15/23

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
WATER QUALITY TREATMENT
SUMMARY 3 OF 3

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 15, 2023
DESIGNER LM/WT/JB
CHECKED SC DRAWN JB
SHEET 33 OF 64

Date: Dec 15, 2023, 2:24pm User ID: jbennett
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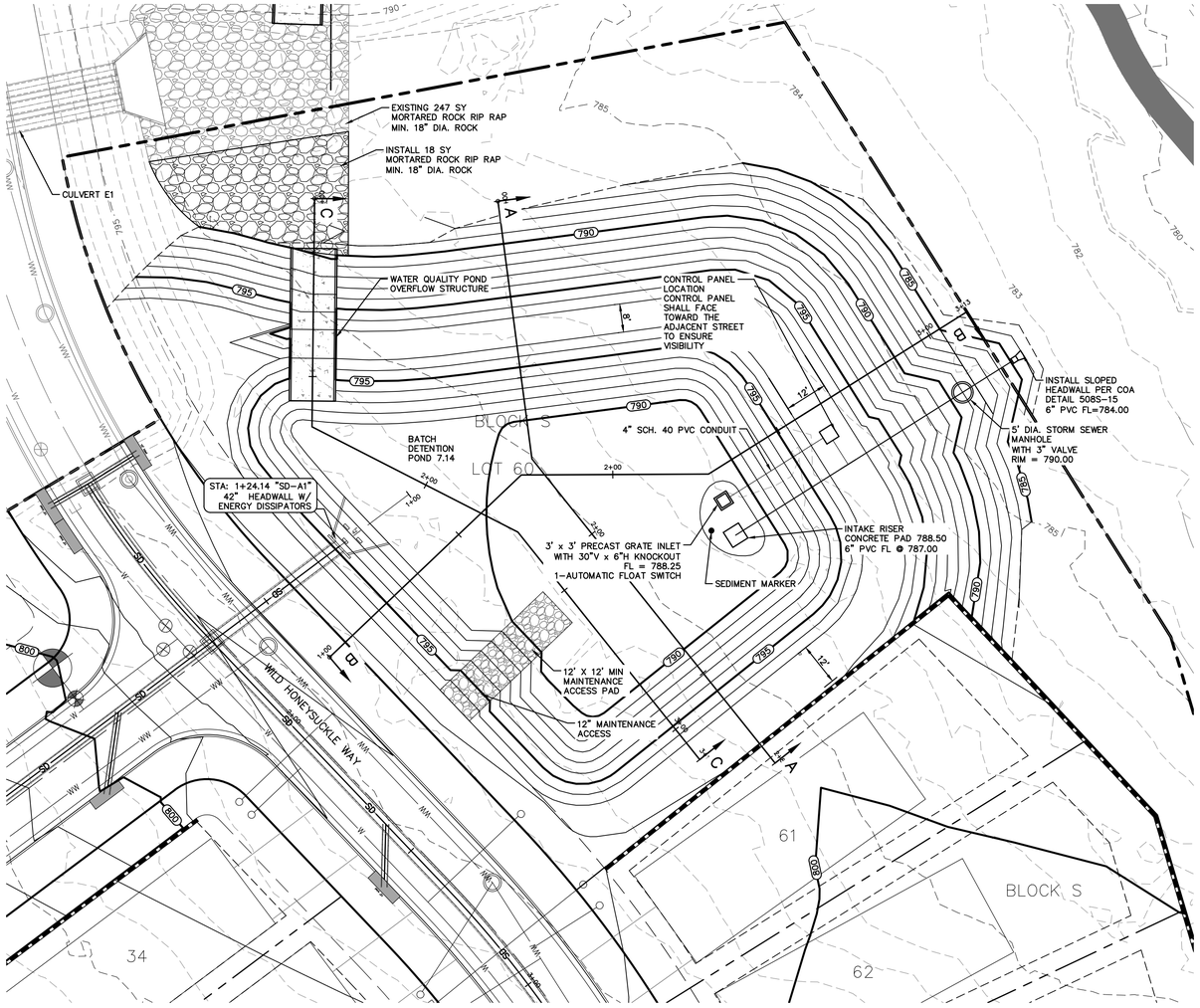
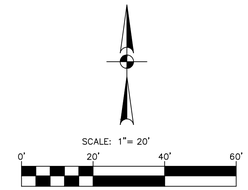
PICP 2023-46402





NOTE:
MINIMUM BURY DEPTH OF ELECTRICAL CONDUIT AT POND SHALL BE 24 INCHES.

Water Quality Pond 7.14 Combined Elevation-Area-Storage Table

Stage (ft. msl)	Pond Area (sf)	Pond Area (ac)	Incremental Height (ft)	Incremental Volume Avg. End Area (cf)	Cumulative Volume (cf)	Cumulative Volume (ac-ft)	Comments
789	269	0.0062	---	---	---	---	
789.5	2,437	0.0559	0.50	676	676	0.02	Sed Marker @ 0.5 ft Sed Depth
790	5,143	0.1181	0.50	1,895	2,571	0.06	
791	7,961	0.1828	1.00	6,552	9,123	0.21	
792	9,107	0.2091	1.00	8,534	17,657	0.41	
793	10,310	0.2367	1.00	9,709	27,366	0.63	
794	11,569	0.2656	1.00	10,940	38,306	0.88	Water Quality Volume
795	12,885	0.2958	1.00	12,227	50,533	1.16	
795.8	13,983	0.3210	0.80	10,747	61,281	1.41	100 YR WSEL
796	14,258	0.3273	0.20	2,824	64,105	1.47	
797	15,687	0.3601	1.00	14,972	79,077	1.82	Top of Berm

ORIFICE DRAWDOWN TIME FOR EXTENDED DETENTION

Average End Area Method $V_{1,2} = \left[\frac{A_1 + A_2}{2}\right] * d$

Contour Elevation (ft)	Contour Area (ft^2)	Incremental Volume (ft^3)	Total Volume (ft^3)	Orifice Discharge (cfs)	Incremental Drawdown Time (hr)	Total Drawdown Time (hr)
794	11,569	0	0			
793	10,310	10,940	10,940	0.70	4.3	8.4
792	9,107	9,709	20,648	0.66	4.1	4.1
791	7,961	8,534	29,183	0.62	3.8	7.9
790	5,143	6,552	35,735	0.57	3.2	11.1
789	269	2,706	38,440	0.52	1.4	12.5

ORIFICE DIAMETER	3.00	in
ORIFICE FL ELEV	784.54	
ORIFICE CENTROID ELEV	**784.67**	
ORIFICE AREA (Ao)	**0.049**	sf
ORIFICE COEFFICIENT	**0.6**	

ORIFICE EQUATION $Q = CA_o\sqrt{2gH}$

CALCULATE 24 HR DRAWDOWN ELEVATION FOR WATER QUALITY POND (USE IN DETENTION MODEL)

Total Drawdown Time	12.5	hours
Total Hold + Drawdown Time (Max. 48 Hours)	24.5	hours
Orifice Discharge Rate (Average)	0.85	cfs

POND UNDERDRAIN SIZING CALCULATIONS

DRAIN LINE ID	WATER QUALITY VOLUME **WQV** (cf)	AVERAGE DRAWDOWN FLOWRATE FROM ORIFICE (VALVE) **Q** (cfs)	PIPE DIAMETER **D** (in)	MANNINGS N **n**	PIPE SLOPE **S** (ft/ft)	FULL FLOW CAPACITY **Qcap**	**K**	FRICTION SLOPE **Sf** (ft/ft)
POND DRAIN 7.14	38,306	0.81	6	0.010	0.029	1.24	7.29	0.0125

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
POND 7.14

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 34 OF 64

Date: Dec 18, 2023, 9:50am User ID: Jbennett
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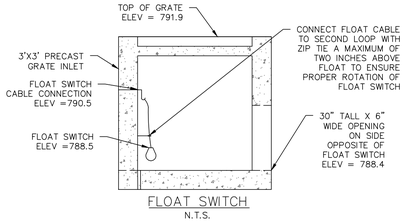
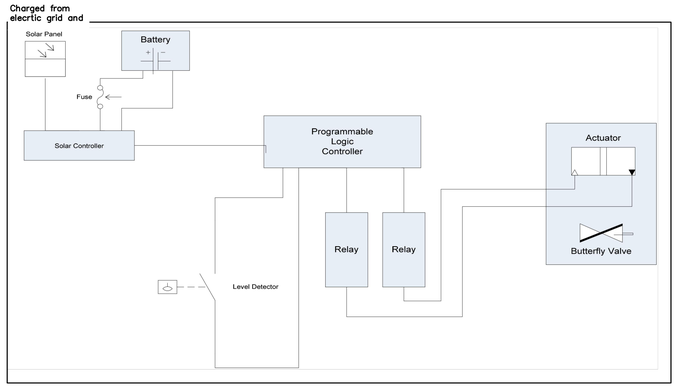


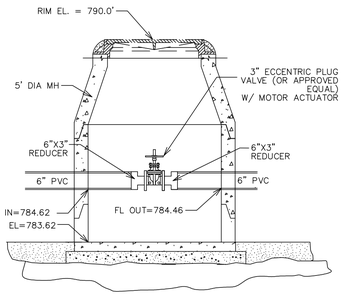
FLOAT SWITCH
N.T.S.



Batch Detention Pond Controller Information		
Component	**Description**	**Voltage**
Power System	Solar Charged 12 VDC Battery (Model MK Powered 8GU1) (Or approved equal) or charged from electric grid.	
Logic Controller	IDEC FL1C-H12RCE (Or approved equal)	12
Parts Enclosure	Southwest Photovoltaic Model BBG-1 (15.75" wide x 9.75" deep x 11.75" tall) (Or approved equal)	
Nature of Event Sensing	Anchor Scientific Float Switch(Or approved equal)	
Valve Type	Keystone 4" Butterfly Valve with over torque sensors and mechanical hand crank for physical override if necessary. Able to withstand 100 psi minimum. (Or approved equal)	
Actuator	EPI-6 12 VDC. Able to withstand 100 psi minimum. (Or approved equal)	12
Power Consumption (actuator, controller, relay, PLC)	242.58 W, 46.5 W-hours	

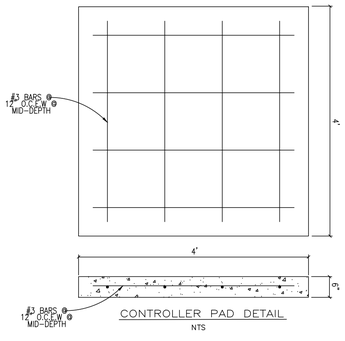
LOGIC CONTROLLER CYCLE OVERVIEW:

1. CASE 1: A SINGLE RAIN EVENT FILLS THE BATCH DETENTION BASIN. THE BASIN HOLDS THE DIVERTED STORM WATER FOR THE DETENTION TIME (12 HOURS) AND THE RELEASES THE WATER. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
2. CASE 2: A SINGLE RAIN EVENT OCCURS, BUT DOES NOT COMPLETELY FILL THE BATCH DETENTION BASIN. THE BASIN HOLDS THE WATER FOR THE DETENTION PERIOD (12 HOURS), AND THEN RELEASES IT. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
3. CASE 3: A SINGLE RAIN EVENT FILLS THE BATCH DETENTION BASIN UNDER THE TRIP POINT OF THE LEVEL SENSOR. THE LEVEL SENSOR DOES NOT TRIP. THE CAPTURED WATER IS HELD UNTIL IT INFILTRATES / EVAPORATES OR IS JOINED BY STORM WATER FROM A SUBSEQUENT STORM.
4. CASE 4: BEGINS THE SAME AS CASE 1. DURING THE DRAWDOWN PERIOD, ONE OR MORE ADDITIONAL RAIN EVENTS OCCUR CAUSING ADDITIONAL WATER TO ENTER THE BATCH DETENTION BASIN. THE VALVE REMAINS OPEN AND THE ADDITIONAL WATER VOLUME IS DRAINED. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
5. CASE 5: BEGINS THE SAME AS CASE 2. DURING THE DRAWDOWN PERIOD, ONE OR MORE ADDITIONAL RAIN EVENTS CAN OCCUR CAUSING ADDITIONAL WATER TO ENTER THE BASIN. THE VALVE REMAINS OPEN AND THE ADDITIONAL WATER VOLUME IS DRAINED. ONCE THE BATCH DETENTION BASIN IS EMPTY, A DELAY OF 2 HOURS IS STARTED TO ALLOW THE BASIN TO COMPLETELY DRAIN, AND THEN A CLOSE SIGNAL IS SENT TO THE ACTUATOR TO CLOSE THE VALVE.
6. CASE 6: INTERMITTENT NUISANCE WATER LESS THAN THE FLOAT ON ELEVATION, TO ALLEVIATE SMALL FLOWS DUE TO IRRIGATION OUTSIDE OF STORM EVENTS, THE CONTROLLER WILL OPEN THE VALVE ONCE A WEEK FOR TWO HOURS TO DRAIN ANY NUISANCE WATER.
7. CONTROL PANEL SHALL HAVE A TWO KNOB CONTROL PANEL. KNOB 1 TOGGLES FROM OPEN/CLOSED/AUTO AND KNOB 2 TOGGLES FROM WATER QUALITY MODE TO TEST MODE. TEST MODE SHOULD HAVE AN OPEN CLOSE CYCLE OF ONE MINUTE AND THE WATER QUALITY MODE SHOULD FOLLOW TCEQ STANDARDS. WHEN SET IN TEST MOST, THE ONE MINUTE CYCLE IS INITIATED BY ENGAGING/TRIGGERING THE FLOAT SWITCH.

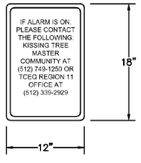


STORM SEWER MANHOLE DETAIL
NTS

NOTE:
CONTROL VALVE TO BE MOTOR ACTUATED VALVE. VALVE SHALL BE WIRED TO A CONTROLLER THAT OPENS VALVE 12 HOURS AFTER RAINFALL EVENT AND CLOSES VALVE ONCE POND HAS DRAINED DRY. CONTROLLER SHALL INCLUDE PROVISIONS FOR A MANUAL OVERRIDE SWITCH.

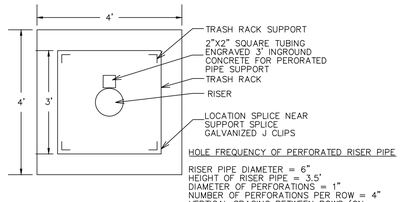


CONTROLLER PAD DETAIL
NTS



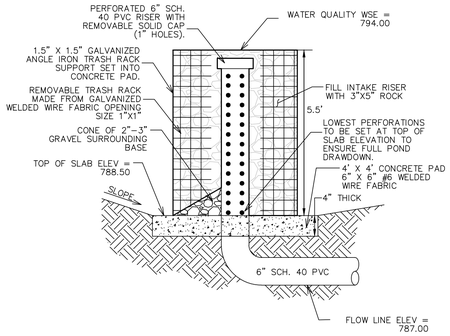
POND SIGN DETAIL

SIGN NOTING CONTACT INFORMATION FOR RESPONSIBLE PARTY IN CASE OF ALARM. SHALL HAVE MINIMUM DIMENSION OF 12" WIDE BY 18" HIGH AND SHALL HAVE BLACK LETTERS ON A WHITE REFLECTIVE BACKGROUND. SIGN MUST BE LOCATED NEAR SYSTEM ALARM.



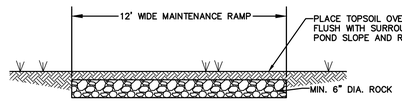
HOLE FREQUENCY OF PERFORATED RISER PIPE

RISER PIPE DIAMETER = 6"
HEIGHT OF RISER PIPE = 3.5'
DIAMETER OF PERFORATIONS = 1"
NUMBER OF PERFORATIONS PER ROW = 4"
VERTICAL SPACING BETWEEN ROWS (ON CENTER) = 4"

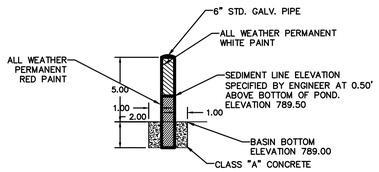


INTAKE RISER DETAIL
NTS

NOTE:
INTAKE RISER TO BE USED AS TEMPORARY SEDIMENT BASIN DEWATERING OUTLET DURING INTERIM CONSTRUCTION ACTIVITIES.



POND MAINTENANCE ACCESS SECTION
N.T.S.



SEDIMENT DEPTH MARKER DETAIL
NTS

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Kissing Tree, Phase 6C
Date Prepared: 12/15/2023

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

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

Page 3-29 Equation 3.3: L_M = 27.2(A_N x P)

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resul
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

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

County =	Hays	
Total project area included in plan * =	21.81	acres
Predevelopment impervious area within the limits of the plan * =	0.00	acres
Total post-development impervious area within the limits of the plan* =	7.24	acres
Total post-development impervious cover fraction * =	0.33	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	6499	lbs.
Number of drainage basins / outfalls areas leaving the plan area =	4	

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

Drainage Basin/Outfall Area No. =	7.14	
Total drainage basin/outfall area =	10.33	acres
Predevelopment impervious area within drainage basin/outfall area =	0.00	acres
Post-development impervious area within drainage basin/outfall area =	4.29	acres
Post-development impervious fraction within drainage basin/outfall area =	0.42	
$L_{M\ THIS\ BASIN}$ =	3851	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Batch Detention	
Removal efficiency =	91	percent

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

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

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

A_C =	10.33	acres
A_I =	4.29	acres
A_P =	6.04	acres
L_R =	4555	lbs

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

Overtreatment for 0.054 AC of Impervious Cover Treated to 80% TSS Removal

Desired $L_{M\ THIS\ BASIN}$ =	4350	lbs.	(27.2 * 0.054 * 33)	=	48	+ 3,806	=	3,854
F =	0.95							

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

Rainfall Depth =	2.60	inches
Post Development Runoff Coefficient =	0.31	
On-site Water Quality Volume =	30637	cubic feet

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

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	6127	
Total Capture Volume (required water quality volume(s) x 1.20) =	36764	cubic feet

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

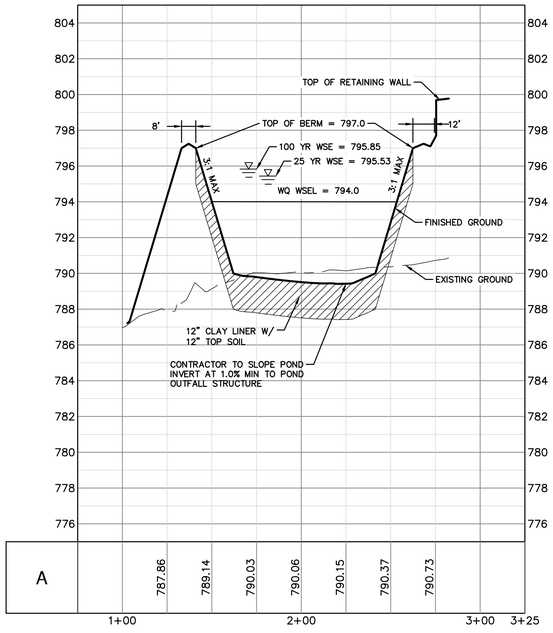
KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
POND DETAILS 1 OF 2

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 35 OF 64

Date: Dec 18, 2023, 10:54am User ID: jbennett
File: I:\Projects\5208\48\61\301 Construction Documents\Civil\P050848-61 TCEQ Submittal ONLY.dwg

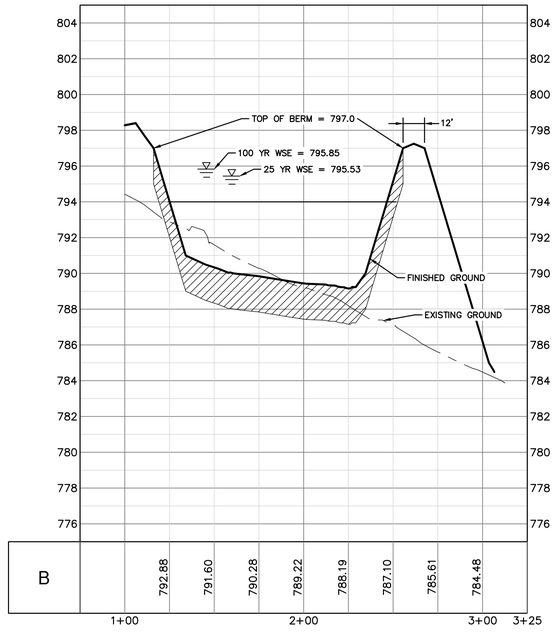
CROSS SECTION A–A

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



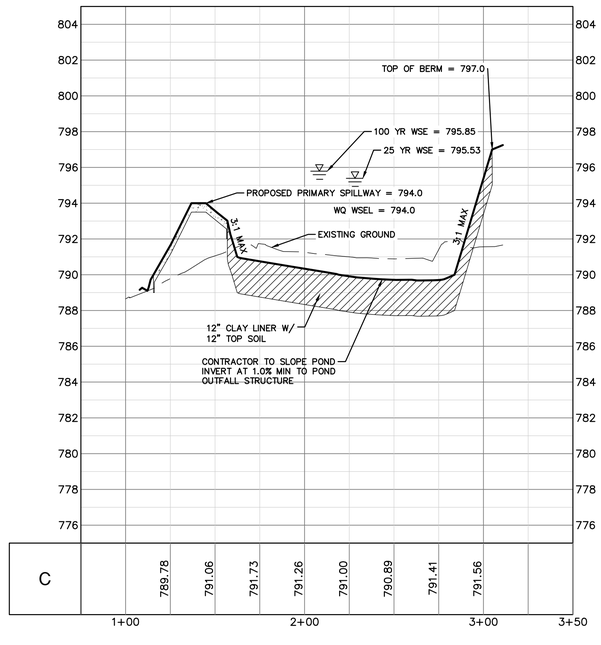
CROSS SECTION B–B

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



CROSS SECTION C–C

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



Material Property	Requirement	Testing Standard
Minimum Liquid Limit	> 50	ASTM D 4318
Minimum Plasticity Index	> 30	ASTM D 4318
Minimum Percent Passing # 200 Sieve	> 60 %	ASTM D 422
Maximum Particle Size	< 1 inch	ASTM D 422
Maximum Laboratory Permeability	< 1 x10^{-7} cm/sec	ASTM D 5084

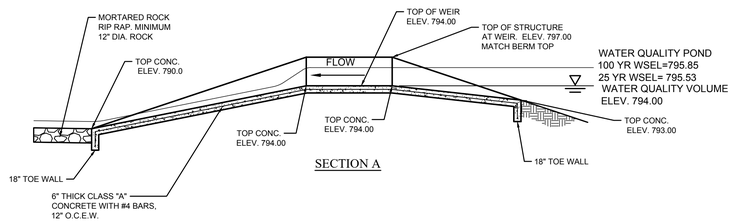
*REFER TO GEOTECHNICAL REPORT PREPARED BY MLA LABS, INC., DATED OCTOBER 26, 2015 FOR CLAY LINER RECOMMENDATIONS.

NOTE

1. THE CONSTRUCTED HEIGHT OF AN EARTHEN EMBANKMENT SHALL BE EQUAL TO THE DESIGN HEIGHT PLUS THE AMOUNT NECESSARY TO ENSURE THAT THE DESIGN HEIGHT WILL BE MAINTAINED ONCE ALL SETTLEMENT HAS TAKEN PLACE. THIS AMOUNT SHALL IN NO CASE BE LESS THAN 5% OF THE TOTAL FILL HEIGHT. ALL EARTHEN EMBANKMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH CITY OF SAN MARCOS STANDARD SPECIFICATIONS.
2. UPON COMPLETION OF THE PROPOSED SITE IMPROVEMENT AND PRIOR TO THE RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY BY THE PERMIT CENTER, THE DESIGN ENGINEER SHALL CERTIFY IN WRITING THAT THE PROPOSED DETENTION FACILITY, FILTRATION FACILITIES OR WATER QUALITY FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE APPROVED PLANS. ANY SUCH FACILITIES BUILT WITHIN THE CITY OF SAN MARCOS CITY LIMITS WILL NEED TO SHOW COMPLIANCE WITH THE CITY MUNICIPAL SEPARATE STORM SEWER SYSTEM ORDINANCES. PRIOR TO RELEASE OF THE CERTIFICATE OF ACCEPTANCE OR OCCUPANCY A CITY EASEMENT MUST BE SHOWN AROUND ALL SUCH FACILITIES WITH A MAINTENANCE COVENANT FOR EACH FACILITY.
3. STABILIZATION OF POND OR OTHER DISTURBED SLOPES 3:1 OR STEEPER WITH DEGRADABLE SOIL RETENTION BLANKETS, OR EQUIVALENT BMP IS REQUIRED. OR SOD.

WATER QUALITY POND OVERFLOW STRUCTURE DETAIL - POND 7.14

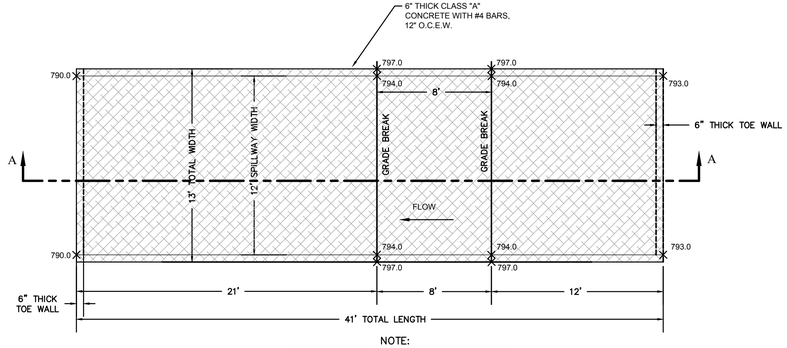
1" = 5'



SECTION A

100 YR WEIR FLOW CALCULATIONS	25 YR WEIR FLOW CALCULATIONS
$Q = CLH^{1.5}$	$Q = CLH^{1.5}$
Q = 82 cfs	Q = 57 cfs
L = 12 feet	L = 12 feet
C = 2.70*	C = 2.50*
H = 1.85 feet	H = 1.53 feet

*WEIR COEFFICIENT FROM TABLE 5-3, HANDBOOK OF HYDRAULICS, BRATER AND KING



PLAN VIEW

NOTE:
ALL ELEVATIONS SHOWN REPRESENT TOP OF FINISHED CONCRETE.

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
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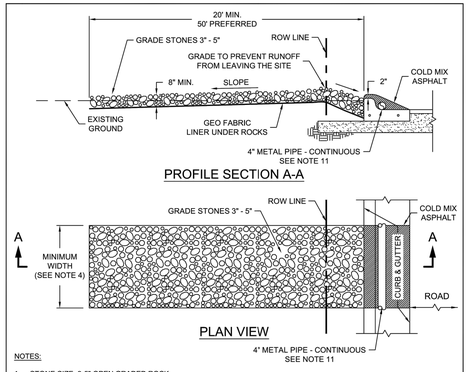
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
POND DETAILS 2 OF 2

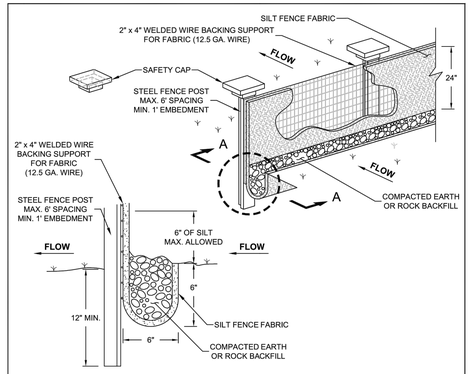
CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 36 OF 64



NOTES:

1. STONE SIZE: 3-5" OPEN GRADED ROCK.
2. LENGTH: 50' PREFERRED OR AS EFFECTIVE BUT NOT LESS THAN 20'.
3. THICKNESS: NOT LESS THAN 8".
4. WIDTH: NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS/EGRESS.
5. DIMENSIONS OF SITE WILL DICTATE THE DIMENSIONS OF THE STABILIZED CONSTRUCTION ENTRANCES IF THE PREFERRED DIMENSIONS ARE NOT POSSIBLE ON SITE.
6. WASHING: WHEN NECESSARY, VEHICLE WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATERCOURSE USING APPROVED METHODS.
7. MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AS WELL AS REPAIR AND CLEAN OUT OF ANY MEASUREMENT DEVICES USED TO TRAP SEDIMENT. ALL SEDIMENT THAT IS SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
8. DRAINAGE: ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
9. WHEN ALL SITE WORK IS COMPLETED, REMOVE STABILIZED CONSTRUCTION ENTRANCE COMPLETELY. REGRADE TO ORIGINAL CONDITION, ELEVATION AND RESTORE TO MATCH EXISTING OR PROPOSED CONDITIONS.
10. TOP OF GRADE STONES SHALL MATCH TOP OF EXISTING PAVEMENT OR CURB. COLD MIX ASPHALT & 4" METAL PIPE OR ALTERNATIVE WILL NOT BE REQUIRED WHERE THERE IS NO CATCH OR SPILL CURB.
11. PRE-FABRICATED CURB RAMPS ARE AN ACCEPTABLE ALTERNATIVE TO COLD MIX ASPHALT AND 4" METAL PIPE.

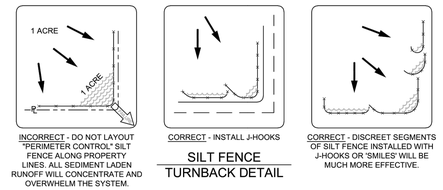
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	STABILIZED CONSTRUCTION ENTRANCE	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 641S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



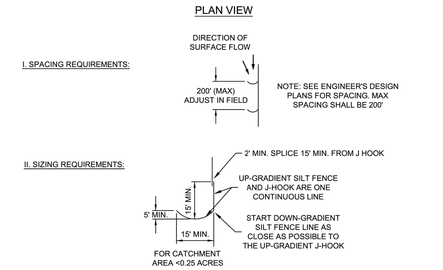
NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS SHALL MATCH THE TOP OF THE FENCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1'.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST.
5. INSPECTION SHALL BE MADE WEEKLY AND REPAIR OR REPLACEMENT SHALL BE MADE WITHIN 24 HOURS OF INSPECTION.
6. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS PERMANENTLY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WITHIN 24 HOURS WHEN IT REACHES A DEPTH OF 6" OR AS DIRECTED BY OWNER. THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. INSTALL J-HOOK SPACING PER ENGINEER'S DESIGN , BUT NOT TO EXCEED 200'.

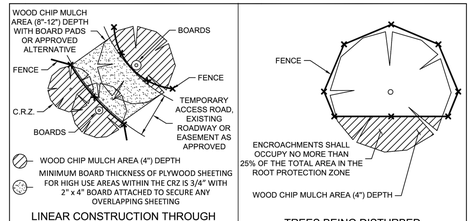
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SILT FENCE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 2



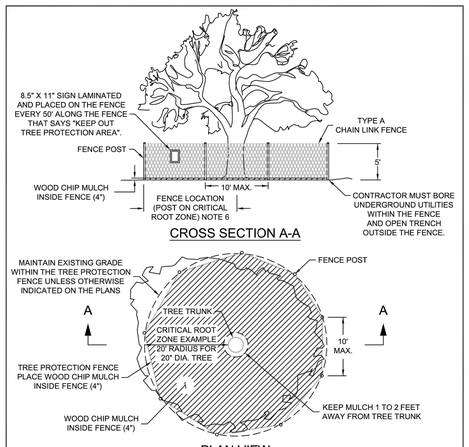
SILT FENCE PLACEMENT FOR PERIMETER CONTROL



The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SILT FENCE	
RECORD COPY SIGNED BY	1/1/2020	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 642S-1-SM
LAURIE MOYER, P.E.	ADOPTED		2 OF 2



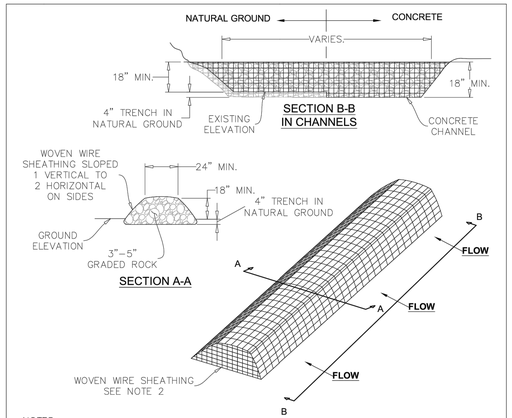
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TREE PROTECTION FENCE LOCATION	
RECORD COPY SIGNED BY	3/17/2017	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 610S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



NOTES:

1. SEE SPECIFICATIONS FOR ADDITIONAL TREE PROTECTION REQUIREMENTS.
2. IF THERE IS NO EXISTING IRRIGATION, SEE SPECIFICATIONS FOR WATERING REQUIREMENTS.
3. NO PRUNING SHALL BE PERFORMED EXCEPT BY APPROVED ARBORIST.
4. NO EQUIPMENT SHALL OPERATE INSIDE THE PROTECTIVE FENCING INCLUDING DURING FENCE INSTALLATION AND REMOVAL.
5. SEE TREE PRESERVATION PLAN FOR ANY MODIFICATIONS WITHIN THE TREE PROTECTION AREA.
6. ROOT PROTECTION ZONE EQUALS TO CRITICAL ROOT ZONE AND IS DETERMINED BY MEASURING THE TREE'S DIAMETER AT 54 INCHES FROM THE NATURAL GROUND LEVEL. FOR EVERY INCH IN DIAMETER THERE IS 1 FOOT RADIUS TREE PROTECTION.

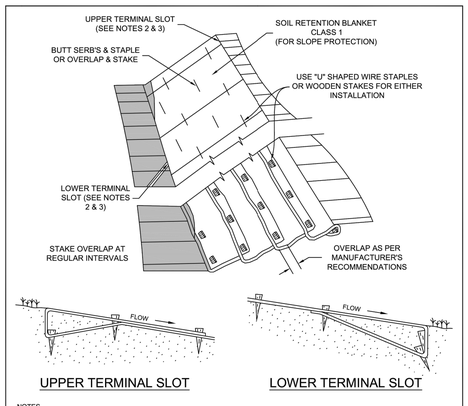
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	TREE PROTECTION FENCE TYPE A - CHAIN LINK	
RECORD COPY SIGNED BY	3/17/2017	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 610S-2-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



NOTES

1. USE ONLY OPEN GRADED ROCK 3"-5" IN DIAMETER.
2. THE ROCK BERM SHALL BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM 1" OPENINGS AND MINIMUM WIRE DIAMETER OF 20 GAUGE.
3. THE ROCK BERM SHALL BE INSPECTED WEEKLY OR AFTER EACH RAIN, AND THE STONE AND/OR FABRIC CORE-WOVEN WIRE SHEATHING SHALL BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT CONSTRUCTION, TRAFFIC DAMAGE, ETC.
4. WHEN SILT REACHES A DEPTH EQUAL TO 6", THE SILT WILL BE REMOVED AND DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CREATE A SILTATION PROBLEM.
5. DAILY INSPECTION SHALL BE MADE ON SEVERE SERVICE ROCK BERMS.
6. WHEN THE SITE IS COMPLETELY STABILIZED, THE BERM AND ACCUMULATED SILT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED MANNER.

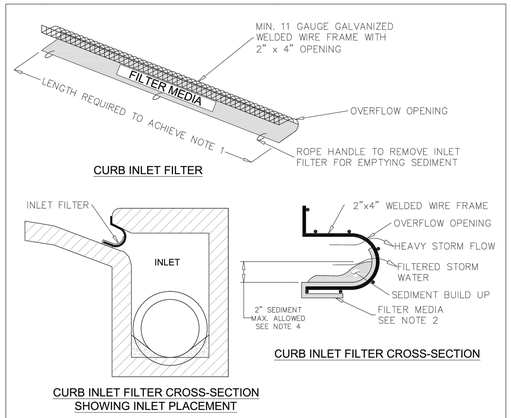
The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	ROCK BERM DETAIL	
RECORDED COPY SIGNED BY	8/4/2014	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	639S-1-SM
LAURIE MOYER, P.E.	ADOPTED	N.T.S.	STANDARD DETAIL



NOTES

1. INSTALL SOIL RETENTION BLANKETS (SERB'S) BEGINNING AT THE DOWNSTREAM END AND PROCEED UPSTREAM.
2. THE LOCATION, SPACING AND CONFIGURATION OF UPPER AND LOWER TERMINAL SLOTS, CHECK SLOTS, ETC. MAY VARY FOR EACH CLASS AND TYPE OF SERB ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. FIRMLY TAMP TOPSOIL BACKFILL INTO ALL TERMINAL SLOTS.
3. SERB EDGES ALONG THE TOP SLOPE OR TOE OF SLOPE SHALL BE ANCHORED AS PER MANUFACTURER'S RECOMMENDATIONS.
4. THE "U" SHAPED WIRE STAPLES ARE TO BE INSTALLED AT 90° TO THE SLOPE PLANE. IF WIRE STAPLES PROVE TO BE AN UNSATISFACTORY METHOD OF SECURING THE SERB IN AREAS OF ROCK, RAILROAD SPIKES OR 60 PENNY NAILS MAY BE SUBSTITUTED WITH APPROVAL OF THE ENGINEER.
5. WIRE STAPLES SHALL BE MADE FROM NOT LESS THAN 13" LENGTHS OF NO. 11 WIRE BENT TO FORM A "U" APPROXIMATELY 1" IN WIDTH.
6. WOOD STAKES SHALL BE A MINIMUM LENGTH OF 10". WOOD DIAGONAL STAKES MAY BE USED.
7. IMMEDIATELY AFTER THE SERB HAS BEEN SECURED TO THE GROUND, THE AREA COVERED SHALL BE SPRINKLED AND ROLLED WITH A LIGHT ROLLER OF SUFFICIENT WEIGHT TO PRESS THE BLANKET INTO THE SURFACE OF THE SOIL. THE ROLLER SHALL BE OF SUCH WEIGHT TO AVOID OVER-COMPACTION OF THE SEEDBED.
8. FOLLOW MANUFACTURERS SPECIFICATIONS FOR INSTALLMENT.
9. REFER TO COSM SPECIFICATION 605S FOR ADDITIONAL DETAILS.
10. SOD MAY BE USED IN LIEU OF SOIL RETENTION BLANKETS FOR SLOPE LESS THAN 4H:1V.

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	SOIL RETENTION BLANKET	
RECORD COPY SIGNED BY	1/1/2021	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD.	STANDARD NO. 605S-1-SM
LAURIE MOYER, P.E.	ADOPTED		1 OF 1



NOTE:

1. THE INLET FILTER SHALL BE INSERTED INTO THE CURB INLET TO CREATE A COMPRESSION FIT IN THE INLET.
2. THE FILTER MEDIA FOR PROJECTS WITHIN CITY OF SAN MARCOS JURISDICTION IS TO BE WOVEN FILTER FABRIC WITH A MINIMUM WATER FLOW RATE OF 300 GALLONS A MINUTE PER SQUARE FOOT(300 GAL/MIN/SF).
3. THE FILTER MEDIA IS TO BE ATTACHED TO THE WIRE FRAME WITH HOG RINGS LEAVING AN OVERFLOW OPENING ABOVE THE FILTER MEDIA.
4. INSPECTION SHALL BE MADE BY THE CONTRACTOR WEEKLY AND WITHIN 24 HOURS OF A RAIN EVENT AND SILT ACCUMULATION MUST BE REMOVED WHEN THE DEPTH REACHES 2 INCHES.
5. INLET FILTER WILL BE REMOVED UPON STABILIZATION OF SEDIMENT SOURCES

The City of San Marcos Engineering and Capital Improvements	CURRENT AS OF 1/1/2023	CURB INLET PROTECTION	
RECORDED COPY SIGNED BY	2-15-2015	THE ARCHITECT/ENGINEER ASSUMES RESPONSIBILITY FOR APPROPRIATE USE OF THIS STANDARD	628S-1-SM
LAURIE MOYER, P.E.	ADOPTED	N.T.S.	STANDARD DETAIL

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

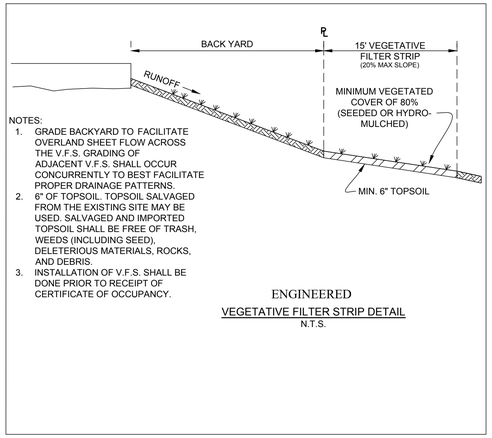
PAPE-DAWSON ENGINEERS
AUSTIN | SAN ANTONIO | HOUSTON | FORT WORTH | DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 | AUSTIN, TX 78759 | 512.454.8711
TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS
EROSION CONTROL DETAILS 1 OF 2

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 45 OF 64

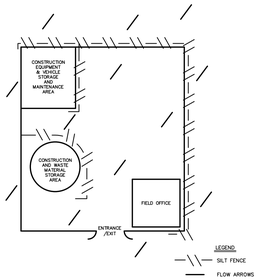
Date: Dec 18, 2023, 9:47am User ID: jbennett
File: I:\Projects\50848\48\61\301 Construction Documents\Civil\D750848-61.dwg

PICP 2023-46402

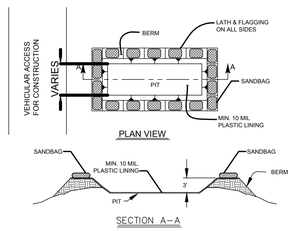


NOTES:
1. GRADE BACKYARD TO FACILITATE OVERLAND SHEET FLOW ACROSS THE V.F.S. GRADING OF ADJACENT V.F.S. SHALL OCCUR CONCURRENTLY TO BEST FACILITATE PROPER DRAINAGE PATTERNS.
2. 6" OF TOPSOIL. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED. SALVAGED AND IMPORTED TOPSOIL SHALL BE FREE OF TRASH, WEEDS (INCLUDING SEED), DELETERIOUS MATERIALS, ROCKS, AND DEBRIS.
3. INSTALLATION OF V.F.S. SHALL BE DONE PRIOR TO RECEIPT OF CERTIFICATE OF OCCUPANCY.

ENGINEERED
VEGETATIVE FILTER STRIP DETAIL
N.T.S.



TYP. CONSTRUCTION STAGING AREA



MATERIALS:

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

INSPECTION AND MAINTENANCE GUIDELINES:

1) When temporary concrete washout facilities are no longer required for the work, the hardened concrete should be removed and disposed of.

2) Materials used to construct temporary concrete washout facilities should be removed from the site of the work and disposed of.

3) Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities should be backfilled and repaired.

GENERAL NOTES:

1) Detail above illustrates minimum dimensions. Pit can be increased in size depending on expected frequency of use.

2) Washout pit shall be located in an area easily accessible to construction traffic.

3) Washout pit shall not be located in areas subject to inundation from storm water runoff.

4) Locate washout area at least 50 feet from sensitive features, storm drains, open ditches, or water bodies.

5) Temporary concrete washout facility should be constructed with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations.

CONCRETE TRUCK WASHOUT PIT

Date: Dec 18, 2023, 9:47am User ID: jennett
File: H:\Projects\50848-48\61\301 Construction Documents\Civil\DT50848-61.dwg

NO.	REVISION	DATE

STATE OF TEXAS
STEVEN S. CRAUFORD
92677
LICENSED
PROFESSIONAL ENGINEER
12/18/23

PAPE-DAWSON ENGINEERS
AUSTIN I SAN ANTONIO I HOUSTON I FORT WORTH I DALLAS
10801 N MOPAC EXPY, BLDG 3, STE 200 I AUSTIN, TX 78759 I 512.454.8711
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028801

KISSING TREE - PHASE 6C
CITY OF SAN MARCOS, TEXAS

EROSION CONTROL DETAILS 2 OF 2

CITY JOB No. 2023-46402
JOB NO. 50848-61
DATE December 18, 2023
DESIGNER
CHECKED SC DRAWN
SHEET 46 OF 64

PICP 2023-46402

ATTACHMENT G

MAINTENANCE PROCEDURES FOR PERMANENT BMPs

Note: Additional guidance can be obtained from TCEQ's Technical Guidance Manual (TGM) RG-348 (2005) Section 3.5

A written record will be kept of inspection results and maintenance performed.

3.5.8 Vegetative Filter Strips

Once a vegetated area is well established, little additional maintenance is generally necessary. The key to establishing a viable vegetated feature is the care and maintenance it receives in the first few months after it is planted. Once established, all vegetated BMPs require some basic maintenance to insure the health of the plants including:

- *Pest Management.* An Integrated Pest Management (IPM) Plan should be developed for vegetated areas. This plan should specify how problem insects and weeds will be controlled with minimal or no use of insecticides and herbicides.

- *Seasonal Mowing and Lawn Care.* If the filter strip is made up of turf grass, it should be mowed as needed to limit vegetation height to 18 inches, using a mulching mower (or removal of clippings). If native grasses are used, the filter may require less frequent mowing, but a minimum of twice annually. Grass clippings and brush debris should not be deposited on vegetated filter strip areas. Regular mowing should also include weed control practices, however herbicide use should be kept to a minimum (Urbonas et al., 1992). Healthy grass can be maintained without using fertilizers because runoff usually contains sufficient nutrients. Irrigation of the site can help assure a dense and healthy vegetative cover.

- *Inspection.* Inspect filter strips at least twice annually for erosion or damage to vegetation; however, additional inspection after periods of heavy runoff is most desirable. The strip should be checked for uniformity of grass cover, debris and litter, and areas of sediment accumulation. More frequent inspections of the grass cover during the first few years after establishment will help to determine if any problems are developing, and to plan for long-term restorative maintenance needs. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Construction of a level spreader device may be necessary to reestablish shallow overland flow.

- *Debris and Litter Removal.* Trash tends to accumulate in vegetated areas, particularly along highways. Any filter strip structures (i.e. level spreaders) should be kept free of obstructions to reduce floatables being flushed downstream, and for aesthetic reasons. The need for this practice is determined through periodic inspection, but should be performed no less than 4 times per year.

- *Sediment Removal.* Sediment removal is not normally required in filter strips, since the vegetation normally grows through it and binds it to the soil. However, sediment may accumulate along the upstream boundary of the strip preventing uniform overland flow. Excess sediment should be

removed by hand or with flat-bottomed shovels. Inspections should be performed at least twice a year and after each rainfall event, with at least one biannual inspection to occur during or immediately after a rainfall event.

- *Grass Reseeding and Mulching*. A healthy dense grass should be maintained on the filter strip. If areas are eroded, they should be filled, compacted, and reseeded so that the final grade is level. Grass damaged during the sediment removal process should be promptly replaced using the same seed mix used during filter strip establishment. If possible, flow should be diverted from the damaged areas until the grass is firmly established. Bare spots and areas of erosion identified during semi-annual inspections must be replanted and restored to meet specifications. Corrective maintenance, such as weeding or replanting should be done more frequently in the first two to three years after installation to ensure stabilization. Dense vegetation may require irrigation immediately after planting, and during particularly dry periods, particularly as the vegetation is initially established. Inspections should be performed twice a year and after each rainfall event, with at least one biannual inspection to occur during or immediately after a rainfall event.

3.5.20 Batch Detention Basin

Batch detention basins may have somewhat higher maintenance requirements than an extended detention basin since they are active stormwater controls. The maintenance activities are identical to those of extended detention basins with the addition of maintenance and inspections of the automatic controller and the valve at the outlet.

- *Inspections*. Inspections should take place a minimum of twice a year. One inspection should take place during wet weather to determine if the basin is meeting the target detention time of 12 hours and a drawdown time of no more than 48 hours. The remaining inspections should occur between storm events so that manual operation of the valve and controller can be verified. The level sensor in the basin should be inspected and any debris or sediment in the area should be removed. The outlet structure and the trash screen should be inspected for signs of clogging. Debris and sediment should be removed from the orifice and outlet(s) as described in previous sections. Debris obstructing the valve should be removed. During each inspection, erosion areas inside and downstream of this BMP should be identified and repaired/revegetated immediately.

- *Mowing*. The basin, basin side-slopes, and embankment of the basin must be mowed to prevent woody growth and control weeds. A mulching mower should be used, or the grass clippings should be caught and removed. Mowing should take place at least twice a year, or more frequently if vegetation exceeds 18 inches in height. More frequent mowing to maintain aesthetic appeal may be necessary in landscaped areas.

- *Litter and Debris Removal*. Litter and debris removal should take place at least twice a year, as part of the periodic mowing operations and inspections. Debris and litter should be removed from the surface of the basin. Particular attention should be paid to floatable

debris around the outlet structure. The outlet should be checked for possible clogging or obstructions and any debris removed.

- *Erosion control.* The basin side slopes and embankment all may periodically suffer from slumping and erosion. To correct these problems, corrective action, such as regrading and revegetation, may be necessary. Correction of erosion control should take place whenever required based on the periodic inspections.

- *Nuisance Control.* Standing water or soggy conditions may occur in the basin. Some standing water may occur after a storm event since the valve may close with 2 to 3 inches of water in the basin. Some flow into the basin may also occur between storms due to spring flow and residential water use that enters the storm sewer system. Twice a year, the facility should be evaluated in terms of nuisance control (insects, weeds, odors, algae, etc.).

- *Structural Repairs and Replacement.* With each inspection, any damage to structural elements of the basin (pipes, concrete drainage structures, retaining walls, etc.) should be identified and repaired immediately. An example of this type of repair can include patching of cracked concrete, sealing of voids, removal of vegetation from cracks and joints. The various inlet/outlet structures in a basin will eventually deteriorate and must be replaced.

- *Sediment Removal.* A properly designed batch detention basin will accumulate quantities of sediment over time. The accumulated sediment can detract from the appearance of the facility and reduce the pollutant removal performance of the facility. The sediment also tends to accumulate near the outlet structure and can interfere with the level sensor operation. Sediment shall be removed from the basin at least every 5 years, when sediment depth exceeds 6 inches, when the sediment interferes with the level sensor or when the basin does not drain within 48 hours. Care should be taken not to compromise the basin lining during maintenance.

- *Logic Controller.* The Logic Controller should be inspected as part of the twice-yearly investigations. Verify that the external indicators (active, cycle in progress) are operating properly by turning the controller off and on, and by initiating a cycle by triggering the level sensor in the basin. The valve should be manually opened and closed using the open/close switch to verify valve operation and to assist in inspecting the valve for debris. The solar panel should be inspected and any dust or debris on the panel should be carefully removed. The controller and all other circuitry and wiring should be inspected for signs of corrosion, damage from insects, water leaks, or other damage. At the end of the inspection, the controller should be reset.

Signature
Chad Matheson
Carma Paso Robles, LLC

9/20/2022
Date

ATTACHMENT I

KISSING TREE PHASE 6C
Water Pollution Abatement Plan Modification Application

Measures for Minimizing Surface Stream Contamination

Any points where discharge from the site is concentrated and erosive velocities existing will include appropriately sized energy dissipators to reduce velocities to non-erosive levels.

AGENT AUTHORIZATION

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

I Chad Matheson,
Print Name

C.F.O.,
Title - Owner/President/Other

of Carma Paso Robles, LLC,
Corporation/Partnership/Entity Name

have authorized Steven Crauford, P.E.
Print Name of Agent/Engineer

of Pape-Dawson Engineers, Inc.
Print Name of Firm

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

I also understand that:

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

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

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

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

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

SIGNATURE PAGE:

Applicant's Signature

9/20/2022
Date

THE STATE OF Texas §

County of Travis §

BEFORE ME, the undersigned authority, on this day personally appeared Chad Matheson 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 20th day of September, 2022

JENNIFER A. SHEESLEY
Notary Public, State of Texas
Comm. Expires 03-10-2025
Notary ID 128849950

NOTARY PUBLIC

Jennifer A. Sheesley
Typed or Printed Name of Notary

MY COMMISSION EXPIRES: 03-10-2025

APPLICATION FEE FORM

Application Fee Form

Texas Commission on Environmental Quality
Name of Proposed Regulated Entity: Kissing Tree Phase 6C
Regulated Entity Location: Northeast of the intersection of Centerpoint Road and Hunter Road
Name of Customer: Carma Paso Robles, LLC
Contact Person: Chad Matheson Phone: (512) 391-1342
Customer Reference Number (if issued):CN 603437310
Regulated Entity Reference Number (if issued):RN 111587408
Austin Regional Office (3373)

☒ Hays ☐ Travis ☐ Williamson

San Antonio Regional Office (3362)

☐ Bexar ☐ Medina ☐ Uvalde
☐ Comal ☐ Kinney

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

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

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

Site Location (Check All That Apply):

☒ Recharge Zone ☒ Contributing Zone ☐ Transition Zone

Type of Plan	***Size***	***Fee Due***
Water Pollution Abatement Plan, Contributing Zone Plan: One Single Family Residential Dwelling	Acres	$
Water Pollution Abatement Plan, Contributing Zone Plan: Multiple Single Family Residential and Parks	21.81 Acres	$ 4,000.00
Water Pollution Abatement Plan, Contributing Zone Plan: Non-residential	Acres	$
Sewage Collection System	L.F.	$
Lift Stations without sewer lines	Acres	$
Underground or Aboveground Storage Tank Facility	Tanks	$
Piping System(s)(only)	Each	$
Exception	Each	$
Extension of Time	Each	$

Signature: _____ Date: 12/20/23

Application Fee Schedule

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

Water Pollution Abatement Plans and Modifications

Contributing Zone Plans and Modifications

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

Organized Sewage Collection Systems and Modifications

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

Underground and Aboveground Storage Tank System Facility Plans and Modifications

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

Exception Requests

Project	*Fee*
Exception Request	$500

Extension of Time Requests

Project	*Fee*
Extension of Time Request	$150

CORE DATA FORM

TCEQ Core Data Form

TCEQ Use Only

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

SECTION I: General Information

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

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

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

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 603437310		RN 111587408

SECTION II: Customer Information

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

☐ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

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

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

Carma Paso Robles, LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number *(if applicable)*
0800754355	13837531378	38-3753137	

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

12. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

13. Independently Owned and Operated?
☐ Yes ☒ No

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

☒ Owner ☐ Operator ☐ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

9600 N. Mopac Expy. Suite:750

City	Austin	State	TX	ZIP	78759	ZIP + 4	

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

18. Telephone Number	19. Extension or Code	20. Fax Number *(if applicable)*
(512) 391-1343		( ) -

SECTION III: Regulated Entity Information

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

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

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

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

Kissing Tree Phase 6C

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

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:	600 LF South of Wild Honeysuckle Way and Dancing Oak Lane				
26. Nearest City			**State**	**Nearest ZIP Code**	
San Marcos			TX	78666	
27. Latitude (N) In Decimal:	29.843300		**28. Longitude (W) In Decimal:**	-98.002307	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
29	50	35.9	-98	0	8.30

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
1611		237210	236117

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

Construction of a public right-or-way (R.O.W.) and associated civil infrastructure

34. Mailing Address:	**9600 N. Mopac Expy. Suite: 750**							
	City	**Austin**	**State**	**TX**	**ZIP**	**78759**	**ZIP + 4**	**3169**

35. E-Mail Address:	**chad.matheson@brookfieldpropertiesdevelopment.com**	
36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*
(512) 391-1343		**( ) -**

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

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

SECTION IV: Preparer Information

40. Name:	Steven Crauford, P.E.	**41. Title:**	Vice President
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(512) 454-8711		( ) -	scrauford@pape-dawson.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:	Pape-Dawson Engineers, Inc.	**Job Title:**	Vice President
Name *(In Print):*	Steven Crauford, P.E.	**Phone:**	(512) 454- 8711
Signature:		**Date:**	12/20/23