

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Jon Niermann, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



COPY

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

October 9, 2015

RECEIVED

OCT 16 2015

Mr. Will Lockett, P.E., Area Engineer
San Antonio District
Texas Department of Transportation
4102 IH 35 South
New Braunfels, TX 78132

COUNTY ENGINEER

Re: Edwards Aquifer, Comal County
FM 306 at Hunter Road; North of Hunter Road to North of Hoffman Lane; New Braunfels, Texas
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. 13-15090210

Dear Mr. Lockett:

The Texas Commission on Environmental Quality (TCEQ) has completed its review of the WPAP application for the referenced project submitted to the Austin Regional Office by the Texas Department of Transportation on September 2, 2015. As presented to the TCEQ, the Temporary and Permanent Best Management Practices (BMPs) and construction plans were prepared by a Texas licensed professional engineer to be in general compliance with the requirements of 30 TAC Chapter 213. These planning materials were sealed, signed, and dated by a Texas licensed professional engineer. Therefore, based on the engineer's concurrence of compliance, the planning materials for construction of the proposed project and pollution abatement measures are hereby approved subject to applicable state rules and the conditions in this letter. The applicant or a person affected may file with the chief clerk a motion for reconsideration of the executive director's final action on this Water Pollution Abatement 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% of the construction has commenced on the project or an extension of time has been requested.*

PROJECT DESCRIPTION

The proposed roadway project will be constructed within an approximately 82.62 acre right-of-way (ROW). The construction will include installing appropriate temporary BMPs; expanding lanes from two existing 12-foot wide lanes to four 12-foot wide lanes with 5-foot shoulders; adding a continuous two way turn lane; providing shared-use paths; and providing permanent BMPs, and other associated appurtenances. The impervious cover will be increased from approximately 25.5 acres to 39.8 acres (48.2 percent). No new wastewater will be generated by this project.

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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, designed using the TCEQ technical guidance document, Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices, engineered filter strips (VFS) and one (1) Jellyfish flow-through stormwater filter (JF 6-3-1) will be constructed to treat stormwater runoff. The required total suspended solids (TSS) treatment for this project area is 12827 pounds of TSS generated from the additional 4.2 acres of impervious cover. Design calculations were sealed by Linda Cox, P.E., on May 1, 2015 to demonstrate the total treatment load removal to exceed the required 12827 lbs. increase caused by the project by 1283 lbs. Treatment, by rule, is required only for the increase in total suspended solids (TSS).

GEOLOGY

According to the geologic assessment included with the application, the project limits cross through the Recharge Zone, and the Contributing Zone within the Transition Zone, and the Contributing Zone. In addition, the project crosses the Austin Chalk, Del Rio Clay and Buda Limestone, as well as the Quaternary Alluvium near creek crossings. A couple of faults are identified in the literature, but not apparent on site. No wells or sensitive features were identified within the right-of-way. The TCEQ site assessment of October 2, 2015 confirms this general description.

SPECIAL CONDITIONS

- I. Since this is a roadway construction project, deed recordation of this approval letter is not required.
- II. A staging area was not proposed for this project. If the contractor desires a staging area, information indicating the proposed location and placement of appropriate temporary erosion and sedimentation controls must be submitted to the TCEQ for review and approved prior to its installation.

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.

Prior to Commencement of Construction:

2. 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.
3. 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.

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4. 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.
5. 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. 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.
6. 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.

During Construction:

7. 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.
8. 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.
9. 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.

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10. No evidence of wells exist. 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.
11. 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.
12. 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.
13. 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.
14. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, and construction activities will not resume within 21 days. When the initiation of stabilization measures by the 14th day is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable.

After Completion of Construction:

15. 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.
16. 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.
17. 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.

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COUNTY ENGINEER

Approval of the plan for the new regulated activity by the executive director is required prior to commencement of the new regulated activity.

18. 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.
19. 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 Mr. Kevin Lee Smith, P.E. of the Edwards Aquifer Protection Program of the Austin Regional Office at 512-339-2929.

Sincerely,



Carolyn Runyon, Water Section Manager
Austin Region Office
Texas Commission on Environmental Quality

CDR/cls

Enclosure: Change in Responsibility for Maintenance on Permanent BMPs-Form TCEQ-10263

cc: Mr. Tom Hornseth, P.E., County Engineer, Comal County
Ms. Lynn Bumgaardner, Water Section Manager, San Antonio Regional Office
Ms. Theresa Canales, San Antonio District, Texas Department of Transportation
Mr. Garry Ford, P.E., City Engineer, City of New Braunfels
Mr. Roland Ruiz, General Manager, Edwards Aquifer Authority
TCEQ Central Records, Building F, MC212

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Change in Responsibility for Maintenance
on Permanent Best Management Practices and Measures

COUNTY ENGINEER

The applicant is no longer responsible for maintaining the permanent best management practice (BMP) and other measures. The project information and the new entity responsible for maintenance is listed below.

Customer: _____

Regulated Entity Name: _____

Site Address: _____

City, Texas, Zip: _____

County: _____

Approval Letter Date: _____

BMPs for the project: _____

New Responsible Party: _____

Name of contact: _____

Mailing Address: _____

City, State: _____ Zip: _____

Telephone: _____ FAX: _____

Signature of New Responsible Party Date

I acknowledge and understand that I am assuming full responsibility for maintaining all permanent best management practices and measures approved by the TCEQ for the site, until another entity assumes such obligations in writing or ownership is transferred.

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.

Bryan W. Shaw, Ph.D., P.E., *Chairman*
Toby Baker, *Commissioner*
Richard A. Hyde, P.E., *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 4, 2015

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SEP 08 2015

Mr. Thomas H. Hornseth, P.E.
Comal County Engineer
195 David Jonas Drive
New Braunfels, Texas 78132

COUNTY ENGINEER

Re: Edwards Aquifer, **Comal County**
PROJECT NAME: **FM 306 at Hunter Road**; North of Hunter Road to Hoffman Lane;
New Braunfels, Texas
PLAN TYPE: Application for Approval of a **Water Pollution Abatement Plan (WPAP)**;
30 Texas Administrative Code (TAC) Chapter 213; Edwards Aquifer Protection
Program ID No. 13-15090210

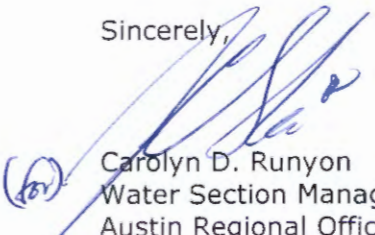
Dear Mr. Hornseth:

The enclosed WPAP application is being forwarded to you pursuant to the Edwards Aquifer Rules. The Texas Commission on Environmental Quality (TCEQ) is required by 30 TAC Chapter 213 to provide copies of all applications to affected incorporated cities, groundwater conservation districts, and counties in which the proposed regulated activity will be located.

Please forward any comments to this office by **October 4, 2015**.

Should you have any questions concerning this matter, please contact Mr. Kevin Smith, P.E. of the Edwards Aquifer Protection Program at the Austin Regional Office (512) 339-2929.

Sincerely,


Carolyn D. Runyon
Water Section Manager
Austin Regional Office

CDR/pc

Enclosure

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SEP 08 2015

Texas Commission on Environmental Quality Edwards Aquifer Application Cover Page

Our Review of Your Application

COUNTY ENGINEER

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 if not withdrawn the application will be denied and 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 to you:

- You can withdraw your application, and your fees will be refunded or credited for a resubmittal.
- 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 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 effected 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: FM 306						2. Regulated Entity No.:				
3. Customer Name: Texas Dept. Of Transportation						4. Customer No.: 600803456				
5. Project Type: (Please circle/check one)	New <input checked="" type="checkbox"/>		Modification			Extension		Exception		
6. Plan Type: (Please circle/check one)	WPAP <input checked="" type="checkbox"/>	CZP	SCS	UST	AST	EXP	EXT	Technical Clarification		Optional Enhanced Measures
7. Land Use: (Please circle/check one)	Residential		Non-residential			<input checked="" type="checkbox"/>		8. Site (acres):		82.62
9. Application Fee:			10. Permanent BMP(s):				Vegetated Filter Strips, Flow-through Storm Filter			
11. SCS (Linear Ft.):	8680 Ft		12. AST/UST (No. Tanks):				N/A			
13. County:	Comal		14. Watershed:				Alligator Creek, Guadalupe River			

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

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

I certify that to the best of my knowledge, that the application is complete and accurate. This application is hereby submitted to TCEQ for administrative review and technical review.

Texas Dept. of Transportation/Theresa Canales

Print Name of Customer/Authorized Agent

Signature of Customer/Authorized Agent

Date

OR 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):

COMAL CO.

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: Theresa Canales

Date: 8/24/2015

Signature of Customer/Agent:

Theresa Canales

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**TCEQ
AUSTIN - REGION 11**

Project Information

1. Regulated Entity Name: FM 306
2. County: Comal
3. Stream Basin: Alligator Creek, Guadalupe River
4. Groundwater Conservation District (If applicable): _____
5. Edwards Aquifer Zone:
 - ☒ Recharge Zone
 - ☐ Transition Zone
6. Plan Type:
 - ☒ WPAP
 - ☐ SCS
 - ☐ Modification

- ☐ AST
- ☐ UST
- ☐ Exception Request

7. Customer (Applicant):

Contact Person: Theresa Canales

Entity: Texas Department of Transportation

Mailing Address: 4615 NW Loop 410

City, State: San Antonio

Zip: 78229

Telephone: 210-615-6308

FAX: _____

Email Address: Theresa.Canales@txdot.gov

8. Agent/Representative (If any):

Contact Person: N/A

Entity: _____

Mailing Address: _____

City, State: _____

Zip: _____

Telephone: _____

FAX: _____

Email Address: _____

9. Project Location:

- ☒ The project site is located inside the city limits of New Braunfels.
☐ 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.

FM 306 from 0.41 mile north of Hunter Road to 0.24 mile north of Hoffman Lane, (From IH 35 go northeast on FM 306), a portion of FM 306 is in New Braunfels corporate boundary.

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: June 1, 2015

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:

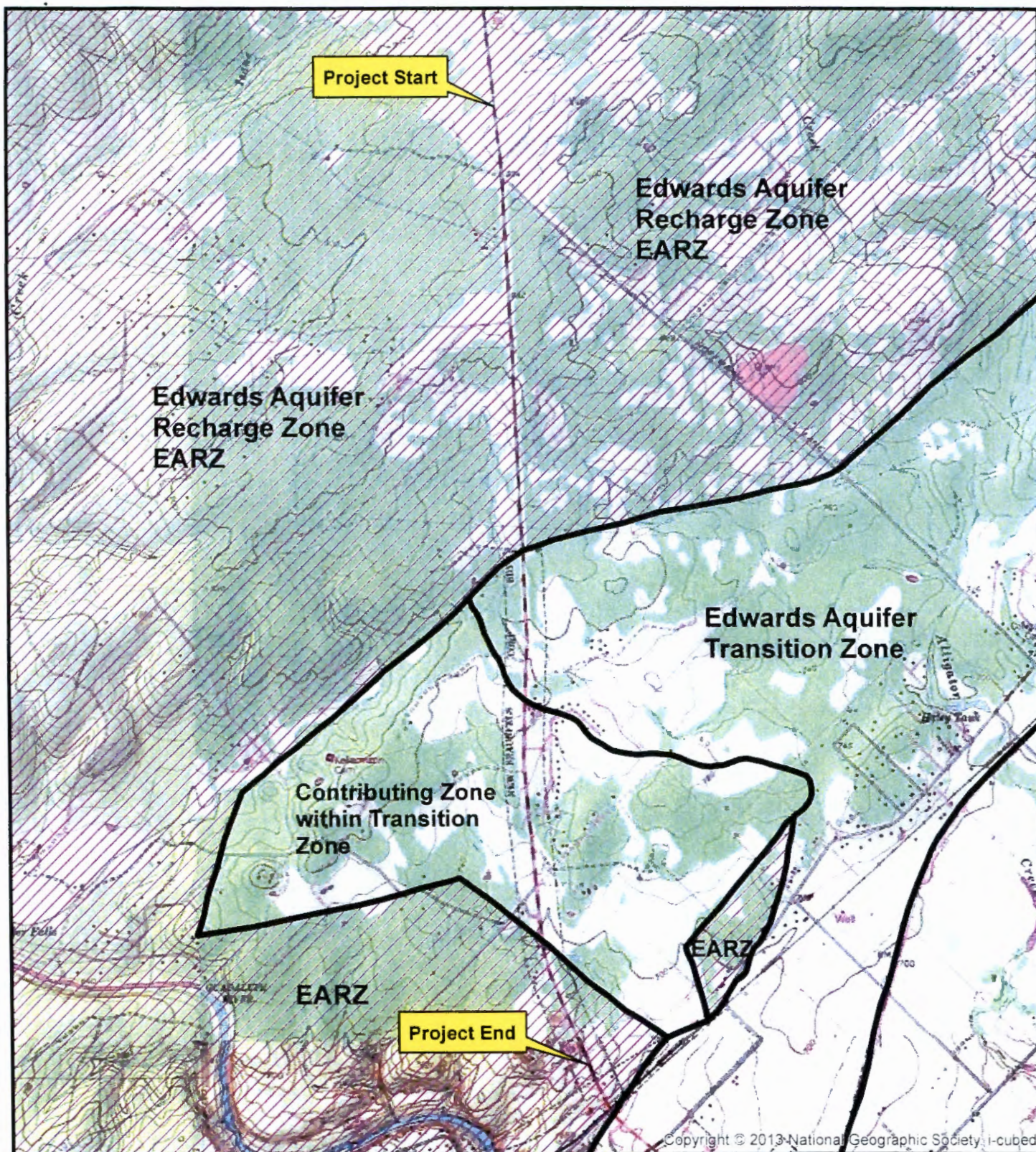
- ☐ For a Water Pollution Abatement Plan or Modification, the total acreage of the site where regulated activities will occur.
- ☐ For an Organized Sewage Collection System Plan or Modification, the total linear footage of all collection system lines.
- ☐ For a UST Facility Plan or Modification or an 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.

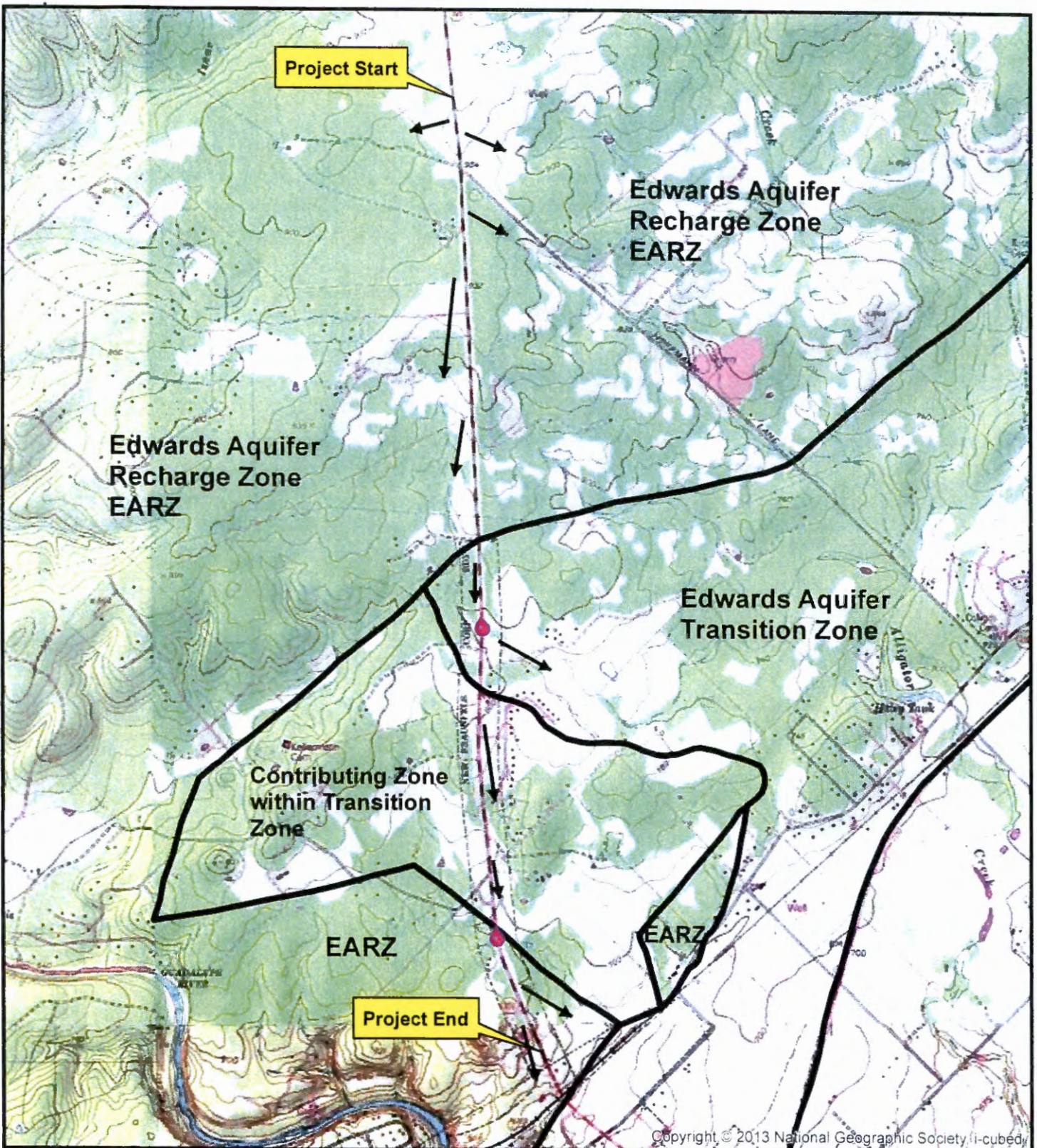


USGS 7.5 minute
New Braunfels East

Attachment B
USGS/Edwards Aquifer
Recharge Zone
FM 306 - Comal Co.

0 0.225 0.45 Miles





↓ Drainage to Recharge Zone Boundary

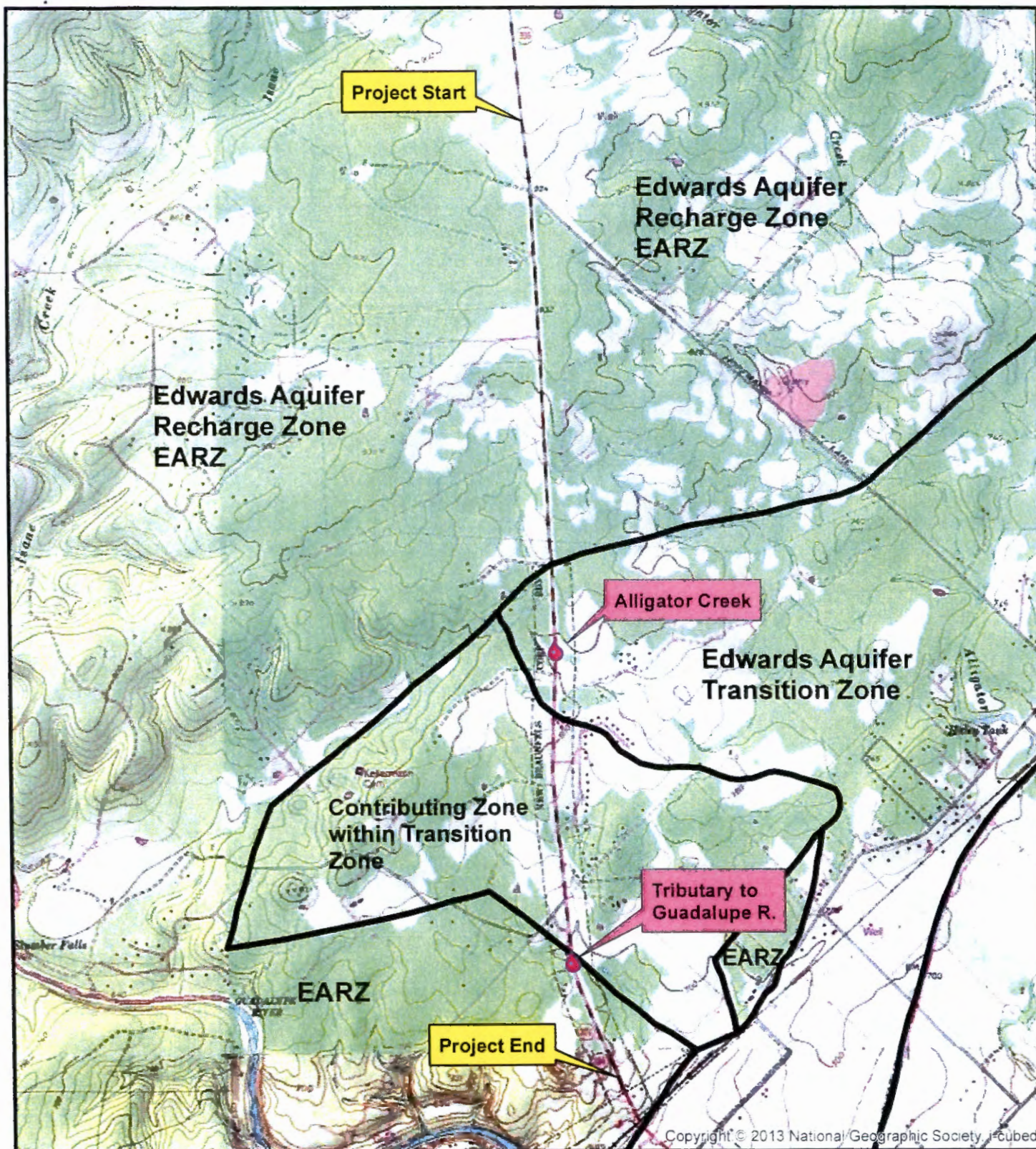
● Surface Waters

Attachment B-1
EARZ Boundaries
FM 306
CSJ 1728-02-058

0 0.225 0.45 Miles



USGS 7.5 minute
 New Braunfels East



USGS 7.5 minute
New Braunfels East

 Surface Waters

Attachment B-2
Surface Waters
FM 306
CSJ 1728-02-058

0 0.225 0.45 Miles



GENERAL INFORMATION FORM (TCEQ-0587)

ATTACHMENT C – Project Description

The proposed project is located within the city limits and extended territorial jurisdiction (ETJ) of New Braunfels in Comal County. Adjacent land use in the project location is rural residential and vacant land. A New Braunfels Utility switchyard substation is adjacent to the ROW.

The project limits on FM 306 are 0.24 mile north of Hoffman Lane to 0.41 mile north of Hunter Road. FM 306 is currently a two-lane roadway, containing two 12-ft travel lanes with five to six foot shoulders having a maximum pavement width of 36 feet. The existing right-of-way (ROW) is 120 feet wide. No additional ROW would be required. There are no existing or proposed easements.

The proposed improvements would consist of expanding the roadway from two 12-ft lanes to four 12-ft lanes with a continuous 12-ft left-turn-lane, 6-ft bike lanes, 5-ft shoulders, and 5-ft sidewalks. The proposed pavement width would be 92 feet. Underground water, telephone, and cable utility lines are present on both sides of the roadway and would require adjustments. The project is located on the Edwards Aquifer Recharge Zone, Edwards Aquifer Transition Zone, and Contributing Zone within the Transition Zone.

Work in the drainages are summarized below:

Station #	Description	Existing Structure	Proposed	Sec.404 permit	Perm. Impacts (AC)
1353+59	Unnamed drainage/no stream channel	2-(24"X84") CMP	4-(24"X84") CMP	NA	0.002
1437+17	Alligator Creek	2-(7'X4'X89') MBC	2-(7'X4'X118') MBC, dissipators on dwnstrm	NWP 14 – no PCN	0.0096
1496+55	Tributary to Guadalupe River	8' X 4' X 84' LFS Box	8' X 4' X 123' LFS MBC	NA	0.002
1513+00	Unnamed drainage/no stream channel	42" X 84' CMP	3 (42" X 106') CMP, SET upstrm side	NA	0.002

Final: Geologic Assessment

PROPOSED IMPROVEMENTS TO FM 306 IN COMAL, COUNTY, TEXAS CSJ: 1728-02-058

Prepared by: Cardno, Inc.

Date: March 25, 2015

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

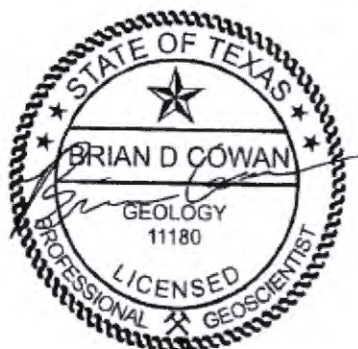
**GEOLOGIC ASSESSMENT FOR
PROPOSED IMPROVEMENTS TO FM 306 IN
COMAL, COUNTY, TEXAS
CSJ: 1728-02-058**

Prepared for
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701

05 March 2015

In accordance with the Texas Board of Professional Geologists rules at 22 Texas Administrative Code, Part 39, Chapter 851, Subchapter C, §851.156, this report is signed and sealed on the title page to assure the user that the work has been performed by or directly supervised by the following professional geologist who takes full responsibility for this work.

The computer generated seal appearing on this document was authorized by Brian D. Cowan, P.G. 11180, on 05 March 2015.



Brian Cowan

05 March 2015

Brian D. Cowan, Texas Professional Geoscientist No. 11180
Zara Environmental LLC Geoscience Firm Registration No. 5036

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

REGULATED ENTITY NAME: PROPOSED IMPROVEMENTS TO FM 306 IN COMAL, COUNTY, TEXAS, CSJ 1728-02-
058

TYPE OF PROJECT: ☒ WPAP ☐ AST ☐ SCS ☐ UST

LOCATION OF PROJECT: ☒ Recharge Zone ☐ Transition Zone ☐ Contributing Zone within the Transition Zone

PROJECT INFORMATION

1. ☒ Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE**.
2. 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.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Comfort-Rock outcrop complex (CrD)	B	1.66
Denton silty clay (DeB)	B	3.0
Krum clay (KrB)	B	>6.66
Medlin-Eckrant association (MEC)	C	>6.66
Purves clay (PuC)	B	1.66
Rumple-Comfort association (RUD)	B	3.33
Tarpley clay (TaB)	C	1.66

* 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.

3. ☒ A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. X A NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

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

5. X Appropriate SITE GEOLOGIC MAP(S) are attached:

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" = 3800 '
Site Geologic Map Scale	1" = 3800 '
Site Soils Map Scale (if more than 1 soil type)	1" = 3800 '

6. Method of collecting positional data:
X Global Positioning System (GPS) technology.
X Other method(s). (Fault locations derived from geologic maps by others)
7. X The project site is shown and labeled on the Site Geologic Map.
8. X Surface geologic units are shown and labeled on the Site Geologic Map.
9. X 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.
10. X The Recharge Zone boundary is shown and labeled, if appropriate.
11. All known wells (test holes, water, oil, unplugged, capped and/or abandoned, etc.):
X 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.
X The wells are in use and comply with 16 TAC Chapter 76.
— There are no wells or test holes of any kind known to exist on the project site.

ADMINISTRATIVE INFORMATION

12. X 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.

Date(s) Geologic Assessment was performed: 20 February 2015
Date(s)

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.

Brian Cowan
Print Name of Geologist

(512) 291-4555
Telephone

(866) 908-9137
Fax

Brian Cowan
Signature of Geologist

05 March 2015
Date



Representing: Zara Environmental LLC
(Name of Company)

If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.
TCEQ-0585 (Rev. 10-01-10)

GEOLOGIC ASSESSMENT TABLE						PROJECT NAME: PROPOSED IMPROVEMENTS TO FM 306 IN COMAL COUNTY, TEXAS, CSJ 1728-02-058													
LOCATION			FEATURE CHARACTERISTICS											EVALUATION		PHYSICAL SETTING			
1A	1B *	1C*	2A	2B	3	4			5	5A	6	7	8A	8B	9	10	11	12	
FEATURE ID	LATITUDE	LONGITUDE	FEATURE TYPE	POINTS	FORMATION	DIMENSIONS (FEET)			TREND (DEGREES)	ROCK	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
FM306-01	29.7826	-98.1051	SF	20	Kkg	13.1	3.3	0.07	247	-	1/3.3	0.01	F, V	10	30	X		X	Drainage
FM306-02	29.7779	-98.1051	SH	20	Kkg	0.3	0.6	1.0	-	-	-	-	F	15	35	X		X	Drainage
FM306-03	29.7573	-98.1048	MB	30	Kdr	-	-	-	-	-	-	-	-	5	35	X	X		Hillside
FM306-04	29.776179	-98.104901	F	20	Kkg/Kau	-	-	-	27	10	-	-	-	5	35	X	-	-	Hilltop
FM306-05	29.769676	-98.104850	F	20	Kau/Kbu	-	-	-	13	10	-	-	-	5	35	X	-	-	Hillside
FM306-06	29.759814	-98.104644	F	20	Kdr	-	-	-	38	10	-	-	-	5	35	X	-	-	Hilltop
FM306-07	29.754666	-98.104070	F	20	Kdr	-	-	-	128	-	-	-	-	5	25	X	-	-	Hillside

* DATUM: NAD 83

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

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

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

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

Brian Cowan



Date 05 March 2015
 Sheet 1 of 1
 TCEQ-0585-Table (Rev. 10-01-04)

Introduction

A geologic assessment (GA) was conducted within the right-of-way (ROW) of Farm to Market (FM) Road 306 in support of proposed improvements from Hoffmann Lane to 0.5 miles north of Hunter Road in Comal County, Texas (Figure 1). The proposed improvements would consist of expanding the roadway from two 12 ft lanes to four 12 ft lanes with a continuous left turn lane, bike lanes, and sidewalks. This project area is inside the Edwards Aquifer Recharge Zone, Transition Zone, and the Contributing Zone within the Transition Zone (Figure 1). A detailed walking survey of the entire area was conducted on 20 February 2015, documenting two surface features and one well.

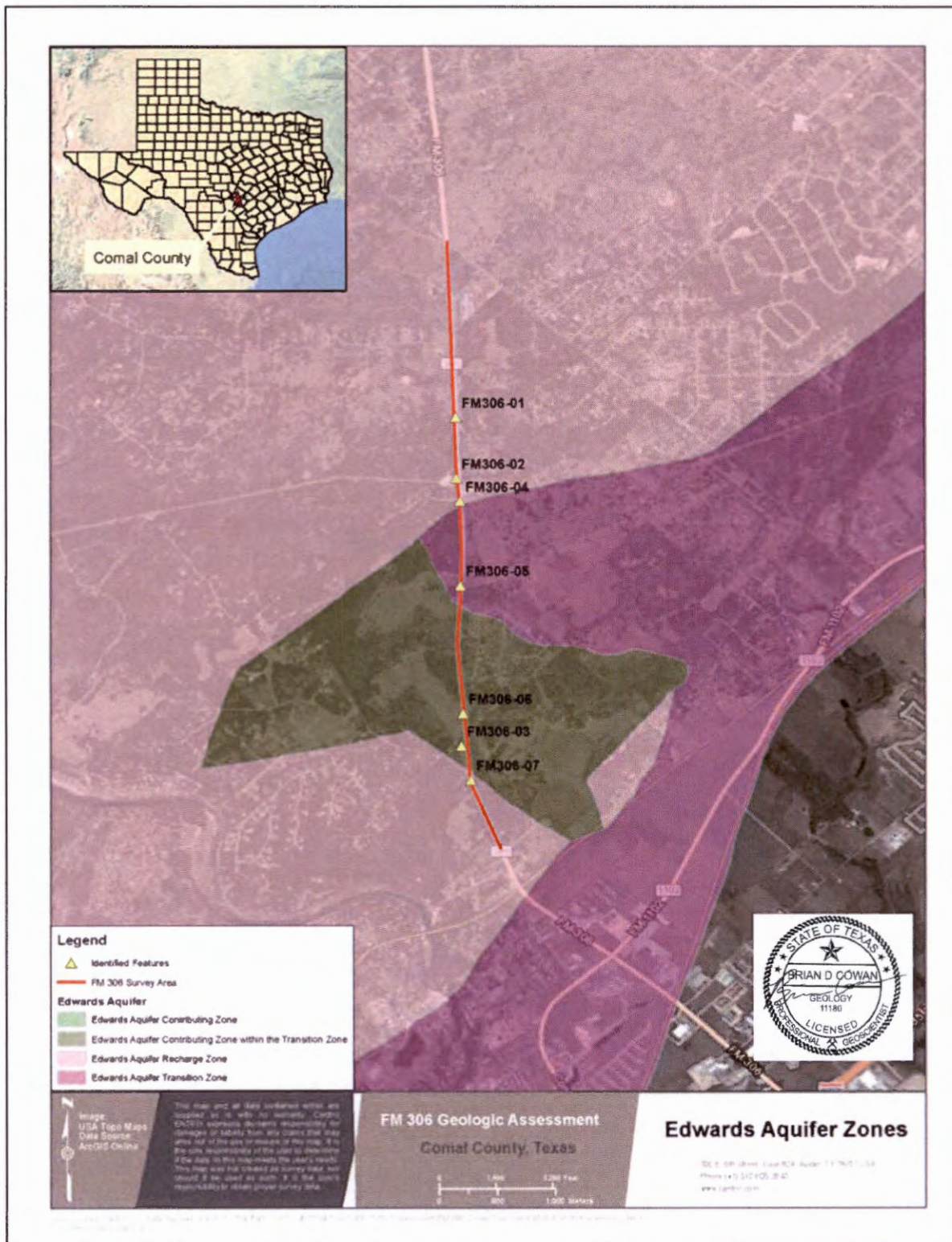


Figure 1. Location map displaying survey area in Comal County, Texas and Edwards Aquifer Zones (TCEQ 2005).

Methods

Background Data Collection

Background geology was reviewed from U. S. Geological Survey and the University of Texas Bureau of Economic Geology (2007) and Blome et al. (2005).

Field Survey

Karst survey methods followed protocols outlined in TCEQ Instructions to Geologists for Geologic Assessments (TCEQ 2004). Walking ground surveys, as defined by Veni and Reddell (2002), Barrett (2005), and TCEQ (2004) were conducted throughout the project survey area and reconnaissance excavations were conducted at all potential karst features. Positions of all features were documented using Global Positioning System (GPS) technology and checked with field maps based on digital orthoimagery. All features identified were inspected by a licensed professional geologist and evaluated for potential impact to Edwards Aquifer recharge. This is completed by ranking the recharge sensitivity of each feature using the point scheme defined by TCEQ (2004). Field work for the karst survey was supervised by Texas Licensed Professional Geoscientist Brian Cowan (#11180).

Results

Soils

Soil descriptions were compiled from the Web Soil Survey of the U.S. Department of Agriculture (USDA) (USDA 2015), and site observations. Seven different soil types are identified in the project area by the USDA dataset (Figure 2). A brief description of each soil type is below and a detailed description of all soil types is presented in Appendix A.

Comfort-Rock outcrop complex (CrD) - This is a slope/footslope forming soil that is characterized by cobbles, stones and boulders, and is capable of transmitting up to 0.20in/hr. of precipitation by its limiting layer to subsurface.

Denton silty clay (DeB) - This is a slope/footslope forming soil that is characterized by clay, and is capable of transmitting up to 0.20in/hr. of precipitation by its limiting layer to subsurface.

Krum clay (KrB) - This is a stream terrace forming soil that is characterized by clay, and is capable of transmitting up to 0.20in/hr. of precipitation by its limiting layer to subsurface.

Medlin-Eckrant association (MEC) - This is a ridge forming soil that is characterized by clay, and is capable of transmitting up to 0.06in/hr. of precipitation by its limiting layer to subsurface.

Purves clay (PuC) - This is a plain forming soil that is characterized by clay, and is capable of transmitting up to 0.57in/hr. of precipitation by its limiting layer to subsurface.

Ruple-Comfort association (RUD) - This is a plain forming soil that is characterized by gravelly clay and gravelly clay loam, and is capable of transmitting up to 0.57in/hr. of precipitation by its limiting layer to subsurface.

Tarpley clay (TaB) - This is a hillslope forming soil that is characterized by clay, and is capable of transmitting up to 0.06in/hr. of precipitation by its limiting layer to subsurface.

Regional Geology

The survey area is located in the southeastern portion of the Edwards Plateau Physiographic Province of central Texas, along the Balcones Fault Zone. The Balcones Fault Zone also forms the Balcones Escarpment, which is a highly eroded region bordering the Edwards Plateau on its southern and western boundaries. The region is typified by higher elevations to the north and west, generally sloping in a southeastern direction. Canyons and drainage basins were formed by surface flow of the Guadalupe River and its tributaries.

The geologic formations occurring within the region are comprised mostly of Cretaceous age-rocks with some overlaying Quaternary alluvium along surface drainages. The soils that have formed on top of these limestones are typically relatively thin and offer very minimal filtering capability. The limestone bedrock developed from the accumulation of thick sequences of marine sediments deposited in a lagoon environment on the San Marcos Platform protected by a barrier reef during the Cretaceous about 100 million years ago (Rose 1972). In central Texas, the Cretaceous strata slightly dip to the southeast at about 10 to 15 feet per mile toward the Gulf of Mexico.

Regional Stratigraphy

The geological formations that comprise the Edwards Aquifer are from top to bottom the Georgetown, Person and Kainer. A stratigraphic column showing the regional geology is shown in Figure 3. The Georgetown Limestone can be up to about 20 feet thick in the project area and unconformably overlies the Person Formation. The Georgetown can be identified by the presence of the index fossil brachiopod *Waconella wacoensis*. The Georgetown is a shaley, relatively impervious yellow limestone that is not known to yield

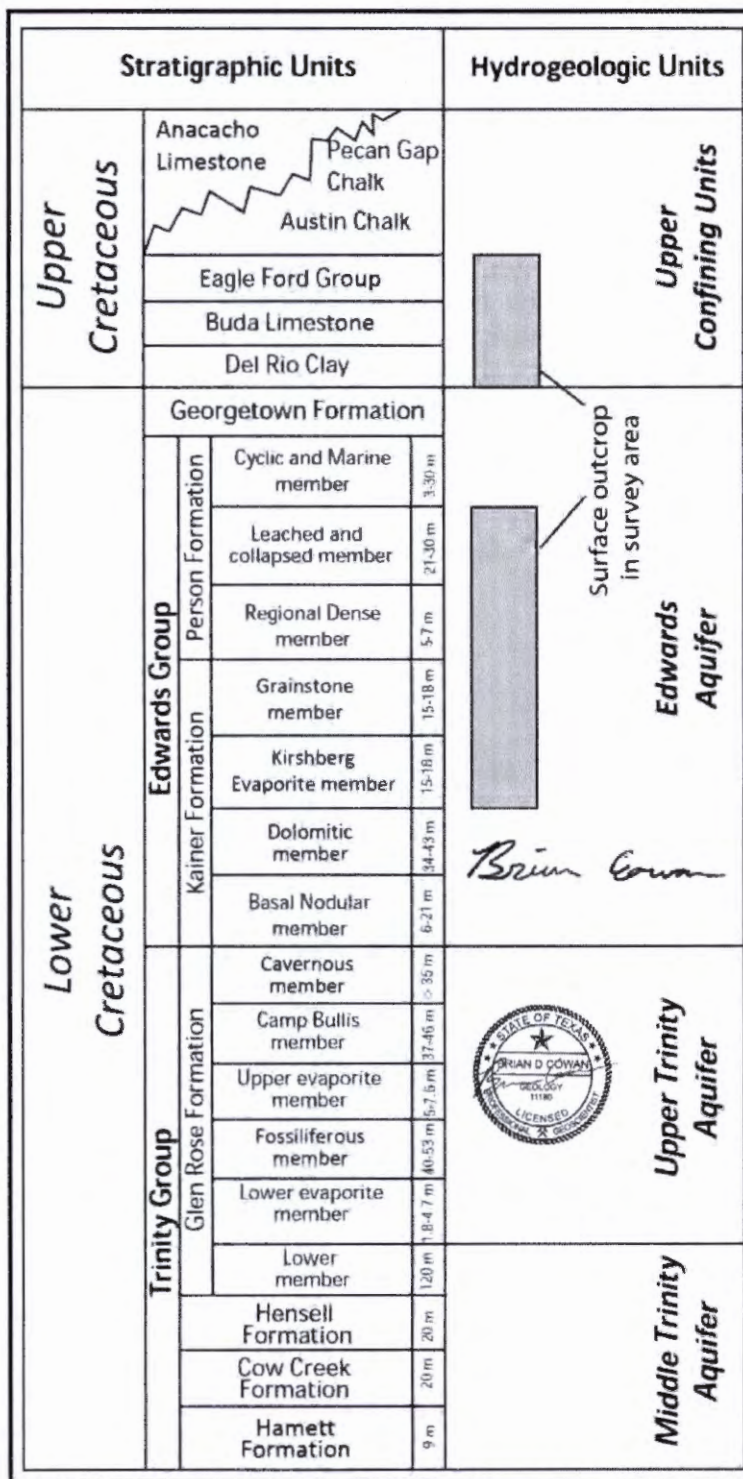


Figure 3. This stratigraphic column shows the regional geologic units and indicates the zones of rocks that outcrop in the project area. Adapted from Lindgren et al. (2004).

water and sometimes can be considered part of the upper confining unit to the Edwards Aquifer.

The Person and Kainer Formations comprise the Edwards Group (Rose 1972). The Person Formation is about 185 feet thick in the project area. The composition of the Person Formation ranges from crystalline limestone to grainstone to mudstone and is comprised of three informal hydrogeologic units: the Cyclic and Marine members, undivided; the Leached and Collapsed members, undivided; and the Regional Dense member.

The Cyclic and Marine members are composed of mudstone to fossiliferous packstone and are approximately 85 feet thick but can be somewhat variable in thickness because of the erosional unconformity between the Person and Georgetown Formations. The cyclic member is an alternating tidal flat deposit with small collapsed breccias, and the marine member is a cross-bedded biosparite to biomicrite with chert nodules.

The Leached and Collapsed members are a sequence of interbedded mudstone and grainstone intervals that form one of the more porous and permeable subdivisions of the Edwards Aquifer. The leached member is a dense, bioturbated micrite and the collapsed member is composed of several one- to five-foot thick zones of collapsed stromatolitic limestone (Rose 1972). Average thickness of the Collapsed and Leached members is approximately 80 feet near the project area and is characterized by two highly churned, iron stained beds separated by a more massive light colored limestone. Horizontal caverns with relatively large rooms develop in this unit.

The bottom unit of the Person Formation is the Regional Dense member (RDM), which throughout the region has a relatively consistent thickness of 20 feet. The RDM is composed of a dense argillaceous mudstone and is easily identified in the outcrop and on a variety of geophysical logs. Most of the fractures that penetrate the RDM do not appear to be solution enlarged. Caves that breach the RDM are not enlarged but are usually vertical shafts with horizontal caverns developed above or below the RDM.

The RDM can function as a confining unit between the upper and lower portions of the Edwards Aquifer between the Kainer and the Person Formation. However, caves, faults, and fractures may greatly reduce the vertical confining ability of the RDM. The RDM is probably not an effective barrier to lateral flow at faults because of the relatively thin 20-foot section. The flow of water tends to circumvent the RDM because of the impermeable nature of this unit.

The Kainer Formation has an approximate total thickness of 285 feet. The lithology of the Kainer Formation ranges from mudstone to *miliolid* grainstone to crystalline limestone. The Kainer is subdivided into four informal members that include the grainstone, Kirschberg Evaporate, Dolomitic and Basal Nodular members.

The Grainstone member is the uppermost unit of the Kainer Formation and is approximately 55-feet thick. Unit V is composed of thick sequences of dense, tightly-cemented, miliolid grainstone. Primary matrix porosity, as measured on geophysical logs, is some of the lowest in the Edwards Aquifer. Secondary fracture porosity accounts for the bulk of effective porosity in this aquifer unit.

The Kirschberg evaporite member underlies the Grainstone member and is about 60 feet in thickness. This hydrogeologic unit consists of crystalline limestone interbedded with mudstone containing chert lenses. Collapse features are common. The porosity has been described as boxwork (Maclay and Small 1976) because of the configuration of the voids and the secondary neospar and travertine deposits. The boxwork porosity does not seem to be prevalent throughout the entire thickness or extent of subdivision VI, but occurs sporadically within more massive limestone. Dissolution of evaporite minerals, such as gypsum and anhydrite, and the existence of contorted beds in the Kirschberg evaporite results in extensive secondary porosity, which creates one of the most permeable subdivisions in the Edwards Aquifer.

The Dolomitic member is a dense, crystalline limestone with interbedded grainstone and burrowed mudstone with some chert beds. The Dolomitic member has a total thickness of about 110 feet and is characterized by massive thick beds. Effective porosity and probable pathways of water in this unit are restricted to solution enlarged bedding planes, joints, fractures and faults.

The basal nodular member is the lowermost unit of the Edwards Group and is about 50 to 60 feet of tan, marly, nodular limestone. In the subsurface, the basal nodular member has negligible porosity and permeability (Maclay and Small 1984), and can function as part of the lower confining unit. However, in outcrop the basal nodular member often displays extensive karstification, which has generated secondary porosity in the form of large lateral caves.

Portions of the project area lay within the Transition Zone and the Contributing Zone within the Transition Zone. Within these zones the Austin Chalk, Buda Limestone, and Del Rio Clay crop out in the project area.

The Austin Chalk Formation is about 210 feet thick near the project area. It consists of recrystallized, fossiliferous, interbedded chalk marls with some volcanic ash beds. The Austin Chalk is not currently recognized as a minor aquifer in the State. However, near San Antonio and to the west through Medina, Uvalde, Kinney and Val Verde Counties, the Austin Chalk can be karstified with cavern development. Some wells tap the Austin Chalk, especially west of San Antonio. The Austin Chalk host significant springs that produce Edwards Aquifer water, such as San Antonio and San Pedro Springs.

The Buda Limestone Formation is a hard, dense, fine-grained, buff or light gray limestone with small, calcite-filled fractures. The Buda is distinctly nodular with a conchoidal fracture and has been

described as "porcelaneous" with little primary porosity or permeability. The Buda Limestone is not recognized as a major aquifer.

The Del Rio Formation is a blue "sticky" clay in the subsurface, which weathers in outcrop to greenish-yellow brown clay with pyrite and gypsum. The Del Rio Clay ranges from about 40 to 50 feet thick and often has large accumulations of "rams-horn" index fossil (*Ilymatogyra arietina*). The Del Rio is not recognized as a major aquifer.

Regional Groundwater

This area is in a semi-arid environment with average annual rainfall of about 30 to 35 inches per year. Evaporation of 75 to 90 inches per year removes much of this water prior to recharging the aquifers. Many of the rainfall events occur as thermal convection thunderstorms that can produce excessive amounts of precipitation in short periods of time. Some of this water makes its way into the aquifers usually through concentrated areas along creeks and rivers in outcrop areas of the recharge zone.

The Edwards Aquifer is one of the most permeable and productive limestone aquifers in the United States. In the San Antonio region, the aquifer supplies drinking water to more than 1.7 million people and provides habitat for several endangered aquatic species. Karst aquifers are, by their nature, extremely vulnerable to contamination. Soils in karst areas tend to be thin and patchy. Thus, the filtration of diffuse recharge afforded by soils is at best low, and is only decreased by human activity. Recharge in karst systems commonly occurs as point recharge into specific karst features, bypassing what little filtration a limited soil zone might afford.

Site Geology

Site geology is consistent with that mapped by Blome et al. (2005) and U. S. Geological Survey and the University of Texas Bureau of Economic Geology (2007) and is shown in Figure 4. The northern and far southern portion of the survey area is within the Edwards Aquifer Recharge Zone and the center portion is within the Transition Zone and Contributing Zone within the Transitions Zone. Portions of the project area are overlain by thick Quaternary alluvium, particularly near stream crossings, and geomorphic features and the sediments in those areas are consistent with those of stream deposits. It is unlikely that water could rapidly infiltrate into the subsurface within the alluvial areas; however, it should be noted that runoff from this portion of the study area could enter streams and potentially recharge the aquifer at locations outside the survey area. Portions of the project area crossing the Austin Chalk, Del Rio Clay and Buda Limestone are less likely to rapidly transmit water rapidly into the subsurface as these units are clay rich and have lower porosity. There were no karst features discovered within the Buda Limestone, Del Rio Clay or Austin Chalk. Portions of the study area within the Recharge Zone are more likely to contain sensitive features that can rapidly transmit water into the subsurface. Both features found were within the Recharge Zone; however, neither is sensitive according to TCEQ guidelines (TCEQ 2004).

Description of Features

Results of the surface karst feature survey are presented in the TCEQ Geologic Assessment Table at the beginning of this document and discussed below. All features were ranked according to TCEQ standards and reported in TCEQ-0585-Table (Rev. 10-01-04) and Figure 2 and Figure 4 (Soils and Geology maps). A search of the Texas Water Development Board's Well Database showed that one well is located within the survey area and one well was discovered during pedestrian surveys.

Feature FM306-01; Solution Enlarged Fractures

These solution enlarged fractures are located in the eastern ROW of FM 306 approximately 0.4 mi (0.64 km) south of River Oaks Drive (Figure 5 – Figure 7). It is filled with modern fine soils and measures 13.1 ft (4 m) long, 3.3 ft (1 m) wide, and 0.07 ft (0.02 m) deep. It has a catchment area of greater than 1.6 acres. The feature was not excavated. The fractures are filled with fine soils and vegetation and there are no open voids continuing into the subsurface. There is a low potential for this feature to rapidly transmit water to the subsurface due to the infill of all fractures and lack of downward trending voids.



Figure 5. Overview of Feature FM306-01.



Figure 6. Close view of Feature FM306-01.

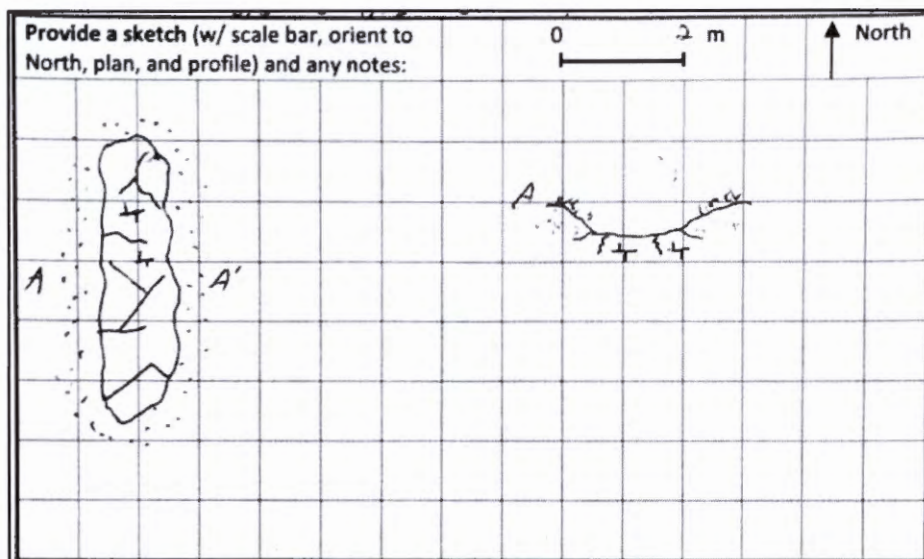


Figure 7. Field sketch of Feature FM306-01.

Feature FM306-02; Collapse Sinkhole

This collapse sinkhole is located in the western ROW of FM 306 approximately 1,185 ft (361 m) north of Millies Lane (Figure 6 - Figure 8). It is filled with modern fine soils and bedrock. It measures 0.3 ft (0.1 m) long, 0.6 ft (0.2 m) wide, and 1 ft (0.3 m) deep. It has a catchment area of greater than 1.6 acres but only receives recharge when flow through the ditch is greater than 6 inches (15 cm) deep. The feature was not excavated. A void continues through the bedrock an unknown distance into the subsurface but is partially filled with sediment. There is a moderate potential for

this feature to rapidly transmit water to the subsurface due to the presence of downward trending voids.

Figure 6. Overview of Feature FM306-02.





Figure 7. Interior of Feature FM306-02.

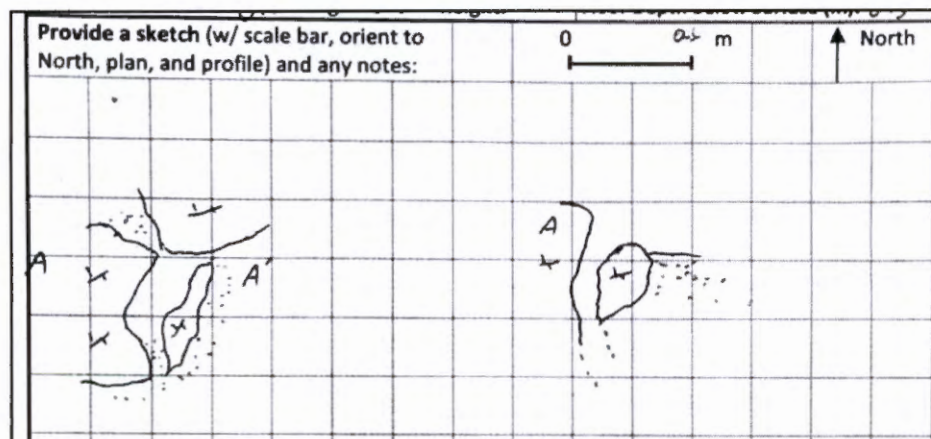


Figure 8. Field sketch of Feature FM306-02.

Feature FM306-03; Well

This well is located in the western ROW of FM 306 approximately 275 ft (84 m) south of Bretzke Lane (Figure 9 and Figure 10). It has a sign on it indicating that it is an Edwards Aquifer Authority monitoring well, but Texas Water Development Board (TWDB) records indicated that it is owned by the TWDB. It is state well number 6816701. There is a crack in the concrete pad, but it is unknown if the integrity of the well has been breached.



Figure 9. Overview of Feature FM306-03.

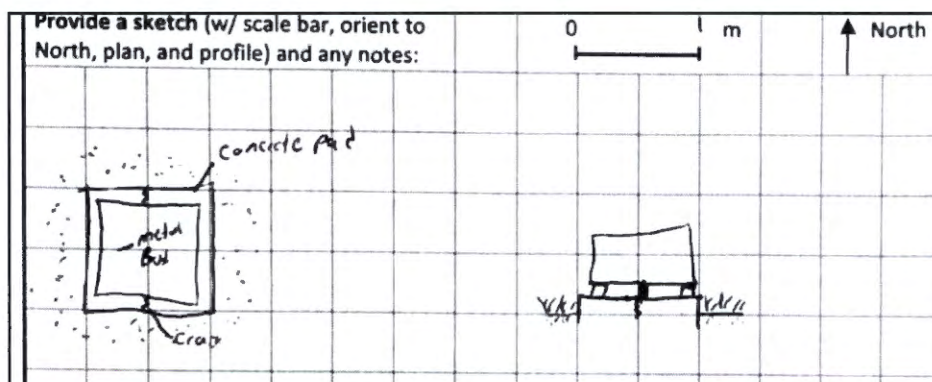


Figure 10. Field sketch of Feature FM306-03.

Features FM306-04 to FM306-07; Faults

These four features are all mapped faults. None of these faults was observed in the field due to the developed nature of the ROW. The point where the fault crosses the approximate centerline of the ROW was marked as the feature location for each fault. Locations of these features are shown on the Site Geologic Maps in Appendix B. Because no surface expressions of the mapped faults were observed, infilling materials could not be determined. Infiltration rates for all faults were assumed to be low, as the faults are covered by fill and road materials associated with the original construction the road. The bearing of each fault where it crosses the ROW was measured using ArcGIS and added to the GA table.

Discussion and Recommendations

Groundwater impacts area measured as both impacts to the quantity and quality of water entering the aquifer. Potential impacts to groundwater quantity in karst aquifers such as the Edwards Aquifer are typically influenced by the introduction of impervious cover that can limit direct infiltration. This can limit the amount of direct and diffuse recharge, particularly with large-scale urbanization. Increased runoff due to impervious cover can divert storm water sheet flow to discrete channels and eventually to surface streams, thus focusing surface water flow to creeks and rivers. Potential impacts to groundwater could occur due to construction activities and highway transportation (operation phase) activities.

Care should also be taken near the four mapped faults that cross the ROW within the proposed project area. Excavation activities may remove the clay-rich soil overlying either fault and/or penetrate bedrock near the fault, which may increase the potential for faults to rapidly transmit water to the subsurface. Soil-covered faults with no surface expression are mapped based U. S. Geological Survey and the University of Texas Bureau of Economic Geology (2007) and Blome et al. (2005); however, it is beyond the scope of this study to precisely locate the position of these faults.

If contaminants, such as sediments or hydrocarbons, are mobilized during construction, they could flow into the creeks crossed by the project and enter the aquifer via faults, fractures, or other unidentified recharge features outside the survey area, or contaminants could also flow directly into caves whose surface or subsurface drainage basin intersects the proposed project area. Temporary best management practices should be implemented throughout the project area during construction to minimize the potential for the mobilization of disturbed soils and untreated runoff from entering karst features or creeks.

The overall potential for rapid infiltration of runoff into the subsurface within the survey area is low, particularly in the center portion of the survey area, which is underlain by the less permeable Del Rio Clay, Buda Limestone and Austin Chalk. No sensitive features were found during surveys; therefore, no sensitive karst feature best management practices are recommended or are required to be implemented during construction. The Texas Department of Transportation should follow its procedures for identifying voids encountered during construction, including reporting and assessing

them according to TCEQ rules. All excavation that penetrates bedrock should be performed under the supervision of a qualified Professional Geoscientist.

Literature Cited

- Barrett, M.E. 2005. Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices: TCEQ, Field Operations Divisions, RG-348. 315pp.
- Blome, C.D., Faith, J.R., Pedraza, D.E., Ozuna, G.B., Cole, J.B., Clark, A.K., Small, T.A., and R.R. Morris. 2005. Geologic Map of the Edwards Aquifer Recharge Zone, South-central Texas. US Geological Survey Scientific Investigations Map 2873.
- Lindgren, R.J., Dutton, A.R., Hovorka, S.D., Worthington, S.R.H., and S. Painter. 2004. Conceptualization and Simulation of the Edwards Aquifer, San Antonio Region, Texas. US Geological Survey Scientific Investigations Report 2004-5277.
- Maclay, R. W., Small, T. A.. 1976. Progress report on geology of the Edwards aquifer, San Antonio area, Texas, and preliminary interpretation of borehole geophysical and laboratory data on carbonate rocks. United States Geological Survey Open-File Report 76-627, 65 p.
- Maclay, R. W., Small, T. A. 1984. Carbonate geology and hydrology of the Edwards aquifer in the San Antonio area, Texas. United States Geological Survey Open-File Report 83-537, 72 p.
- Rose, P.R. 1972. Edwards Group, surface and subsurface, central Texas: Austin, University of Texas, Bureau of Economic Geology, Report of Investigations 74, 198 p.
- Texas Commission on Environmental Quality (TCEQ). 2004. Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone. TCEQ RG-0508, 34 p., revised 1 October 2004.
- U. S. Department of Agriculture (USDA), Natural Resources Conservation Service, Soil Survey Staff. 2015. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 20 February 2015.
- U. S. Geological Survey and the University of Texas at Austin Bureau of Economic Geology. 2007. Geologic Database of Texas, 1:24,000 Dataset. Available at: <http://tnris.org/data-catalog/geology/geologic-database-of-texas/>. Accessed 20 February 2015.
- Veni, G., and J. Reddell. 2002. Protocols for Assessing Karst Features for Endangered Invertebrate Species. Report by George Veni and Associates, San Antonio, Texas. 7pp.

Appendix A – Soil Descriptions

CrD—Comfort-Rock outcrop complex, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: dq2m

Elevation: 300 to 8,700 feet

Mean annual precipitation: 10 to 36 inches

Mean annual air temperature: 52 to 73 degrees F

Frost-free period: 120 to 320 days

Farmland classification: Not prime farmland

Map Unit Composition

Comfort and similar soils: 70 percent

Rock outcrop: 15 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Comfort Setting

Landform: Ridges

Landform position (two-dimensional): Foothill Landform position (three-dimensional): Base slope Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: extremely stony clay H2 - 6 to 13 inches: extremely stony clay H3 - 13 to 20 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Percent of area covered with surface fragments: 30.0 percent Depth to restrictive feature: 9 to 20 inches to lithic bedrock Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 6s *Hydrologic Soil Group:* D

Ecological site: Low stony hill 29-35" pz (R081CY360TX)

Description of Rock Outcrop Setting

Landform: Ridges

Landform position (two-dimensional): Footslope *Landform position (three-dimensional):* Base

slope Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Limestone

Typical profile

H1 - 0 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: 0 to 2 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 8s *Hydrologic Soil Group:* D

Minor Components Unnamed

Percent of map unit: 15 percent

DeB—Denton silty clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t26l

Elevation: 570 to 1,870 feet

Mean annual precipitation: 31 to 36 inches

Mean annual air temperature: 65 to 68 degrees F

Frost-free period: 220 to 260 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Denton and similar soils: 88 percent

Minor components: 12 percent

Estimates are based on observations, descriptions, and transects of the map unit.

Description of Denton Setting

Landform: Hillslopes

Landform position (two-dimensional): Toeslope *Landform position (three-dimensional):* Base slope

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Silty and clayey slope alluvium over residuum weathered from limestone

Typical profile

A - 0 to 14 inches: silty clay *Bw - 14 to 25 inches:* silty clay *Bk - 25 to 33 inches:* silty clay

Ck - 33 to 36 inches: gravelly silty clay

R - 36 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: 22 to 60 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high
(0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 80 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: D

Ecological site: Clay loam 29-35" pz (R081CY357TX)

Minor Components Krum

Percent of map unit: 6 percent

Landform: Drainageways

Landform position (two-dimensional): Toeslope *Landform position (three-dimensional):* Tread

Down-slope shape: Linear

Across-slope shape: Concave

Ecological site: Clay loam 29-35" pz (R081CY357TX)

Doss

Percent of map unit: 4 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Convex

Across-slope shape: Linear

Ecological site: Shallow 23-31" pz (R081BY343TX)

Anhalt

Percent of map unit: 2 percent

Landform: Hillslopes

Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Deep redland 29-35" pz (R081CY358TX)

KrB—Krum clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t2j5

Elevation: 550 to 1,750 feet

Mean annual precipitation: 31 to 37 inches

Mean annual air temperature: 65 to 69 degrees F

Frost-free period: 230 to 250 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Krum and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Krum

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Calcareous silty and clayey alluvium derived from limestone

Typical profile

A - 0 to 16 inches: clay Bk1 - 16 to 58 inches: clay Bk2 - 58 to 66 inches: clay Ck - 66 to 80 inches: clay

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 50 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 3.0

Available water storage in profile: High (about 9.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification (nonirrigated):* 3e *Hydrologic Soil Group:* C

Ecological site: Clay loam 29-35" pz (R081CY357TX)

Minor Components Bolar

Percent of map unit: 5 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope *Landform position (three-dimensional):* Side slope *Down-slope shape:* Linear

Across-slope shape: Linear

Ecological site: Clay loam 29-35" pz (R081CY357TX)

Doss

Percent of map unit: 3 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope *Landform position (three-dimensional):* Base slope *Down-slope shape:* Convex

Across-slope shape: Linear

Ecological site: Shallow 29-35" pz (R081CY574TX)

Lewisville

Percent of map unit: 2 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Concave

Across-slope shape: Linear

Ecological site: Clay loam 29-35" pz (R081CY357TX)

MEC—Medlin-Eckrant association, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: f6fp

Elevation: 500 to 2,400 feet

Mean annual precipitation: 22 to 34 inches

Mean annual air temperature: 64 to 70 degrees F

Frost-free period: 210 to 265 days

Farmland classification: Not prime farmland

Map Unit Composition

Medlin and similar soils: 50 percent Eckrant and similar soils: 30 percent Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Medlin Setting

Landform: Ridges

Landform position (two-dimensional): Summit, backslope, footslope

Landform position (three-dimensional): Interfluvium

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 9 inches: clay H2 - 9 to 38 inches: clay H3 - 38 to 80 inches: clay

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 35 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 4.0

Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 3e *Hydrologic Soil Group:* D

Ecological site: Blackland 29-35" pz (R081CY356TX)

Description of Eckrant Setting

Landform: Ridges

Landform position (two-dimensional): Shoulder *Landform position (three-dimensional):* Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: extremely stony clay *H2 - 6 to 17 inches:* extremely stony clay *H3 - 17 to 20 inches:* bedrock

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 8 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 7s *Hydrologic Soil Group:* D

Ecological site: Low stony hill 29-35" pz (R081CY360TX)

Minor Components Unnamed

Percent of map unit: 20 percent

PuC—Purves clay, 1 to 5 percent slopes

Map Unit Setting

National map unit symbol: f6fx

Elevation: 400 to 1,800 feet

Mean annual precipitation: 27 to 37 inches

Mean annual air temperature: 64 to 68 degrees F

Frost-free period: 210 to 240 days

Farmland classification: Not prime farmland

Map Unit Composition

Purves and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Purves Setting

Landform: Plains

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 19 inches: clay

H2 - 19 to 22 inches: bedrock

Properties and qualities

Slope: 1 to 5 percent

Depth to restrictive feature: 8 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high
(0.06 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 40 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 4e *Hydrologic Soil Group:* D

Ecological site: Shallow 29-35" pz (R081CY574TX)

Minor Components

Unnamed

Percent of map unit: 15 percent

RUD—Rumple-Comfort association, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: f6fy

Elevation: 1,000 to 2,300 feet

Mean annual precipitation: 23 to 36 inches

Mean annual air temperature: 63 to 70 degrees F

Frost-free period: 210 to 265 days

Farmland classification: Not prime farmland

Map Unit Composition

Rumple and similar soils: 60 percent *Comfort and similar soils:* 20 percent *Minor components:* 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumple Setting

Landform: Plains

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 10 inches: very gravelly clay loam

H2 - 10 to 28 inches: very gravelly clay

H3 - 28 to 36 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 6s *Hydrologic Soil Group:* C

Ecological site: Gravelly redland 29-35" pz (R081CY359TX)

Description of Comfort Setting

Landform: Ridges

Landform position (two-dimensional): Footslope *Landform position (three-dimensional):* Base

slope Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 7 inches: extremely stony clay *H2 - 7 to 12 inches:* extremely stony clay *H3 - 12 to 20 inches:* bedrock

Properties and qualities

Slope: 1 to 8 percent

Percent of area covered with surface fragments: 30.0 percent *Depth to restrictive feature:* 9 to 20 inches to lithic bedrock *Natural drainage class:* Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification (nonirrigated):* 6s *Hydrologic Soil Group:* D
Ecological site: Low stony hill 29-35" pz (R081CY360TX)

Minor Components Unnamed

Percent of map unit: 20 percent

TaB—Tarpley clay, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2t2m9

Elevation: 570 to 2,300 feet

Mean annual precipitation: 30 to 37 inches

Mean annual air temperature: 64 to 68 degrees F

Frost-free period: 220 to 260 days

Farmland classification: Not prime farmland

Map Unit Composition

Tarpley and similar soils: 90 percent

Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tarpley Setting

Landform: Hillslopes

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Clayey residuum weathered from limestone

Typical profile

A - 0 to 6 inches: clay

Bt - 6 to 17 inches: clay

R - 17 to 60 inches: bedrock

Properties and qualities

Slope: 1 to 3 percent

Depth to restrictive feature: 13 to 20 inches to lithic bedrock

Natural drainage class: Well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 2 percent

Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum in profile: 1.0

Available water storage in profile: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification

(nonirrigated): 4s Hydrologic Soil Group: D

Ecological site: Redland 29-35" pz (R081CY361TX)

Minor Components Anhalt

Percent of map unit: 4 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Deep redland 29-35" pz (R081CY358TX)

Rumple

Percent of map unit: 2 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Gravelly redland 29-35" pz (R081CY359TX)

Doss

Percent of map unit: 2 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope Landform position (three-dimensional): Side slope Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Shallow 29-35" pz (R081CY574TX)

Rock outcrop

Percent of map unit: 2 percent

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope, interfluve

Down-slope shape: Linear

Across-slope shape: Linear

This report was written on behalf of the Texas Department of Transportation by



106 E. 6th Street, Austin,
Texas, 78701
www.Cardno.com

Geologic Assessment

SUPPLEMENT TO PROPOSED IMPROVEMENTS TO FM 306 IN COMAL, COUNTY, TEXAS CSJ: 1728-02-058

Prepared by: Cardno, Inc.

Date: August 5, 2015

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

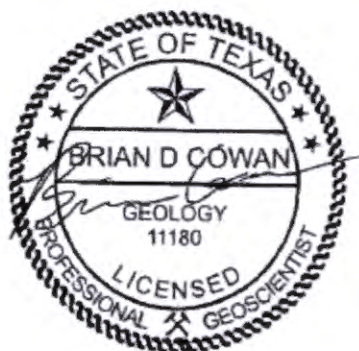
GEOLOGIC ASSESSMENT FOR
SUPPLEMENT TO PROPOSED IMPROVEMENTS TO FM 306 IN
COMAL, COUNTY, TEXAS
CSJ: 1728-02-058

Prepared for
Texas Department of Transportation
125 E. 11th Street
Austin, TX 78701

5 August 2015

In accordance with the Texas Board of Professional Geologists rules at 22 Texas Administrative Code, Part 39, Chapter 851, Subchapter C, §851.156, this report is signed and sealed on the title page to assure the user that the work has been performed by or directly supervised by the following professional geologist who takes full responsibility for this work.

The computer generated seal appearing on this document was authorized by Brian D. Cowan, P.G. 11180, on 5 August 2015.



Brian Cowan

5 August 2015

Brian D. Cowan, Texas Professional Geoscientist No. 11180
Zara Environmental LLC Geoscience Firm Registration No. 5036

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

REGULATED ENTITY NAME: SUPPLIMENT TO PROPOSED IMPROVEMENTS TO FM 306 IN COMAL, COUNTY, TEXAS, CSJ 1728-02-058

TYPE OF PROJECT: ☒ WPAP ☐ AST ☐ SCS ☐ UST

LOCATION OF PROJECT: ☒ Recharge Zone ☐ Transition Zone ☐ Contributing Zone
within the Transition Zone

PROJECT INFORMATION

1. N/A Geologic or manmade features are described and evaluated using the attached **GEOLOGIC ASSESSMENT TABLE**.
2. 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.

Soil Units, Infiltration Characteristics & Thickness		
Soil Name	Group*	Thickness (feet)
Comfort-Rock outcrop complex (CrD)	B	1.66
Rumple-Comfort association (RUD)	B	3.33

* 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.

3. X A **STRATIGRAPHIC COLUMN** is attached at the end of this form that shows formations, members, and thicknesses. The outcropping unit should be at the top of the stratigraphic column.

4. X A **NARRATIVE DESCRIPTION OF SITE SPECIFIC GEOLOGY** is attached at the end of this form. The description must include a discussion of the potential for fluid movement to the Edwards Aquifer, stratigraphy, structure, and karst characteristics of the site.

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

5. X Appropriate **SITE GEOLOGIC MAP(S)** are attached:

The Site Geologic Map must be the same scale as the applicant's Site Plan. The minimum scale is 1" : 400'

Applicant's Site Plan Scale 1" = 400 '
Site Geologic Map Scale 1" = 400 '
Site Soils Map Scale (if more than 1 soil type) 1" = 400 '

6. Method of collecting positional data:
N/A Global Positioning System (GPS) technology.
N/A Other method(s).

7. X The project site is shown and labeled on the Site Geologic Map.

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

9. 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.

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

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

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

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

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

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

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

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

ADMINISTRATIVE INFORMATION

12. X 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.

Date(s) Geologic Assessment was performed: 23 July 2015
Date(s)

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.

Brian Cowan (512) 291-4555 (866) 908-9137
Print Name of Geologist Telephone Fax

Brian Cowan 5 August 2015
Signature of Geologist Date

Representing: Zara Environmental LLC
(Name of Company)



If you have questions on how to fill out this form or about the Edwards Aquifer protection program, please contact us at 210/490-3096 for projects located in the San Antonio Region or 512/339-2929 for projects located in the Austin Region.

Individuals are entitled to request and review their personal information that the agency gathers on its forms. They may also have any errors in their information corrected. To review such information, contact us at 512/239-3282.
TCEQ-0585 (Rev. 10-01-10)

Date 5 August 2015
Sheet 1 of 1
TCEQ-0585-Table (Rev. 10-01-04)

Introduction

An additional geologic assessment (GA) was conducted within the right-of-way (ROW) of Farm to Market (FM) Road 306 in support of additional proposed improvements to the original FM 306 project. The additional project area extends from Hoffmann Lane to 0.24 miles north of Hoffman Lane (approximately 1,300 ft north of the original project area) and from 0.50 miles north of Hunter Road to 0.41 miles north of Hunter Road (approximately 450 ft south of the original project area) in Comal County, Texas (Figure 1). The proposed improvements will consist of expanding the roadway from two 12 ft. lanes to four 12 ft. lanes with a continuous left turn lane, bike lanes, and sidewalks. This project area is inside the Edwards Aquifer Recharge Zone (Figure 1). A detailed walking survey of the entire area was conducted on 23 July 2015, no features were identified.

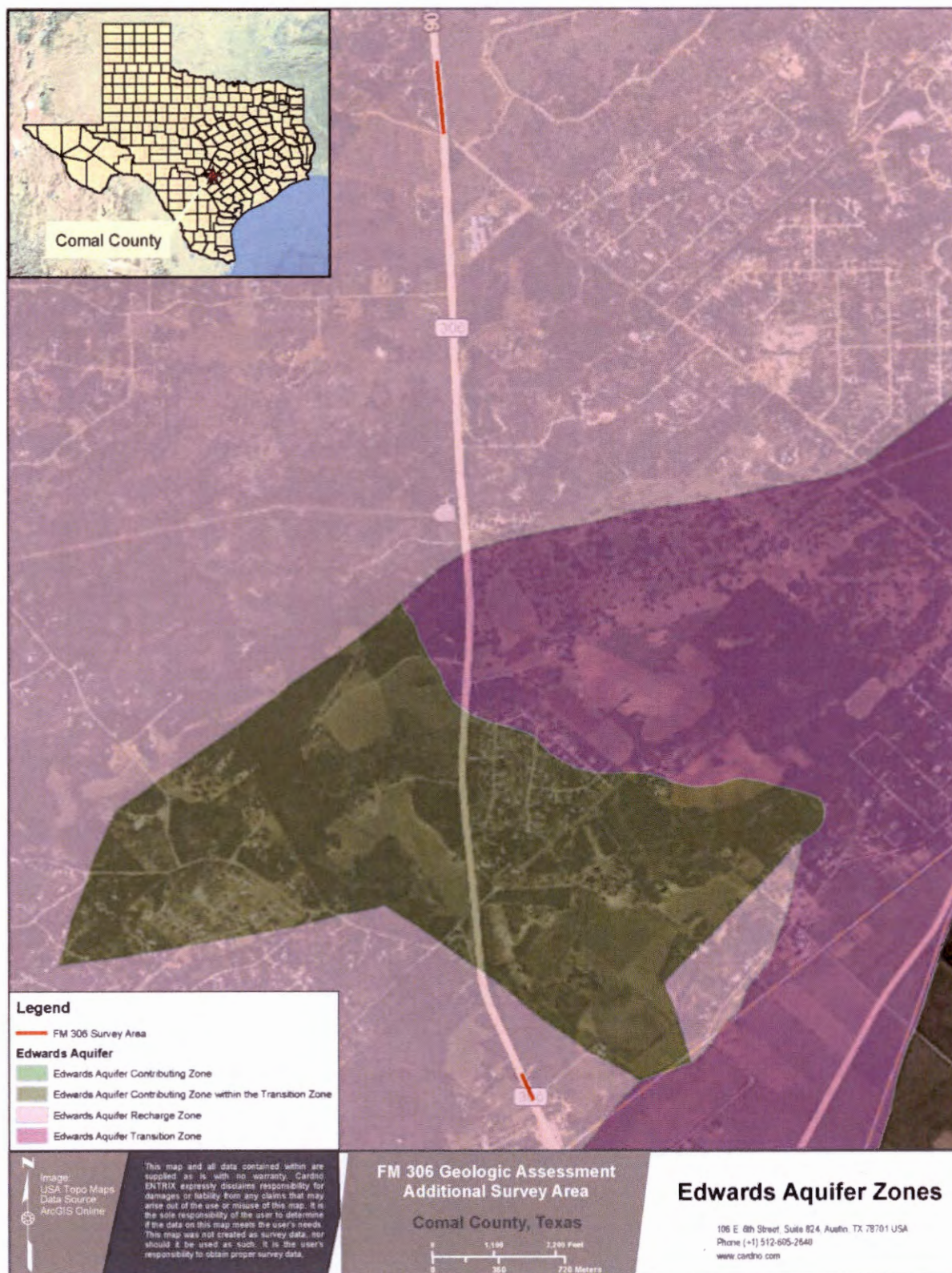


Figure 1. Location map displaying survey area in Comal County, Texas and Edwards Aquifer Zones.

Methods

Background Data Collection

Background geology was reviewed from U. S. Geological Survey and the University of Texas Bureau of Economic Geology (2007) and Blome et al. (2005).

Field Survey

Karst survey methods followed protocols outlined in TCEQ Instructions to Geologists for Geologic Assessments (TCEQ 2004). Walking ground surveys, as defined by Veni and Reddell (2002), Barrett (2005), and TCEQ (2004) were conducted throughout the project survey area and reconnaissance excavations were conducted at all potential karst features. If karst features are identified during field surveys, they are documented using Global Positioning System (GPS) technology and checked with field maps based on digital orthoimagery. Faults may not be identifiable in the field due to grading or other disturbances, therefore some faults may be identified using GIS data based on previous geologic mapping. All potential features were inspected by a licensed professional geologist and evaluated for potential impact to Edwards Aquifer recharge. This is completed by ranking the recharge sensitivity of each feature using the point scheme defined by TCEQ (2004). Field work for the karst survey was supervised by Texas Licensed Professional Geoscientist Brian Cowan (#11180).

Results

Soils

Soil descriptions were compiled from the Web Soil Survey of the U.S. Department of Agriculture (USDA) (USDA 2015), and site observations. Two different soil types are identified in the project area by the USDA dataset (Figure 2). A brief description of each soil type is below and a detailed description of all soil types is presented in Appendix A.

Comfort-Rock outcrop complex (CrD) - This is a slope/footslope forming soil that is characterized by cobbles, stones and boulders, and is capable of transmitting up to 0.20in/hr. of precipitation by its limiting layer to subsurface.

Ruple-Comfort association (RUD) - This is a plain forming soil that is characterized by gravelly clay and gravelly clay loam, and is capable of transmitting up to 0.57in/hr. of precipitation by its limiting layer to subsurface.



Figure 2. Map displaying mapped soils in the project area (USDA 2015).

Regional Geology

The survey area is located in the southeastern portion of the Edwards Plateau Physiographic Province of central Texas, along the Balcones Fault Zone. The Balcones Fault Zone also forms the Balcones Escarpment, which is a highly eroded region bordering the Edwards Plateau on its southern and western boundaries. The region is typified by higher elevations to the north and west, generally sloping in a southeastern direction. Canyons and drainage basins were formed by surface flow of the Guadalupe River and its tributaries.

The geologic formations occurring within the region are comprised mostly of Cretaceous age-rocks with some overlaying Quaternary alluvium, especially along surface drainages. The soils that have formed on top of these formations are typically relatively thin and offer very minimal filtering capability. The bedrock developed from the accumulation of thick sequences of marine sediments deposited in a lagoon environment on the San Marcos Platform protected by a barrier reef during the Cretaceous about 100 million years ago (Rose 1972). In central Texas, the Cretaceous strata slightly dip to the southeast at about 10 to 15 feet per mile toward the Gulf of Mexico.

Regional Stratigraphy

The geological formations that comprise the Edwards Aquifer are from top to bottom the Georgetown, Person and Kainer. A stratigraphic column showing the regional geology is shown in Figure 3. The Georgetown Limestone can be up to about 20 feet thick near the project area and unconformably overlies the Person Formation. The Georgetown can be identified by the presence of the index fossil brachiopod *Waconella wacoensis*. The Georgetown is a shaley, relatively impervious yellow limestone that is not known to yield water and sometimes can be considered part of the upper confining unit to the Edwards Aquifer.

The Person and Kainer Formations comprise the Edwards Group (Rose 1972). The Person Formation is about 185 feet thick in the project area. The composition of the Person Formation ranges from crystalline limestone to grainstone to mudstone and is comprised of three informal hydrogeologic units: the Cyclic and Marine members, undivided; the Leached and Collapsed members, undivided; and the Regional Dense member.

Stratigraphic Units					Hydrogeologic Units		
Upper Cretaceous	Anacacho Limestone		Navarro & Taylor		Upper Confining Units		
	Austin Chalk						
	Eagle Ford Group						
	Buda Limestone						
	Del Rio Clay						
Lower Cretaceous	Georgetown Formation				Edwards Aquifer		
	Edwards Group	Person Formation	Cyclic and Marine member	3-30 m			Surface outcrop in survey area
			Leached and collapsed member	21-30 m			
			Regional Dense member	5-7 m			
		Kainer Formation	Grainstone member	15-18 m			
			Kirshberg Evaporite member	15-18 m			
			Dolomitic member	34-43 m			
			Basal Nodular member	6-21 m			
	Trinity Group	Glen Rose Formation	Cavernous member	> 35 m	Upper Trinity Aquifer		
			Camp Bullis member	37-46 m			
			Upper evaporite member	5-7 m			
			Fossiliferous member	40-53 m			
			Lower evaporite member	18-47 m			
		Lower member	120 m	Middle Trinity Aquifer			
		Hensell Formation			20 m		
	Cow Creek Formation		20 m				
	Hamett Formation		9 m				

Figure 3. This stratigraphic column shows the regional geologic units and indicates the zones of rocks that outcrop in the project area. Adapted from Lindgren et al. (2004).

The Cyclic and Marine members are composed of mudstone to fossiliferous packstone and are approximately 85 feet thick but can be somewhat variable in thickness because of the erosional unconformity between the Person and Georgetown Formations. The cyclic member is an alternating tidal flat deposit with small collapsed breccias, and the marine member is a cross-bedded biosparite to biomicrite with chert nodules.

The Leached and Collapsed members are a sequence of interbedded mudstone and grainstone intervals that form one of the more porous and permeable subdivisions of the Edwards Aquifer. The leached member is a dense, bioturbated micrite and the collapsed member is composed of several one- to five-foot thick zones of collapsed stromatolitic limestone (Rose 1972). Average thickness of the Collapsed and Leached members is approximately 80 feet near the project area and is characterized by two highly churned, iron stained beds separated by a more massive light colored limestone. Horizontal caverns with relatively large rooms develop in this unit.

The bottom unit of the Person Formation is the Regional Dense member (RDM), which throughout the region has a relatively consistent thickness of 20 feet. The RDM is composed of a dense argillaceous mudstone and is easily identified in the outcrop and on a variety of geophysical logs. Most of the fractures that penetrate the RDM do not appear to be solution enlarged. Caves that breach the RDM are not enlarged but are usually vertical shafts with horizontal caverns developed above or below the RDM.

The RDM can function as a confining unit between the upper and lower portions of the Edwards Aquifer between the Kainer and the Person Formation. However, caves, faults, and fractures may greatly reduce the vertical confining ability of the RDM. The RDM is probably not an effective barrier to lateral flow at faults because of the relatively thin 20-foot section. The flow of water tends to circumvent the RDM because of the impermeable nature of this unit.

The Kainer Formation has an approximate total thickness of 285 feet. The lithology of the Kainer Formation ranges from mudstone to *miliolid* grainstone to crystalline limestone. The Kainer is subdivided into four informal members that include the grainstone, Kirschberg Evaporate, Dolomitic and Basal Nodular members.

The Grainstone member is the uppermost unit of the Kainer Formation and is approximately 55-feet thick. Unit V is composed of thick sequences of dense, tightly-cemented, miliolid grainstone. Primary matrix porosity, as measured on geophysical logs, is some of the lowest in the Edwards Aquifer. Secondary fracture porosity accounts for the bulk of effective porosity in this aquifer unit.

The Kirschberg evaporite member underlies the Grainstone member and is about 60 feet in thickness. This hydrogeologic unit consists of crystalline limestone interbedded with mudstone containing chert lenses. Collapse features are common. The porosity has been described as boxwork (Maclay and Small 1976) because of the configuration of the voids and the secondary

neospir and travertine deposits. The boxwork porosity does not seem to be prevalent throughout the entire thickness or extent of subdivision VI, but occurs sporadically within more massive limestone. Dissolution of evaporite minerals, such as gypsum and anhydrite, and the existence of contorted beds in the Kirschberg evaporite results in extensive secondary porosity, which creates one of the most permeable subdivisions in the Edwards Aquifer.

The Dolomitic member is a dense, crystalline limestone with interbedded grainstone and burrowed mudstone with some chert beds. The Dolomitic member has a total thickness of about 110 feet and is characterized by massive thick beds. Effective porosity and probable pathways of water in this unit are restricted to solution enlarged bedding planes, joints, fractures and faults.

The basal nodular member is the lowermost unit of the Edwards Group and is about 50 to 60 feet of tan, marly, nodular limestone. In the subsurface, the basal nodular member has negligible porosity and permeability (Maclay and Small 1984), and can function as part of the lower confining unit. However, in outcrop the basal nodular member often displays extensive karstification, which has generated secondary porosity in the form of large lateral caves.

The Del Rio Formation is a blue "sticky" clay in the subsurface, which weathers in outcrop to greenish-yellow brown clay with pyrite and gypsum. The Del Rio Clay ranges from about 40 to 50 feet thick and often has large accumulations of "rams-horn" index fossil (*Ilymatogyra arietina*). The Del Rio is not recognized as a major aquifer.

Regional Groundwater

This area is in a semi-arid environment with average annual rainfall of about 30 to 35 inches per year. Evaporation of 75 to 90 inches per year removes much of this water prior to recharging the aquifers. Many of the rainfall events occur as thermal convection thunderstorms that can produce excessive amounts of precipitation in short periods of time. Some of this water makes its way into the aquifers usually through concentrated areas along creeks and rivers in outcrop areas of the recharge zone.

The Edwards Aquifer is one of the most permeable and productive limestone aquifers in the United States. In the San Antonio region, the aquifer supplies drinking water to more than 1.7 million people and provides habitat for several endangered aquatic species. Karst aquifers are, by their nature, extremely vulnerable to contamination. Soils in karst areas tend to be thin and patchy. Thus, the filtration of diffuse recharge afforded by soils is at best low, and is only decreased by human activity. Recharge in karst systems commonly occurs as point recharge into specific karst features, bypassing what little filtration a limited soil zone might afford.

Site Geology

Site geology is consistent with that mapped by Blome et al. (2005) and U. S. Geological Survey and the University of Texas Bureau of Economic Geology (2007) and is shown in Figure 4. All of the

survey area is within the Edwards Aquifer Recharge Zone. The southern portion of the survey area is within the Del Rio Clay, which is less likely to rapidly transmit water rapidly into the subsurface due to the lower porosity of this clay-rich unit. The northern portion of the survey area is within the Leached and Collapsed Member, which is more likely to contain sensitive features that can rapidly transmit water into the subsurface; however, no karst features were found within this portion of the survey area. Portions of the survey area are overlain by thick Quaternary alluvium, making it is unlikely that water could rapidly infiltrate into the subsurface within the alluvial areas. It should be noted that runoff from alluvial areas could enter streams and potentially recharge the aquifer at locations outside the survey area.

Discussion and Recommendations

No karst features were found during surveys; therefore, no best management practices are recommended or are required to be implemented during construction. Faults are mapped near the survey area but no evidence of faulting was visible within the survey area. The Texas Department of Transportation should follow its procedures for identifying voids encountered during construction, including reporting and assessing them according to TCEQ rules.

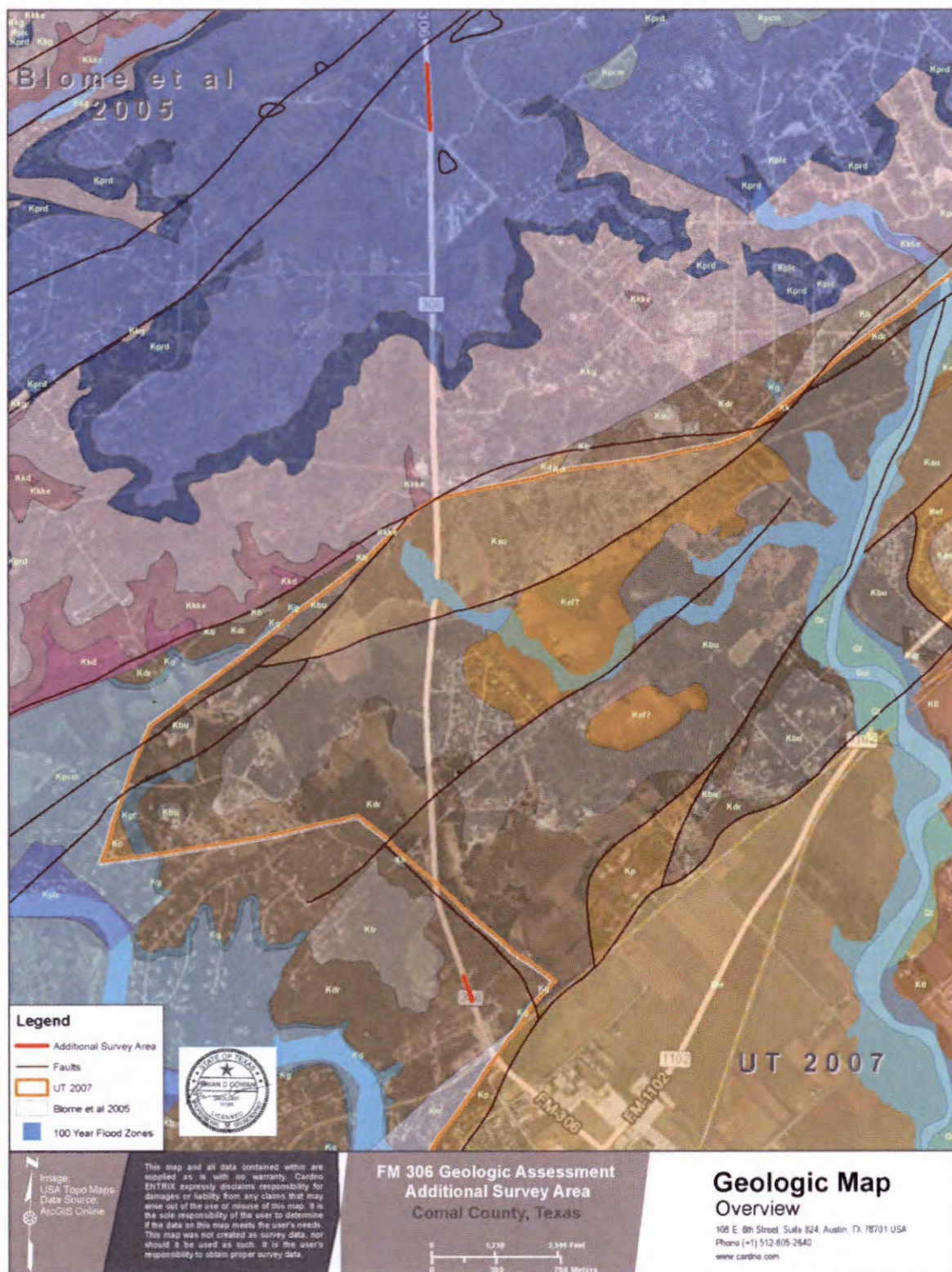


Figure 4. Geology of study area including location of identified features.

Literature Cited

- Barrett, M.E. 2005. Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices: TCEQ, Field Operations Divisions, RG-348. 315pp.
- Blome, C.D., Faith, J.R., Pedraza, D.E., Ozuna, G.B., Cole, J.B., Clark, A.K., Small, T.A., and R.R. Morris. 2005. Geologic Map of the Edwards Aquifer Recharge Zone, South-central Texas. US Geological Survey Scientific Investigations Map 2873.
- Lindgren, R.J., Dutton, A.R., Hovorka, S.D., Worthington, S.R.H., and S. Painter. 2004. Conceptualization and Simulation of the Edwards Aquifer, San Antonio Region, Texas. US Geological Survey Scientific Investigations Report 2004-5277.
- Maclay, R. W., Small, T. A.. 1976. Progress report on geology of the Edwards aquifer, San Antonio area, Texas, and preliminary interpretation of borehole geophysical and laboratory data on carbonate rocks. United States Geological Survey Open-File Report 76-627, 65 p.
- Maclay, R. W., Small, T. A. 1984. Carbonate geology and hydrology of the Edwards aquifer in the San Antonio area, Texas. United States Geological Survey Open-File Report 83-537, 72 p.
- Rose, P.R. 1972. Edwards Group, surface and subsurface, central Texas: Austin, University of Texas, Bureau of Economic Geology, Report of Investigations 74, 198 p.
- Texas Commission on Environmental Quality (TCEQ). 2004. Instructions to Geologists for Geologic Assessments on the Edwards Aquifer Recharge/Transition Zone. TCEQ RG-0508, 34 p., revised 1 October 2004.
- U. S. Department of Agriculture (USDA), Natural Resources Conservation Service, Soil Survey Staff. 2015. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed 20 February 2015.
- U. S. Geological Survey and the University of Texas at Austin Bureau of Economic Geology. 2007. Geologic Database of Texas, 1:24,000 Dataset. Available at: <http://tnris.org/data-catalog/geology/geologic-database-of-texas/>. Accessed 20 February 2015.
- Veni, G., and J. Reddell. 2002. Protocols for Assessing Karst Features for Endangered Invertebrate Species. Report by George Veni and Associates, San Antonio, Texas. 7pp.

Appendix A – Soil Descriptions

CrD—Comfort-Rock outcrop complex, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: dq2m

Elevation: 300 to 8,700 feet

Mean annual precipitation: 10 to 36 inches

Mean annual air temperature: 52 to 73 degrees F

Frost-free period: 120 to 320 days

Farmland classification: Not prime farmland

Map Unit Composition

Comfort and similar soils: 70 percent

Rock outcrop: 15 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Comfort Setting

Landform: Ridges

Landform position (two-dimensional): Foothlope Landform position (three-dimensional): Base slope Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 6 inches: extremely stony clay H2 - 6 to 13 inches: extremely stony clay H3 - 13 to 20 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Percent of area covered with surface fragments: 30.0 percent Depth to restrictive feature: 9 to 20 inches to lithic bedrock Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 6s Hydrologic Soil Group: D

Ecological site: Low stony hill 29-35" pz (R081CY360TX)

Description of Rock Outcrop Setting

Landform: Ridges

Landform position (two-dimensional): Footslope *Landform position (three-dimensional):* Base

slope Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Limestone

Typical profile

H1 - 0 to 80 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: 0 to 2 inches to lithic bedrock

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to very high (0.06 to 19.98 in/hr)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification*

(nonirrigated): 8s Hydrologic Soil Group: D

Minor Components Unnamed

Percent of map unit: 15 percent

RUD—Rumple-Comfort association, 1 to 8 percent slopes

Map Unit Setting

National map unit symbol: f6fy

Elevation: 1,000 to 2,300 feet

Mean annual precipitation: 23 to 36 inches

Mean annual air temperature: 63 to 70 degrees F

Frost-free period: 210 to 265 days

Farmland classification: Not prime farmland

Map Unit Composition

Rumple and similar soils: 60 percent *Comfort and similar soils:* 20 percent *Minor components:* 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rumples Setting

Landform: Plains

Down-slope shape: Convex

Across-slope shape: Linear

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 10 inches: very gravelly clay loam

H2 - 10 to 28 inches: very gravelly clay

H3 - 28 to 36 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Depth to restrictive feature: 20 to 40 inches to lithic bedrock

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 5 percent

Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified Land capability classification

(nonirrigated): 6s Hydrologic Soil Group: C

Ecological site: Gravelly redland 29-35" pz (R081CY359TX)

Description of Comfort Setting

Landform: Ridges

Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope

Down-slope shape: Convex

Across-slope shape: Convex

Parent material: Residuum weathered from limestone

Typical profile

H1 - 0 to 7 inches: extremely stony clay H2 - 7 to 12 inches: extremely stony clay H3 - 12 to 20 inches: bedrock

Properties and qualities

Slope: 1 to 8 percent

Percent of area covered with surface fragments: 30.0 percent *Depth to restrictive feature:* 9 to 20 inches to lithic bedrock *Natural drainage class:* Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum in profile: 20 percent

Available water storage in profile: Very low (about 1.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified *Land capability classification (nonirrigated):* 6s *Hydrologic Soil Group:* D

Ecological site: Low stony hill 29-35" pz (R081CY360TX)

Minor Components Unnamed

Percent of map unit: 20 percent

Appendix B: Geologic Maps

Blome et al
2005

Legend

- Additional Survey Area
- Faults
- UT 2007
- Blome et al 2005

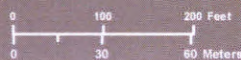


UT 2007

Image:
USA Topo Maps
Data Source:
ArcGIS Online

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FM 306 Geologic Assessment Additional Survey Area Comal County, Texas



Geologic Map Overview

106 E. 8th Street, Suite 824, Austin, TX 78701 USA
Phone (+1) 512-605-2640
www.cardno.com

Blome et al
2005

Legend

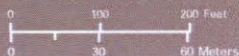
- Additional Survey Area
- Faults
- UT 2007
- Blome et al 2005



Image:
USA Topo Maps
Data Source:
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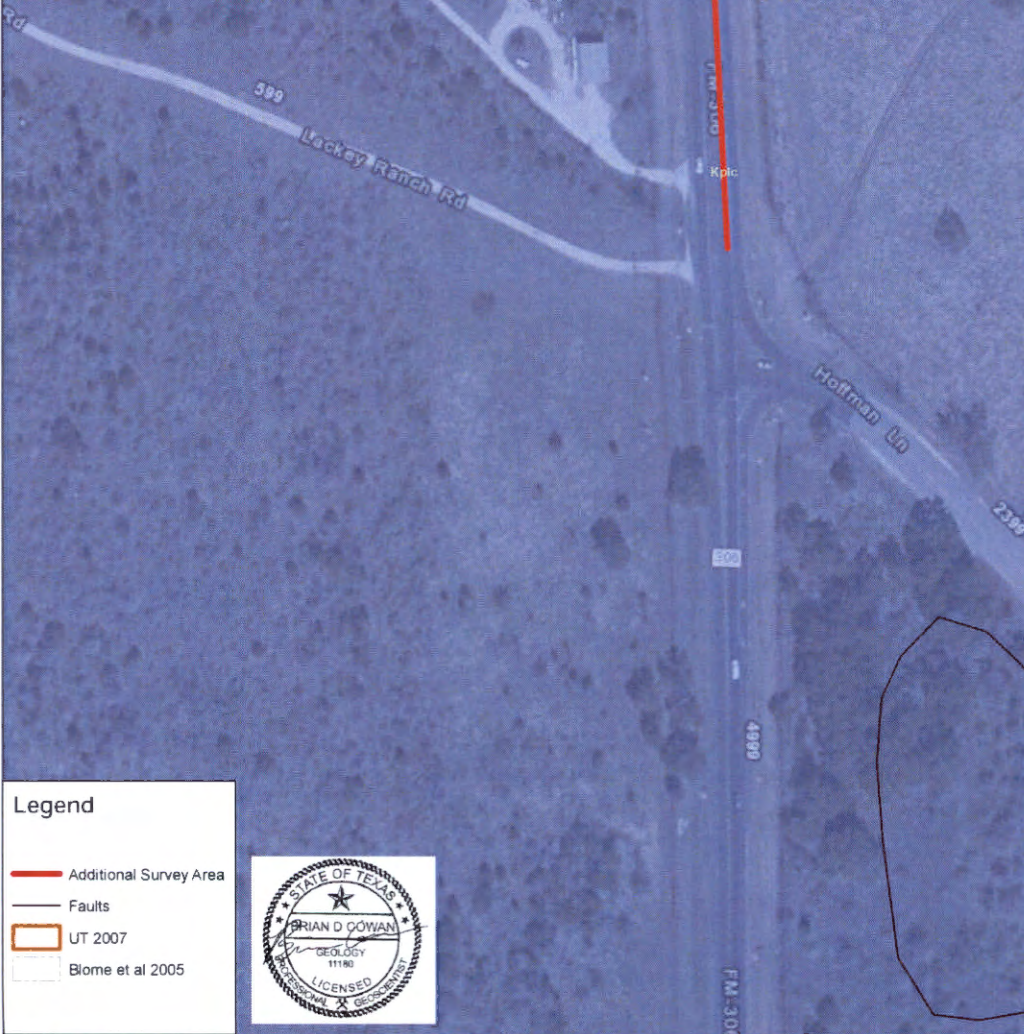
FM 306 Geologic Assessment Additional Survey Area Comal County, Texas



Geologic Map Overview

106 E. 6th Street, Suite 824, Austin, TX 78701 USA
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Blome et al
2005



Legend

- Additional Survey Area
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- UT 2007
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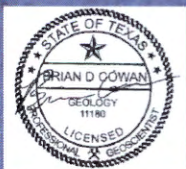


Image:
USA Topo Maps
Data Source:
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FM 306 Geologic Assessment Additional Survey Area Comal County, Texas



Geologic Map Overview

106 E. 6th Street, Suite 824, Austin, TX 78701 USA
Phone (+1) 512-605-2640
www.cardno.com

This report was written on behalf of the Texas Department of Transportation by



1307 East 4th Street
Austin, Texas, 78702
www.Cardno.com

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: Theresa Canales, Texas Dept. of Transportation

Date: 8-27-15

Signature of Customer/Agent:

Theresa Canales

Regulated Entity Name: FM 306

Regulated Entity Information

1. The type of project is:

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

2. Total site acreage (size of property): 82.62 ac

3. Estimated projected population: n/a

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

Table 1 - Impervious Cover Table

Impervious Cover of Proposed Project	Sq. Ft.	Sq. Ft./Acre	Acres
Structures/Rooftops		$\div 43,560 =$	
Parking		$\div 43,560 =$	
Other paved surfaces	1,733,739	$\div 43,560 =$	39.80
Total Impervious Cover	1,733,739	$\div 43,560 =$	39.80

Total Impervious Cover $39.80 \div$ Total Acreage $82.62 \times 100 = 48\%$ 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.): 8,680 feet.
 Width of R.O.W.: Varies feet.
 $L \times W = 3,599,109 \text{ Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} = 82.62 \text{ acres}.$
10. Length of pavement area: 8,680 feet.
 Width of pavement area: Varies feet.
 $L \times W = 1,733,739 \text{ Ft}^2 \div 43,560 \text{ Ft}^2/\text{Acre} = 39.80 \text{ acres}.$
 Pavement area $39.80 \text{ acres} \div$ R.O.W. area $82.62 \text{ acres} \times 100 = 48.17\%$ impervious cover.
11. ☐ A rest stop will be included in this project.
☒ A rest stop will not be included in this project.

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

Stormwater to be generated by the Proposed Project

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

Wastewater to be generated by the Proposed Project

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

<u>0</u> % Domestic	<u>0.00</u> Gallons/day
<u>0</u> % Industrial	<u>0.00</u> Gallons/day
<u>0</u> % Commingled	<u>0.00</u> Gallons/day
TOTAL gallons/day <u>0.00</u>	

15. Wastewater will be disposed of by:

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

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

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

☐ Sewage Collection System (Sewer Lines):

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

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

☐ The SCS was previously submitted on _____.

☐ The SCS was submitted with this application.

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

- ☐ The sewage collection system will convey the wastewater to the _____ (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) source(s): _____

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

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

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

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

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

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

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

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

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

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

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

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

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

Administrative Information

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

WATER POLLUTION ABATEMENT PLAN APPLICATION (TCEQ-0584)

ATTACHMENT A – Factors Affecting Surface Water Quality

The project would excavate rock and soils in the State right-of-way, and make them vulnerable to erosion. Material used to widen the road and construction equipment are potential sources of storm water pollutants. Construction materials include roadway base material, new topsoil, and asphalt products which are sprayed onto the widened pavement surface. Construction equipment would run on diesel or gasoline fuels and contain lubricating oils, engine coolants, and hydraulic oils. Incidental releases or accidents could cause construction material and equipment releases into soils, which could then be carried to receiving streams. Newly seeded or sodded soils may be fertilized. A storm water pollution prevention plan implemented per the TCEQ's Construction General Permit TXR150000 would minimize the incorporation of construction related pollutants into storm water runoff during the construction phase. After construction is complete, the additional impervious cover would generate an increase in total suspended solids (TSS) as calculated by TCEQ's technical guidance. However, the additional TSS would be treated with vegetated filter strips and a Contech Jellyfish Filter stormwater treatment system to exceed TCEQ requirements.

ATTACHMENT B – Volume and Character of Stormwater

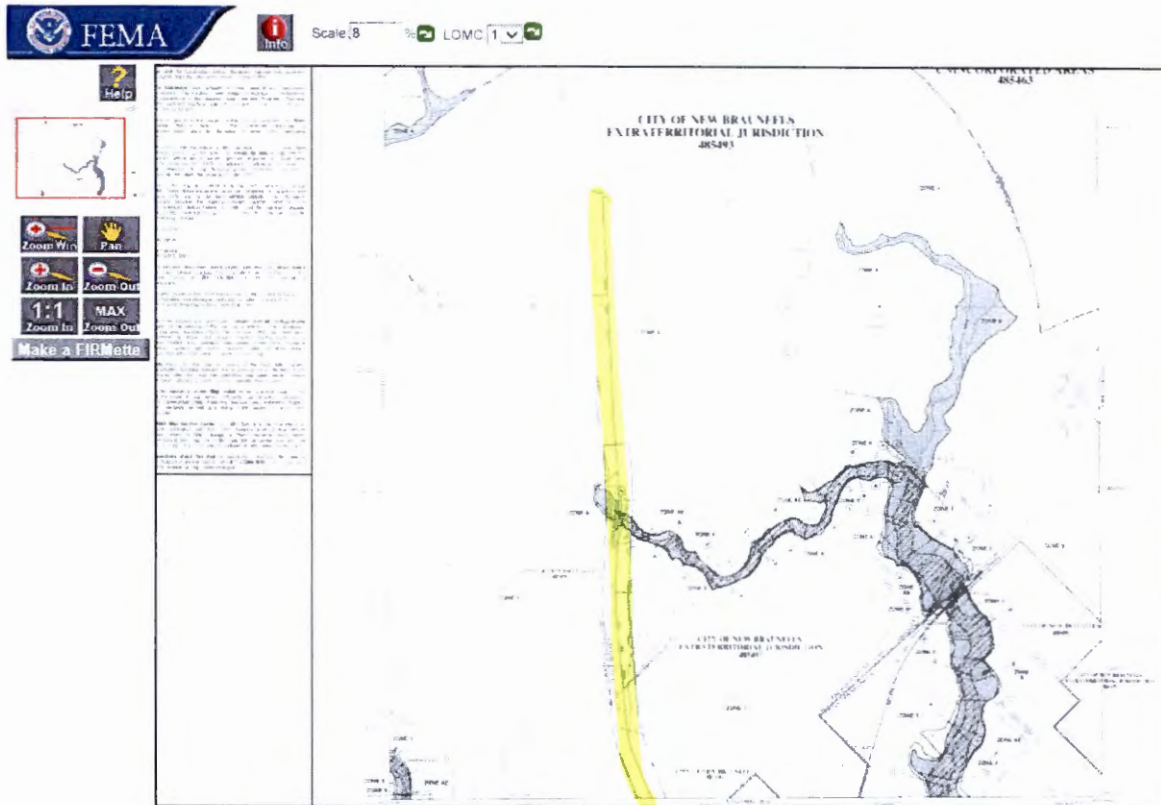
The runoff coefficient describes the ratio of runoff to rainfall. The pre-construction runoff coefficient is 0.26 and the post-construction coefficient would be 0.35. Storm water discharging from the project limits is a combination of runoff from the paved and unpaved portions of the State ROW. Stormwater runoff quality is influenced by numerous factors including natural soil chemistry, on-site land use (roadway) and area land use. The project would not cause any significant long term change in the character of the runoff. The project includes vegetated filter strips and Jellyfish storm water filters, which would slow the rate of runoff.

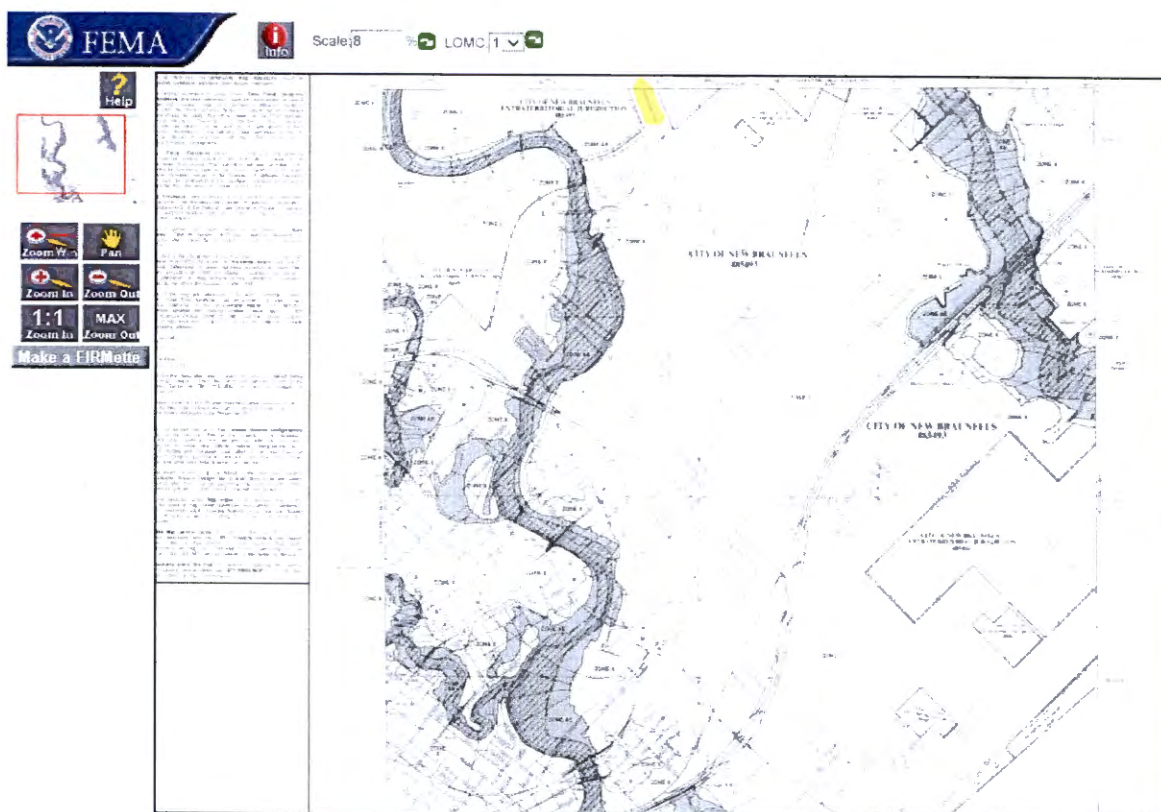
ATTACHMENT C – Suitability Letter from Authorized Agent

Not applicable because the project does not involve sewerage facilities.

ATTACHMENT D – Exception to the Required Geologic Assessment

Not applicable because no exception is requested.





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: Theresa Canales

Date: 8-27-15

Signature of Customer/Agent:

Theresa Canales

Regulated Entity Name: FM 306

Project Information

Potential Sources of Contamination

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

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

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

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

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

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

Sequence of Construction

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

Temporary Best Management Practices (TBMPs)

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

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

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

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

Soil Stabilization Practices

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

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

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

Administrative Information

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

Temporary Stormwater Section (TCEQ-0602)

ATTACHMENT A – Spill Response Actions

TxDOT's plans require the contractor to remediate any spills that they cause, and to report spills as follows:

- to the National Response Center at (800) 424-8802,
- to the Edwards Aquifer Authority at (210) 222-2204,
- to the State Emergency Response Center at (800) 832-8224 (if after hours), or
- to the TCEQ Regional Office (210) 490-3096 (if during business hours),
- Spills involving sanitary sewers shall be reported to San Antonio Water System (SAWS) at (210) 233-2015.

Spills shall be reported within 24 hours unless regulations require more expedient notifications. Refer to the EPIC Plan Sheet and SW3P Narrative Sheet for additional information.

ATTACHMENT B – Potential Sources of Contamination

Potential pollutants include disturbed soil, rock and plant matter; fuel and oil from construction equipment; concrete products including curing compounds; asphalt products, and aggregates such as road base and gravel. Sanitary sewer lines are also a potential source of pollutants.

ATTACHMENT C – Sequence of Major Activities

Refer to Major Soil Disturbing Activities Sequence of Events on SW3P General site data, Sheet # 439.

ATTACHMENT D – Temporary BMPs

Refer to the TxDOT Storm Water Pollution Prevention Plan (SW3P) General site data sheet # 439, SW3P layouts, and Erosion Control Standard sheets which describe the temporary structural practices in detail.

ATTACHMENT E - Request to Temporarily Seal a Feature

Not applicable – no temporary sealing is proposed.

ATTACHMENT F – Structural Practices

Structural practices for this project include silt containment fence, rock filter dams, rock bedding at construction exit, curbs and gutters, storm sewers, velocity control devices.

ATTACHMENT G – Drainage Area Map

See attached drainage area sheets (sheets # 238-239).

ATTACHMENT H – Temporary Sediment Ponds and Calculations

Not applicable – no temporary ponds are proposed.

ATTACHMENT I – Inspection and Maintenance for BMPs

The maintenance and inspection plan for all temporary BMPs is contained in the SW3P General Site Data Sheet (sheet # 439) attached. An inspector will perform a regularly scheduled inspection of all temporary BMPs (SW3P) every 7 calendar days and inspections will be recorded. Maintenance and repairs are performed before the next anticipated storm event or as soon as practicable. Instructions for recordkeeping and documentation of temporary BMPs are in Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls) of Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges (TxDOT Specifications, 2014).

ATTACHMENT J – Schedule of Interim and Permanent Soil Stabilization Practices

All areas not planned for impervious cover (asphalt/concrete) would be permanently stabilized prior to completion of the project. The SW3P layouts show the project's re-vegetation plans.

vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement by hog rings or cord every 15 in. or less.

- 4.4.8.4. **Fabric and Net Splices.** Locate splices at a fence post with a minimum lap of 6 in. attached in at least 6 places equally spaced unless otherwise shown on the plans. Do not locate splices in concentrated flow areas.

Requirements for installation of used temporary sediment-control fence include the following:

- fabric with minimal or no visible signs of biodegradation (weak fibers),
- fabric without excessive patching (more than 1 patch every 15 to 20 ft.),
- posts without bends, and
- backing without holes.

- 4.4.9. **Biodegradable Erosion Control Logs.** Install biodegradable erosion control logs near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the biodegradable erosion control logs into the erosion measures used to control sediment in areas of higher flow. Install, align, and locate the biodegradable erosion control logs as specified below, as shown on the plans, or as directed.

Secure biodegradable erosion control logs in a method adequate to prevent displacement as a result of normal rain events, prevent damage to the logs, and as approved, such that flow is not allowed under the logs. Temporarily removing and replacing biodegradable erosion logs as to facilitate daily work is allowed at the Contractor's expense.

- 4.4.10. **Vertical Tracking.** Perform vertical tracking on slopes to temporarily stabilize soil. Provide equipment with a track undercarriage capable of producing a linear soil impression measuring a minimum of 12 in. long × 2 to 4 in. wide × 1/2 to 2 in. deep. Do not exceed 12 in. between track impressions. Install continuous linear track impressions where the 12 in. length impressions are perpendicular to the slope. Vertical tracking is required on projects where soil disturbing activities have occurred unless otherwise approved.

- ✓ 4.5. **Monitoring and Documentation.** Monitor the control measures on a daily basis as long as there are BMPs in place and/or soil disturbing activities are evident to ensure compliance with the SWP3 and TPDES General Permit TXR150000. During time suspensions when work is not occurring or contract non-work days, daily inspections are not required unless a rain event has occurred. Monitoring will consist of, but is not limited to, observing, inspecting, and documenting site locations with control measures and discharge points to provide maintenance and inspection of controls as described in the SWP3. Keep written records of daily monitoring. Document in the daily monitoring report the control measure condition, the date of inspection, required corrective actions, responsible person for making the corrections, and the date corrective actions were completed. Maintain records of all monitoring reports at the project site or at an approved place. Provide copies within 7 days. Together, the CRPE and an Engineer's representative will complete the Construction Stage Gate Checklist on a periodic basis as directed.

5. MEASUREMENT

- 5.1. **Rock Filter Dams.** Installation or removal of rock filter dams will be measured by the foot or by the cubic yard. The measured volume will include sandbags, when used.
- 5.1.1. **Linear Measurement.** When rock filter dams are measured by the foot, measurement will be along the centerline of the top of the dam.
- 5.1.2. **Volume Measurement.** When rock filter dams are measured by the cubic yard, measurement will be based on the volume of rock computed by the method of average end areas.
- 5.1.2.1. **Installation.** Measurement will be made in final position.
- 5.1.2.2. **Removal.** Measurement will be made at the point of removal.

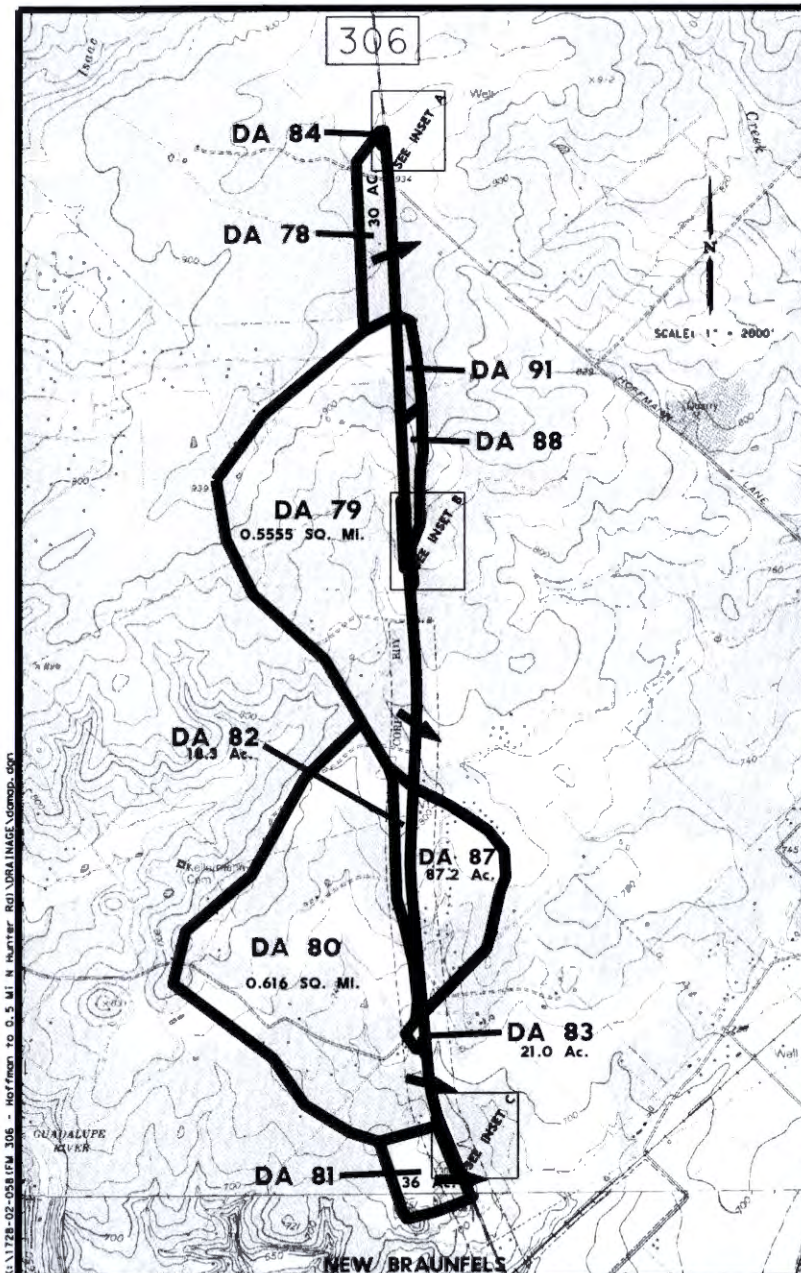
RDWY: FM 306
CSJ: 1728-02-058
LIMITS: Hoffman Lane to 0.50 mile north of Hunter Rd.
COUNTY: Comal

GENERAL NOTE IN PLANS CALLING OUT TY 5 ROCK FILTER DAM.

--Item 1122--

Rock Filter Dam (Ty 5) (reinforced) constructed as follows:

Height:	6" to 12", as directed by the Engineer, measured vertically from the existing ground to the top of the filter dam, with wire mesh
Top Width:	24"
Slopes:	2:1 maximum (outside clear zone) 6:1 maximum (within clear zone)
Aggregate:	Gradation shall be 3 to 6 inches.



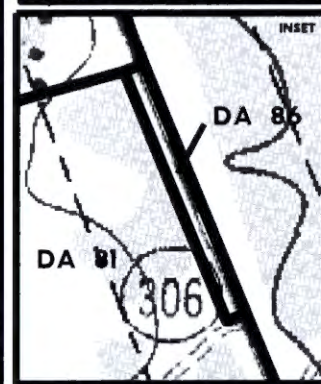
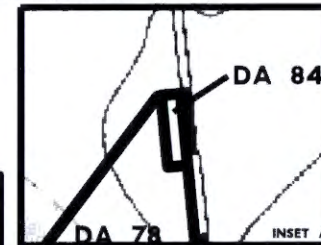
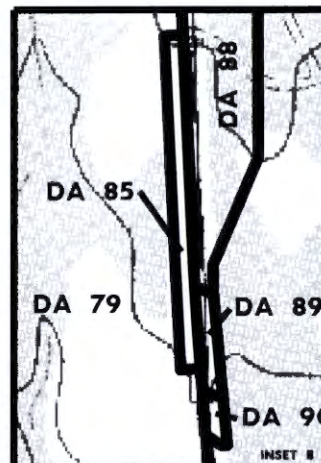
CROSS DRAINAGE STRUCTURES				
DRAINAGE AREA	78	79 **	80	81
STRUCTURE NO.	78	79	80	81
STRUCTURE STATION	1353+58.95	437+15.23	496+55.23	513+00.44
HYDROLOGIC METHOD USED	RATIONAL	HEC-HMS	HEC-HMS	RATIONAL
AREA (ACRE RATIONAL) (SQ. MI. UNIT HYDROGRAPH)	30.0	0.56	0.616	36.0
AVERAGE C OR UNIT HYDROGRAPH CURVE NUMBER	0.45	72	60	0.46
Tc (10 MINUTES min.) (LAG FOR UNIT HYDROGRAPH)	30	20	42	30
I 10 (IN/HR) OR 24 HR DEPTH vs FREQUENCY	4.6	6.33	6.3	4.6
I 25 (IN/HR) OR 24 HR DEPTH vs FREQUENCY	5.3	8.07	7.8	5.3
I 100 (IN/HR) OR 24 HR DEPTH vs FREQUENCY	6.6	11.16	10.70	6.6
Q 10 (CFS) MINIMUM DESIGN FREQUENCY (MINOR ARTERIAL)	62.0	900	370.16	76.2
Q 25 (CFS) DESIRABLE DESIGN FREQUENCY (MINOR ARTERIAL)	72.0	1242	559.42	88.0
Q 100 (CFS) (CHECK)	89.0	1850	959.34	109.3

DRIVEWAY AND INTERSECTION STRUCTURES										
DRAINAGE AREA	82 *	83 *	84 *	85 *	86 *	87 *	88 *	89 *	90 *	91 *
STRUCTURE NO.	82	83	84	85	86	87	88	89	90	91
STRUCTURE STATION	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00	1341+50.00
HYDROLOGIC METHOD USED	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL	RATIONAL
AREA (ACRE RATIONAL) (SQ. MI. UNIT HYDROGRAPH)	18.3	21.0	0.353	1.545	1.425	87.2	25.2	25.3	25.5	11.1
AVERAGE C OR UNIT HYDROGRAPH CURVE NUMBER	0.42	0.42	0.767	0.774	0.738	0.42	0.38	0.38	0.38	0.38
Tc (10 MINUTES min.) (LAG FOR UNIT HYDROGRAPH)	47	48	10	10	10	50	103	104	105	44.9
I 10 (IN/HR) OR 24 HR DEPTH vs FREQUENCY	3.5	3.4	8.095	8.095	8.095	3.3	1.9	2.0	2.0	3.6
I 100 (IN/HR) OR 24 HR DEPTH vs FREQUENCY	5.0	4.9	11.547	11.547	11.547	4.8	2.8	2.9	2.9	5.2
Q 10 (CFS) DESIRABLE DESIGN FREQUENCY (MINOR ARTERIAL)	27.0	30.0	2.189	9.681	8.510	120.8	18.2	19.2	19.4	15.8
Q 100 (CFS) (CHECK)	38.4	43.2	3.123	13.809	12.138	175.8	26.8	27.9	28.1	22.0

NOTIFICATION OF THE FEMA FLOOD PLAIN ADMINISTRATORS WAS COMPLETED ON (MARCH 17, 2014).

***-DRIVEWAY AND INTERSECTION STRUCTURES ARE DESIGNED FOR 10yr EVENT, 5yr IS THE DESIRABLE DESIGN FOR A MINOR ARTERIAL ROADWAY.

***-INFO FROM FEMA STUDY DATED October 29, 2004 Revised August 26, 2005
PERFORMED BY HALFF ASSOCIATES, INC.

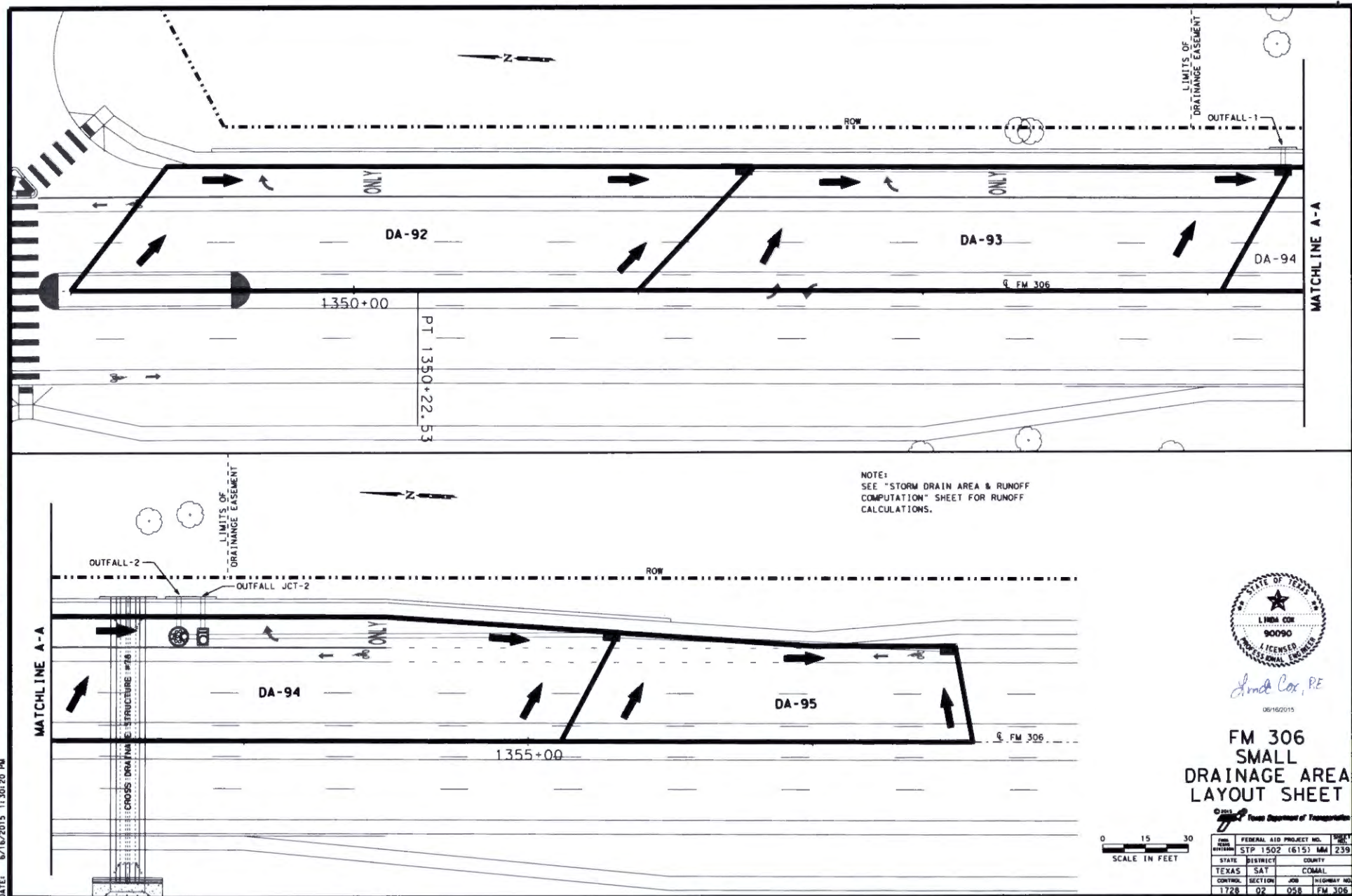


Linda Cox, PE
6-18-2015

**FM 306
DRAINAGE AREA
SHEET**

FROM	PROJECT NO.	SHEET NO.
FM 1502	16151	238
STATE	COUNTY	CITY
TEXAS	SAT	COMAL
CERTIFY	SECTION	DATE
1728	02	058

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 mi N Hunter Rd\RAINAGE\Small-damoa.dgn
DATE: 6/16/2015 11:30:20 PM



Linda Cox, PE
06/16/2015

FM 306 SMALL DRAINAGE AREA LAYOUT SHEET

Texas Department of Transportation



FEDERAL AID PROJECT NO.		SHEET NO.
STP 1502 (615) MM		239
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTROL	SECTION	JOB
1728	02	058
		FM 306

FILE: K:\1728-02-058(FM 306 - Hoffman to 0.5 MI N Hunter Rd)\DRAINAGE\STORM DRAIN HYDRODATA.dgn
 DATE: 6/16/2015 11:31:08 PM

RATIONAL COMPUTATIONS 10 YR					
AREA ID	RUNOFF COEFFICIENT	DRAINAGE AREA (ACRE)	TIME OF CONETRATION USED (MIN)	RAINFALL INTENSITY (in/hr)	DISCHARGE (CFS)
DA-92	0.930	0.200	10.00	8.10	1.540
DA-93	0.930	0.200	10.00	8.10	1.490
DA-94	0.930	0.200	10.00	8.10	1.520
DA-95	0.930	0.110	10.00	8.10	0.800

RATIONAL COMPUTATIONS 100 YR CHECK					
AREA ID	RUNOFF COEFFICIENT	DRAINAGE AREA (ACRE)	TIME OF CONETRATION USED (MIN)	RAINFALL INTENSITY (in/hr)	DISCHARGE (CFS)
DA-92	0.930	0.200	10.00	11.55	2.200
DA-93	0.930	0.200	10.00	11.55	2.120
DA-94	0.930	0.200	10.00	11.55	2.170
DA-95	0.930	0.110	10.00	11.55	1.150



Linda Cox, P.E.

6-16-2015

FM 306
 STORM DRAIN
 AREA & RUNOFF
 COMPUTATIONS

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FORM NO. 1	FEDERAL AID PROJECT NO.	SHEET NO.
STANDARD	STP 1502 (615)	MM 258
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTRACT	SECTION	SECTION NO.
1728	02	058 FM 306

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)(li), (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: Theresa Canales, TxDOT SAT District

Date: 8-27-15

Signature of Customer/Agent

Theresa Canales

Regulated Entity Name: FM 306

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

Permanent Stormwater Section

ATTACHMENT A – 20% or Less Impervious Cover Waiver

Not applicable because this threshold is exceeded.

ATTACHMENT B – BMPs for Upgradient Stormwater

The project does not include specific BMPs for post-construction treatment of runoff from upgradient locations. Runoff from upgradient locations would be treated by the on-site stormwater BMPs.

ATTACHMENT C – BMPs for On-site Stormwater

Vegetated filter strips and a Jellyfish flow-through stormwater filter will be used to remove TSS from on-site stormwater. The treatment is designed to exceed TCEQ requirements. Details of the stormwater filter are below:

Structure #	Detail Sheet designation	Storm filter design type	Num. of 54" Hi-Flo cartridges for flow-through configuration	TSS removal (lbs)
BMP No.Jf-2	JF-2 (approx. sta. 1353+80)	Flow-through	3	1,435 lbs
Grass Filter Strip	Grass Filter Strip Area	Vegetated filter strip		12,675 lbs
		Total TSS Removal		14,110 lbs/yr

Compliance with Edwards Rules would require removal of approximately 12,827 lbs/yr of total suspended solids (TSS). The proposed project would remove a total of approximately 14,110 lbs/yr of TSS, thereby exceeding the minimum requirement necessary for compliance with 30 TAC 213.

ATTACHMENT D – BMPs for Surface Streams (and sensitive features)

The project crosses Alligator Creek and unnamed tributaries. Rock filter dams and temporary sediment control fence would be used to protect Alligator Creek and the tributaries from pollutant runoff during construction. Dissipators would be placed on the downstream side of the Alligator Creek culvert. Several areas with karst features were

found in the ROW (see Figure 4 of Geologic Assessment, 3-25-15). The karst features were evaluated according to TCEQ standards as not being sensitive, with ratings of less than 40; however, rock filter dams would be used during construction to protect these features. Vegetated filter strips and flow-through storm water filters would be used for post construction control of stormwater runoff.

ATTACHMENT E – Request to Seal Features

No features would be sealed.

ATTACHMENT F – Construction Plans and Calculations

Signed and sealed plans and calculations follow this page.

ATTACHMENT G – Inspection, Maintenance, Repair and Retrofit Plan

The inspection, maintenance, repair and retrofit plan follow this page.

ATTACHMENT H – Pilot-Scale Field Testing Plan

Not applicable.

ATTACHMENT I – Measures for Minimizing Surface Stream Contamination

The project would use grass filter strips and Jellyfish Filter to filter runoff from the pavement. In addition, post-construction measures for hazardous substances/hydrocarbon spill measures would be addressed by TxDOT San Antonio District Spill Response Procedures (SRP). The SRP flowchart follows this page.

ATTACHMENT G
Permanent Storm Water Section
Inspection, Maintenance, Repair and Retrofit Plan
CSJ 1728-02-058, Comal County, Texas

Jellyfish Inspection and Maintenance Guidelines

These maintenance guidelines were prepared at the request of the TCEQ with regard to their approval of an Edwards Aquifer Protection Plan for the above referenced project. These guidelines apply to the permanent storm water controls constructed for this project.

Maintenance

The Jellyfish® Filter is approved for inclusion in "Complying with the Edwards Aquifer Rules Technical Guidance on Best Management Practices" (Revised July 5, 2005). The primary purpose of the Jellyfish Filter is to capture and remove pollutants from stormwater runoff. As with any filtration system, captured pollutants must be removed to maintain the filter's maximum treatment performance. Regular inspection and maintenance are required to insure proper functioning of the system.

Maintenance frequencies and requirements of the Jellyfish Filter are site specific and vary depending on pollutant loading. Maintenance activities may be required in the event of an upstream chemical spill or due to excessive sediment loading from site erosion or extreme runoff events. It is a good practice to inspect the system after major storm events.

Maintenance activities typically include:

- Removal of oil, floatable trash and debris
- Removal of collected sediments from manhole sump
- Rinsing and re-installing the filter cartridges
- Replace filter cartridge tentacles, as needed.

The unit must be cleaned annually. This cleaning includes removal and appropriate disposal of all water, sediment, oil and grease, and debris that has accumulated within the unit.

Filter cartridges should be tested for adequate flow rate, every 12 months and cleaned and re-commissioned, or replaced if necessary. A manual backflush must be performed on a single draindown cartridge using a Jellyfish Cartridge Backflush Pipe (described in the Jellyfish® Filter Owner's Manual). The unit should be cleaned out immediately after an oil, fuel or chemical spill.

External rinsing of the cartridge is performed by removing the cartridge from the cartridge deck and externally rinsing the filtration tentacles using a low-pressure water sprayer, as described in the Jellyfish® Filter Owners Manual. Sediment is subsequently removed from the lower chamber by standard vacuum service.

Inspections

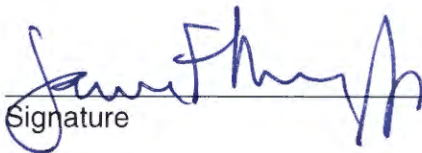
In general, inspections should be performed at the times indicated below; *or per the approved project stormwater quality documents (if applicables), whichever is more frequent.*

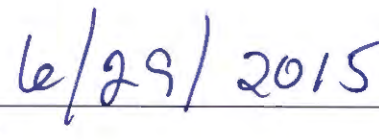
- Post-construction inspection is required prior to putting the Jellyfish Filter into service. All construction debris or construction-related sediment within the device must be removed, and any damage to system components repaired.

- A minimum of two inspections during the first year of operation to assess the sediment and floatable pollutant accumulation, and to ensure proper functioning of the system.
- Inspections should also be performed immediately after oil, fuel, or other chemical spill.

Maintenance Contact: The maintenance supervisor may be contacted for questions or concerns pertaining to maintenance of the facility.

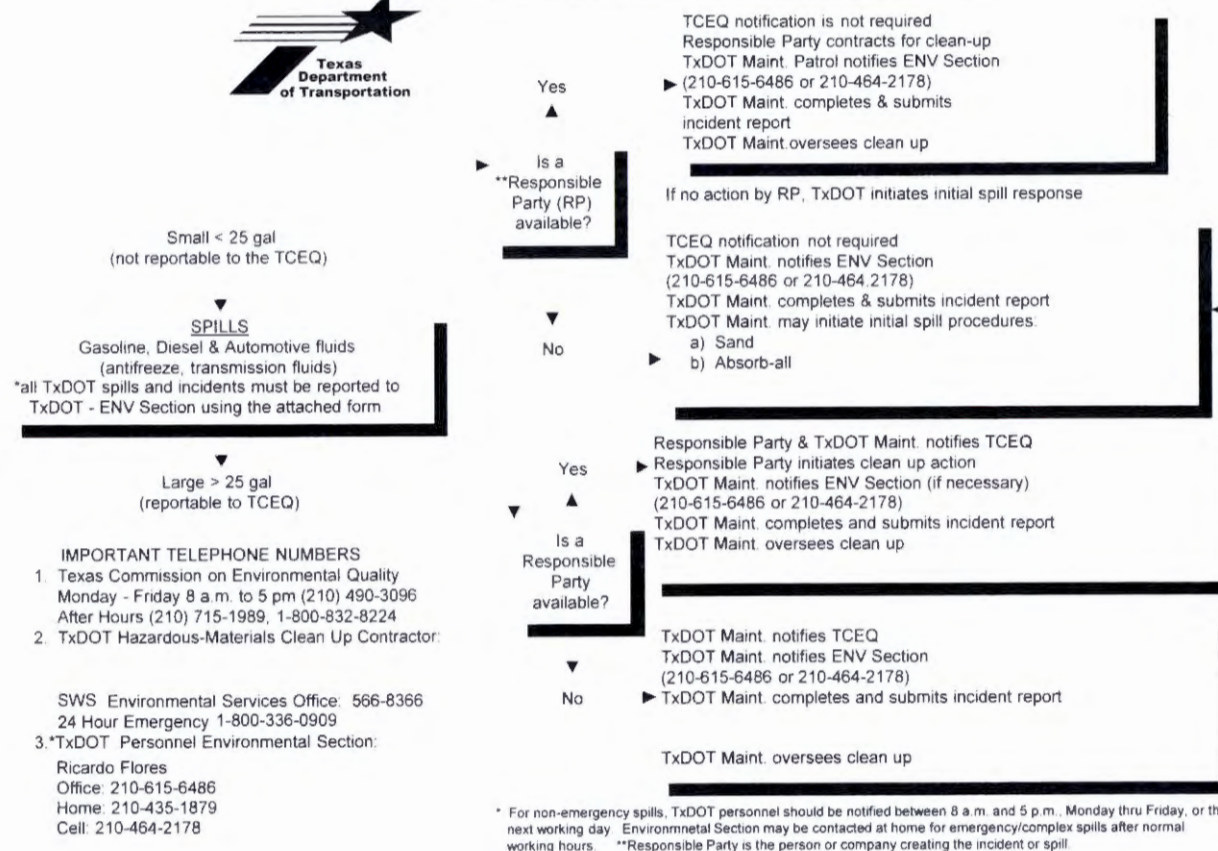
James F. Browne, Jr.
Maintenance Section Supervisor
4102 IH 35 South
New Braunfels, TX 78130


Signature


Date



SAN ANTONIO DISTRICT SPILL RESPONSE PROCEDURES



PERMANENT STORMWATER SECTION

Attachment F

Impervious Cover Calculations

TSS Removal Calculations

TCEQ WPAP General Construction Notes

Stormwater Treatment System (Jellyfish Filter) Details

WPAP Layouts (with geologic features)

Existing and Proposed Contour Sheets

Typical Sections

Plan Sheets

SW3P Sheets

IMPERVIOUS COVER CALCULATIONS

PROJECT NAME

**FM 306 ~ FROM HOFFMANN LN TO 0.5 MI N OF HUNTER RD
CSJ: 1728-02-058**

Length of Project =	1.64 miles	8,680.32 feet	
EXISTING ROW (Area calculated in microstation) =		3,599,109.18 ft ²	82.62 acres
EXISTING ROADWAY (Area calculated in microstation) =		1,111,001.00 ft ²	25.51 acres
EXISTING DRIVEWAYS & PARKING AREAS (Area calculated in microstation) =		0.00 ft ²	0.00 acres
EXISTING RIP-RAP (Area calculated in microstation) =		0.00 ft ²	0.00 acres
TOTAL EXISTING IMPERVIOUS COVER		1,111,001.00 ft²	25.51 acres
PROPOSED ROW (Same as existing)		3,599,109.18 ft ²	82.62 acres
PROPOSED ROADWAY (Area calculated in microstation) =		1,709,334.00 ft ²	39.24 acres
PROPOSED DRIVEWAYS (Area calculated in microstation) =		24,405.00 ft ²	0.56 acres
PROPOSED RIP-RAP (Area calculated in microstation) =		0.00 ft ²	0.00 acres
TOTAL PROPOSED IMPERVIOUS COVER		1,733,739.00 ft²	39.80 acres
Pre-Construction Fraction of Impervious Cover (IC)			30.87 %
Post-Construction Fraction of Impervious Cover (IC)			48.17 %
Net increase in Impervious Area (An)		622,738.00 ft²	14.30 acres

Runoff Coefficient Calculations:

Pre-Construction Runoff

$$R_v = 1.72x(IC)^3 - 1.97x(IC)^2 + 1.23x(IC) + 0.02$$

$$R_v = 1.72x(0.3444)^3 - 1.97x(0.3444)^2 + 1.23x(0.3444) + 0.02$$

$$R_v = 0.26$$

Post-Construction Runoff

$$R_v = 1.72x(IC)^3 - 1.97x(IC)^2 + 1.23x(IC) + 0.02$$

$$R_v = 1.72x(0.4318)^3 - 1.97x(0.4318)^2 + 1.23x(0.4318) + 0.02$$

$$R_v = 0.35$$



Linda Cox, P.E.

06/12/2015

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: FM 306
Date Prepared: 4/22/2015

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: $L_d = 27.2(A_p \times P)$

where

L_d (lb/day) = Required TSS removal resulting from the proposed development = 60% of increased load

A_p = 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 =	Comal
Total project area included in plan =	92.67 acres
Predevelopment impervious area within the limits of the plan =	25.51 acres
Total post-development impervious area within the limits of the plan =	39.89 acres
Total post-development impervious cover fraction =	0.48
P =	33 inches

L_d (lb/day) = 12827 lbs

Number of drainage basins / outfalls areas leaving the plan area = 1

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	92.67 acres
Predevelopment impervious area within drainage basin/outfall area =	25.51 acres
Post-development impervious area within drainage basin/outfall area =	39.89 acres
Post-development impervious fraction within drainage basin/outfall area =	0.48
L_d (lb/day) =	12827 lbs

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strip
Removal efficiency = 85 percent

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

RG-348 Page 3-33 Equation 3-7: $L_d = (BMP \text{ efficiency}) \times P \times (A_p \times 34.8 + A_p \times 0.54)$

where

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

A_p = Impervious area proposed in the BMP catchment area

A_p = Previous area remaining in the BMP catchment area

L_d = TSS Load removed from the catchment area by the proposed BMP

A_p = 11.06 acres
 A_p = 12.06 acres
 A_p = 0.90 acres
 L_d = 12675 lbs

Texas Commission on Environmental Quality
TSS Removal Calculations

Project Name: FM 306 (CSJ 5788-08-058) - JP-2

Date Prepared: 3/24/2015

1. The Required Load Reduction for the total project:

Calculations from RG-348

Page 3-29 Equation 3-3: $L_d = 27.2(A_p \times P)$

Pages 3-27 to 3-30

L_d (lb/day) = Required TSS removal resulting from the proposed development = 60% of increased load

A_p = 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 =	Comal
Total project area included in plan =	92.67 acres
Predevelopment impervious area within the limits of the plan =	25.51 acres
Total post-development impervious area within the limits of the plan =	39.89 acres
Total post-development impervious cover fraction =	0.48
P =	33 inches

L_d (lb/day) = 12827 lbs

Number of drainage basins / outfalls areas leaving the plan area = 1

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

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	92.67 acres
Predevelopment impervious area within drainage basin/outfall area =	25.51 acres
Post-development impervious area within drainage basin/outfall area =	39.89 acres
Post-development impervious fraction within drainage basin/outfall area =	0.48
L_d (lb/day) =	12827 lbs

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Vegetated Filter Strip
Removal efficiency = 85 percent

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

RG-348 Page 3-33 Equation 3-7: $L_d = (BMP \text{ efficiency}) \times P \times (A_p \times 34.8 + A_p \times 0.54)$

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

A_p = Impervious area proposed in the BMP catchment area

A_p = Previous area remaining in the BMP catchment area

L_d = TSS Load removed from the catchment area by the proposed BMP

A_p = 11.06 acres
 A_p = 12.06 acres
 A_p = 0.90 acres
 L_d = 12675 lbs

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

Desired L_d (lb/day) = 12827 lbs
 L_d = 12827 lbs

6. Calculate Treated Flow required by the BMP Type for this drainage basin / outfall area.

Calculations from RG-348

Pages Section 3-2.22

Runoff Intensity = 0.32 inches per hour

Effective Area = 2.169 acres

Cartridge Length = 54 inches

Peak Treatment Flow Required = 0.46 cubic feet per second

7. Arch Dam

Designed as Required in RG-348

Section 3-2.22

Flow Through Jetty Fish Size

Jettyfish Size for Flow Based Configuration

Jettyfish Treatment Flow Rate = 0.64 cfs



Linda Cox, P.E.

05/01/2015

FM 306
WPAP LAYOUTS
CALCULATIONS

NTS			
Texas Department of Transportation			
STATE	COUNTY	SHEET NO.	
TEXAS	SAT	478	
SECTION	DATE	PROJECT NO.	
1728	02	058 FM 306	

LOADING SUMMARY ANALYSIS

Project Name: ON FM 306
CSJ: 1728-02-058

<u>Summary:</u>	TSS reduction requirements for the project =	12,827 lbs/yr
	Load removed from vegetated filter strips that meet the width and slope criteria =	12,675 lbs/yr
	Load removed by Stormwater Treatment System, "Jellyfish" Filter =	1,435 lbs/yr
	Removal Total =	<hr/> 14,110 lbs/yr

Conclusion:

The required TSS load reduction for the project is 12,827 lbs/yr. For the engineered vegetated filter strips that met the width and slope criteria, the strips would remove 12,675 lbs/year. For the Stormwater Treatment System, "Jellyfish" Filter the removal would be 1,435 lbs/yr. The total removal for the project 14,110 lbs/yr which exceeds the project load removal requirements.



Linda Cox, P.E.

05/01/2015

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

1. Written construction notification must be given to the appropriate TCEQ regional office no later than 48 hours prior to commencement of the regulated activity. Information must include the date on which the regulated activity will commence, the name of the approved plan for the regulated activity, and the name of the prime contractor and the name and telephone number of the contact person.
2. All contractors conducting regulated activities associated with this project must be provided with complete copies of the approved Water Pollution Abatement Plan and the TCEQ letter indicating the specific conditions of its approval. During the course of these regulated activities, the contractors are required to keep on-site copies of the approved plan and approval letter.
3. If any sensitive feature is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately. The appropriate TCEQ regional office must be immediately notified of any sensitive features encountered during construction. The regulated activities near the sensitive feature may not proceed until the TCEQ has reviewed and approved the methods proposed to protect the sensitive feature and the Edwards Aquifer from any potentially adverse impacts to water quality.
4. No temporary aboveground hydrocarbon and hazardous substance storage tank system is installed within 150 feet of a domestic, industrial, irrigation, or public water supply well, or other sensitive feature.
5. Prior to commencement of construction, all temporary erosion and sedimentation (E&S) control measures must be properly selected, installed, and maintained in accordance with the manufacturers specifications and good engineering practices. Controls specified in the temporary storm water section of the approved Edwards Aquifer Protection Plan are required during construction. If inspections indicate a control has been used inappropriately, or incorrectly, the applicant must replace or modify the control for site situations. The controls must remain in place until disturbed areas are revegetated and the areas have become permanently stabilized.
6. 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).
7. Sediment must be removed from sediment traps or sedimentation ponds not later than when design capacity has been reduced by 50%. A permanent stake must be provided that can indicate when the sediment occupies 50% of the basin volume.
8. 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).
9. All spoils (excavated material) generated from the project site must be stored on-site with proper E&S controls. For storage or disposal of spoils at another site on the Edwards Aquifer Recharge Zone, the owner of the site must receive approval of a water pollution abatement plan for the placement of fill material or mass grading prior to the placement of spoils at the other site.
10. Stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by weather conditions, stabilization measures shall be initiated as soon as practicable. Where construction activity on a portion of the site is temporarily ceased, and earth disturbing activities will be resumed within 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 seasonal arid conditions, stabilization measures shall be initiated as soon as practicable.
11. The following records shall be maintained and made available to the TCEQ upon request: the dates when major grading activities occur; the dates when construction activities temporarily or permanently cease on a portion of the site; and the dates when stabilization measures are initiated.

12. The holder of any approved Edwards Aquifer protection plan must notify the appropriate regional office in writing and obtain approval from the executive director prior to initiating any of the following:
 - A. any physical or operational modification of any water pollution abatement structure(s), including but not limited to ponds, dams, berms, sewage treatment plants, and diversionary structures;
 - B. any change in the nature or character of the regulated activity from that which was originally approved or a change which would significantly impact the ability of the plan to prevent pollution of the Edwards Aquifer;
 - C. any development of land previously identified as undeveloped in the original water pollution abatement plan.

Austin Regional Office
2800 S. IH 35, Suite 100
Austin, Texas 78704-5712
Phone (512) 339-2929
Fax (512) 339-3795

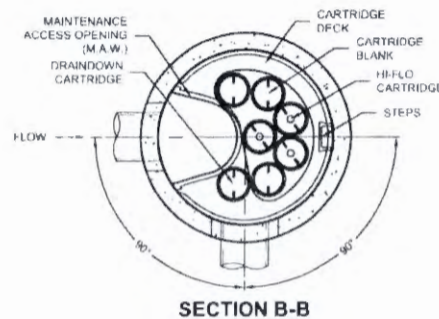
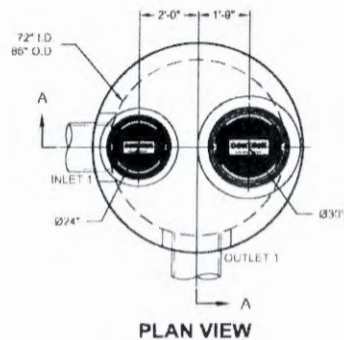
San Antonio Regional Office
14250 Judson Road
San Antonio, Texas 78233-4480
Phone (210) 490-3096
Fax (210) 545-4329

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

FILE: K:\1728-QR-DESIGN\306 - Hoffman to 0.5 MI. N. Hunter Rd\ENVIRONMENTAL\TCEQ Gen Notes WPAP.dgn
DATE: 4/28/2015 1:16:27 PM

FM 306
TCEQ WPAP
GENERAL CONSTRUCTION
NOTES

FEDERAL AID PROJECT NO.		SHEET NO.	
		441	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306



MATERIAL LIST - PROVIDED BY CONTECH

COUNT	DESCRIPTION	INSTALLED BY
3	54" HI-FLO CARTRIDGE (70 mm ORIFICE)	CONTECH
1	54" DRAINDOWN CARTRIDGE (35 mm ORIFICE)	CONTECH
0	PRESSURE RELIEF PIPE (P.R.P.)	CONTECH
3	CARTRIDGE BLANK	CONTECH
1	MAINTENANCE ACCESS WALL (M.A.W.) EXTENSION	CONTECH
1	JF6 CARTRIDGE DECK WITH 54" SEPARATION SKIRT	CONTECH
0	DEFLECTOR PLATE	CONTECH
1	JOINT SEALANT	CONTRACTOR
1	30" X 4" E.J. #416004B4 FRAME & COVER	CONTRACTOR
1	24" X 4" E.J. #416003B5 FRAME & COVER	CONTRACTOR
N/A	GRADE RING/RISER	CONTRACTOR
5	STEPS	CONTECH

SITE DESIGN DATA

WATER QUALITY FLOW RATE	2.34 CFS
PEAK FLOW RATE	N/A
RETURN PERIOD OF PEAK FLOW	OFFLINE

GENERAL NOTES

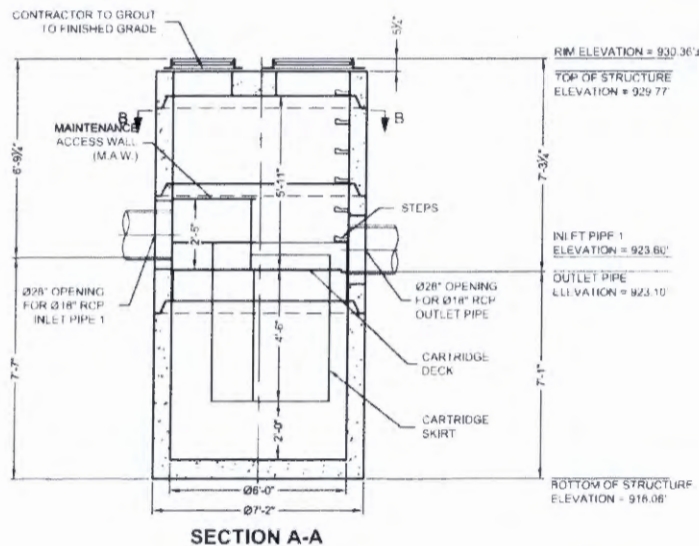
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS REPRESENTATIVE. WWW.CONTECHES.COM
- JELLYFISH WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS-20, ASSUMING EARTH COVER OF 0' - 1' AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 LOAD RATING AND BE CAST WITH THE CONTECH LOGO.
- STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT).
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED FROST/RUNOFF.
- CARTRIDGE INSTALLATION BY CONTECH SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE JELLYFISH UNIT IS CLEAN AND FREE OF DEBRIS. CONTACT CONTECH TO COORDINATE CARTRIDGE INSTALLATION WITH SITE STABILIZATION AT (866) 740-3318.

STRUCTURE WEIGHT

APPROXIMATE HEAVIEST PICK OF 4 PIECES = 14000 LBS.



NO.	DATE	REVISION	APPROVAL

CONTECH
ENGINEERED SOLUTIONS LLC
www.contechES.com
561 Oak and Hwy. 100, Suite 112 | Oak Ridge, MO 64070
866.740.3318 817.261.5525 866.276.8111 FAX

Jellyfish® Filter
AASHTO M306 LOAD RATING
CONFORMS TO ASTM C-478

The following is a summary of the design data provided to the engineer by the client. The engineer is not responsible for the accuracy of the design data provided by the client. The engineer is responsible for the accuracy of the design data provided to the client. The engineer is not responsible for the accuracy of the design data provided by the client. The engineer is responsible for the accuracy of the design data provided to the client.

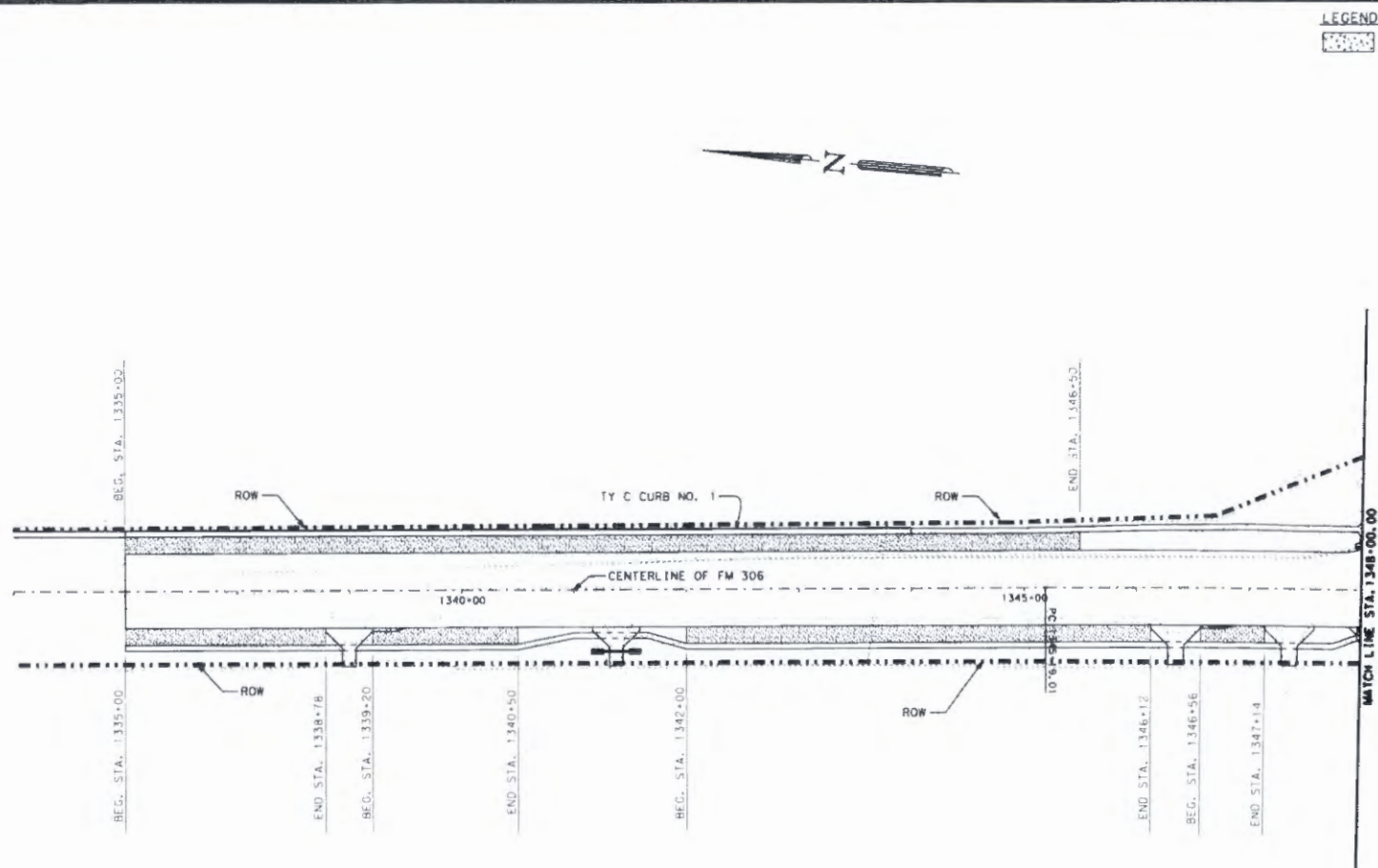
FM 306 STORMWATER TREATMENT SYSTEM DETAILS

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CONTECH
CONTRACT
DRAWING

HANW
LAYOUT 1A

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Linda Cox, P.E.
05/03/2015

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SCALE IN FEET

FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
SHEET 1 OF 16			
STATE	FEDERAL AID PROJECT NO.	SHEET NO.	
TEXAS	STP 1502 (615) NM	479	
DISTRICT	COUNTY		
SAT	COMAL		
SECTION	JOB	HIGHWAY NO.	
1728	02	058 FM 306	


 Texas Department of Transportation
 SHEET 2 OF 16

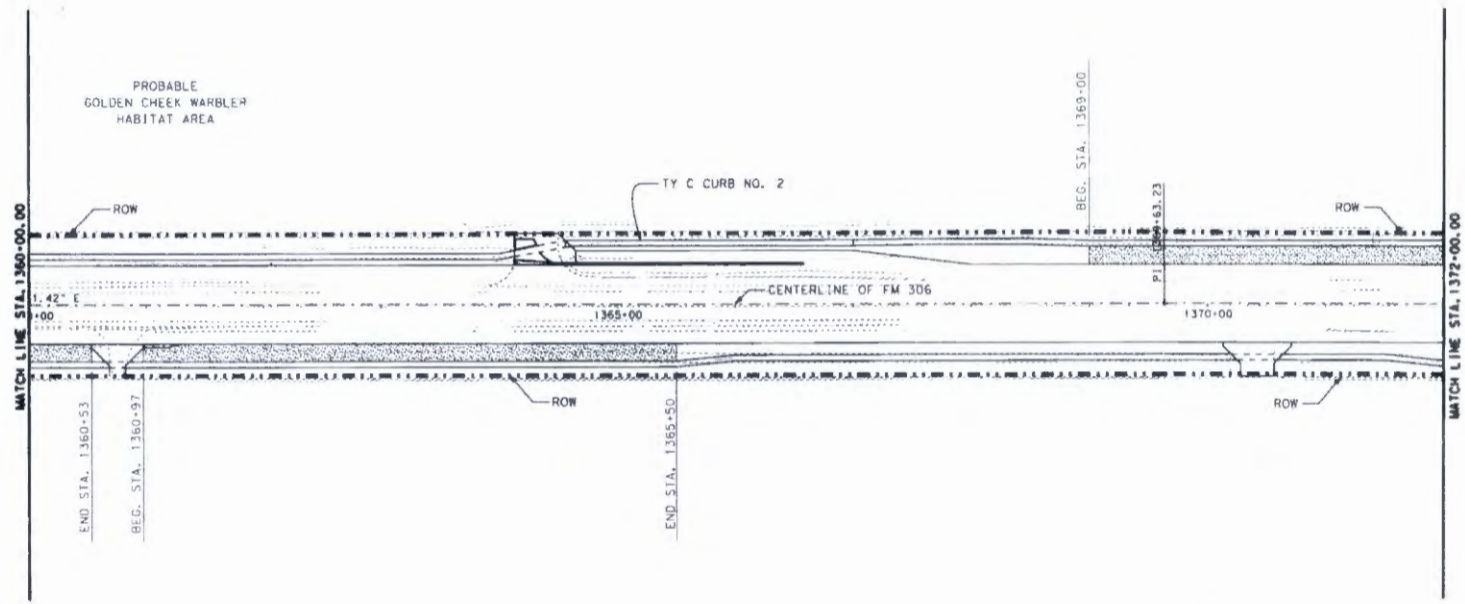
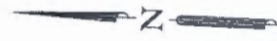
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	STP 1502 (615) MM		
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	ALTERNATE NO.
1728	02	050	FM 308

LEGEND



GRASS FILTER STRIP AREA

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



Linda Cox, P.E.
05/01/2015



Texas Department of Transportation
SHEET 3 OF 16

FEDERAL AID PROJECT NO.		MM
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TEXAS	SAT	COMAL
SECTION	JOB	APPROX. NO.
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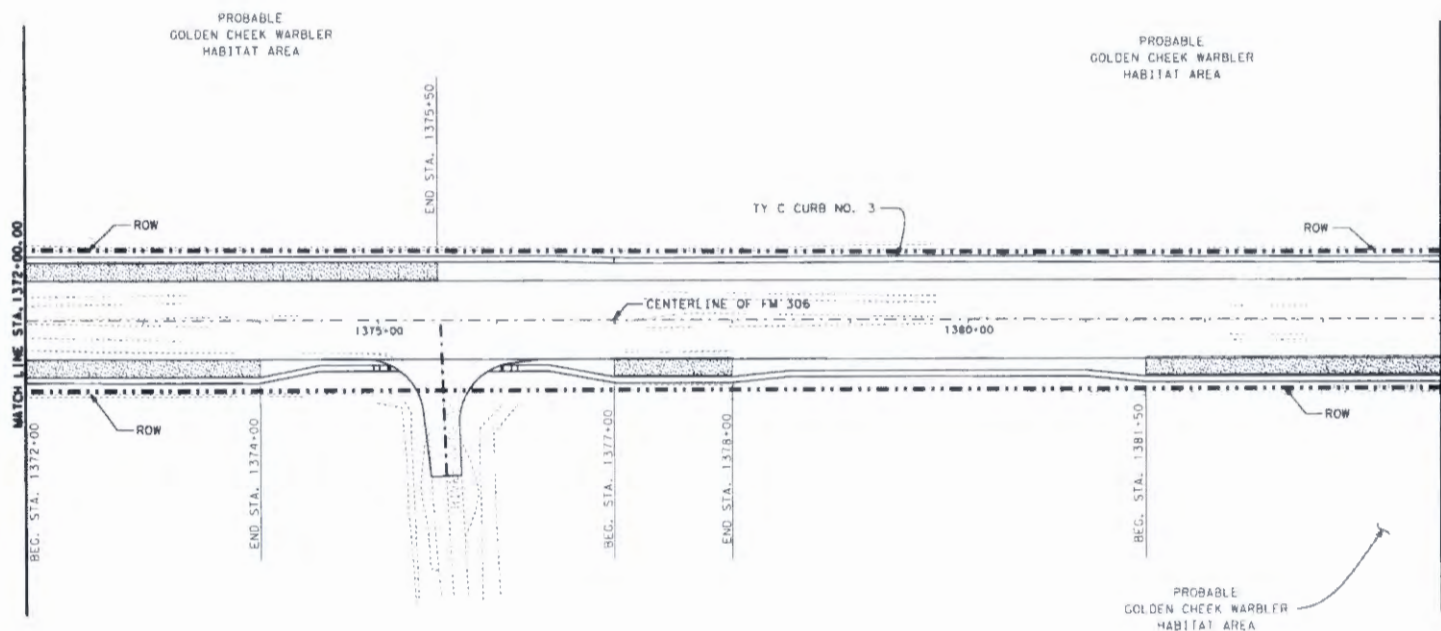
FM 306
WPAP
LAYOUTS

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LEGEND




GRASS FILTER STRIP AREA



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05/01/2015



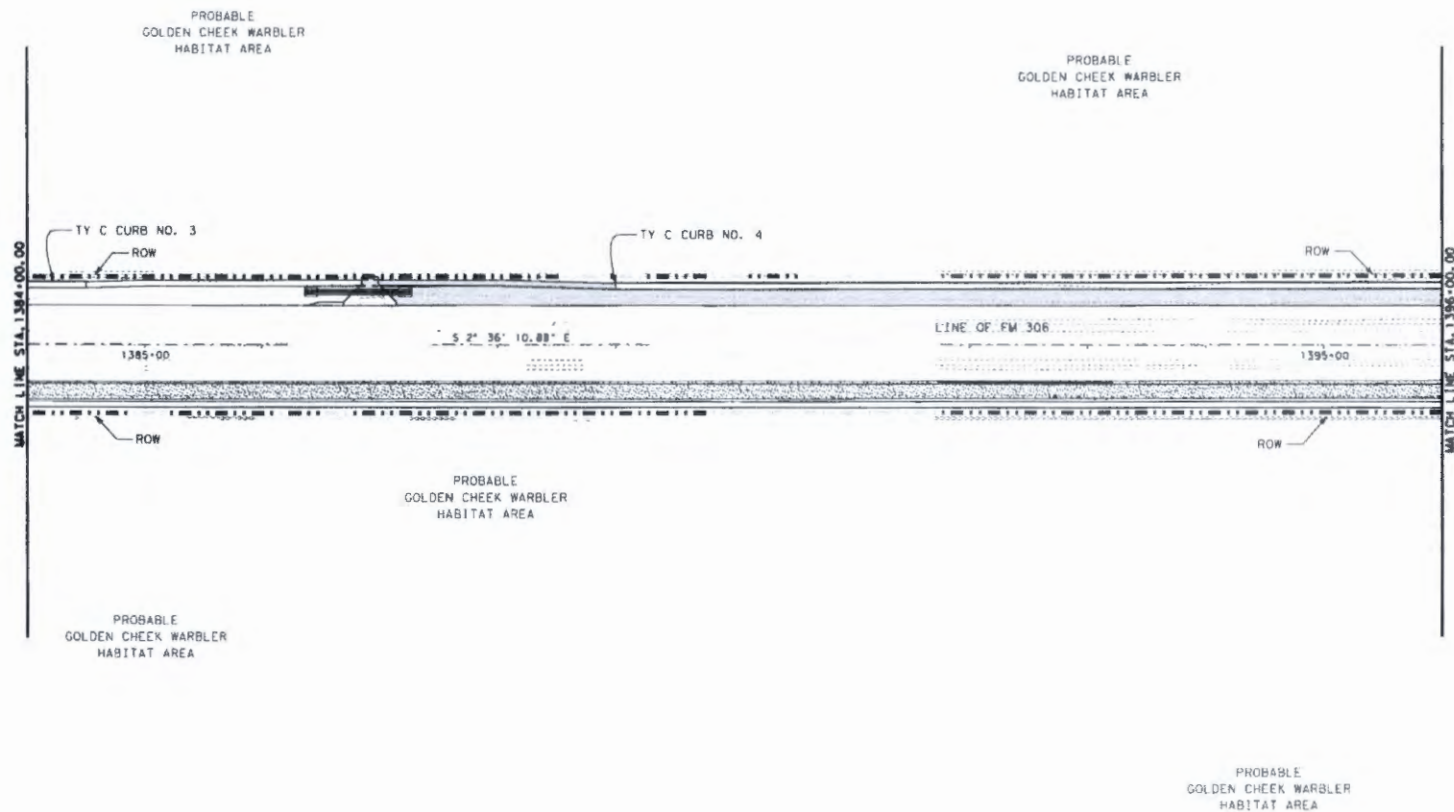
FM 306
WPAP
LAYOUTS


Texas Department of Transportation
 SHEET 4 OF 16

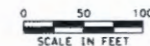
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STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTRACT SECTION	JOB	WARRANTY NO.
1728 02	058 FM 308	

LEGEND

GRASS FILTER STRIP AREA



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05/01/2015



STATE OF TEXAS
Department of Transportation

SHEET 5 OF 16

PROJECT	STP 1502 (615) MM 483
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DISTRICT	SAT
COUNTY	COMAL
SECTION	1728
DATE	02-08-15
PROJECT NO.	FM 306

FM 306
WPAP
LAYOUTS

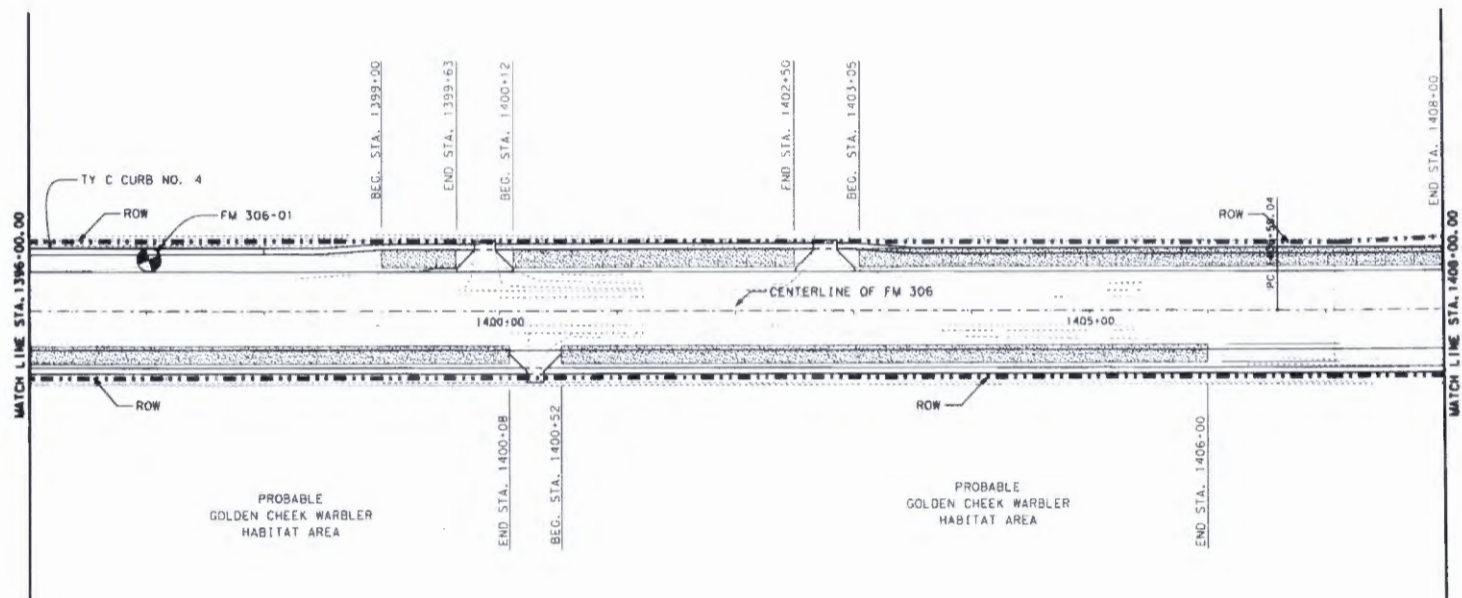
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LEGEND

-  GRASS FILTER STRIP AREA
-  GEOLOGIC FEATURE



PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA

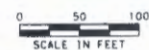
PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



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07/09/2015



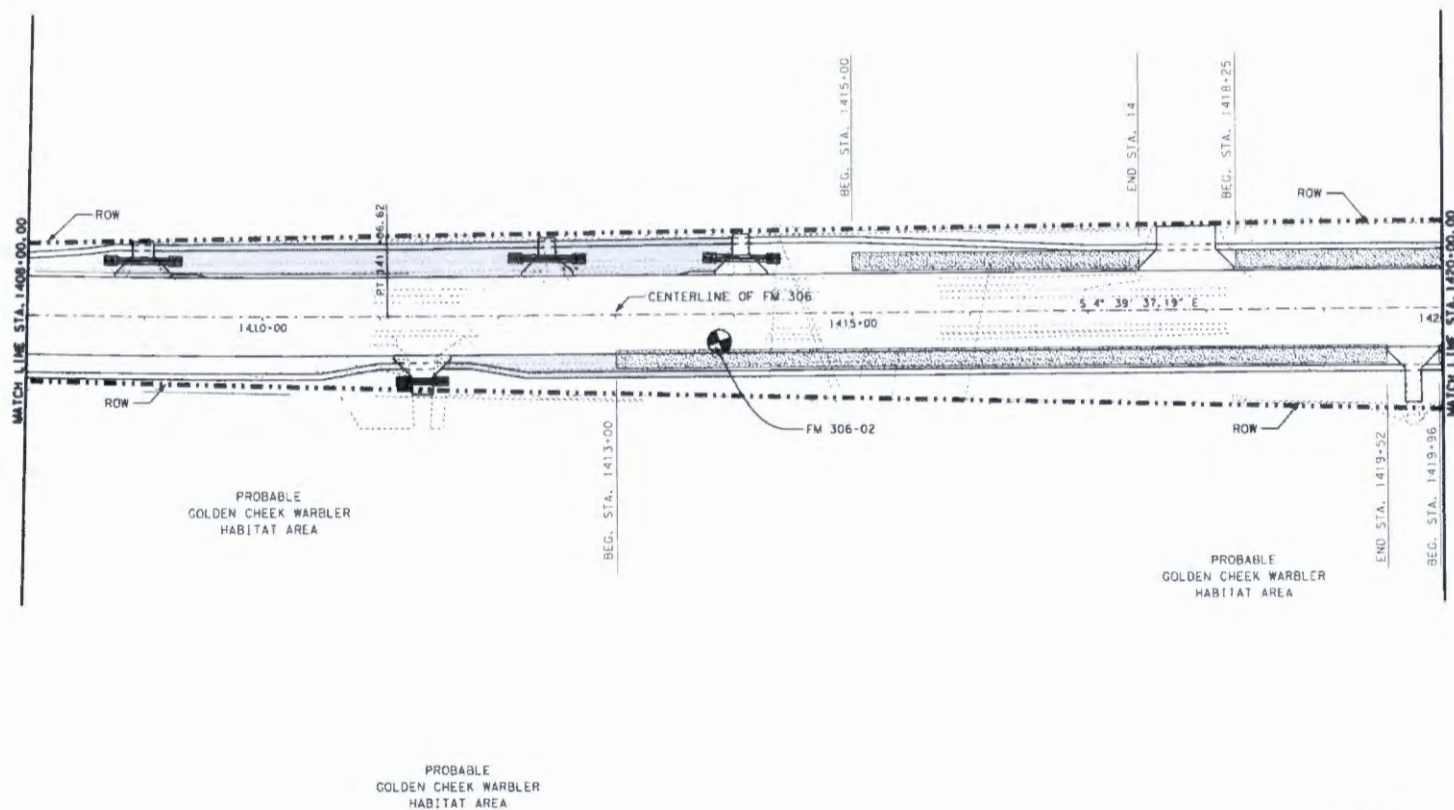
FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
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SECTION	SUBSECTION	PROJECT NO.	
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- GRASS FILTER STRIP AREA
- GEOLOGIC FEATURE



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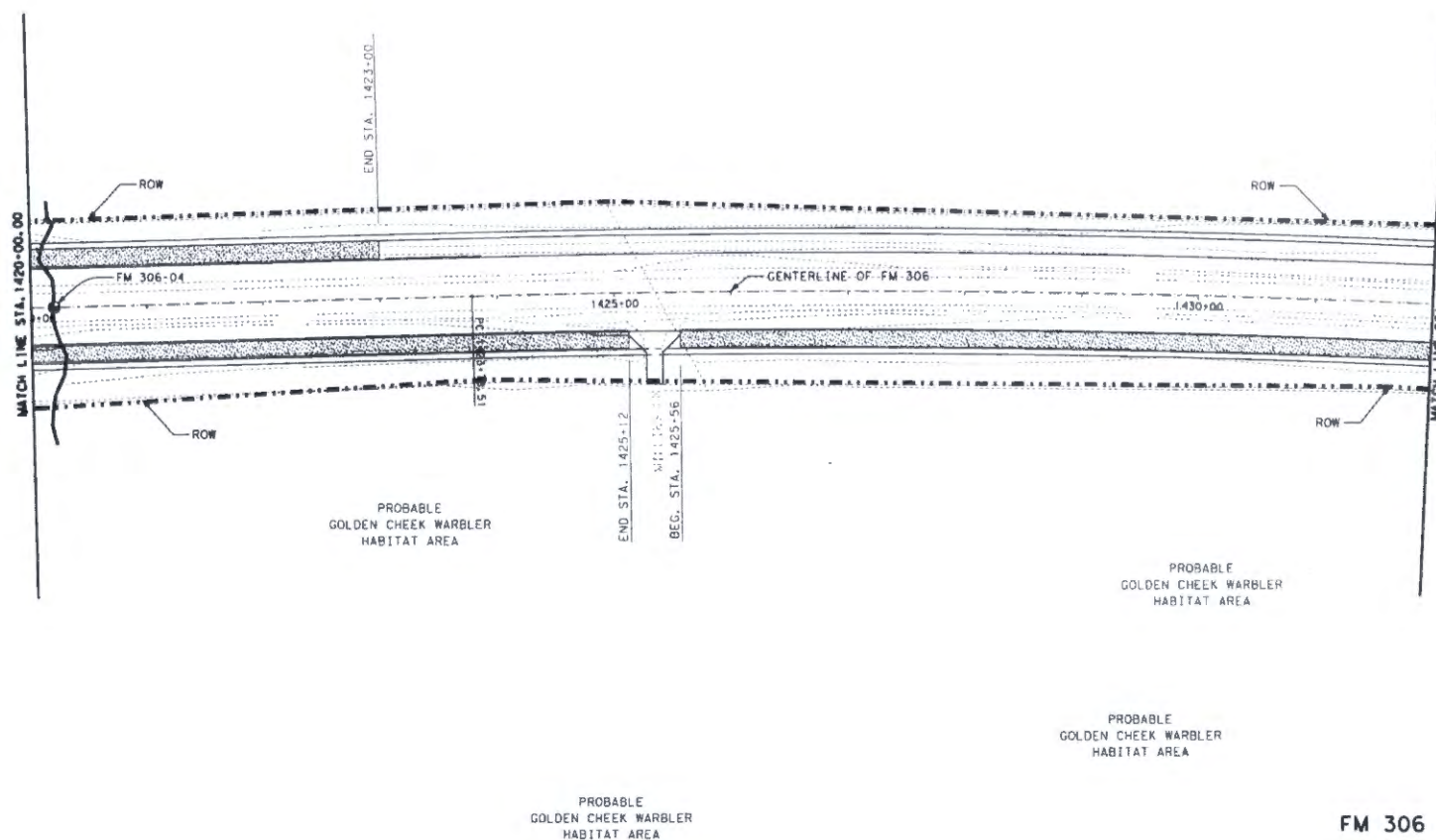
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FM 306
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LAYOUTS

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DATE	02	058	FM 306

LEGEND

- GRASS FILTER STRIP AREA
- GEOLOGIC FEATURE



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07/09/2015

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FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
SHEET 8 OF 16			
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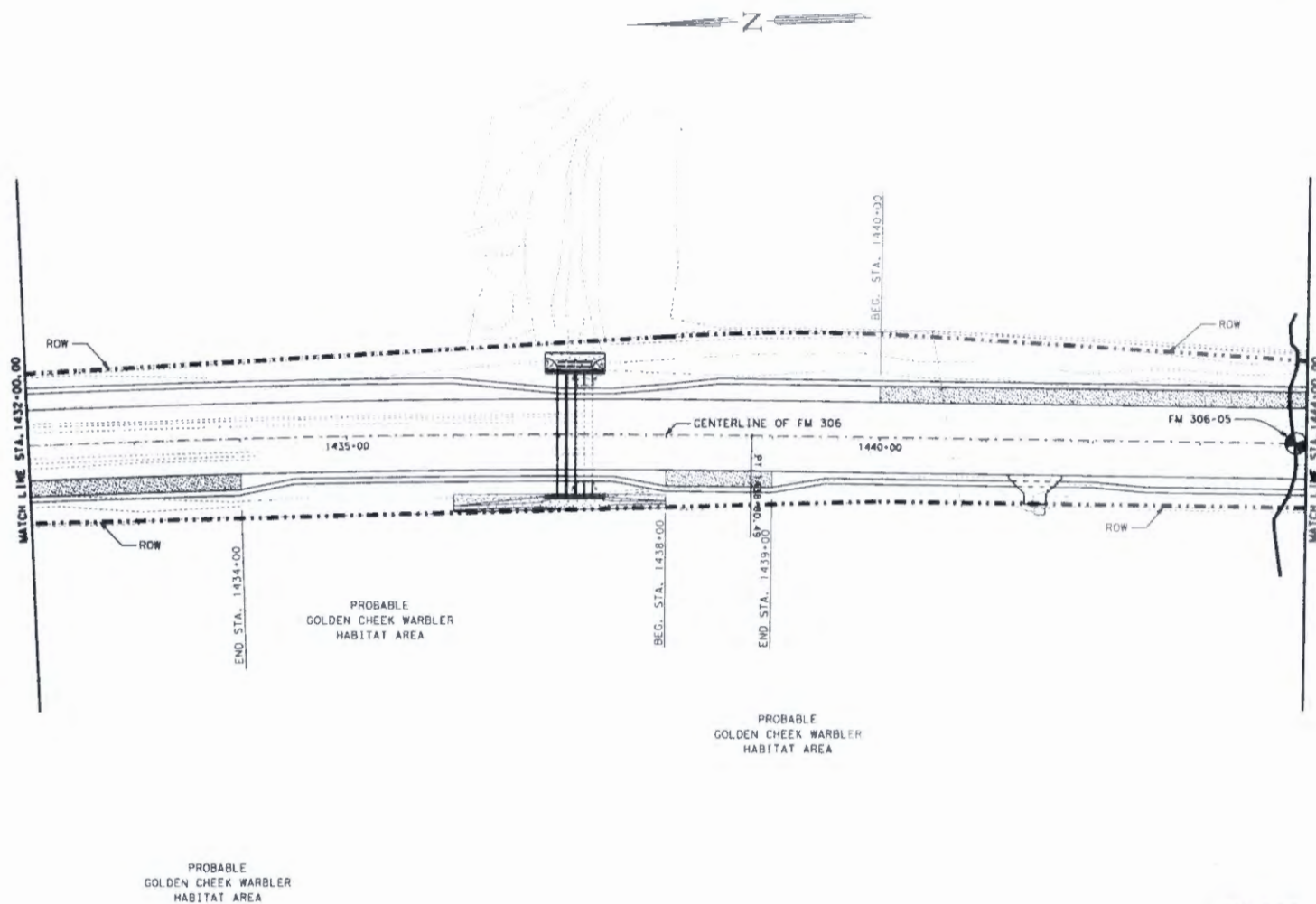
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GRASS FILTER STRIP AREA



GEOLOGIC FEATURE



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07/09/2015

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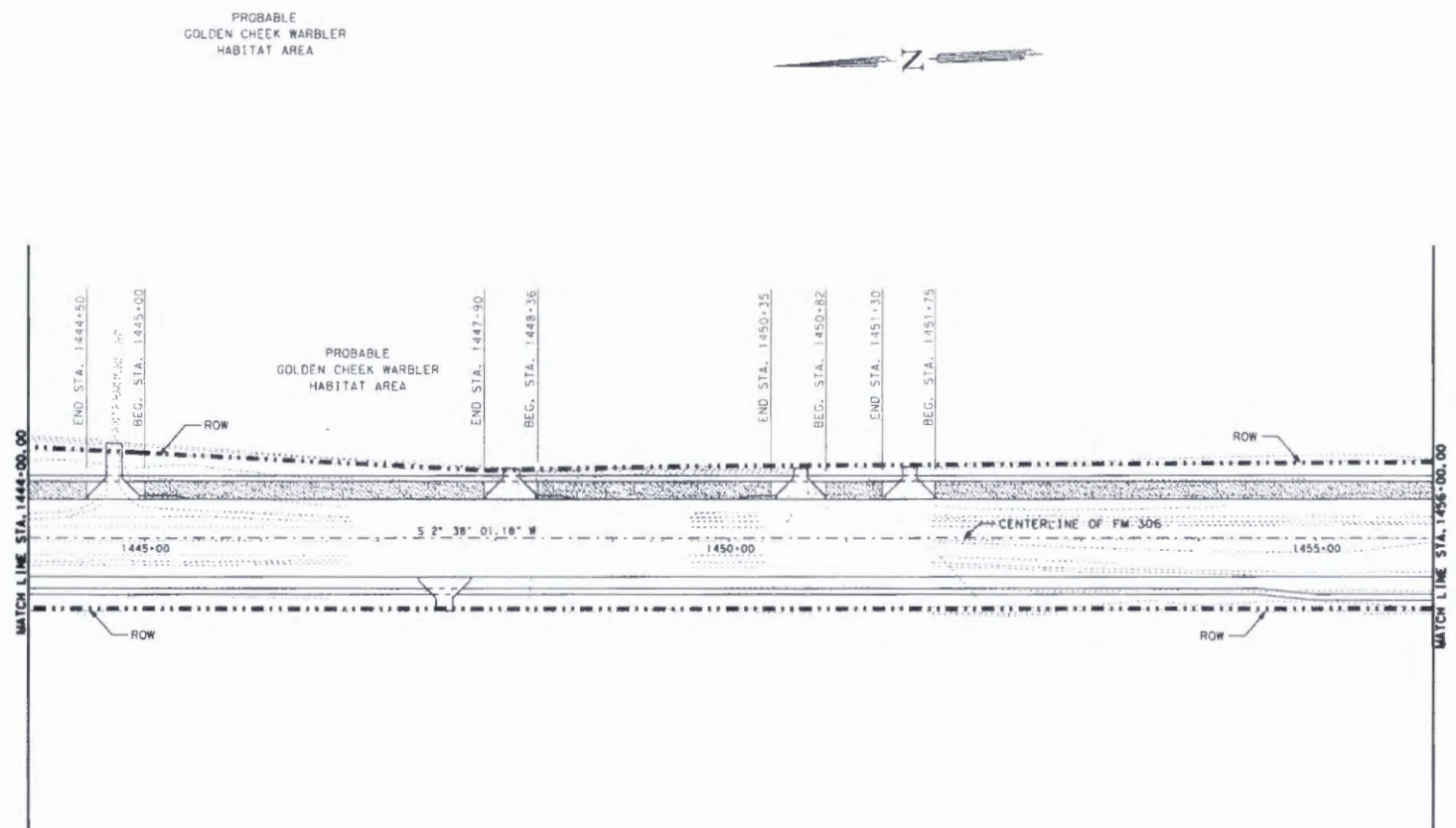
FM 306
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LAYOUTS

Texas Department of Transportation			
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SECTION	SECTION	SECTION	
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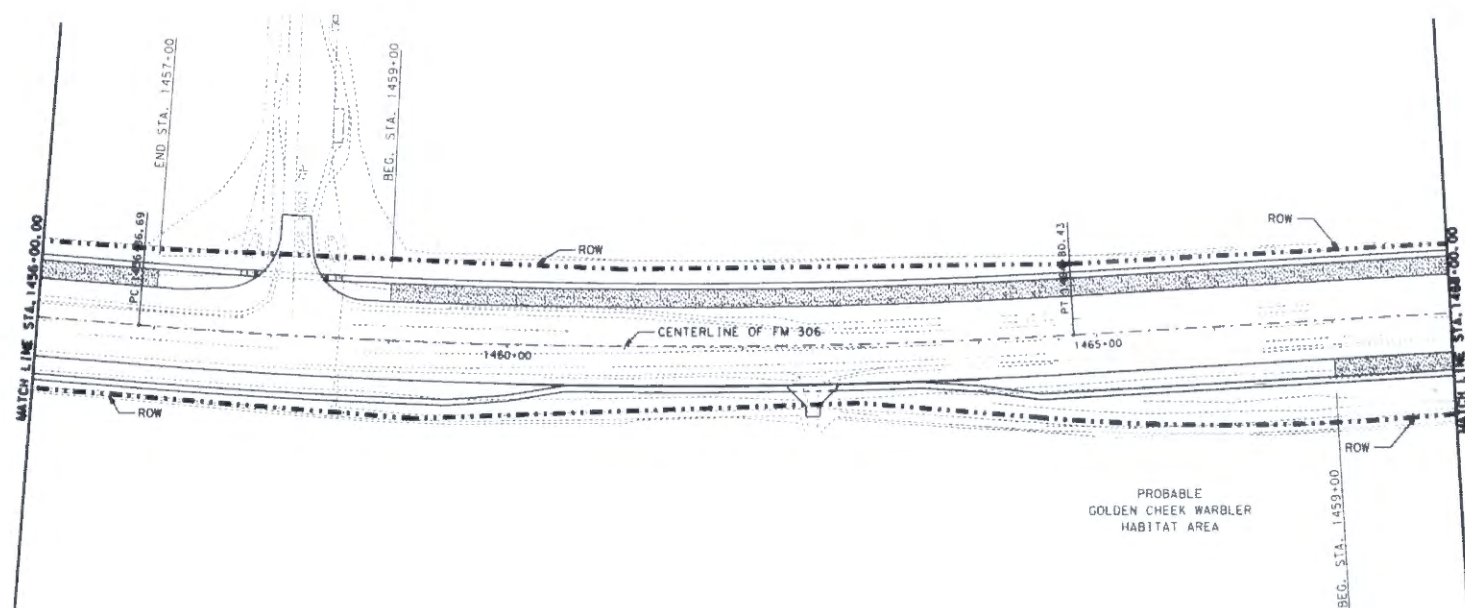
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05/01/2015

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SCALE IN FEET

FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
SHEET 10 OF 16			
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STP 1502 (615) LM	498		
STATE	COUNTY		
TEXAS	SAT COMAL		
CONTRACT	SECTION	APP	PROJECT NO.
1728	02	058	FM 306

LEGEND

 GRASS FILTER STRIP AREA

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA


PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



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05/01/2015

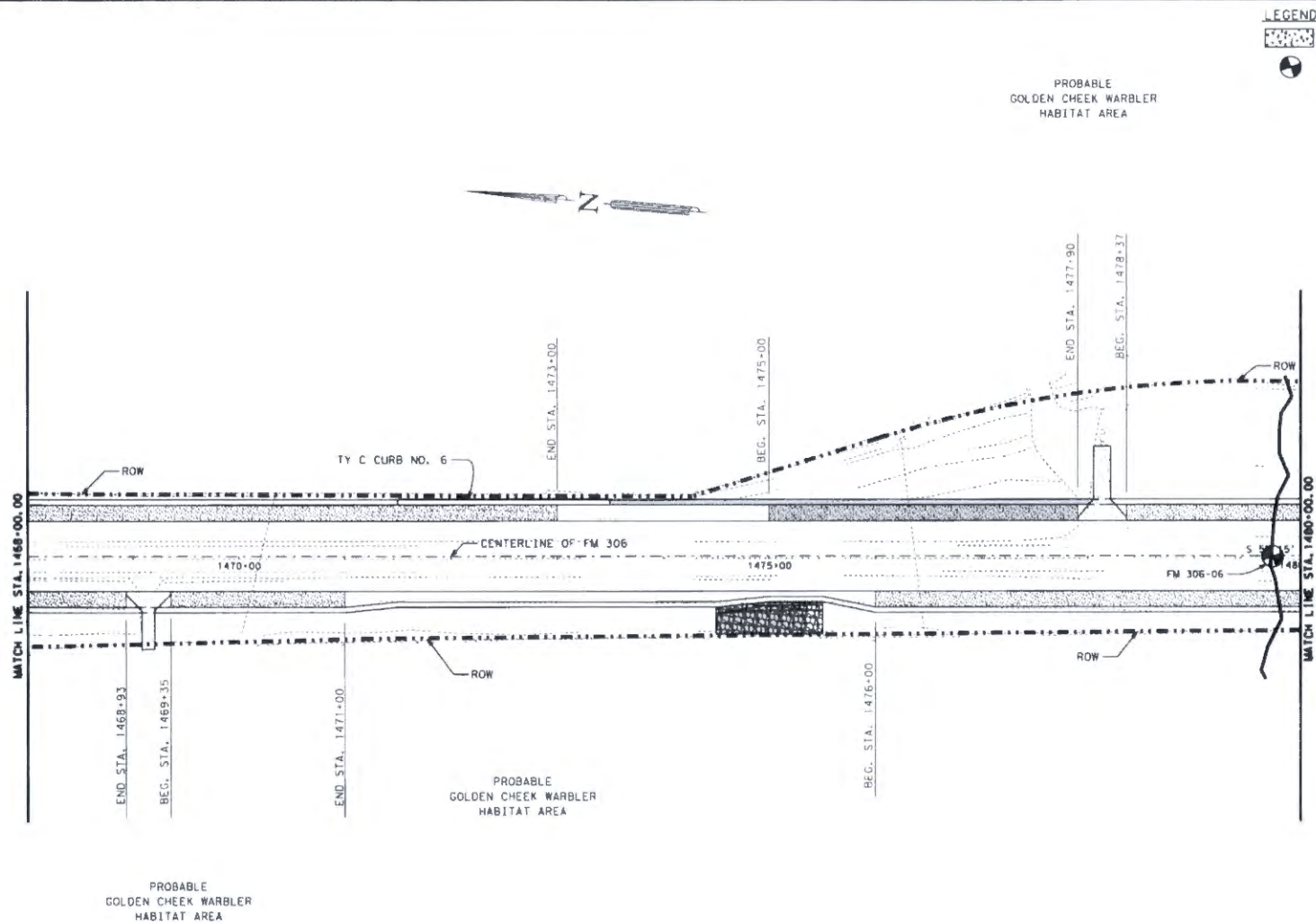



 Texas Department of Transportation
 SHEET 13 OF 16

FROM TEXAS DIVISION	FEDERAL AID PROJECT NO.	SHEET NO.
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TEXAS	SAT	COMAL
CONTRACT	SECTION	JOB
1728	02	05B
		HIGHWAY NO.
		FM 306

FM 306
WPAP
LAYOUTS

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LEGEND

- GRASS FILTER STRIP AREA
- GEOLOGIC FEATURE



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07/09/2015

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FM 306
WPAP
LAYOUTS

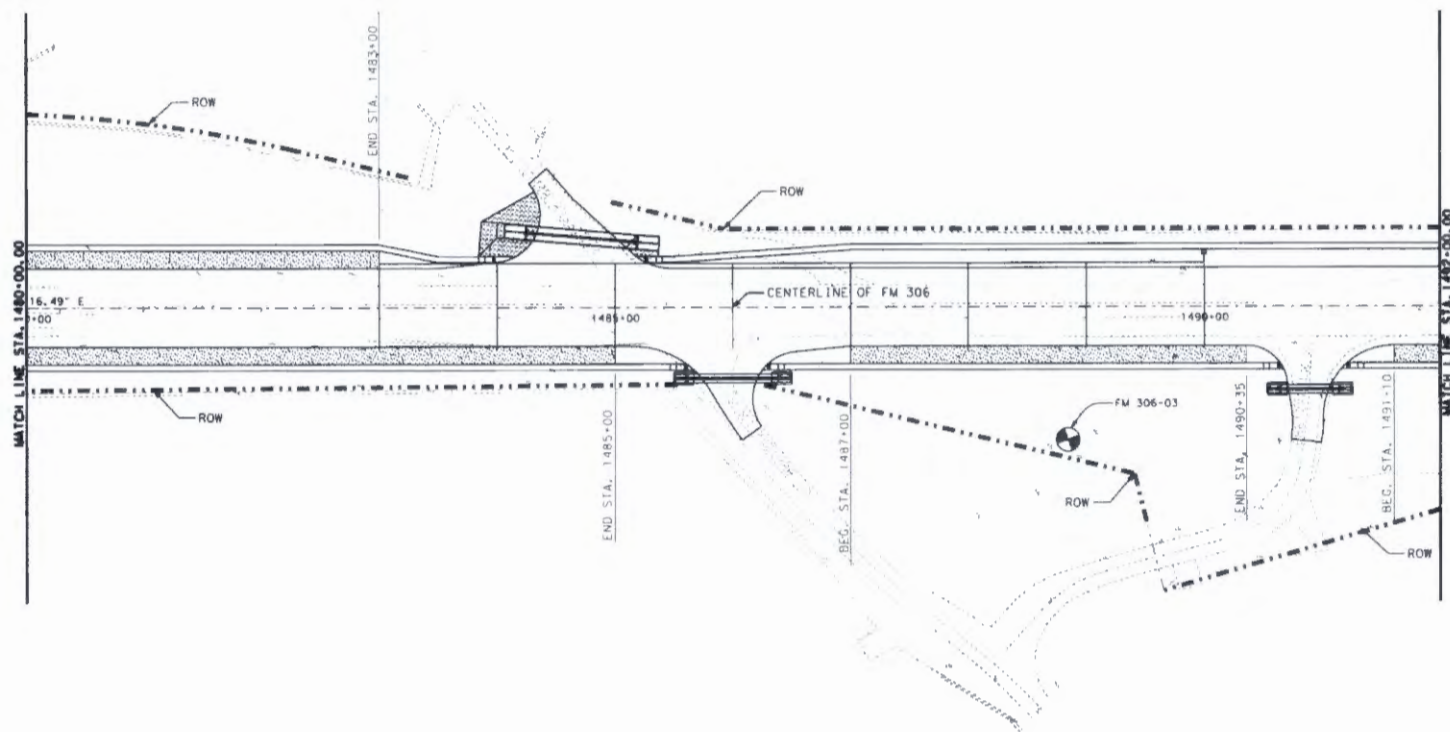
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TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	ALTERNATE NO.
1728	02	058	FM 306

LEGEND

- GRASS FILTER STRIP AREA
- GEOLOGIC FEATURE

PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA

N



PROBABLE
GOLDEN CHEEK WARBLER
HABITAT AREA



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07/09/2015

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SCALE IN FEET

Texas Department of Transportation			
SHEET 13 OF 16			
PROJECT	STP 1502 (615) LM 450	SHEET	13
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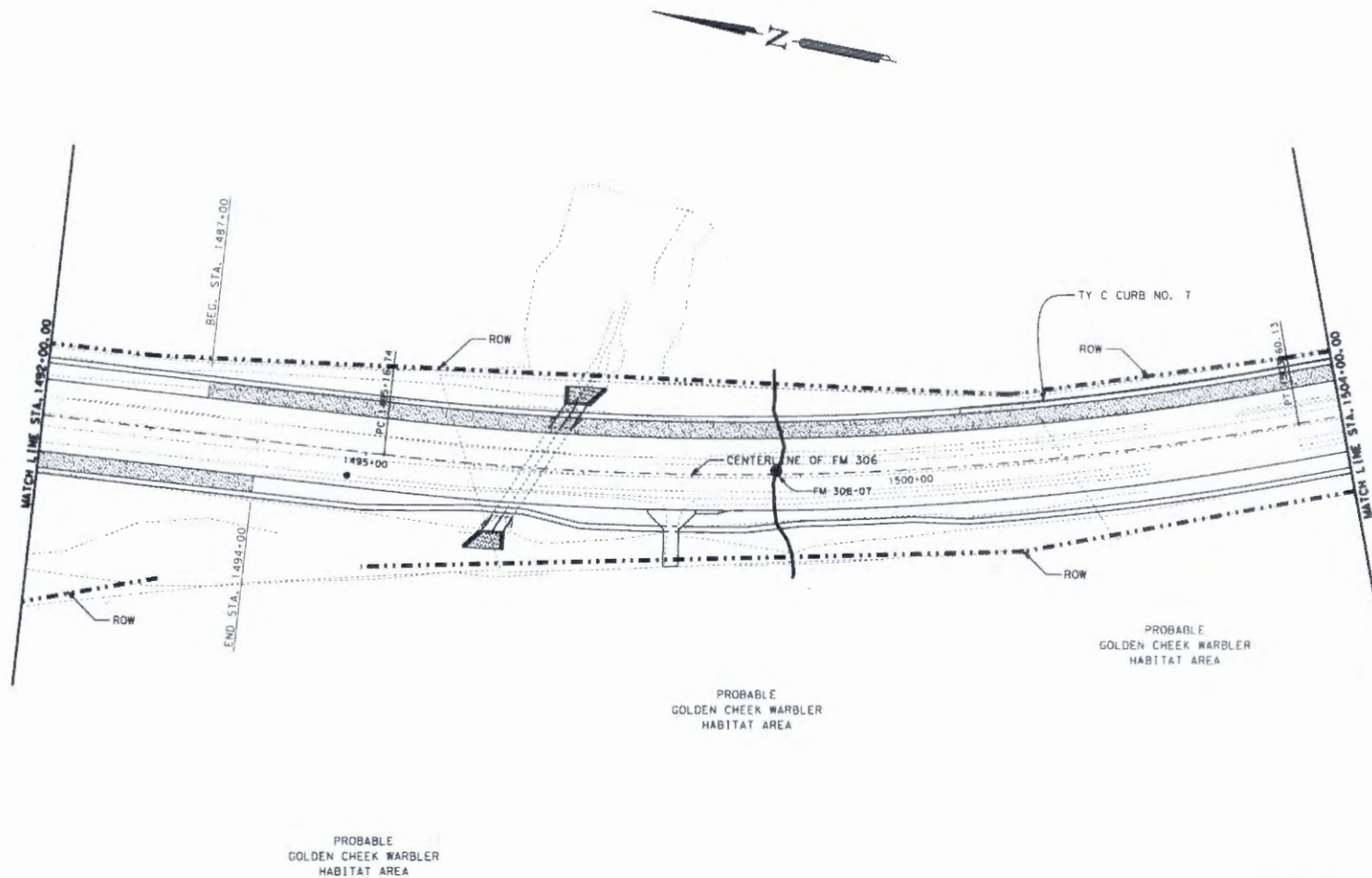
FM 306
WPAP
LAYOUTS

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LEGEND

- GRASS FILTER STRIP AREA
- GEOLOGIC FEATURE



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07/09/2015

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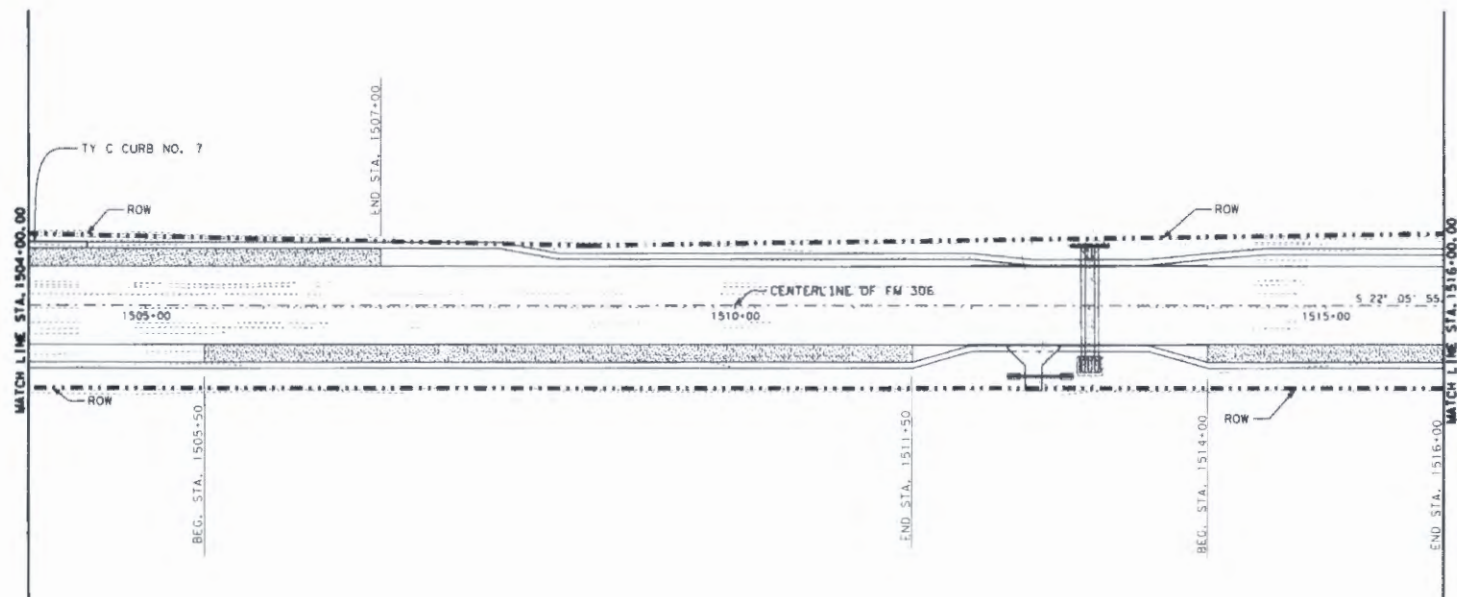
FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
SHEET 14 OF 16			
STATE	COUNTY	FEDERAL AID PROJECT NO.	SHEET NO.
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CONTRACT	SECTION	JOB	PIECESHEET NO.
1728	02	058	FM 306

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LEGEND

 GRASS FILTER STRIP AREA



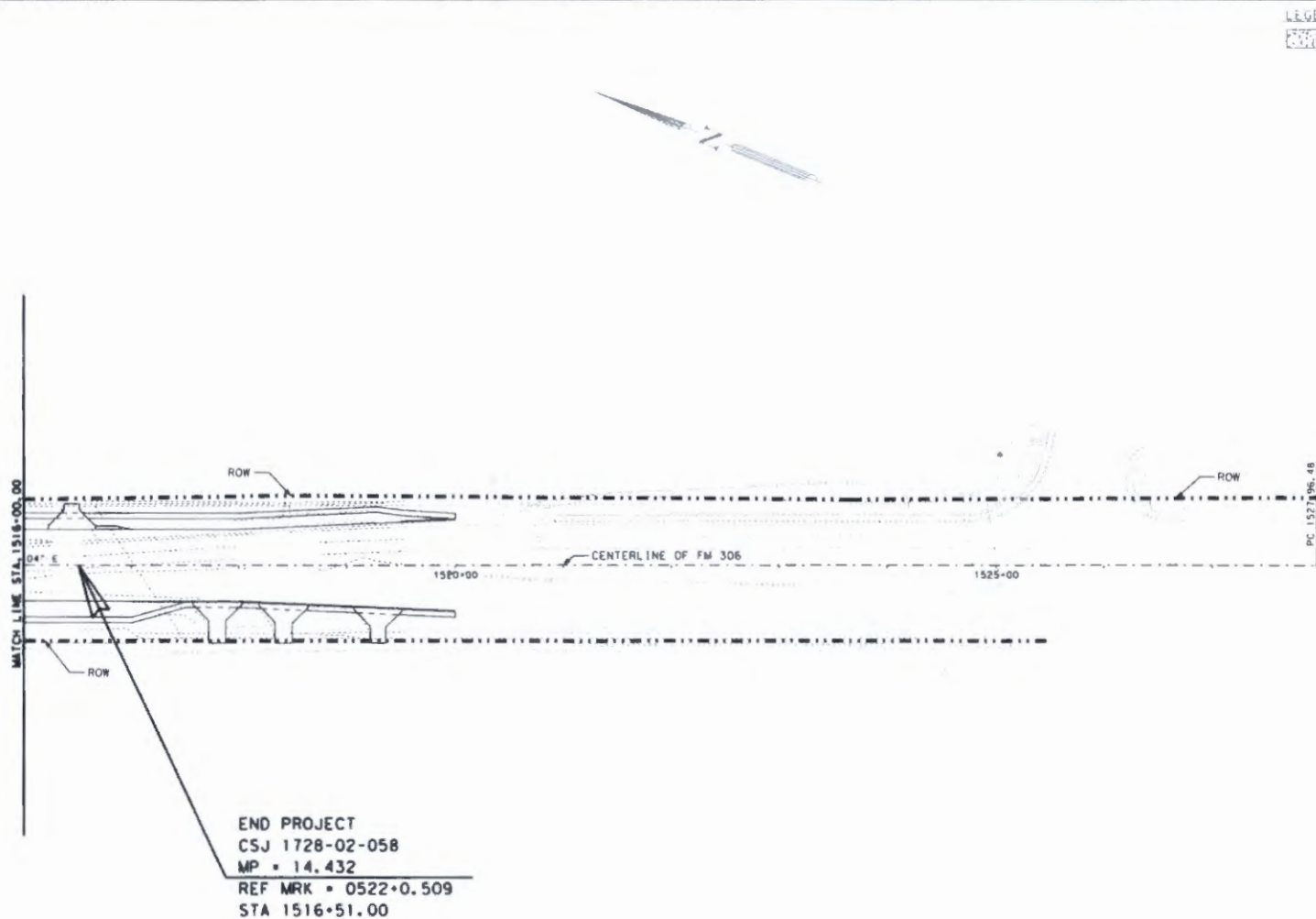
Linda Cox, P.E.
05/01/2015

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FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
SHEET 15 OF 16			
PROJECT	STP 1502 (615) LM 493	DATE	05/01/2015
STATE	TEXAS	COUNTY	SAT
SECTION	COMAL	JOB	1728 02 058
CONTRACT	FM 306	DESIGNER	

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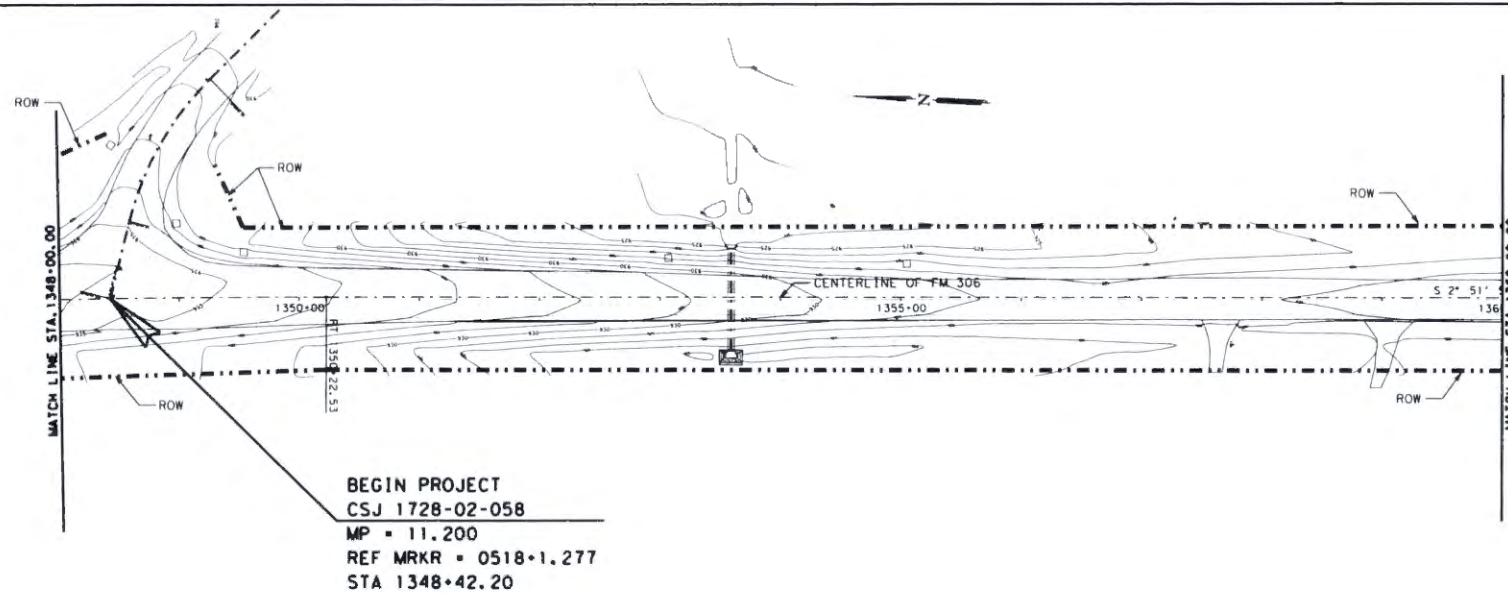
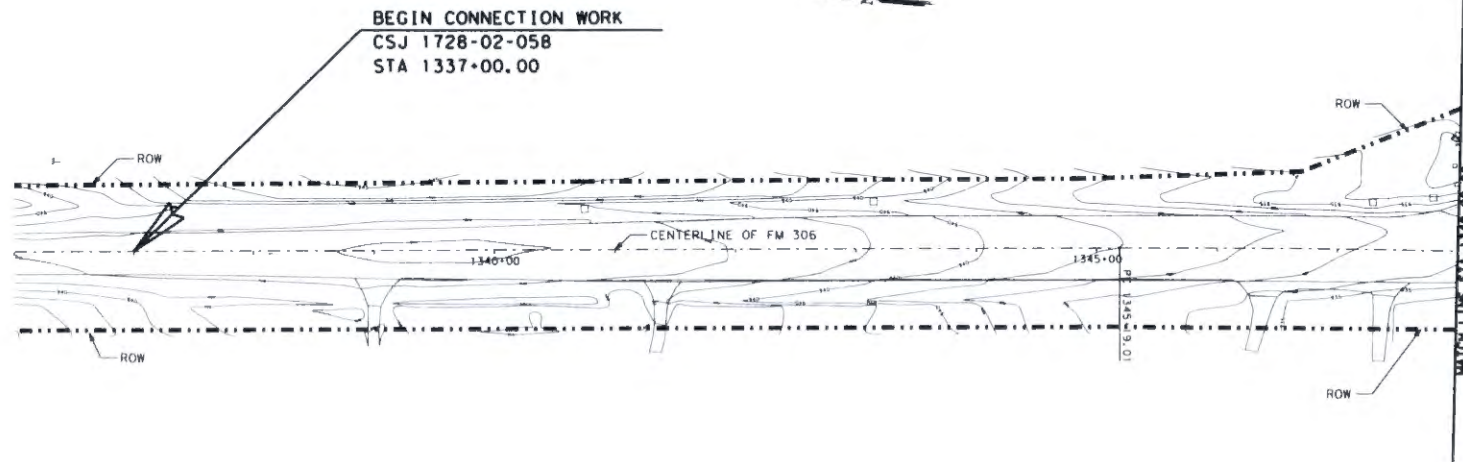
Linda Cox, PE
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FM 306
WPAP
LAYOUTS

Texas Department of Transportation			
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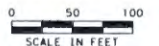
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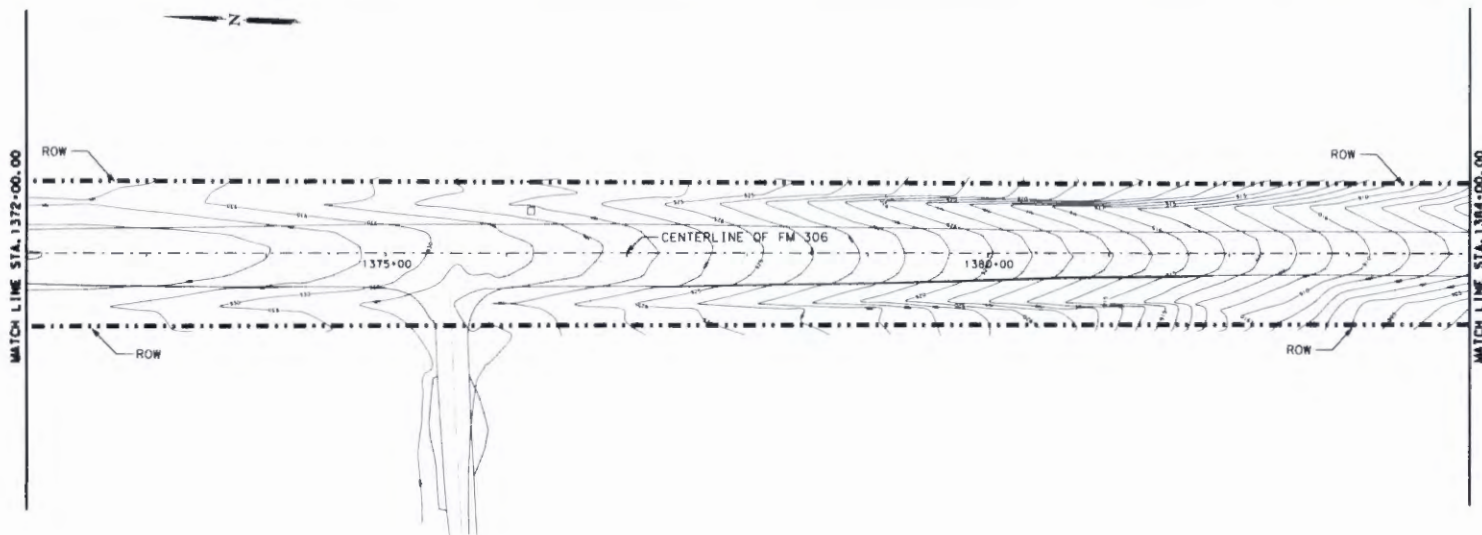
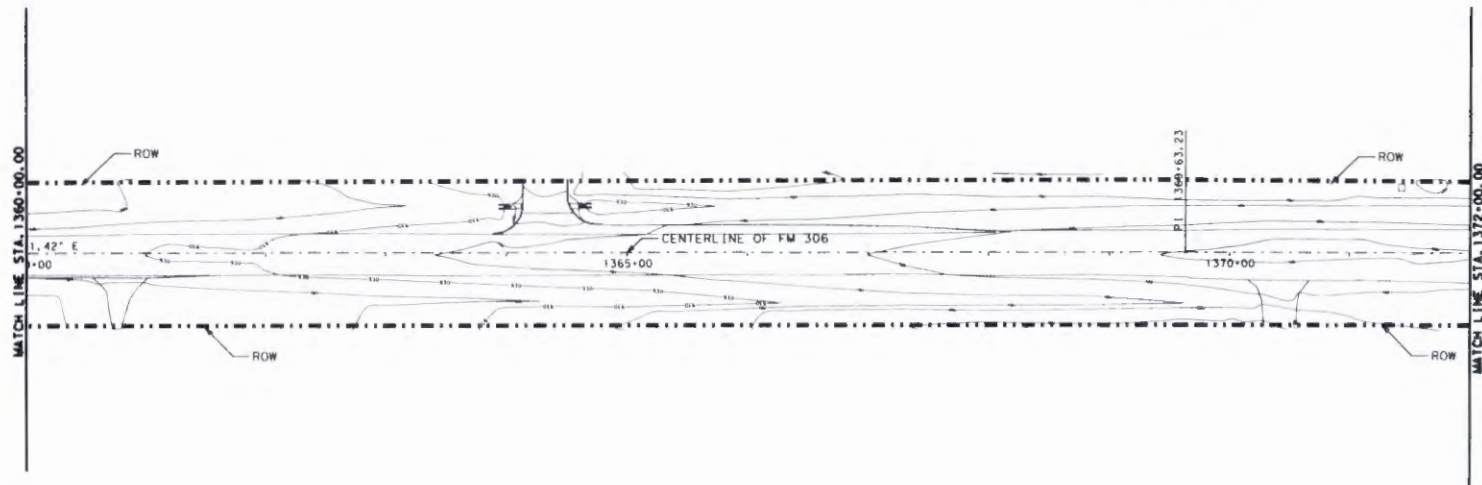
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FM 306 EXISTING CONTOUR SHEETS



SHEET 1 OF 8			
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TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
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05/01/2015

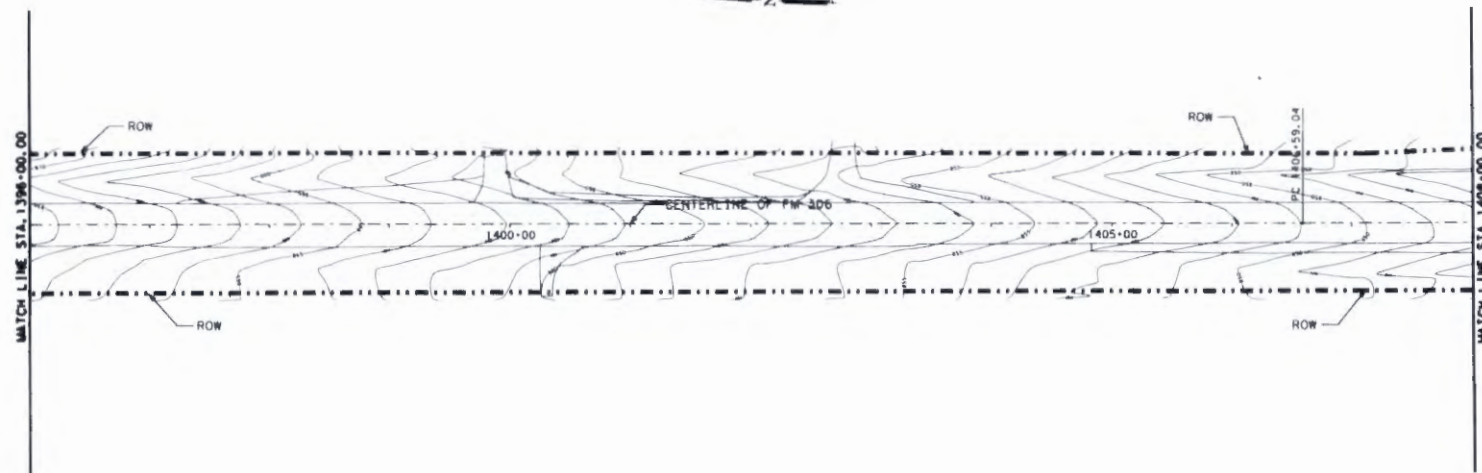
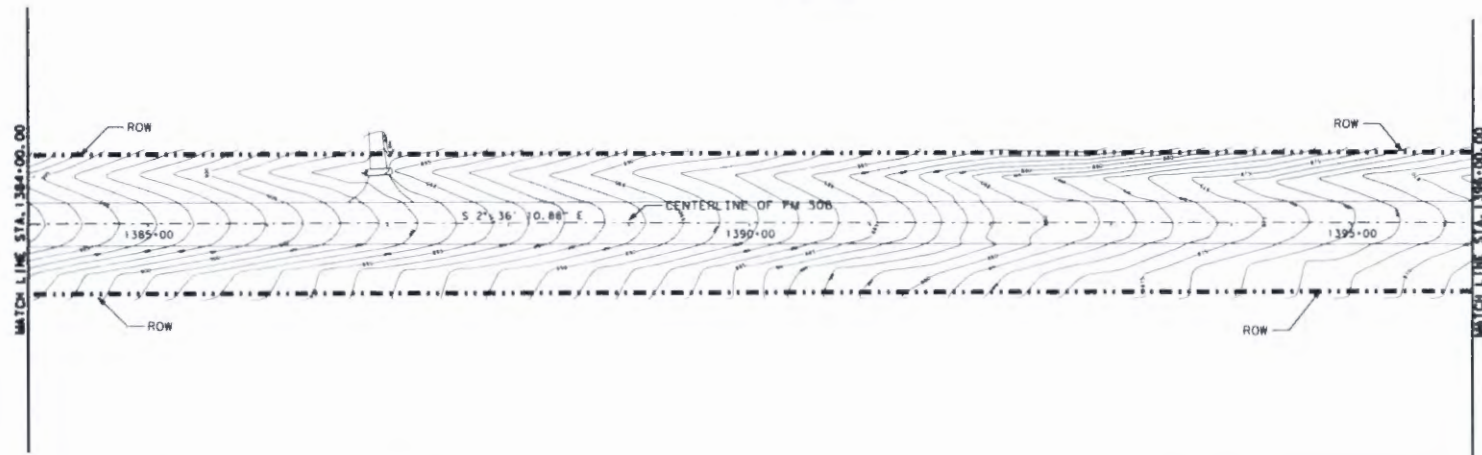
FM 306 EXISTING CONTOUR SHEETS

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SCALE IN FEET

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SHEET 2 OF 8

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STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTROL	SECTION	JOB
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		FM 306

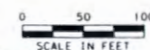
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05/01/2015

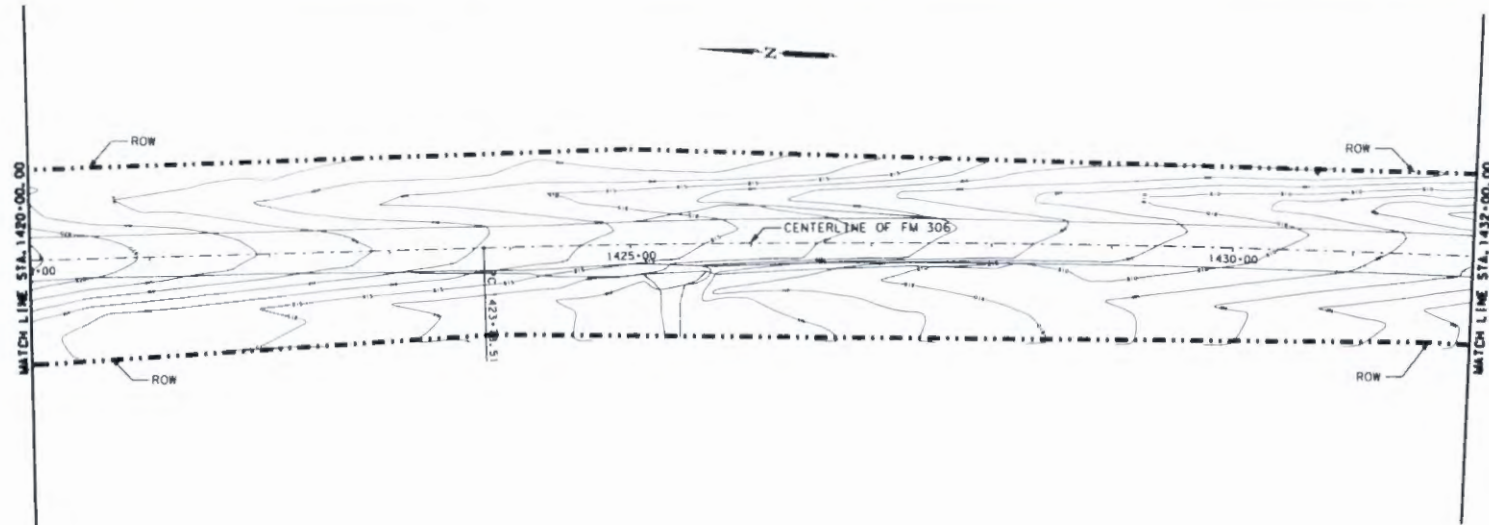
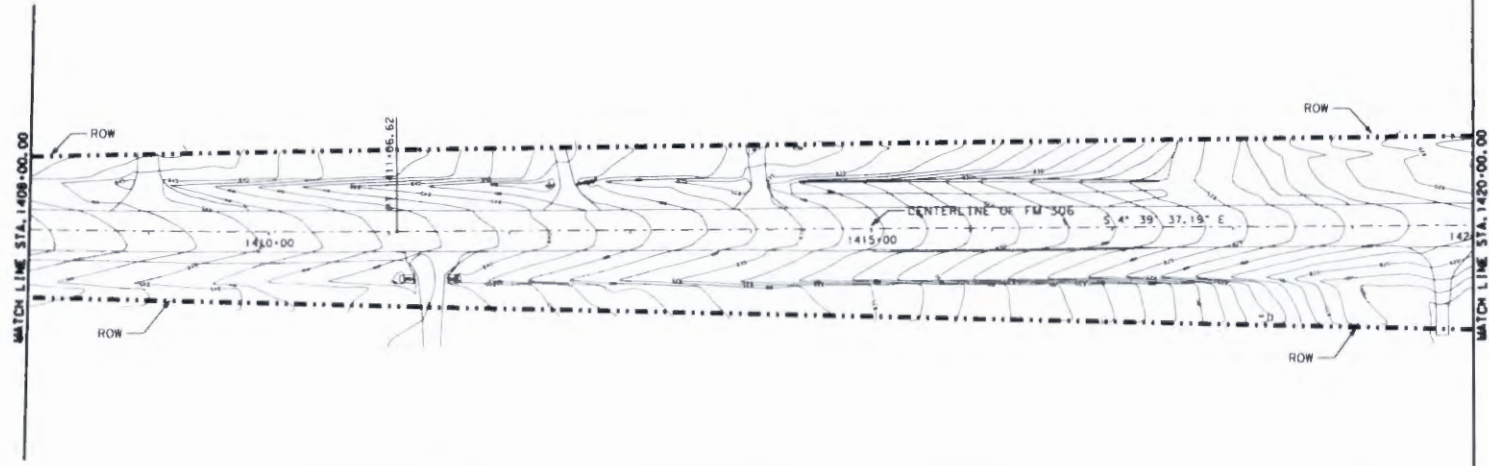
FM 306 EXISTING CONTOUR SHEETS



Texas Department of Transportation

SHEET 3 OF 8			
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TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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05/01/2015

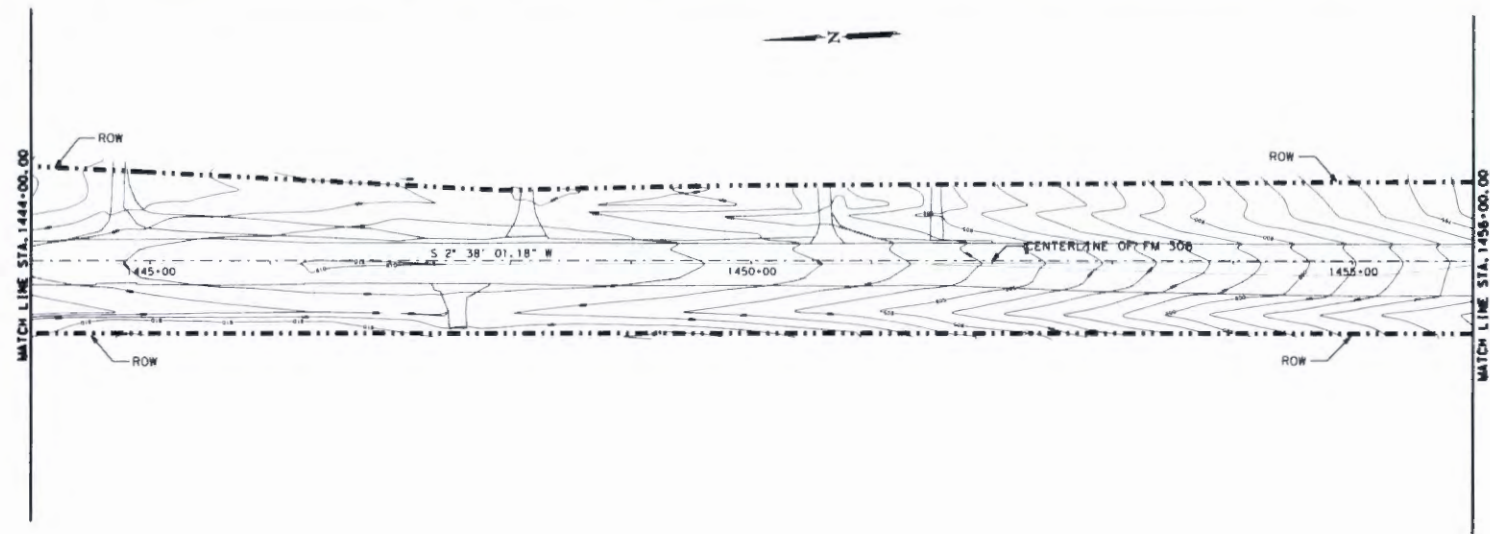
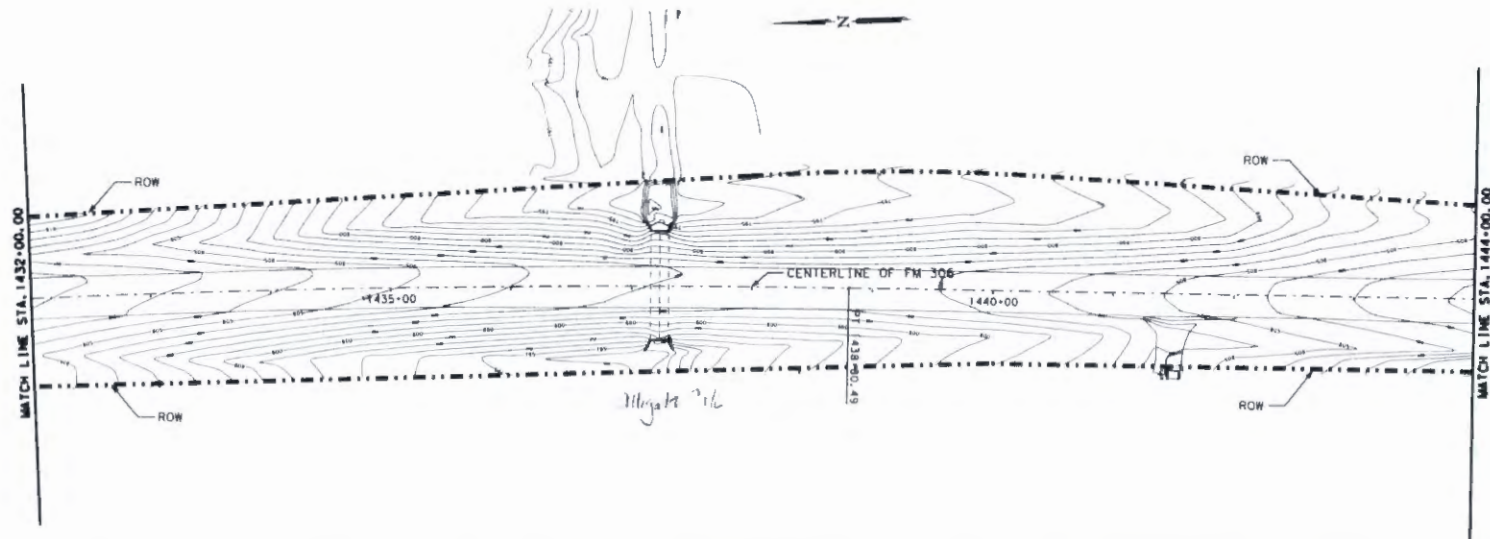
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Texas Department of Transportation

SHEET 4 OF 8			
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STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL SECTION	JOB	HIGHWAY NO.	
1728	02	058	FM 306

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Linda Cox, P.E.

05/01/2015

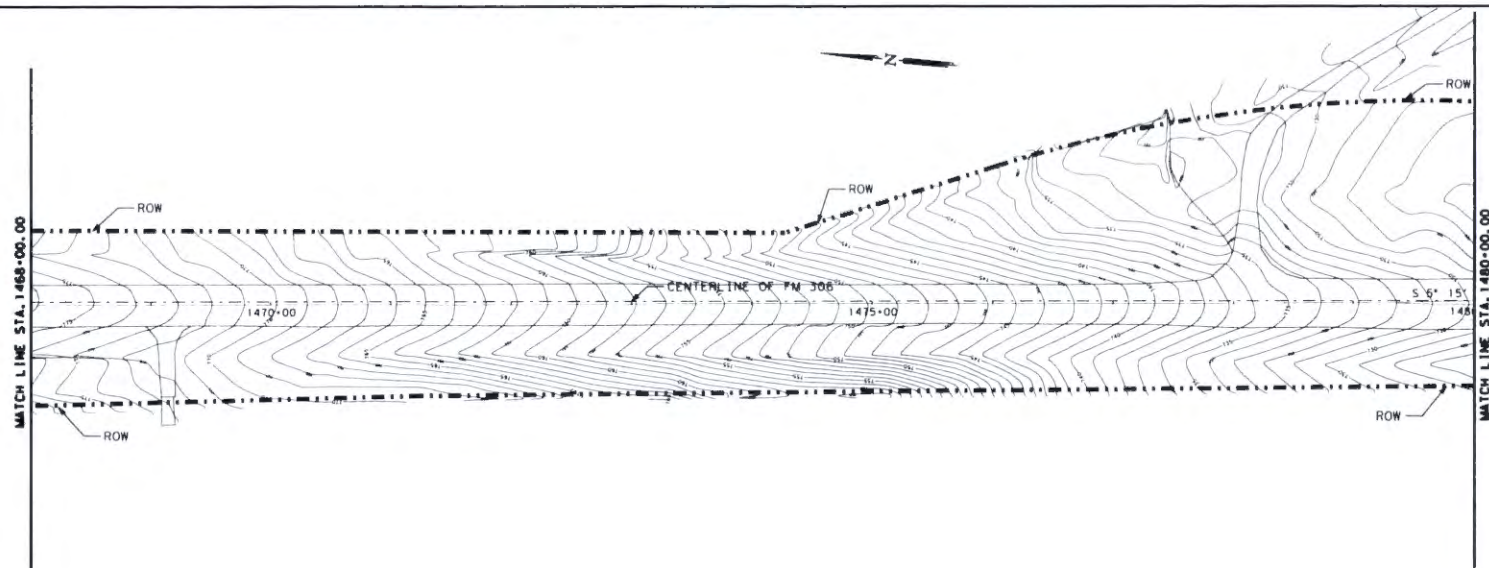
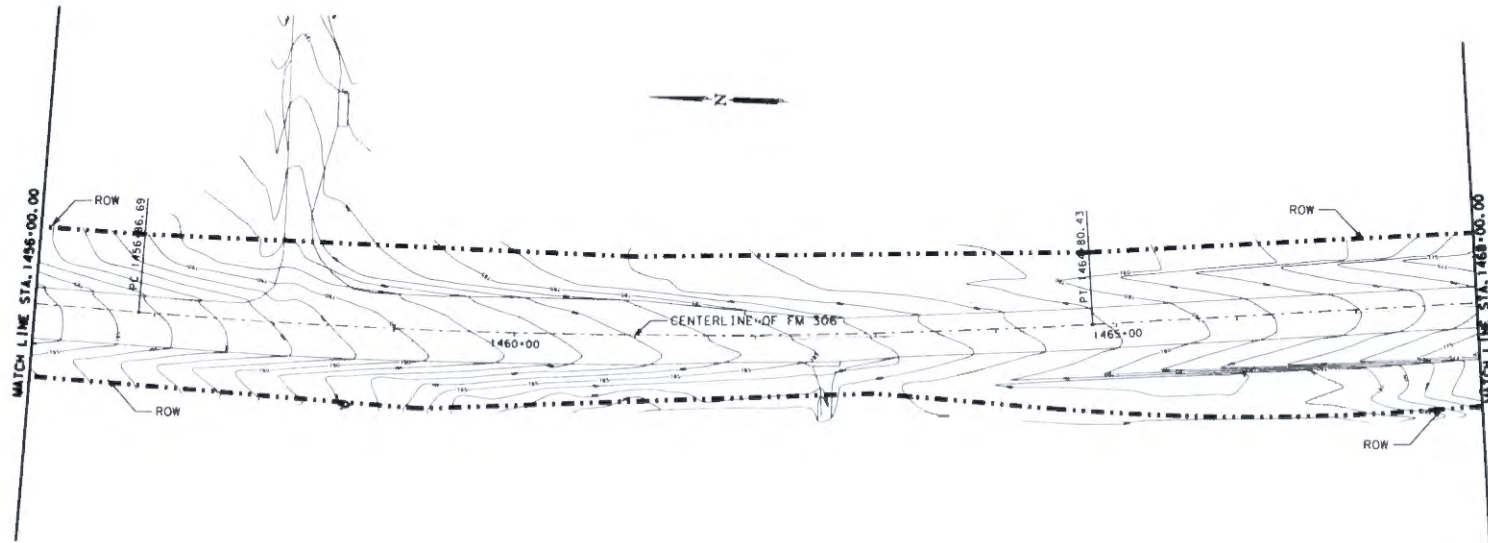
FM 306 EXISTING CONTOUR SHEETS

0 50 100
SCALE IN FEET

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SHEET 5 OF 8

FEDERAL AID PROJECT NO.	STP 1502 (615) MM		SHEET NO.
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO
1728	02	058	FM 306

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05/01/2015

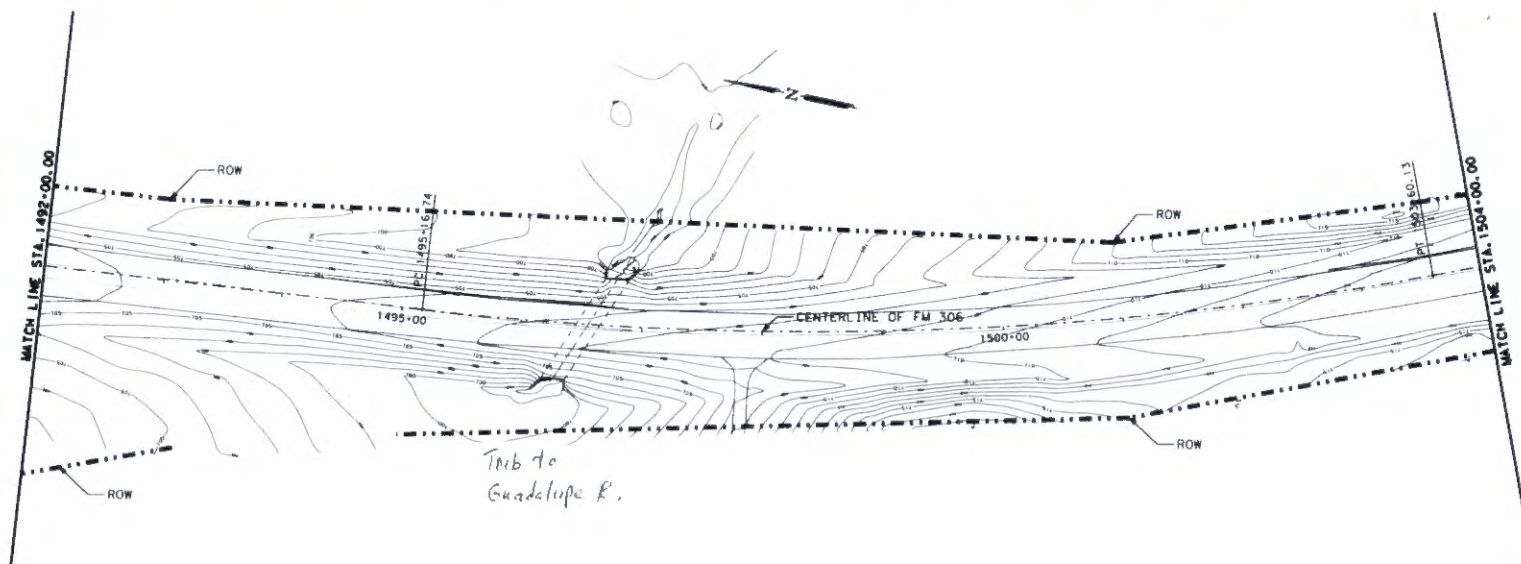
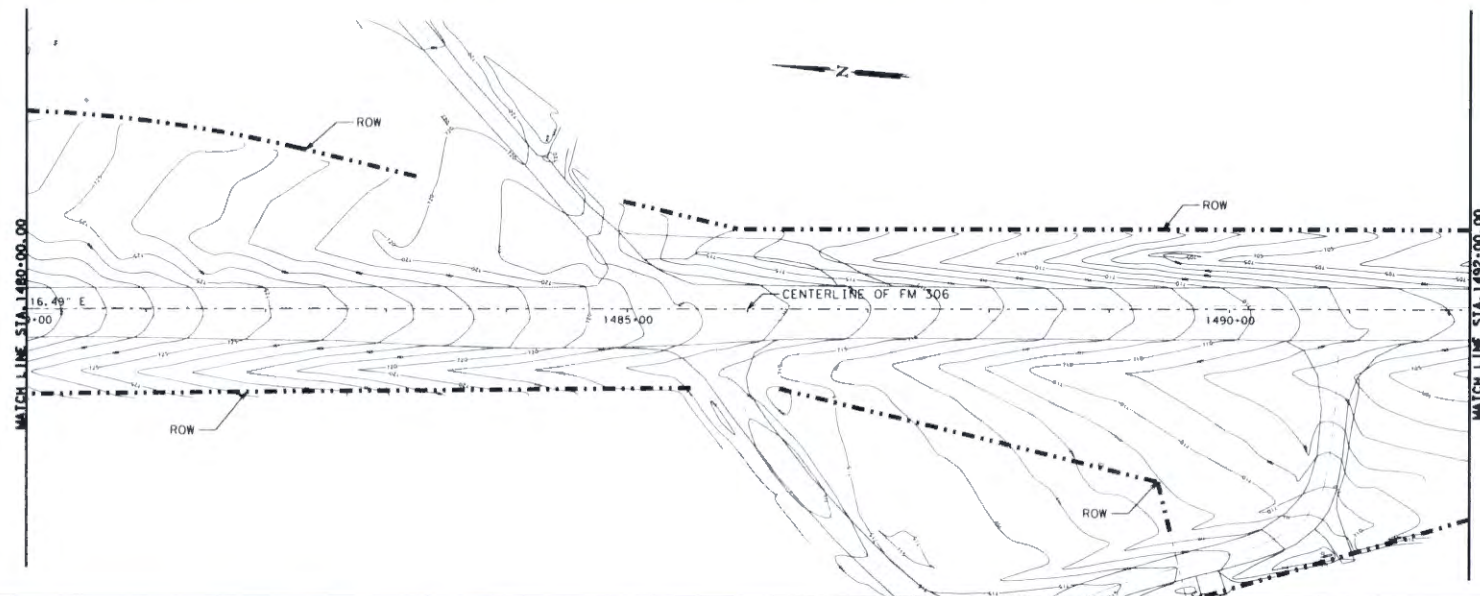
FM 306 EXISTING CONTOUR SHEETS



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 SHEET 6 OF 8

FEDERAL AID PROJECT NO.	STP 1502 (615) MM
STATE DISTRICT	TEXAS SAT
COUNTY	COMAL
CONTROL SECTION	1728 02 058
HIGHWAY NO.	FM 306

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05/01/2015

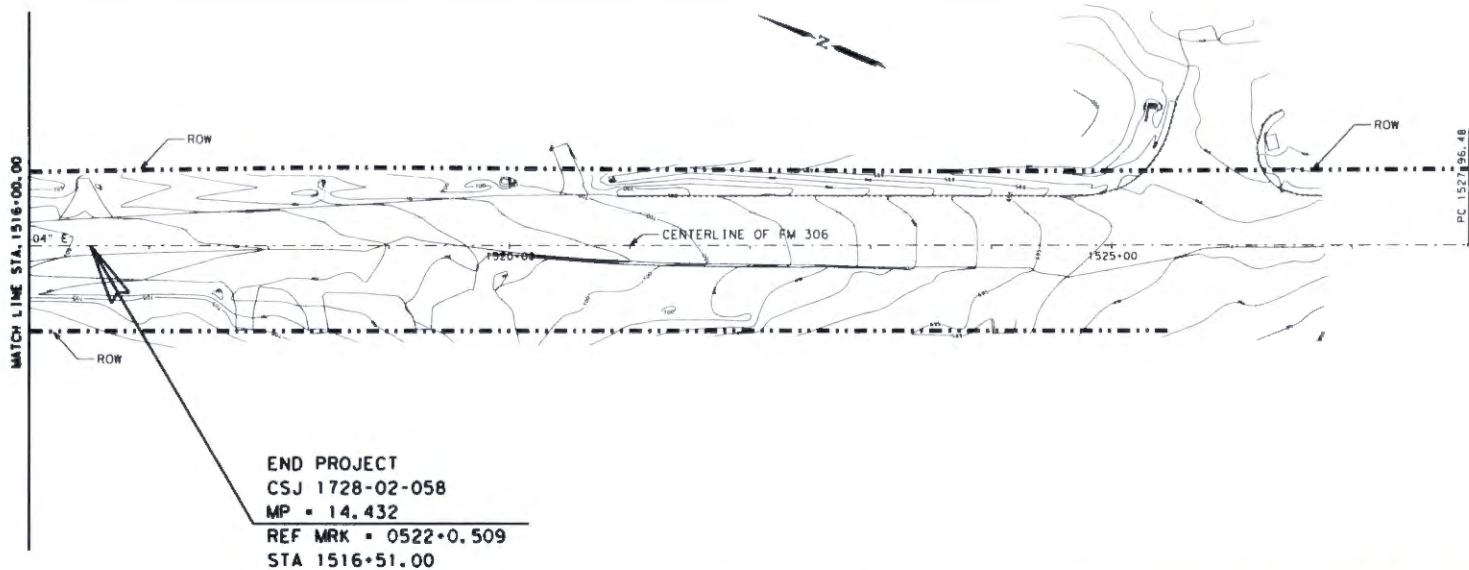
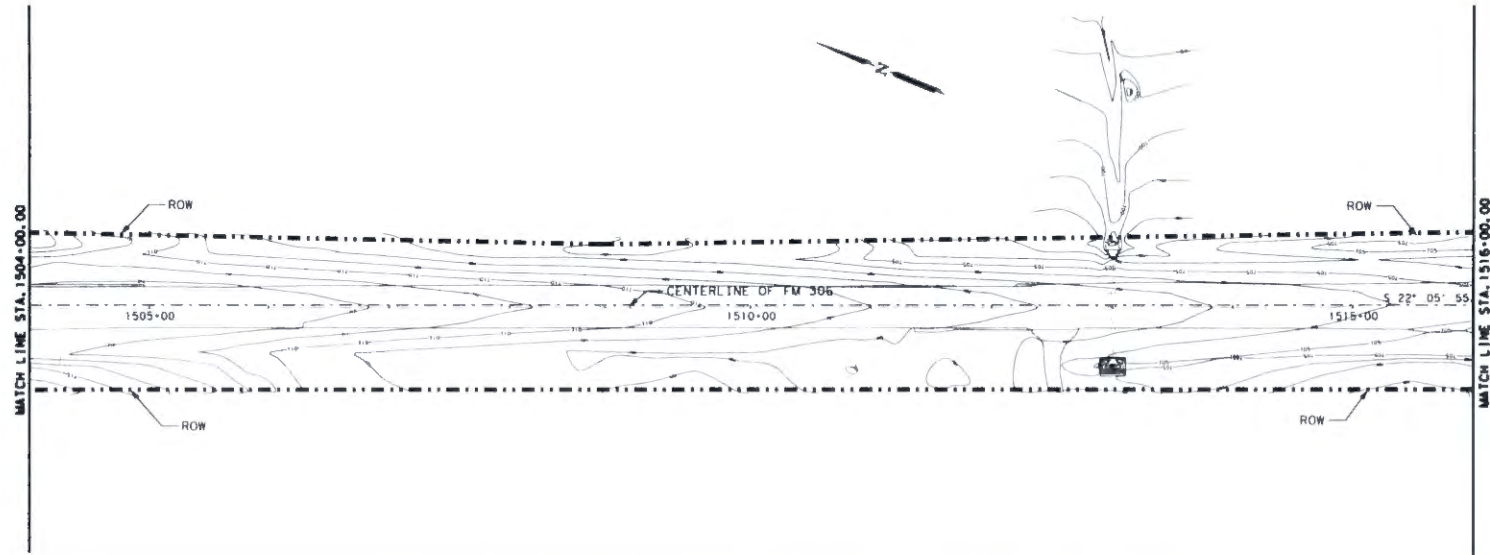
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 SCALE IN FEET

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SHEET 7 OF 8			
FEDERAL AID PROJECT NO.	STP 1502	1615	1A1
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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END PROJECT
 CSJ 1728-02-058
 MP = 14.432
 REF MK = 0522+0.509
 STA 1516+51.00



Linda Cox, P.E.

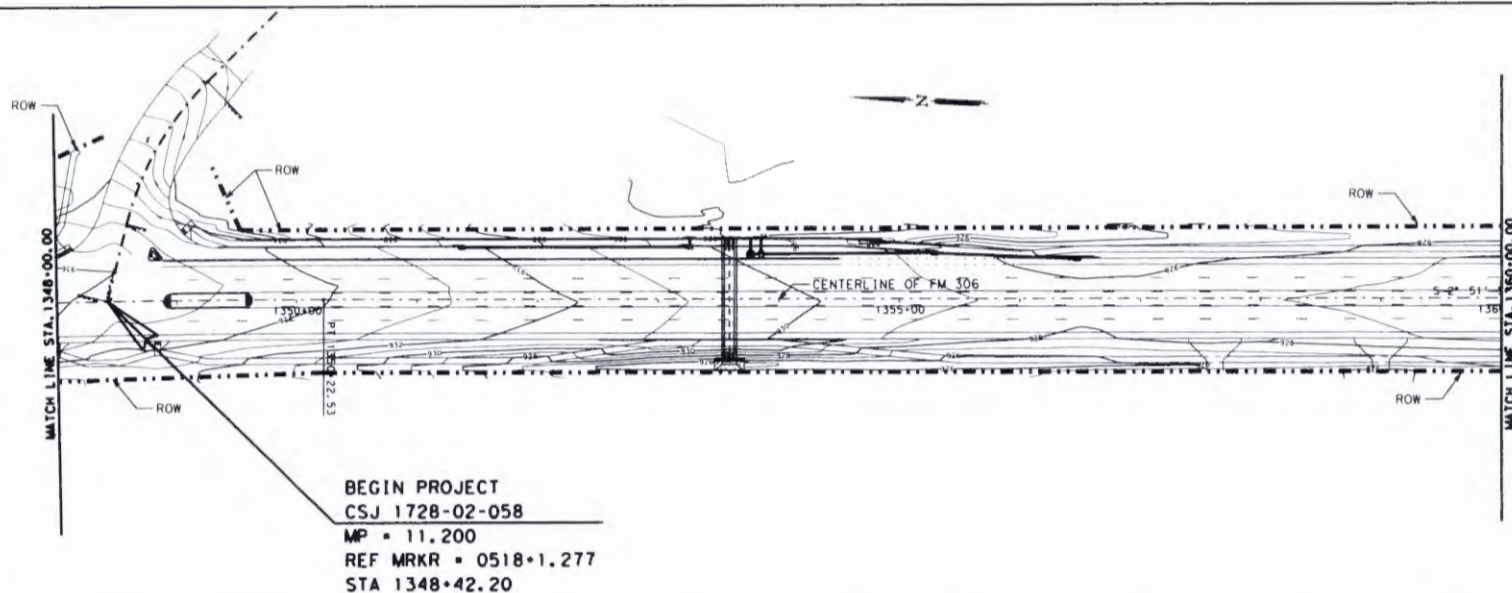
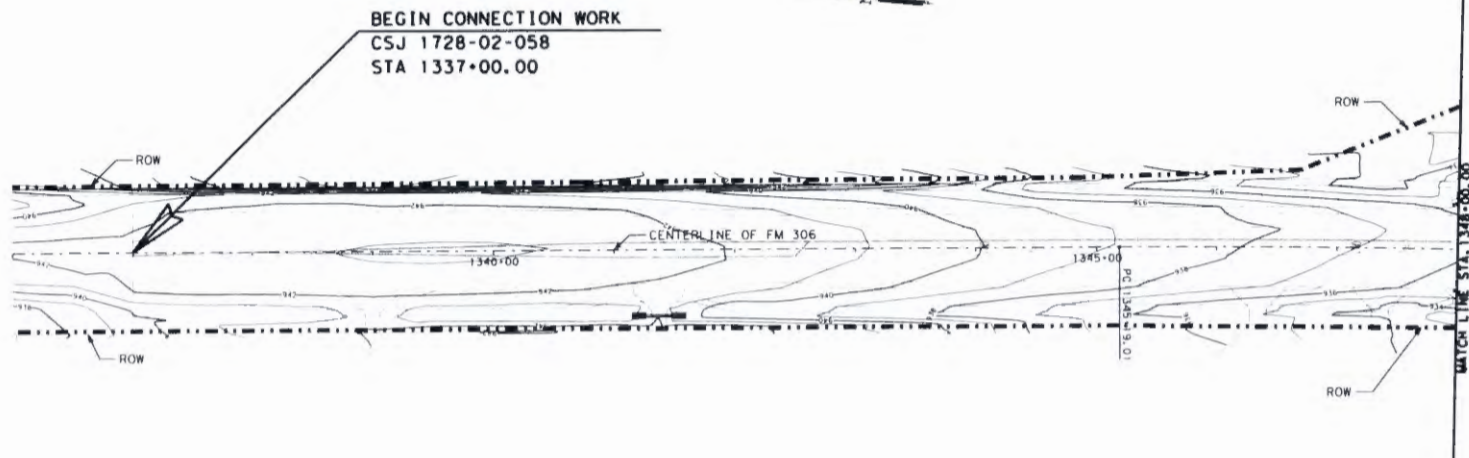
05/01/2015

FM 306 EXISTING CONTOUR SHEETS

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 SCALE IN FEET

Texas Department of Transportation			
SHEET 8 OF 8			
JOB NO.	FEDERAL AID PROJECT NO.	SHEET	
DIVISION	STP 1502 (615) MM	1502	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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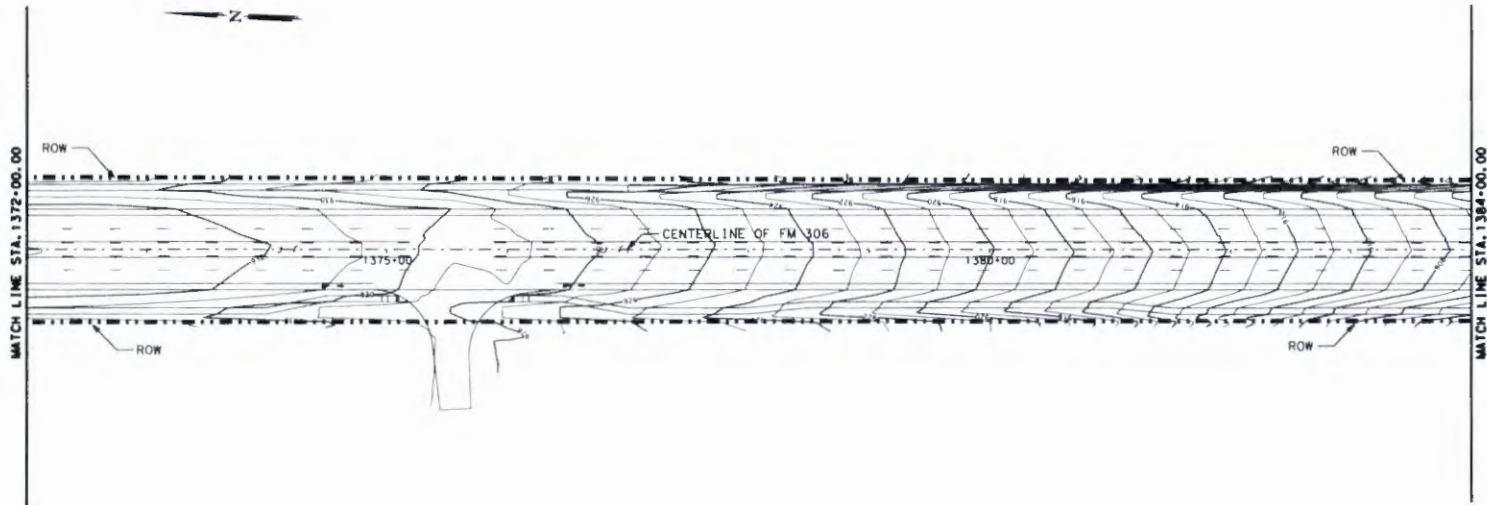
05/01/2015

FM 306 PROPOSED CONTOUR SHEETS

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SCALE IN FEET

STATE OF TEXAS			
LINDA COX			
90090			
LICENSED PROFESSIONAL ENGINEER			
SHEET 1 OF 8			
FEDERAL AID PROJECT NO.	STP 1502 (615)	MM	1502
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL SECTION	JOB	HIGHWAY NO.	
1728	02	058	FM 306

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05/01/2015

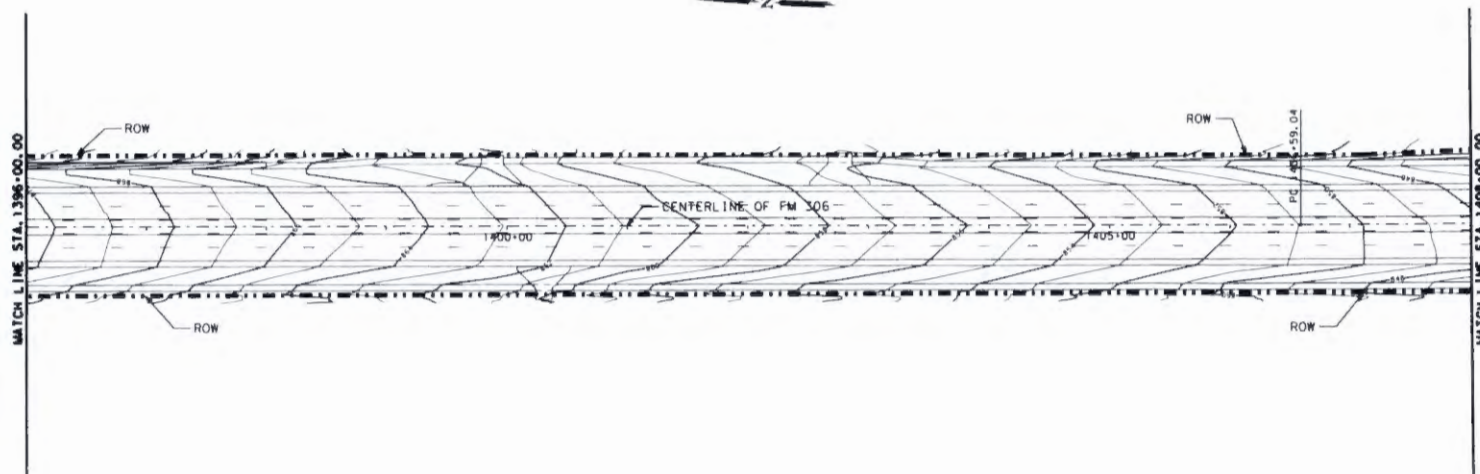
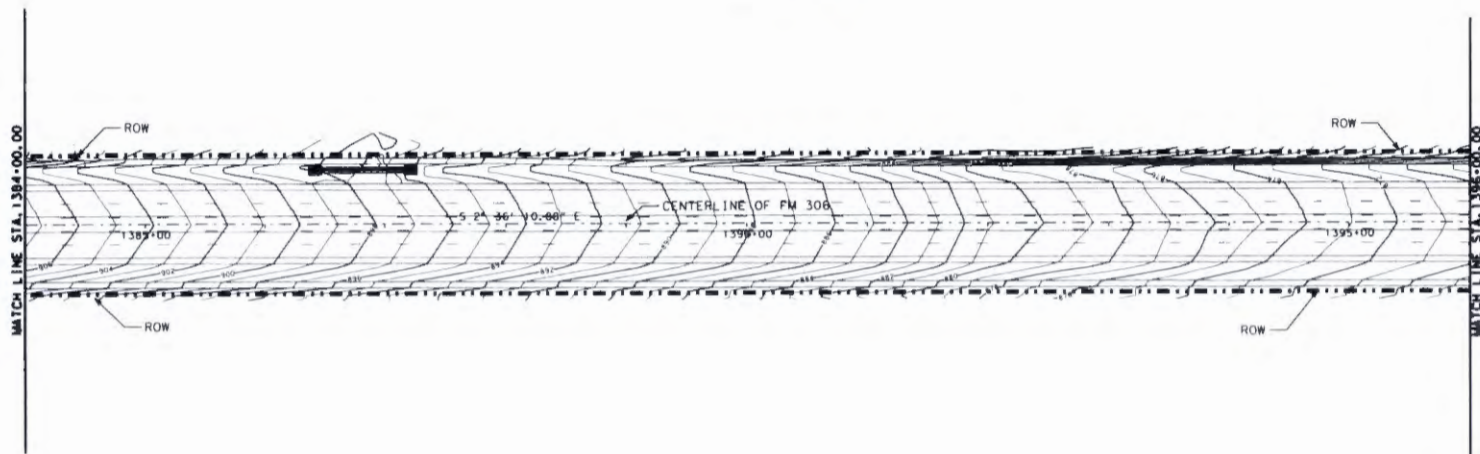
FM 306 PROPOSED CONTOUR SHEETS



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 SHEET 2 OF 8

FEDERAL AID PROJECT NO.		STP 1502 (6151) MM	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL SECTION	JOB	HIGHWAY NO.	
1728	02	058	FM 306

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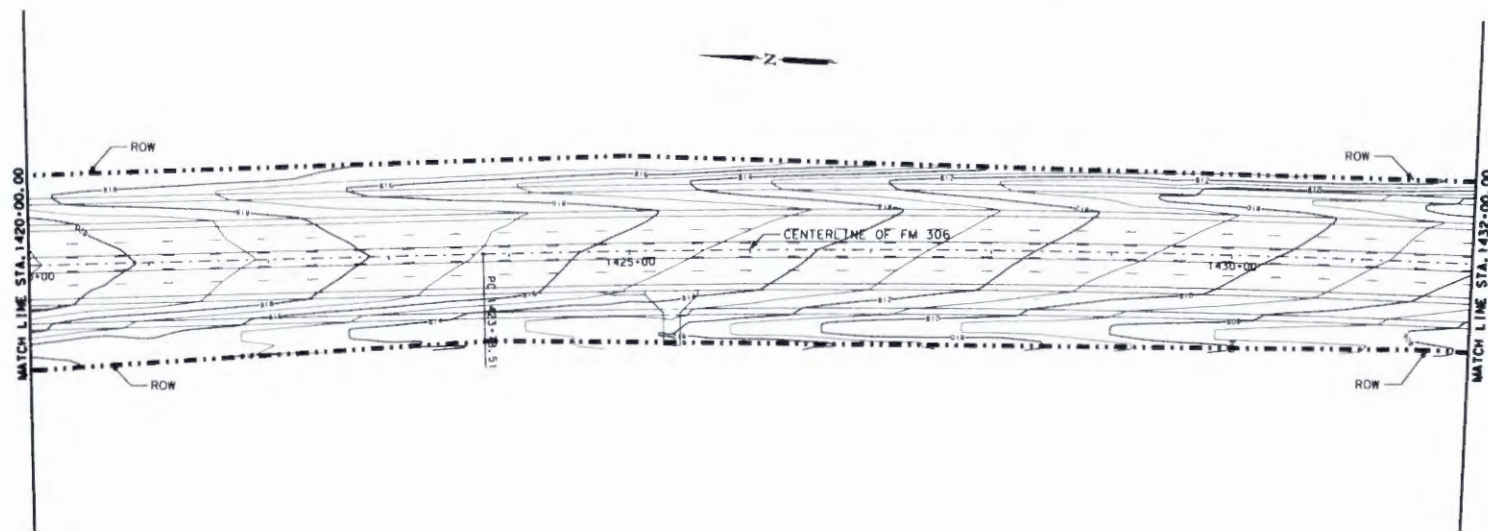
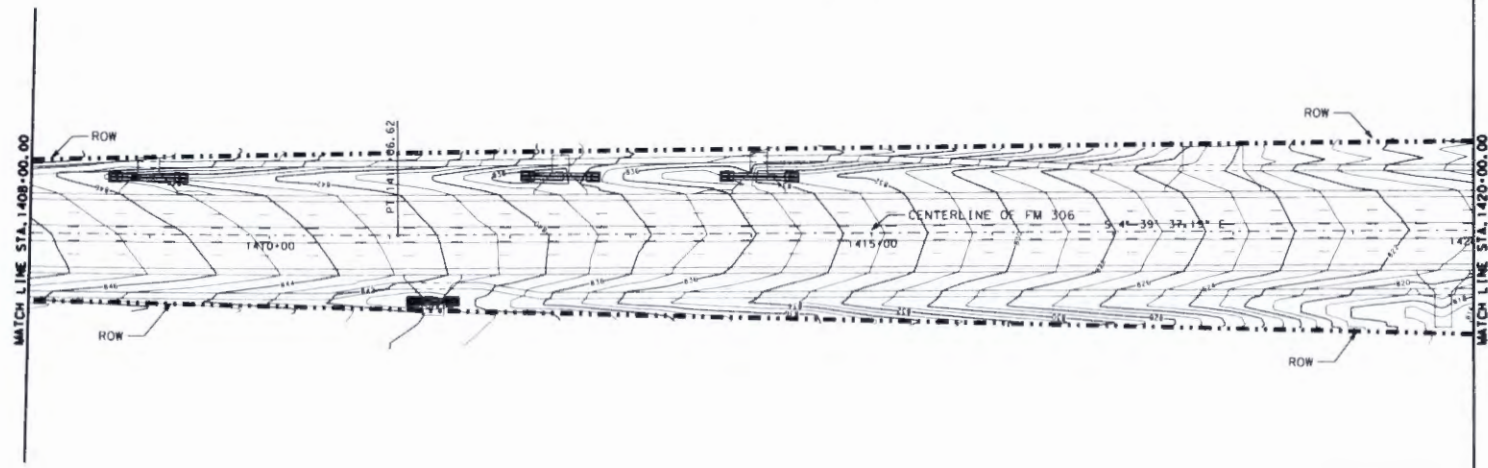
FM 306 PROPOSED CONTOUR SHEETS

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Texas Department of Transportation
SHEET 3 OF 8

FEDERAL AID PROJECT NO.		STP 1502 (615) MM	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY
1728	02	058	FM 30

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05/01/2015

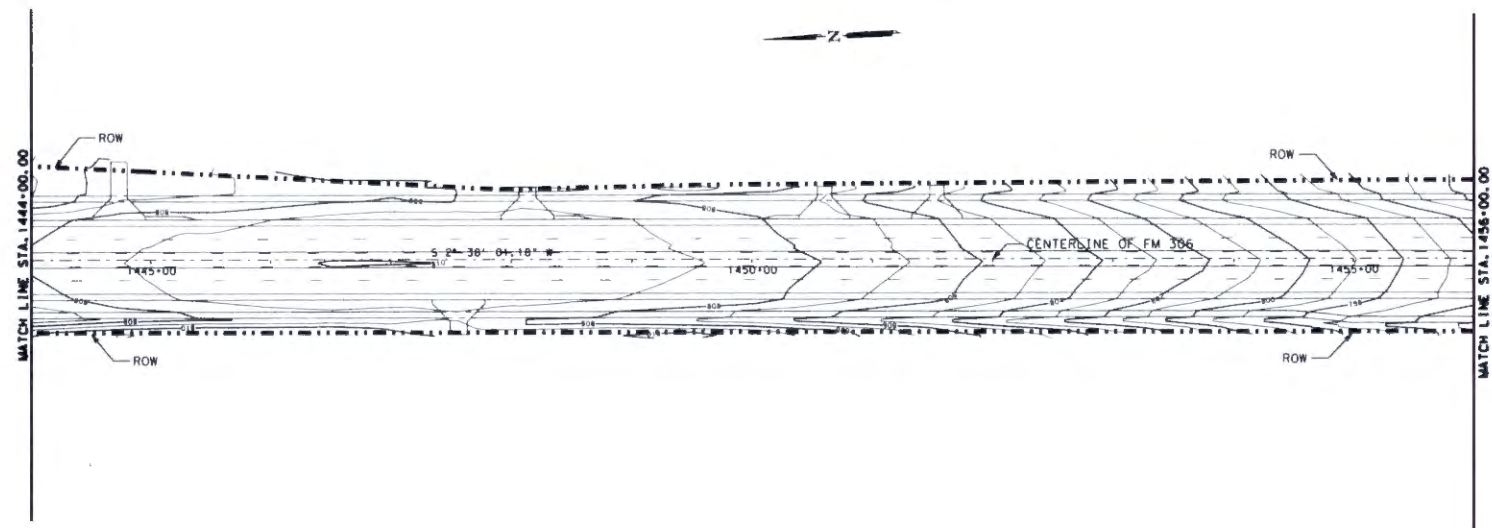
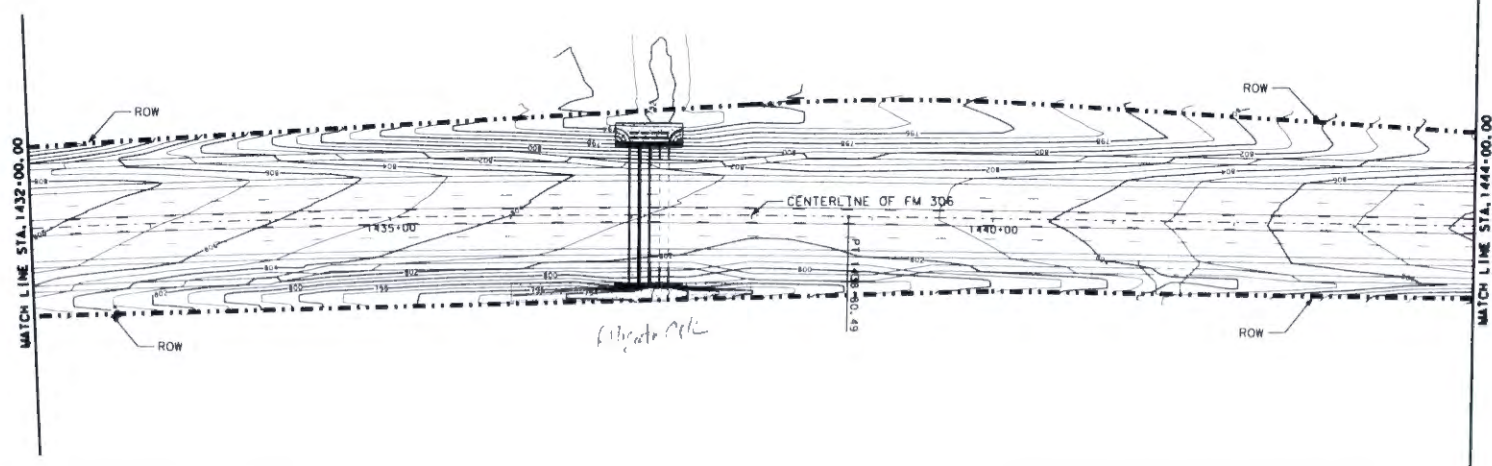
FM 306 PROPOSED CONTOUR SHEETS

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SCALE IN FEET

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SHEET 4 OF 8

SHEET 4 OF 8		SHEET	
FEDERAL AID PROJECT NO.	STP 1502 (615) MM		
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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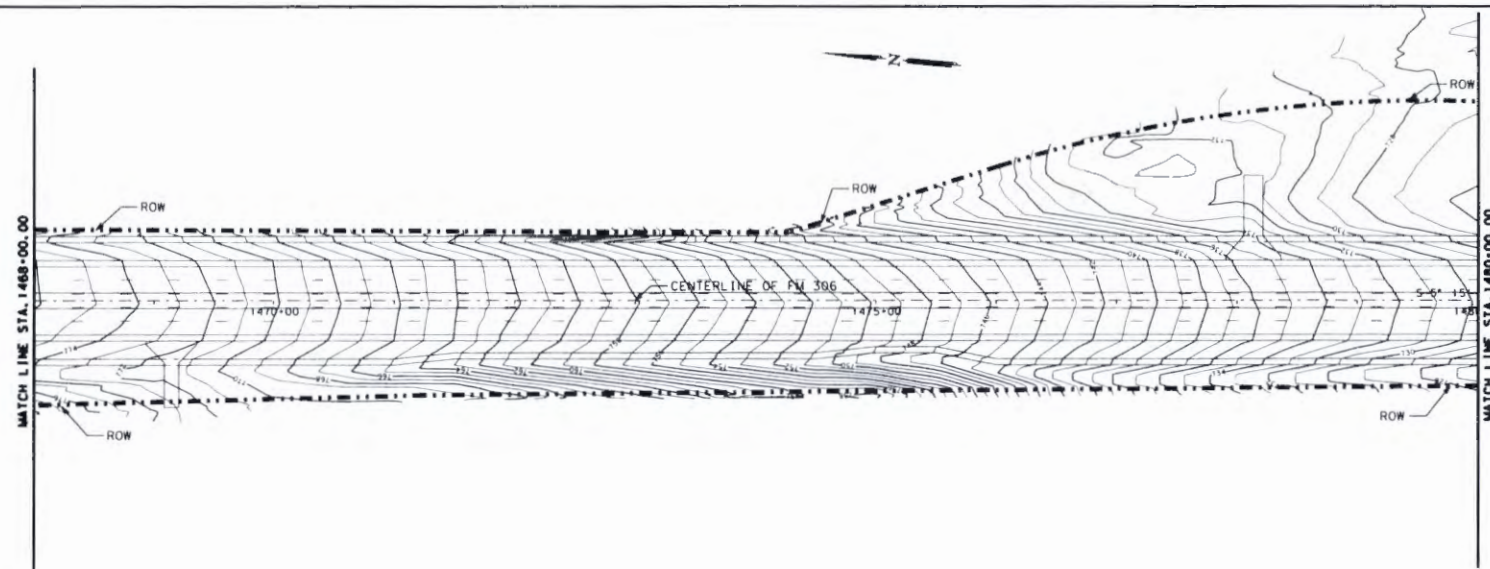
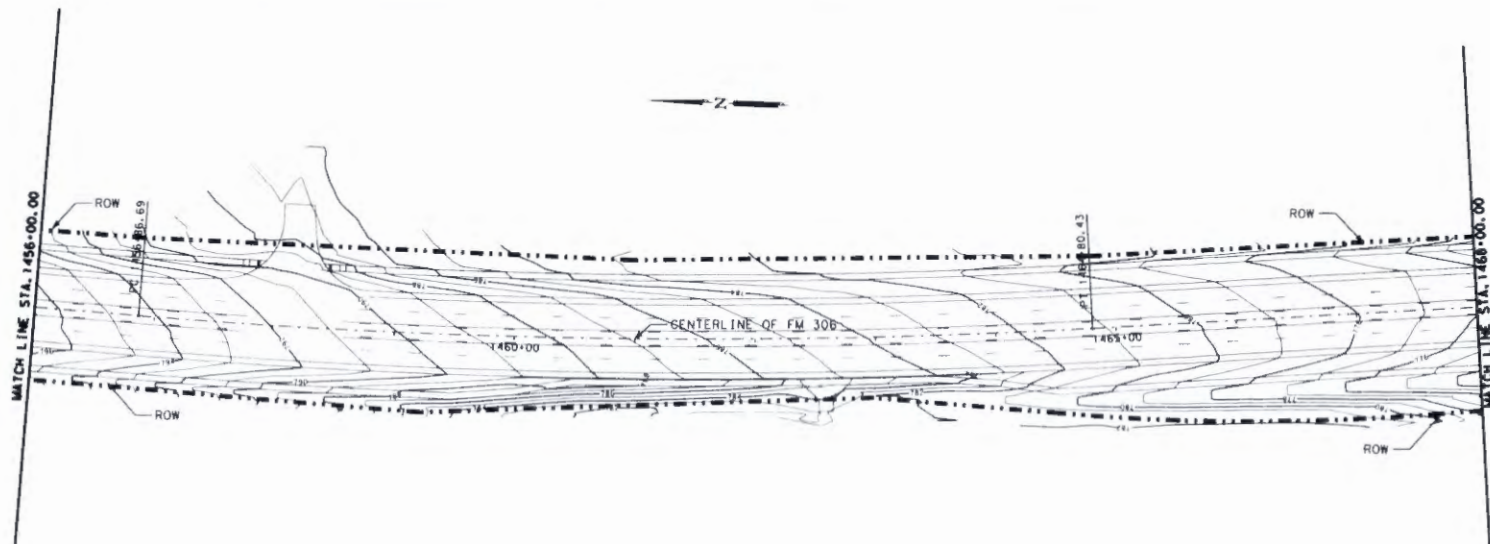
FM 306 PROPOSED CONTOUR SHEETS

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SCALE IN FEET

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SHEET 5 OF 8

SHEET 5 OF 8			
FEDERAL AID PROJECT NO.	SHEET NO.		
STP 1502 (615) MM			
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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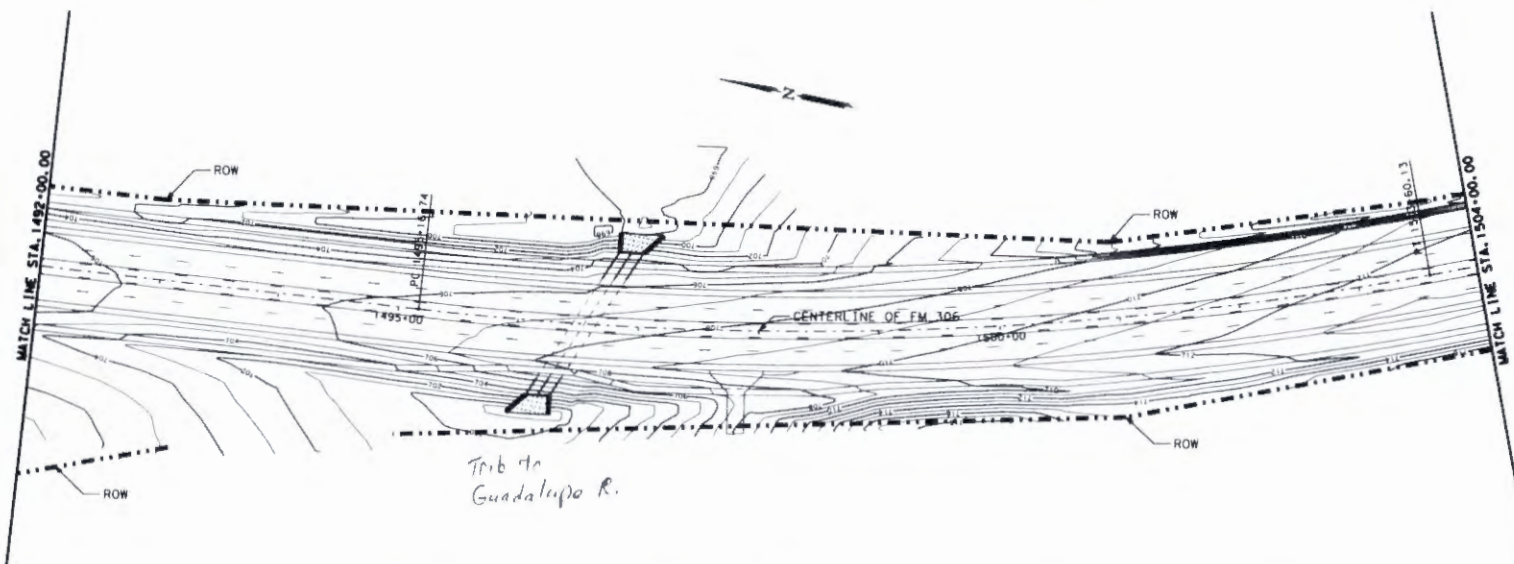
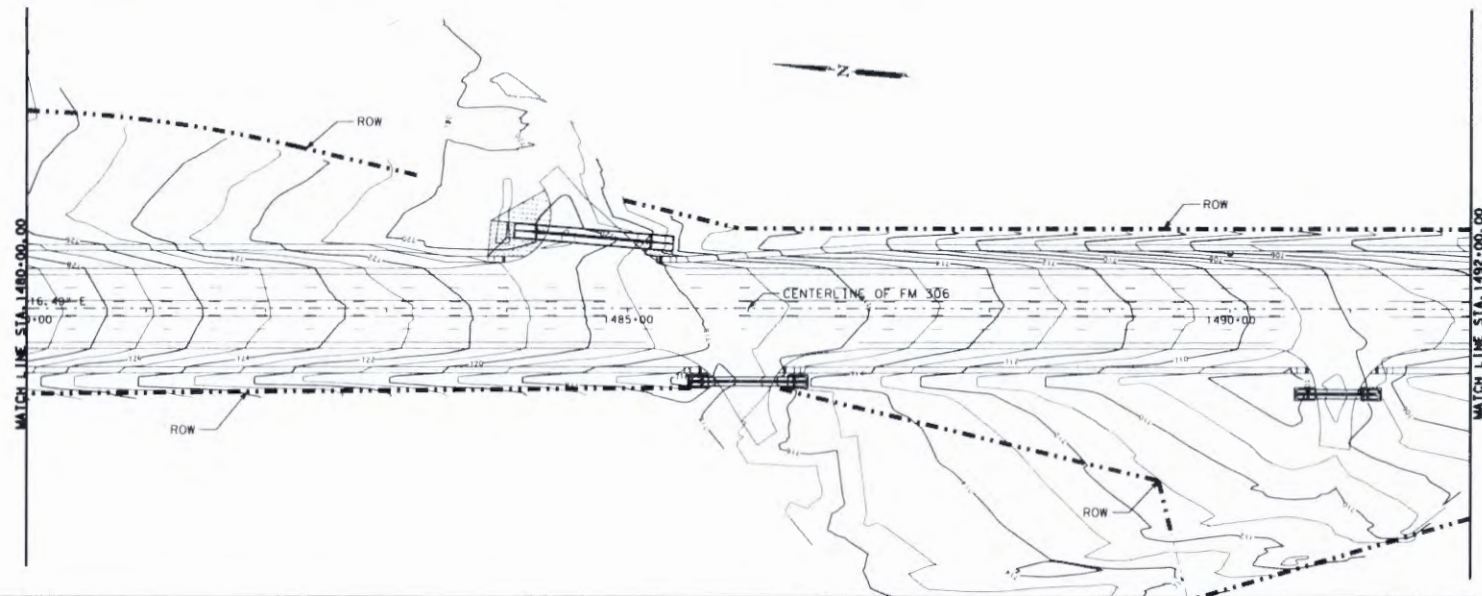
FM 306 PROPOSED CONTOUR SHEETS

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Texas Department of Transportation
 SHEET 6 OF 8

FEDERAL AID PROJECT NO.		SHEET 6 OF 8	
STP 1502 (615) MM		SHEET NO.	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

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05/01/2015

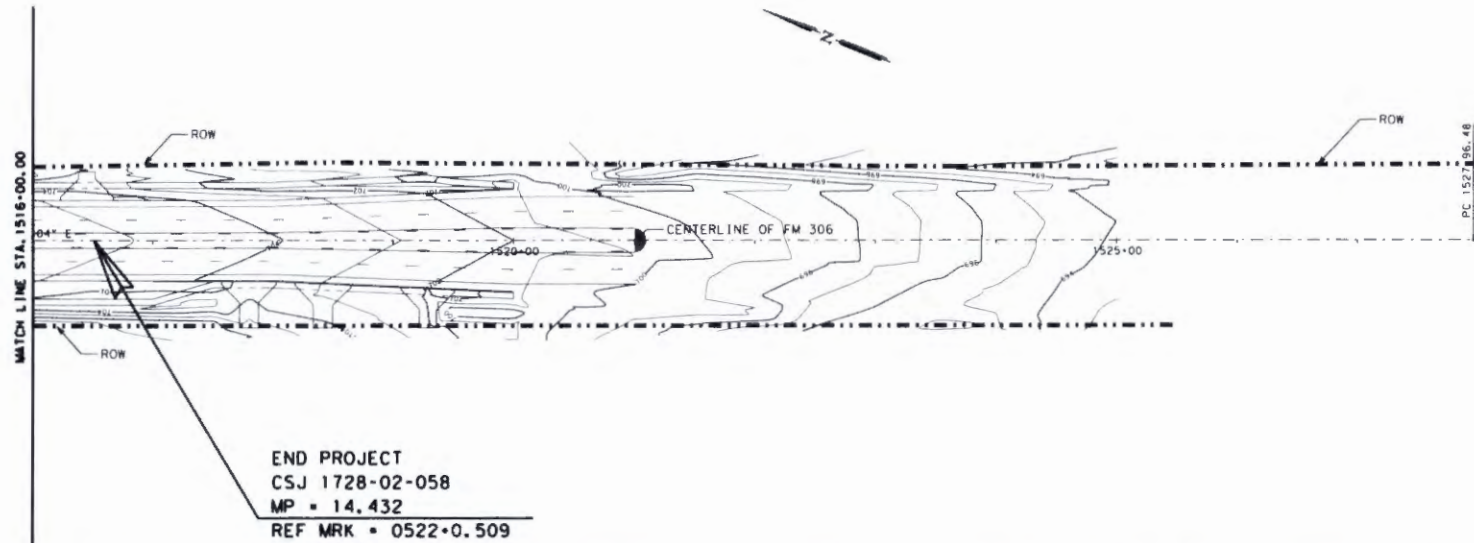
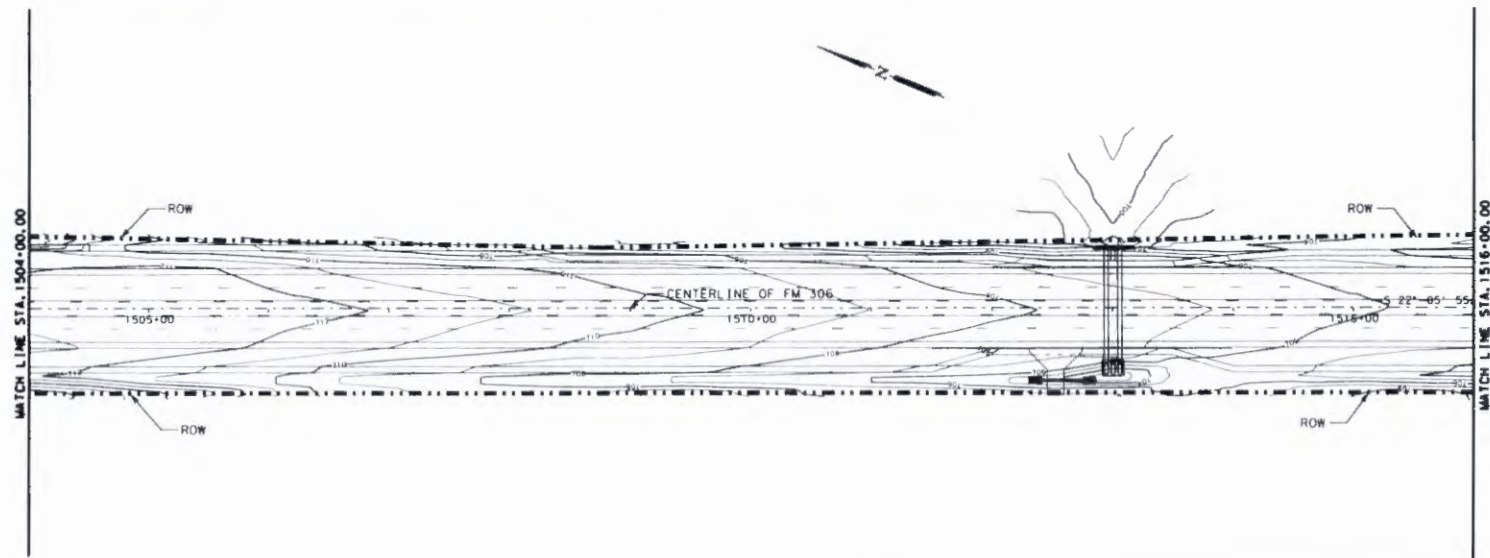
FM 306 PROPOSED CONTOUR SHEETS

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SCALE IN FEET

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SHEET 7 OF 8

FED. ROAD DIVISION	FEDERAL AID PROJECT NO.	SHEET NO.
STP 1502 (615) MM		
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTROL SECTION	JOB	HIGHWAY NO.
1728 02	058	FM 306

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CSJ 1728-02-058
MP = 14.432
REF MKR = 0522+0.509
STA 1516+51.00



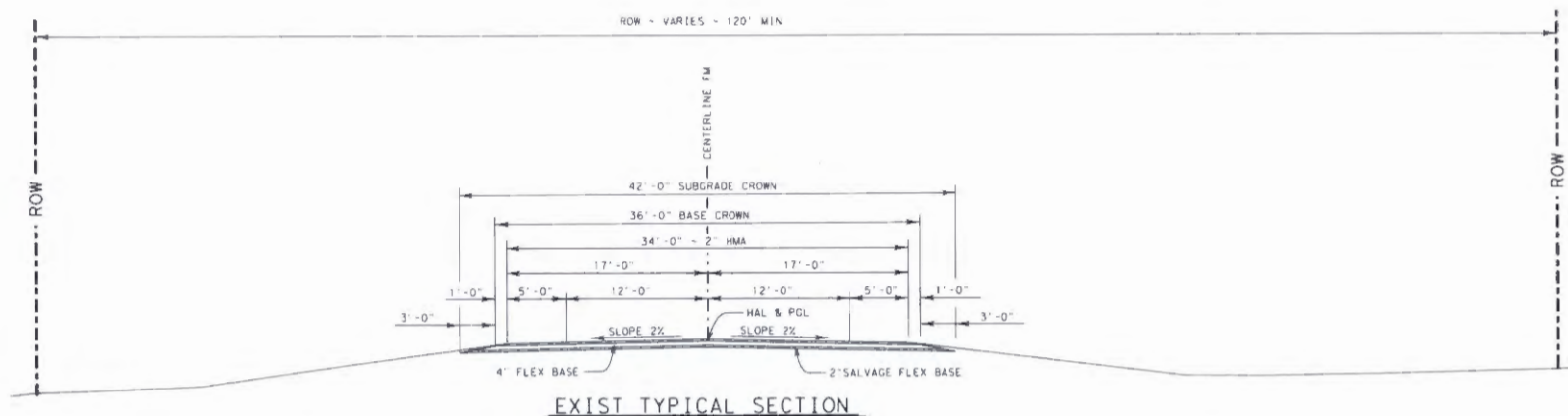
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05/01/2015

FM 306 PROPOSED CONTOUR SHEETS

0 50 100
SCALE IN FEET

Texas Department of Transportation			
SHEET 8 OF 8			
FEDERAL AID PROJECT NO.	STP 1502 (615) MM	SHEET NO.	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL SECTION	JOB	HIGHWAY NO.	
1728	02	058 FM 306	



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05/01/2015

NTS

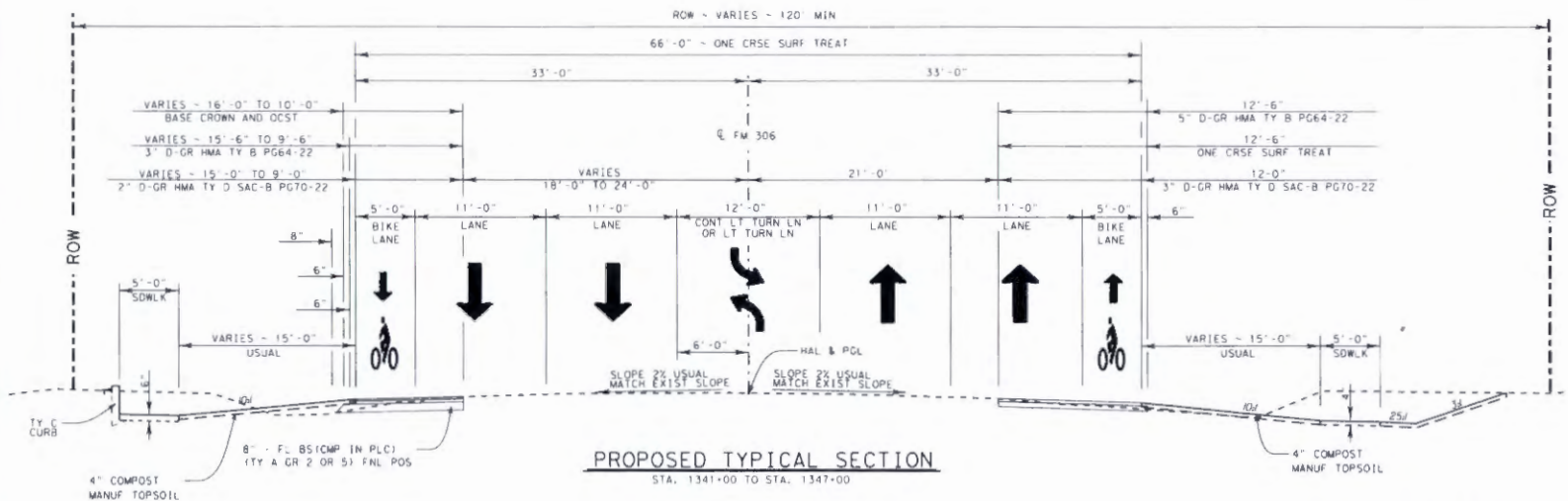
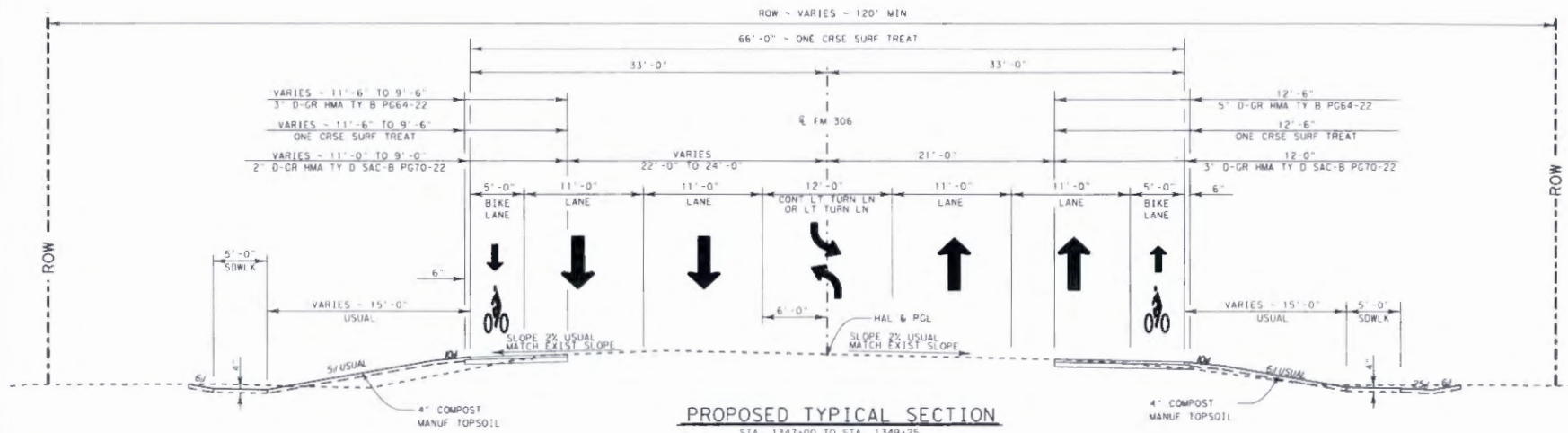
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SHEET 1 OF 0

FUND	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	STP 1502 (615) NM	11
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTRACT	SECTION	WORK NO.
1728	02	058 FM 306

FM 306

TYPICAL SECTIONS

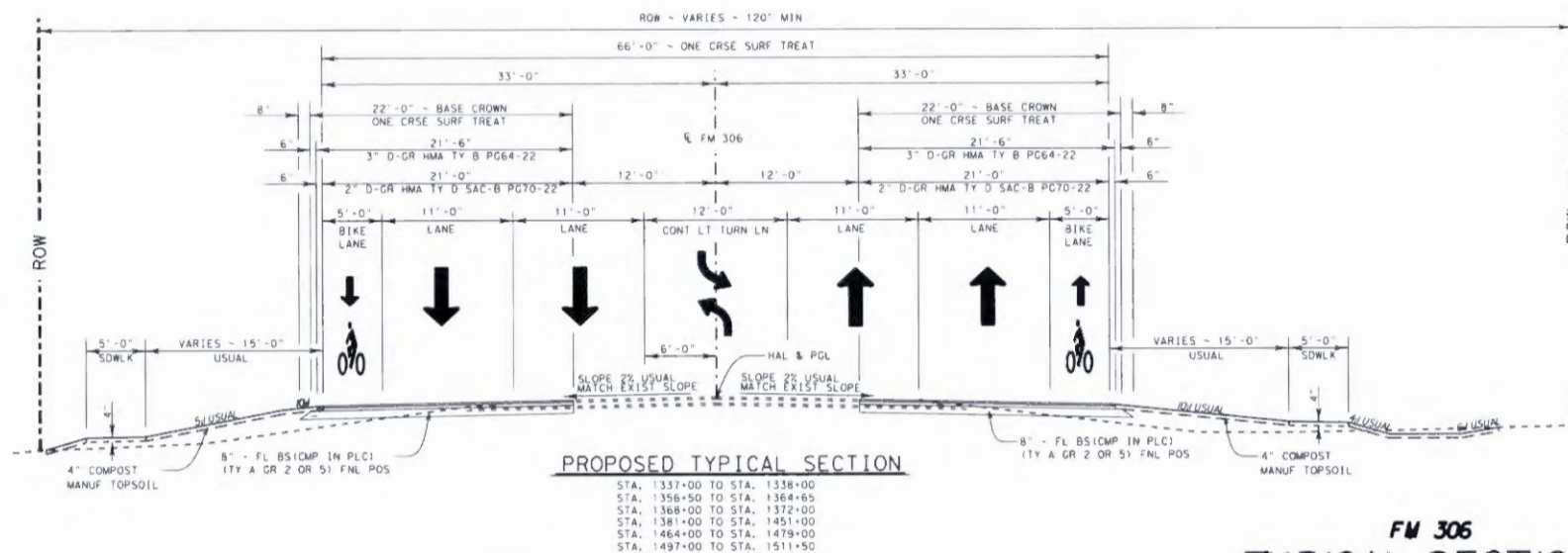
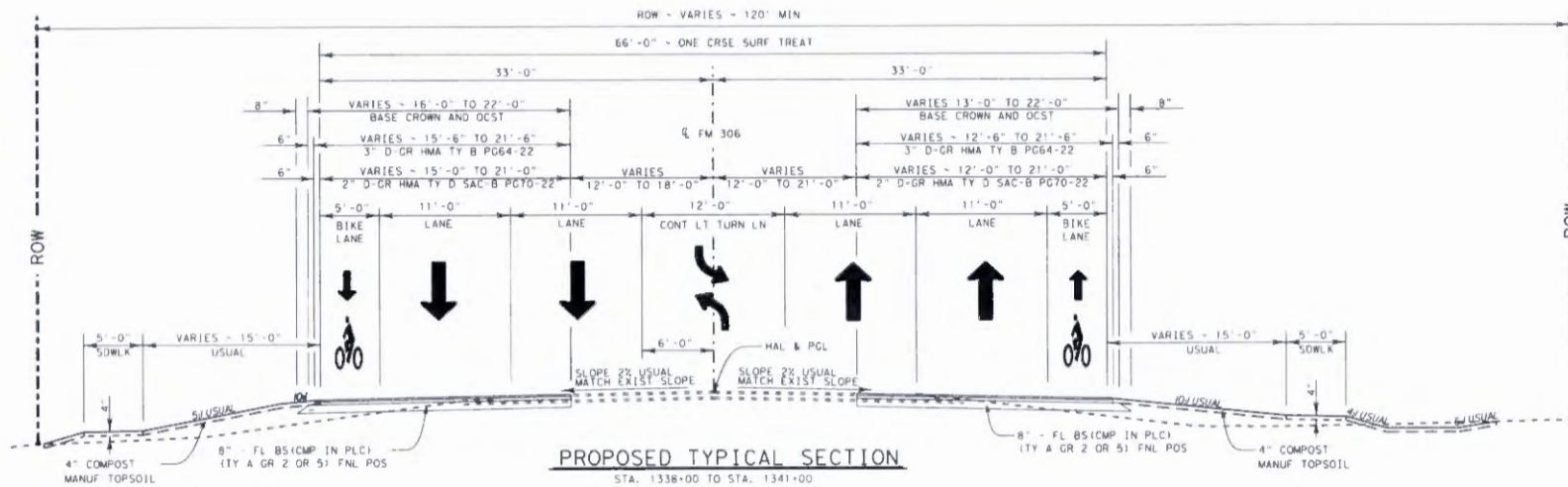


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05/01/2015

FM 306 TYPICAL SECTIONS

NTS

Texas Department of Transportation			
SHEET 3 OF 8			
FEDERAL AID PROJECT NO.	STP 1502 (615) MVA	COUNTY	13
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	WIDENING NO.
172R	02	058	FM 306



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05/01/2015

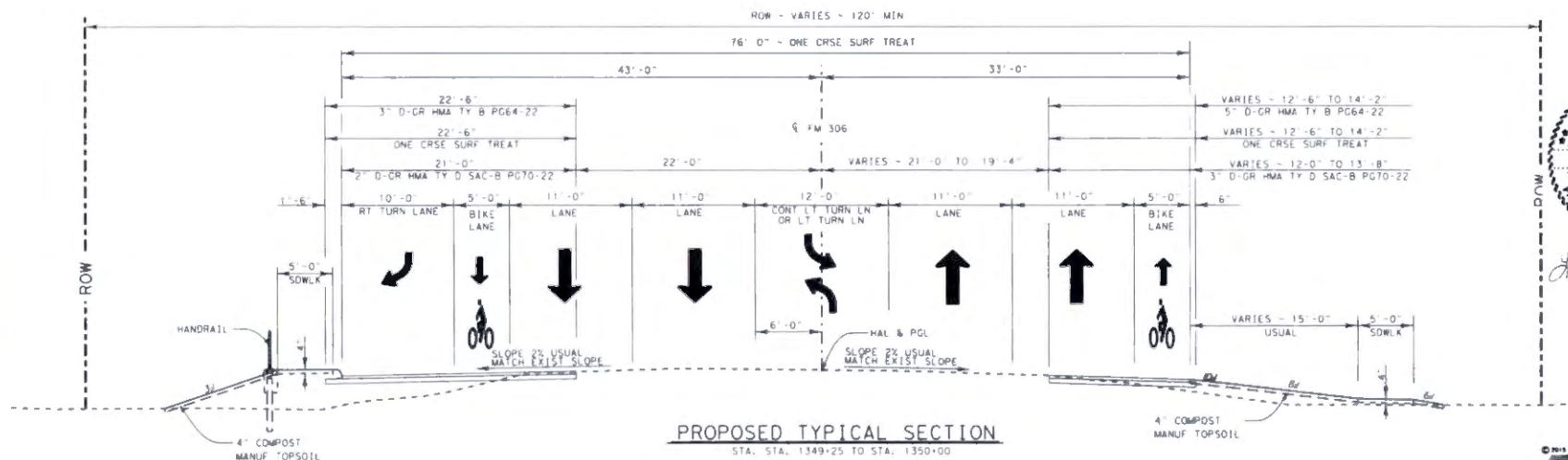
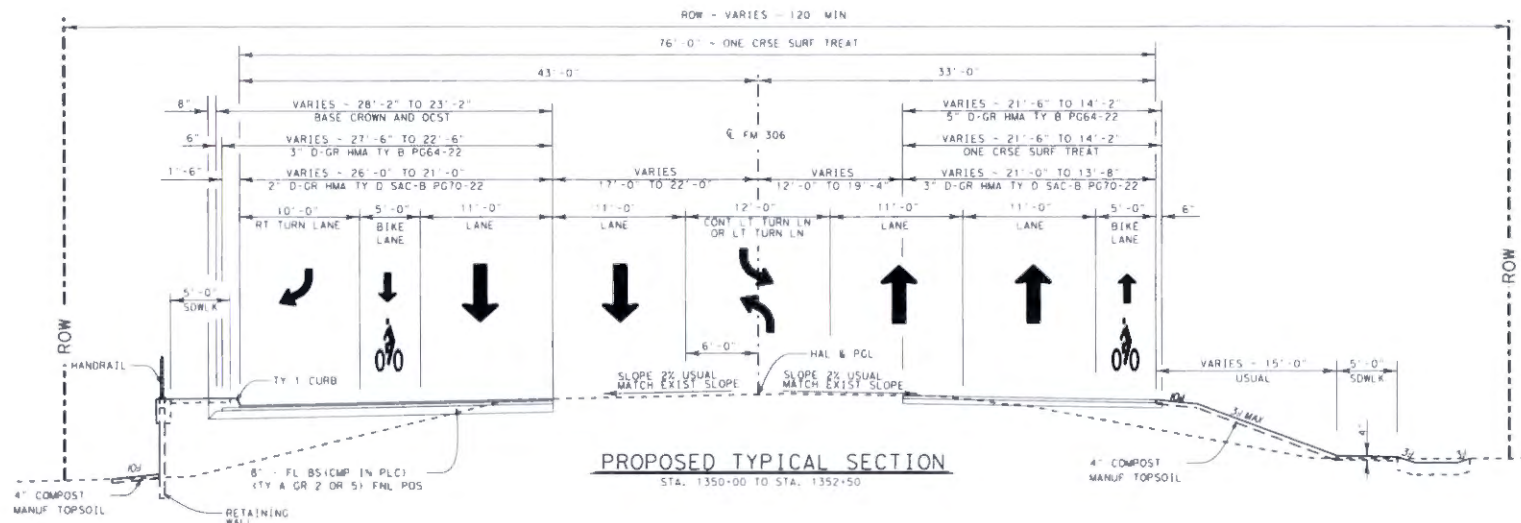
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SHEET 2 OF 1

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STP 1502 (615) MM	1		
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	REVISION NO.
172B	02	058	FM 306

FM 306
TYPICAL SECTIONS

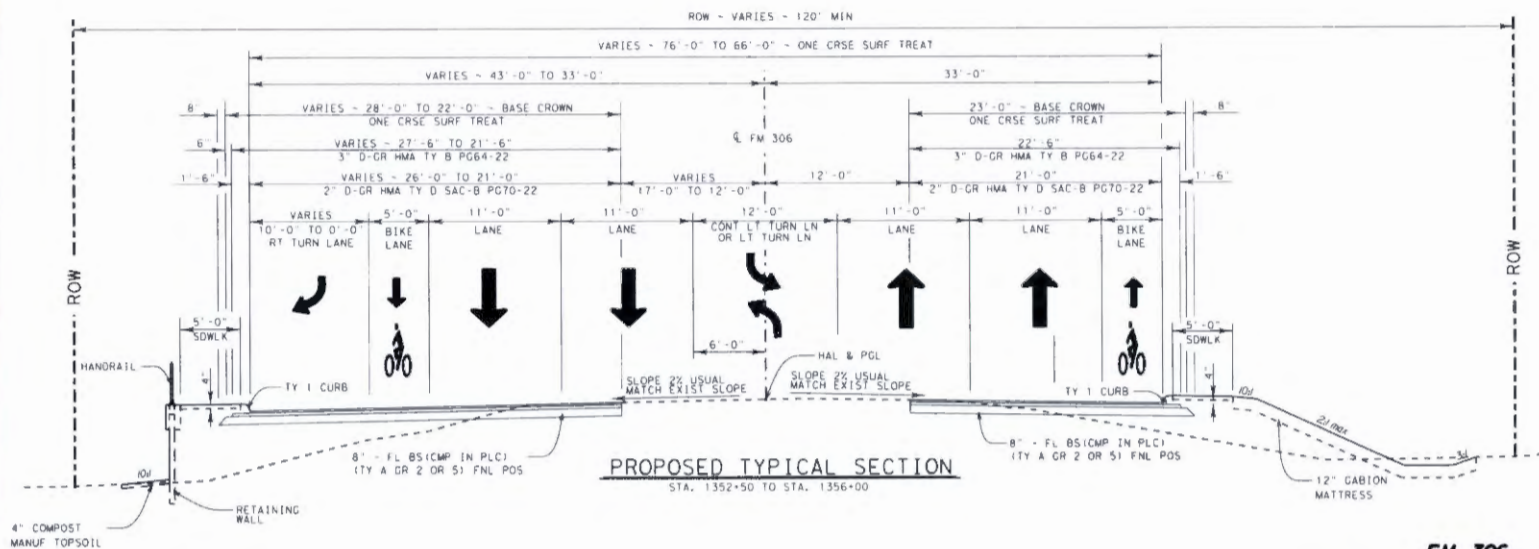
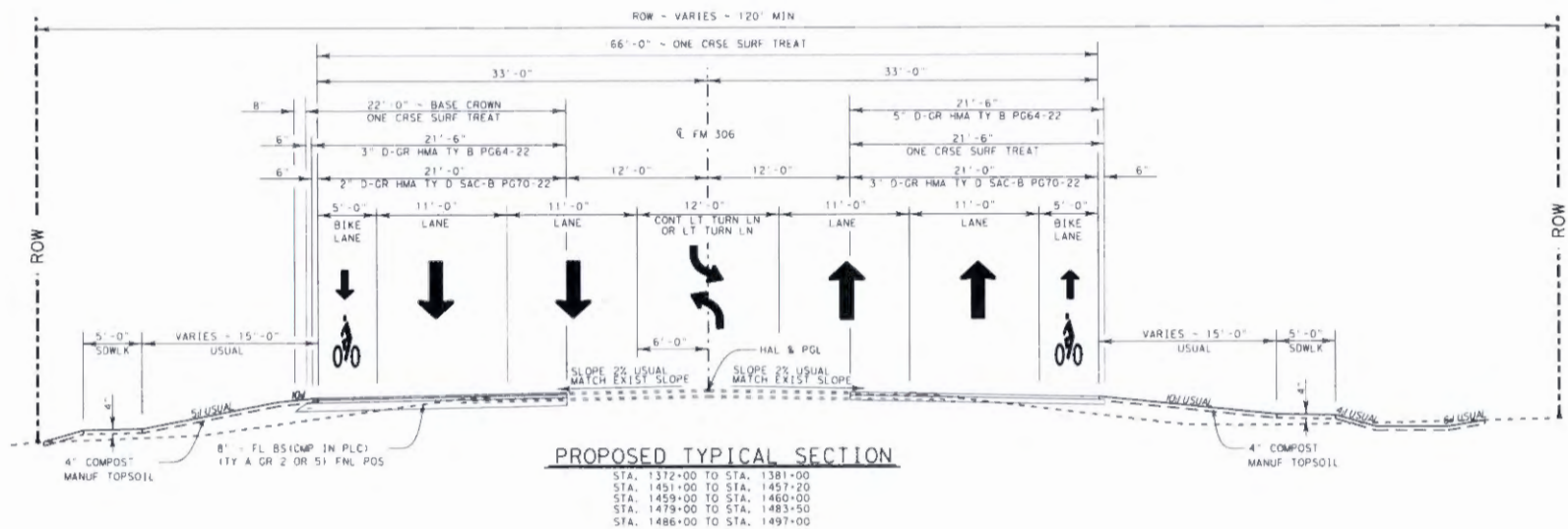


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05/01/2015

FM 306
TYPICAL SECTIONS

NTS

Texas Department of Transportation			
SHEET 4 OF 8			
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	SAT	COMAL	14
SECTION	SECTION	SECTION	SECTION
172R	02	058	FM 306



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05/01/2015

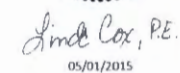
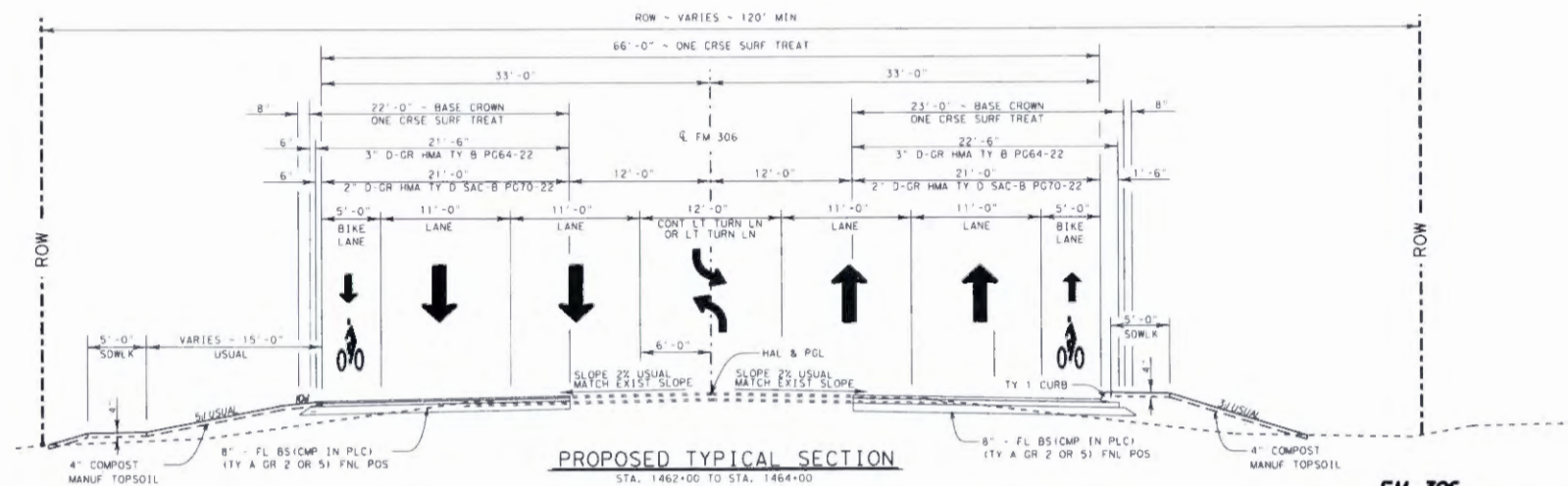
FM 306
TYPICAL SECTIONS

NTS

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SHEET 5 OF 8

FEDERAL AID PROJECT NO.	STP 1502	16151 NM	15
STATE	TEXAS	DISTRICT	COMAL
COUNTY	172B	SECTION	02
DATE	05/01/2015	PROJECT NO.	FM 306



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SHEET 7 OF 8

FEDERAL AID PROJECT NO.		SHEET NO.	
STP 1502 (615) MM		1	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	HIGHWAY NO.
1728	02	058	FM 306

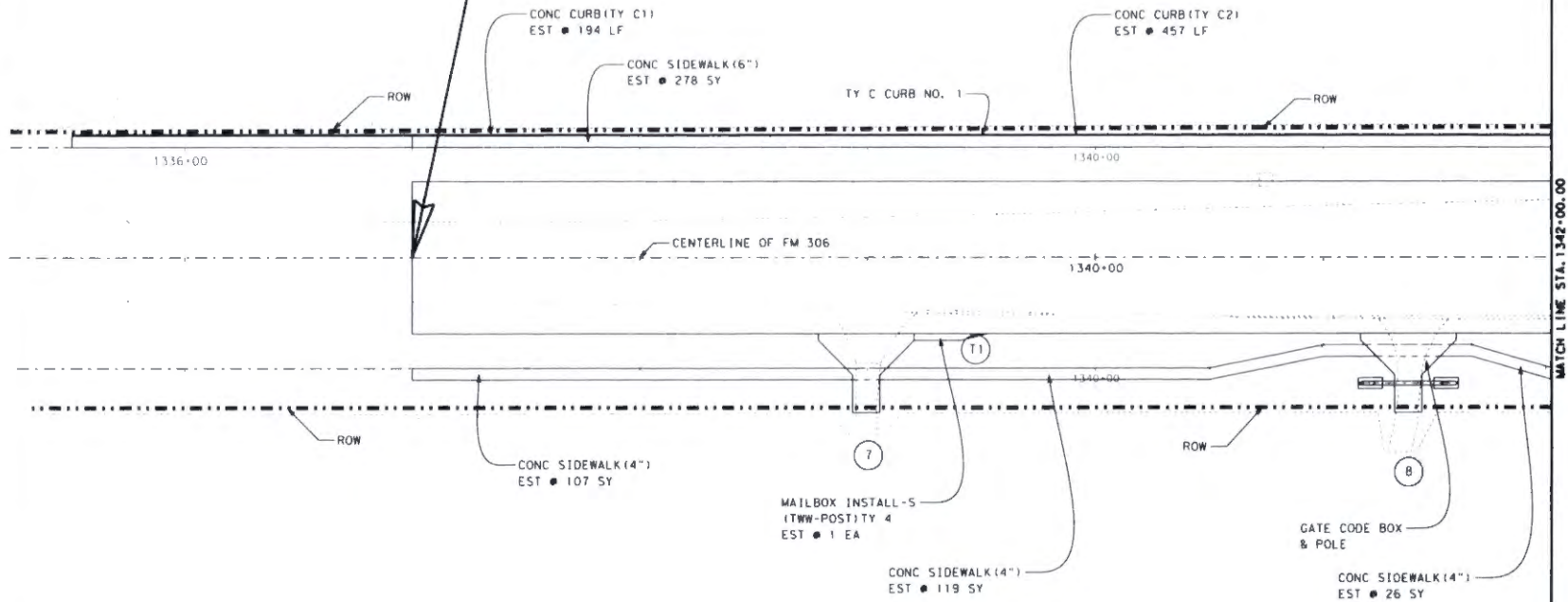
FM 306

TYPICAL SECTIONS

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DESCRIPTION	QUAN	UNIT
PREPARING ROW	5	STA
FL BS (CMP IN PLC) (TY D GR 1-2) (FINAL POS)	16661	CY
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
CONC CURB (TY C2)	457	LF
CONC CURB (TY C1)	194	LF
CONC SIDEWALKS (4")	252	SY
CONC SIDEWALKS (6")	278	SY
MAILBOX INSTALL 5 (TWW-POST) TY 4	1	EA

BEGIN CONNECTION WORK
CSJ 1728-02-058
STA 1337+00.00



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T1)	MAILBOX TURNOUT NUMBER
(1)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306
PLAN SHEETS

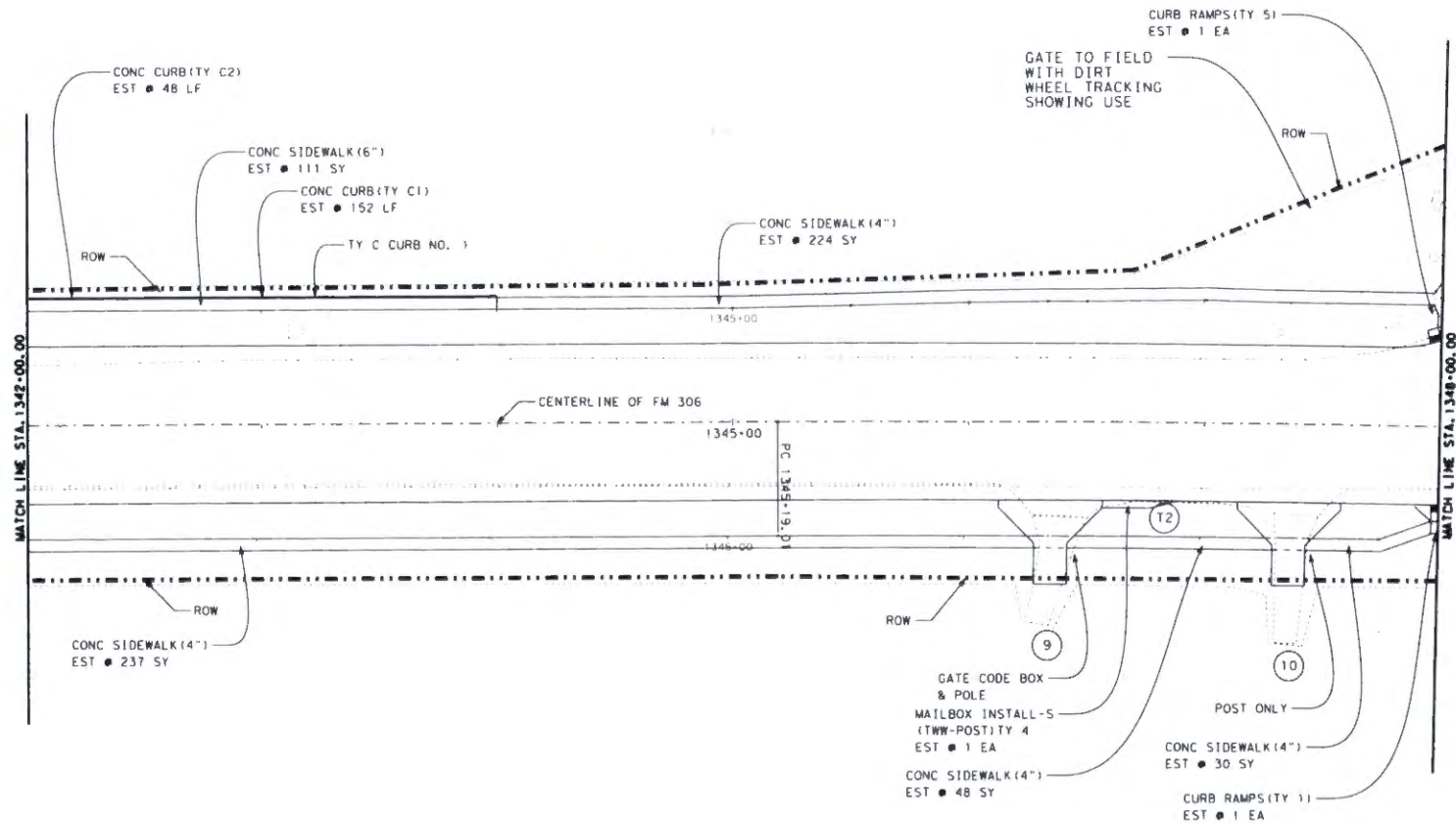


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Texas Department of Transportation			
SHEET 1 OF 31			
PROJECT	STP 1502 (615) NM	155	
STATE	TEXAS	COUNTY	COMAL
SECTION	1728	DATE	02 058
WIDENING NO.			

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DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C2)	48	LF
CONC CURB (TY C1)	152	LF
CONC SIDEWALKS (4")	539	SY
CONC SIDEWALKS (6")	111	SY
CURB RAMPS (TY 1)	1	EA
CURB RAMPS (TY 5)	1	EA
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

- LEGEND
- (T) MAILBOX TURNOUT NUMBER
 - (I) DRIVEWAY NUMBER
 - [Pattern] GABION MATTRESSES
 - [Pattern] CONC RIPRAP
 - [Pattern] WIDENING AREA

FM 306 PLAN SHEETS



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05/01/2015

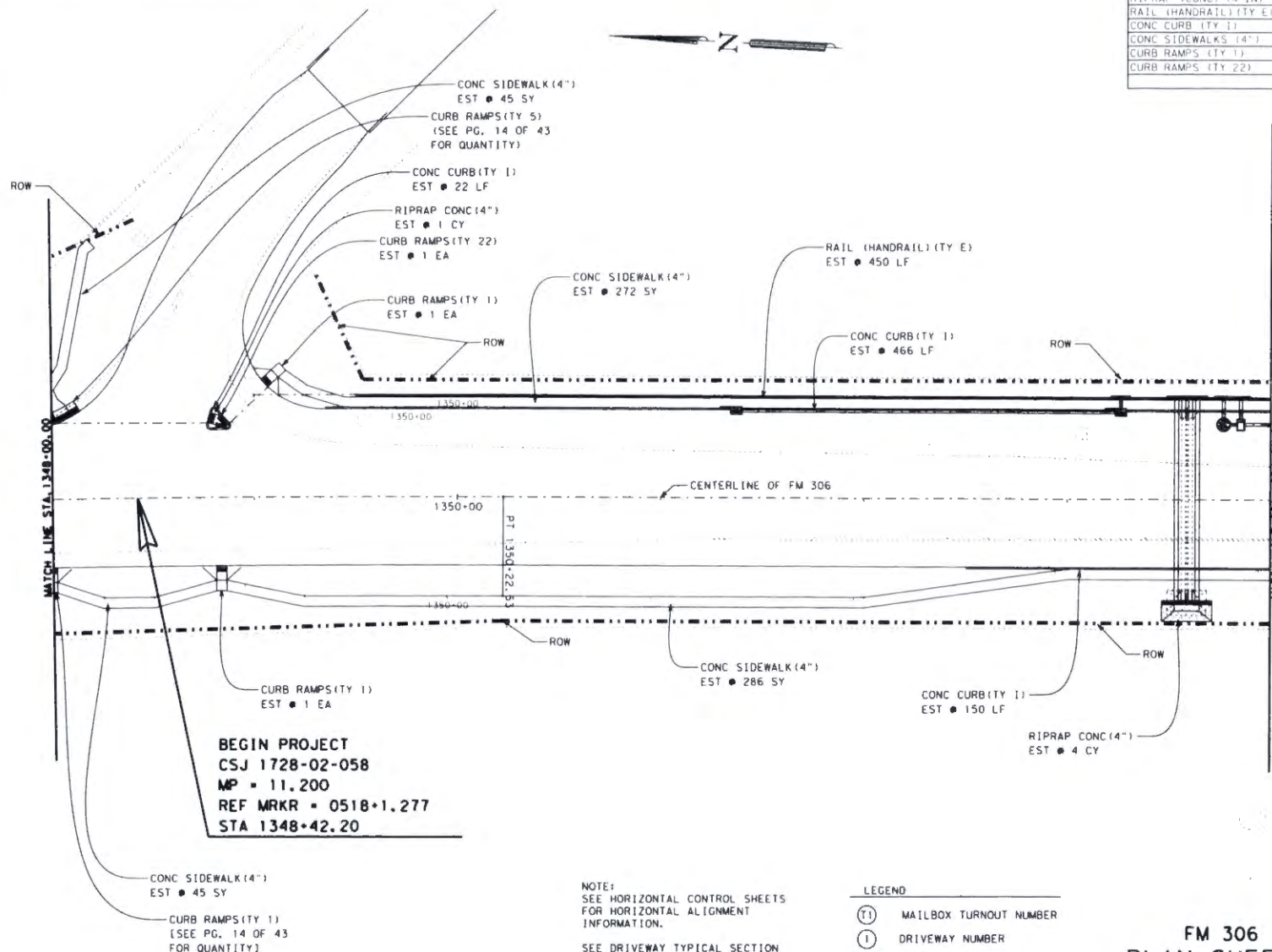
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SHEET 2 OF 31

STATE	STP 1502 (615) AM	156
STATE	TEXAS	SAT COMAL
CONTRACT	1728 02 058	FM 306

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DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
RIPRAP (CONC) (4 IN)	5	CY
RAIL (HANDRAIL) (TY E)	450	LF
CONC CURB (TY 1)	638	LF
CONC SIDEWALKS (4")	648	SY
CURB RAMPS (TY 1)	2	EA
CURB RAMPS (TY 22)	1	EA



BEGIN PROJECT
CSJ 1728-02-058
MP = 11.200
REF MKR = 0518+1.277
STA 1348+42.20

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

**FM 306
PLAN SHEETS**




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05/01/2015

0 50
SCALE IN FEET






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SHEET 3 OF 31			
PROJECT	STP 1502 (615) MM	157	
STATE	TEXAS	COUNTY	COMAL
SECTION	1728	02	058
ROADWAY	FM 306		



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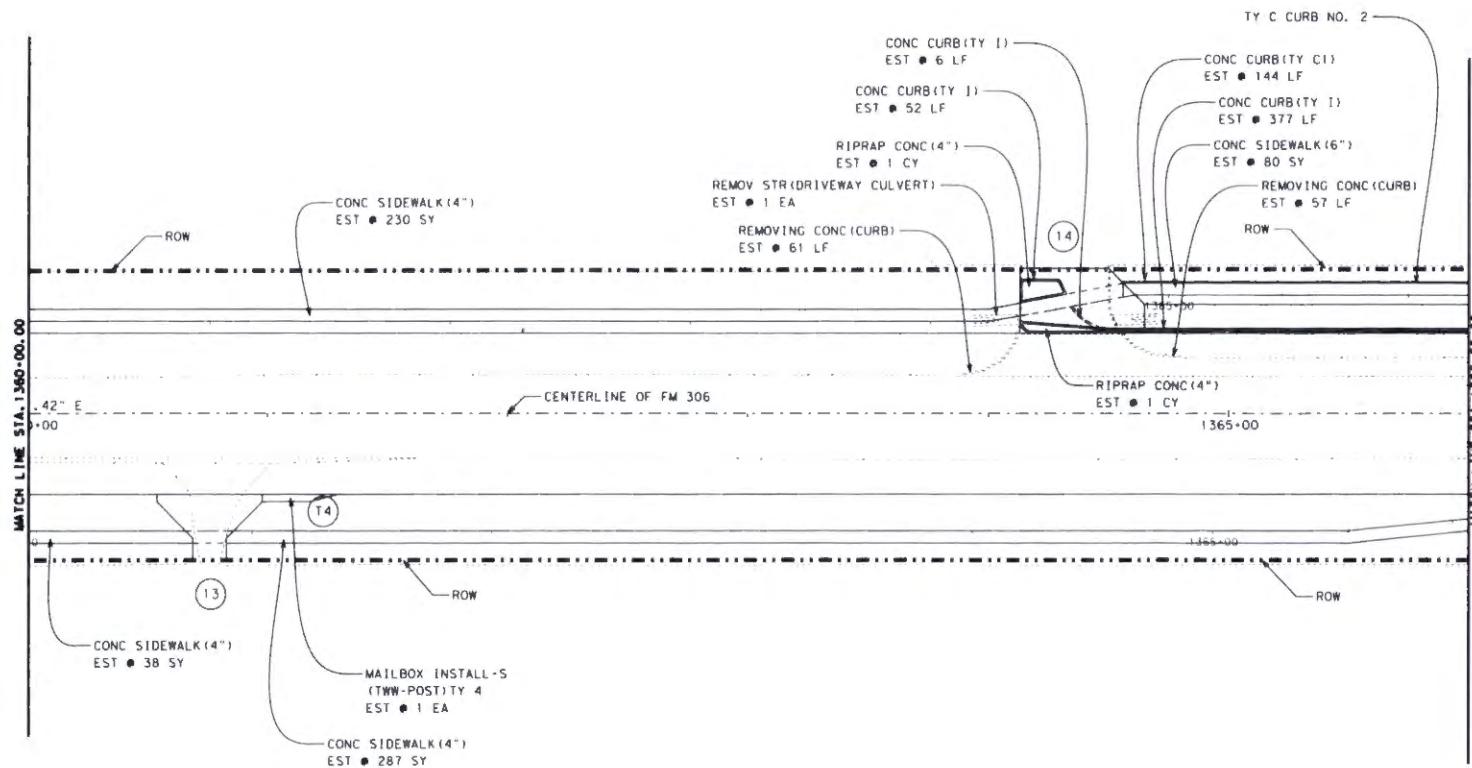

Texas Department of Transportation
SHEET 4 OF 31

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.	SHEET NO.
	STP 1502 (615) MM	158
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTRACT	SECTION	JOB
1728	02	058
		HIGHWAY NO.
		FM 306

LEGEND	
	MAILBOX TURNOUT NUMBER
	DRIVEWAY NUMBER
	GABION MATTRESSES
	CONC RIPRAP
	WIDENING AREA

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DATE: 4/28/2015 3:23:39 PM



DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
REMOVING CONC (CURB)	118	LF
RIPRAP (CONC) (4 IN)	2	CY
REMOV STR (DRIVEWAY CULVERT)	1	EA
CONC CURB (TY 1)	435	LF
CONC CURB (TY 1)	144	LF
CONC SIDEWALKS (4")	555	SY
CONC SIDEWALKS (6")	80	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (I) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS



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05/01/2015

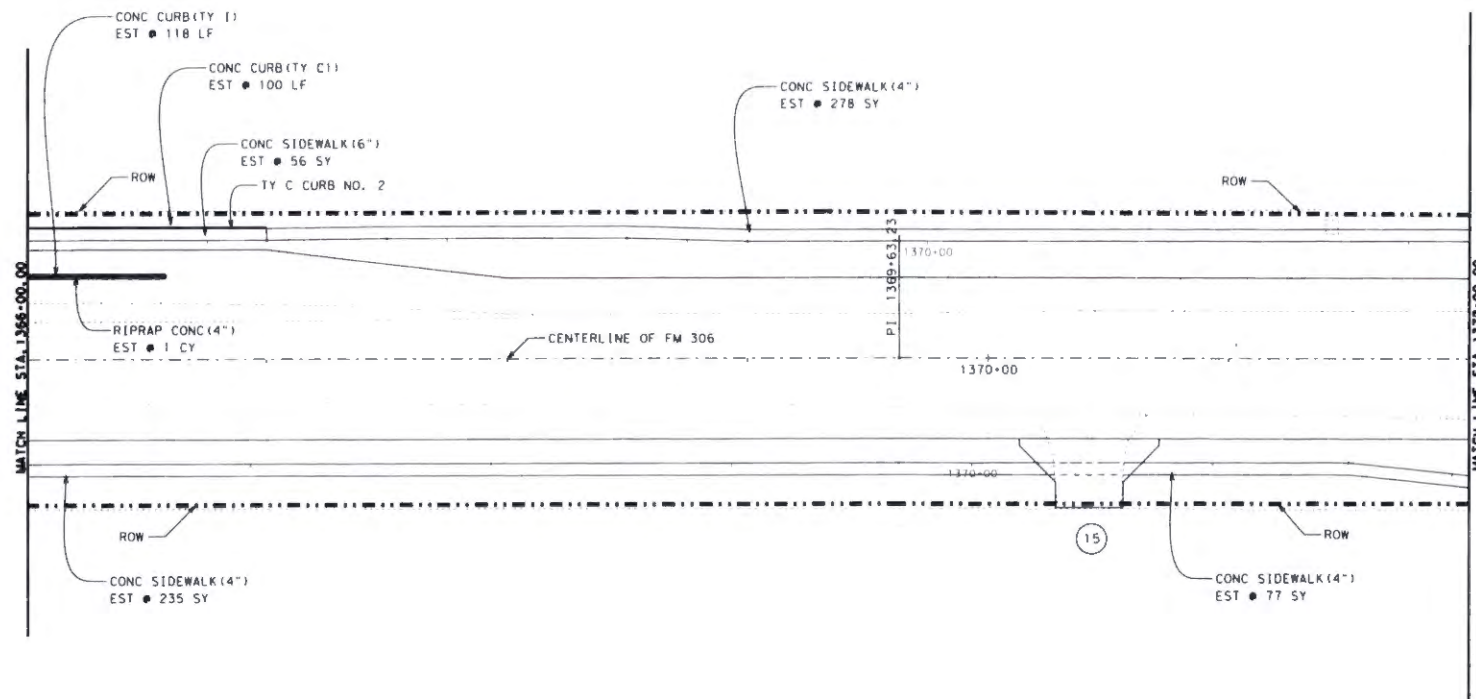
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SHEET 5 OF 31

PROJECT	STP 1502 (615) FM 159		
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	REVISION NO.
1728	02	058	FM 306

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DATE: 4/28/2015 3:23:45 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
RIPRAP (CONC) (4 IN)	1	CY
CONC CURB (TY T)	118	LF
CONC CURB (TY C)	100	LF
CONC SIDEWALKS (4")	590	SY
CONC SIDEWALKS (6")	56	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306 PLAN SHEETS



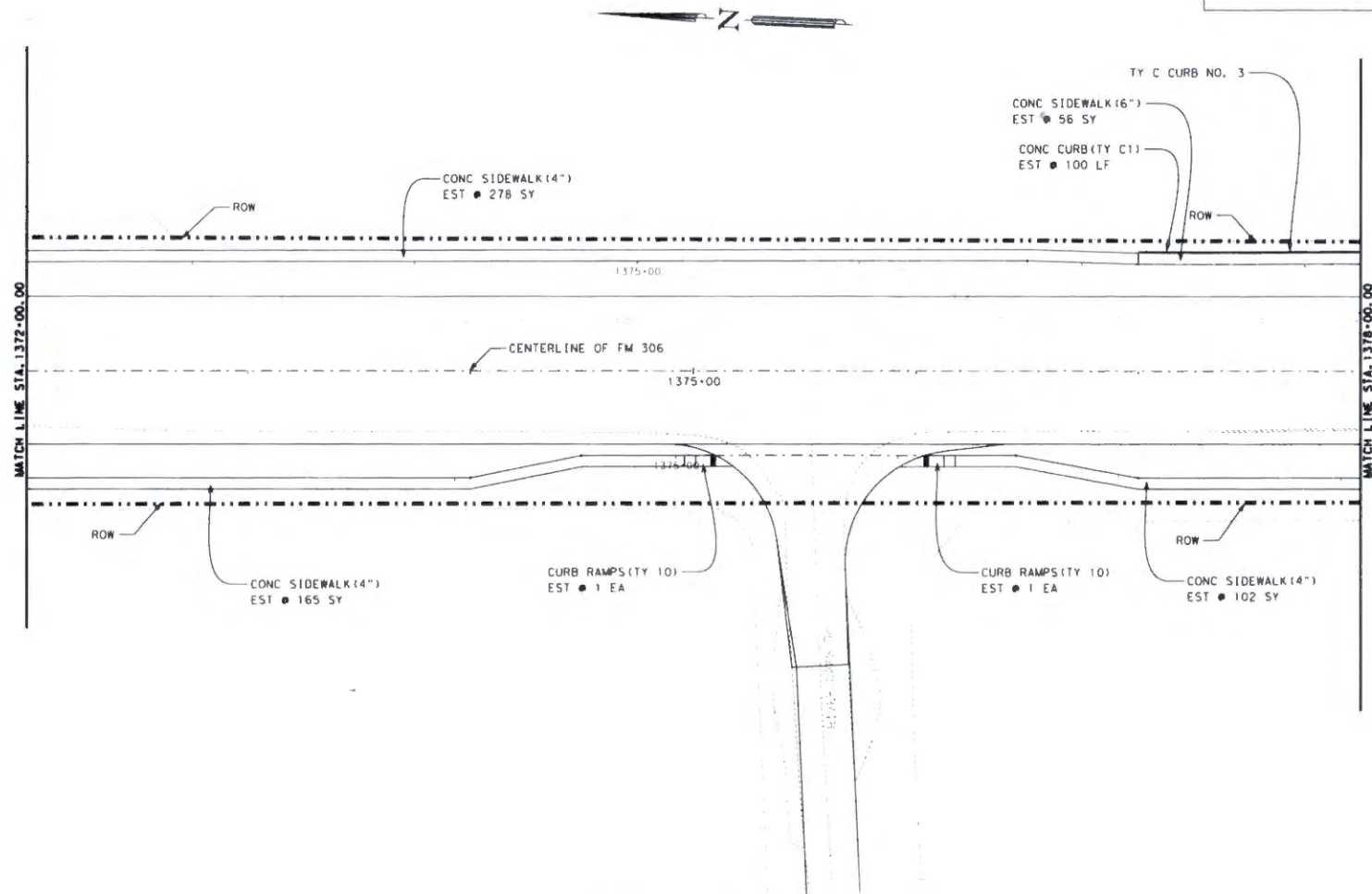
Linda Cox, P.E.
05/01/2015

0 50
SCALE IN FEET

Texas Department of Transportation			
SHEET 6 OF 31			
STATE	FEDERAL AID PROJECT NO.	SHEET NO.	
TEXAS	STP 1502 (615) MM	160	
COUNTY	DISTRICT	COUNTY	
1728	02	058 FM 306	

FILE: K:\1728-02-058\FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHTS 50\PLAN019(058).dgn
DATE: 4/28/2015 3:23:52 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C1)	100	LF
CONC SIDEWALKS (4")	545	SY
CONC SIDEWALKS (6")	56	SY
CURB RAMPS (TY 10)	2	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306 PLAN SHEETS



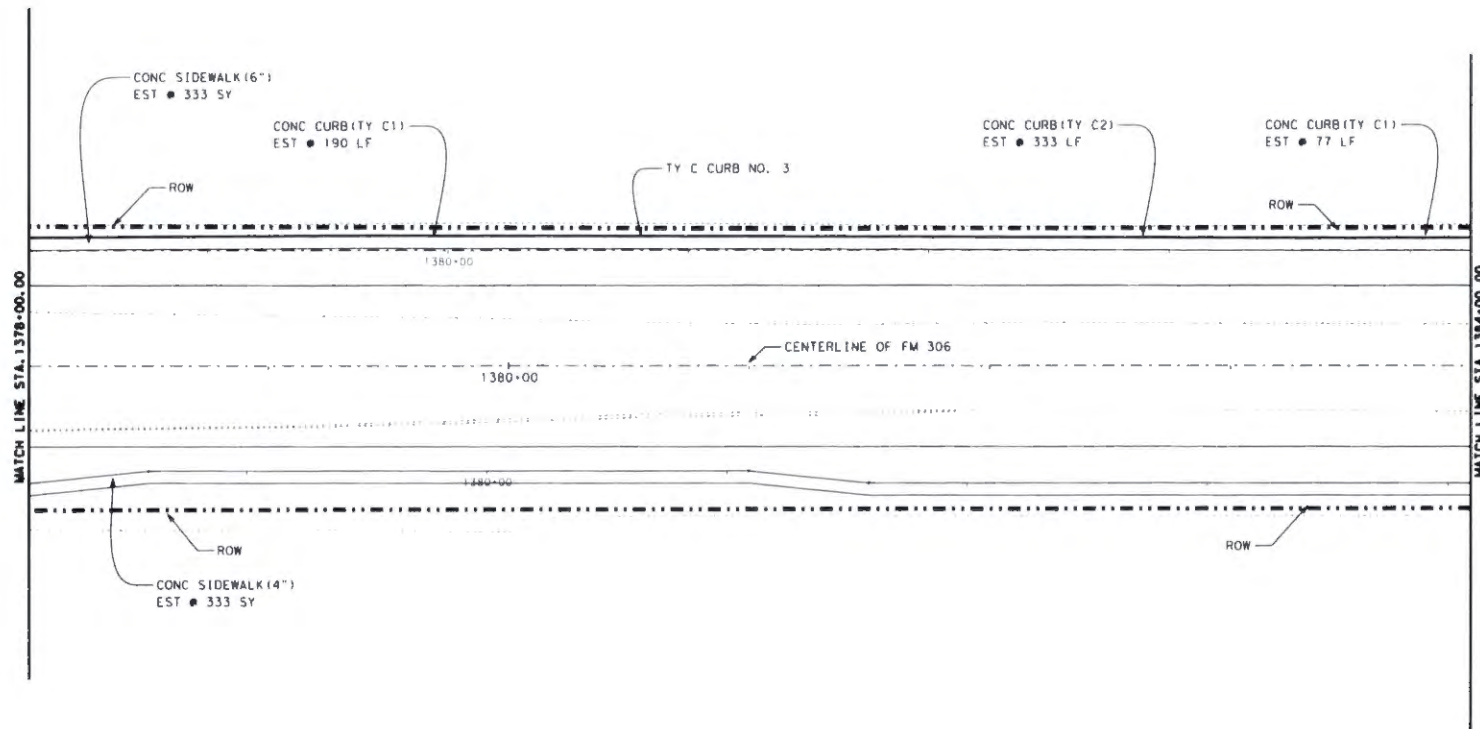
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0 50
SCALE IN FEET

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SHEET 7 OF 31			
STATE	DISTRICT	COUNTY	SHEET
TEXAS	SAT	COMAL	161
CONTRACT	SECTION	JOB	ALTERNATE NO.
1728	02	058	FM 306

FILE: K:\1726-02-058\FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHYS SOL\172602058.dgn
DATE: 4/28/2015 3:23:51 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C2)	333	LF
CONC CURB (TY C1)	267	LF
CONC SIDEWALKS (4")	333	SY
CONC SIDEWALKS (6")	333	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (I) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS



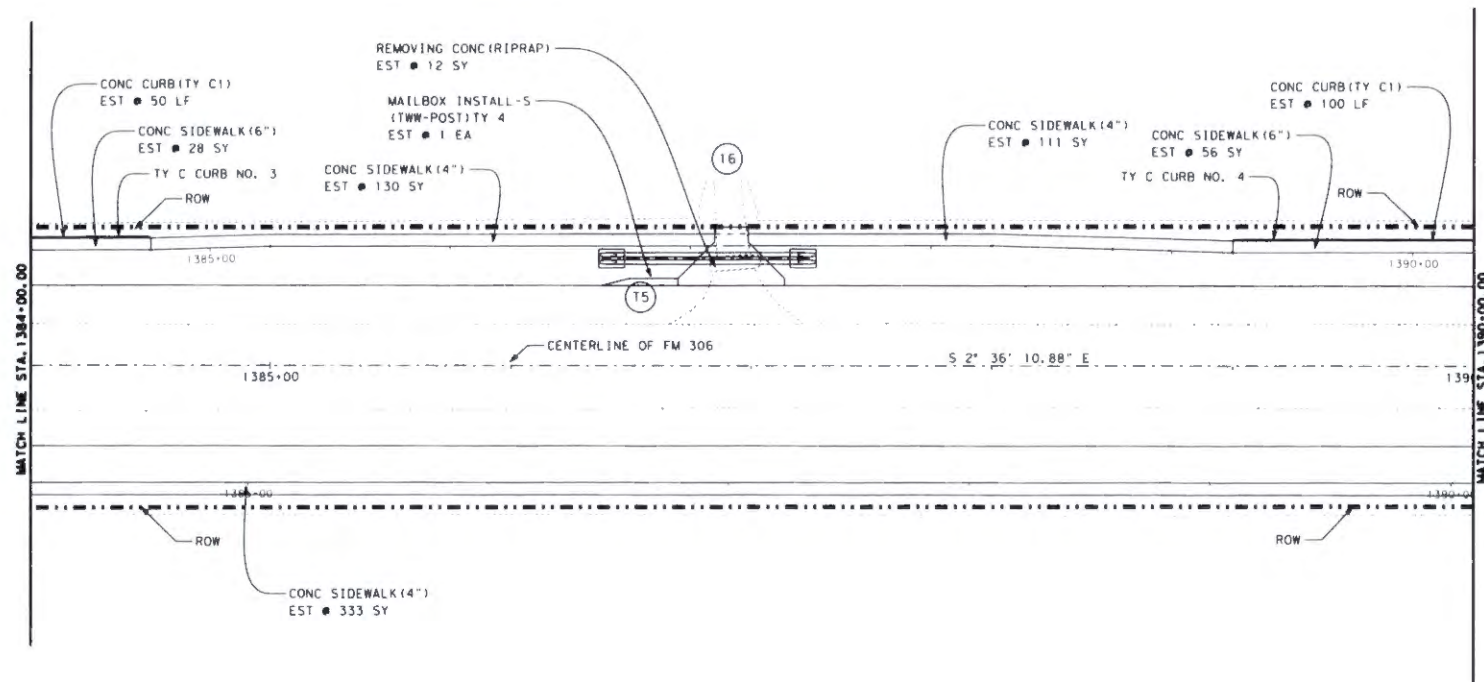
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05/01/2015

0 50
SCALE IN FEET

Texas Department of Transportation			
SHEET 8 OF 31			
PROJECT	STP 1502 (615) MM	162	
STATE	TEXAS	SAT	COMAL
CONTROL	SECTION	JOB	WARRANT NO.
1726	02	058	FM 306

FILE: K:\1728-02-058\FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHTS\SONELN021 (058).dgn
DATE: 4/28/2015 3:24:04 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
REMOVING CONC (RIPRAP)	12	SY
CONC CURB (TY C1)	150	LF
CONC SIDEWALKS (4")	574	SY
CONC SIDEWALKS (6")	84	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (I) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS



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05/01/2015

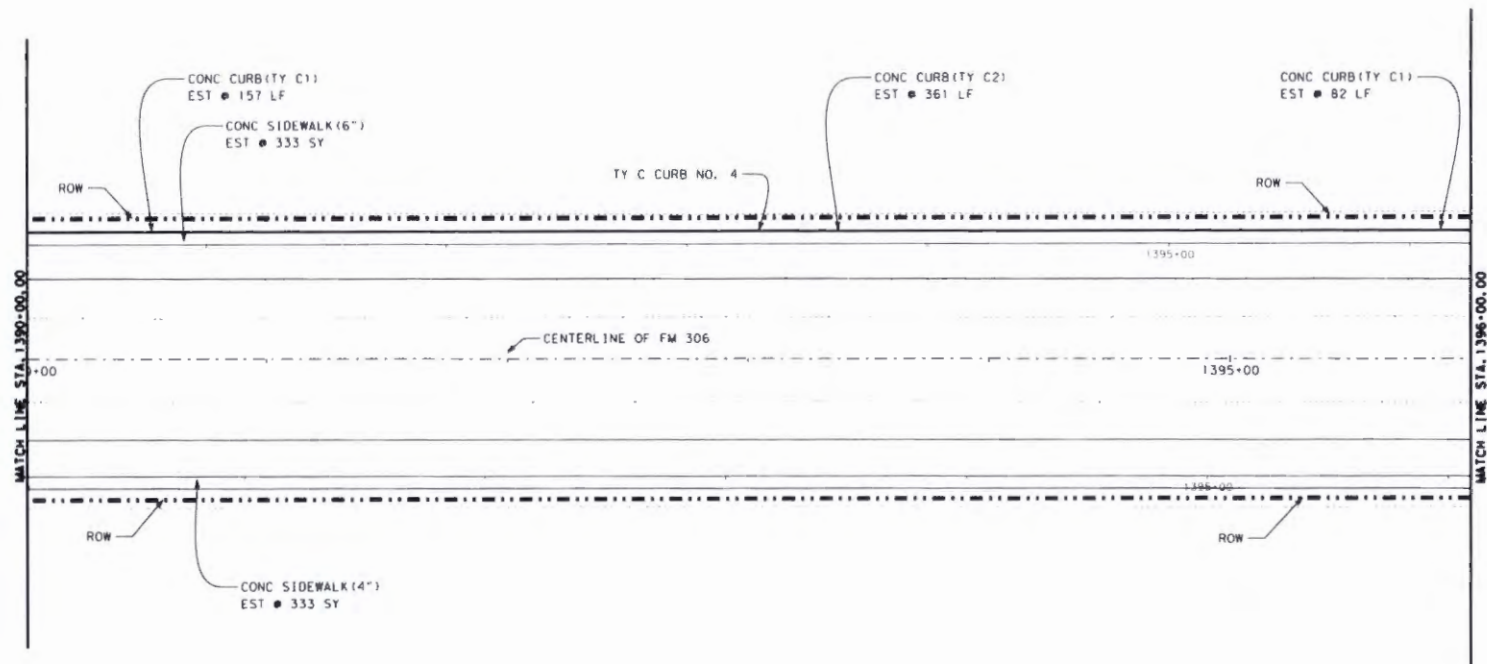
0 50
SCALE IN FEET

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SHEET 9 OF 31

PROJECT	STP 1502 (615) MM 163
STATE	DISTRICT
TEXAS	SAT
CONTROL	SECTION
1728	02 058

FILE: K:\1728-02-058\FM 306 - Hoffman to 0.5 M. N Hunter RA\ROADWAY\PLAN SHTS\05PLN022(058).dgn
DATE: 4/28/2015 3:24:14 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C2)	361	LF
CONC CURB (TY C1)	239	LF
CONC SIDEWALKS (4")	333	SY
CONC SIDEWALKS (6")	333	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306
PLAN SHEETS



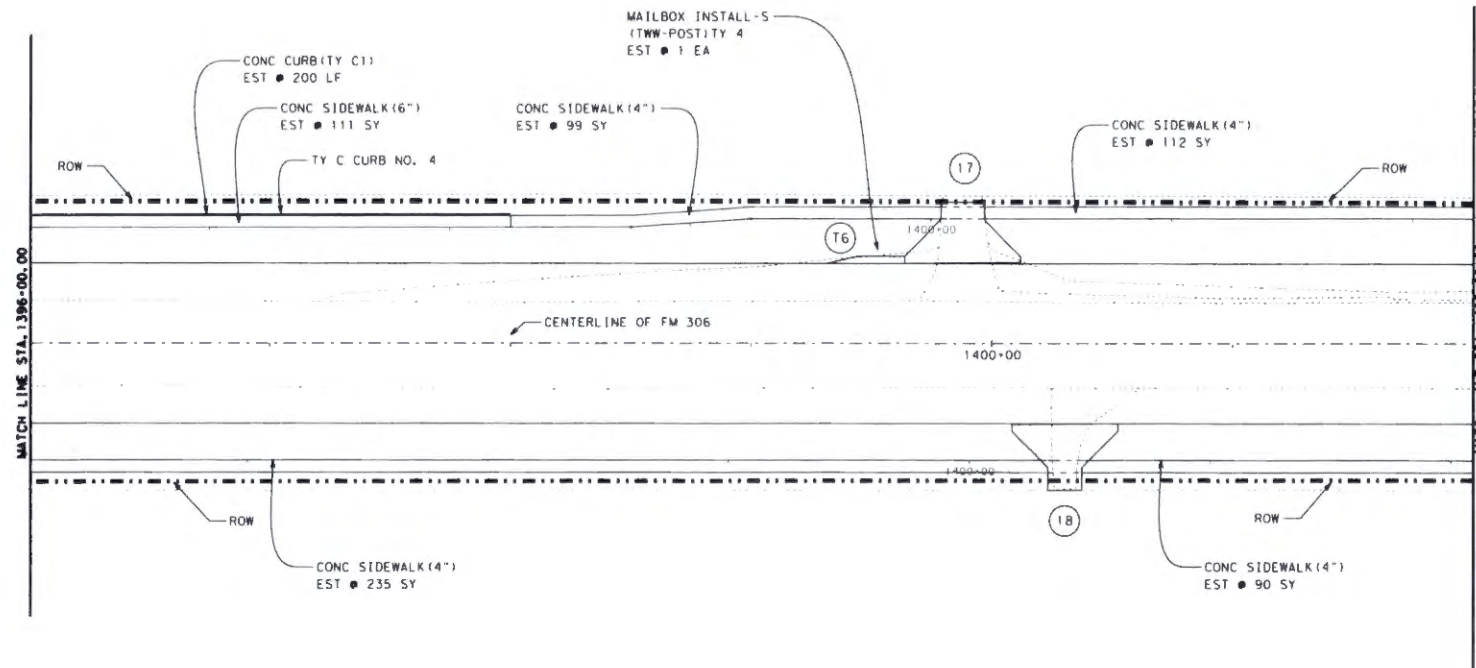
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05/01/2015

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SCALE IN FEET

Texas Department of Transportation			
SHEET 10 OF 31			
PROJECT	STP 1502 (615) MM	164	
STATE	TEXAS	SAT	COMAL
CONTROL	SECTION	DATE	1728 02 058 FM 306

FILE: K:\1728-02-058\FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHITS 50\PLN023(058).dgn
DATE: 4/28/2015 3:24:19 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C1)	200	LF
CONC SIDEWALKS (4")	536	SY
CONC SIDEWALKS (6")	111	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T1) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS



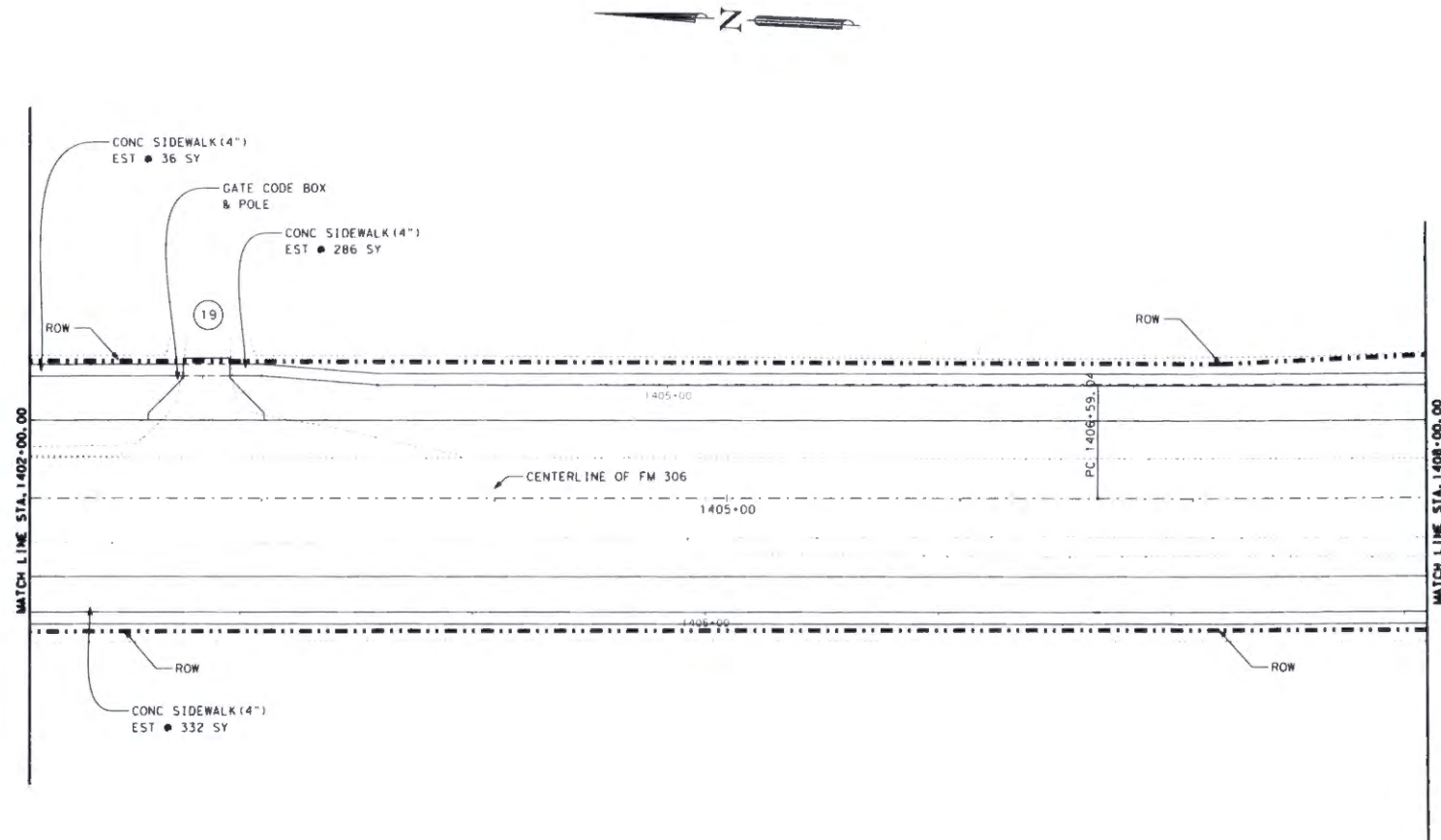
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SCALE IN FEET

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SHEET 11 OF 31

STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTROL	SECTION	JOB
1728	02	058
		MEMBER NO.
		FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC SIDEWALKS (4")	653	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(1)	MAILBOX TURNOUT NUMBER
(1)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306
PLAN SHEETS



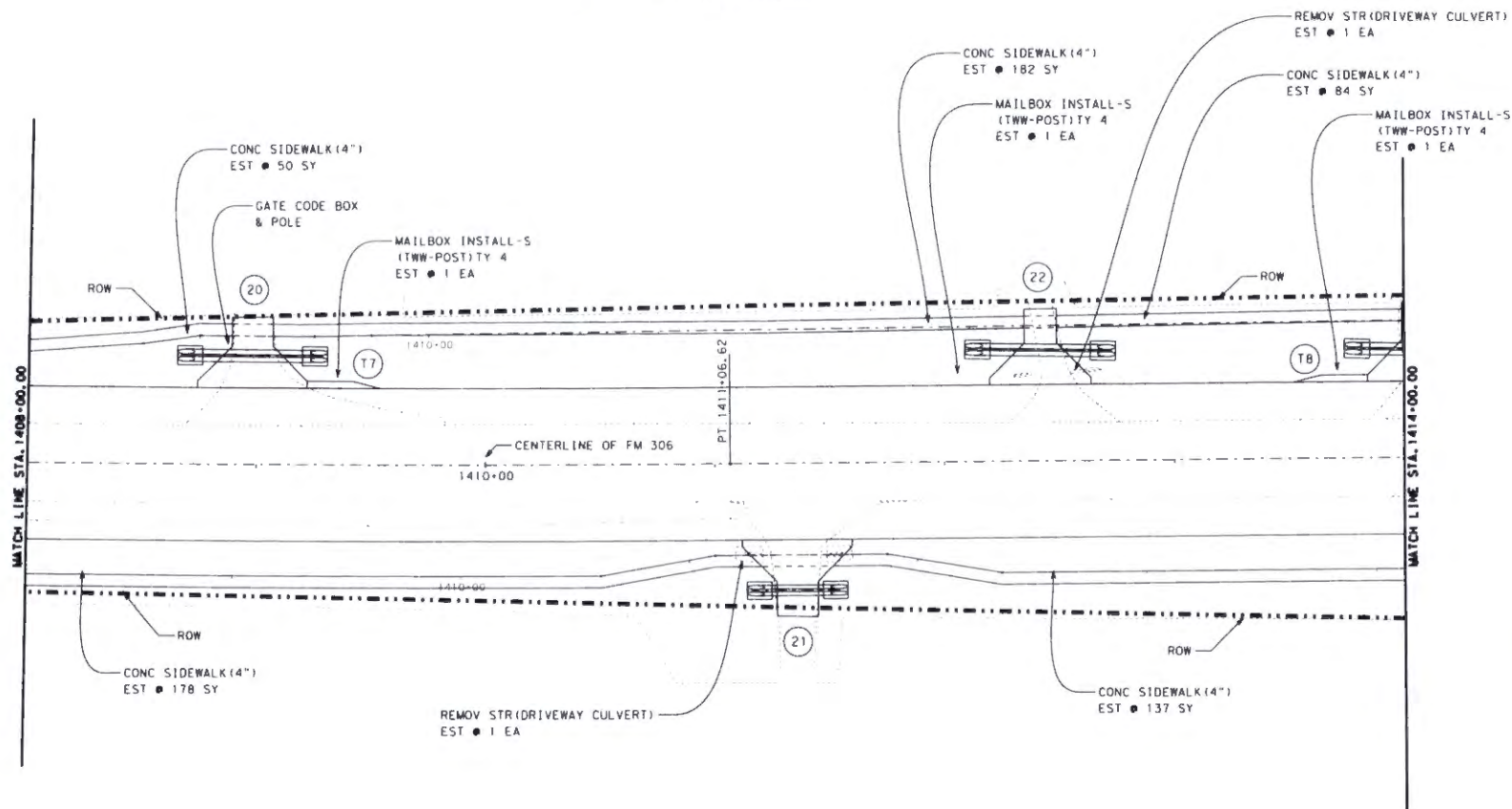
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05/01/2015

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SCALE IN FEET

Texas Department of Transportation			
SHEET 12 OF 31			
PROJECT	STP 1502 (615) MM	166	
STATE	TEXAS	COUNTY	COMAL
CONTROL	SECTION	JOB	1728 02 058 FM 306

FILES: K:\1728-02-058\FM 306 - Hoffman to 0.5 Mi N Hunter Rd\ROADWAY\PLN SHRS 50\PLN025 0581.dgn
 DATE: 4/28/2015 3:24:35 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
REMOV STR (DRIVEWAY CULVERT)	2	EA
CONC SIDEWALKS (4")	631	SY
MAILBOX INSTALL - 5 (TWW-POST) TY 4	3	EA



NOTE:
 SEE HORIZONTAL CONTROL SHEETS
 FOR HORIZONTAL ALIGNMENT
 INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
 AND SUMMARY SHEET FOR
 DRIVEWAY DETAILS AND
 QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
 INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(1)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

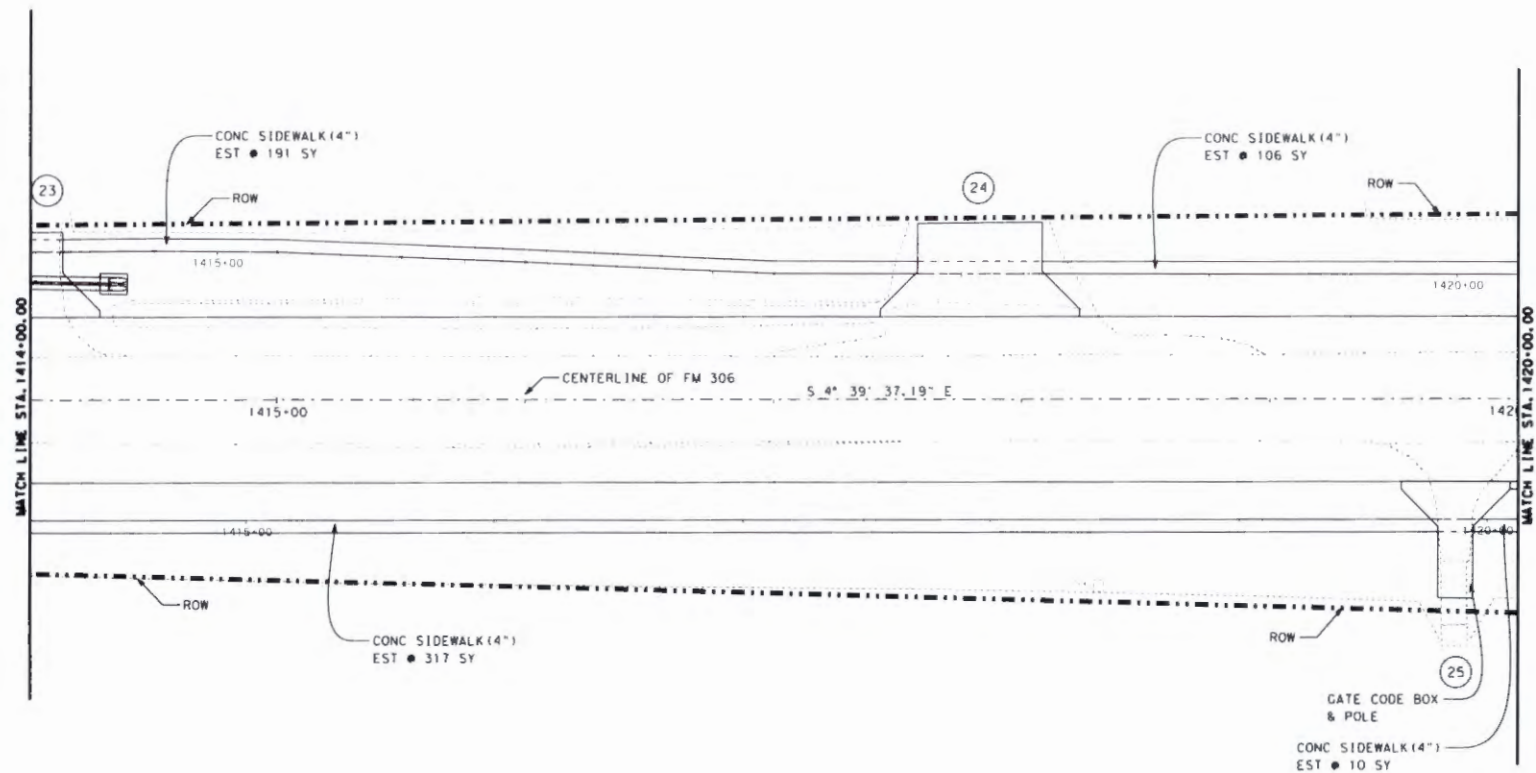
FM 306
 PLAN SHEETS



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 05/01/2015

0 50 SCALE IN FEET			
Texas Department of Transportation SHEET 13 OF 31			
STATE	SECTION	DATE	PROJECT NO.
TEXAS	SAT	COMAL	1728 02 058 FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC SIDEWALKS (4")	624	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T1) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306 PLAN SHEETS

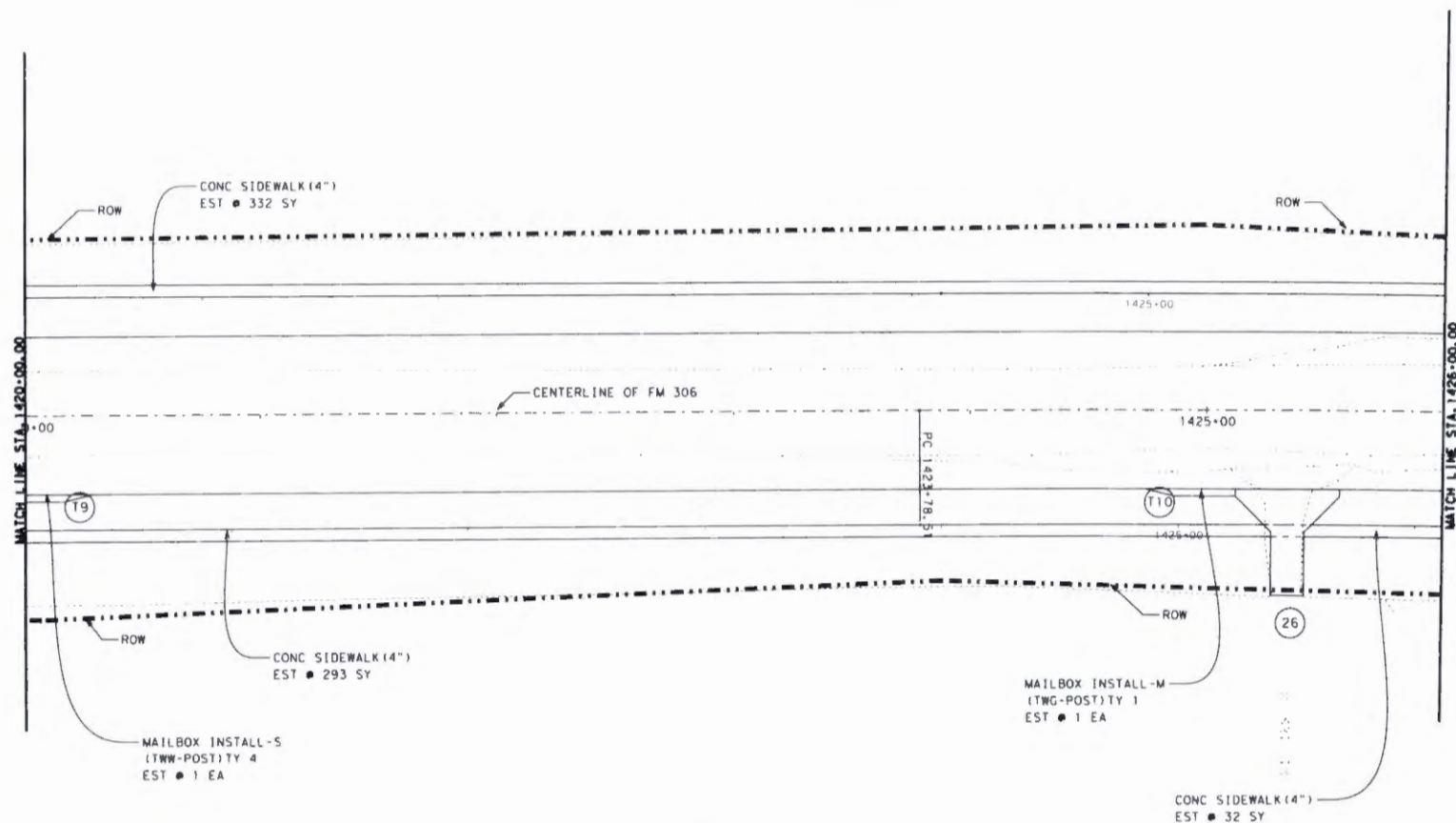
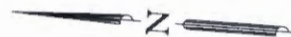


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05/01/2015

0 50
SCALE IN FEET

Texas Department of Transportation			
SHEET 14 OF 31			
PROJECT	STP 1502 (615) L&B	161	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	ROUTE
1728	02	05B	FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC SIDEWALKS (4")	657	SY
MAILBOX INSTALL - M (TGW-POST) TY 1	1	EA
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T1) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS



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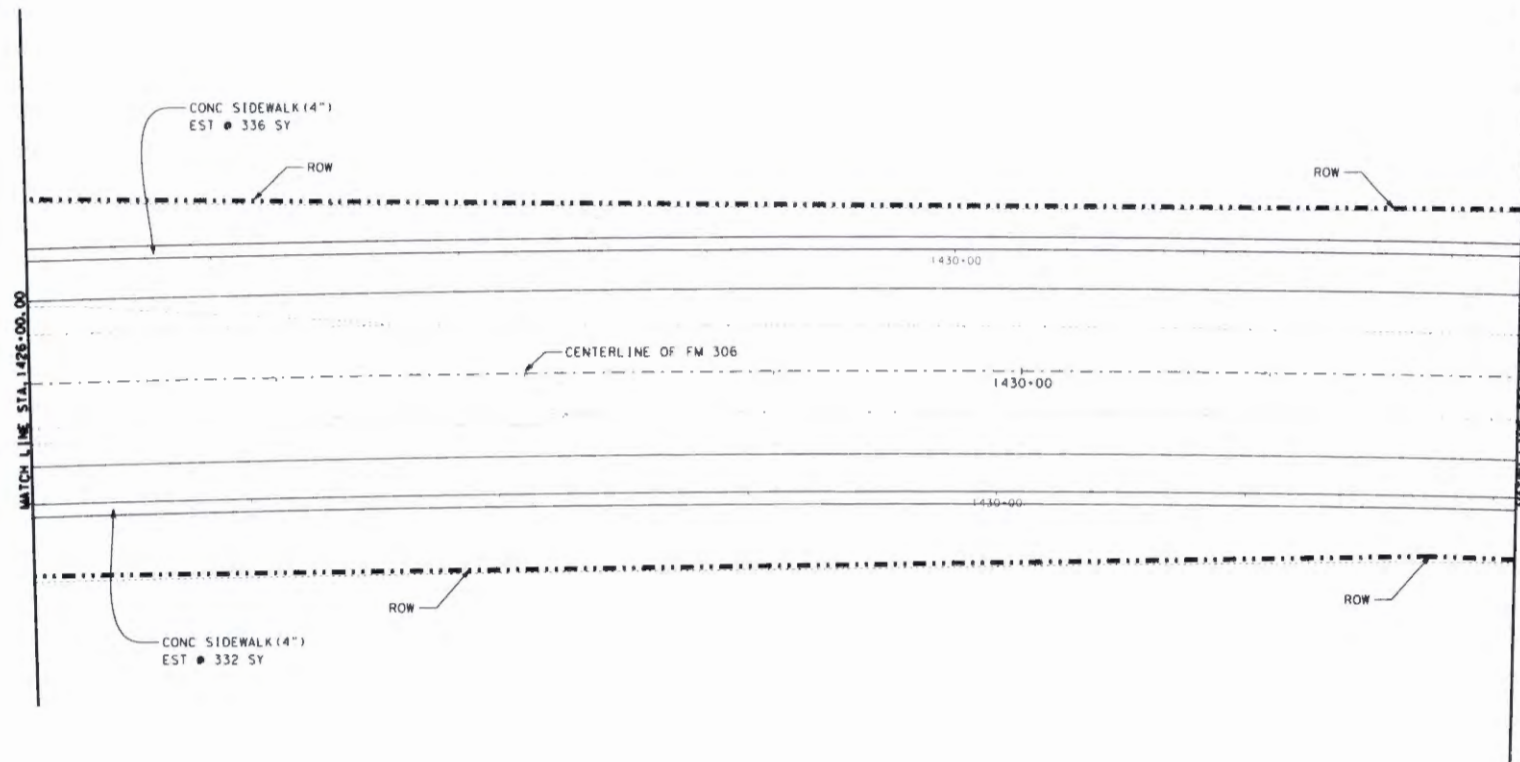
05/01/2015



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SHEET 15 OF 31

FUND	FEDERAL AID PROJECT NO.	SHEET NO.
SECTION	STP 1502 (615) NM 165	
STATE	DISTRICT	COUNTY
TEXAS	SAT	COMAL
CONTRACT	SECTION	JOB
1728	02	058 FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC SIDEWALKS (4")	668	SY



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05/01/2015

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

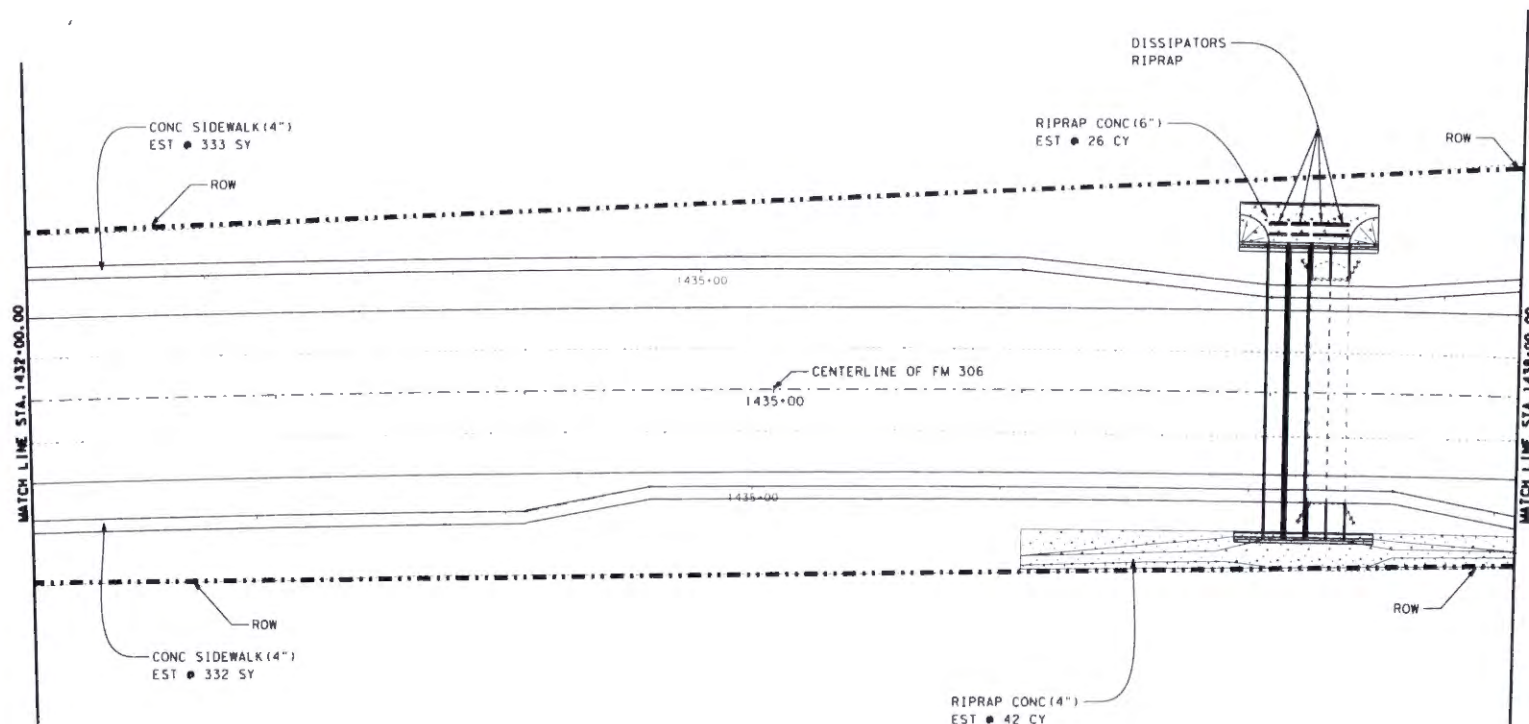
FM 306 PLAN SHEETS



Texas Department of Transportation			
SHEET 18 OF 31			
FEDERAL PROJECT NO.	STP 1502 (615) MM	SHEET NO.	17
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	1728 02 058 FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLN SHTS 50\PLN029 (058).dgn
DATE: 4/28/2015 3:26:13 PM

DESCRIPTION	QTY	UNIT
PREPARING ROW	6	STA
RIPRAP (CONC) (4" IN)	42	CY
RIPRAP (CONC) (6" IN)	26	CY
CONC SIDEWALKS (4")	665	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306 PLAN SHEETS

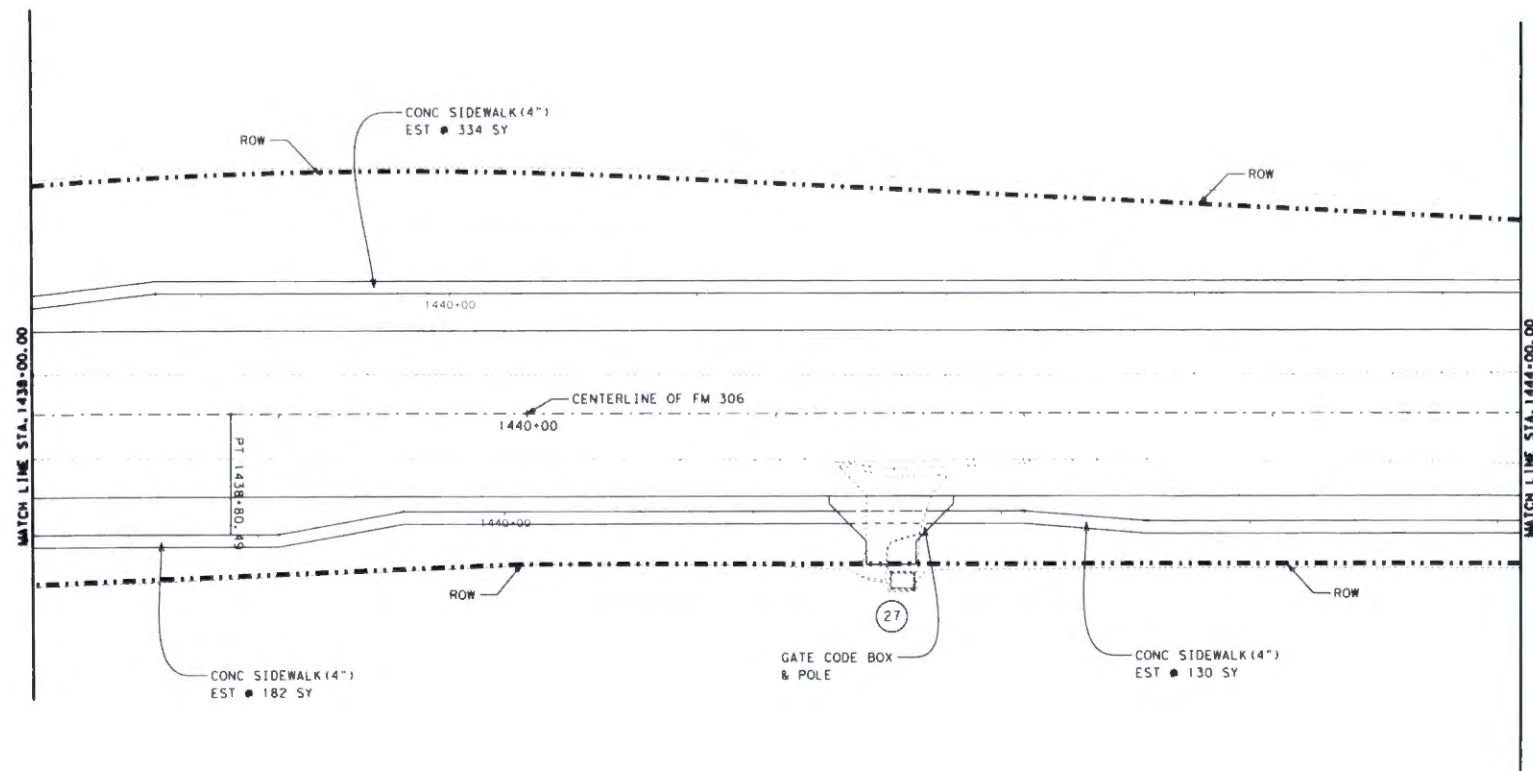


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05/01/2015



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SHEET 17 OF 31			
FUND	FEDERAL AID PROJECT NO.	SHEET NO.	
REVISION	STP 1502 (615) MM	17	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	HYDROLOGIST NO.
1728	02	058	FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC SIDEWALKS (4")	646	SY








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05/01/2015

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.


SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- | | |
|---|------------------------|
|  | MAILBOX TURNOUT NUMBER |
|  | DRIVEWAY NUMBER |
|  | GABION MATTRESSES |
|  | CONC RIPRAP |
|  | WIDENING AREA |

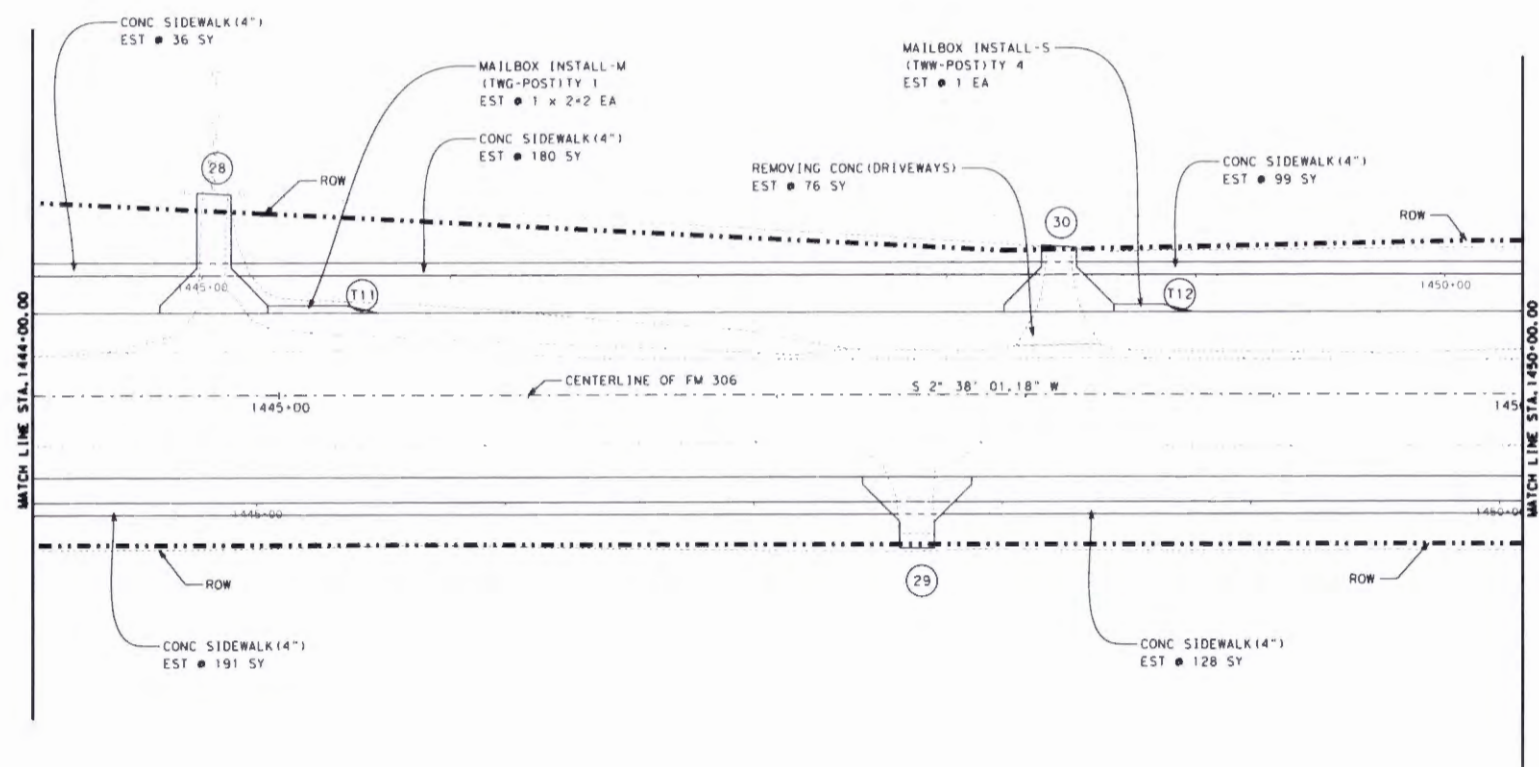
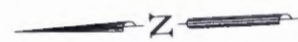
FM 306
PLAN SHEETS




 Texas Department of Transportation
 SHEET 18 OF 31

FEDERAL AID PROJECT NO.	SHEET NO.
STP 1502 (615) MM	17
STATE	COUNTY
TEXAS	COMAL
SECTION	RIGHT OF WAY
1728 02	058 FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
REMOVING CONC (DRIVEWAYS)	76	SY
CONC SIDEWALKS (4")	634	SY
MAILBOX INSTALL - M (TGW-POST) TY 1	1	EA
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T1)	MAILBOX TURNOUT NUMBER
(I)	DRIVEWAY NUMBER
[Pattern]	CABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306 PLAN SHEETS



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05/01/2015

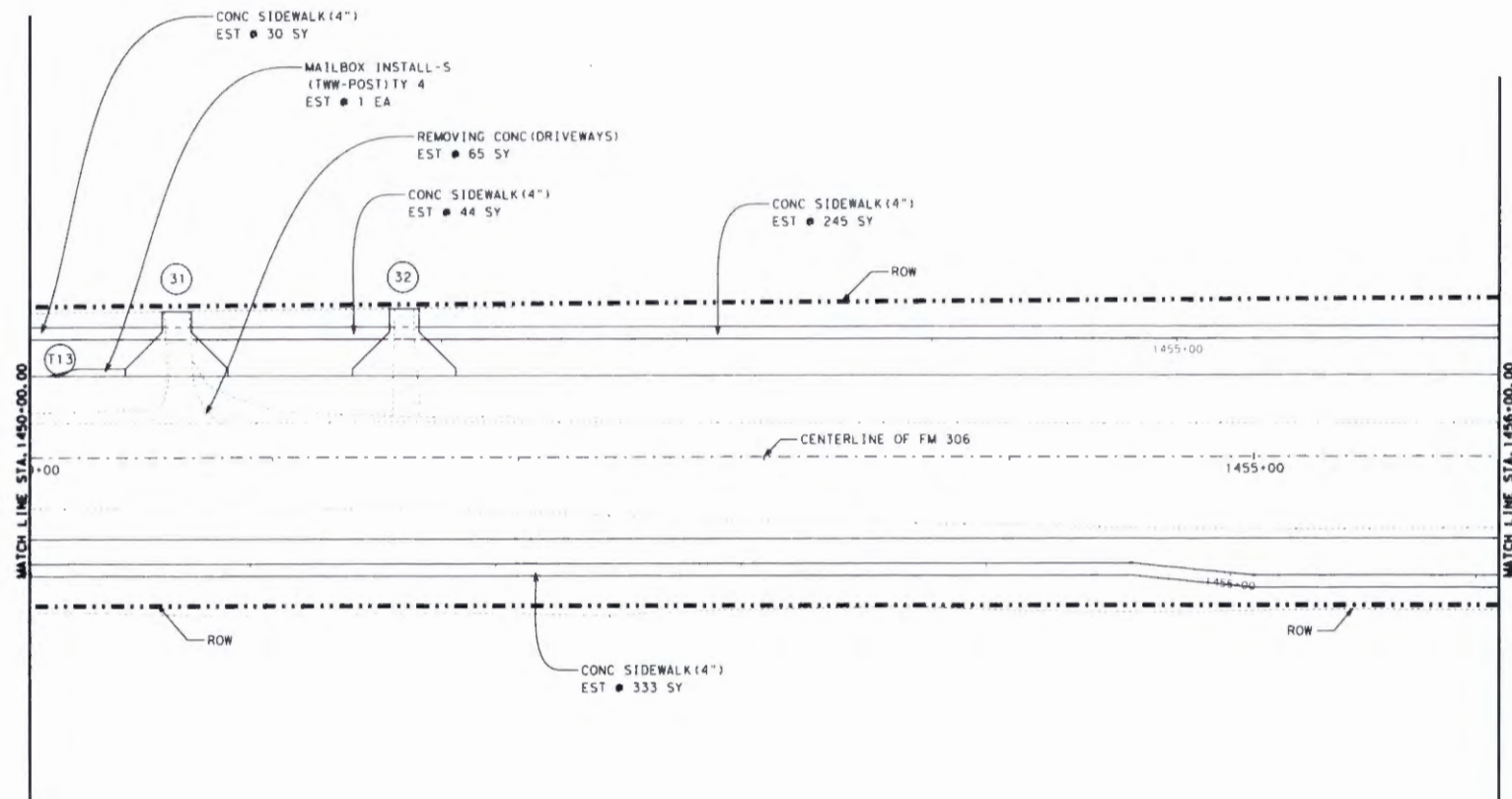


Texas Department of Transportation			
SHEET 19 OF 31			
PROJECT	FEDERAL AID PROJECT NO.	SHEET NO.	
DISTRICT	STP 1502 (615) LMA	17	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	WARRANT NO.
1728	02	058	FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHTS 50\PLAN031 (058).dgn
DATE: 4/28/2015 3:26:34 PM

FILE: K:\1728-02-058\FM 306 - Hoffman to D. S. Mt. N Hunter Rd\ROADWAY\PLAN SHITS 50\PLN032 (058) .dgn
DATE: 4/28/2015 3:26:40 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
REMOVING CONC (DRIVEWAYS)	65	SY
CONC SIDEWALKS (4")	652	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- GABION MATTRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306 PLAN SHEETS



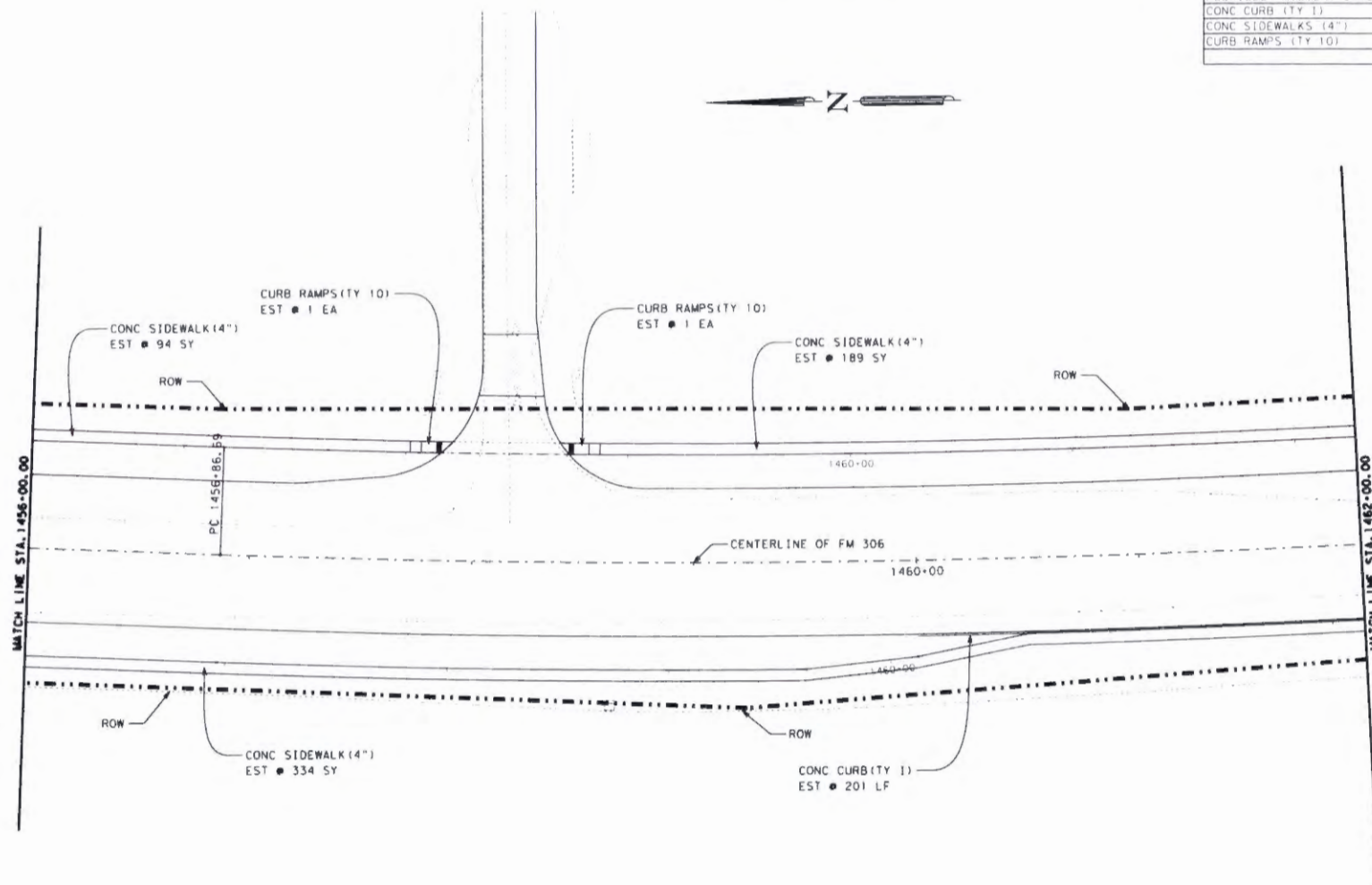
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05/01/2015

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SCALE IN FEET

Texas Department of Transportation			
SHEET 20 OF 31			
FEDERAL AID PROJECT NO.	STP 1502 (615)	MM	17
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	REVISION NO.
1728	02	058	FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLN SHTS 50\PLN0310581.dgn
DATE: 4/28/2015 3:26:46 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
CONC CURB (TY 1)	201	LF
CONC SIDEWALKS (4")	617	SY
CURB RAMPS (TY 10)	2	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T1) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- GABION MATRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306
PLAN SHEETS



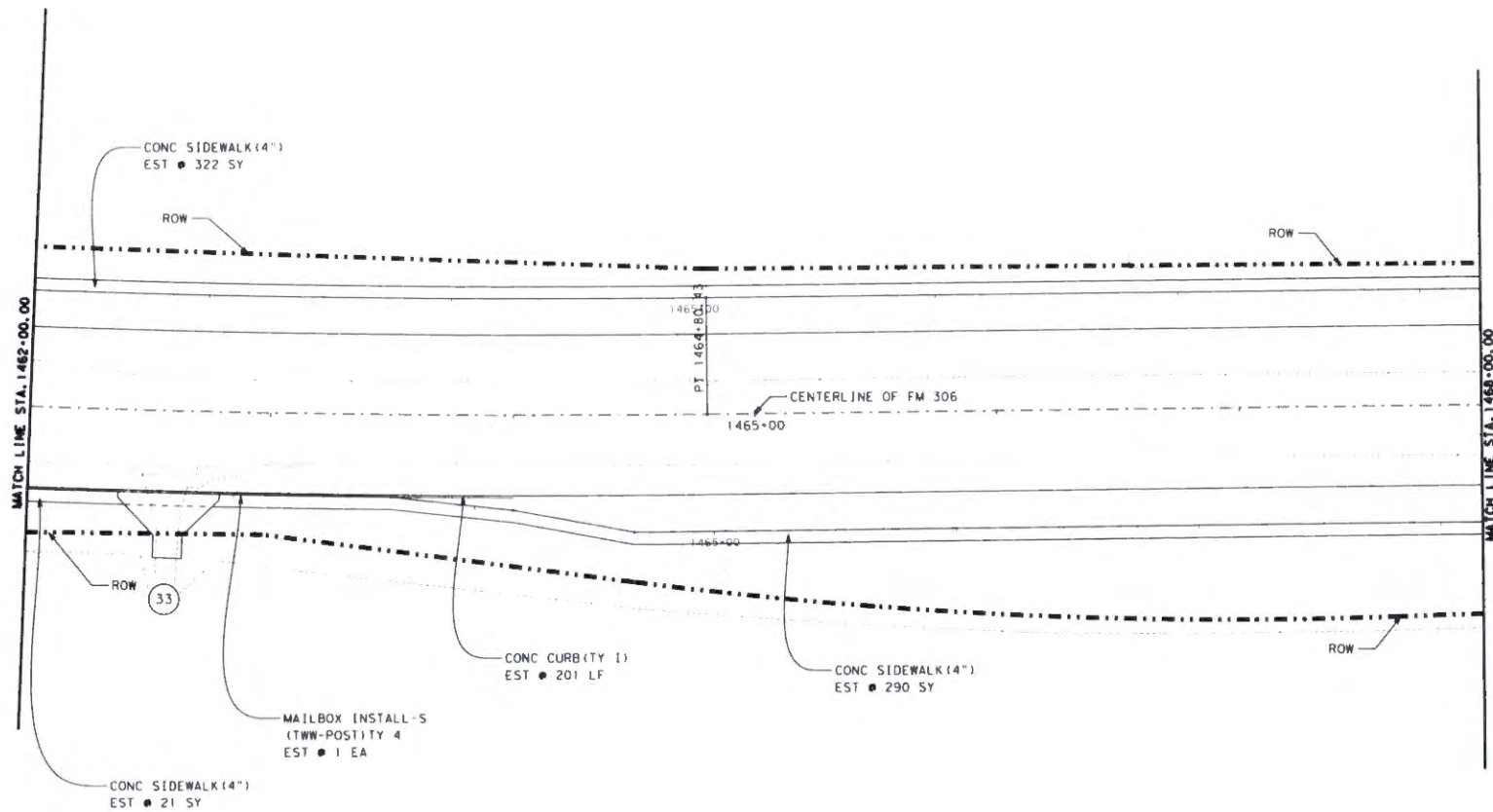
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05/01/2015

0 50
SCALE IN FEET

Texas Department of Transportation			
SHEET 21 OF 31			
FEDERAL AID PROJECT NO.	STP 1502 (615) MM	175	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	WIDENING NO.
1728	02	058	FM 306

FILE: K:\1728-02-058(FM 306 - Hoffman to 0.5 MI N Hunter Rd)\ROADWAY\PLAN SHTS\50\PLAN034(058).dgn
DATE: 4/28/2015 3:26:54 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
CONC CURB (TY 1)	201	LF
CONC SIDEWALKS (4")	633	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (11) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306 PLAN SHEETS



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05/01/2015

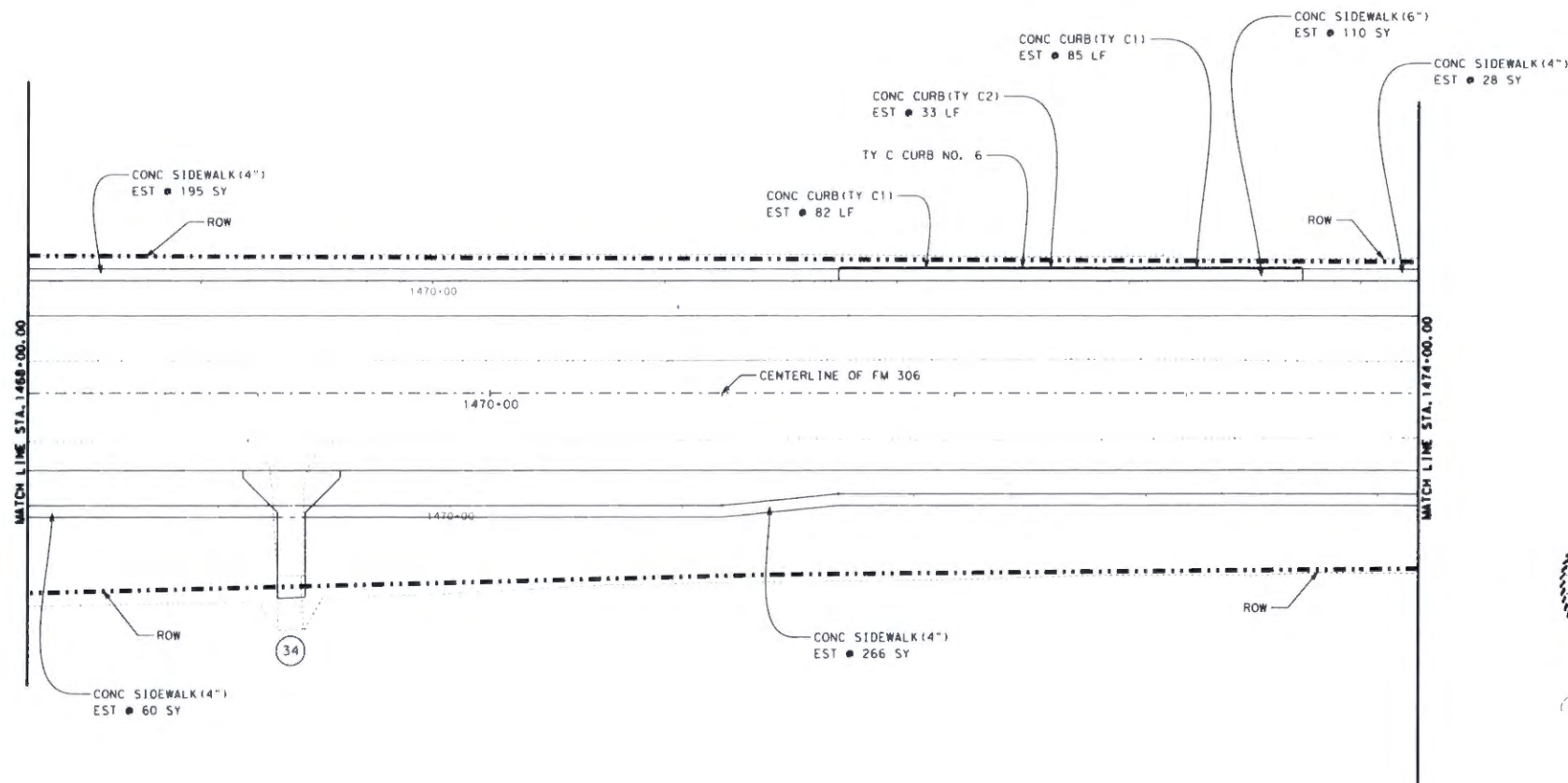
0 50
SCALE IN FEET

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SHEET 22 OF 31

FEDERAL AID PROJECT NO.		SHEET NO.	
STP 1502 (615) MM		171	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	KEYWAY NO.
1728	02	058	FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN SHRS 50\PLAN035 (058).dgn
DATE: 4/28/2015 3:27:01 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
CONC CURB (TY C2)	33	LF
CONC CURB (TY C1)	167	LF
CONC SIDEWALKS (4")	549	SY
CONC SIDEWALKS (6")	110	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- GABION MATTRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306
PLAN SHEETS



Linda Cox, PE
05/01/2015

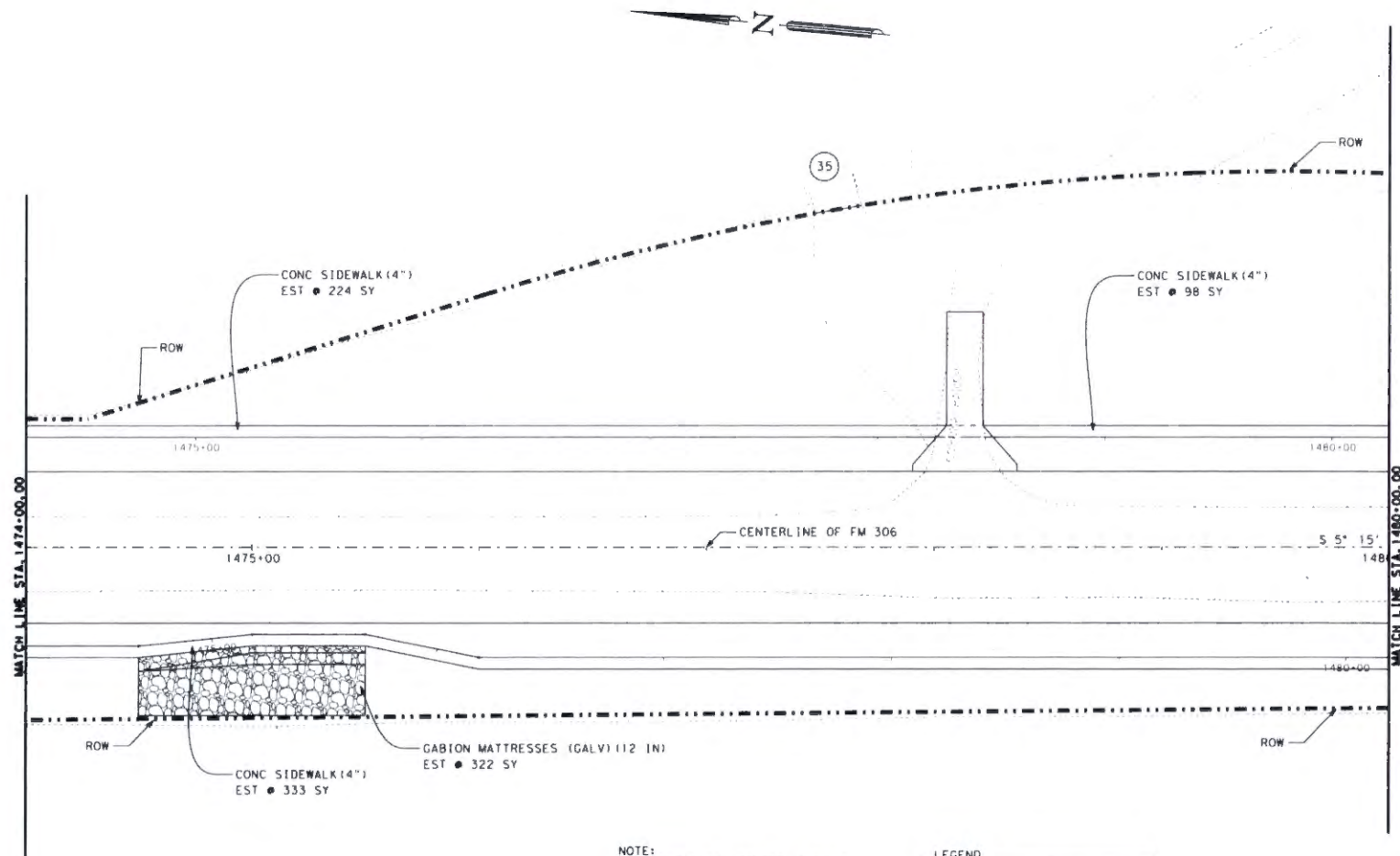
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SCALE IN FEET

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SHEET 23 OF 31

STATE	FEDERAL AID PROJECT NO.	SHEET NO.
TEXAS	STP 1502 (615) MM 177	
DISTRICT	COUNTY	
SAT	COMAL	
SECTION	JOB	WIDENING NO.
1728	02 058	FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 MI N Hunter Rd\ROADWAY\PLAN_SHTS\50\PLW036 (058).dgn
DATE: 4/28/2015 3:27:07 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
GABION MATTRESSES (GALV) (12 IN)	322	SY
CONC SIDEWALKS (4")	655	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T1) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS

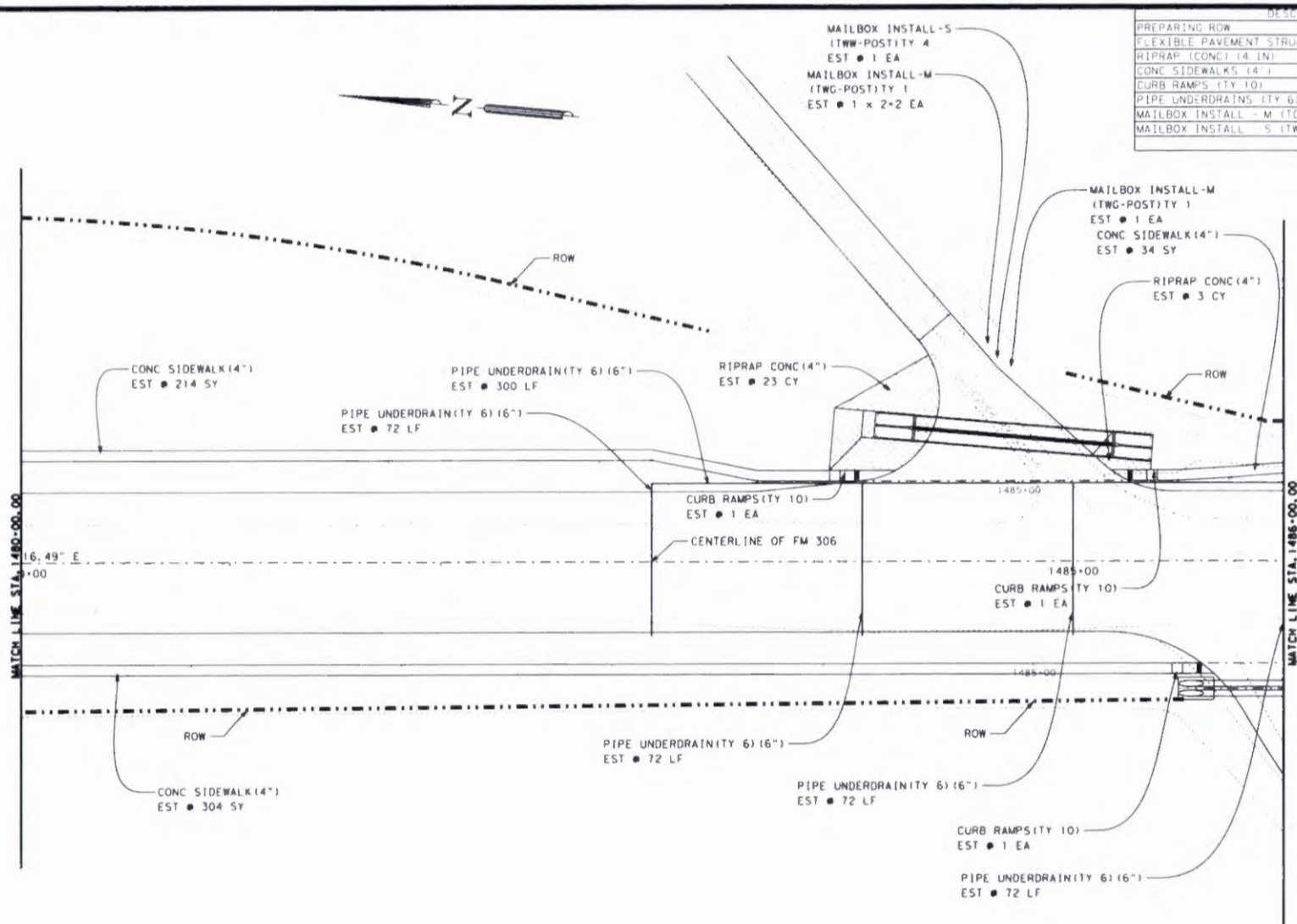


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05/01/2015

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SCALE IN FEET

Texas Department of Transportation			
SHEET 24 OF 31			
STATE	DISTRICT	COUNTY	PROJECT NO.
TEXAS	SAT	COMAL	1728
SECTION	JOB	ALTERNATE NO.	
1728	02	058	FM 306

FILE: K:\1728-02-058(FM 306 - Hoffman to 0.5 MI N Hunter Rd)\ROADWAY\PLAN SHITS 50\PLAN\W03T(058).dgn
DATE: 4/28/2015 3:27:13 PM



DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	534	SY
RIPRAP (CONC) (4 IN)	26	CY
CONC SIDEWALKS (4")	552	SY
CURB RAMPS (TY 10)	3	EA
PIPE UNDERDRAINS (TY 6) (6")	588	LF
MAILBOX INSTALL - M (TWW-POST) TY	3	EA
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T)	MAILBOX TURNOUT NUMBER
(1)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

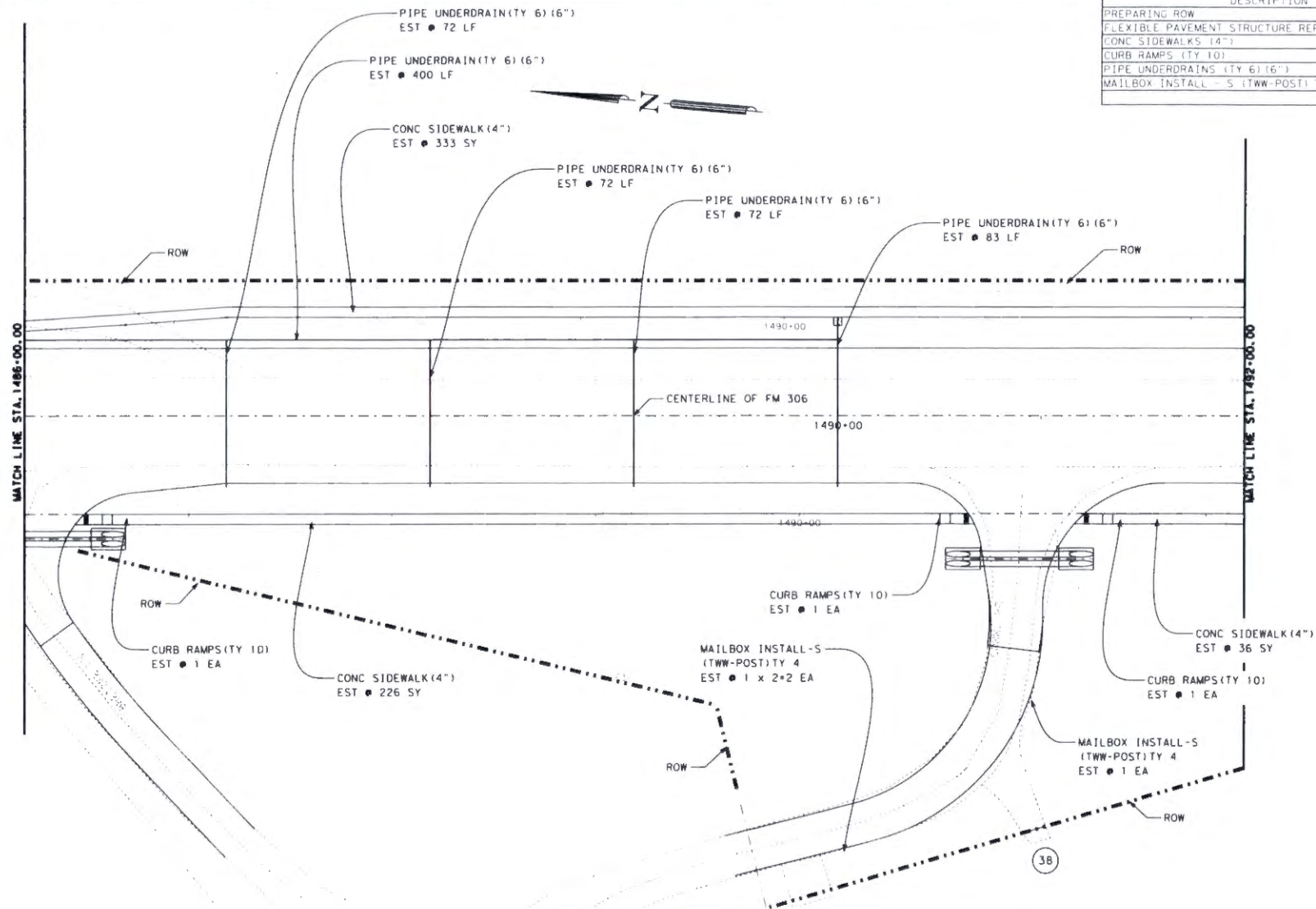
FM 306 PLAN SHEETS



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05/01/2015

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STATE OF TEXAS LINDA COX 90090 LICENSED PROFESSIONAL ENGINEER			
SHEET 25 OF 31			
PROJECT	STP 1502 (615) MJ	171	
STATE	TEXAS	COUNTY	COMAL
SECTION	02	JOB	1728
DATE	02	YEAR	05B FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 Mi N Hunter Rd\ROADWAY\PLAN SHOTS\058\038 (058).dgn
DATE: 4/28/2015 3:21:20 PM



DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	534	SY
CONC SIDEWALKS (4")	595	SY
CURB RAMPS (TY 10)	3	EA
PIPE UNDERDRAINS (TY 6) (6")	699	LF
MAILBOX INSTALL - S (TWW-POST) TY 4	3	EA

NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- GABION MATRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306 PLAN SHEETS

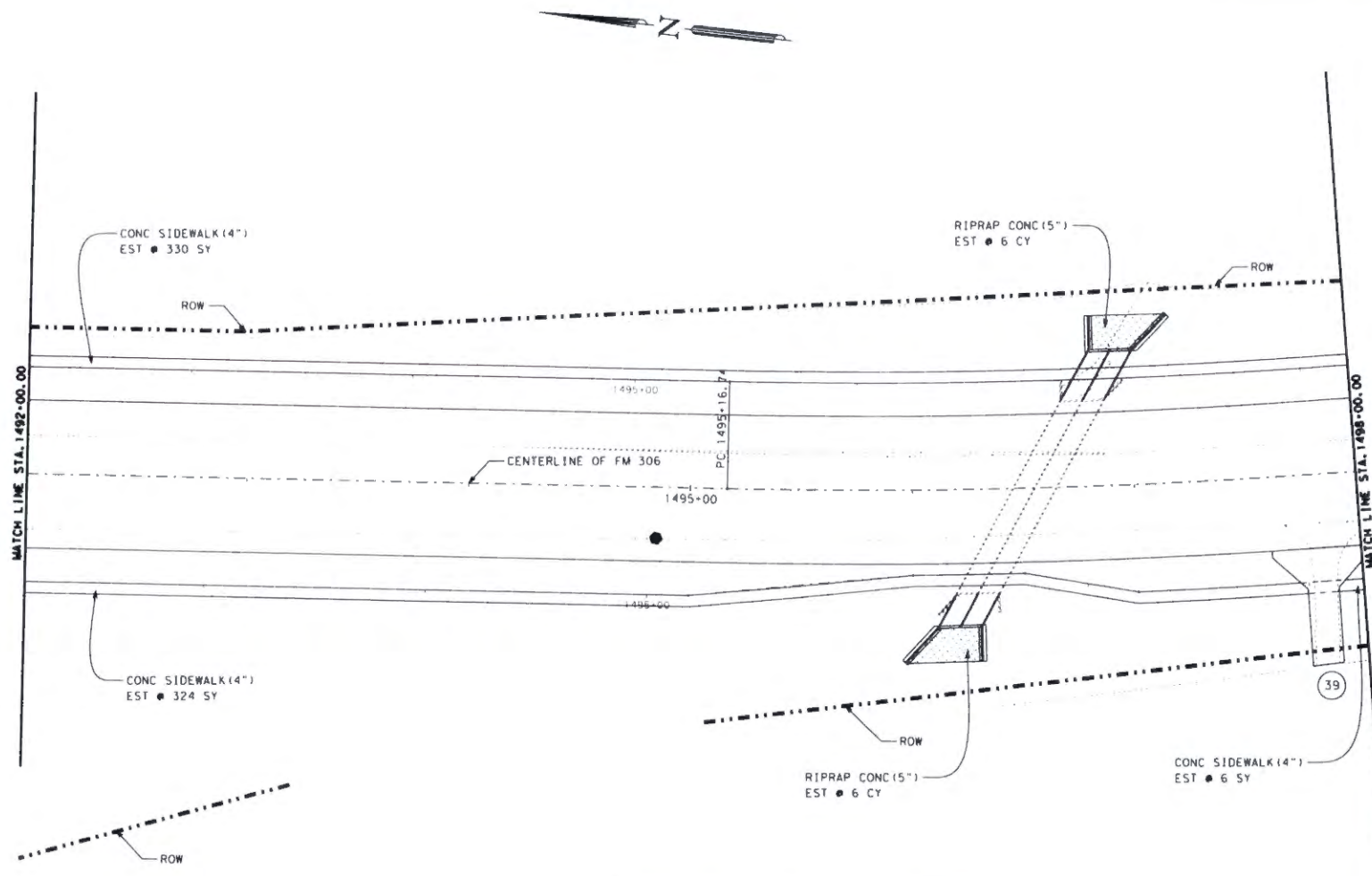


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05/01/2015

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SHEET 28 OF 31			
FED. AID PROJECT NO.	STP 1502 (615)	MM	18
STATE	TEXAS	DISTRICT	SAT
COUNTY	COMAL		
CONTRACT	SECTION	JOB	ALLOCATION NO.
1728	02	058	FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	534	SY
RIPRAP (CONC) (5 IN)	12	CY
CONC SIDEWALKS (4")	660	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (I) DRIVEWAY NUMBER
- GABION MATTRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306 PLAN SHEETS



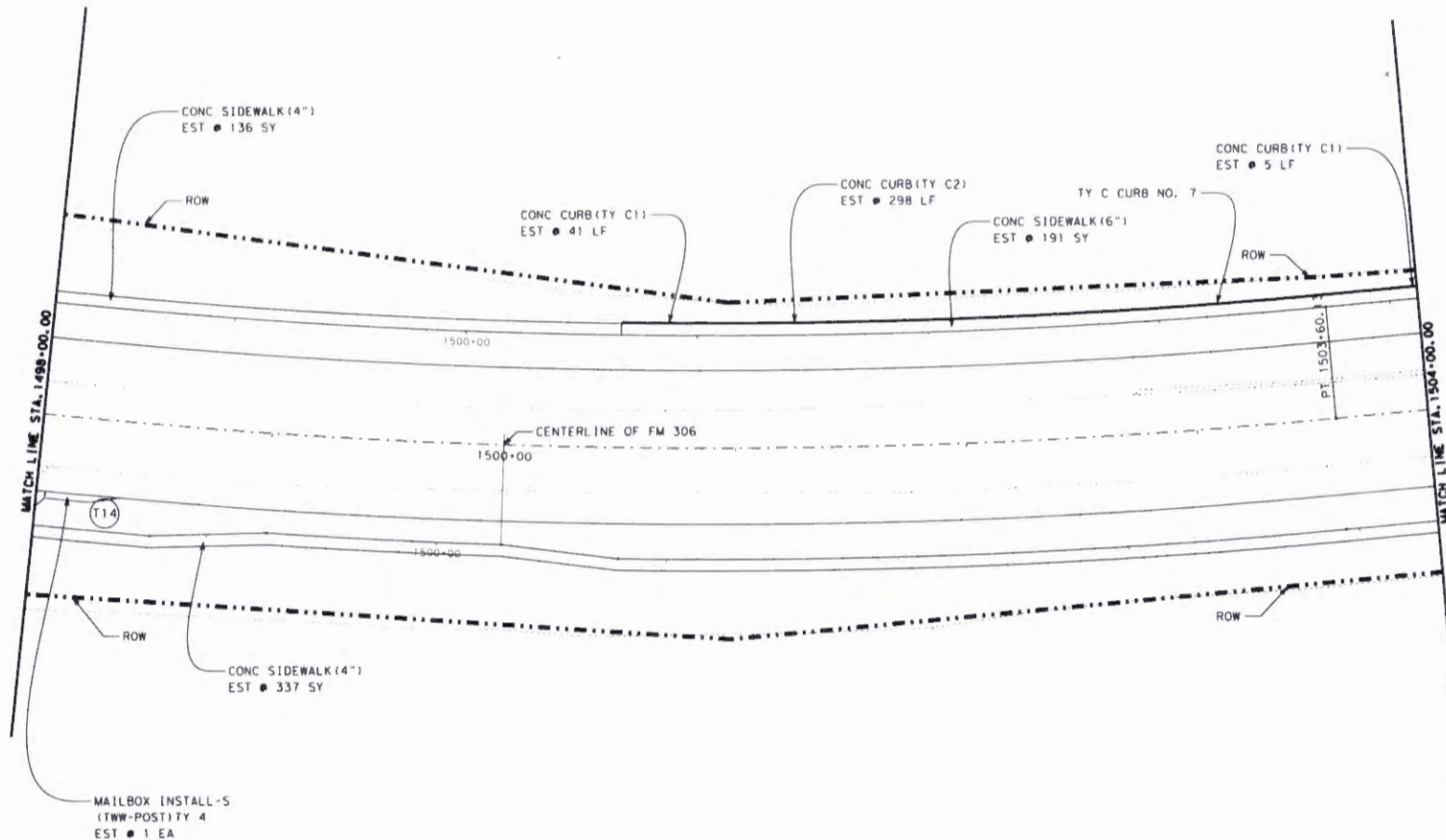
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05/01/2015

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SHEET 27 OF 31			
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	SAT	COMAL	18
PROJECT	SECTION	JOB	CONTRACT NO.
1728	02	058	FM 306

FILE: K:\1728-02-058 FM 306 - Hoffman to 0.5 Mi N Hunter Rd\ROADWAY\PLAN SHTS\50\PLN040(058).000
DATE: 4/28/2015 3:27:34 PM

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
FLEXIBLE PAVEMENT STRUCTURE REPAIR (8")	267	SY
CONC CURB (TY C2)	298	LF
CONC CURB (TY C1)	46	LF
CONC SIDEWALKS (4")	473	SY
CONC SIDEWALKS (6")	191	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND	
(T1)	MAILBOX TURNOUT NUMBER
(1)	DRIVEWAY NUMBER
[Pattern]	GABION MATTRESSES
[Pattern]	CONC RIPRAP
[Pattern]	WIDENING AREA

FM 306
PLAN SHEETS

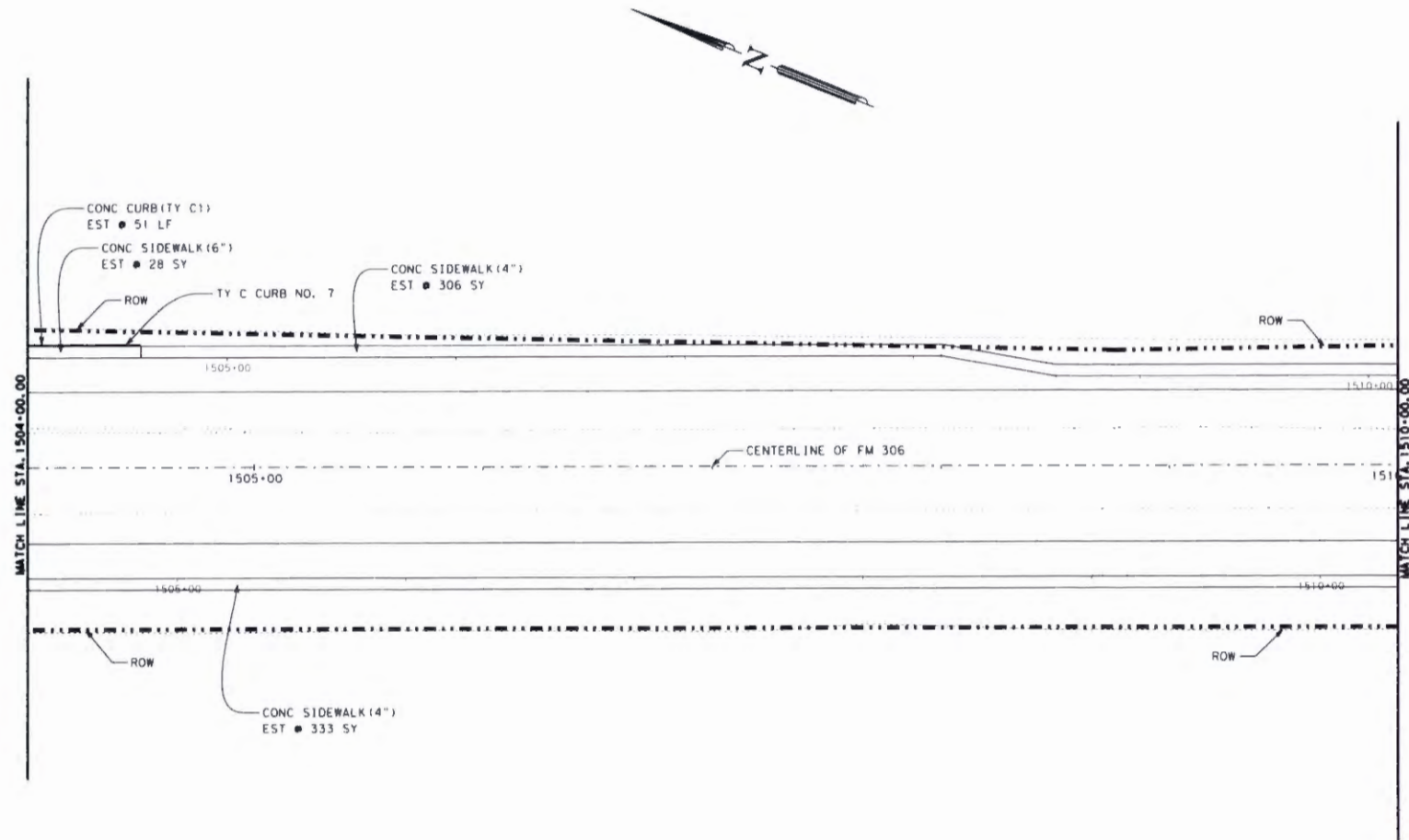


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05/01/2015



Texas Department of Transportation			
SHEET 28 OF 31			
FEDERAL AID PROJECT NO.	STP 1502 (615) MM	182	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTROL	SECTION	JOB	1728 02 058 FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY C1)	51	LF
CONC SIDEWALKS (4")	639	SY
CONC SIDEWALKS (6")	28	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (I) DRIVEWAY NUMBER
- GABION MATTRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306
PLAN SHEETS

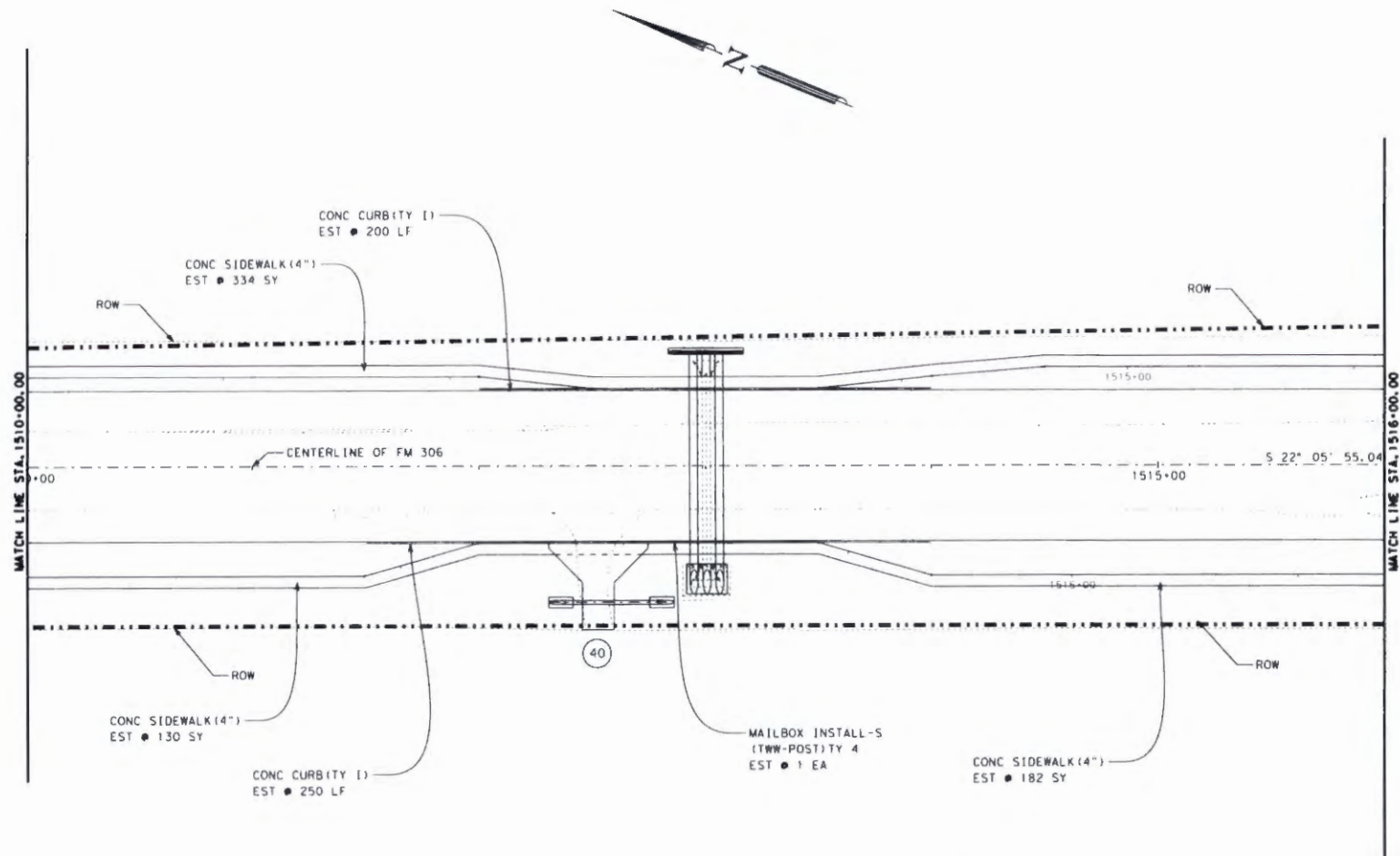


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SHEET 29 OF 31			
FEDERAL AID PROJECT NO.	STP 1502 (615) MM	18	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	ROADWAY NO.
1728	02	05B	FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	6	STA
CONC CURB (TY 1)	450	LF
CONC SIDEWALKS (4")	646	SY
MAILBOX INSTALL - S (TWW-POST) TY 4	1	EA



NOTE:
SEE HORIZONTAL CONTROL SHEETS
FOR HORIZONTAL ALIGNMENT
INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- [Pattern] GABION MATTRESSES
- [Pattern] CONC RIPRAP
- [Pattern] WIDENING AREA

FM 306
PLAN SHEETS

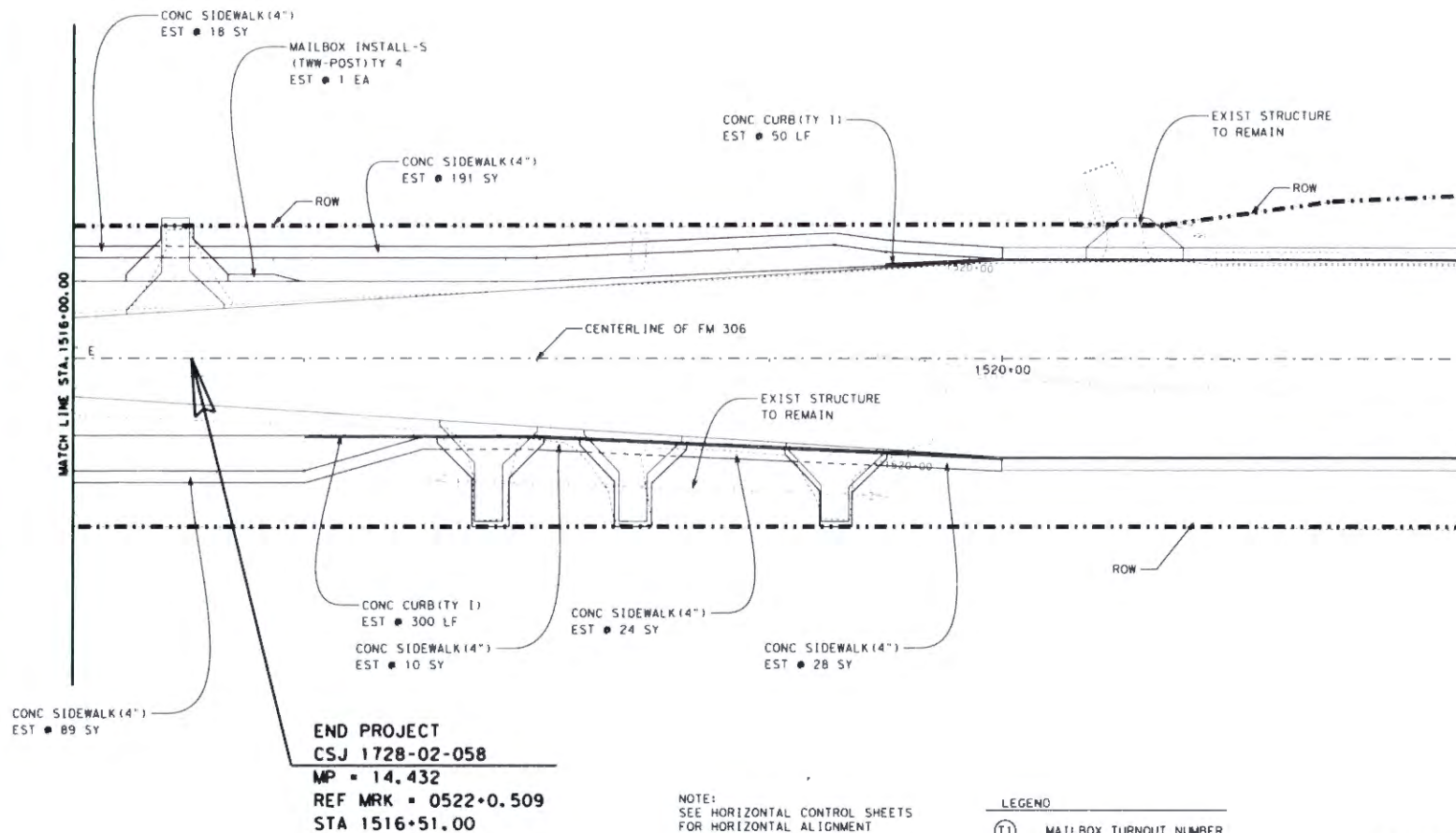


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05/01/2015

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SCALE IN FEET

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SHEET 30 OF 31			
FY	FEDERAL AID PROJECT NO.	SHEET NO.	
1728	STP 1502 (615) LM	18	
STATE	DISTRICT	COUNTY	
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	DRIVEWAY NO.
1728	02	058	FM 306

DESCRIPTION	QUAN	UNIT
PREPARING ROW	4	STA
CONC CURB (TY 1)	350	LF
CONC SIDEWALKS (4")	360	SY



NOTE:
SEE HORIZONTAL CONTROL SHEETS
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INFORMATION.

SEE DRIVEWAY TYPICAL SECTION
AND SUMMARY SHEET FOR
DRIVEWAY DETAILS AND
QUANTITIES.

SEE INTERSECTION LAYOUTS FOR
INTERSECTION DETAILS.

LEGEND

- (T) MAILBOX TURNOUT NUMBER
- (1) DRIVEWAY NUMBER
- GABION MATTRESSES
- CONC RIPRAP
- WIDENING AREA

FM 306 PLAN SHEETS



Linda Cox, PE
05/01/2015

0 50 SCALE IN FEET			
STATE OF TEXAS DEPARTMENT OF TRANSPORTATION PROJECT NO. 1728-02-058 SHEET 31			
STATE	DISTRICT	COUNTY	DATE
TEXAS	SAT	COMAL	
CONTRACT	SECTION	JOB	REVISION NO.
1728	02	058	FM 306

DISCLAIMER: This form is a standard form used by the Texas Department of Transportation. It is not intended to be used for any purpose other than that for which it was designed. The use of this form for any other purpose is at the user's risk. The Texas Department of Transportation assumes no responsibility for damages resulting from its use.

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit (CGP) required for projects with 1 or more acres of disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

☐ No Action Required ☒ Required Action
Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000.
2. Comply with the Storm Water Pollution Prevention Plan (SWPPP) and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SWPPP information on or near the site, accessible to the public and Texas Commission on Environmental Quality (TCEQ), Environmental Protection Agency (EPA) or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, Contractor shall submit Notice of Intent (NOI) to TCEQ and the Engineer.

NOI required? ☒ Yes ☐ No

Note: If amount of soil disturbance changes, permit requirements may change.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

US Army Corps of Engineers (USACE) Permit required for filling, dredging, excavating or other work in any potential USACE jurisdictional water, such as, rivers, creeks, streams, or wetlands.

The Contractor shall adhere to all of the terms and conditions associated with the following permit(s):

- ☐ No Permit Required
☒ Nationwide Permit (NMP) 14 - Pre-construction Notice (PCN) not Required
☐ Nationwide Permit 14 - PCN Required
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NMP# _____

Required Action(s): List waters of the US permit applies to, location in project and check Best Management Practices (BMPs) planned to control erosion, sedimentation and post-project total suspended solids (TSS).

1. Alligator Creek Tributary (Sta. 1437+16.75)
- 2.
- 3.
- 4.

401 Best Management Practices: (Not applicable if no USACE permit)

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input checked="" type="checkbox"/> Vegetative Filter Strips
<input checked="" type="checkbox"/> Blankets/Matting	<input checked="" type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> Sedimentation Chambers
		<input type="checkbox"/> Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

- 1.
- 2.
- 3.
- 4.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

☒ No Action Required ☐ Required Action

Action No.

- 1.
- 2.
- 3.
- 4.

V. FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANDIDATE SPECIES AND MIGRATORY BIRDS.

☐ No Action Required ☒ Required Action

Action No.

1. MIGRATORY BIRD NESTS: Schedule construction activities as needed to meet the following requirements:

A. Do not remove or destroy any active migratory bird nests (nests containing eggs and/or flightless birds) at any time of year. If there are any active nests, they shall not be removed until the nests become inactive.

B. On/in structures, if there are any active nests, they shall not be removed until all nests become inactive. After inactive nests are removed and/or before nest activity begins, deterrent materials may be applied to the structures to prevent future nest building.

2. See Item 5 in General Notes.

3.

4.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canisters, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

Does the project involve the demolition of a span bridge?

☐ Yes ☒ No (No further action required)

If "Yes", a pre-demolition notification must be submitted to the Texas Department of State Health Services, 20 calendar days prior to the demolition of the bridge(s) on the project. Contact TxDOT's hazardous material Coordinator at 210-615-6486 for assistance with the notification.

VII. OTHER ENVIRONMENTAL ISSUES

(includes regional issues such as Edwards Aquifer District, etc.)

☐ No Action Required ☒ Required Action

Action No.

1. Project is located on the Edwards Aquifer Recharge Zone and the Contributing Zone within the Transition Zone. The Contractor shall comply with the Texas Commission on Environmental Quality (TCEQ) approved Water Pollution Abatement Plan (WPAP) and conditions in the TCEQ order/NOI on letter for this project. A copy of the project WPAP and TCEQ approval letter shall be maintained on site.

2. The Contractor must immediately report spills (including sanitary sewer discharge of reportable quantities to TxDOT and to the following:
• State Emergency Response Center 800-832-8224
• TCEQ Regional Office 210-490-3096
• National Response Center at 800-424-8807
• Edwards Aquifer Authority at 210-222-2704
• San Antonio Water Systems (SAWS) for sewer spill at 210-233-2015

3. Hazardous substances (e.g., fuel, oil, asphalt emulsion, concrete curing compounds) shall not be stored on the State ROW or easements.

4. Intentional discharges of sediment laden storm water during construction are not allowed.

5. If any sensitive feature (e.g., cave, sinkhole, well) is discovered during construction, all regulated activities near the sensitive feature must be suspended immediately and notify the Engineer. Construction near the sensitive feature may not proceed until the feature has been evaluated and approval to continue construction has been received.

6. Temporary Best Management Practices (BMPs) will be installed as necessary to manage discharges due to dewatering of drill shafts. The type and location of the BMP's will be at the discretion of the Engineer.

 Texas Department of Transportation
San Antonio District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC

FILE: epic_2015_02_18_SAT.dgn	DN: TxDOT	CA: TxDOT	DN: BW	CA: JAB
© TxDOT FEBRUARY 2015	CONT	SECT	JOB	HYDWAY
REVISIONS	1728	02	058	FM 306
	2015		COUNTY	SHEET NO.
	SAT		COMAL	440