

Solicitation 1811-281

FY 19 Cross Culvert Replacements

Bid Designation: Public



Williamson County, Texas

Bid 1811-281

FY 19 Cross Culvert Replacements

Bid Number 1811-281
 Bid Title FY 19 Cross Culvert Replacements
 Expected Expenditure **\$630,000.00** (This price is expected - not guaranteed)

Bid Start Date In Held
 Bid End Date Jan 10, 2019 3:00:00 PM CST
 Question & Answer End Date Jan 4, 2019 5:00:00 PM CST

Bid Contact Blake Skiles
 Senior Purchasing Specialist
 512-943-1478
 blake.skiles@wilco.org

Contract Duration 60 days
 Contract Renewal Not Applicable
 Prices Good for 365 days
 Pre-Bid Conference Dec 19, 2018 10:00:00 AM CST
 Attendance is optional
 Location: 3151 Southeast Innerloop
 Georgetown, TX 78626

Bid Comments **Williamson County is seeking qualified Contractors to provide materials, experienced construction crews and equipment to construct the FY 19 cross culvert replacements throughout Precinct 4 of Williamson County.**

Item Response Form

Item 1811-281-01-01 - Total Bid Price
 Quantity 1 each
 Unit Price
 Delivery Location **Williamson County, Texas**
No Location Specified
 Qty 1

Description
 Total Bid Price

Item 1811-281-01-02 - Please Attach All Documents To This Line
 Quantity 1 each
 Prices are not requested for this item.
 Delivery Location **Williamson County, Texas**

No Location Specified

Qty 1

Description

Please Attach All Documents To This Line



PUBLIC ANNOUNCEMENT AND GENERAL INFORMATION

WILLIAMSON COUNTY PURCHASING DEPARTMENT SOLICITATION 1811-281 FY 19 Cross Culvert Replacements

**BIDS MUST BE RECEIVED ON OR BEFORE:
Jan 10, 2019 3:00:00 PM CST**

**BIDS WILL BE PUBLICLY OPENED:
Jan 10, 2019 3:00:00 PM CST**

Notice is hereby given that sealed Bids for the above-mentioned goods and/or services will be accepted by the Williamson County Purchasing Department. Williamson County uses BidSync to distribute and receive bids. Specifications for this IFB may be obtained by registering at www.bidsync.com.

Williamson County prefers and requests electronic submittal of this Bid.

All electronic bids must be submitted via: www.bidsync.com

Electronic bids are requested, however paper bids will currently still be received, until further notice and may be mailed or delivered to the address listed below.

Bidders are strongly encouraged to carefully read this entire IFB.

All interested Bidders are invited to submit a Bid in accordance with the Instructions and General Requirements, Bid Format, Bid Specifications, and Definitions, Terms and Conditions stated in this IFB.

Please note that a complete package must be submitted choosing one of the above two methods. Split packages submitted will be considered “unresponsive” and will not be accepted or evaluated.

Williamson County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder.

General Information:

- If mailed or delivered in person, Bids and Bid addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the Public Announcement and General Information listed above for this IFB, to:

Williamson County Purchasing Department
Attn: **BID NAME AND NUMBER**
901 South Austin Avenue
Georgetown, Texas 78626

- Bidders should list the Bid Number, Bid Name, Name and Address of Bidder, and the Date of the Bid opening on the outside of the box or envelope and note "Sealed Bid Enclosed."
 - Bidder should submit one (1) original.
 - Williamson County will NOT be responsible for unmarked or improperly marked envelopes.
 - Williamson County will not accept any responsibility for Bids being delivered by third party carriers.
 - Facsimile transmittals will NOT be accepted.
- Bids will be opened publicly in a manner; however, to avoid public disclosure of contents only the names and of Bidders and prices will be read aloud.
 - All submitted questions with their answers will be posted and updated on www.bidsync.com.
 - It is the Bidder's responsibility to review all documents in BidSync, including any Addenda that may have been added after the document packet was originally released and posted.
 - Any Addenda and/or other information relevant to the IFB will be posted on www.bidsync.com.
 - The Williamson County Purchasing Department takes no responsibility to ensure any interested Bidder has obtained any outstanding addenda or additional information.



Williamson County – Invitation for Bid (IFB)

SECTION 1 - DEFINITIONS

Addendum/Addenda – means any written or graphic instruments issued by the County prior to the consideration of Bids which modify or interpret the Bid Documents by additions, deletions, clarifications, or corrections.

Agreement/Ensuing Agreement(s) – means the Successful Bidder may be required by the County to sign an additional Agreement containing terms necessary to ensure compliance with the IFB and the Bidder's Bid. Such Ensuing Agreement(s) shall contain the Bid specifications, terms and conditions that are derived from the IFB.

Bid Documents – means the Legal Notice, IFB including attachments, and any Addenda issued by the County prior to the consideration of any Bids.

Bid – means the completed and signed bid form, (sometimes referred to as the Price Sheet), and ALL required forms and documentation listed in the IFB package which have been submitted in accordance with the terms and conditions described in the IFB package. A Bid submitted in accordance with this IFB is irrevocable during the specified period for evaluation and acceptance of Bids unless a waiver is obtained from the Williamson County Purchasing Agent.

Bidder – means a person or entity who submits a Bid in response to this IFB.

Contract – means this IFB and the Bid of the Successful Bidder shall become a Contract between the Successful Bidder and the County once the Successful Bidder's Bid is properly accepted by the Williamson County Commissioners Court.

Commissioner's Court – means the Williamson County Commissioners Court.

County – means Williamson County, a political subdivision of the State of Texas.

Invitation for Bid (IFB) – means this document, together with the attachments thereto and any future Addenda issued by the County.

Successful Bidder – means the liable Bidder to whom the County intends to award the Contract.

SECTION 2 - BID FORMAT AND SUBMISSION

2.1 ORGANIZATION OF BID CONTENTS FOR SUBMITTAL

Each Bid should be organized and items submitted in the order described below:

- A. Transmittal Letter. Please see Section 2.3, Transmittal Letter, for more information.
- B. Price Sheet.
- C. Conflict of Interest Questionnaire. Please see Section 2.2, Conflict of Interest, for more information in regards to this. Please note that even if you deem there to be no Conflict of Interest, this signed questionnaire must be included in your package.
- D. References. Please see Section 3.15, References, for more information.
- E. Bid Affidavit.
- F. Form 1295. Please see Section 2.4, Certificate of Interested Parties – Form 1295.

2.2 CONFLICT OF INTEREST

No public official shall have interest in a Contract, in accordance with Vernon's Texas Codes Annotated, Local Government Code, Title 5, Subtitle C, Chapter 171, as amended.

As of January 1, 2006, all Bidders are responsible for complying with Local Government Code, Title 5, Subtitle C, Chapter 176. Additional information may be obtained from the County's website at the following link:

<http://www.wilco.org/CountyDepartments/Purchasing/ConflictofInterestDisclosure/tabid/689/language/en-US/Default.aspx>

Each Bidder must disclose any existing or potential conflict of interest relative to the performance of the requirements of this IFB. **Examples of potential conflicts of interest may include an existing business or personal relationship between the Bidder, its principal, or any affiliate or subcontractor with the County or any other entity or person involved in any way with the project that is subject to this IFB.** Similarly, any personal or business relationship between the Bidder, the principals, or any affiliate or subcontractor with any employee, or official of the County or its suppliers must be disclosed. Any such relationship that might be perceived or represented as a conflict must be disclosed. Failure to disclose any such relationship or reveal personal relationships with the County employees or officials may be cause for termination.

The County will decide if an actual or perceived conflict should result in Bid disqualification.

By submitting a Bid in response to this IFB, all Bidders affirm they have not given, nor intend to give, at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a the County public servant or any employee, official or representative of same, in connection with this procurement.

Each Bidder must provide a Conflict of Interest Statement with their Bid Package. Package may be deemed incomplete without this form.

2.3 TRANSMITTAL LETTER

The Bidder should submit a Transmittal Letter that provides the following information:

- A. Name and address of individual or business entity submitting the Bid.
- B. Name, physical address, email address, business and fax number of the Bidder's principal contact person regarding all contractual matters relating to this IFB.
- C. The Bid's Federal Employer Identification Number.
- D. If the Proposal being submitted will have an effect on air quality for the County (as it relates to any state, federal, or voluntary air quality standard), then the Respondent is encouraged to provide information in narrative indicating the anticipated air quality impact. See Section 4.36, Air Quality for more information.

2.4 CERTIFICATE OF INTERESTED PARTIES – FORM 1295

As of January 1, 2016, all Successful Bidders are responsible for complying with the Texas Government Code, Section 2252.908. The law states that the County may not enter into certain contracts with a Bidder unless the Bidder submits a disclosure of interested parties to the County at the time the Bidder submits the signed Contract. The law applies only to a Contract of the County on or after January 1, 2016 that either:

- A. Requires an action or vote by the Commissioners Court before the Contract may be signed (all contracts that fall under the jurisdiction of the Commissioners Court approval, such as contracts resulting from an Initiation for Bid (IFB), RFP, Request for Qualifications (RFQ), etc., excluding, but not limited to, certain Juvenile Service contracts, contracts funded with Sheriff's seized monies, etc.); or
- B. Has a value of at least \$1,000,000.

By January 1, 2016, the Texas Ethics Commission will make available on its website, a new filing application that must be used to file Form 1295. Information regarding how to use the filing application is available on the Texas Ethics Commission website at the following link:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

A Respondent must:

- A. Use the online application to process the required information on Form 1295.
- B. Print a copy of the form which will contain a unique certification number.
- C. An authorized agent of the Bidder must sign the printed copy of the form.
- D. Have the form notarized.
- E. File the completed Form 1295 and certification of filing (scanning and emailing form is sufficient) with Williamson County Purchasing Agent at the time the signed Contract is submitted for approval.

After the Commissioners Court award of the Contract, the County shall notify the Texas Ethics Commission, using the Texas Ethics Commission's filing application, of the receipt of the filed Form 1295 and certification of filing not later than the 30th day after the date the Contract binds all parties to the Contract. The Texas Ethics Commission will post the completed Form 1295 to its website within seven business days after receiving notice from the County.

2.5 ETHICS

The Bidder shall not accept or offer gifts or anything of value nor enter into any business arrangement with any employee, official or agent of the County.

2.6 BID SUBMITTAL DEADLINE

The Bid is due no later than the submittal date and time set forth in the Public Announcement and General Information listed in this IFB package. Contents of each Bid shall be submitted in accordance with this IFB.

2.7 DELIVERY OF BIDS

The County uses BidSync to distribute and receive Bids and proposals. It is preferred that Bids submitted electronically through BidSync; however, Bidders can submit a hard copy.

Refer to www.bidsync.com for further information on how to submit electronically.

If mailed or delivered in person, Bids and Bid Addenda are to be delivered in sealed envelope on or before the submittal deadline, as noted in the Public Announcement and General Information listed in this IFB package, to:

Williamson County Purchasing Department
Attn: **Bid Name and Number**
901 South Austin Avenue
Georgetown, Texas 78626

Also, all Bidders should list their Name and Address, and the Date of the Bid opening on the outside the box or envelope and note "Sealed Bid Enclosed." The County will not accept any Bids received after the submittal deadline, and shall return such Bids unopened to the Bidder. The County will not accept any responsibility for Bids being delivered by third party carriers.

Bids will be opened publically and the names of Bidders and pricing will be read aloud.

SECTION 3 - INSTRUCTIONS AND GENERAL REQUIREMENTS

3.1 INSTRUCTIONS

Read this document carefully, and follow all instructions and requirements. All Bidders are responsible for fulfilling all requirements and specifications. Be sure to have a clear understanding of this IFB.

General requirements apply to all advertised IFBs; however, these may be superseded, in whole or in part, by the bid specifications, Addenda and modifications issued as a part of this IFB. Be sure your Bid package is complete.

3.2 AMBIGUITY, CONFLICT, OR OTHER ERRORS IN THIS IFB

If a Bidder discovers any ambiguity, conflict, discrepancy, omission or other error in this IFB, the Bidder shall immediately notify the County Purchasing Department of such error in writing and request modification or clarification of the document.

Modifications will be made by issuing Addenda. If the Bidder fails to notify the County prior to the date and time fixed for submission of Bids of an error or ambiguity in the IFB known to the Bidder, or an error or ambiguity that reasonably should have been known to the Bidder, then the Bidder shall be deemed to have waived the error or ambiguity or its later resolution.

The County may also modify the IFB, no later than forty-eight (48) hours prior to the date and time fixed for submission of Bids, by issuance of an Addendum. All Addenda will be numbered consecutively, beginning with one (1).

3.3 NOTIFICATION OF MOST CURRENT ADDRESS

All Bidders in receipt of this IFB shall notify the Williamson County Purchasing Department of any address changes, contact person changes, and/or telephone number changes no later than forty-eight (48) hours prior to the date and time fixed for submission of Bids.

3.4 SIGNATURE OF BIDDER

- A. If the Bidder is a Corporation or Limited Liability Company, the legal name of the Corporation Limited Liability Company shall be provided together with the signature of the officer or officers authorized to sign on behalf of such entity.
- B. If the Bidder is a General Partnership, the true name of the firm shall be provided with the signature of each partner authorized to sign.
- C. If the Bidder is a Limited Partnership, the name of the Limited Partner's General Partner shall be provided with the signature of the officer authorized to sign on behalf of the General Partner.
- D. If the Bidder is a Sole Proprietor(s) (individual), each Sole Proprietor(s) shall sign.
- E. If signature is by an agent, other than the Sole Proprietor(s) or an officer of a Corporation, Limited Liability Company, General Partner or a member of a General Partnership, a power of attorney equivalent document must be submitted to the Williamson County Purchasing Department.

3.5 ASSUMED BUSINESS NAME

If the Bidder operates business under an Assumed Business Name, the Bidder must have on file with the Williamson County Clerk a current Assumed Name Certificate and provide a file marked copy of same.

3.6 BID OBLIGATION

The contents of the IFB, Bid, and any clarification thereof submitted by the Successful Bidder shall become part of the contractual obligation and incorporated by reference into the Contract and any Ensuing Agreement(s).

3.7 COMPLIANCE WITH IFB SPECIFICATIONS

It is intended that this IFB describe the requirements and the Bid format in sufficient detail to secure comparable Bids. Failure to comply with all provisions of the IFB may, at the sole discretion of the County, result in disqualification.

3.8 WITHDRAWAL OF BID

The Bidder may withdraw its Bid by submitting a written request with the company letterhead and the signature of an authorized individual, as described in Section 3.4, Signature of Bidder, to the Williamson County Purchasing Department any time prior to the submission deadline.

The Bidder may submit a new Bid prior to the deadline. Alterations of the Bid in any manner will not be considered if submitted after the deadline. Withdrawal of a Bid after the deadline will be subject to written approval of the Williamson County Purchasing Agent.

3.9 EVALUATION AND AWARD

The County reserves the right to use all pertinent information (also learned from sources other than disclosed in the Bid process) that might affect the County's judgment as to the appropriateness of award to the lowest and best evaluated Bid. This information may be appended to the Bid evaluation process results. Information on a Bidder from reliable sources, and not within the Bidder's Bid, may also be noted and made part of the evaluation file. The County shall have sole discretion for determining the reliability of the source.

To ensure the proper and fair evaluation of a solicitation, the County prohibits unsolicited communication initiated by the Bidder to the County Official or Employee evaluating or considering the Bids prior to the time an award has been made. Unsolicited communication may be ground for disqualifying the offending Bidder from consideration or award of the solicitation, or any future solicitation.

Communication between the Bidder and the County will be initiated by the appropriate County Official Employee in order to obtain information or clarification needed to develop a proper and accurate evaluation of the solicitation.

The County intends to award a Contract to the most responsible and responsive Bidder whose Bid will be most advantageous to the County. In accordance with Texas Government Code and Local Government Code, the County may consider, to the extent allowed by law, the following:

- A. Price;
- B. The Bidder's experience and reputation;
- C. Quality of the Bidder's goods and/or services;
- D. The Bidder's safety record;
- E. The Bidder's proposed personnel;
- F. The Bidder's financial capabilities; and
- G. Any other relevant factors specifically listed in this IFB or authorized by law.

3.10 CONSIDERATION OF LOCATION OF PRINCIPAL OFFICE

Pursuant to Texas Local Government Code, Section 271.905, in purchasing any real property or personal property that is not affixed to real property, if the County receives one or more Bids from a Bidder whose principal place of business is in Williamson County and whose Bid is within three (3) percent of the lowest Bid price received by the County from a Bidder who is not a resident of Williamson County, the County may enter into a contract with:

- A. The lowest Bidder; or the Bidder whose principal place of business is in Williamson County if the Commissioners Court determines, in writing, that the local Bidder offers the County the best combination of contract price and additional economic development opportunities Williamson County created by the contract award, including the employment of residents Williamson County and increased tax revenues to Williamson County.

3.11. REJECTION OR ACCEPTANCE

It is understood that the Commissioners Court of Williamson County, Texas, reserves the right to accept or reject any and/or all Bids for any or all goods and/or services covered in this IFB, and to waive informalities or defects in the Bid or to accept such Bid, if it shall deem to be in the best interest of the County.

Awards should be made approximately sixty (60) business days after the Bid opening date. Results may be obtained by viewing the Williamson County vendor portal at the following link:

<http://www.wilco.org/CountyDepartments/Purchasing/SearchforaPastBid/tabid/5213/language/en-US/Default.aspx>

3.12 RESPONSIBILITY

It is expected that a prospective Bidder will be able to affirmatively demonstrate responsibility. A prospective Bidder should be able to meet the following requirements:

- A. Have adequate financial resources, or the ability to obtain such resources as required;
- B. Be able to comply with the required or proposed delivery schedule;
- C. Have a satisfactory record of performance that can be determined thru references provided; and
- D. Be otherwise qualified and eligible to receive an award.

The County may request representation and other information sufficient to determine the Bidder's ability to meet these minimum standards listed above.

3.13 FIRM PRICING

For unit price items, all of the items listed are to be on a "per unit" basis, stating a firm price per unit or unit quantity of each item. The Bidder must submit a firm price that must be good from the date of Bid opening for the fixed period of time set out in this IFB. Unless the IFB expressly states otherwise, this period shall be until the end of the Initial Contract Period.

Bids which do not state a fixed price, or which are subject to change without notice, will not be considered. The Court may award a Contract for the period implied or expressly stated in the lowest and best Bid.

3.14 PURCHASE ORDERS

If required by the Williamson County Purchasing Department, a purchase order(s) may be generated to the Successful Bidder for goods and/or services. If a purchase order is issued, the purchase order number must appear on all itemized invoices and/or requests for payment.

3.15 SILENCE OF SPECIFICATIONS

The apparent silence of these specifications as to any detail or to the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

3.16 REFERENCES

The County may require the Bidder to supply a list of at least three (3) references where like services and/or goods have been supplied by their firm within the past five (5) years, to include names, titles, phone numbers and email addresses of key personnel, and dates of performance.

The County may contact some or all of the references in order to determine the Respondent performance record on work similar to that described in this RFP. The County reserves the right to contact references other than those provided in the response and to use the information gained from them in the evaluation process.

References, if requested, should be provided in accordance with this IFB. Bid may not be deemed complete without the inclusion of requested references.

SECTION 4 - TERMS AND CONDITIONS

4.1 VENUE AND GOVERNING LAW

The Bidder hereby agrees and acknowledges that venue and jurisdiction of any suit, right, or cause of action arising out of or in connection with this IFB, the Contract and any Ensuing Agreement(s), shall lie exclusively in either Williamson County, Texas or in the Austin Division of the Western Federal District of Texas, and the parties hereto expressly consent and submit to such jurisdiction. Furthermore, except to the extent that this IFB, the Contract and any Ensuing Agreement(s) is governed by the laws of the United States, this IFB, the Contract and any Ensuing Agreement(s) shall be governed by and construed in accordance with the laws of the State of Texas, excluding, however, its choice of law rules.

4.2 INCORPORATION BY REFERENCE AND PRECEDENCE

- A. The Contract shall be derived from the IFB and its Addenda (if applicable), and the Bidder's Bid. In the event of a dispute under the Contract, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence:
 - 1. The IFB and its Addenda (if applicable); and
 - 2. The Bidder's Bid.
- B. In the event the County requires that an Ensuing Agreement be executed following award and a dispute arises between the terms and conditions of the Ensuing Agreement, the IFB and its Addenda (if applicable), and the Bidder's Bid, applicable documents will be referred to for the purpose of clarification or for additional detail in the following order of precedence:
 - 1. Terms and conditions of the Ensuing Agreement;
 - 2. The IFB its Addenda; and
 - 3. The Bidder's Bid.

4.3 OWNERSHIP OF BID

Each Bid shall become the property of the County upon submittal and will not be returned to Bidders unless received after the submittal deadline.

4.4 DISQUALIFICATION OF BIDDER

Upon signing and submittal of the Bid, a Bidder offering to sell supplies, materials, services, or equipment to the County, certifies that the Bidder has not violated the antitrust laws of the State of Texas codified in Business & Commerce Code, Section 15.01, or the Federal Antitrust Laws, and has not communicated directly or indirectly the offer made to any competitor or any other person engaged in such line of business. Any or all Bids may be rejected if the County believes that collusion exists among the Bidders.

4.5 FUNDING

The County intends to budget and make sufficient funds available and authorize funds for expenditure to finance the costs of the Contract. All Bidders understand and agree that the County's payment of amounts under the Contract shall be contingent on the County receiving appropriations or other expenditure authority sufficient to allow the County, in the exercise of reasonable administrative discretion, to make payments under this Contract.

4.6 ASSIGNMENT, SUCCESSORS AND ASSIGNS

The Successful Bidder may not assign, sell, or otherwise transfer the Contract or any other rights or interests obtained under the Contract without written permission of the Commissioners Court. The Contract and any Ensuing Agreement(s) shall be binding upon and inure to the benefit of the contracting parties hereto and their respective successors and permitted assigns.

4.7 IMPLIED REQUIREMENTS

Products or services not specifically described or required in the IFB, but are necessary to provide the functional capabilities described by the Bidder, shall be implied and deemed to be included in the Bid.

4.8 TERMINATION

- A. Termination for Cause:** The County reserves the right to terminate the Contract and/or any Ensuing Agreement(s) for default if the Successful Bidder breaches any of the Bid specifications, terms and conditions, including warranties of the Bidder, if any, or if the Successful Bidder becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other remedies the County may have at law or in equity or as may otherwise provided hereunder. Default may be construed as, but not limited to, failure to deliver the proper goods and/or services within the proper amount of time, and/or to properly perform any and all other requirements to the County's satisfaction, and/or to meet all other obligations and requirements.
- B. Termination for Convenience:** The County may terminate the Contract and/or any Ensuing Agreement(s) for convenience and without cause or further liability, upon no less than thirty (30) calendar days written notice to the Successful Bidder. The County reserves the right to extend this period if it is in the best interest of the County. In the event the County exercises its right to terminate without cause, it is understood and agreed that only the amounts due to the Successful Bidder for goods, commodities and/or services provided and expenses incurred to and including the date of termination, will be due and payable. No penalty will be assessed for the County termination for convenience.

4.9 NON-PERFORMANCE

It is the objective of the County to obtain complete and satisfactory performance of the requirements set forth herein. In addition to any other remedies available at law, in equity or that may be set out herein, failure to perform may result in a deduction of payment equal to the amount of the goods and/or services that were not provided and/or performed to the County's satisfaction.

In the event of such non-performance, the County shall have the right, but shall not be obligated, to complete the services itself or by others and/or purchase the goods from other sources. If the County elects to acquire the goods or perform the services itself or by others, pursuant to the foregoing, the Successful Bidder shall reimburse the County, within ten (10) calendar days of demand, for all costs incurred by the County (including, without limitation, applicable, general, and administrative expenses, and field overhead, and the cost of necessary equipment, materials, and field labor) in correcting the nonperformance which the Successful Bidder fails to meet pursuant to the requirements set out herein. In the event the Successful Bidder refuses to reimburse the County as set out in this provision, the County shall have the right to deduct such reimbursement amounts from any amounts that may be then owing or that may become owing in the future to the Successful Bidder.

4.10 PROPRIETARY INFORMATION AND THE TEXAS PUBLIC INFORMATION ACT

All material submitted to the County shall become public property and subject to the Texas Public Information Act upon receipt. If a Bidder does not desire proprietary information in the Bid to be disclosed, each page must be clearly identified and marked proprietary at time of submittal or, more

preferably, all proprietary information may be placed in a folder or appendix and be clearly identified and marked as being proprietary. Failure to clearly identify and mark information as being proprietary as set forth under this provision will result in all unmarked information being deemed non-proprietary and available to the public. For all information that has not been clearly identified and marked as proprietary by the Bidder, the County may choose to place such information on the County's website and/or a similar public database without obtaining any type of prior consent from the Bidder.

The County will, to the extent allowed by law, endeavor to protect from public disclosure the information that has been identified and marked as proprietary. The final decision as to what information must be disclosed, however, lies with the Texas Attorney General.

To the extent, if any, that any provision in this IFB or in the Bidder's Bid is in conflict with Texas Government Code, Chapter 552, as amended (the "Public Information Act"), the same shall be of no force or effect. Furthermore, it is expressly understood, and agreed, that the County, and its officers and employees, may request advice, decisions and opinions of the Attorney General of the State of Texas in regard to the application of the Public Information Act to any items or data furnished to the County as to whether or not the same are available to the public. It is further understood that the County, and its officers and employees, shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that the County, its officers and employees shall have no liability or obligation to any party hereto for the disclosure to the public, or to any person or persons, of any items or data furnished to the County by a party hereto, in reliance of any advice, decision or opinion of the Attorney General of the State of Texas.

4.11 RIGHT TO AUDIT

The Successful Bidder agrees that the County or its duly authorized representatives shall, until the expiration of three (3) years after termination or expiration of the services to be performed, have access to and the right to examine and photocopy any and all books, documents, papers and records of the Successful Bidder, which are directly pertinent to the services to be performed or goods to be delivered for the purposes of making audits, examinations, excerpts and transcriptions. The Successful Bidder agrees that the County shall have access during normal working hours to all necessary facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. The County shall give the Successful Bidder reasonable advance notice of intended audits.

4.12 TESTING AND INSPECTIONS

The County reserves the right to inspect and test equipment, supplies, materials and goods for quality and compliance with this IFB, and ability to meet the needs of the user. Demonstration units must be available for review. Should the goods or services fail to meet requirements and/or be unavailable for evaluation, the County can deem the Bidder to be in breach and terminate the Contract and/or any Ensuing Agreement(s).

4.13 BID PREPARATION COSTS

The cost of developing Bids is the sole responsibility of the Bidders and shall not be charged to the County. There is no expressed or implied obligation for the County to reimburse the Bidders for any expense incurred in preparing a Bid in response to this IFB and the County will not reimburse the Bidders for such expenses.

4.14 INDEMNIFICATION

The Successful Bidder shall indemnify, defend and save harmless, the County, its officials, employees, agents and agent's employees from, and against, all claims, liability, and expenses including reasonable attorneys' fees, arising from activities of the Bidder, its agents, servants or employees, performed hereunder that result from the negligent act, error, or omission of the Bidder or any of the Bidder

agents, servants or employees, as well as all claims of loss or damage to the Bidder's and the County property, equipment, and/or supplies.

Furthermore, the County, its officials, employees, agents and agents' employees shall not be liable for damages to the Successful Bidder arising from any act of any third party, including, but not limited to, theft. The Successful Bidder further agrees to indemnify, defend and save harmless, the County from its officials, employee, agents and agents' employees against all claims of whatever nature arising from any accident, injury, or damage whatsoever, caused to any person, or the property of any person, occurring in relation to the Successful Bidder's performance of any services requested hereunder during the term of the Contract and/or any Ensuing Agreement(s).

The Successful Bidder shall timely report all claims, demands, suits, actions, proceedings, liens or judgements to the County and shall, upon the receipt of any claim, demand, suit, action, proceeding, lien or judgement, not later than the fifteenth (15th) day of each month; provide the County with a written report on each such matter, setting forth the status of each matter, the schedule or planned proceedings with respect to each matter and the cooperation or assistance, if any, of the County required by the Successful Bidder in the defense of each matter. The Successful Bidder's duty to defend, indemnify and hold the County harmless shall be absolute. It shall not abate or end by reason of the expiration or termination of the Contract and/or any Ensuing Agreement(s), unless otherwise agreed by the County in writing. The provisions of this section shall survive the termination of the Contract and shall remain in full force and effect with respect to all such matters no matter when they arise.

In the event of any dispute between the parties, as to whether a claim, demand, suit, action, proceeding, lien or judgement, that appears to have been caused by or appears to have arisen out of or in connection with acts or omissions of the County, the Bidder shall nevertheless fully defend such claim, demand, suit or action, proceeding, lien or judgement, until and unless there is a determination by a court of competent jurisdiction that the acts and omissions of the Bidder are not an issue in the matter.

The Successful Bidder's indemnification shall cover, and the Successful Bidder agrees to, indemnify the County, in the event the County is found to have been negligent for having selected the Successful Bidder to perform the work described in this request. The provision by the Successful Bidder of insurance shall not limit the liability of the Successful Bidder under the Contract and/or any Ensuing Agreement(s).

4.15 WAIVER OF SUBROGATION

The Successful Bidder and the Successful Bidder's insurance carrier waive any and all rights whatsoever with regard to subrogation against the County as an indirect party to any suit arising out of personal or property damages resulting from the Bidder's performance under this Contract and any Ensuing Agreement(s).

4.16 RELATIONSHIP OF THE PARTIES

The Successful Bidder shall be an independent contractor and shall assume all of the rights, obligations, liabilities, applicable to it as such independent contractor hereunder and any provisions herein which may appear to give the County the right to direct the Successful Bidder as to details of doing work herein covered, or to exercise a measure of control over the work, shall be deemed to mean that the Successful Bidder shall follow the desires of the County in the results of the work only. The County shall not retain or have the right to control the Successful Bidder's means, methods or details pertaining to the Successful Bidder's performance of the work. The County and the Successful Bidder hereby agree and declare that the Successful Bidder is an independent contractor and as such meets the qualifications of an "Independent Contractor" under Texas Workers Compensation Act, Texas Labor Code, Section 406.141, that the Successful Bidder is not an employee of the County, and that the Successful Bidder and its employees, agents and subcontractors shall not be entitled to workers compensation coverage or any other type of insurance coverage held by the County.

4.17 SOLE PROVIDER

The Successful Bidder agrees and acknowledges that it shall not be considered a sole provider of the goods and/or services described herein and that the County may contract with other providers of such goods and/or services if the County deems, at its sole discretion, that multiple providers of the same goods and/or services will serve the best interest of the County.

4.18 FORCE MAJEURE

If the party obligated to perform is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of said party, the other party shall grant such party relief from the performance. The burden of proof for the need of such relief shall rest upon the party obligated to perform. To obtain release based on force majeure, the party obligated to perform shall file a written request with the other party.

4.19 SEVERABILITY

If any provision of this IFB, the Contract or any Ensuing Agreement(s) shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provision thereof, but rather the entire IFB, Contract or any Ensuing Agreement (s) will be construed as if not containing the particular invalid or unenforceable provision or provisions, and the rights and obligation of the parties shall be construed and enforced in accordance therewith. The parties acknowledge that if any provision of this IFB, the Contract or any Ensuing Agreement(s) is determined to be invalid or unenforceable, it is the desire and intention of each that such provision be reformed and construed in such a manner that it will, to the maximum extent practicable, give effect to the intent of this IFB, the Contract or any Ensuing Agreement(s) and be deemed to be validated and enforceable.

4.20 EQUAL OPPORTUNITY

Neither party shall discriminate against any employee or applicant for employment because of race, color, sex, religion or national origin.

4.21 NOTICE

Any notice to be given shall be in writing and may be distributed by personal delivery, or by registered or certified mail, return receipt requested, addressed to the proper party, at the following address:

The County: Williamson County Purchasing Department
Attn: Purchasing Agent
901 South Austin Avenue
Georgetown, Texas 78626

The Bidder: Address set out in Bidder's Transmittal Letter.

Notices given in accordance with this provision shall be effective upon (1) receipt by the party to which notice is given, or (2) on the third (3rd) calendar day following mailing, whichever occurs first.

4.22 SALES AND USE TAX EXEMPTION

The County is a body, corporate and politic, under the laws of the State of Texas and claims exemption from sales and use taxes under Texas Tax Code, Section 151.309, as amended, and the services and/or goods subject hereof are being secured for use by the County.

4.23 COMPLIANCE WITH LAWS

The County and the Successful Bidder shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of the Contract and any Ensuing Agreement(s), including, without limitation, Workers' Compensation laws, salary and wage statutes and regulations, licensing laws and regulations. When required, the Successful Bidder shall furnish the County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

4.24 INCORPORATION OF EXHIBITS, APPENDICES AND ATTACHMENTS

All of the Exhibits, Appendices and Attachments referred to herein are incorporated by reference as if set forth verbatim herein. Any conflicting terms in the Contract documents will be resolved at the sole discretion of the Commissioners Court.

4.25 NO WAIVER OF IMMUNITIES

Nothing herein shall be deemed to waive, modify or amend any legal defense available at law or in equity to the County, its past or present officers, employees, or agents, nor to create any legal rights or claim on behalf of any third party. The County does not waive, modify, or alter to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

4.26 NO WAIVER

The failure or delay of any party to enforce at any time or any period of time any of the provisions of this IFB, the Contract or any Ensuing Agreement(s) shall not constitute a present or future waiver of such provisions nor the right of either party to enforce each and every provision. Furthermore, no term or provision hereof shall be deemed waived and no breach excused unless such waiver or consent shall be in writing and signed by the party claimed to have waived or consented. Any consent by any party to, or waiver of, a breach by the other, whether expressed or implied, shall not constitute a consent to, waiver of or excuse for any other, different or subsequent breach.

4.27 CURRENT REVENUES

The obligations of the parties under the Contract and any Ensuing Agreement(s) do not constitute a general obligation or indebtedness of the County for which the County is obligated to levy, pledge, or collect any of taxation. It is understood and agreed that the County shall have the right to terminate the Contract and any Ensuing Agreement(s) at the end of any the County fiscal year if the governing body of the County does not appropriate sufficient funds as determined by the County's budget for the fiscal year in question. The County may effect such termination by giving written notice of termination to Successful Bidder at the end of its then-current fiscal year.

4.28 FOB DESTINATION

To the extent applicable to this IFB, all of the items listed are to be Free On Board to final destination (FOB Destination) with all transportation charges if applicable to be included in the Bid, unless otherwise specified in the Invitation for Bids. The title and risk of loss of the goods shall not pass to the County until receipt and acceptance takes place at the FOB Destination point.

4.29 BINDING EFFECT

This Contract and any Ensuing Agreement(s) shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

4.30 ASSIGNMENT

The Successful Bidder's interest and duties hereunder may not be assigned or delegated to a third party without the express written consent of the County.

4.31 SAFETY

The Successful Bidder is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with any services to be provided hereunder. The safety program shall comply with all applicable requirements of the current federal Occupational Safety and Health Act and all other applicable federal, state and local laws and regulations.

4.32 GENERAL OBLIGATIONS AND RELIANCE

The Successful Bidder shall perform all services and/or provide all goods, as well as those reasonably inferable and necessary for completion and provision of services and/or goods required hereunder. The Successful Bidder shall keep the County informed of the progress and quality of the services. The Successful Bidder agrees and acknowledges that the County is relying on the Successful Bidder's represented expertise and ability to provide the goods and/or services described herein. The Successful Bidder agrees to use its best efforts, skill, judgment, and abilities to perform its obligations in accordance with the highest standards used in the profession and to further the interests of the County accordance with the County's requirements and procedures. The Successful Bidder's duties, set forth herein, shall at no time be in any way diminished by reason of any approval by the County, nor shall the Successful Bidder be released from any liability by reason of such approval by the County, it being understood that the County at all times is ultimately relying upon the Successful Bidder's skill and knowledge in performing the services and providing any goods required hereunder.

4.33 ESTIMATED QUANTITIES

To the extent applicable to this IFB, the estimated quantity of each item listed in this IFB is only estimate; the actual quantity to be purchased may be more or less. The County is not obligated purchase any minimum amount, and the County may purchase any reasonable amount greater than the estimate for the same unit price. Any limit on quantities available must be stated expressly in the Bid.

4.34 CONTRACTUAL DEVELOPMENT

The contents of the IFB and the Successful Bidder's Bid will become an integral part of the Contract, but may be modified, at the County's sole discretion, by provisions of an Ensuing Agreement. Therefore, the Bidder must agree to an inclusion of an Ensuing Agreement of the Bid specifications, terms and conditions of this IFB. If an Ensuing Agreement is required under this IFB, information relative to the Agreement will be located in the Additional Stipulations Section of this IFB.

4.35 SURVIVABILITY

All applicable agreements that were entered into between the Successful Bidder and the County, under the terms and conditions of the Contract and/or any Ensuing Agreement(s), shall survive the expiration or termination thereof for ninety (90) days unless a new contract has been awarded.

The County may exercise, by written notice to the Successful Bidder no later than ten (10) calendar days of the Contract expiration, this clause for emergencies only.

4.36 AIR QUALITY

In determining the overall best Bid, the County may, to the extent applicable, exercise the option granted to local governments under the Texas Local Government Code, Section 271.907.

This option allows the County to evaluate Bids and give preference to goods and/or services of a Bidder that demonstrates that the Bidder meets or exceeds any and all state or federal environmental standards, including voluntary standards, relating to air quality. If the Bid being submitted will have an effect on air quality for the County (as it relates to any state, federal, or voluntary air quality standard), then the Bidder is encouraged to provide information in narrative indicating the anticipated air quality impact. All Bidders are expected to meet all mandated state and federal air quality standards.

4.37 ENTIRE AGREEMENT

The Contract and any Ensuing Agreement(s) shall supersede all prior Agreements, written or oral between the Successful Bidder and the County and shall constitute the entire Agreement and understanding between the parties with respect to the services and/or goods to be provided. Each of the provisions herein shall be binding upon the parties and may not be waived, modified, amended or altered, except by writing signed by the Successful Bidder and the County.

4.38 PAYMENT

The County's payment for goods and services shall be governed by the Texas Government Code, Chapter 2251. An invoice shall be deemed overdue the thirty-first (31st) day after the later of the following:

- A. The date the County receives the goods under the Contract;
- B. The date the performance of the service under the Contract is completed; or
- C. The date the Williamson County Auditor receives an invoice for the goods or services.

Interest charges for any overdue payments shall be paid by the County in accordance with Texas Government Code, Section 2251.025. More specifically, the rate of interest that shall accrue on a late payment is the rate in effect on September 1 of the County's fiscal year in which the payment becomes due. The said rate in effect on September 1 shall be equal to the sum of one (1) percent, and the prime rate published in the Wall Street Journal on the first (1st) day of July of the preceding fiscal year that does not fall on a Saturday or Sunday.

In the event that an error appears in an invoice submitted by the Successful Bidder, the County shall notify the Successful Bidder of the error not later than the twenty-first (21st) day after the date the County receives the invoice. If the error is resolved in favor of the Successful Bidder, the Successful Bidder shall be entitled to receive interest on the unpaid balance of the invoice submitted by the Successful Bidder beginning on the date that the payment for the invoice became overdue. If the error is resolved in favor of the County, the Successful Bidder shall submit a corrected invoice that must be paid in accordance within the time set forth above. The unpaid balance accrues interest as provided by the Texas Government Code, Chapter 2251, if the corrected invoice is not paid by the appropriate date.

As a minimum, invoices shall include:

- A. Name, address, and telephone number of the Successful Bidder and similar information in the event the payment is to be made to a different address.
- B. The County Contract, Purchase Order.
- C. Identification of items or service as outlined in the Contract.
- D. Quantity or quantities, applicable unit prices, total prices and total amount.
- E. Any additional payment information which may be called for by the Contract.

Payment inquiries should be directed to the following address:

Williamson County Auditor's Office, Accounts Payable Department
Email: accountspayable@wilco.org
Phone: 512-943-1500

4.39 CONTRACTUAL FORMATION AND ENSUING AGREEMENT

The IFB and the Bidder's Bid, when properly accepted by the Commissioners Court, shall constitute a Contract equally binding between the Successful Bidder and the County.

If an Ensuing Agreement is required by this IFB, that information will be provided in Special Provisions section of this IFB. The Successful Bidder shall be required to execute the Agreement at the Williamson County Purchasing Department approximately ten (10) calendar days after the Successful Bidder is notified of award. The Ensuing Agreement shall be in the same form as the Agreement which is attached to the end of this IFB. The only anticipated changes in the Ensuing Agreement will be to include additional exhibits, to fill in blanks to identify the Successful Bidder, and terms relating to the compensation, or to revise the Agreement to accommodate corrections, changes in the scope of services, or changes pursuant to Addenda issued. **Bidders should raise any questions regarding the terms of the Agreement in the form of written questions or submittals as described in the Public Announcement and General Information portion of this IFB.** Because the signed Ensuing Agreement will be substantively and substantially derived from the attached Agreement, each Bidder is urged to seek independent legal counsel as to any questions about the terms, conditions or provisions contained in the Agreement *before* submitting a Bid. Again, the attached Agreement, if applicable, contains important legal provisions and is considered part and parcel of this IFB. Failure or refusal to sign aforesaid Agreement shall be grounds for the County to revoke any award which has been issued, forfeit Bid security, if applicable, and select another Bidder.

4.40 COOPERATIVE PURCHASING PROGRAM

During the term of the Contract resulting from this IFB, the County would like to afford the same prices, terms and conditions to other political subdivisions or public entities. Another entity's participation in the Contract resulting from this IFB is subject to a properly authorized Purchasing Cooperative Inter-local Agreement with the County. Any liability created by purchase orders issued against the Contract shall be the sole responsibility of the governmental agency placing the order.

4.41 INSURANCE REQUIREMENTS

To the extent applicable Insurance information will appear in the Additional Stipulations section that is in this IFB Package.

4.42 BIDDERS BOND, WARRANTY BOND, PERFORMANCE AND PAYMENT BONDS

To the extent applicable Bond information will appear in the Additional Stipulations section that is in this IFB Package.

4.43 LEGAL LIABILITY INFORMATION

The Successful Bidder shall disclose all legal liability information by listing any pending litigation anticipated litigation that your firm is involved in including, but not limited to, potential or actual legal matters with private parties and any local, state, federal or international governmental entities. The County reserves the right to consider legal liability information in the recommendation of any proposed contract to the Commissioners Court.

4.44 INCLEMENT WEATHER

In case of inclement weather or any other unforeseen event causing the County to close for business on the date of a Bid submission deadline, the Bid closing will automatically be postponed until the next business day the County is open. If inclement weather conditions or any other unforeseen event causes delays in carrier service operations, the County may issue an Addendum to all known Bidders interested in the project to extend the deadline. It will be the responsibility of the Bidder to notify the County of their interest in the project if these conditions are impacting their ability to turn in a submission within the stated deadline. The County reserves the right to make the final judgement call to extend any deadline.

4.45 PREVAILING WAGE RATES

To the extent this procurement is for the construction of a public work, including a building, highway, road, excavation, and repair work or other project development or improvement, paid for in whole or in part from public funds, without regard to whether the work is done under public supervision or direction, Texas Government Code, Chapter 2258, shall apply and the contractor shall pay not less than the wage scale of the various classes of labor as shown on the "Prevailing Wage Schedule" provided by the County. Pursuant to Texas Government Code, Section 2258.022(a)(2), the County has determined the general prevailing rate of the "Prevailing Wage Schedule" in the locality in which the public work is to be performed for each craft or type of worker needed to execute the contract and the prevailing rate for legal holiday and overtime work by using the prevailing wage rate as determined by the United States Department of Labor in accordance with the United States Code, Section 276a (Davis-Bacon Act).

The specified wage rates are minimum rates only, and are not representations that qualified labor adequate to perform the work is available locally at the prevailing wage rates. The County is not bound to pay—and will not consider—any claims for additional compensation made by any contractor because the contractor pays wages in excess of the applicable minimum rate contained in the Contract Documents. The "Prevailing Wage Schedule" is not a representation that quantities of qualified labor adequate to perform the work may be found locally at the specified wage rates.

For classifications not shown, workers shall not be paid less than the wage indicated for laborers. The contractor shall notify each worker commencing work on the project the worker's job classification and the established minimum wage rate required to be paid, as well as the actual amount being paid. The notice must be delivered to and signed in acknowledgement of receipt by the employee and must list both the monetary wages and fringe benefits to be paid or furnished for each classification in which the worker is assigned duties. When requested by the County, competent evidence of compliance with the Texas Prevailing Wage Law shall be furnished by contractor. A copy of each worker wage rate notification shall be submitted to the County with the Application for Payment for the period during which the worker began on-site activities.

Should the contractor at any time become aware that a particular skill or trade not reflected on the County's "Prevailing Wage Schedule" will be or is being employed in the work, whether by the contractor or by a subcontractor, the contractor shall promptly inform the County and shall specify a wage rate for that skill or trade, which shall bind the contractor.

The contractor and any subcontractor shall pay to the County a penalty of sixty dollars (\$60.00) for each worker employed for each calendar day, or portion thereof, that the worker is paid less than the wage rates stipulated in the "Prevailing Wage Schedule" or any supplement thereto. The contractor and each subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all workers employed in connection with the work, and showing the actual per diem wages paid to each worker, which records shall be open at all reasonable hours for the inspection by the County.

Within thirty-one (31) days of receipt of information concerning a violation of the Texas Government Code Chapter 2258, the County shall make an initial determination as to whether good cause exists to believe a violation occurred. The County's decision on the initial determination shall be reduced to writing and sent to the contractor or subcontractor against whom the violation was alleged, and to the affected worker. When a good cause finding is made, the County shall retain the full amounts claimed by the claimant or claimants as the difference between wages paid and wages due under the "Prevailing Wage Schedule" and any supplements thereto, together with the applicable penalties, such amounts being subtracted from successive progress payments pending a final decision on the violation.

After the County makes its initial determination, the affected contractor or subcontractor and worker have fourteen (14) calendar days in which to resolve the issue of whether a violation occurred, including the amount that should be retained by the County or paid to the affected worker. If the contractor or subcontractor and affected worker reach an agreement concerning the worker's claim, the contractor shall promptly notify the County in a written document signed by the worker. If the contractor or Subcontractor and affected worker do not agree before the fifteenth (15th) calendar day after the County determination, the contractor or subcontractor and affected worker must participate in binding arbitration in accordance with the Texas General Arbitration Act, Chapter 171, (Texas Civil Practice and Remedies Code). The parties to the arbitration have ten (10) calendar days after the expiration of the fifteen (15) calendar days referred to above, to agree on an arbitrator; if by the eleventh (11th) calendar day there is no agreement to an arbitrator, a district court shall appoint an arbitrator on the petition of any of the parties to the arbitration.

If an arbitrator determines that a violation has occurred, the arbitrator shall assess and award against the contractor or subcontractor the amount of penalty as provided above and the amount owed the worker. The County may use any amounts retained hereunder to pay the worker the amount as designated in the arbitration award. If the County has not retained enough from the contractor or subcontractor to pay the worker in accordance with the arbitration award, the worker has a right of action against the contractor and subcontractor as appropriate, and the surety of either to receive the amount owed, attorneys' fees and court costs. The contractor shall promptly furnish a copy of the arbitration award to the County.

Money retained pursuant to the provisions above shall be used to pay the claimant or claimants the difference between the amount the worker received in wages for labor on the project at the rate paid by the contractor or subcontractor and the amount the worker would have received at the general prevailing wage rate as provided by the agreement of the claimant and the contractor or subcontractor affected, or in the arbitrator's award. The full statutory penalty of sixty dollars (\$60.00) per calendar day of violation per worker shall be retained by Williamson County to offset its administrative costs, pursuant to Texas Government Code, Section, 2258.023. Any retained funds in excess of these amounts shall be paid to the contractor on the earlier of the next progress payment or final payment. Provided, however, that the County shall have no duty to release any funds to either the claimant or the contractor until it has received the notices of agreement or the arbitration award as provided under the provision herein-above.

4.46 CONFIDENTIALITY

The Bidder expressly agrees that it will not use any direct or incidental confidential information that may be obtained while working in a governmental setting for its own benefit, and agrees that it will not access unauthorized areas or confidential information and it will not disclose any information to unauthorized third parties, and will take care to guard the security of the information at all times.



Additional Stipulations

1 Additional Stipulations

1.1 Introduction

The Bid evaluation and selection process is detailed in this section, as are other factors, and the format in which the Price Bid of each Bid should be submitted.

1.2 Contract Administrator

J. Terron Evertson, P.E. (or successor), County Engineer, Williamson County 3151 South East Inner Loop, Suite B, Georgetown, Texas shall serve as the County's Technical Contact with designated responsibility to ensure compliance with the requirements of the Contract and any Ensuing Agreement, such as, but not limited to, acceptance, inspection and delivery. The Technical Contact together with the Purchasing Department will serve as a liaison between the Williamson County Commissioners Court and the Successful Bidder.

1.3 Time for Performance

A time frame of sixty (60) days (fifty (50) to substantial completion / sixty (60) to final completion) is given for completion of plans on this bid. This may begin at the time specified by the County within the three hundred sixty-five (365) days of the pricing quoted on this bid, starting on the day of award. The Contractor will be given written notice to begin work on this project. The Work on this project shall begin within five (5) calendar days after such notification.

Liquidated damages for failure to substantially complete the work within the allotted time will be applied. Liquidated damages are \$200 per working day.

The Contractor will be given written notice to begin work on this project. Work on this project shall begin within five (5) working days after such notification. Failure to begin work within the allotted time will result in liquidated damages being incurred at the rate of \$200 per working day.

Additional Stipulations - Bid

1.4 Performance and Payment Bonds

To the extent, this IFB is for the procurement of a public work contract, and the following shall apply:

Texas Local Government Code, Chapter 262.032, governs the requirements for performance bonds for government entities making public work contracts. A performance bond is required if the contract is in excess of \$50,000 and is to be made for the full amount of the contract.

Texas Government Code, Chapter 2253.021, governs the requirements for payment bonds for government entities making public work contracts. A payment bond is required if the contract is in excess of \$25,000 and is to be made for the full amount of the contract.

The bonds are to be executed and delivered to the County **prior to issuing Notice to Proceed**. The bonds must be executed by a corporate surety or sureties in accordance with the Texas Insurance Code. For unit price contracts, the total contract price shall be estimated and calculated by multiplying the estimated quantities to the Bidder's unit bid price.

If the public works contract is less than \$50,000, the performance bond will not be required as long as the contract provides that payment is not due until the work is completed and accepted by the County.

1.5 Bidder's Bonds

All Bids requiring a Bid Bond shall be accompanied by a certified cashier's check upon a National or State bank in an amount not less than five (5) percent of the total maximum bid price, payable without recourse to the County, or a bid bond in the same amount from a reliable surety company, as a guarantee that the Bidder will enter into a contract and **execute and deliver to the County performance and payment bonds prior to being recommended for award of the Contract. Bid guarantees must be submitted in the same sealed envelope with the Bid.** Bids submitted without check or bid bonds will not be considered. For unit price contracts, the total maximum bid price shall be estimated and calculated by multiplying the estimated quantities to the unit bid price.

1.6 Warranty Bonds

When a Warranty Bond is required it shall be submitted by the Successful Bidder prior to issuing Notice to Proceed, and shall be in the amount of twenty (20) percent of the total project construction cost. This Warranty Bond shall be security for the true and faithful performance of all warranties for two (2) years from the date of final payment. For unit price contracts, the total project construction cost shall be estimated and calculated by multiplying the estimated quantities to the bidder's unit bid price.

Additional Stipulations - Bid

1.7 Insurance Requirements

By signing its Bid, the Bidder agrees to maintain at all times during any term of the Contract and any ensuing Agreement at Bidder's cost, insurance in accordance with this provision.

Bidder will be required to submit Certificates of Insurance **prior to contract award and any renewals.**

All certificates of insurance coverage as specified below must be provided to the following location:

Williamson County Purchasing Department
901 S Austin Ave
Georgetown, Texas 78626

Failure to comply with these Insurance Requirements may result in the termination of the Contract and any ensuing Agreement(s) between the Successful Bidder and County.

The following coverage limits shall be required at a minimum:

- | | | | |
|----|--|------------------------|----------------|
| A. | Worker's Compensation | Statutory – Texas Law | |
| B. | Employer's Liability: | | |
| | Bodily Injury by Accident | \$500,000 Ea. Accident | |
| | Bodily Injury by Disease | \$500,000 Ea. Employee | |
| | Bodily Injury by Disease | \$500,000 Policy Limit | |
| C. | Comprehensive general liability including completed operations and contractual liability insurance for bodily injury, death, or property damages in the following amounts: | | |
| | COVERAGE | PER PERSON | PER OCCURRENCE |
| | Comprehensive General Liability | \$1,000,000 | \$1,000,000 |
| | Aggregate policy limits: | \$2,000,000 | |

Successful Bidder's property will not be covered by any insurance that may be carried by the County. Successful Bidder assumes the risk of loss on its contents and property that are situated on/in/around the County property. The Successful Bidder is strongly encouraged to obtain insurance on its property to the extent deemed necessary by the Successful Bidder.

The deductible for an insurance policy required hereunder shall not exceed \$100,000. **The County shall be named as an additional insured under any policy of insurance required hereunder.**

Successful Bidder shall not commence any work until it has obtained all required insurance and such insurance has been approved by County. Successful Bidder shall not allow any subcontractor(s) to commence work to be performed until all required insurance has been obtained by such subcontractor(s) and approved by County. Approval of the insurance by County shall not relieve or decrease the liability of Successful Bidder or its subcontractor(s) hereunder.

Additional Stipulations - Bid

The required insurance must be written by a company approved to do business in the State of Texas with a financial standing of at least an A- rating, as reflected in Best's insurance ratings or by a similar rating system recognized within the insurance industry at the time the policy is issued. Successful Bidder shall furnish County with a certificate of coverage issued by the insurer. Successful Bidder shall not cause any insurance to be canceled nor permit any insurance to lapse. ALL INSURANCE CERTIFICATES SHALL INCLUDE A CLAUSE TO THE EFFECT THAT THE POLICY SHALL NOT BE CANCELED OR REDUCED, RESTRICTED OR LIMITED UNTIL TEN (10) CALENDAR DAYS AFTER COUNTY HAS RECEIVED WRITTEN NOTICE AS EVIDENCED BY RETURN RECEIPT OF REGISTERED OR CERTIFIED LETTER.

It is the intention of the County, and agreed to and hereby acknowledged by the Successful Bidder, that no provision of this Contract or any ensuing Agreement shall be construed to require the County to submit to mandatory arbitration or mediation in the settlement of any claim, cause of action or dispute, except as specifically required in direct connection with an insurance claim or threat of claim under an insurance policy required hereunder which absolutely requires arbitration or mediation of such claim, or as otherwise required by law or a court of law with jurisdiction over the provisions of this Contract or any ensuing Agreement.

Workers' Compensation Coverage Requirements

The Texas Labor Code, Section 406.096, requires workers' compensation insurance coverage for all persons providing services on a building or construction project for a governmental entity such as the County. The rule requires the County to timely obtain certificates of coverage and retain them for the duration of the project. The rule also sets out the language to be included in the Bid specifications and in contracts awarded by a governmental entity and the information required to be in the posted notice to employees. The rule is adopted under the Texas Labor Code, Section 402.061.

The information provided below is a result of this rule. By submitting your Bid to the County, you are acknowledging that this rule is a part of these Bid specifications, and that you will observe and abide by all of the requirements outlined in the rule. You are further agreeing that should your Bid be accepted by the Williamson County Commissioners Court, the necessary certificates of coverage showing workers' compensation coverage, will be provided to the following name and address prior to beginning work:

Williamson County Purchasing Department
901 S. Austin Ave.
Georgetown, TX 78626

Failure to comply with this request may result in termination of the Contract and any ensuing Agreement. If you have any questions related to this ruling and/or requirement, you are encouraged to contact either the Williamson County Purchasing Department at (512) 943-1546, or you may call the Texas Workers' Compensation Commission at (800) 372-7713.

- A. The following words and terms, when used in this provision, shall have the following meanings. Terms not defined in this rule shall have the meaning defined in the Texas Labor Code, if so defined.

Additional Stipulations - Bid

1. Certificate of coverage (certificate) – A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a workers' compensation coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.
 2. Building or Construction – Has the meaning defined in the Texas Labor Code, Section 406.096(e)(1).
 3. Contractor – A person bidding for or awarded a building or construction project by Williamson County.
 4. Coverage – Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, Section 401.011(44).
 5. Coverage agreement – A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Texas Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G, as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for persons providing services on the project.
 6. Duration of the project--Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the County.
 7. Persons providing services on the project ("subcontractor" in the Texas Labor Code, Section 406.096) – includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.
 8. Project – Includes the provision of all services related to a building or construction contract for the County.
- B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of the Texas Labor Code, Section 401.011(44), for all employees of the contractor providing services on the project, for the duration of the project.
- C. The Contractor must provide a certificate of workers compensation coverage to Williamson County prior to being awarded the Contract.

Additional Stipulations - Bid

- D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with Williamson County showing that coverage has been extended.
- E. The contractor shall obtain from each person providing services on a project, and provide to the County:
 - 1. A certificate of coverage, prior to that person beginning work on the project, so Williamson County will have on file certificates of coverage showing coverage for all persons providing services on the project; and
 - 2. No later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.
- F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.
- G. The contractor shall notify the County in writing by certified mail or personal delivery, within ten (10) days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.
- H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.
- I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:
 - 1. Provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44), for all of its employees providing services on the project, for the duration of the project;
 - 2. Provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;
 - 3. Provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

Additional Stipulations - Bid

4. Obtain from each other person with whom it contracts, and provide to the contractor:
 - i. (a) a certificate of coverage, prior to the other person beginning work on the project; and
 - ii. (b) a new certificate of coverage showing extension of coverage, prior to the end of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
 5. Retain all required certificates of coverage on file for the duration of the project and for one year thereafter;
 6. Notify the County in writing by certified mail or personal delivery, within ten (10) days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and
 7. Contractually require each person with whom it contracts, to perform as required by paragraphs 1 – 7, with the certificates of coverage to be provided to the person for whom they are providing services
- J. By signing this Contract or providing or causing to be provided a certificate of coverage, the contractor is representing to Williamson County that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.
- K. The contractor's failure to comply with any of these provisions is a breach of Contract by the contractor which entitles the County to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the County.

County: Williamson

Project Name: FY 19 Cross Culvert Replacements

GENERAL NOTES AND TECHNICAL SPECIFICATIONS

DEFINITION OF TERMS

Asphalt Season: April 1 through September 30.

County: Williamson County acting through the Road and Bridge Division.

Contractor: Successful bidder of the attached Invitation for Bid.

Engineer: Williamson County Engineer of Road and Bridge Division, or designee.

Inspector: Engineer's designee assigned full, or part, time to the contractor's crew for the oversight of the work.

Specifications: Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges 2014.

TxDOT: Texas Department of Transportation

Working Day: Monday through Friday (excluding County approved holidays), if weather permits the performance of the contract (as determined by the Inspector) for a continuous period of at least 6 hrs. (excluding lunch) between 8:00 A.M. and 5:00 P.M.

CONTROL OF MATERIALS

Source Control

The Contractor shall use only materials that meet Contract requirements. Unless otherwise specified or approved by the Engineer, the Contractor shall use new materials for the work. The Contractor shall secure the Engineer's approval of the proposed source of materials to be used before their delivery to the site. Materials can be approved by the Engineer at a supply source or staging area but may be re-inspected at the job site. Contractor shall be responsible for cost of additional sampling and testing if material source changes.

Material Quality

It is the Contractor's responsibility to correct or remove materials that fail to meet the Contract requirements.

Materials not meeting Contract requirements will be rejected, unless the Engineer approves corrective actions. Upon rejection by the Engineer, the Contractor must immediately remove and replace rejected materials.

If the Contractor does not comply with this Article, the County may remove and replace defective material. The cost of testing, removal, and replacement will be deducted from invoice submitted to the County.

County: Williamson

Project Name: FY 19 Cross Culvert Replacements

Manufacturer Warranties

Contractor shall transfer to the County warranties and guarantees required by the Contract, from Contractor sources, or received as part of normal trade practice.

Plant Inspection and Testing

The Engineer may, but is not obligated to, inspect materials at the acquisition or manufacturing source. Material samples will be obtained and tested for compliance with quality requirements. Materials produced under County inspection are for County use only unless released in writing by the Engineer.

If inspection is at the plant, Contractor shall meet the following conditions unless otherwise specified:

- Cooperate fully and assist the Engineer during the inspection.
- Ensure the Engineer has full access to all parts of the plant used to manufacture or produce materials.
- In accordance with pertinent Items and the Contract, provide a facility at the plant for use by the Engineer as an office or laboratory.

The Engineer may provide inspection for periods other than daylight hours if:

- Continuous production of materials for County use is necessary due to the production volume being handled at the plant, and
- The lighting is adequate to allow satisfactory inspection.

The Contractor shall provide copies of all test results to the County and the Engineer prior to the County's acceptance of improvements.

The Contractor shall coordinate with the County's field representative 48 hours prior to schedule density testing. The County's field representative shall witness all testing.

GENERAL NOTES

All work performed and all products furnished under the provision of the contract shall comply with requirements which pertain to the various Items of work included herein as *Standard Specification for Construction of Highways, Streets and Bridges* of the Texas Department of Transportation, adopted November 1, 2014, and as amended and/or updated, which is incorporated herein by reference for all purposes. In the event that any specification set out herein conflicts with said TxDOT specifications, the specification set out herein shall control and govern.

The Contractor will be given written Notice to Proceed on this project. The project shall begin within five (5) working days after such notification and shall continue for sixty (60) working days.

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Contractor shall not begin asphalt work prior to the beginning of the asphalt season (April 1), nor after the ending of the asphalt season (September 30), except with the approval of the Engineer.

Contractor specifically acknowledges that Williamson County will sustain damages for each working day beyond the date in which construction work is to begin. Once the written Notice to Proceed is given by Williamson County, the Contractor has five (5) working days to begin the work. Contractor agrees that two-hundred and No/100 Dollars (\$200.00) per working day shall be retained by Williamson County from any amounts due Contractor for every day that Contractor does not begin the construction work.

Contractor specifically acknowledges that Williamson County will sustain damages for each working day beyond the required dates of substantial completion of the project. Because of the impracticality and extreme difficulty of fixing and ascertaining Williamson County's actual damages, Contractor agrees that two-hundred and No/100 Dollars (\$200.00) per working day shall be retained by Williamson County from any amounts due Contractor for every day that Contractor does not complete the project.

Periods of time (i) during which Williamson County suspends the work by written notice to Contractor, or (ii) during which contractor has performed work and is waiting for Williamson County's acceptance, or (iii) during which a delay directly related to delays caused by "Acts of God", non-county governmental processes, national emergency, or any other causes beyond Contractor's or Williamson County's reasonable control, shall not be taken into account in computing the amount retained. In the event that work received by Williamson County is found to be incomplete, the period of time from the end of the performance of the work to the receipt of subsequent performance necessary to produce completed work will be taken into account in computing the number of days and the amount retained.

Contractor shall submit a basic work plan, bar chart, or schedule for the Engineer to review one week prior to commencement of work.

Once work begins, Contractor shall continuously execute the work until completion at each culvert crossing site, unless otherwise directed by the Engineer.

The Contractor shall determine the exact location of all existing utilities before commencing work, and is fully responsible for any and all damages associated by Contractor's failure to locate and preserve utilities.

The actual quantity required may be varied from the estimated quantities in the contract. The Contractor shall be compensated for completed work based on actual quantities per bid item.

If multiple days are required to complete work, Contractor shall not leave work in hazardous conditions, as determined by the Engineer.

Do not park equipment or make stockpiles where driver sight distance to businesses and side street intersections is obstructed, especially after work hours. If it is necessary to park where

County: Williamson

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driver's views are blocked, Contractor shall make every effort to flag traffic accordingly. Give the travelling public first priority.

The Contractor shall be responsible for marking every 100 foot station, and shall maintain the markings at the applicable culvert crossing site for the duration of the project. This work shall be considered subsidiary to the various bid Items.

An English-speaking superintendent shall be available on the project at all times when work is being performed. The Contractor shall provide the Construction Inspector with contact information for the superintendent.

If any significant recharge features, such as sinkholes, caves, or any other subterranean openings are discovered during construction or core sampling, all activities near the feature must be immediately suspended. The Construction Inspector must be contacted for evaluation. The discovery may require TCEQ review and approval for the methods proposed to protect the aquifer from any potential adverse impacts.

Construction vehicles may be restricted from traversing or utilizing existing roadways, unprotected construction areas, and areas with vegetative cover, as determined by the Construction Inspector.

Contractor's equipment and vehicles shall not be maintained on-site during construction, except at designated maintenance sites as approved by the Construction Inspector.

Any soils contaminated during construction of the proposed project shall be transported from the site and properly disposed of off-site, off the contributing zone, and off any draining to the recharge zone of the Edwards Aquifer. Payment for this work shall be considered subsidiary to the pertinent bid Items.

Contractor shall provide at least one portable restroom near the work site(s) at all times in order to provide a bathroom to individuals providing work hereunder. Contractor shall monitor and prevent its employees and any of its subcontractors that are providing work on the project from urinating or defecating on property in, on or adjacent to the areas in which work is being performed.

Contractor shall maintain positive drainage for permanent and temporary site conditions for duration of project.

Contractor shall comply with insurance requirements dictated within this contract.

Weekend and holiday work is allowed with prior approval by the Engineer.

The Contractor shall perform work during appropriate weather conditions, unless otherwise directed by the Engineer. If work is performed at the Contractor's option during, or prior to,

County: Williamson

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inclement weather conditions and the work is damaged, the Contractor is responsible for all costs associated with replacing the work.

Testing may be performed at the request of the County any time during the length of the contract through an independent testing laboratory. Testing may be requested by the County on any and/or all items on this contract. If the results determine the item did not meet specifications, then the cost of the testing will be borne by the Contractor. If the results of the test determine that the item did meet specifications, the cost of the testing will be borne by the County.

All construction equipment involved in roadway work shall be equipped with a permanently mounted 360 degree revolving or strobe warning light with amber lens. This light shall have a minimum lens height of 5 inches and a diameter of 5 inches.

This light shall have a mounting height of not less than 6 feet above the roadway surface and shall be visible from all sides. This equipment shall also have attached at each side of the rear end of the vehicle an approved orange warning flag mounted not less than 6 feet above the roadway surface.

ABOVE-GROUND STORAGE TANKS

Shall not be permitted.

BLASTING

No Blasting will be allowed on the project.

ENTRY INTO AND PROTECTION OF ADJACENT PROPERTIES

Design of this project did not contemplate a need to enter adjacent properties except where either permanent or temporary working easements are shown on the Plans. Should it be necessary during construction of the work to enter on adjacent properties, the County shall be notified. The Contractor shall be responsible for all arrangements to enter and shall be liable for repair of fences and restoration of any property damage outside of the right of way and easements shown in the plans.

Access to the right of way and easements adjacent to private property shall be coordinated with the adjacent property owner at least 48 hours in advance.

LOCATION AND PROTECTION OF UTILITIES

Notwithstanding any other provision of this Contract, the Contractor shall be solely responsible for the location and protection of any and all public and/or private utility lines and utility customer service lines in the work area. The Contractor shall exercise due care to locate and to mark, uncover or otherwise protect all such lines in the construction zone and any of the Contractor's work or storage area. Upon request, the County may provide such information that it

County: Williamson

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has about the location and grade of water, gas, telephone cable TV and electric lines and other utilities in the work area, but such information shall not relieve or be deemed to be in satisfaction of the Contractor's obligation hereunder, which shall be primary and nondelegable. Any such lines damaged by the Contractor's operations shall be immediately repaired by the Contractor or he shall cause such damage to be repaired at his expense. Contractor shall contact Dig-Test at 1-800-344-8377, for utility verification prior to beginning construction.

SURPLUS MATERIAL

Excavated or surplus natural soil and rock material, unless otherwise noted in the Plan or Specifications, shall be known a "spoil" and properly disposed of by the Contractor off-site at his sole expense. Any permits necessary for the disposal of such material shall be acquired by the Contractor at his expense.

Any surplus material defined as "solid waste" under the Texas Commission on Environmental Quality Municipal Solid Waste Regulations shall be disposed of in compliance with all applicable solid waste management regulations.

Final cleanup will include the removal of excess material considered detrimental to vegetation growth within the working area. Materials such as excess concrete and other materials, as specified by the Engineer will be removed at the Contractor's expense.

RESTORATION/REVEGETATION

All disturbed areas within the right of way, easements and limits of construction shall be restored. Restoration shall include all topsoil, seeding/sodding, watering, fertilizer, labor and equipment necessary to complete the project in accordance with the Plans and Specifications. Restoration shall be installed and vegetation established prior to final acceptance of the project, or as approved by the County.

Care shall be exercised to prevent damage to all property in and around the construction zone. The Contractor shall be liable for the repair and restoration of any property damaged as a result of the Contractor's prosecution of the work. This shall include, but is not limited to revegetation of all areas damaged or destroyed by construction. Contractor will be held liable and responsible for such areas until growth is reestablished to the satisfaction of the County.

Ornamental landscape plantings of trees, shrubs and grasses that are damaged or destroyed during construction shall be replaced with plant material of comparable size and quality approved by the County.

Revegetation measures will begin as soon as practical. The County reserves the right to require the immediate installation of revegetation measures whenever deemed necessary.

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The County reserves the right to require additional revegetation measures deemed necessary at any time after construction has begun until the County has accepted the erosion control measures and revegetation measures.

The Contractor shall be responsible for maintaining, repairing or replacing all erosion control devices as may be directed by the Construction Inspector. This work will be considered subsidiary to the various bid Items.

Item 100

The Contractor shall notify the Construction Inspector prior to clearing operations. Upon notification, the Inspector will schedule a walk-through with the Contractor and designate all trees and other features to be protected during construction. The Contractor shall not begin any clearing of the right-of-way prior to this walk-through. The designated features shall be protected in accordance with the plans and specifications, or as directed by the Inspector. No fences shall be removed without notification to the Inspector.

Removal of any obstructions on the right of way, including fences, that are not shown on the plans is included under preparing right of way. The Inspector shall be notified prior to removal of obstructions. All right-of-way clearing operations will be coordinated with the project's SW3P and as directed or approved by the Construction Inspector.

The Contractor may be required to trim and remove brush and trees in order to construct the project or to provide a horizontal clearance of approximately 2 feet inside the right-of-way line and a vertical clearance of at least 14 feet. For this operation, no vertical flailing equipment shall be used and the method shall be approved by the Construction Inspector.

Burning of brush will not be permitted, unless otherwise directed by the County.

The Contractor is responsible for plugging and capping all irrigation systems at the right-of-way line. The Contractor shall notify the County at least 48-hours in advance of performing modifications to irrigation systems.

De-watering of creek beds and stock tanks shall be considered subsidiary.

Item 247

The lift thickness will be 4" to 6" unless shown in the plans. When compacted in multiple lifts, the density of the bottom and middle lifts will be 95% and 98% of the maximum dry density, respectively.

Correction of subgrade soft spots is subsidiary.

Complete all subgrade, ditches, slopes, and place all drainage structures to conform to required lines, grades, and cross-sections, as shown and directed, prior to the placement of Flex Base.

Do not use a vibratory roller to compact the material directly over a box culvert.

County: Williamson

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Item 340

Recycled Asphalt Shingles (RAS) or Recycled Asphalt Pavement (RAP) are not permitted for surface course.

Item 402

Temporary special shoring is required for headwalls 5' and taller. Temporary special shoring shall be considered subsidiary.

Item 432

Typical concrete riprap shall be placed at a 5" thickness or as directed by the Engineer.

Item 460 and Item 462

All excavation necessary to install the pipe and boxes shall be replaced with flowable backfill. Flowable backfill shall be considered subsidiary to Items 460 and 462.

Item 460

Field adjust pipe end to maintain the necessary slope. Field cutting of pipe end is allowed. Coat all field cuts with asphalt paint.

All pipe band coupler shall be located in the roadway embankment NOT underneath the roadbed.

Item 462

For pre-cast units, the fill material between the boxes shall consist of concrete aggregate with two sacks of Portland Cement per cubic yard (two sack concrete). The two sacks of cement are part of the box culvert work and shall be considered subsidiary to this Bid Item.

Structural excavation and bedding shall be considered subsidiary to this Bid Item.

Grading the upstream and downstream channel of the box culverts within the temporary construction easement shall be considered subsidiary to this Bid Item.

Item 466

Use Class C concrete for headwalls or wingwalls.

Remove all loose formwork and other materials from the Floodplain or drainage areas, daily, which could float off in a stormwater event, as directed.

Item 496

If necessary, Contractor shall perform traffic control for any structure removal, as directed by the Engineer.

Item 502

Contractor shall provide all traffic control measures to prosecute the work and to ensure a minimum inconvenience to traffic around the construction area. Should the contractor's traffic control measures be found unsatisfactory by the Engineer or Inspector, work will cease.

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Traffic control plans shown within these plans are a minimum requirement. The contractor shall be responsible for any additional signs, barricades, flagmen or other traffic control devices as necessary for the safety of the traveling public. All traffic control devices shall be compliant with the current Texas Manual of Uniform Traffic Control Devices.

Necessary barricades, sufficient lighting, signage and other traffic control methods as may be necessary for the protection and safety of the public shall be provided by the Contractor and maintained during the construction process. Any open trenches shall be covered and protected overnight as needed. The traffic control shall be adjusted in the morning prior to beginning any work.

The Contractor shall notify the County when any traffic control changes are to be made. The Contractor shall also notify all affected emergency service districts, school districts, and U.S. postal offices. The notifications must be made TWO DAYS prior to any change.

The Contractor shall provide all traffic control measures to prosecute the work in conformance with the Texas Manual on Uniform Traffic Control Devices, latest edition.

Access to all side streets and driveways shall be maintained at all times by the Contractor. The Contractor shall maintain 3:1 safety slopes on drop-offs greater than 2-inches that are adjacent to traffic.

The Contractor's crew leader shall be a competent person who will be responsible and available on the project site or in the immediate area to insure compliance with the TCP.

Item 644

All small signs not detailed in the plans shall be built in accordance with the latest edition of the Standard Highway Sign Designs for Texas. Where a sign size or particular legend is shown and such sign size or legend is not shown in the publication, the Contractor shall furnish the sign as detailed in the plans.

All existing regulatory signs must remain displayed at all times unless the roadway is closed to traffic.

The Contractor shall be responsible for removing and replacing any signs that are in the way of construction. Existing signs and sign posts that are in good condition can be replaced with a new triangular slipbase per TxDOT detail. A complete new sign assembly will be required if sign is damaged or at the direction of the Engineer. Sign mounting height shall comply with TxDOT standards.

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GOVERNING SPECIFICATIONS (STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND SPECIAL SPECIFICATIONS)

WHERE DISCREPENCIES OCCUR BETWEEN THE VARIOUS GOVERNING SPECIFICATIONS, THE SPECIAL PROVISIONS SHALL GOVERN OVER BOTH STANDARD SPECIFICATIONS AND SPECIAL SPECIFICATIONS.

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

ITEMS 1 – 9 ARE SUPERSEDED BY THE CONTRACT GENERAL AND SPECIAL CONDITIONS, WHERE APPLICABLE. WHEREVER, IN THE TXDOT STANDARD SPECIFICATIONS, REFERENCE IS MADE TO THE STATE OF TEXAS, THE DEPARTMENT AND ITS REPRESENTATIVES, SUCH REFERENCE SHALL BE TAKEN TO MEAN WILLIAMSON COUNTY AND ITS REPRESENTATIVES.

ITEM 100	PREPARING RIGHT OF WAY
ITEM 105	REMOVING STAB BASE AND ASPH PAV
ITEM 110	EXCAVATION
ITEM 132	EMBANKMENT
ITEM 247	FLEXIBLE BASE
ITEM 334	HOT-MIX COLD-LAID ASPHALT CONCRETE PAVEMENT
ITEM 340	DENSE-GRADED HOT-MIX ASPHALT (SMALL QUANTITY)
ITEM 400	EXCAVATION AND BACKFILL FOR STRUCTURES
ITEM 402	TRENCH EXCAVATION PROTECTION
ITEM 432	RIPRAP
ITEM 460	CORRUGATED METAL PIPE
ITEM 462	CONCRETE BOX CULVERTS AND DRAINS
ITEM 466	HEADWALLS AND WINGWALLS
ITEM 467	SAFETY END TREATMENT
ITEM 496	REMOVING STRUCTURES
ITEM 500	MOBILIZATION

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ITEM 502	BARRICADES, SIGNS AND TRAFFIC HANDLING
ITEM 506	TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS
ITEM 644	SMALL ROADSIDE SIGN SUPPORTS AND ASSEMBLIES
ITEM 658	DELINEATOR AND OBJECT MARKER ASSEMBLIES
ITEM 666	REFLECTORIZED PAVEMENT MARKINGS

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23	CR461 PLAN & PROFILE
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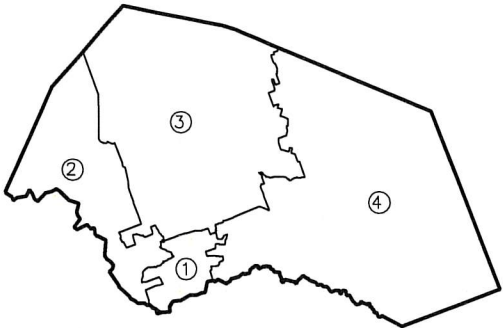
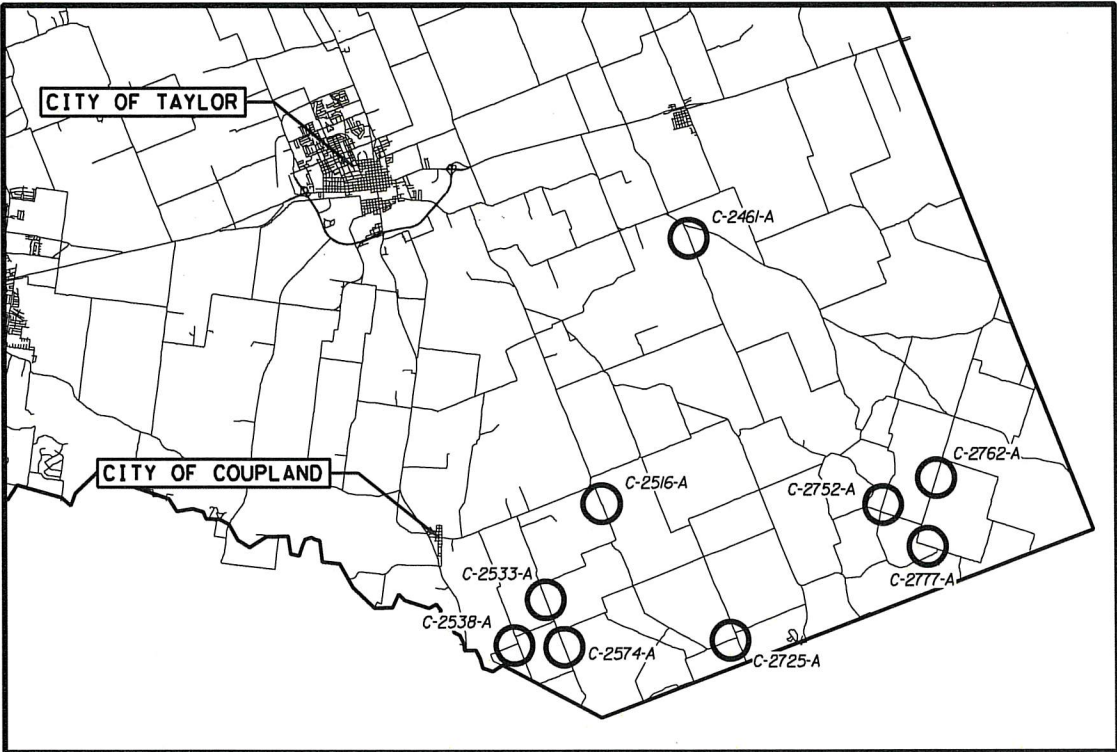
WILLIAMSON COUNTY
PRECINCT 4
PLANS OF PROPOSED
FY19 CROSS CULVERT REPLACEMENTS

WILLIAMSON COUNTY PROJECT NO. IFB _____

NET LENGTH OF PROJECT = VARIES

PROJECT LIMITS: VARIES

FOR THE REPLACEMENT OF CROSS-DRAINAGE STRUCTURES CONSISTING OF CORRUGATED METAL PIPE,
CONCRETE BOX CULVERTS, BASE, ASPHALT PAVEMENT, AND PAVEMENT MARKINGS.



WILLIAMSON COUNTY PRECINCTS

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

OCTOBER 2018

REQUIRED SIGNS SHALL BE PLACED IN ACCORDANCE WITH STANDARD
SHEETS BC(1)-14 THRU BC(12)-14 AND THE "TEXAS MANUAL ON UNIFORM
TRAFFIC CONTROL DEVICES."

TxDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION
OF HIGHWAYS, STREETS AND BRIDGES ADOPTED ON
NOVEMBER 1, 2014 AND ALL APPLICABLE SPECIAL PROVISIONS
AND SPECIAL SPECIFICATIONS AS INDICATED IN THE BID
DOCUMENTS SHALL GOVERN ON THIS PROJECT.

FUNCTIONAL CLASSIFICATION = RURAL LOCAL
DESIGN SPEED (CR 461) = 30 MPH
DESIGN SPEED (CR 463) = 60 MPH
2011 ADT = VARIES



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* THE STANDARDS AND SPECIFICATIONS IDENTIFIED HEREIN
HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION
AND ARE APPLICABLE TO THIS PROJECT.

PREPARED BY:
STEGER BIZZELL

[Signature]
CURTIS R. STEGER, P.E.
PROJECT MANAGER



11/15/18
DATE

APPROVED AND RECOMMENDED FOR CONSTRUCTION:

[Signature]
J. TERRON EVERTSON, P.E.
COUNTY ENGINEER
11/16/18
DATE
[Signature]

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0 0.5 1
SCALE IN MILES



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WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

PROJECT LOCATION MAP

SCALE: 1"=1 MI

DATE: 11/16/2018		BY: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		2
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	

SUMMARY OF QUANTITIES																
CROSSING / STREET		100-6001	105-6037	110-6001	132-6001	247-6366	334-6088	340-6004	340-6106	400-6001	402-6001	432-6002	432-6027	460-6011	460-6012	460-6024
		PREPARING ROW	REMOVING STAB BASE AND ASPH PAV(0"-16")	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(ORD COMP)(TY A)	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	HMCL ACP TY- D AES-300	D-GR HMA(SQ) TY-A PG64-22	D-GR HMA(SQ) TY-D PG64-22	STRUCT EXCAV	TRENCH EXCAVATION PROTECTION	RIPRAP (CONC)(5 IN)	RIPRAP (STONE COMMON) (DRY)(24 IN)	CMP AR (GAL STL DES 4)	CMP AR (GAL STL DES 5)	CMP AR (GAL STL DES 7)
		AC	SY	CY	CY	CY	TON	TON	TON	CY	LF	CY	CY	LF	LF	LF
C-2461	CR 450	0.24	14			5	2			53	15		13		40	
C-2516	CR 464	0.20	12			4	2			67	30		17		50	
C-2533	CR 463	0.92		297	356	638			201	136	31	29				70
C-2538	CR 461	0.23		84	28	123			39	65						56
C-2574	CR 463	0.08	22			8		85	55	38			24	60		
C-2725	CR 484	0.47	56			19	7			294	16		47			
C-2752	CR 480	0.14	14			5	2			69				56		
C-2762	CR 481	0.32	72			24	8			265	14	11	15			
C-2777	CR 481	0.14	12			4	2			40	10				32	
PROJECT-WIDE																
TOTAL		2.74	202	381	384	830	23	85	295	1027	116	40	116	116	122	126

CROSSING / STREET		462-6021	462-6032	466-6063	466-6064	466-6066	466-6111	466-6123	466-6123A	466-6169	466-6183	466-6184	467-6557
		CONC BOX CULV (8 FT X 6 FT)	CONC BOX CULV (10 FT X 8 FT)	HEADWALL (CH - FW - A - 0) (DES= 4)	HEADWALL (CH - FW - A - 0) (DES= 5)	HEADWALL (CH - FW - A - 0) (DES= 6)	HEADWALL (CH - PW - A - 0) (DES= 4)	HEADWALL (CH - PW - A - S) (DES= 7)	HEADWALL (CH - PW/FW - A - S) (DES= 7)	WINGWALL (FW - S) (HW=8 FT)	WINGWALL (PW - 1) (HW=8 FT)	WINGWALL (PW - 1) (HW=9 FT)	SET (TY II) (DES 5) (CMP) (4: 1) (C)
		LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA
C-2461	CR 450												2
C-2516	CR 464				2								
C-2533	CR 463							1	1				
C-2538	CR 461					2							
C-2574	CR 463						2						
C-2725	CR 484		60									2	
C-2752	CR 480			2									
C-2762	CR 481	96								1	1		
C-2777	CR 481				2								
PROJECT-WIDE													
TOTAL		96	60	2	4	2	2	1	1	1	1	2	2

CROSSING / STREET		496-6006	496-6007	500-6001	502-6001	506-6002	506-6011	506-6038	506-6039	644-6068	658-6047	666-6047	666-6314
		REMOV STR (HEADWALL)	REMOV STR (PIPE)	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	RELOCATE SM RD SN SUP&AM TY 10BWG	INSTL OM ASSM (OM-2Y)(WC)GND	REFL PAV MRK TY I (W)24"(SLD)(0 90MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(090 MIL)
		EA	LF	LS	MO	LF	LF	LF	LF	EA	EA	LF	LF
C-2461	CR 450	2	50			15	15	60	60		2		
C-2516	CR 464	1	64			40	40	60	60		2		
C-2533	CR 463	1	118			40	40	56	25		2		
C-2538	CR 461	1	60			20	20	65	65	2	2	11	290
C-2574	CR 463		52			20	20	50	50		2		
C-2725	CR 484	2	66			71	71	93	93		2		
C-2752	CR 480		35			20	20	49	49		2		
C-2762	CR 481	2	101			55	55	75	75		2		
C-2777	CR 481	1	28			15	15	38	38		2		
PROJECT-WIDE				1	3								
TOTAL		10	574	1	3	296	296	546	515	2	18	11	290



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TBPE FIRM NO. 181



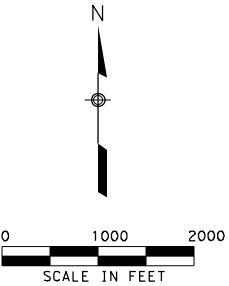
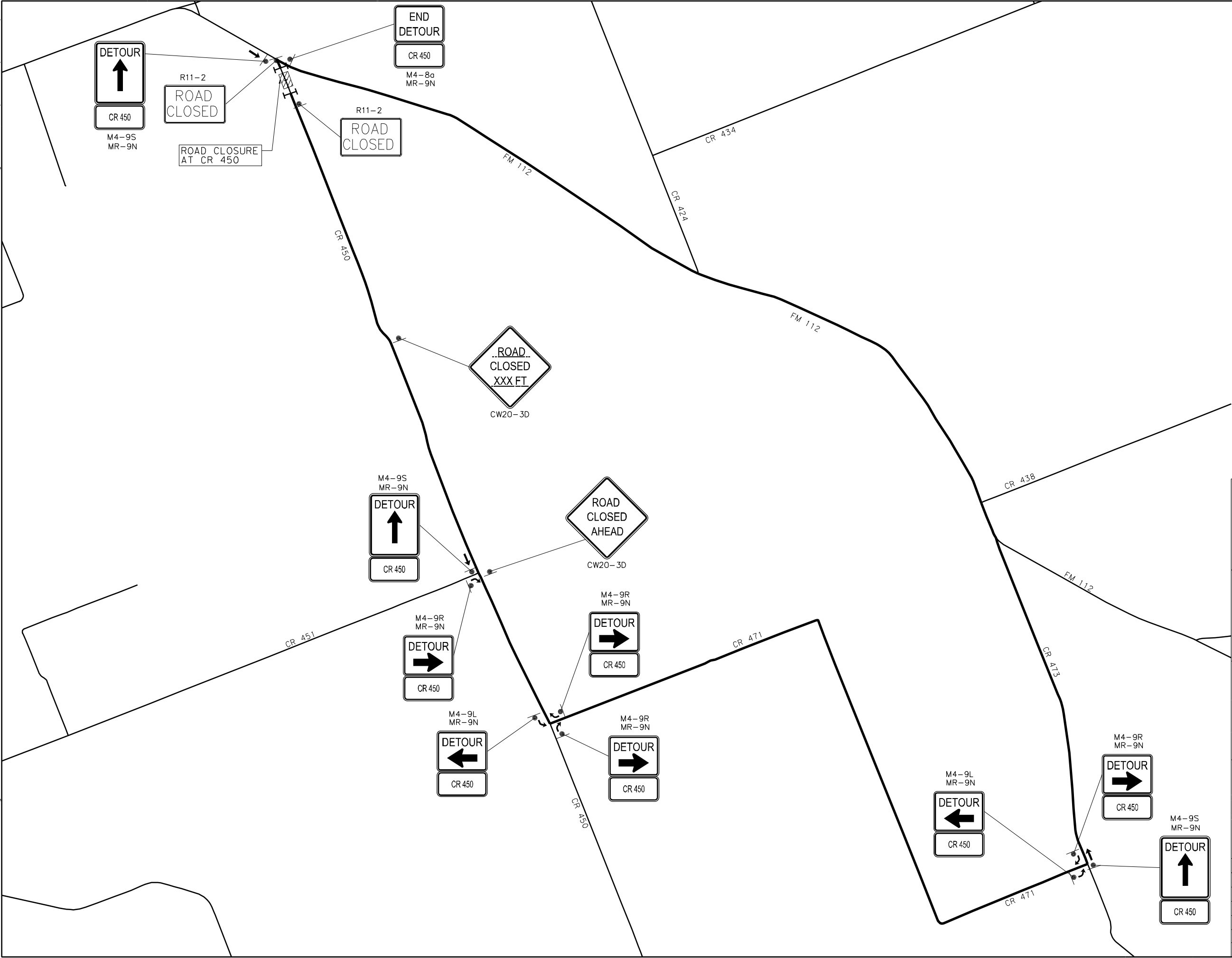
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

SUMMARY OF QUANTITIES

DATE: 11/16/2018		BY: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		3
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	

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LEGEND:

- TYPE III BARRICADE
 - SIGN POST
 - DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 450
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 450 FOR TRAFFIC

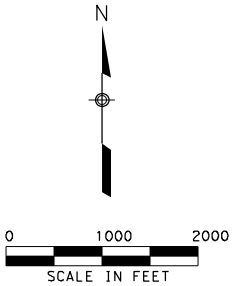
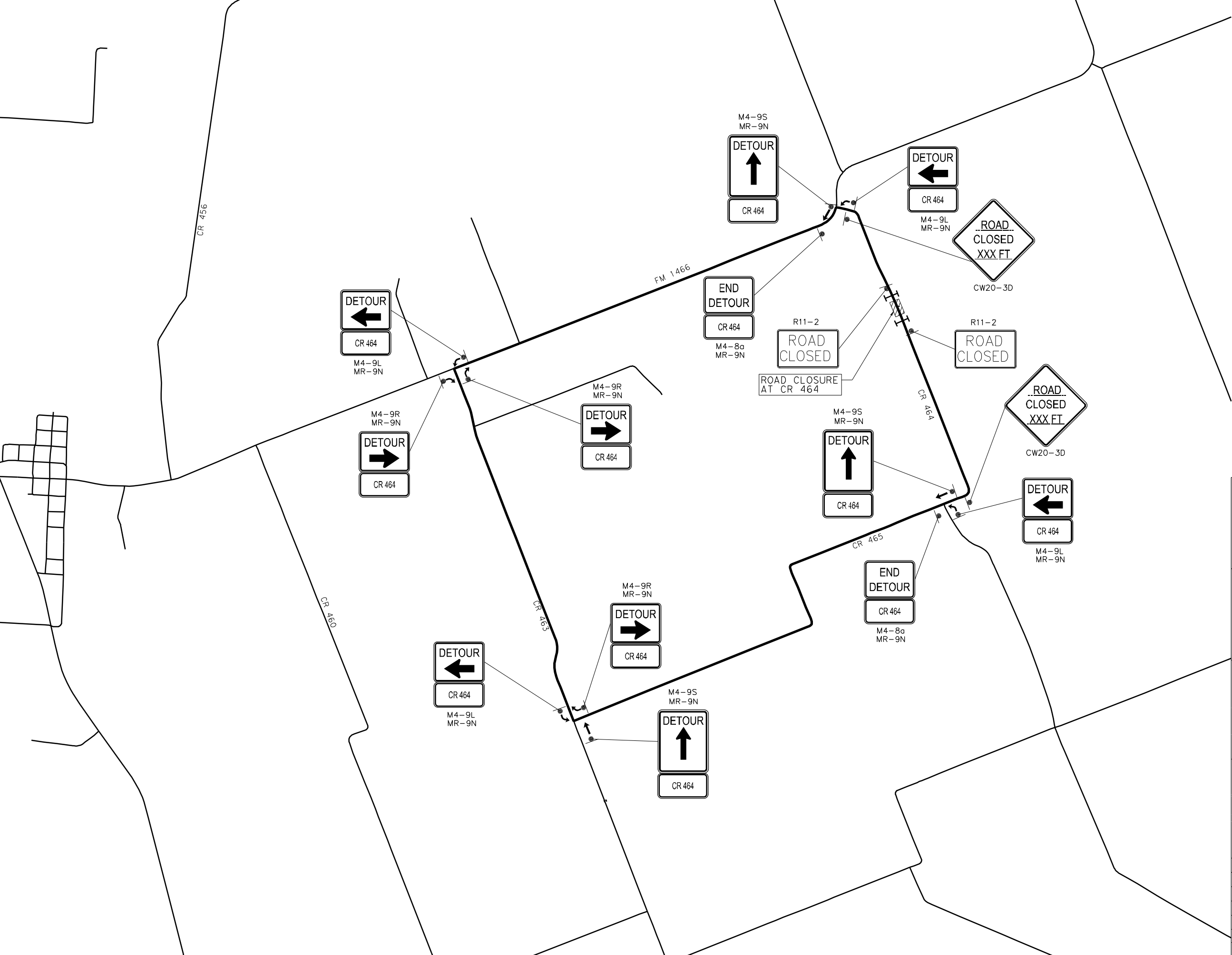
NOTES:

1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 450 AT ALL TIMES.



WILLIAMSON COUNTY			
FY19 CROSS CULVERT REPLACEMENTS			
TRAFFIC CONTROL PLAN			
(C-2461-A AT CR 450)			
SHEET 1 OF 9		SCALE: 1"=2000'	
DATE: 11/16/2018	BY: PH	DW: PH	CK: BRL AP: BRL
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		4
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 450

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PENTABLE: S:\Software\Bentley\Standards\tables\Pen\GRAYSCALE*COLORLOGO.TBL



- LEGEND:**
- TYPE III BARRICADE
 - SIGN POST
 - DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:**
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 464
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 464 FOR TRAFFIC
- NOTES:**
1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 464 AT ALL TIMES.

STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
1848

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STEGER BIZZELL
TBPE FIRM NO. 181

Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

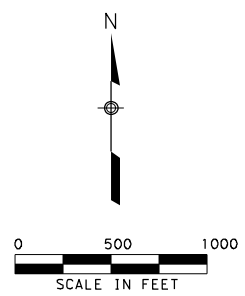
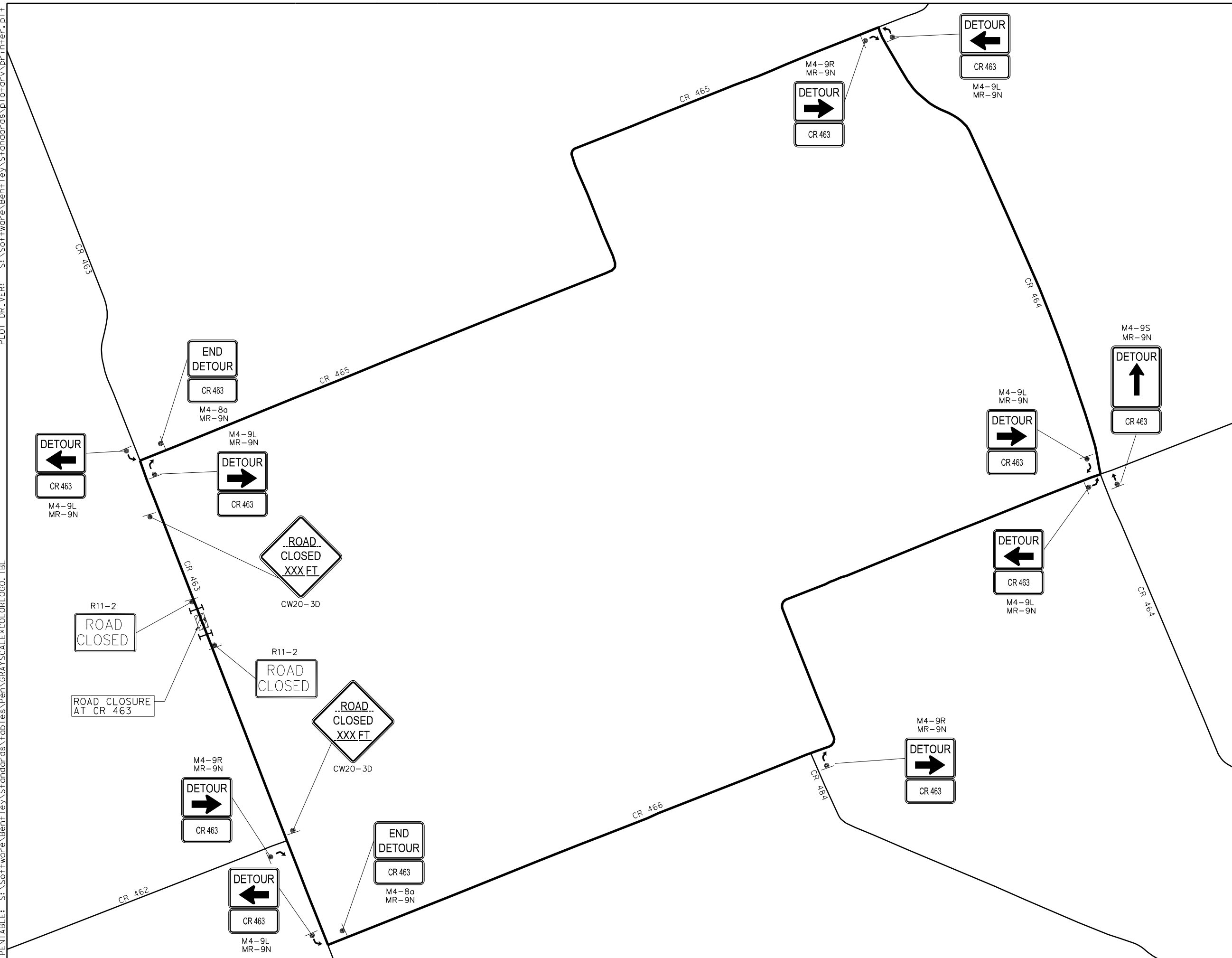
**TRAFFIC CONTROL PLAN
(C-2516-A AT CR 464)**

SHEET 2 OF 9 SCALE: 1"=2000'

DATE: 11/16/2018 DRAWN: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		5
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 464

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PLOT DRIVER: S:\Software\Bentley\Standards\plotdrv\printer.plt



LEGEND:

- 1. TYPE III BARRICADE
 - 2. SIGN POST
 - 3. DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 463
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 463 FOR TRAFFIC

NOTES:

1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 463 AT ALL TIMES.



WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

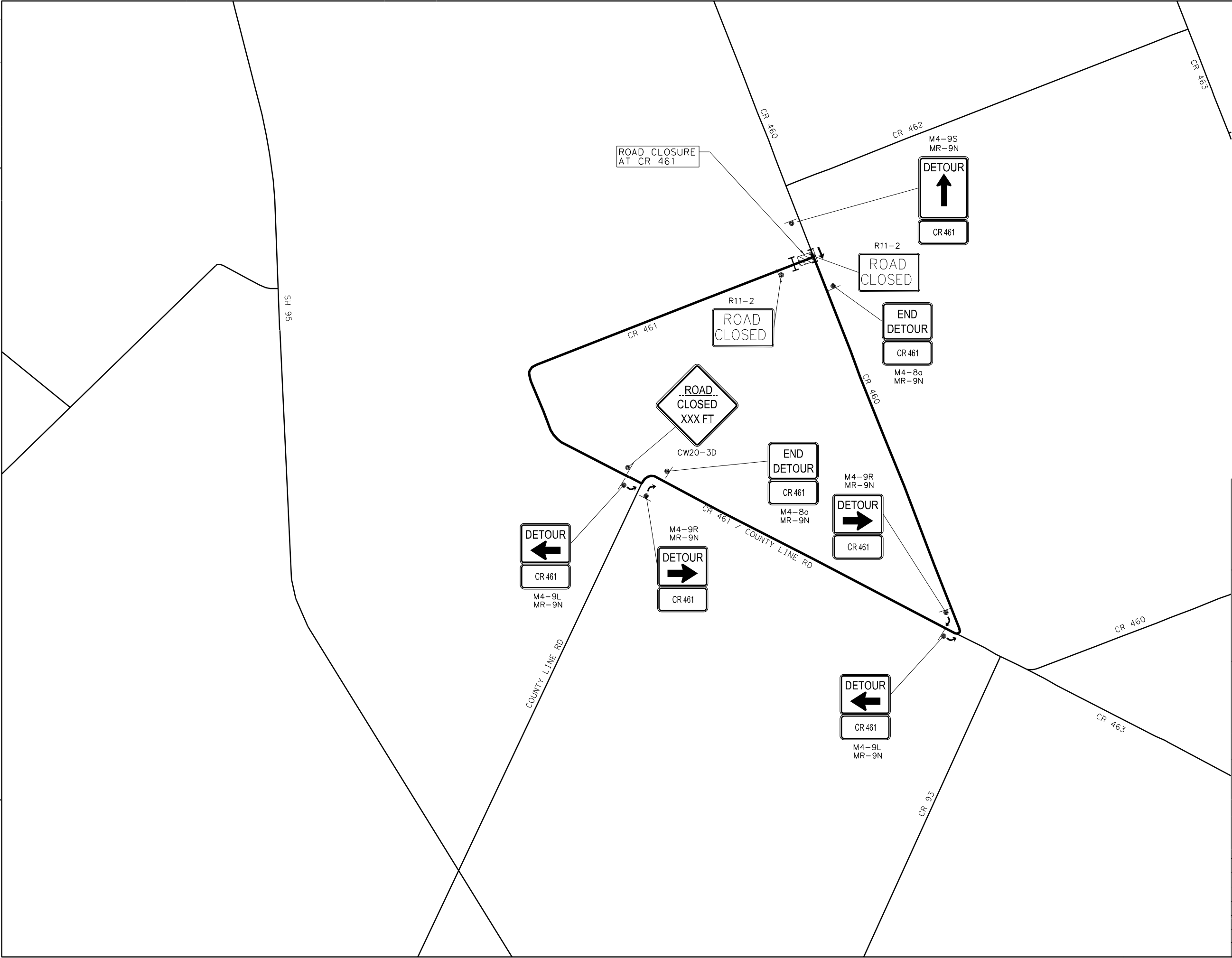
TRAFFIC CONTROL PLAN (C-2533-A AT CR 463)

SHEET 3 OF 9 SCALE: 1"=1000'

DATE 8/16/20				DN: PH DW: PH CK: BRL AP: BRL			
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.				SHEET NO.	
6		----				6	
STATE		DIST.	COUNTY				
TEXAS		---	WILLIAMSON				
CONT.		SECT.	JOB		HIGHWAY NO.		
----		--	---		CR 463		

Williamson County, Texas

FILE: P:\22000-22999\22503 Wilco Culvert Replacement\CAD\Plans\Traffic Control\Traffic Control.dgn
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PLOT DRIVER: S:\Software\Bentley\Standards\plotdrv\prInter.plt



LEGEND:

- TYPE III BARRICADE
- SIGN POST
- DETOUR TRAFFIC FLOW

TRAFFIC CONTROL PHASING:

- INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
- CLOSE CR 461
- DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
- CONSTRUCT CULVERTS AND PAVE STREET
- REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
- OPEN CR 461 FOR TRAFFIC

NOTES:

- THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 461 AT ALL TIMES.

STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
1848

STEGER BIZZELL
TYPE FIRM NO. 181

Michael Baker INTERNATIONAL
TYPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

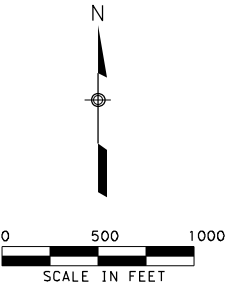
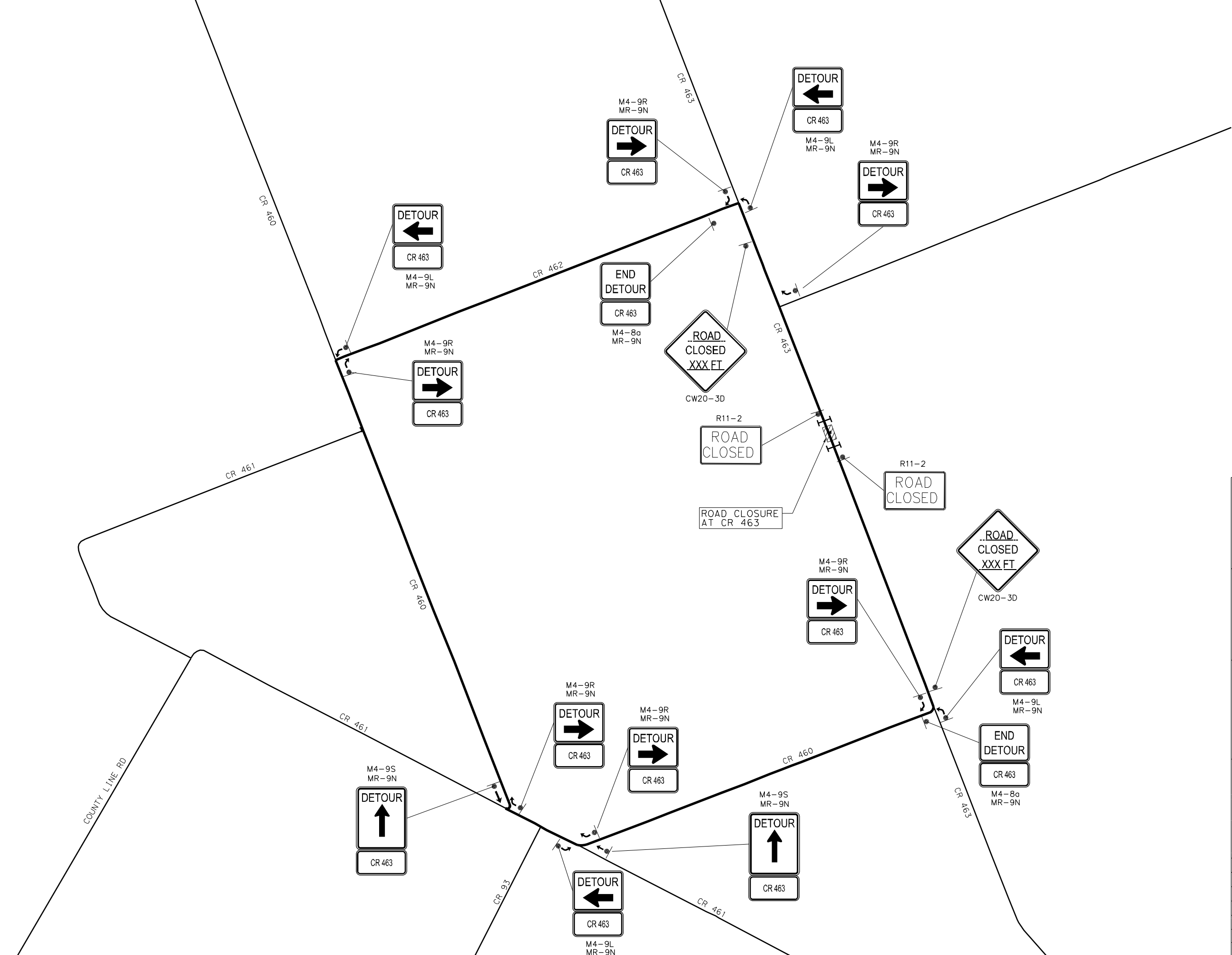
TRAFFIC CONTROL PLAN
(C-2538-A AT CR 461)

SHEET 4 OF 9 SCALE: 1"=1000'

DATE: 11/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	7
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---
HIGHWAY NO. CR 461		

FILE: P:\22000-22999\22503 Wilco Culvert Replacement\CAD\Plans\Traffic Control\Traffic Control.dgn
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PRINTED: 11/16/2018 @ 3:31:43 PM
PLOT DRIVER: S:\Software\Bentley\Standards\Plot\drv\Printer.plt



- LEGEND:
- TYPE III BARRICADE
 - SIGN POST
 - DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 463
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 463 FOR TRAFFIC
- NOTES:
1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 463 AT ALL TIMES.

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

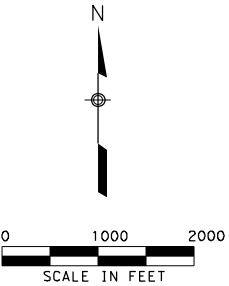
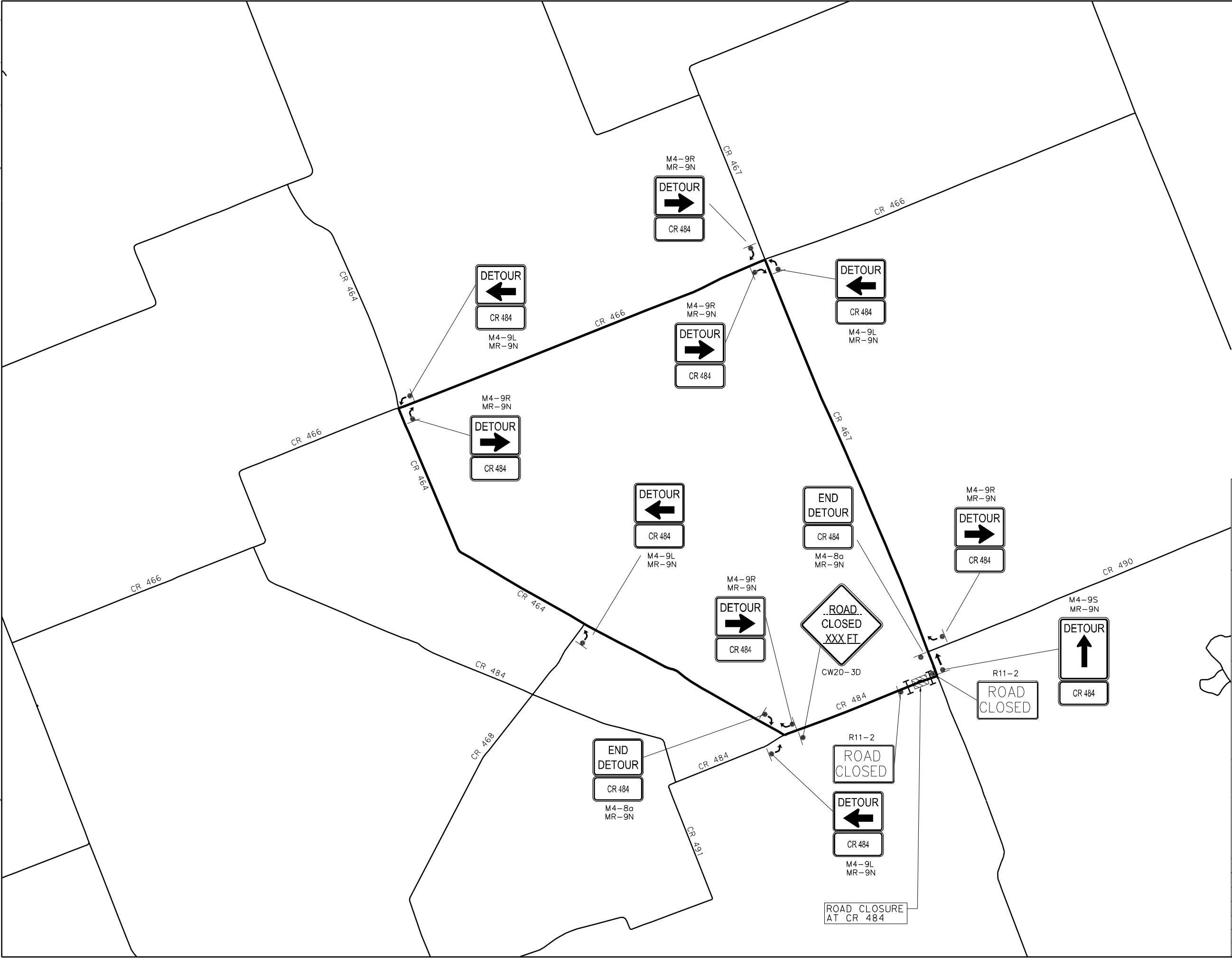
**TRAFFIC CONTROL PLAN
(C-2574-A AT CR 463)**

SHEET 5 OF 9 SCALE: 1"=1000'

DATE: 11/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		8
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 463

FILE: P:\22000-22999\22503 Wilco Culvert Replacement\CAD\Plans\Traffic Control\Traffic Control.dgn
PLOT DRIVER: S:\Software\Bentley\Standards\plotdrv\prInter.plt
PENTABLE: S:\Software\Bentley\Standards\tables\Pen\GRAYSCALE*COLORLOGO.TBL



LEGEND:

- TYPE III BARRICADE
 - SIGN POST
 - DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 484
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 484 FOR TRAFFIC

NOTES:

1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 484 AT ALL TIMES.

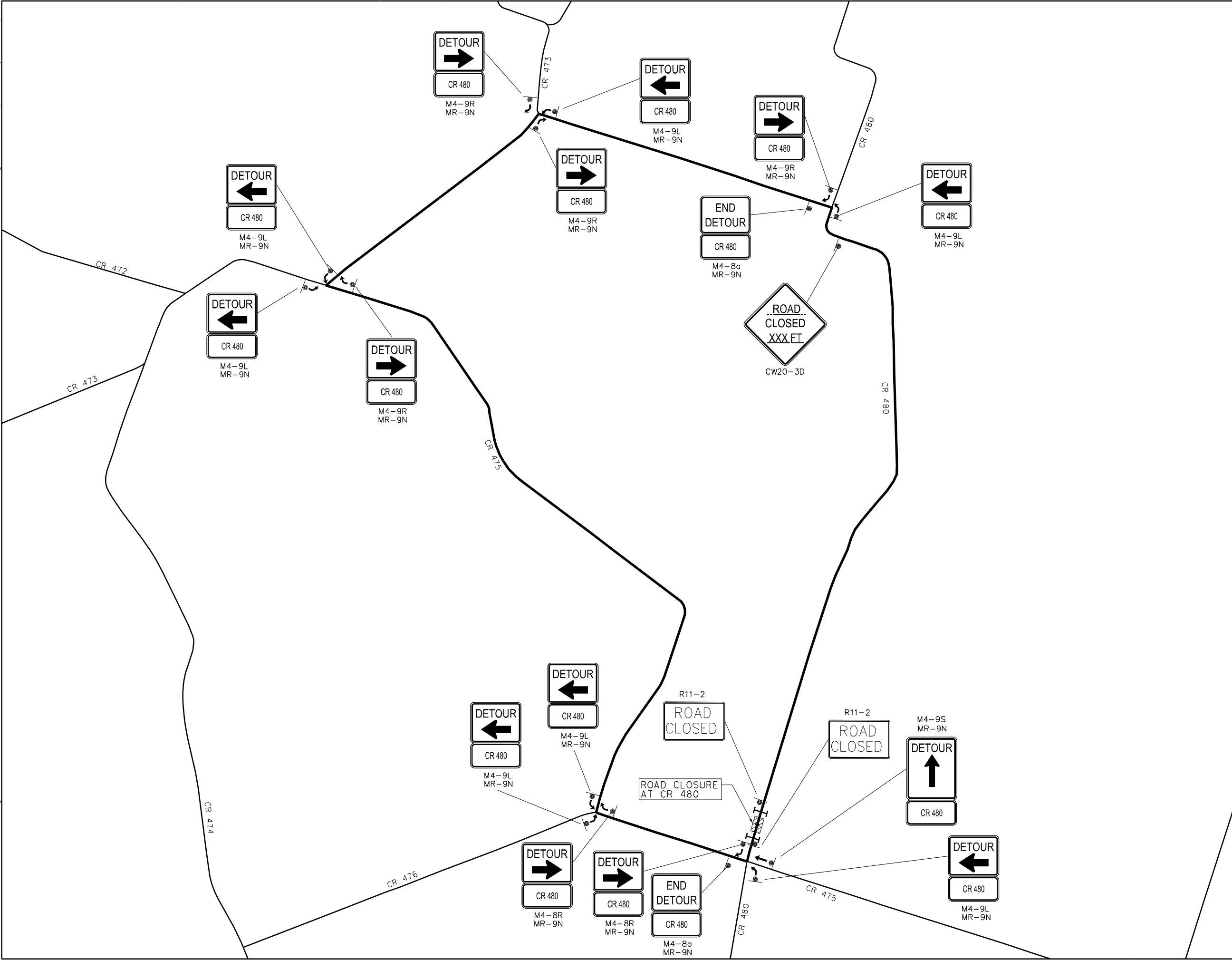
WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**TRAFFIC CONTROL PLAN
(C-2725-A AT CR 484)**

SHEET 6 OF 9 SCALE: 1"=2000'

DATE: 11/16/2018		BY: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		9
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 484

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LEGEND:

- TYPE III BARRICADE
- SIGN POST
- DETOUR TRAFFIC FLOW

TRAFFIC CONTROL PHASING:

- INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
- CLOSE CR 480
- DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
- CONSTRUCT CULVERTS AND PAVE STREET
- REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
- OPEN CR 480 FOR TRAFFIC

NOTES:

- THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 480 AT ALL TIMES.



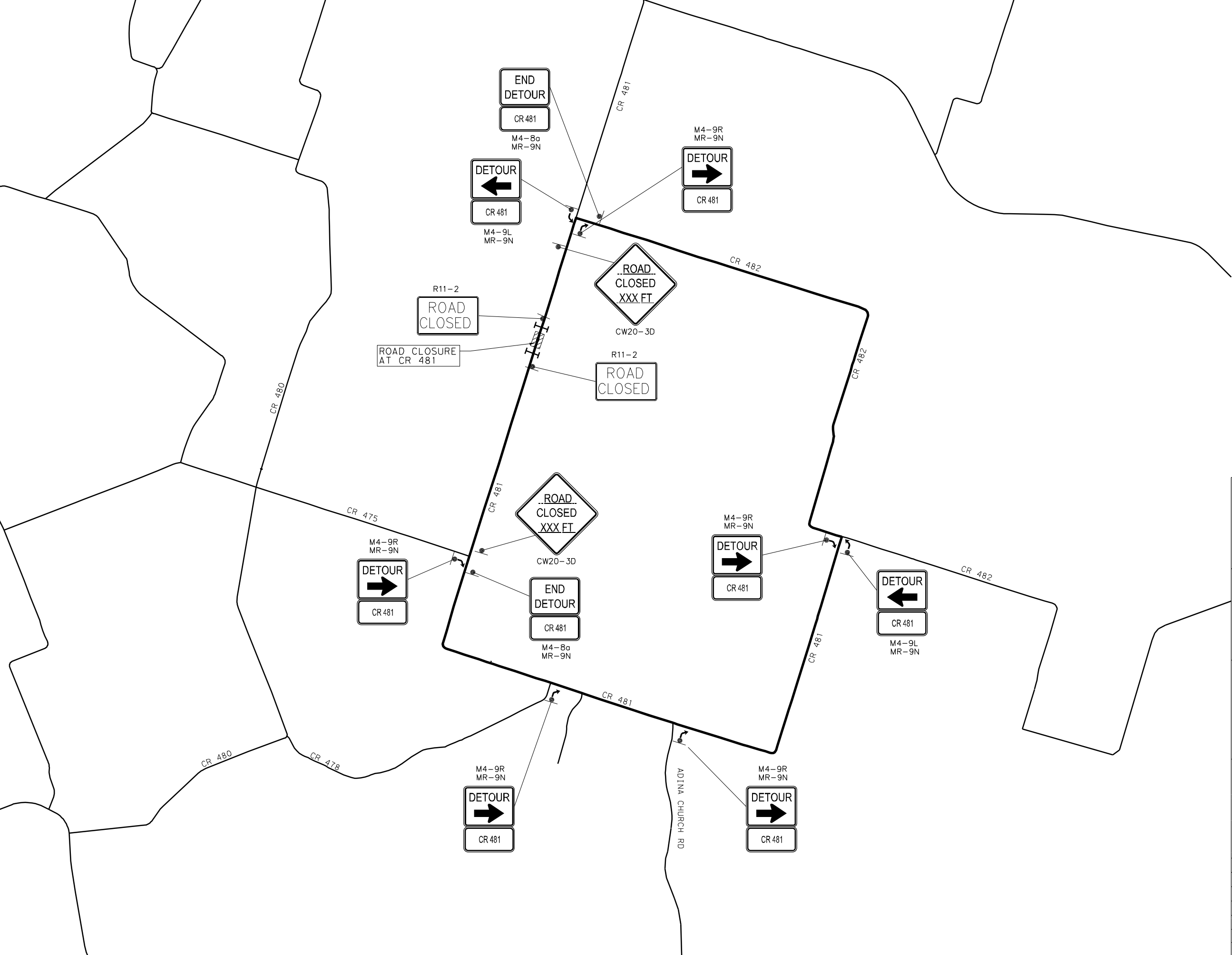
WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

TRAFFIC CONTROL PLAN
(C-2752-A AT CR 480)

SHEET 7 OF 9 SCALE: 1"=1000'

DATE: 11/16/2018		BY: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		10
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 480

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11/16/2018@ 3:31:44 PM



0

1000

2000

SCALE IN FEET

LEGEND:

TYPE III BARRICADE

SIGN POST

DETOUR TRAFFIC FLOW

TRAFFIC CONTROL PHASING:

1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING

2. CLOSE CR 481

3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS

4. CONSTRUCT CULVERTS AND PAVE STREET

5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING

6. OPEN CR 481 FOR TRAFFIC

NOTES:

1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 481 AT ALL TIMES.

STATE OF TEXAS

CURTIS R. STEGER

87905

REGISTERED PROFESSIONAL ENGINEER

11/29/18

WILLIAMSON COUNTY

1848

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STEGER BIZZELL

TYPE FIRM NO. 181

Michael Baker INTERNATIONAL

TYPE FIRM NO. 2677

WILLIAMSON COUNTY

FY19 CROSS CULVERT REPLACEMENTS

TRAFFIC CONTROL PLAN

(C-2762-A AT CR 481)

SHEET 8 OF 9

SCALE: 1"=2000'

DATE: 11/16/2018

BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.

6

FEDERAL AID PROJECT NO.

SHEET NO.

11

STATE

TEXAS

CONT.

DIST.

SECT.

--

COUNTY

WILLIAMSON

JOB

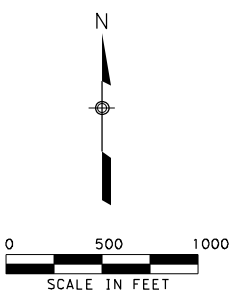
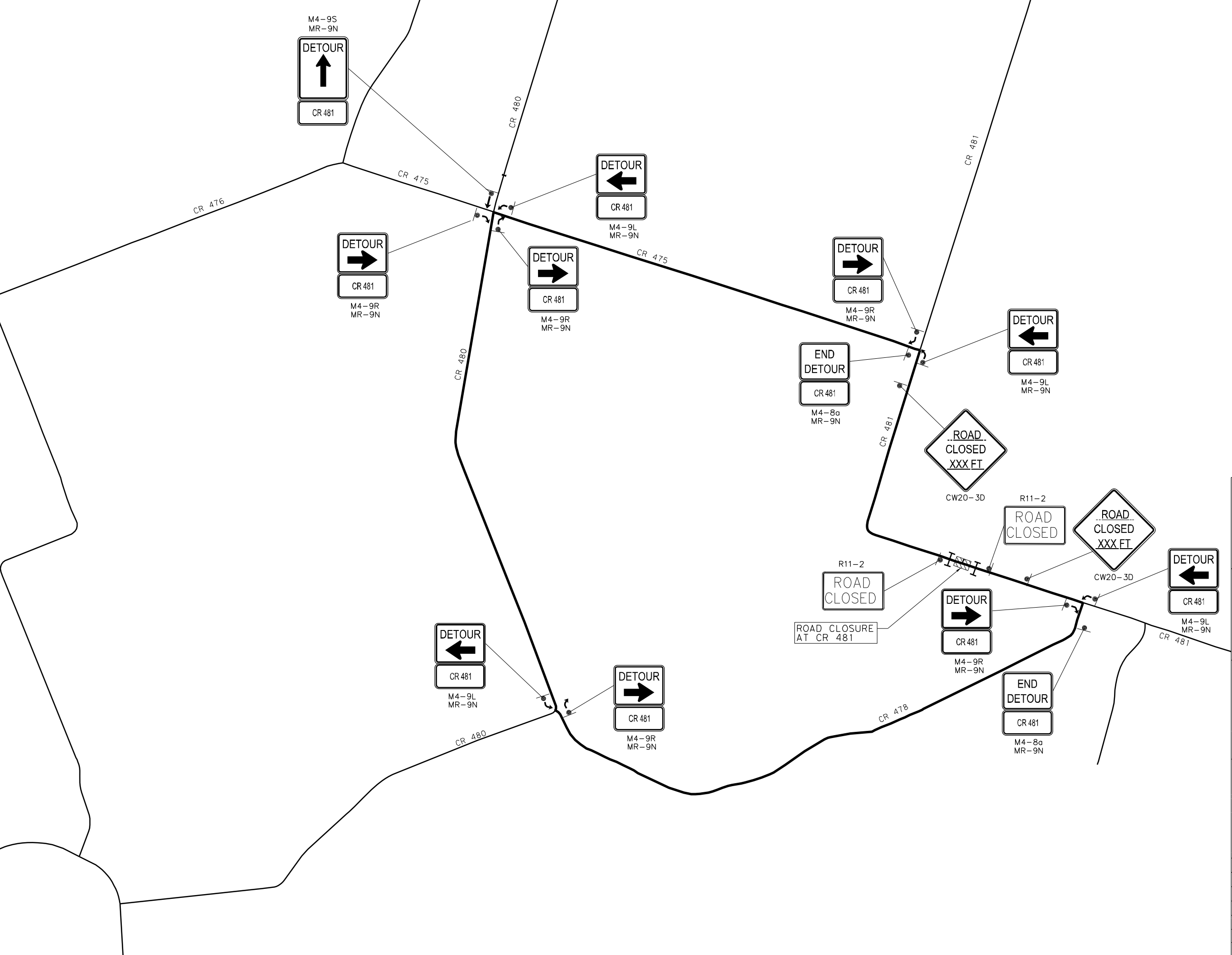
HIGHWAY NO.

CR 481

Williamson County, Texas

11/29/2018

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PENTABLE: S:\Software\Bentley\Standards\tables\PenGRAYSCALE*COLORLOGO.TBL



LEGEND:

- TYPE III BARRICADE
 - SIGN POST
 - DETOUR TRAFFIC FLOW
- TRAFFIC CONTROL PHASING:
1. INSTALL TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 2. CLOSE CR 481
 3. DEMOLISH EXISTING PAVEMENT AND EXISTING CULVERTS
 4. CONSTRUCT CULVERTS AND PAVE STREET
 5. REMOVE TRAFFIC CONTROL MEASURES AND DETOUR SIGNING
 6. OPEN CR 481 FOR TRAFFIC

NOTES:

1. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL ADJACENT PROPERTY ALONG CR 481 AT ALL TIMES.

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**TRAFFIC CONTROL PLAN
(C-2777-A AT CR 481)**

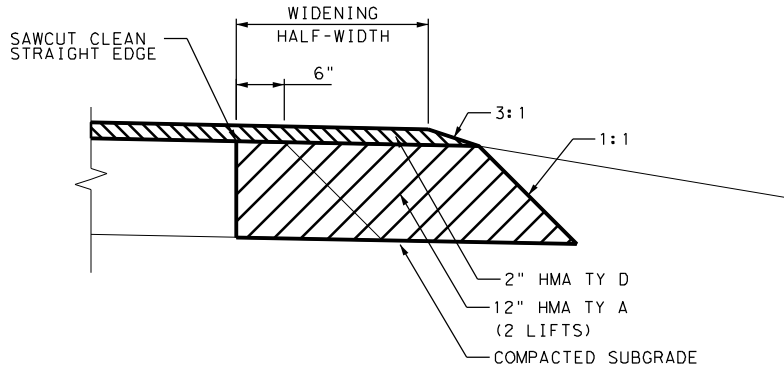
SHEET 9 OF 9 SCALE: 1"=1000'

DATE: 11/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		12
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 481

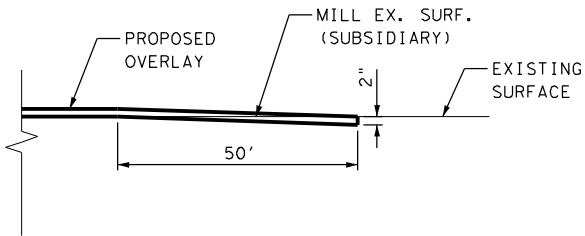
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		FT	FT	FT	SY	TON	TON	
C-2461	CR 450	19	N/C	--	--	--	--	
C-2516	CR 464	18	N/C	--	--	--	--	
C-2533	CR 463	20	20	6 (ONE SIDE)	1822	201	0	REFER TO ROADWAY P&P SHEET FOR LIMITS
C-2538	CR 461	18	20	10 (ONE SIDE)	351	39	0	REFER TO ROADWAY P&P SHEET FOR LIMITS
C-2574	CR 463	15	20	2.5	72	55	85	
C-2725	CR 484	19	N/C	--	--	--	--	
C-2752	CR 480	20	N/C	--	--	--	--	
C-2762	CR 481	19	N/C	--	--	--	--	
C-2777	CR 481	18	N/C	--	--	--	--	
SUM =					2245	295	85	

N/C = NO CHANGE

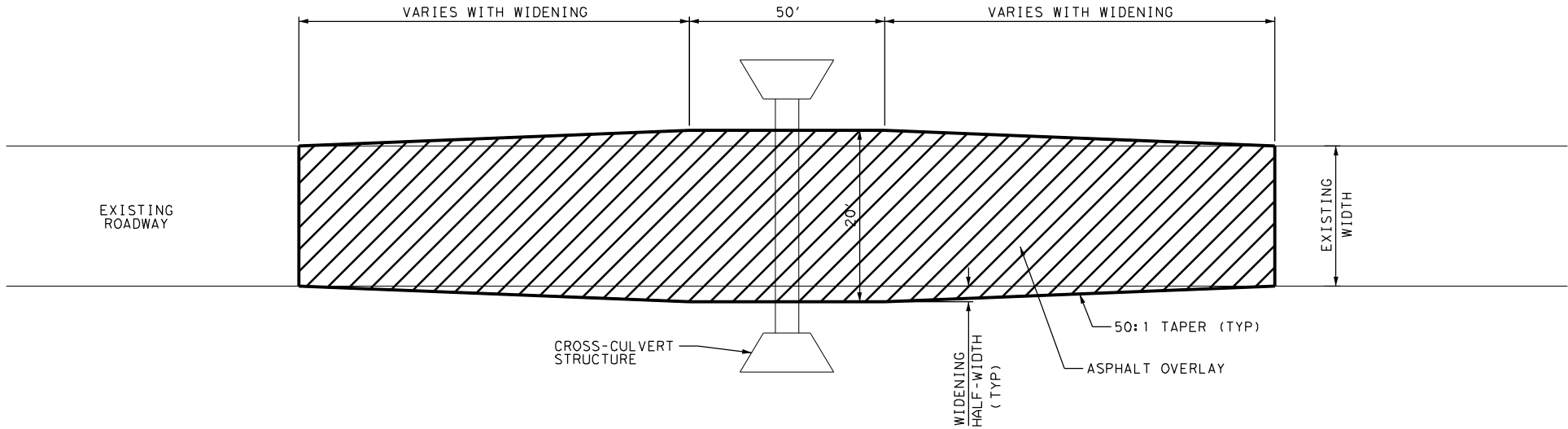


TYPICAL PAVEMENT SECTION
N. T. S.

- NOTES:
1. THE TAPERED HMA EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.
 2. THE SLOPE OF NEW PAVEMENT SHALL MATCH EXISTING PAVEMENT, BUT IN NO CASE BE FLATTER THAN 2.0%.



MILLING BUTT JOINT
N. T. S.



TYPICAL ROADWAY WIDENING
N. T. S.

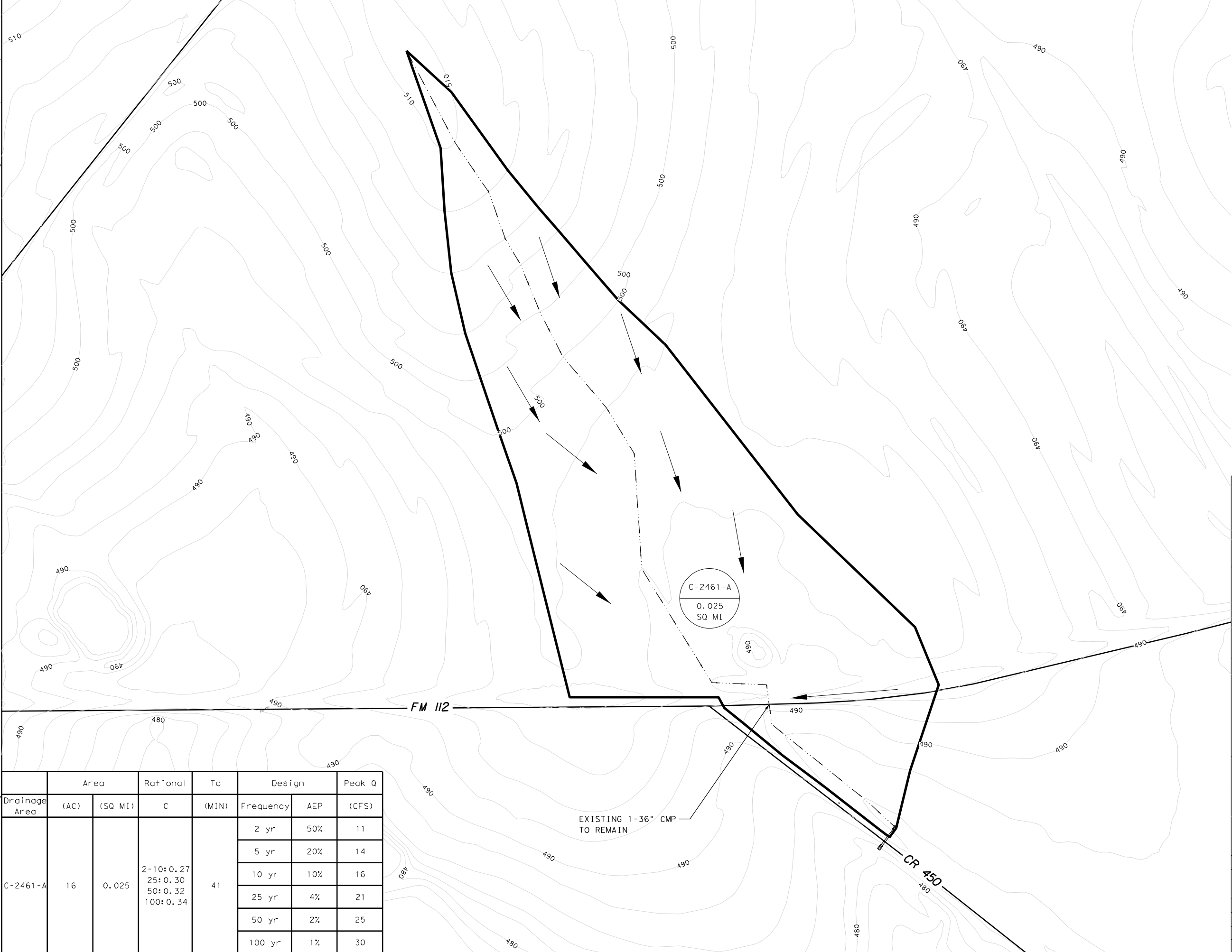


WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**ROADWAY
TAPER DETAILS**

DATE: 4/16/2018		BY: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		13
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	

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PRINTED: 11/16/2018@ 3:32:25 PM
PLOT DRIVER: S:\Software\Bentley\Standards\plots\drv\pinter.plt



LEGEND

- DRAINAGE BASIN BOUNDARY
- TIME OF CONCENTRATION
- FLOW ARROW

NOTES:

- PEAK FLOWS DETERMINED BY RATIONAL METHOD.
- EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.
- RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

SCALE IN FEET

Drainage Area	Area		Rational	To	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2461-A	16	0.025	2-10:0.27 25:0.30 50:0.32 100:0.34	41	2 yr	50%	11
					5 yr	20%	14
					10 yr	10%	16
					25 yr	4%	21
					50 yr	2%	25
					100 yr	1%	30

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

DRAINAGE AREA MAP (C-2461-A)

SHEET 1 OF 9 200'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		14
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 450

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Drainage Area	Area		Rational	Tc	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2516-A	26	0.041	2-10:0.27 25:0.30 50:0.32 100:0.34	45	2 yr	50%	17
					5 yr	20%	22
					10 yr	10%	25
					25 yr	4%	32
					50 yr	2%	39
					100 yr	1%	46



LEGEND

- DRAINAGE BASIN BOUNDARY
- TIME OF CONCENTRATION
- FLOW ARROW

NOTES:

- PEAK FLOWS DETERMINED BY RATIONAL METHOD.
- EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.
- RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

0 100 200
SCALE IN FEET

N

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

DRAINAGE AREA MAP (C-2516-A)

SHEET 2 OF 9 200'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		15
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 464

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PLOT DRIVER: S:\Software\Bentley\Standards\plotdrv\prInter.plt



LEGEND

———— DRAINAGE BASIN BOUNDARY

- . - . - . TIME OF CONCENTRATION

← FLOW ARROW

NOTES:

1. PEAK FLOWS DETERMINED BY RATIONAL METHOD.

2. EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

3. RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

N

0 200 400

SCALE IN FEET

Drainage Area	Area		Rational	To	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2533-A	140	0.219	2-10:0.27 25:0.30 50:0.32 100:0.34	34	2 yr	50%	108
					5 yr	20%	139
					10 yr	10%	159
					25 yr	4%	206
					50 yr	2%	251
					100 yr	1%	295

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TYPE FIRM NO. 181

TYPE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**DRAINAGE AREA MAP
(C-2533-A)**

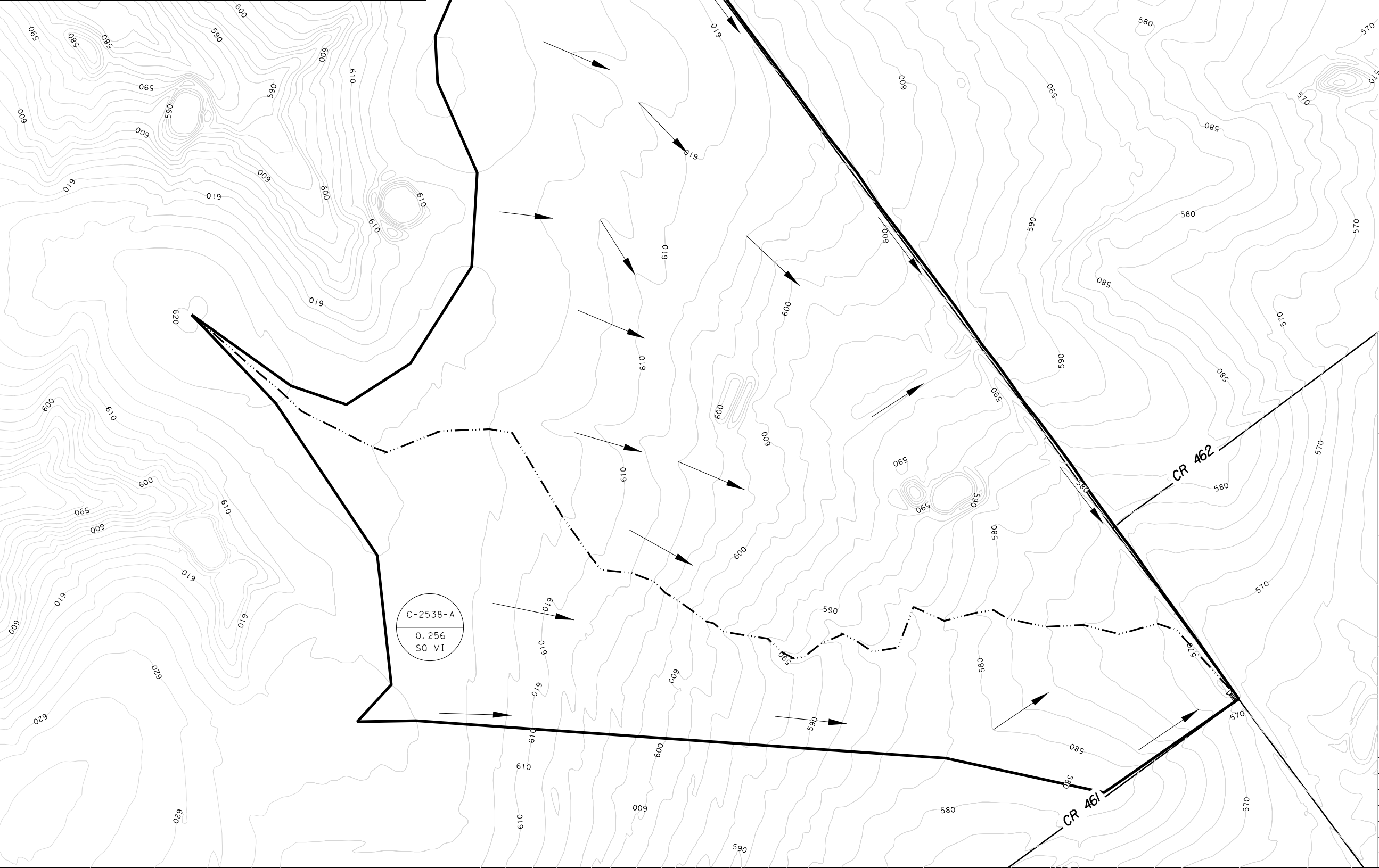
SHEET 3 OF 9 400'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	16
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---
		CR 463

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Drainage Area	Area		Rational	Tc	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2538-A	164	0.256	2-10:0.32 25:0.35 50:0.38 100:0.40	118	2 yr	50%	62
					5 yr	20%	82
					10 yr	10%	94
					25 yr	4%	123
					50 yr	2%	153
					100 yr	1%	178



LEGEND

- DRAINAGE BASIN BOUNDARY
- TIME OF CONCENTRATION
- FLOW ARROW

NOTES:

- PEAK FLOWS DETERMINED BY RATIONAL METHOD.
- EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.
- RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

SCALE IN FEET

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TBPE FIRM NO. 181

TBPE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

DRAINAGE AREA MAP (C-2538-A)

SHEET 4 OF 9 400'

DATE: 4/16/2018	BY: PH	DW: PH	CK: BRL	AP: BRL
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. ----		SHEET NO. 17	
STATE TEXAS	DIST. ---	COUNTY WILLIAMSON		HIGHWAY NO. CR 461
CONT. ----	SECT. --	JOB ---		

FILE: P:\22000-22999\22503 Wilco Culvert Replacement\CAD\Plans\Drainage\Basin Sheets.dgn
PLOT DRIVER: S:\Software\Bentley\Standards\plotdrv\prInter.plt

Drainage Area	Area		Rational	To	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2574-A	35	0.055	2-10:0.27 25:0.30 50:0.32 100:0.34	36	2 yr	50%	26
					5 yr	20%	33
					10 yr	10%	38
					25 yr	4%	49
					50 yr	2%	60
					100 yr	1%	71



LEGEND

— DRAINAGE BASIN BOUNDARY

- . . . - . . . - TIME OF CONCENTRATION

← FLOW ARROW

NOTES:

1. PEAK FLOWS DETERMINED BY RATIONAL METHOD.

2. EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

3. RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

N

0 100 200

SCALE IN FEET

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WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**DRAINAGE AREA MAP
(C-2574-A)**

SHEET 5 OF 9 200'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	----	18	
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 463

Williamson County, Texas

11/29/2018

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LEGEND

- DRAINAGE BASIN BOUNDARY
- - - - - TIME OF CONCENTRATION
- FLOW ARROW

NOTES:

1. THE HYDROLOGIC MODELS WERE DEVELOPED IN HEC-HMS VER 3.5 FOLLOWING TR-55 METHOD.
2. THE CURVE NUMBERS WERE DETERMINED BY FOLLOWING NRCS TR-55 AND ADJUSTED USING THE CLIMATIC ADJUSTMENTS AS DISCUSSED IN CHAPTER 4, SECTION 13 OF 2016 TXDOT HYDRAULIC MANUAL.
3. ACCUMULATED RAINFALL FOR 24 HR STORMS WERE OBTAINED FROM TABLE 2.6-4 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.
4. THE SCS TYPE III 24 HR STORM HYDROGRAPH WAS UTILIZED.

0 500 1000
SCALE IN FEET

Drainage Area	Area		HEC-HMS	LAG TIME	Design		Peak Q
	(AC)	(SQ MI)	CN	(MIN)	Frequency	AEP	(CFS)
C-2725-A	1179	1.842	57	28	2 yr	50%	321
					5 yr	20%	838
					10 yr	10%	1296
					25 yr	4%	1850
					50 yr	2%	2340
					100 yr	1%	2901

Williamson County, Texas


CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER


WILLIAMSON COUNTY
1848
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STEGER BIZZELL
TBE FIRM NO. 181


Michael Baker INTERNATIONAL
TBE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**DRAINAGE AREA MAP
(C-2725-A)**

SHEET 6 OF 9 1000'

DATE: 4/16/2018	BY: PH	DW: PH	CK: BRL	AP: BRL
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. ----		SHEET NO. 19	
STATE TEXAS	DIST. ---	COUNTY WILLIAMSON		
CONT. ---	SECT. --	JOB ---	HIGHWAY NO. CR 484	

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LEGEND

———— DRAINAGE BASIN BOUNDARY

- · · · - · · · - TIME OF CONCENTRATION

————> FLOW ARROW

NOTES:

1. PEAK FLOWS DETERMINED BY RATIONAL METHOD.

2. EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

3. RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

N

0 100 200

SCALE IN FEET

Drainage Area	Area		Rational	Tc	Design		Peak Q
	(AC)	(SQ MI)	C	(MIN)	Frequency	AEP	(CFS)
C-2752-A	14	0.022	2-10:0.27 25:0.30 50:0.32 100:0.34	15	2 yr	50%	18
					5 yr	20%	22
					10 yr	10%	25
					25 yr	4%	33
					50 yr	2%	39
					100 yr	1%	47

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

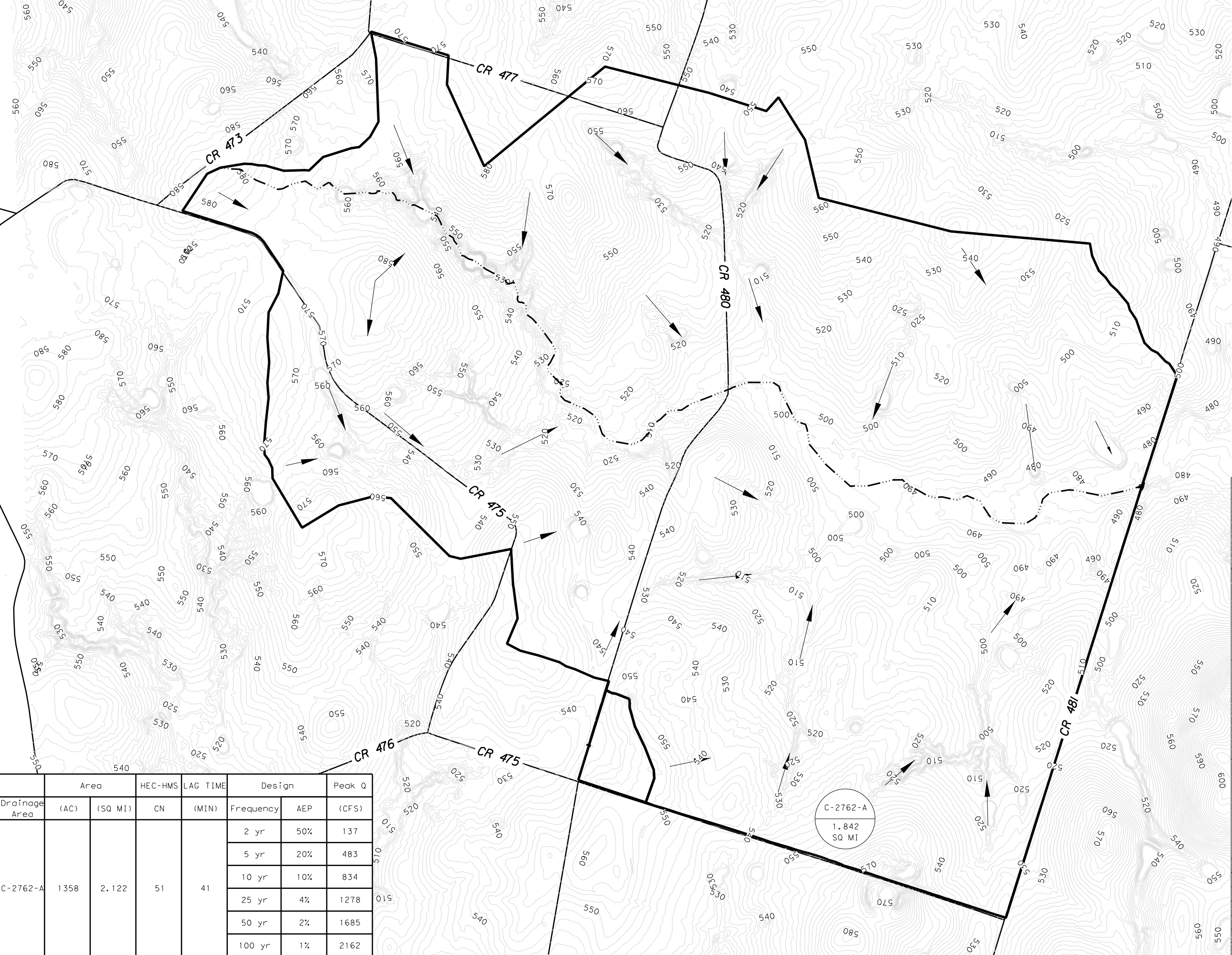
**DRAINAGE AREA MAP
(C-2752-A)**

SHEET 7 OF 9 200'

DATE: 11/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	----	20	
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 480

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LEGEND

— DRAINAGE BASIN BOUNDARY

- - - - - TIME OF CONCENTRATION

← FLOW ARROW

NOTES:

1. THE HYDROLOGIC MODELS WERE DEVELOPED IN HEC-HMS VER 3.5 FOLLOWING TR-55 METHOD.

2. THE CURVE NUMBERS WERE DETERMINED BY FOLLOWING NRCS TR-55 AND ADJUSTED USING THE CLIMATIC ADJUSTMENTS AS DISCUSSED IN CHAPTER 4, SECTION 13 OF 2016 TXDOT HYDRAULIC MANUAL.

3. ACCUMULATED RAINFALL FOR 24 HR STORMS WERE OBTAINED FROM TABLE 2.6-4 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.

4. THE SCS TYPE III 24 HR STORM HYDROGRAPH WAS UTILIZED.

0 500 1000

SCALE IN FEET

STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
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TBPE FIRM NO. 181

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TBPE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**DRAINAGE AREA MAP
(C-2762-A)**

SHEET 8 OF 9 1000'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	21
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---
		HIGHWAY NO.
		CR 481

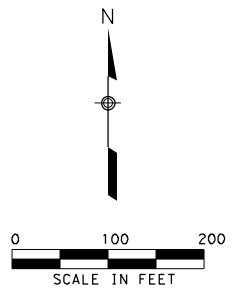
Drainage Area	Area		HEC-HMS	LAG TIME	Design		Peak Q
	(AC)	(SQ MI)	CN	(MIN)	Frequency	AEP	(CFS)
C-2762-A	1358	2.122	51	41	2 yr	50%	137
					5 yr	20%	483
					10 yr	10%	834
					25 yr	4%	1278
					50 yr	2%	1685
					100 yr	1%	2162

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 DRAINAGE BASIN BOUNDARY
 TIME OF CONCENTRATION
 FLOW ARROW

1. PEAK FLOWS DETERMINED BY RATIONAL METHOD.
2. EBD VALUES OBTAINED FROM TABLE 2.6-1 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.
3. RUNOFF COEFFICIENTS WERE OBTAINED FROM TABLE 2.6-3 FROM CHAPTER 4 OF WILLIAMSON COUNTY DESIGN CRITERIA MANUAL.



DRAINAGE AREA MAP (C-2777-A)

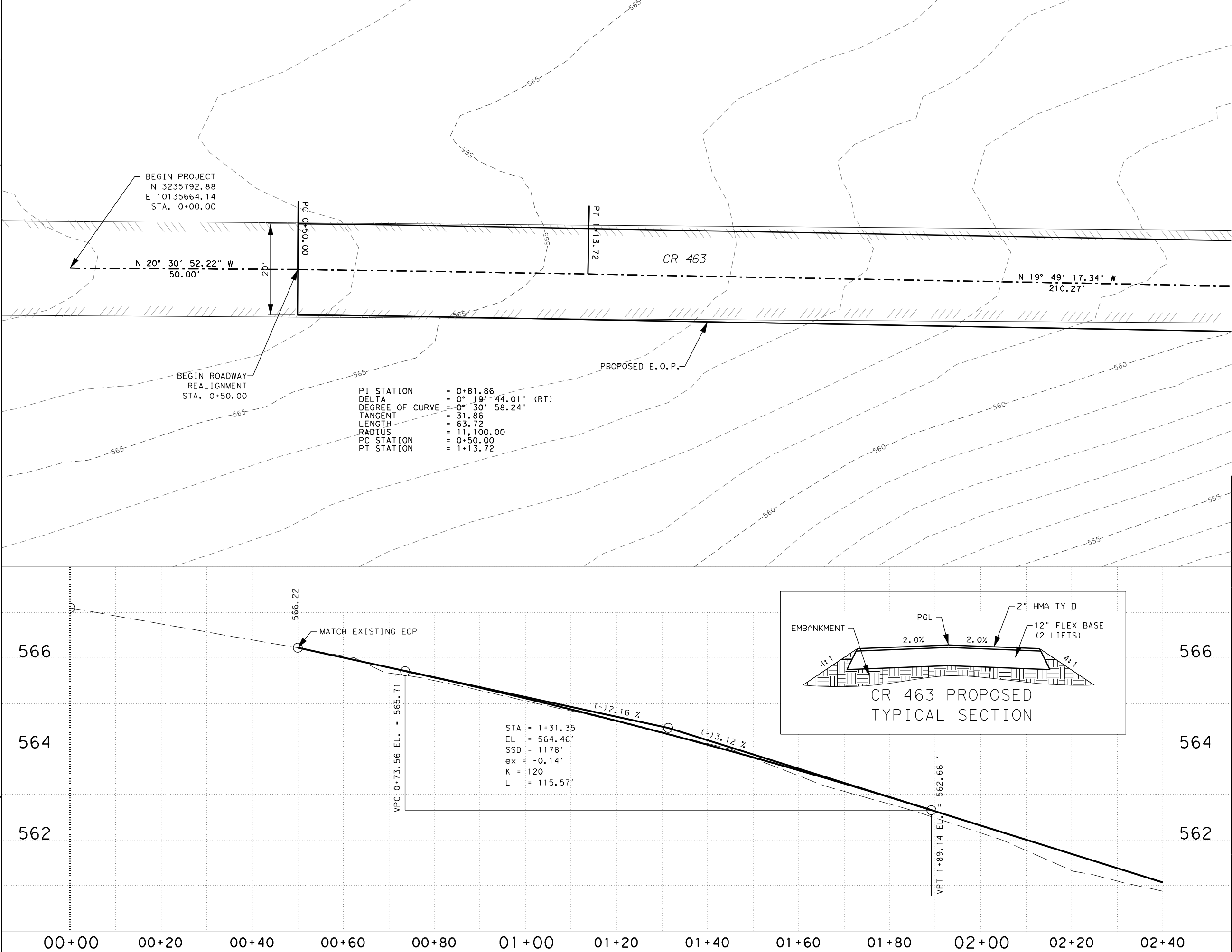
SHEET 9 OF 9	200'
--------------	------

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.
6	----			22
STATE	DIST.	COUNTY		
TEXAS	---	WILLIAMSON		
CONT.	SECT.	JOB	HIGHWAY NO.	
---	--	---	CR 481	

p:\day\CR 461 Intersection Layout.dgn



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LEGEND


- × — × EXISTING FENCE LINE
- - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - - APPROXIMATE PROPERTY LINE
- — — — — PROPOSED CENTERLINE
- - - - - EXISTING GROUND PROFILE
- ▾ — ▾ — EXISTING WATER LINE
- UT — EXISTING TELECOM LINE
- · · · — DITCH FLOWLINE
- OE — EXISTING OVERHEAD ELECTRIC LINE


NOTES:


- ALL UTILITIES SHOWN ARE BY APPROXIMATE LOCATION ONLY AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL REPAIR/RECONNECT EXISTING UTILITIES DISCONNECTED OR DAMAGED DURING CONSTRUCTION.
- THE "ONE-CALL" SYSTEM WILL BE USED TO LOCATE EXISTING UNDERGROUND UTILITIES.
- CONTRACTOR SHALL RETURN THE GROUND AREA DISTURBED BY CONSTRUCTION ACTIVITY TO EQUAL OR BETTER CONDITION IN SUCH A MANNER AS NOT TO CHANGE THE ROUTE OF STORM WATER FLOW.
- EXISTING MAILBOXES TO BE RELOCATED TO EDGE OF PROPOSED SHOULDER AS REQUIRED.


0 10 20
SCALE IN FEET

Williamson County, Texas


CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER


WILLIAMSON COUNTY
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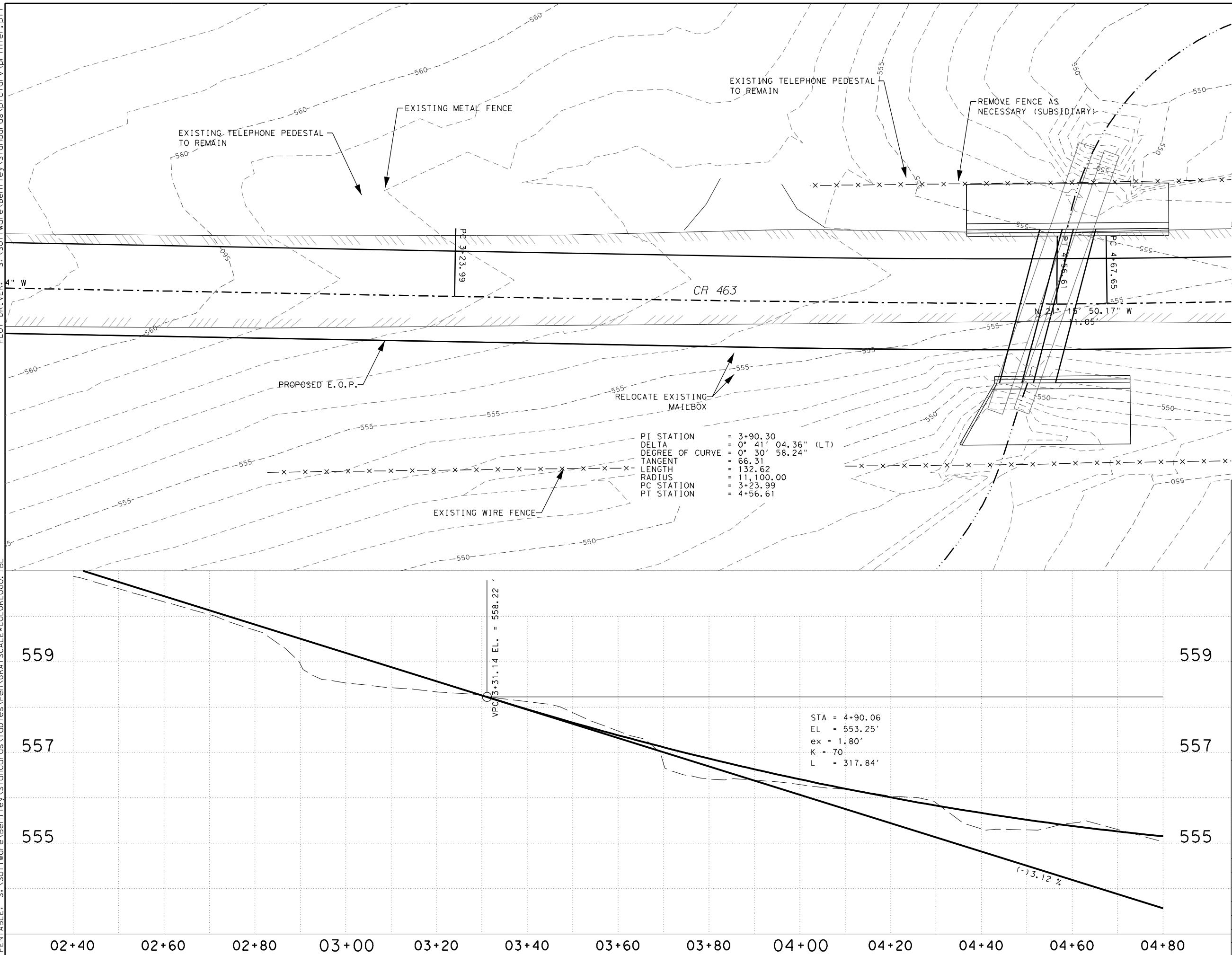

STEGER BIZZELL
TBPE FIRM NO. 181


Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS
**CR 463
PLAN & PROFILE
SHEET 1**
SCALE: 1" = 20' H
1" = 2' V

DATE: 11/18/2018		BY: PH		DW: PH		CK: BRL		AP: BRL	
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.				SHEET NO.			
6		----				24			
STATE	DIST.	COUNTY							
TEXAS	---	WILLIAMSON							
CONT.	SECT.	JOB	HIGHWAY NO.						
----	--	---	CR 463						

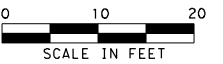
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- ## LEGEND
- | | | |
|-----------|--|---|
| X — X | | EXISTING FENCE LINE |
| - - - - - | | PROPOSED TEMPORARY
CONSTRUCTION EASEMENT |
| — — — — — | | APPROXIMATE PROPERTY LINE |
| — — — — — | | PROPOSED CENTERLINE |
| - - - - - | | EXISTING GROUND PROFILE |
| — ▼ — ▼ — | | EXISTING WATER LINE |
| — UT — | | EXISTING TELECOM LINE |
| — → . . . | | DITCH FLOWLINE |
| — OE — | | EXISTING OVERHEAD
ELECTRIC LINE |

NOTES:

1. ALL UTILITIES SHOWN ARE BY APPROXIMATE LOCATION ONLY AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION
2. CONTRACTOR SHALL REPAIR/RECONNECT EXISTING UTILITIES DISCONNECTED OR DAMAGED DURING CONSTRUCTION.
3. THE "ONE-CALL" SYSTEM WILL BE USED TO LOCATE EXISTING UNDERGROUND UTILITIES
4. CONTRACTOR SHALL RETURN THE GROUND AREA DISTURBED BY CONSTRUCTION ACTIVITY TO EQUAL OR BETTER CONDITION IN SUCH A MANNER AS NOT TO CHANGE THE ROUTE OF STORM WATER FLOW.
5. EXISTING MAILBOXES TO BE RELOCATED TO EDGE OF PROPOSED SHOULDER AS REQUIRED.



PE FIRM NO. 181



PE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

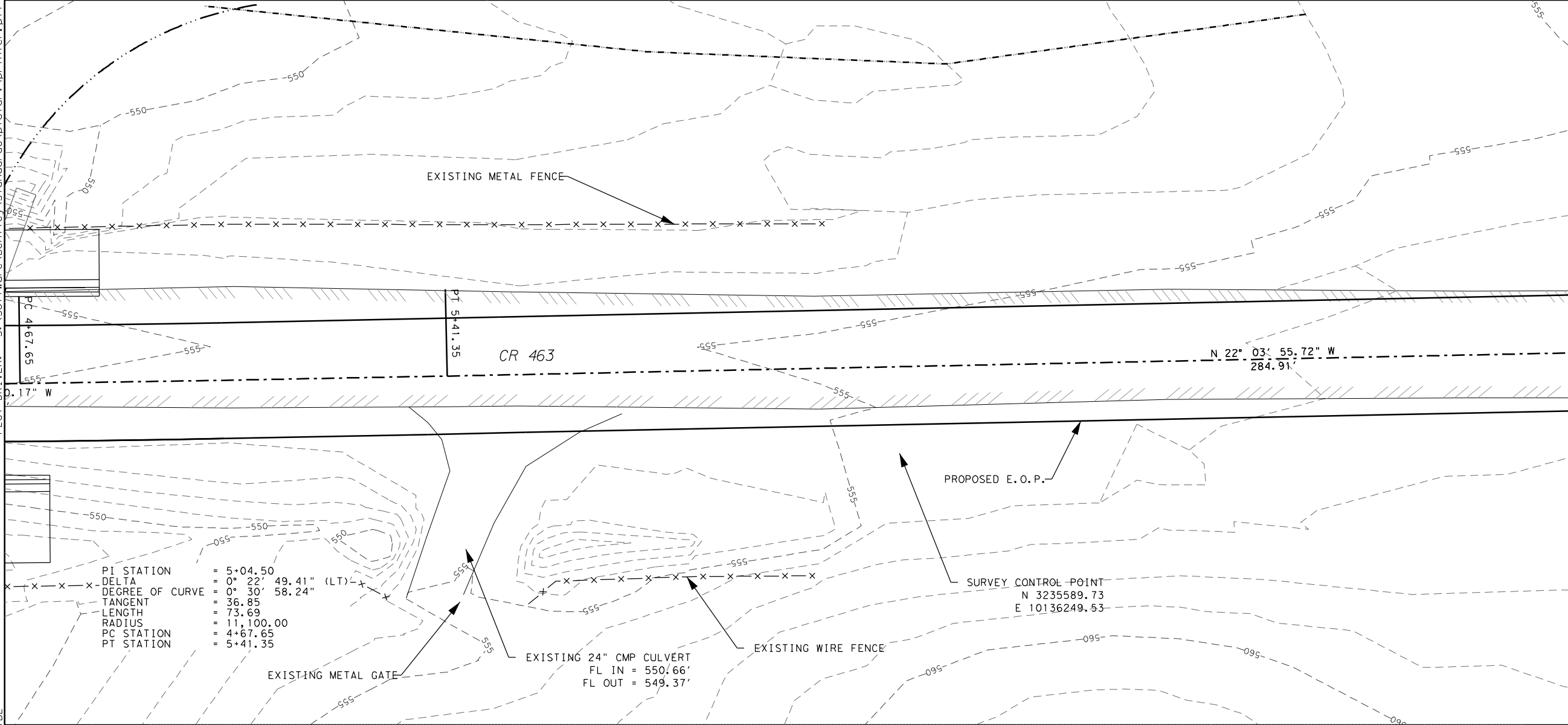
CR 463
PLAN & PROFILE
SHEET 2

SCALE: 1" = 20' H
1" = 2' V

DATE 4/16/2018		DN: PH DW: PH CK: BRL AP: BRL	
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		25
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	
----	--	----	HIGHWAY NO.

Williamson County, Texas

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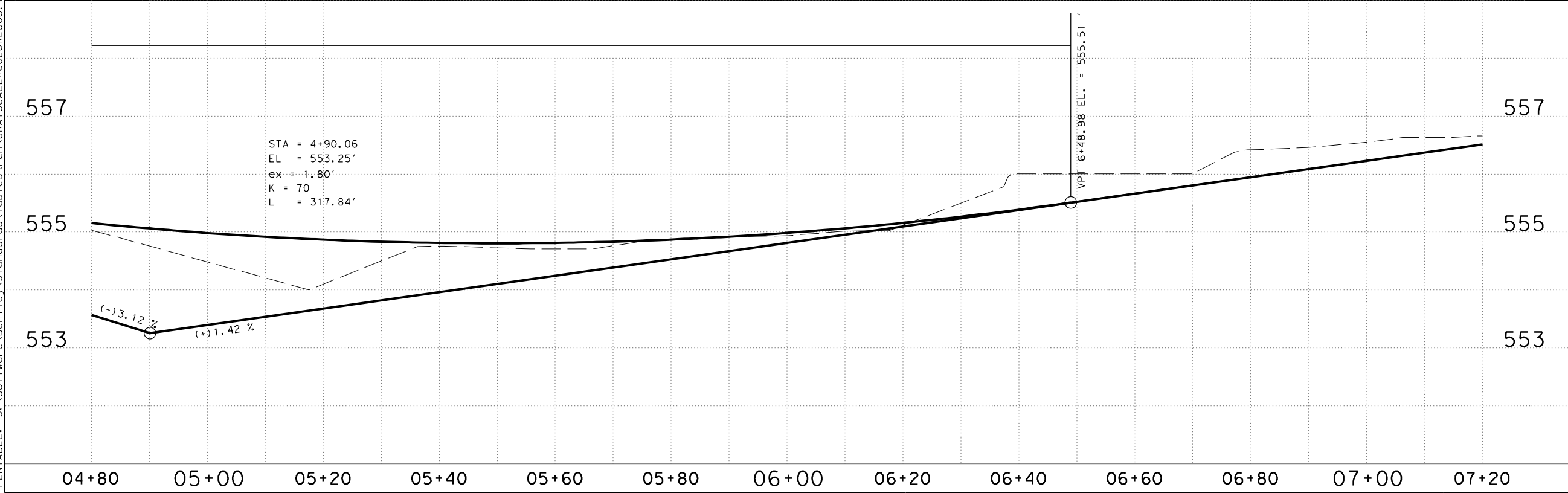
LEGEND

- X—X—X— EXISTING FENCE LINE
- - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - - APPROXIMATE PROPERTY LINE
- - - - - PROPOSED CENTERLINE
- - - - - EXISTING GROUND PROFILE
- ▼—▼— EXISTING WATER LINE
- UT— EXISTING TELECOM LINE
- ...— DITCH FLOWLINE
- OE— EXISTING OVERHEAD ELECTRIC LINE

NOTES:

- ALL UTILITIES SHOWN ARE BY APPROXIMATE LOCATION ONLY AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.
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- EXISTING MAILBOXES TO BE RELOCATED TO EDGE OF PROPOSED SHOULDER AS REQUIRED.

0 10 20
SCALE IN FEET



STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
1848

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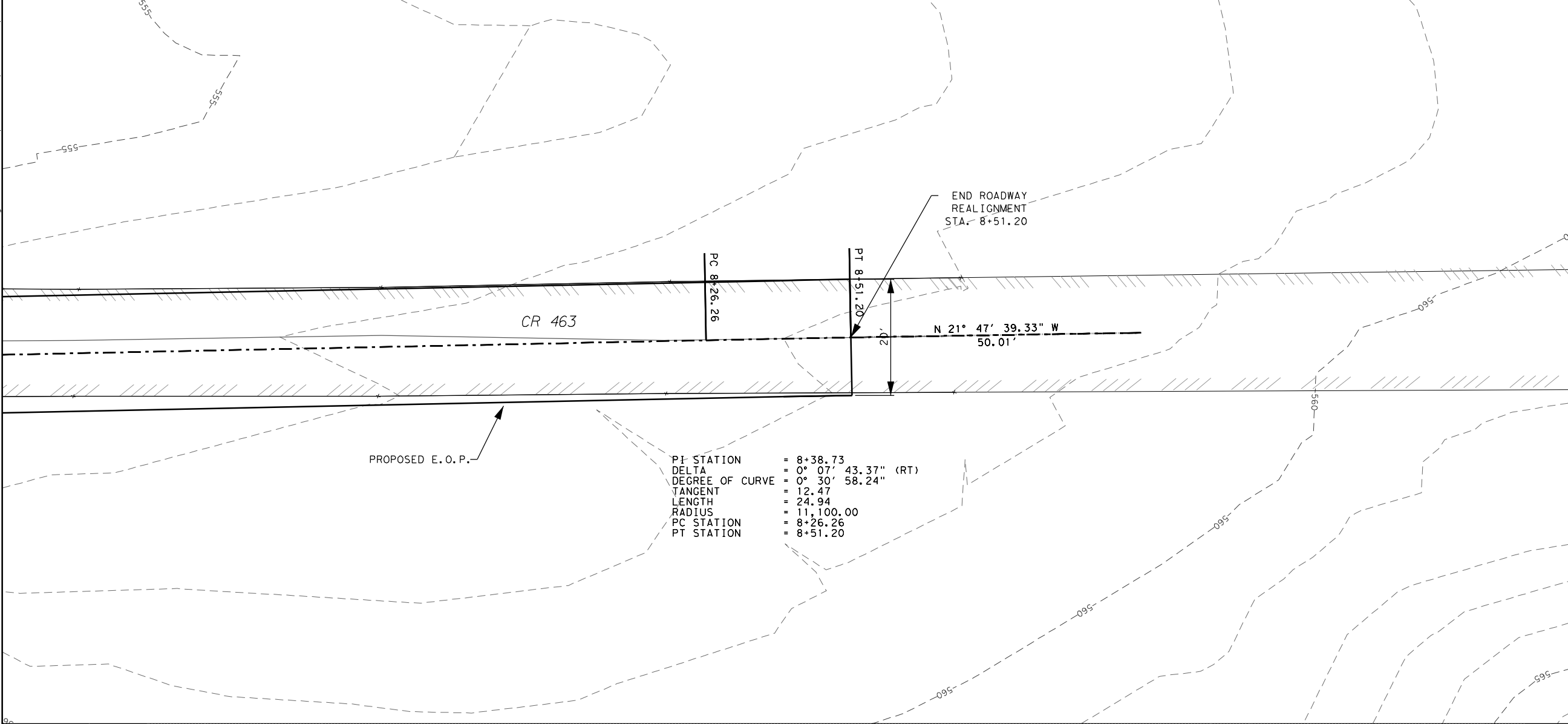
STEGER BIZZELL
TBPE FIRM NO. 181

Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS
**CR 463
PLAN & PROFILE
SHEET 3**
SCALE: 1" = 20' H
1" = 2' V

DATE: 11/16/2018	BY: PH	DW: PH	CK: BRL	AP: BRL
FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. ----		SHEET NO. 26	
STATE TEXAS	DIST. ---	COUNTY WILLIAMSON		
CONT. ---	SECT. --	JOB ---	HIGHWAY NO. ---	

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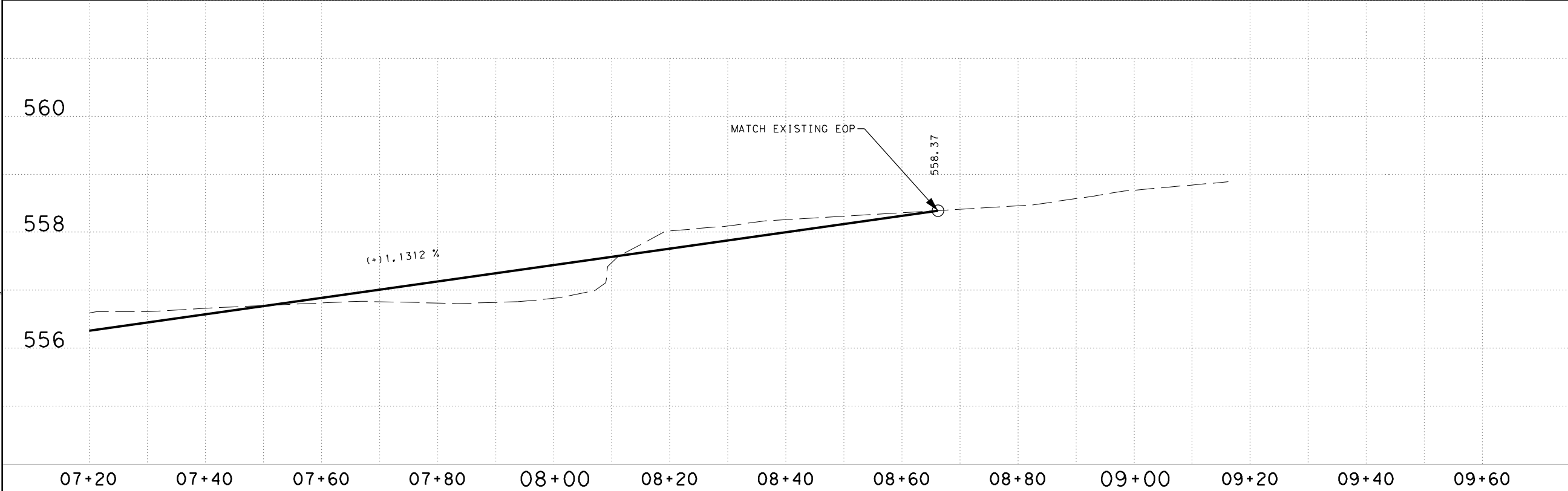
LEGEND

- × — × EXISTING FENCE LINE
- - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - APPROXIMATE PROPERTY LINE
- - - - PROPOSED CENTERLINE
- - - - EXISTING GROUND PROFILE
- ▾ — EXISTING WATER LINE
- UT — EXISTING TELECOM LINE
- · · · DITCH FLOWLINE
- OE — EXISTING OVERHEAD ELECTRIC LINE

NOTES:

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- EXISTING MAILBOXES TO BE RELOCATED TO EDGE OF PROPOSED SHOULDER AS REQUIRED.

0 10 20
SCALE IN FEET



STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
1848

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STEGE BIZZELL
TBPE FIRM NO. 181

Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS
**CR 463
PLAN & PROFILE
SHEET 4**
SCALE: 1" = 20' H
1" = 2' V

DATE: 11/16/2018		BY: PH		DW: PH		CK: BRL		AP: BRL	
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.				SHEET NO.			
6		----				27			
STATE		DIST.		COUNTY					
TEXAS		---		WILLIAMSON					
CONT.		SECT.		JOB		HIGHWAY NO.			
----		--		---					

106.00 ACRES
BURKE, FRANCES
R008713

73.5 ACRES
ESCHBERGER AGNES TRUSTEE OF
THE ESCHBERGER REVOCABLE TRUST
2002052630

LEGEND

- EXISTING FENCE LINE
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
- DITCH FLOWLINE
- EXISTING OVERHEAD ELECTRIC LINE

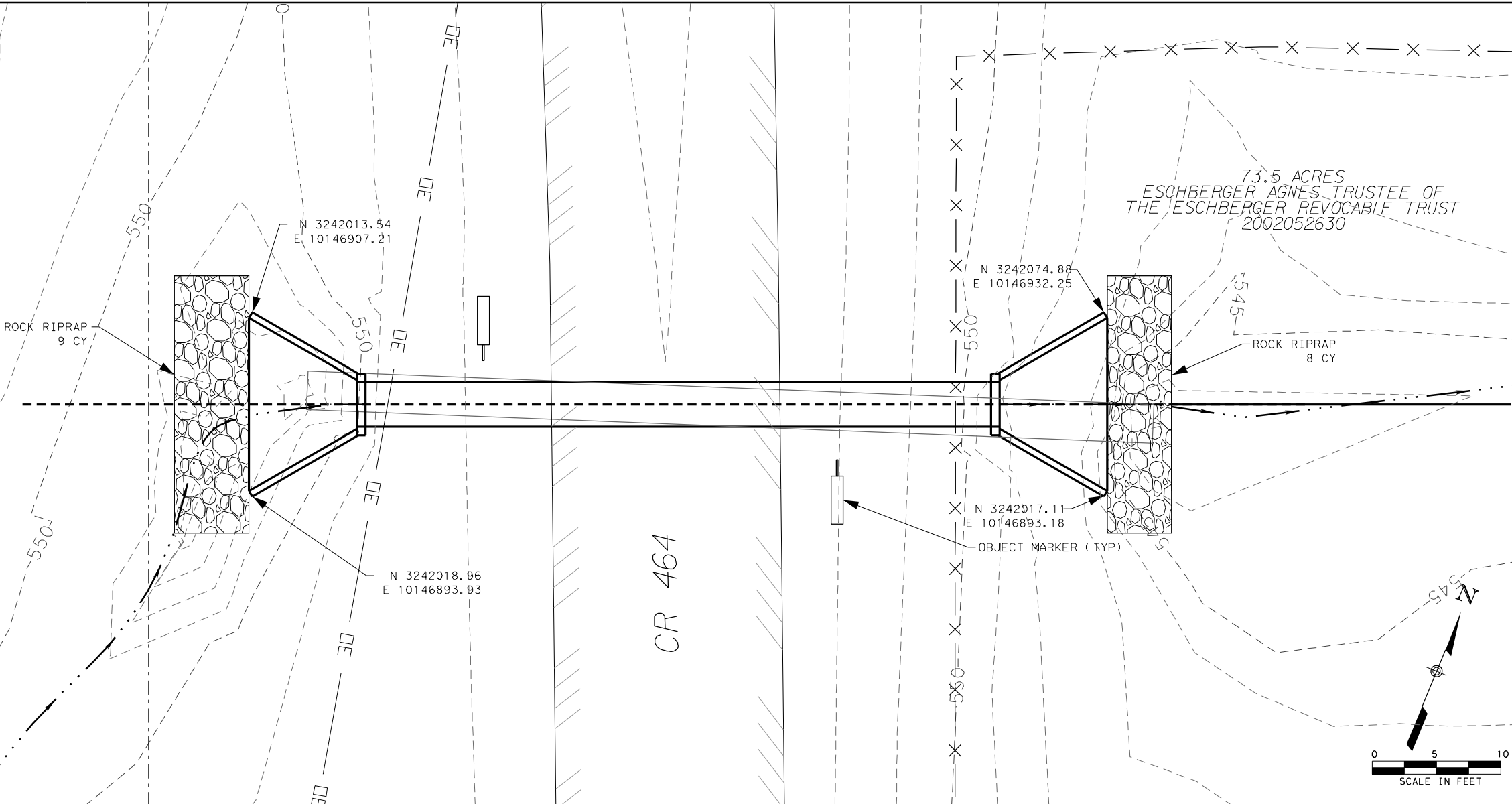
- NOTES:
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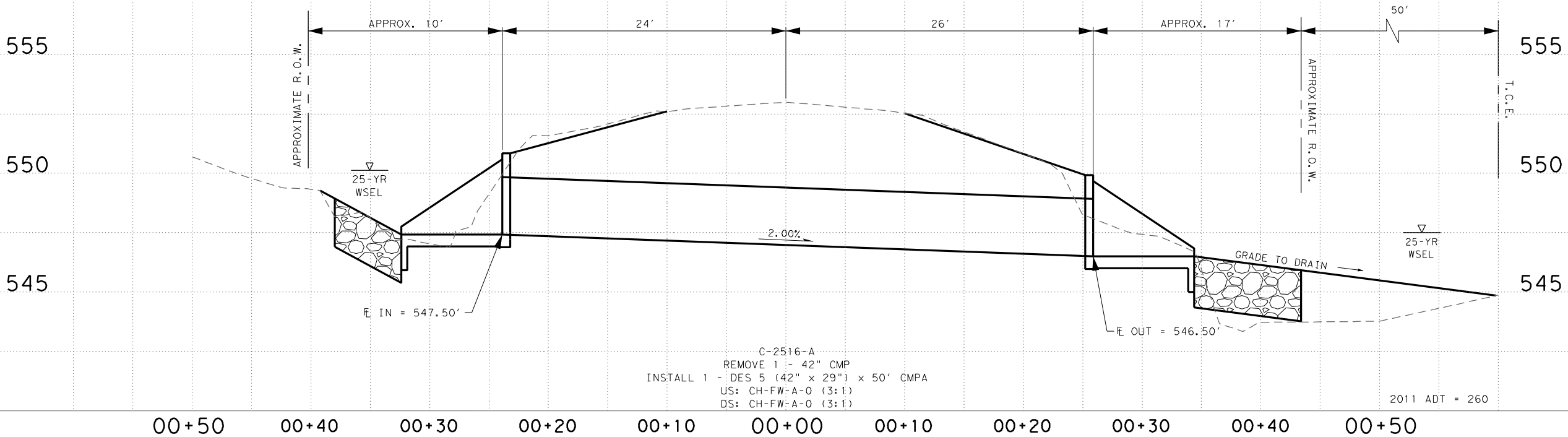
WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

C-2516-A
CROSS SECTION

SHEET 02 OF 9				SCALE: 1" = 10' H 1" = 5' V	
DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL					
FED. RD. DIV. NO.		FEDERAL AID PROJECT NO.			SHEET NO.
6		----			28
STATE		DIST.	COUNTY		
TEXAS		---	WILLIAMSON		
CONT.		SECT.	JOB	HIGHWAY NO.	
----		--	---	CR 464	



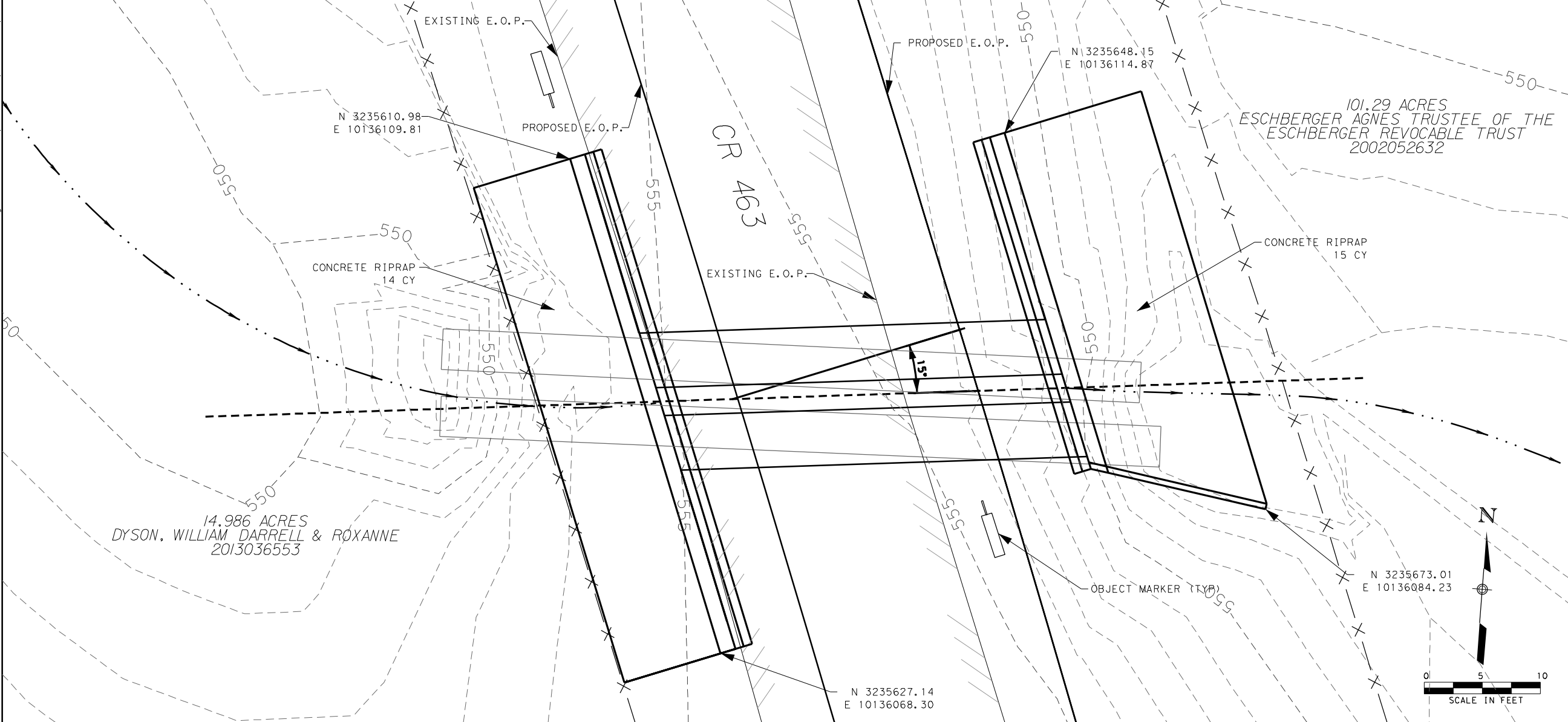
CULVERT	FREQ YR	Q (CFS)	DESCRIPTION	PROPOSED			DESCRIPTION	EXISTING		
				HW ELEV	TW ELEV	V (FT/SEC)		HW ELEV	TW ELEV	V (FT/SEC)
C-2516-A	25	32	1 - DES 5 CMPA	550.15	547.51	7.25	1 - 42" CMP	549.24	545.08	11.23
	100	46		551.38	547.65	8.21		550.02	545.41	11.67



C-2516-A
REMOVE 1 - 42" CMP
INSTALL 1 - DES 5 (42" x 29") x 50' CMPA
US: CH-FW-A-0 (3:1)
DS: CH-FW-A-0 (3:1)

2011 ADT = 260

FILE: P:\22000-22999\22503\Williamson County Replacement\CAD\Plans\XSections\Culvert Plan & XSections.dgn
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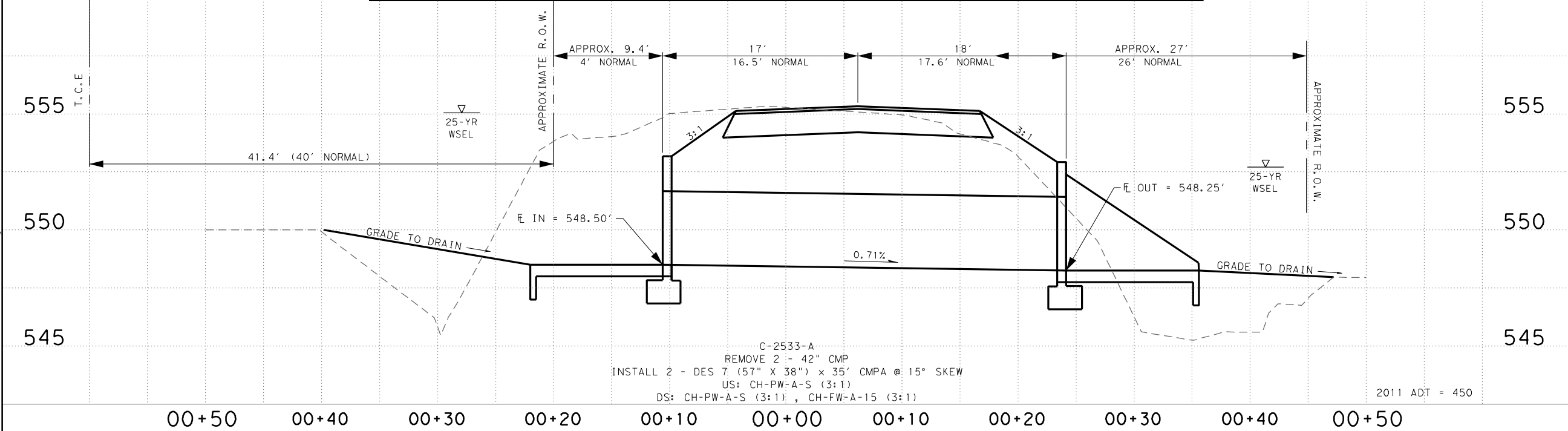
LEGEND

- × — × EXISTING FENCE LINE
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - - APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- W — EXISTING WATER LINE
- UT — EXISTING TELECOM LINE
- · · · DITCH FLOWLINE
- OE — EXISTING OVERHEAD ELECTRIC LINE

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CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2533-A	25	206	2 - DES 7 CMPA	555.04	552.7	7.94	2 - 42" CMP	553.78	550.01	10.61
	100	295		555.33	553.35	8.29		555.26	550.66	11.43



WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**C-2533-A
CROSS SECTION**

SHEET 03 OF 9

DATE: 4/16/2018

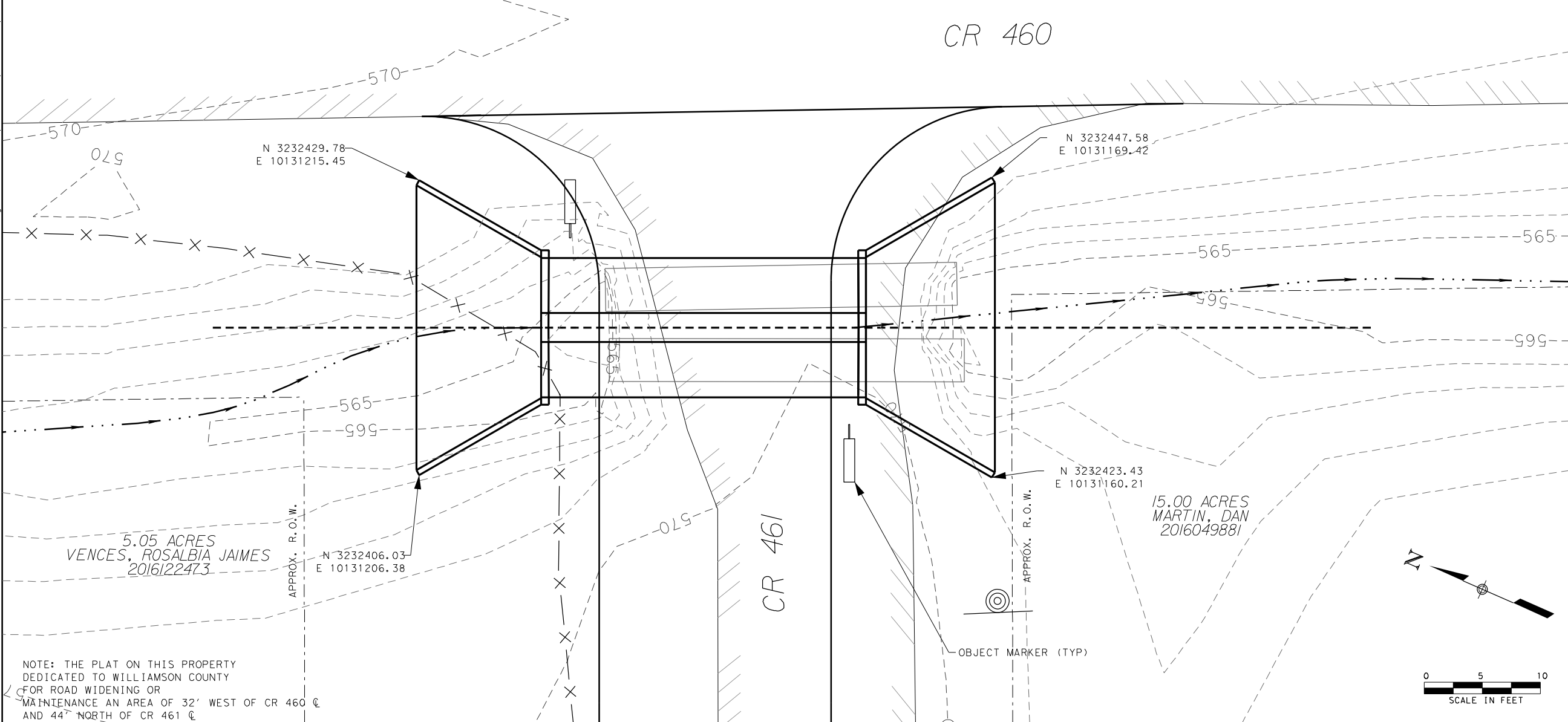
BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	29
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---

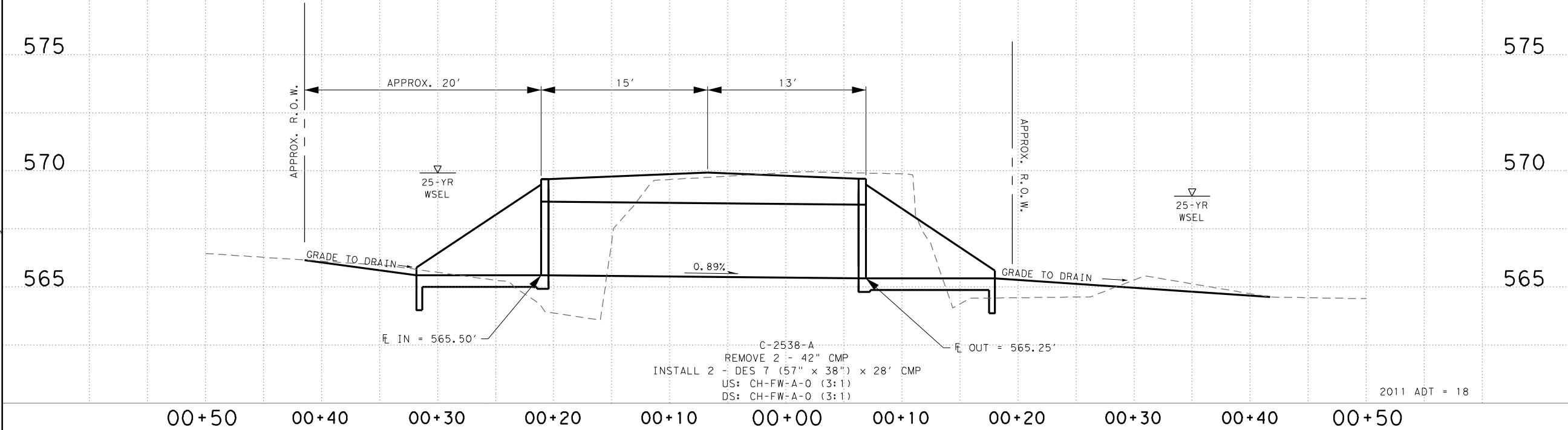
2011 ADT = 450

CR 463

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PENTABLE: S:\Software\Bentley\Standards\Tables\PenGRAYSCALE.cpl



CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2538-A	25	123	2 - DES 7 CMPA	569.13	567.17	7.3	2 - 42" CMP	568.11	567.36	7.47
	100	178		570.2	567.72	8.23		570	567.91	9.13



Williamson County, Texas

STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER

WILLIAMSON COUNTY
1848

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Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

C-2538-A
CROSS SECTION

SHEET 04 OF 9

SCALE: 1" = 10' H
1" = 5' V

DATE: 4/16/2018

DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO. 6

FEDERAL AID PROJECT NO. ---

SHEET NO. 30

STATE TEXAS

DIST. ---

COUNTY WILLIAMSON

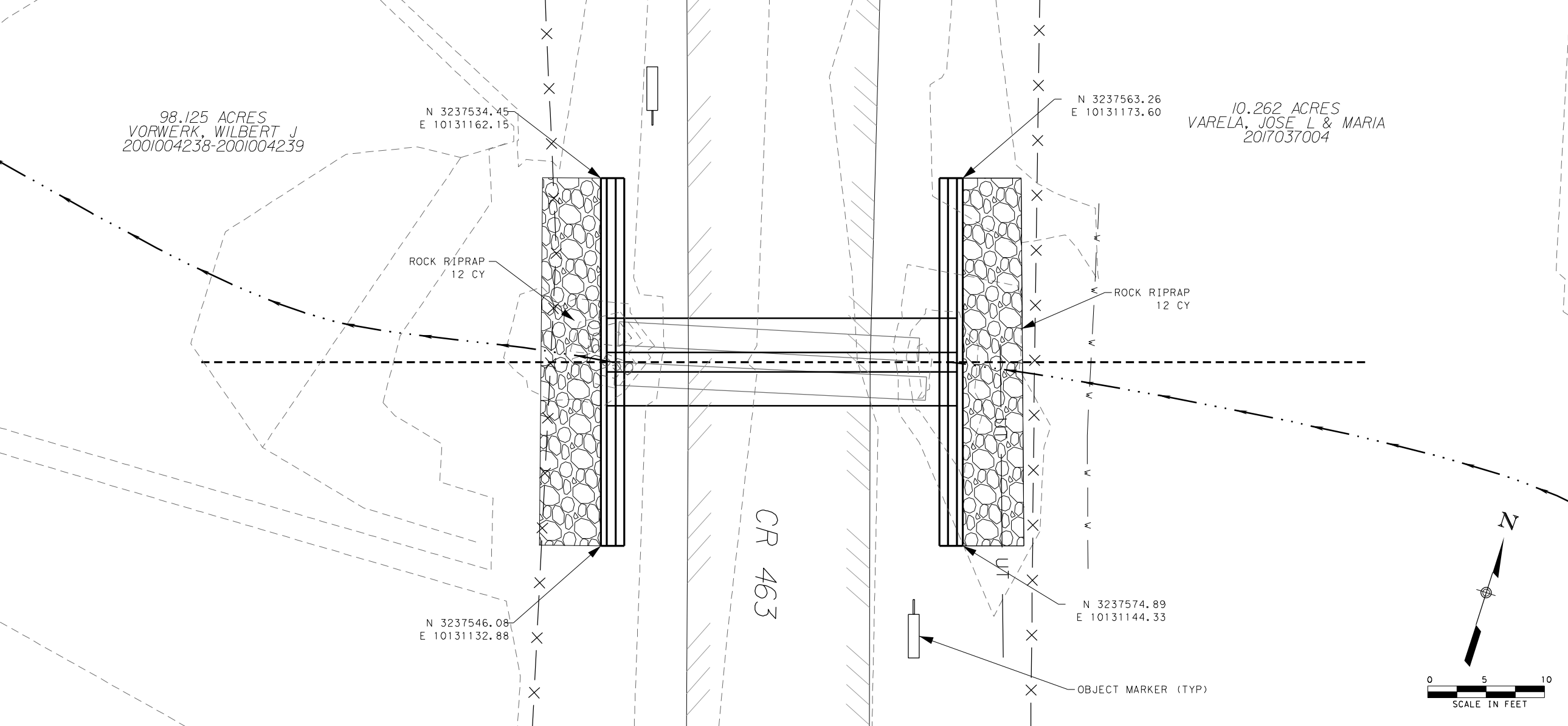
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SECT. ---

JOB ---

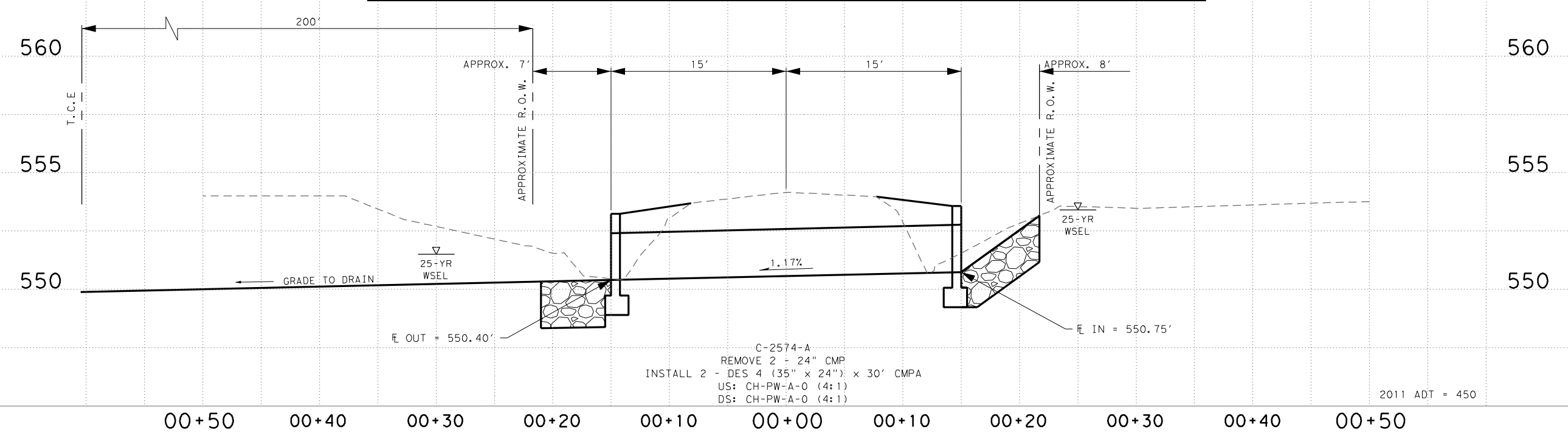
HIGHWAY NO. CR 461


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- ### LEGEND
- X — X — EXISTING FENCE LINE
 - - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
 - - - - - APPROXIMATE PROPERTY LINE
 - - - - - PROPOSED CENTERLINE
 - - - - - EXISTING GROUND PROFILE
 - W — EXISTING WATER LINE
 - UT — EXISTING TELECOM LINE
 - . . . DITCH FLOWLINE
 - OE — EXISTING OVERHEAD ELECTRIC LINE
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CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2538-A	25	123	2 - DES 7 CMPA	569.9	568.92	5.14	2 - 42" CMP	568.11	567.36	7.47
	100	178		570.26	569.47	5.69		570	567.91	9.13






CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER



WILLIAMSON COUNTY
1848



STEGER BIZZELL
TBPE FIRM NO. 181



Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2877

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**C-2574-A
CROSS SECTION**

SHEET 05 OF 9

SCALE: 1" = 10' H
1" = 5' V

DATE: 4/16/2018

BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	31
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---
		HIGHWAY NO.
		CR 463

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22000-22999\22503\Williamson County Replacement\CAD\Plans\XSections\Culvert Plan & XSections.dgn
PLOT DRIVER: S:\Software\Bentley\Standards\Plotdrv\PrInter.plt



23.144 ACRES
KRENEK, MARK J & NANCY L
9713724

N 3256976.47
E 10131724.87

N 3256988.89
E 10131692.86

ROCK RIPRAP
16 CY

ROCK RIPRAP
31 CY

CR 484

N 3256901.25
E 10131658.87

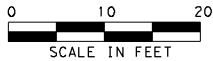
27.10 ACRES
IRA PLUS SOUTHWEST LLC,
FBO GENE NISWANDER
2006086480

OBJECT MARKER (TYP)

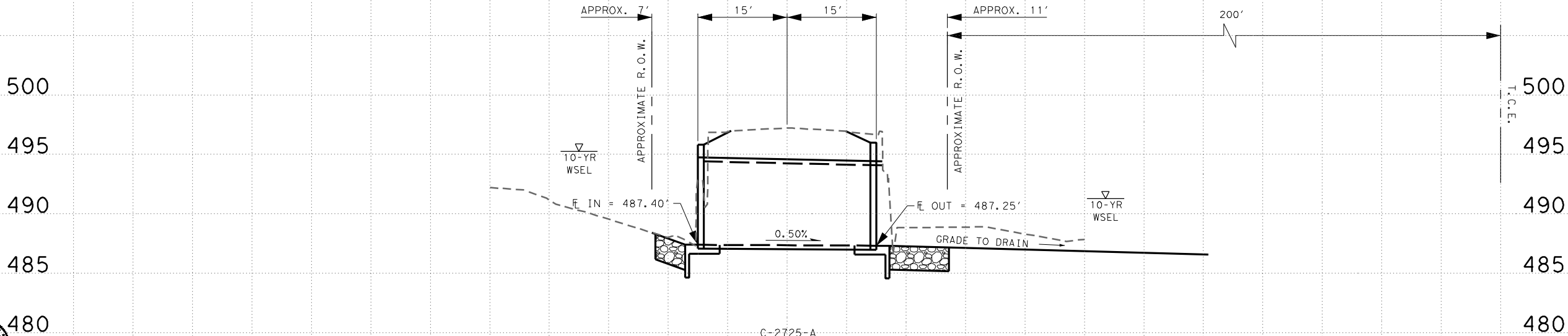
N 3256888.84
E 10131690.88

- LEGEND**
- X — X — EXISTING FENCE LINE
 - - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
 - - - - - APPROXIMATE PROPERTY LINE
 - - - - - PROPOSED CENTERLINE
 - - - - - EXISTING GROUND PROFILE
 - W — EXISTING WATER LINE
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 - - - - - DITCH FLOWLINE
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CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2725-A	10	1296	2 - 10' x 8' CBC	495.26	491.26	13.23	1 - 8', 1 - 6.5' STEEL PIPE	496.48	490.08	14.47
	25	1850		496.43	492.08	14		496.87	490.90	14.66
	100	2901		497.04	493.33	12.3		497.27	492.15	14.86



C-2725-A
REMOVE 1 - 8', 1 - 6.5' STEEL PIPE
INSTALL 2 - 10' x 8' x 30' CBC
US: PW-1 (4:1)
DS: PW-1 (4:1)

2011 ADT = 270

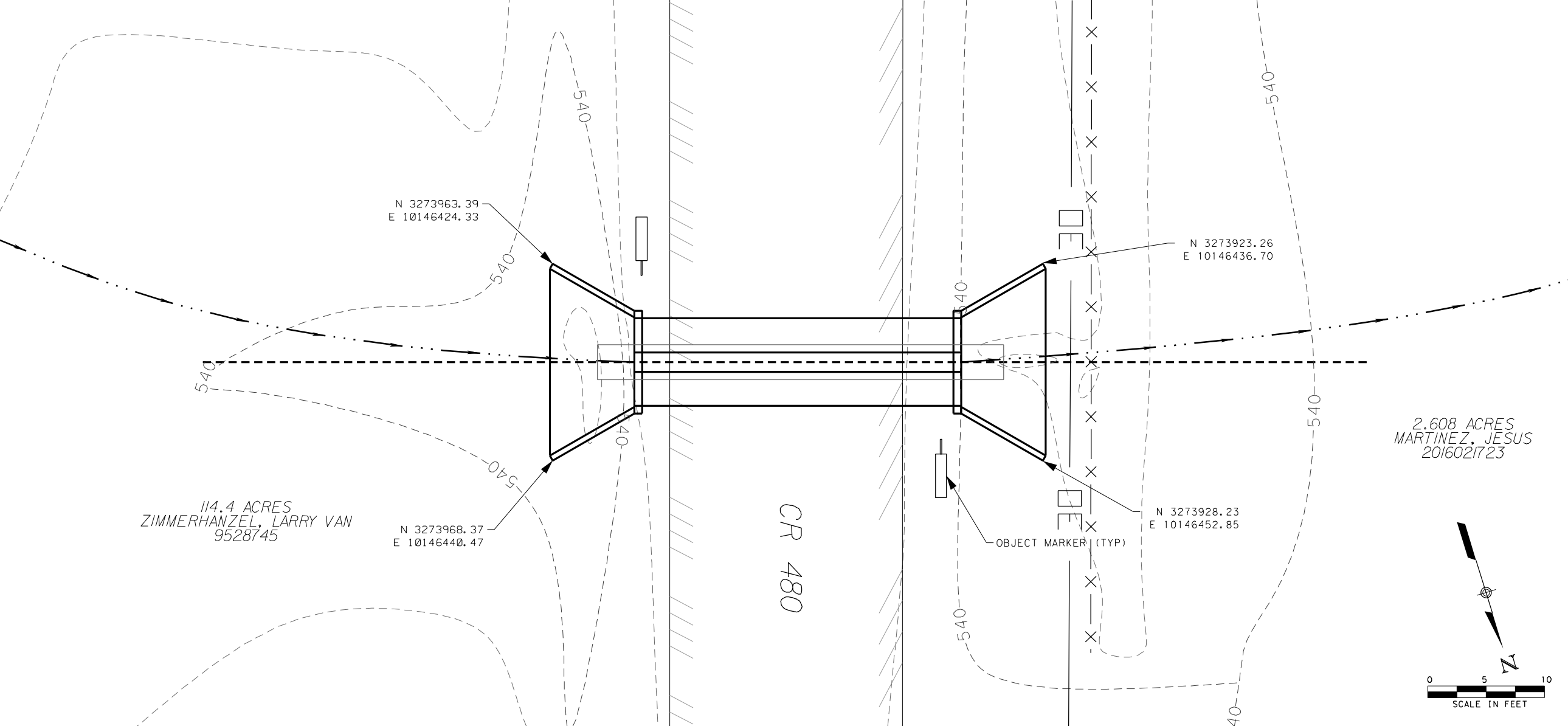


WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**C-2725-A
CROSS SECTION**

SHEET 06 OF 9				SCALE: 1" = 20' H 1" = 10' V	
DATE: 4/16/2018		BY: PH DW: PH CK: BRL AP: BRL		SHEET NO.	
FED. RD. DIV. NO. 6		FEDERAL AID PROJECT NO. ---		32	
STATE	DIST.	COUNTY		201	
TEXAS	---	WILLIAMSON		201	
CONT.	SECT.	JOB	HIGHWAY NO.	201	
---	--	---	CR 484	201	

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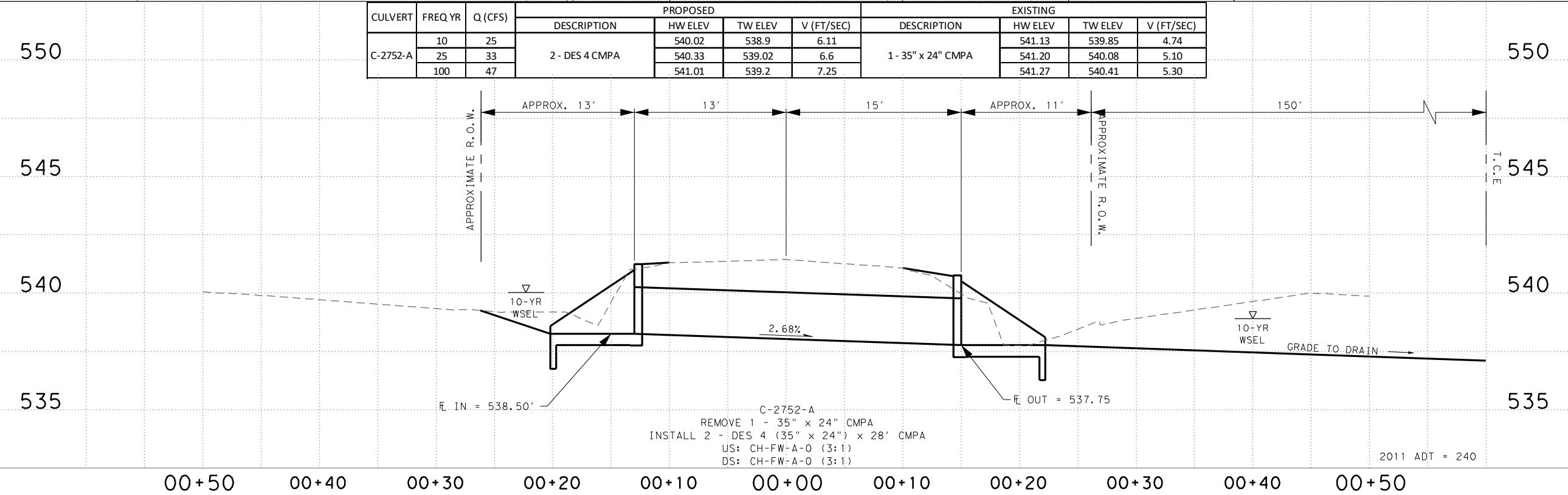


LEGEND

- EXISTING FENCE LINE
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
- DITCH FLOWLINE
- EXISTING OVERHEAD ELECTRIC LINE

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CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2752-A	10	25	2 - DES 4 CMPA	540.02	538.9	6.11	1 - 35" x 24" CMPA	541.13	539.85	4.74
	25	33		540.33	539.02	6.6		541.20	540.08	5.10
	100	47		541.01	539.2	7.25		541.27	540.41	5.30

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**C-2752-A
CROSS SECTION**

SHEET 07 OF 9

SCALE: 1" = 10' H
1" = 5' V

DATE: 4/16/2018
BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	33
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
----	--	---
HIGHWAY NO. CR 480		

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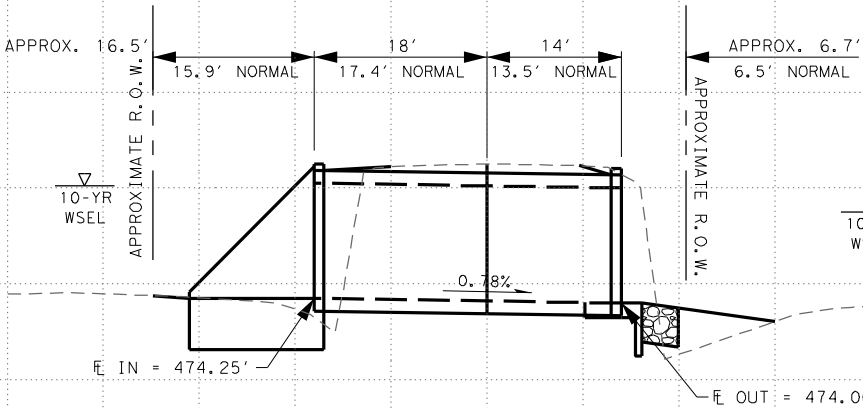


68.86 ACRES
HEINE, GREG R. & ROBIN E.
2016064396

20.03 ACRES
WILEY, JARMON JR. & KIMBERLY
1687-603

12.70 ACRES
SCRUGGS, VIOLA M.

CULVERT	FREQ YR	Q (CFS)	PROPOSED				EXISTING			
			DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)	DESCRIPTION	HW ELEV	TW ELEV	V (FT/SEC)
C-2762-A	10	834	3- 8' x 6' CBC	480.11	478.76	7.3	1- 84", 1- 92" x 76", 1- 102" x 84" STEEL PIPE	479.61	476.64	10.15
	25	1278		481.17	479.59	8.16		481.21	477.47	11.55
	100	2162		481.89	480.81	8.67		481.95	478.69	10.45



C-2762-A
REMOVE 1 - 84", 1 - 92" x 76", 1 - 102" x 84" STEEL
INSTALL 3 - 8' x 6' x 32' CBC @ 15° SKEW
US: FW-S (2:1)
DS: PW-1 (4:1)

2011 ADT = 363

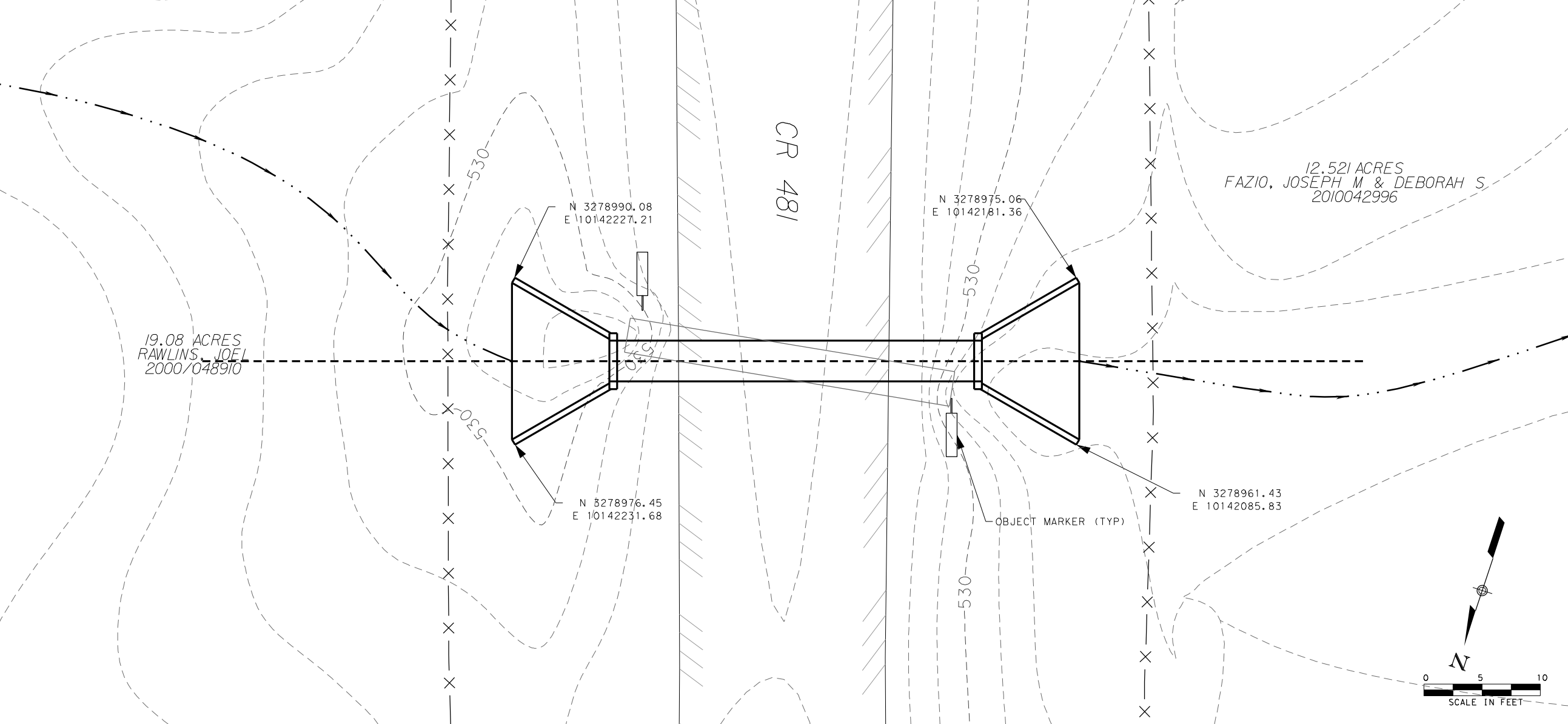
- LEGEND**
- × — × EXISTING FENCE LINE
 - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
 - - - - - APPROXIMATE PROPERTY LINE
 - PROPOSED CENTERLINE
 - EXISTING GROUND PROFILE
 - W — EXISTING WATER LINE
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WILLIAMSON COUNTY FY19 CROSS CULVERT REPLACEMENTS			
C-2762-A CROSS SECTION			
SHEET 08 OF 9			
SCALE: 1" = 20' H 1" = 10' V			
DATE: 4/16/2018			
BY: PH DW: PH CK: BRL AP: BRL			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	---		34
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
---	--	---	CR 481

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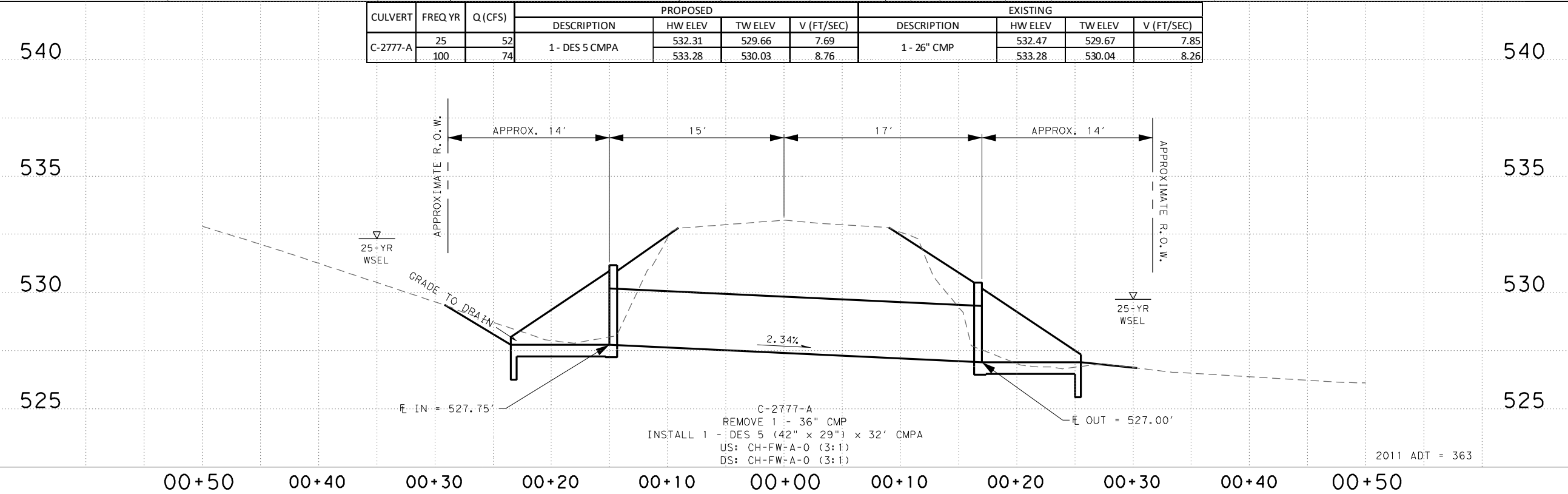
LEGEND

- X — X — EXISTING FENCE LINE
- - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - - APPROXIMATE PROPERTY LINE
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WILLIAMSON COUNTY, TEXAS



WILLIAMSON COUNTY
1848

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STEGER BIZZELL
TBPE FIRM NO. 181

Michael Baker
INTERNATIONAL
TBPE FIRM NO. 2677

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

**C-2777-A
CROSS SECTION**

SHEET 09 OF 9

SCALE: 1" = 10' H
1" = 5' V

DATE: 4/16/2018

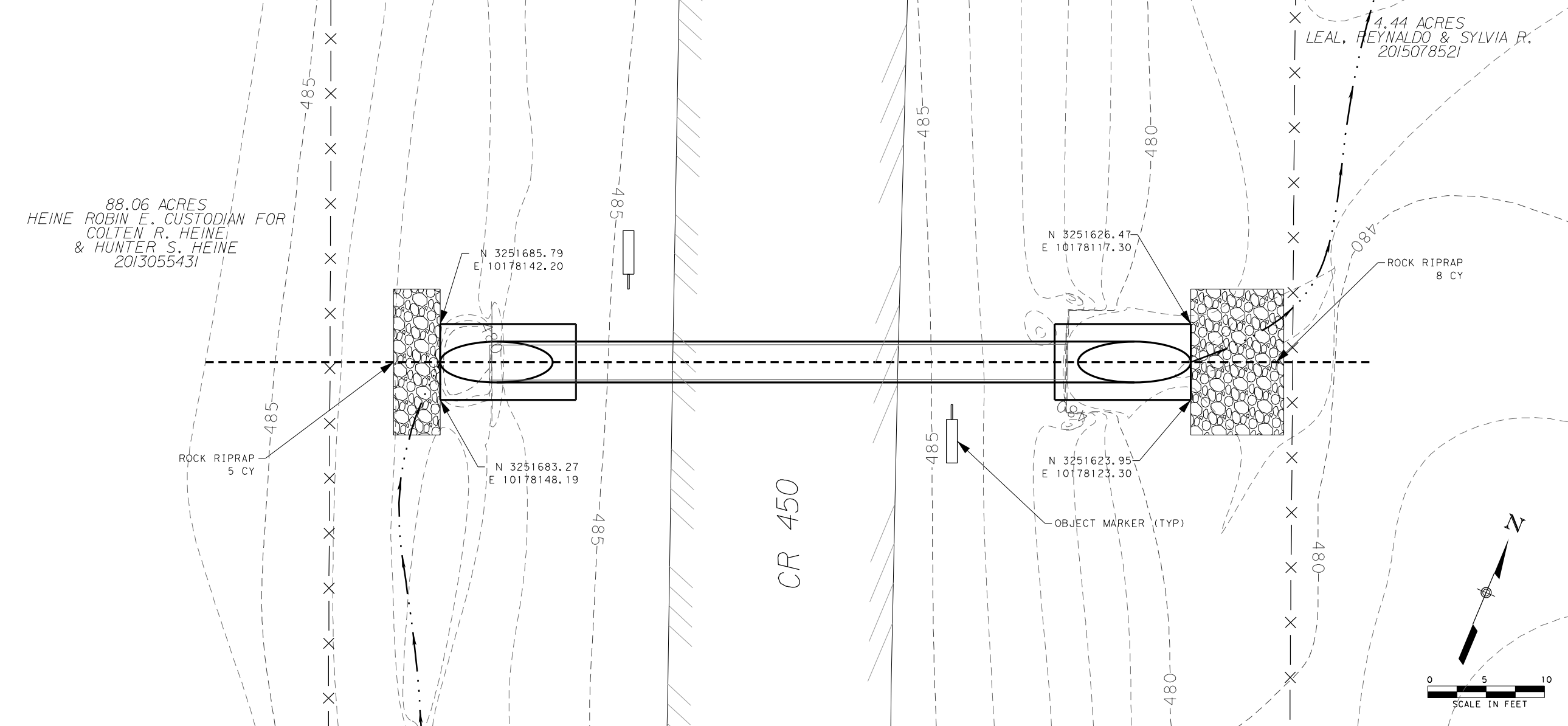
BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	35

STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON

CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 481

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LEGEND

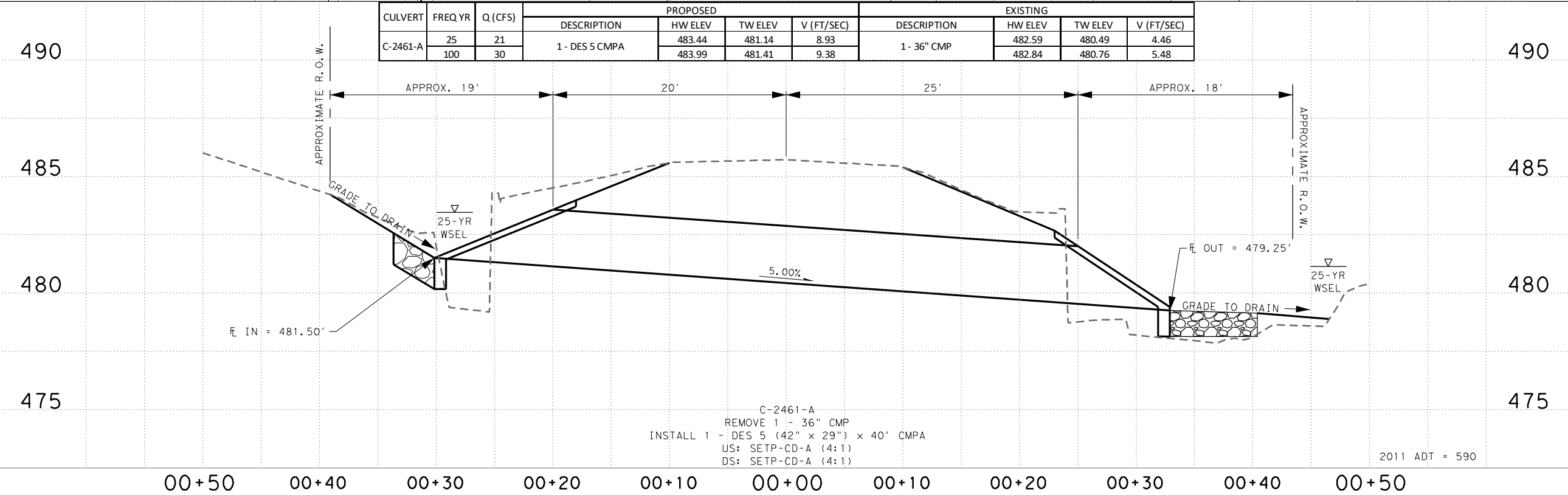
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- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
- DITCH FLOWLINE
- EXISTING OVERHEAD ELECTRIC LINE

NOTES:

- ALL UTILITIES SHOWN ARE BY APPROXIMATE LOCATION ONLY AND ARE TO BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL REPAIR/RECONNECT EXISTING UTILITIES DISCONNECTED OR DAMAGED DURING CONSTRUCTION.
- THE "ONE CALL" SYSTEM WILL BE USED TO LOCATE EXISTING UNDERGROUND UTILITIES.
- CONTRACTOR SHALL RETURN THE GROUND AREA DISTURBED BY CONSTRUCTION ACTIVITY TO EQUAL OR BETTER CONDITION IN SUCH MANNER AS TO NOT CHANGE THE ROUTE OF STORM WATER FLOW.
- EXIST. MAILBOXES TO BE RELOCATED TO EDGE OF PROPOSED SHOULDER AS REQUIRED.

0 5 10
SCALE IN FEET

STATE OF TEXAS
CURTIS R. STEGER
87905
REGISTERED PROFESSIONAL ENGINEER



WILLIAMSON COUNTY
1848

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TBPE FIRM NO. 181

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INTERNATIONAL
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WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

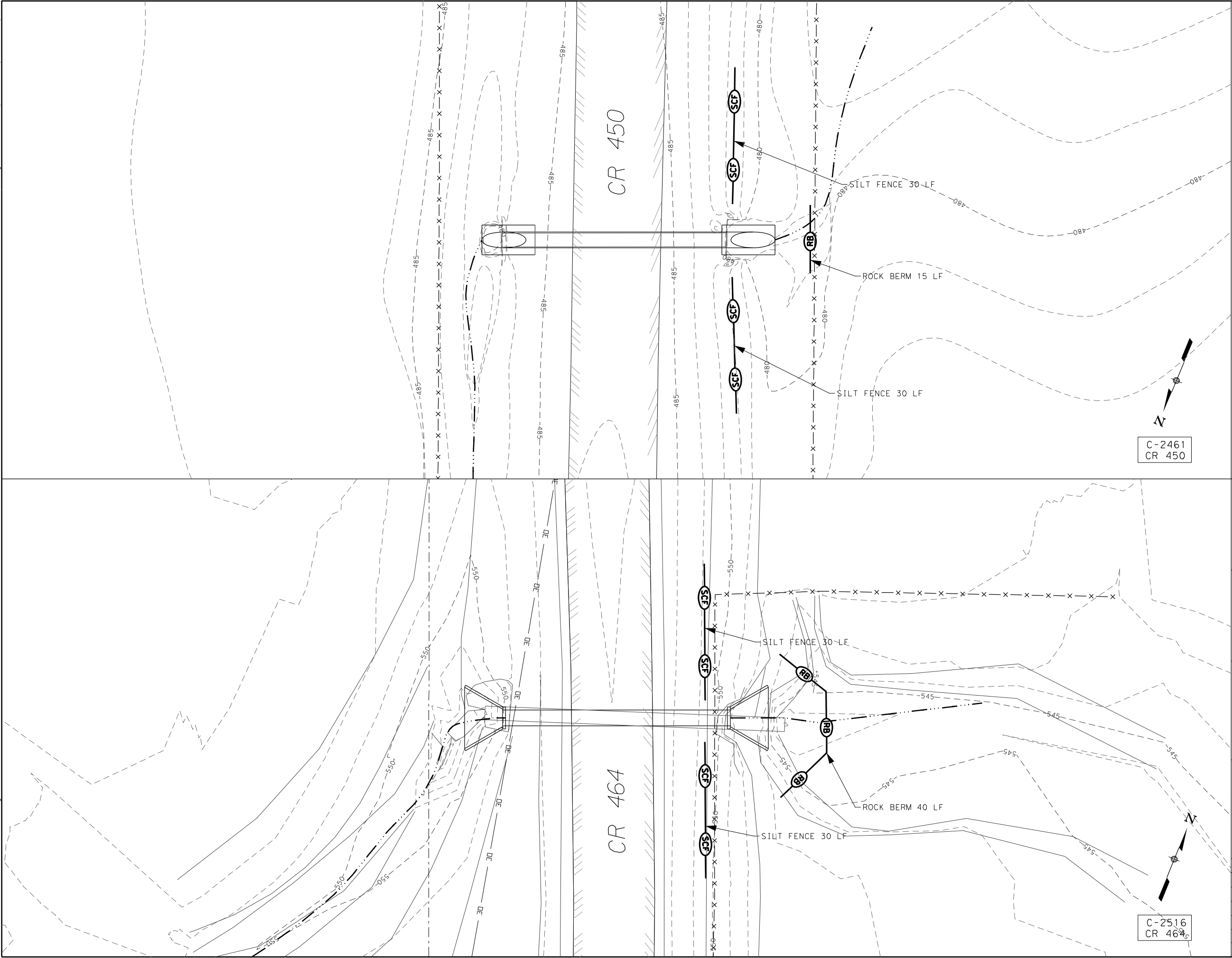
**C-2461-A
CROSS SECTION**

SHEET 01 OF 9

DATE: 4/16/2018
DRAWN BY: PH
CHECKED BY: BRL
APPROVED BY: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	----	36
STATE	DIST.	COUNTY
TEXAS	---	WILLIAMSON
CONT.	SECT.	JOB
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		HIGHWAY NO.
		CR 450

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LEGEND

- X — X — EXISTING FENCE LINE
- - - - - PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- - - - - APPROXIMATE PROPERTY LINE
- - - - - PROPOSED CENTERLINE
- - - - - EXISTING GROUND PROFILE
- W — EXISTING WATER LINE
- UT — EXISTING TELECOM LINE
- OE — EXISTING OVERHEAD ELECTRIC LINE
- . - . - . DITCH FLOWLINE
- (RFD) ROCK BERM
- (SCF) SEDIMENT CONTROL FENCE

WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

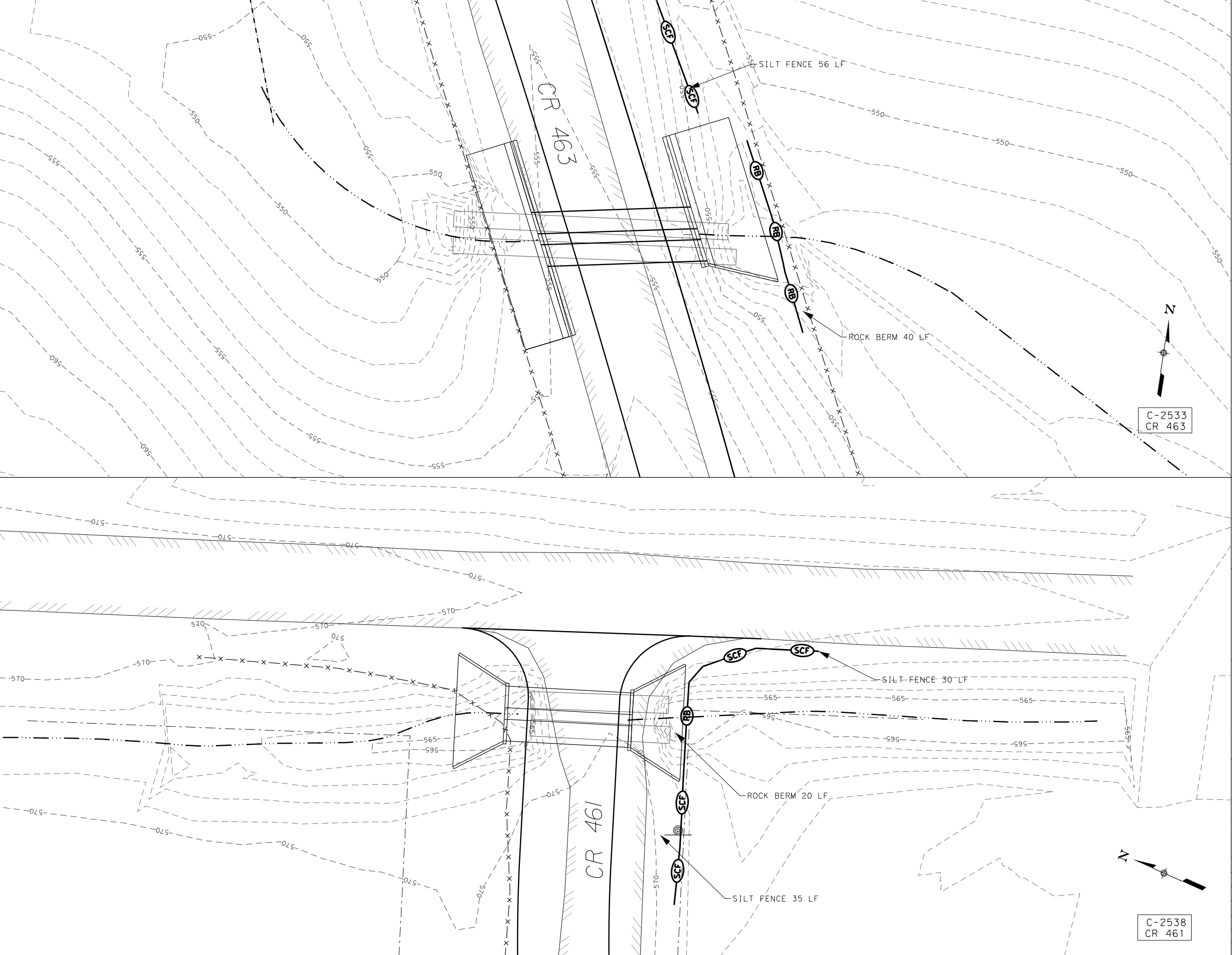
EROSION CONTROL PLAN

SHEET 1 OF 5 SCALE: 1" = 20'

DATE: 11/16/2018 DRAWN: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	---		37
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
---	--	---	CR 450/CR 464

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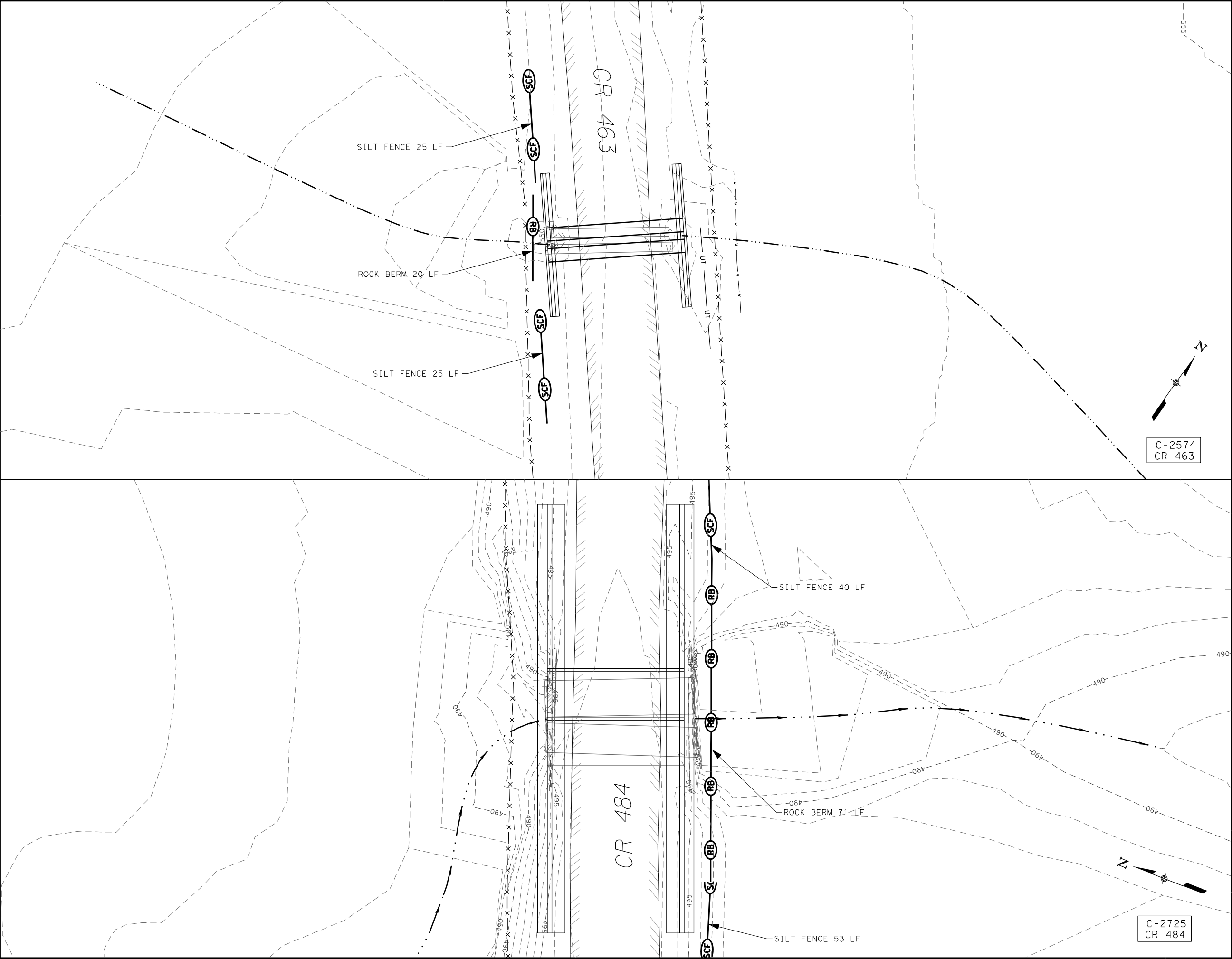
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- EXISTING WATER LINE
- EXISTING TELECOM LINE
- EXISTING OVERHEAD ELECTRIC LINE
- DITCH FLOWLINE
- ROCK BERM
- SEDIMENT CONTROL FENCE



WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS
EROSION CONTROL PLAN

SHEET 2 OF 5		SCALE: 1" = 20'	
DATE: 11/16/2018	BY: PH	DW: PH	CK: BRL
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		38
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
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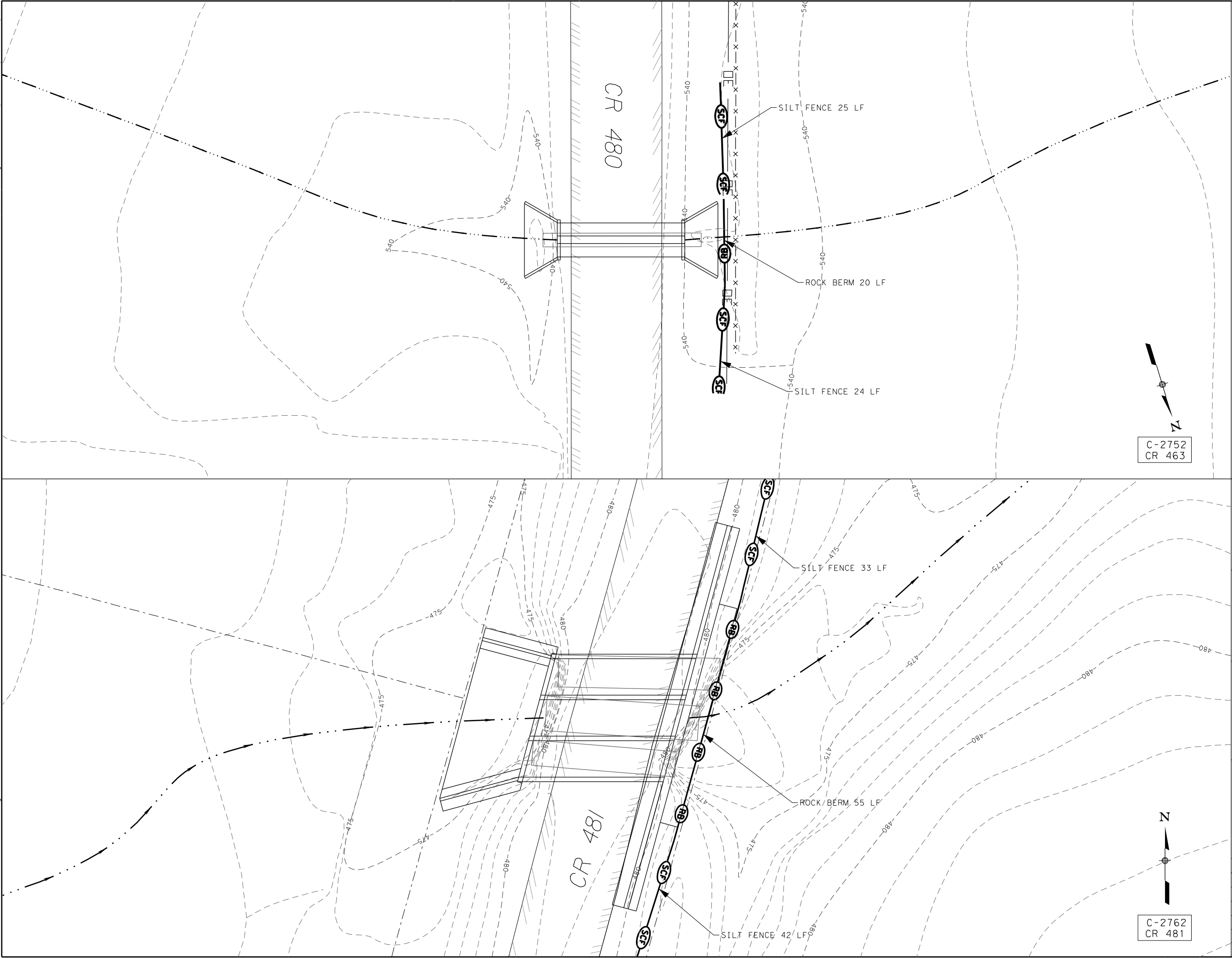
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- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
- EXISTING OVERHEAD ELECTRIC LINE
- DITCH FLOWLINE
- ROCK BERM
- SEDIMENT CONTROL FENCE



WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS
EROSION CONTROL PLAN

SHEET 3 OF 5				SCALE: 1" = 20'	
DATE: 4/16/2018		BY: PH DW: PH CK: BRL AP: BRL			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.			SHEET NO.	
6	-----			39	
STATE	DIST.	COUNTY			
TEXAS	---	WILLIAMSON			
CONT.	SECT.	JOB	HIGHWAY NO.		
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LEGEND

- EXISTING FENCE LINE
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
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- ROCK BERM
- SEDIMENT CONTROL FENCE



WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

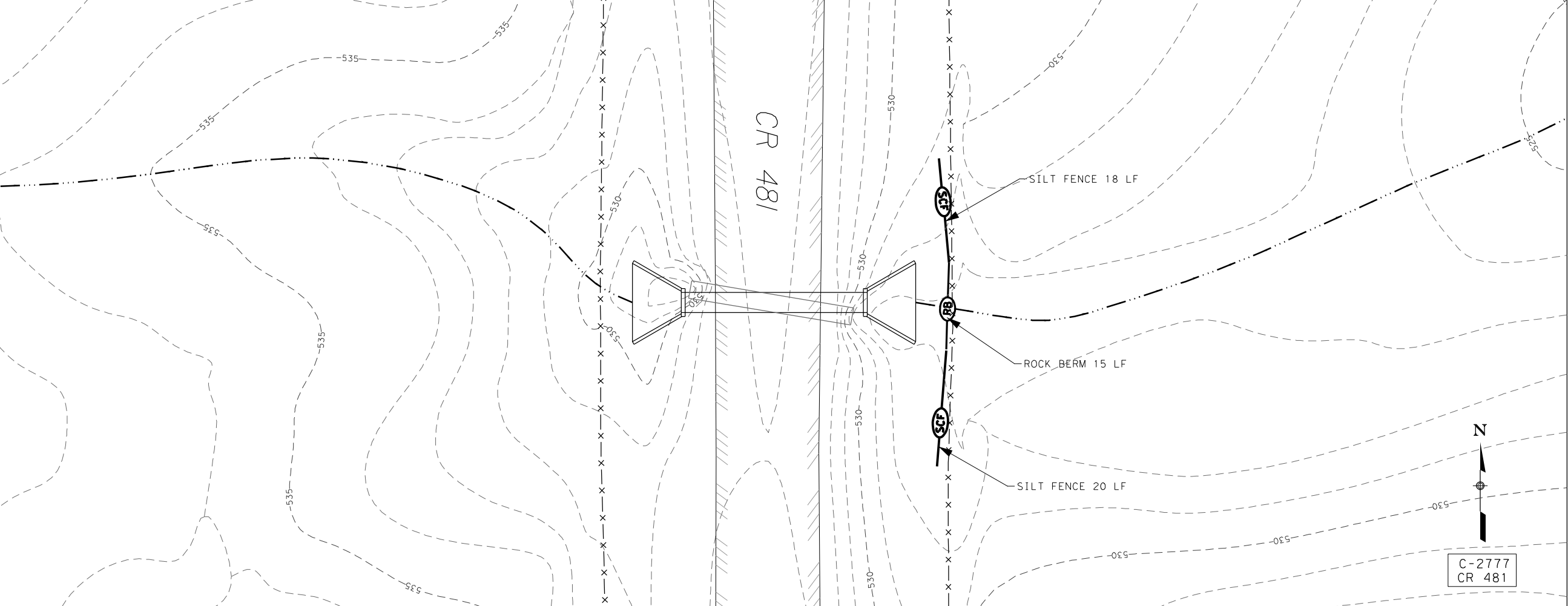
EROSION CONTROL
PLAN

SHEET 4 OF 5 SCALE: 1" = 20'

DATE: 4/16/2018 BY: PH DW: PH CK: BRL AP: BRL

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	----		40
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
----	--	---	CR 480/CR 481

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LEGEND

- EXISTING FENCE LINE
- PROPOSED TEMPORARY CONSTRUCTION EASEMENT
- APPROXIMATE PROPERTY LINE
- PROPOSED CENTERLINE
- EXISTING GROUND PROFILE
- EXISTING WATER LINE
- EXISTING TELECOM LINE
- EXISTING OVERHEAD ELECTRIC LINE
- DITCH FLOWLINE
- ROCK BERM
- SEDIMENT CONTROL FENCE



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WILLIAMSON COUNTY
FY19 CROSS CULVERT REPLACEMENTS

EROSION CONTROL
PLAN

SHEET 5 OF 5 SCALE: 1" = 20'

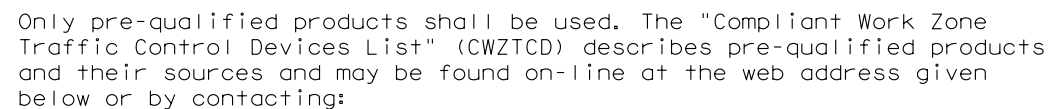
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6	----		41
STATE	DIST.	COUNTY	
TEXAS	---	WILLIAMSON	
CONT.	SECT.	JOB	HIGHWAY NO.
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- DATE: 09/29/2018
FILE: 18-08

11/29/2018 8:12 AM



THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)
TRAFFIC ENGINEERING STANDARD SHEETS

 <p style="font-size: 1.2em; margin: 0;">Texas Department of Transportation</p>	<p style="font-size: 0.8em; margin: 0;">Traffic Operations Division Standard</p>
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BARRICADE AND CONSTRUCTION

GENERAL NOTES

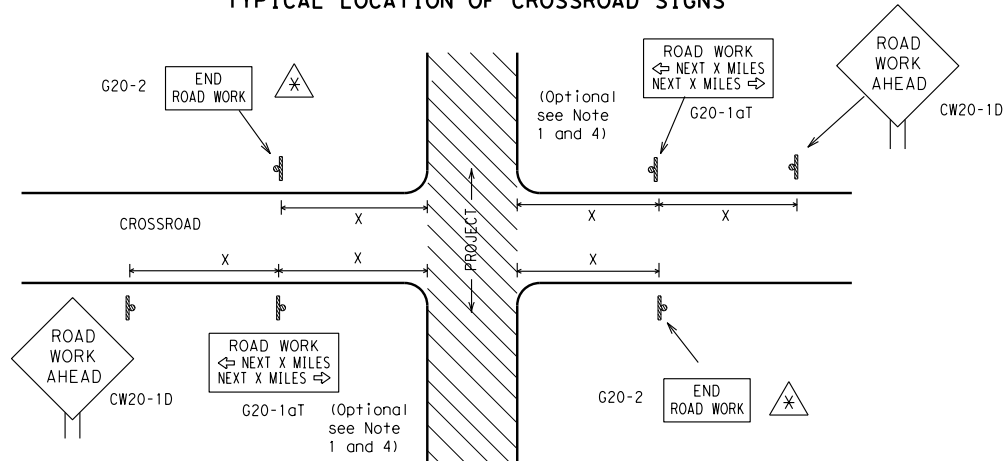
AND REQUIREMENTS

BC (1) - 14

FILE#: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CS: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-03 5-10 8-14				
9-07 7-13	DIST	COUNTY		SHEET NO.
				42

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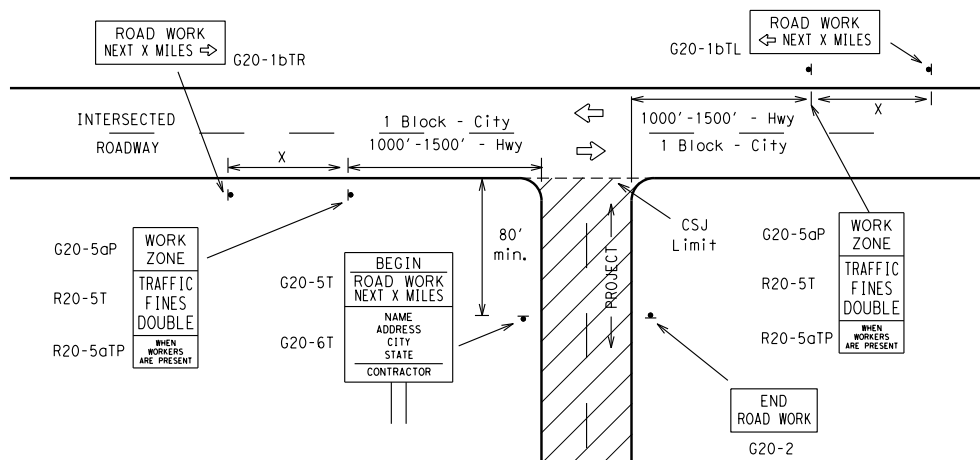
TYPICAL LOCATION OF CROSSROAD SIGNS



May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)

- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
- The Engineer may use the reduced size 36" x 36" ROAD WORK AHEAD (CW20-1D) sign mounted back to back with the reduced size 36" x 18" "END ROAD WORK" (G20-2) sign on low volume crossroads (see Note 4 under "Typical Construction Warning Sign Size and Spacing"). See the "Standard Highway Sign Designs for Texas" manual for sign details. The Engineer may omit the advance warning signs on low volume crossroads. The Engineer will determine whether a road is low volume. This information shall be shown in the plans.
- Based on existing field conditions, the Engineer/Inspector may require additional signs such as FLAGGER AHEAD, LOOSE GRAVEL, or other appropriate signs. When additional signs are required, these signs will be considered part of the minimum requirements. The Engineer/Inspector will determine the proper location and spacing of any sign not shown on the BC sheets, Traffic Control Plan sheets or the Work Zone Standard Sheets.
- The "ROAD WORK NEXT X MILES" (G20-1aT) sign shall be required at high volume crossroads to advise motorists of the length of construction in either direction from the intersection. The Engineer will determine whether a roadway is considered high volume.
- Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
- When work occurs in the intersection area, appropriate traffic control devices, as shown elsewhere in the plans or as determined by the Engineer/Inspector, shall be in place.

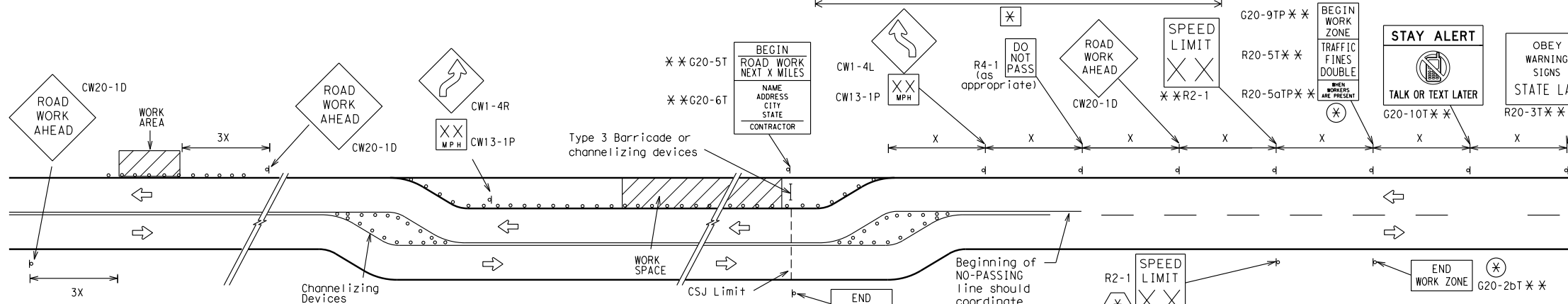
T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

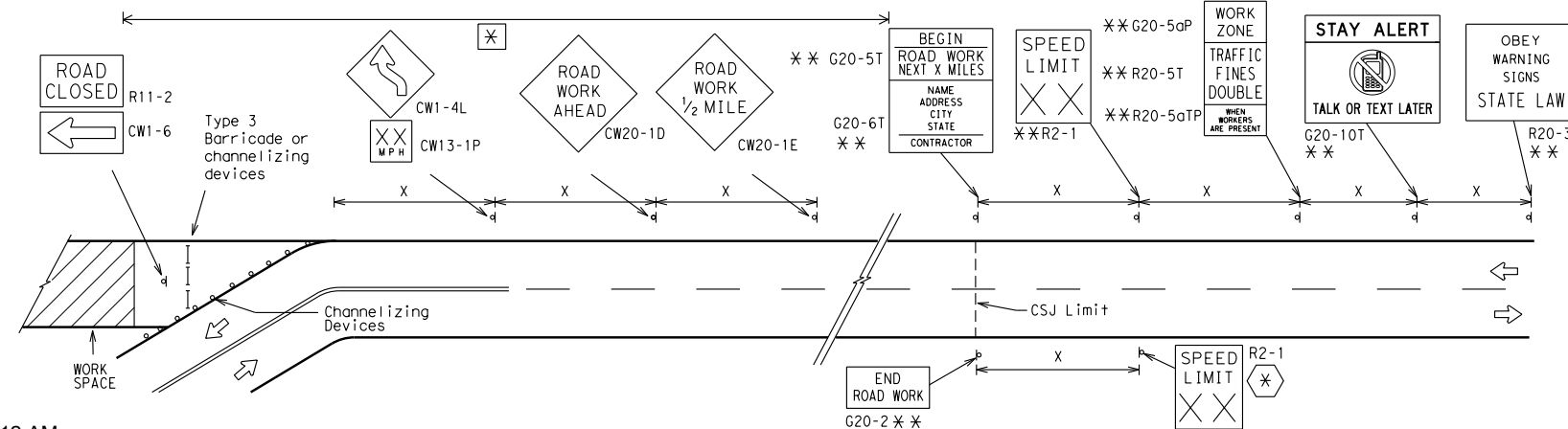
- The Engineer will determine the types and location of any additional traffic control devices, such as a flagger and accompanying signs, or other signs, that should be used when work is being performed at or near an intersection.
- If construction closes the road at a T-intersection the Contractor shall place the "CONTRACTOR NAME" (G20-6T) sign behind the Type 3 Barricades for the road closure (see BC(10) also). The "ROAD WORK NEXT X MILES" left arrow (G20-1bTL) and "ROAD WORK NEXT X MILES" right arrow (G20-1bTR) signs shall be replaced by the detour signing called for in the plans.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing of signs and channelizing devices.

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING DOWNSTREAM OF THE CSJ LIMITS



NOTES

The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.

The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.

Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.

Contractor will install a regulatory speed limit sign at the end of the work zone.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/ Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be used on low volume crossroads at the discretion of the Engineer. See Note 2 under "Typical Location of Crossroad Signs".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

LEGEND

—	Type 3 Barricade
○ ○ ○	Channelizing Devices
—	Sign
X	See Typical Construction Warning Sign Size and Spacing chart or the TMUTCD for sign spacing requirements.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

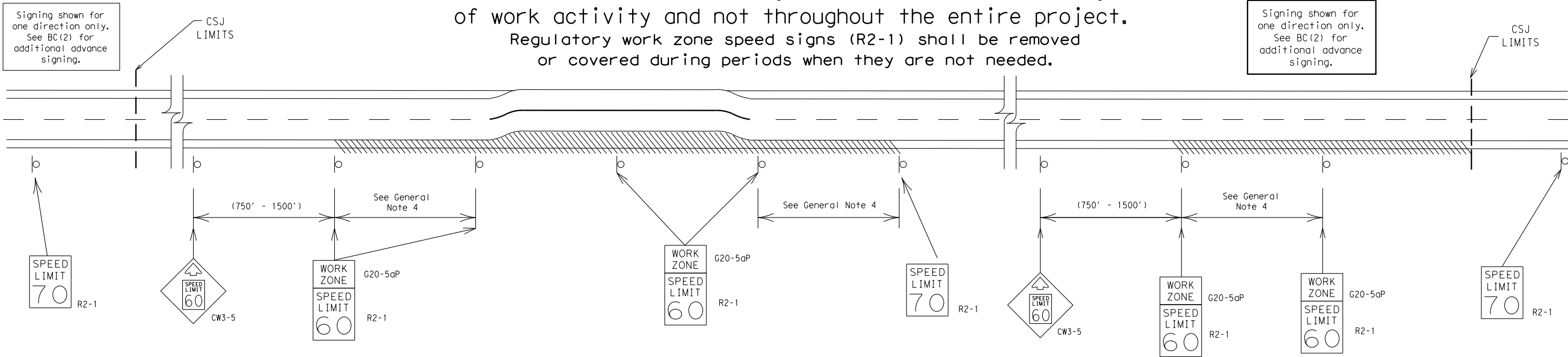
BC(2) - 14

FILE:	bc-14.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB		HIGHWAY			
REVISIONS									
9-07	8-14	DIST	COUNTY				SHEET N		
7-13							43		

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

- a) rough road or damaged pavement surface
- b) substantial alteration of roadway geometrics (diversions)
- c) construction detours
- d) grade
- e) width
- f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the travelled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered. (See Removing or Covering on BC(4)).

GENERAL NOTES

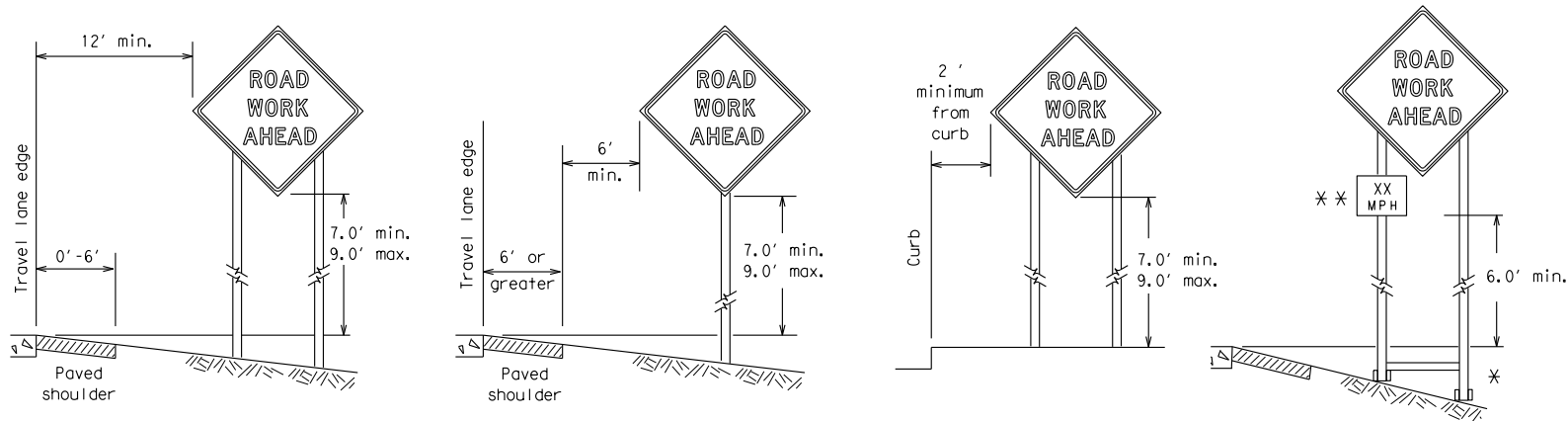
- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:
 - 40 mph and greater 0.2 to 2 miles
 - 35 mph and less 0.2 to 1 mile
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- Fabrication, erection and maintenance of the "ADVANCE SPEED LIMIT" (CW3-5) sign, "WORK ZONE" (G20-5aP) plaque and the "SPEED LIMIT" (R2-1) signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - A. Law enforcement.
 - B. Flagger stationed next to sign.
 - C. Portable changeable message sign (PCMS).
 - D. Low-power (drone) radar transmitter.
 - E. Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

SHEET 3 OF 12

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
BC (3) - 14			
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
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REVISIONS		HIGHWAY	
9-07 8-14	DIST	COUNTY	SHEET NO.
7-13			

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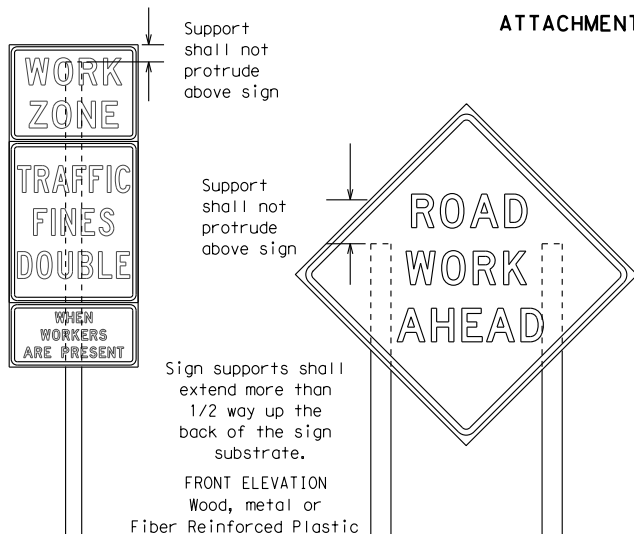
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



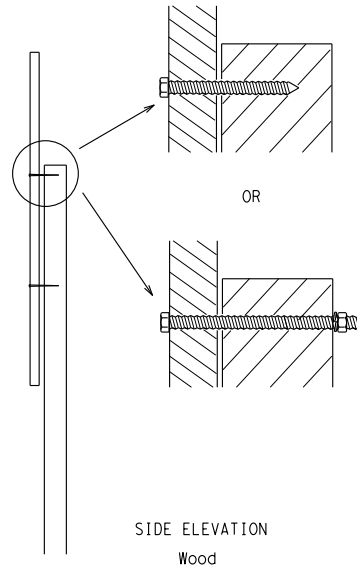
✱ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

✱✱ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

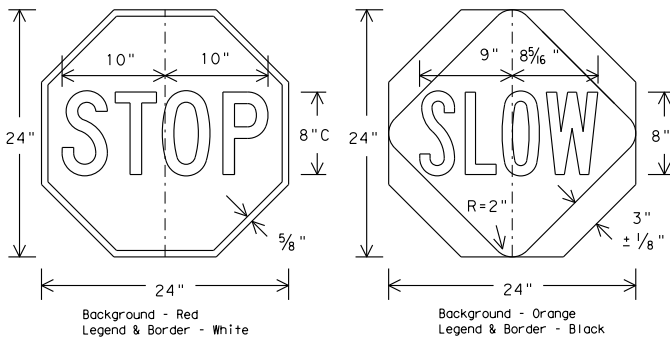


Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the splice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectORIZED.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
2. When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition.
3. When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
4. If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
5. If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
6. Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD). The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height, the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
 - a. Long-term stationary - work that occupies a location more than 3 days.
 - b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
 - c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - d. Short, duration - work that occupies a location up to 1 hour.
 - e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

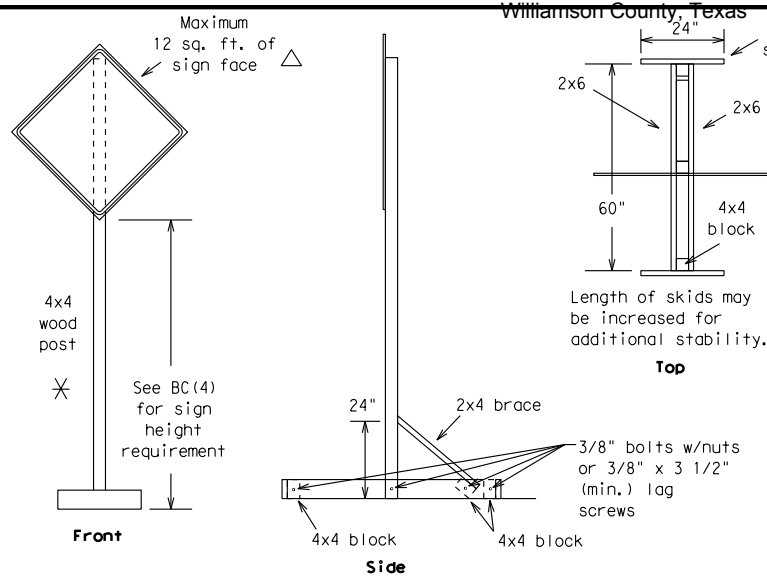
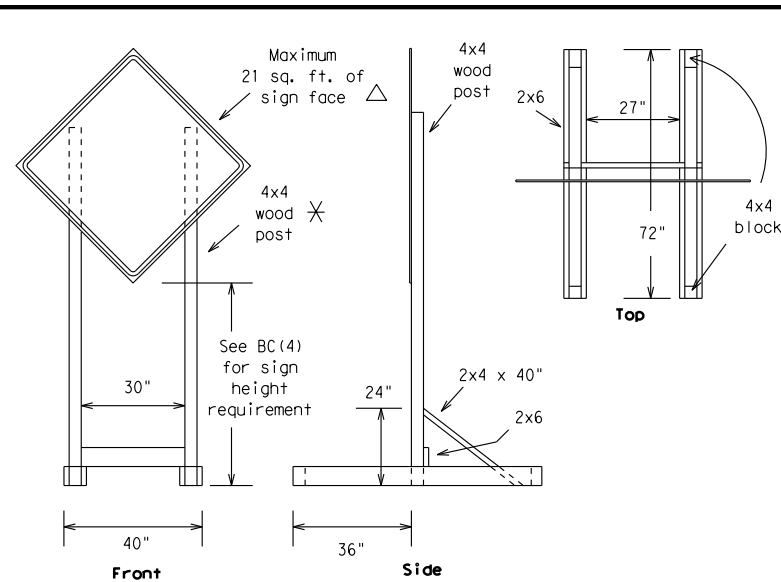
FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

SHEET 4 OF 12

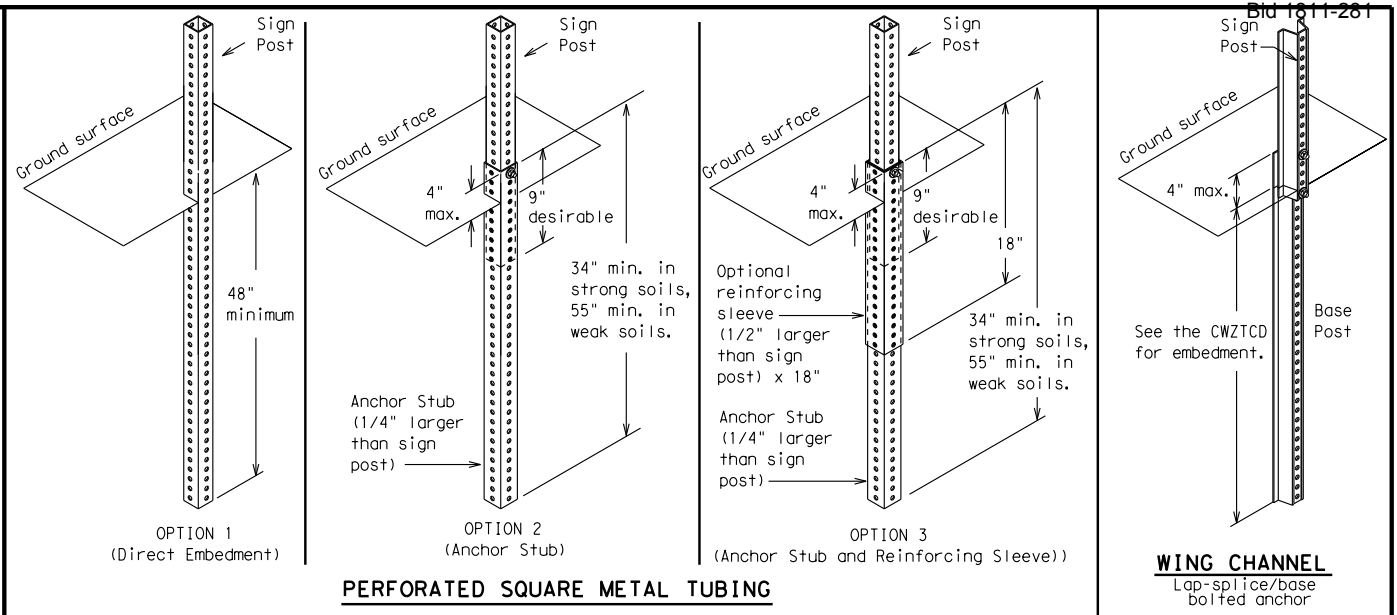
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BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES			
BC (4) - 14			
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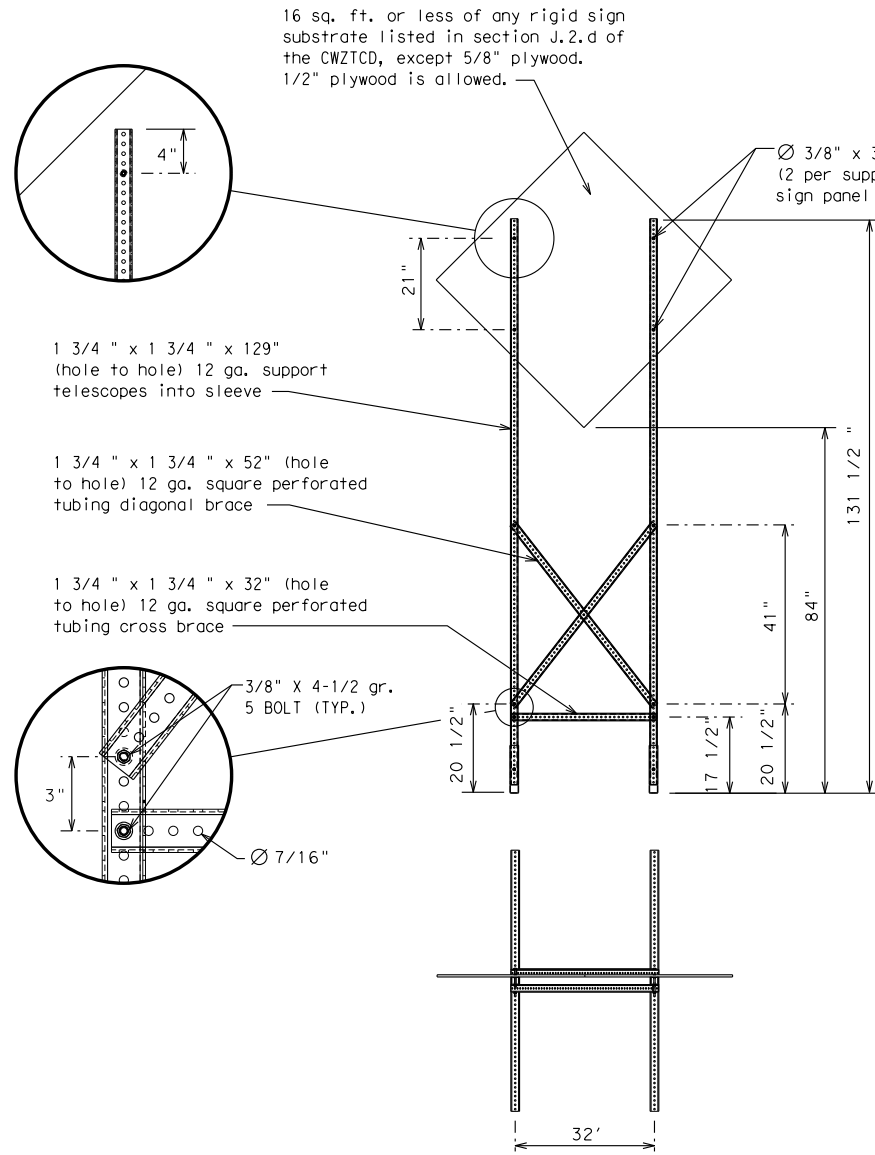
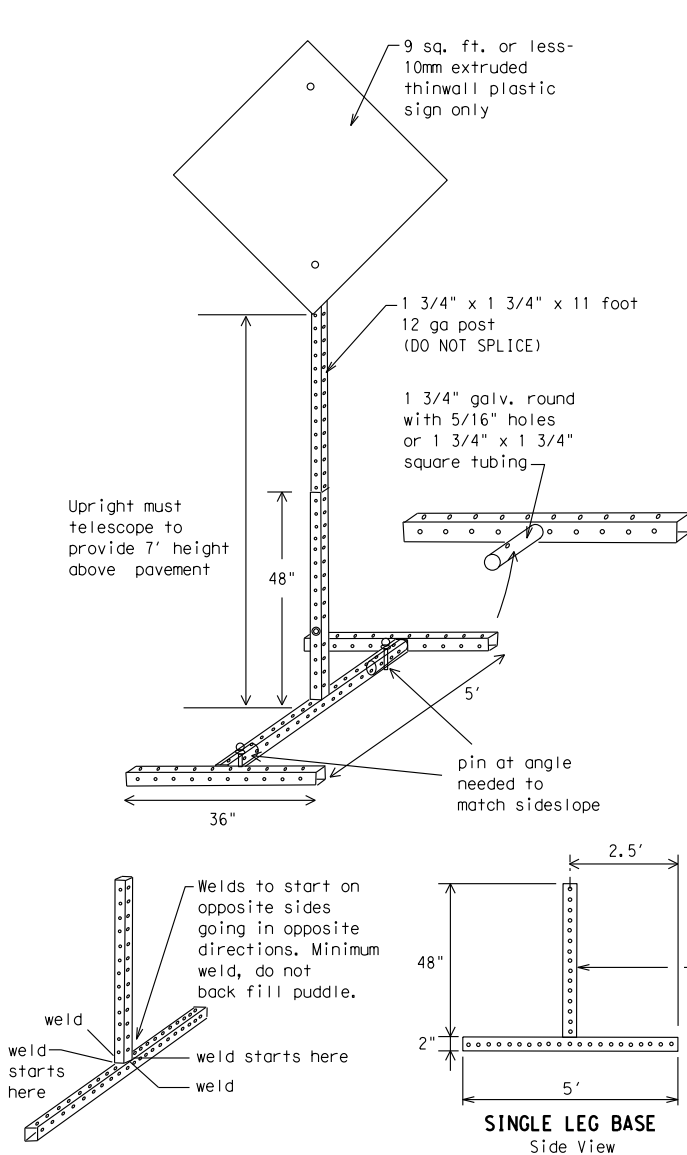
SKID MOUNTED WOOD SIGN SUPPORTS

LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □



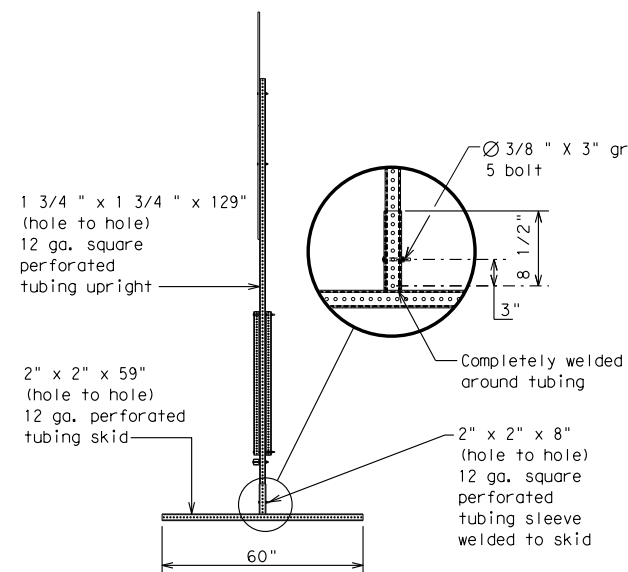
GROUND MOUNTED SIGN SUPPORTS

Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support.
The maximum sign square footage shall adhere to the manufacturer's recommendation.
Two post installations can be used for larger signs.



Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

Both steel and plastic Wedge Anchor Systems as shown on the SMD Standard Sheets may be used as temporary sign supports for signs up to 10 square feet of sign face. They may be set in concrete or in sturdy soils if approved by the Engineer. (See web address for "Traffic Engineering Standard Sheets" on BC(1)).

OTHER DESIGNS

MORE DETAILS OF APPROVED LONG/INTERMEDIATE AND SHORT TERM SUPPORTS CAN BE FOUND ON THE CWZTCD LIST. SEE BC(1) FOR WEBSITE LOCATION.

GENERAL NOTES

- Nails may be used in the assembly of wooden sign supports, but 3/8" bolts with nuts or 3/8" x 3 1/2" lag screws must be used on every joint for final connection.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- When project is completed, all sign supports and foundations shall be removed from the project site. This will be considered subsidiary to Item 502.

□ See BC(4) for definition of "Work Duration."

✱ Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.

△ See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 14

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DATE: 11/29/2018
FILE: 8:42 AM

WHEN NOT IN USE, REMOVE THE PCMS FROM THE RIGHT-OF-WAY OR PLACE THE PCMS BEHIND BARRIER OR GUARDRAIL WITH SIGN PANEL TURNED PARALLEL TO TRAFFIC

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- Messages on PCMS should contain no more than 8 words (about four to eight characters per word), not including simple words such as "TO," "FOR," "AT," etc.
- Messages should consist of a single phase, or two phases that alternate. Three-phase messages are not allowed. Each phase of the message should convey a single thought, and must be understood by itself.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- The message term "WEEKEND" should be used only if the work is to start on Saturday morning and end by Sunday evening at midnight. Actual days and hours of work should be displayed on the PCMS if work is to begin on Friday evening and/or continue into Monday morning.
- The Engineer/Inspector may select one of two options which are available for displaying a two-phase message on a PCMS. Each phase may be displayed for either four seconds each or for three seconds each.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- Do not present redundant information on a two-phase message; i.e., keeping two lines of the message the same and changing the third line.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- The following table lists abbreviated words and two-word phrases that are acceptable for use on a PCMS. Both words in a phrase must be displayed together. Words or phrases not on this list should not be abbreviated, unless shown in the TMUTCD.
- PCMS character height should be at least 18 inches for trailer mounted units. They should be visible from at least 1/2 (.5) mile and the text should be legible from at least 600 feet at night and 800 feet in daylight. Truck mounted units must have a character height of 10 inches and must be legible from at least 400 feet.
- Each line of text should be centered on the message board rather than left or right justified.
- If disabled, the PCMS should default to an illegible display that will not alarm motorists and will only be used to alert workers that the PCMS has malfunctioned. A pattern such as a series of horizontal solid bars is appropriate.

WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD
Alternate	ALT
Avenue	AVE
Best Route	BEST RTE
Boulevard	BLVD
Bridge	BRDG
Cannot	CANT
Center	CTR
Construction Ahead	CONST AHD
CROSSING	XING
Detour Route	DETOUR RTE
Do Not	DONT
East	E
Eastbound	(route) E
Emergency	EMER
Emergency Vehicle	EMER VEH
Entrance, Enter	ENT
Express Lane	EXP LN
Expressway	EXPWY
XXXX Feet	XXXX FT
Fog Ahead	FOG AHD
Freeway	FRWY, FWY
Freeway Blocked	FWY BLKD
Friday	FRI
Hazardous Driving	HAZ DRIVING
Hazardous Material	HAZMAT
High-Occupancy	HOV
Vehicle	
Highway	HWY
Hour(s)	HR, HRS
Information	INFO
It Is	ITS
Junction	JCT
Left	LFT
Left Lane	LFT LN
Lane Closed	LN CLOSED
Lower Level	LWR LEVEL
Maintenance	MAINT

Roadway designation # IH-number, US-number, SH-number, FM-number

WORD OR PHRASE	ABBREVIATION
Major	MAJ
Miles	MI
Miles Per Hour	MPH
Minor	MNR
Monday	MON
Normal	NORM
North	N
Northbound	(route) N
Parking	PKING
Road	RD
Right Lane	RT LN
Saturday	SAT
Service Road	SERV RD
Shoulder	SHLDR
Slippery	SLIP
South	S
Southbound	(route) S
Speed	SPD
Street	ST
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Thursday	THURS
To Downtown	TO DWNTN
Traffic	TRAF
Travelers	TRVLRS
Tuesday	TUES
Time Minutes	TIME MIN
Upper Level	UPR LEVEL
Vehicles (s)	VEH, VEHS
Warning	WARN
Wednesday	WED
Weight Limit	WT LIMIT
West	W
Westbound	(route) W
Wet Pavement	WET PVMT
Will Not	WONT

FULL MATRIX PCMS SIGNS

- When Full Matrix PCMS signs are used, the character height and legibility/visibility requirements shall be maintained as listed in Note 15 under "PORTABLE CHANGEABLE MESSAGE SIGNS" above.
- When symbol signs, such as the "Flagger Symbol" (CW20-7) are represented graphically on the Full Matrix PCMS sign and, with the approval of the Engineer, it shall maintain the legibility/visibility requirement listed above.
- When symbol signs are represented graphically on the Full Matrix PCMS, they shall only supplement the use of the static sign represented, and shall not substitute for, or replace that sign.
- A full matrix PCMS may be used to simulate a flashing arrow board provided it meets the visibility, flash rate and dimming requirements on BC(7), for the same size arrow.

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

FREEWAY CLOSED X MILE
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI

ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT

ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
LANES SHIFT

* LANES SHIFT in Phase 1 must be used with STAY IN LANE in Phase 2.

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

MERGE RIGHT
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE

FORM X LINES RIGHT
USE XXXXX RD EXIT
USE EXIT I-XX NORTH
USE I-XX E TO I-XX N
WATCH FOR TRUCKS
EXPECT DELAYS
END SHOULDER USE
WATCH FOR WORKERS

Location List

AT FM XXXX
BEFORE RAILROAD CROSSING
NEXT X MILES
PAST US XXX EXIT
XXXXXXXX TO XXXXXXXX
US XXX TO FM XXXX

Warning List

SPEED LIMIT XX MPH
MAXIMUM SPEED XX MPH
MINIMUM SPEED XX MPH
ADVISORY SPEED XX MPH
RIGHT LANE EXIT
USE CAUTION
DRIVE SAFELY
DRIVE WITH CARE

** Advance Notice List

TUE-FRI XX AM- X PM
APR XX- XX X PM-X AM
BEGINS MONDAY
BEGINS MAY XX
MAY X-X XX PM - XX AM
NEXT FRI-SUN
XX AM TO XX PM
NEXT TUE AUG XX
TONIGHT XX PM- XX AM

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- If two PCMS are used in sequence, they must be separated by a minimum of 1000 ft. Each PCMS shall be limited to two phases, and should be understandable by themselves.
- For advance notice, when the current date is within seven days of the actual work date, calendar days should be replaced with days of the week. Advance notification should typically be for no more than one week prior to the work.

PCMS SIGNS WITHIN THE R.O.W. SHALL BE BEHIND GUARDRAIL OR CONCRETE BARRIER OR SHALL HAVE A MINIMUM OF FOUR (4) PLASTIC DRUMS PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF THE PCMS, WHEN EXPOSED TO ONE DIRECTION OF TRAFFIC. WHEN EXPOSED TO TWO WAY TRAFFIC, THE FOUR DRUMS SHOULD BE PLACED WITH ONE DRUM AT EACH OF THE FOUR CORNERS OF THE UNIT.

WORDING ALTERNATIVES

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- Distances or AHEAD can be eliminated from the message if a location phase is used.

SHEET 6 OF 12



Texas Department of Transportation

Traffic
Operations
Division
Standard

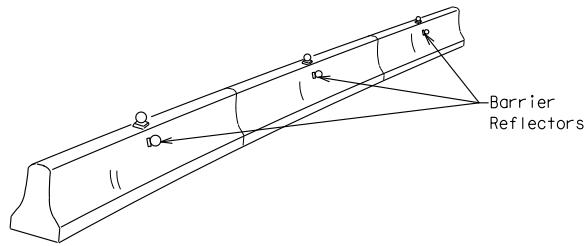
BARRICADE AND CONSTRUCTION
PORTABLE CHANGEABLE
MESSAGE SIGN (PCMS)

BC (6) - 14

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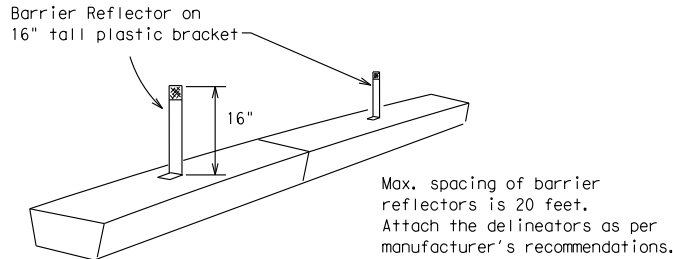
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

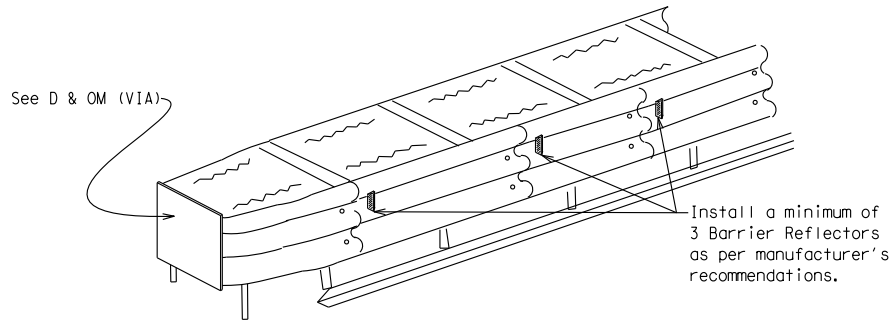


CONCRETE TRAFFIC BARRIER (CTB)

- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. The Barrier Reflector mounted on the side of the CTB shall be located directly below the reflector mounted on top of the barrier, as shown in the detail above.
- Where CTB separates two-way traffic, three barrier reflectors shall be mounted on each section of CTB. The reflector unit on top shall have two yellow reflective faces (Bi-Directional) while the reflectors on each side of the barrier shall have one yellow reflective face, as shown in the detail above.
- When CTB separates traffic traveling in the same direction, no barrier reflectors will be required on top of the CTB.
- Barrier Reflector units shall be yellow or white in color to match the edgeline being supplemented.
- Maximum spacing of Barrier Reflectors is forty (40) feet.
- Pavement markers or temporary flexible-reflective roadway marker tabs shall NOT be used as CTB delineation.
- Attachment of Barrier Reflectors to CTB shall be per manufacturer's recommendations.
- Missing or damaged Barrier Reflectors shall be replaced as directed by the Engineer.
- Single slope barriers shall be delineated as shown on the above detail.



LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

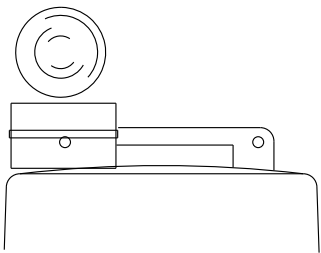
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "FL". The Type A Warning Lights shall not be used with signs manufactured with Type B_{FL} or C_{FL} Sheeting meeting the requirements of Departmental Material Specification DMS-8300.
- Type-C and Type D 360 degree Steady Burn Lights are intended to be used in a series for delineation to supplement other traffic control devices. Their use shall be as indicated on this sheet and/or other sheets of the plans by the designation "SB".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- When required by the Engineer, the Contractor shall furnish a copy of the warning lights certification. The warning light manufacturer will certify the warning lights meet the requirements of the latest ITE Purchase Specifications for Flashing and Steady-Burn Warning Lights.
- When used to delineate curves, Type-C and Type D Steady Burn Lights should only be placed on the outside of the curve, not the inside.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

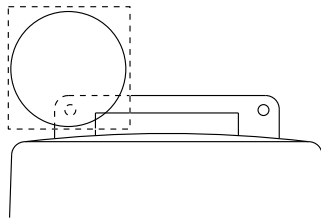
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing devices to form a merging taper may be used for delineation. If used, the successive flashing of the sequential warning lights should occur from the beginning of the taper to the end of the merging taper in order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
- Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, and on other similar conditions.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- The maximum spacing for warning lights on drums should be identical to the channelizing device spacing.

WARNING REFLECTORS MOUNTED ON PLASTIC DRUMS AS A SUBSTITUTE FOR TYPE C (STEADY BURN) WARNING LIGHTS

- A warning reflector or approved substitute may be mounted on a plastic drum as a substitute for a Type C, steady burn warning light at the discretion of the Contractor unless otherwise noted in the plans.
- The warning reflector shall be yellow in color and shall be manufactured using a sign substrate approved for use with plastic drums listed on the CWZTCD.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- Square substrates must have a minimum of 30 square inches of reflectorized sheeting. They do not have to be reflectorized where it attaches to the drum.
- The side of the warning reflector facing approaching traffic shall have sheeting meeting the color and retroreflectivity requirements for DMS 8300-Type B or Type C.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



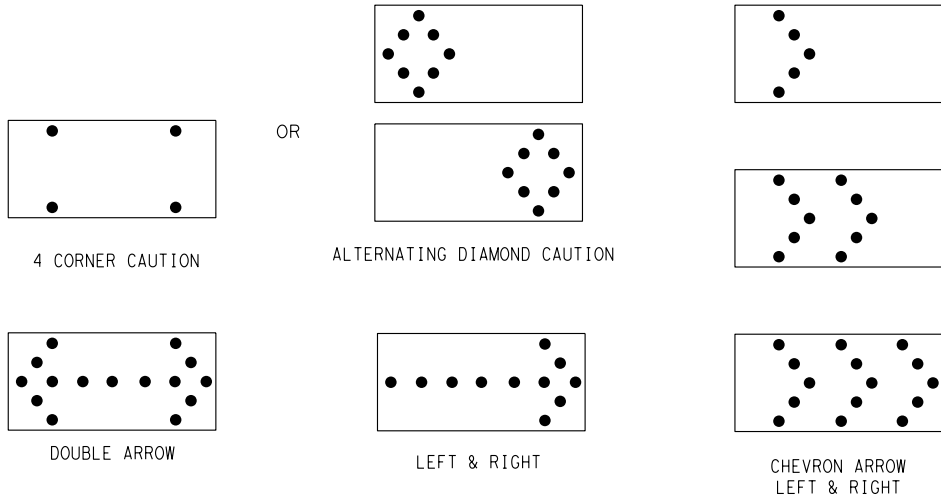
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

- The Flashing Arrow Board should be used for all lane closures on multi-lane roadways, or slow moving maintenance or construction activities on the travel lanes.
- Flashing Arrow Boards should not be used on two-lane, two-way roadways, detours, diversions or work on shoulders unless the "CAUTION" display (see detail below) is used.
- The Engineer/Inspector shall choose all appropriate signs, barricades and/or other traffic control devices that should be used in conjunction with the Flashing Arrow Board.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- The Flashing Arrow Board shall be capable of minimum 50 percent dimming from rated lamp voltage. The flashing rate of the lamps shall not be less than 25 nor more than 40 flashes per minute.
- Minimum lamp "on time" shall be approximately 50 percent for the flashing arrow and equal intervals of 25 percent for each sequential phase of the flashing chevron.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential Chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- A full matrix PCMS may be used to simulate a Flashing Arrow Board provided it meets visibility, flash rate and dimming requirements on this sheet for the same size arrow.
- Minimum mounting height of trailer mounted Arrow Boards should be 7 feet from roadway to bottom of panel.

REQUIREMENTS			
TYPE	MINIMUM SIZE	MINIMUM NUMBER OF PANEL LAMPS	MINIMUM VISIBILITY DISTANCE
B	30 x 60	13	3/4 mile
C	48 x 96	15	1 mile

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

WHEN NOT IN USE, REMOVE THE ARROW BOARD FROM THE RIGHT-OF-WAY OR PLACE THE ARROW BOARD BEHIND CONCRETE TRAFFIC BARRIER OR GUARDRAIL.

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



BARRICADE AND CONSTRUCTION ARROW PANEL, REFLECTORS, WARNING LIGHTS & ATTENUATOR

BC (7) - 14

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9-07	8-14	DIST	COUNTY				SHEET NO.		
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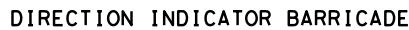
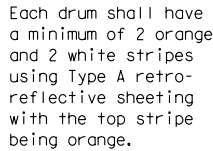
1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

Pre-qualified plastic drums shall meet the following requirements:

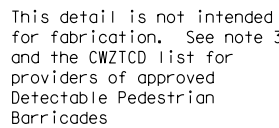
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

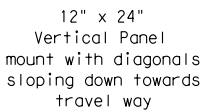
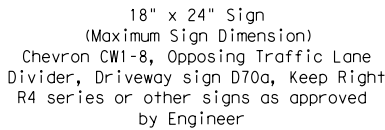
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.



1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CW2TCD List. Ballast shall be as approved by the manufacturers instructions.



1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades may use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



Plywood, Aluminum or Metal sign
substrates shall NOT be used on
plastic drums

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

SHEET 8 OF 12



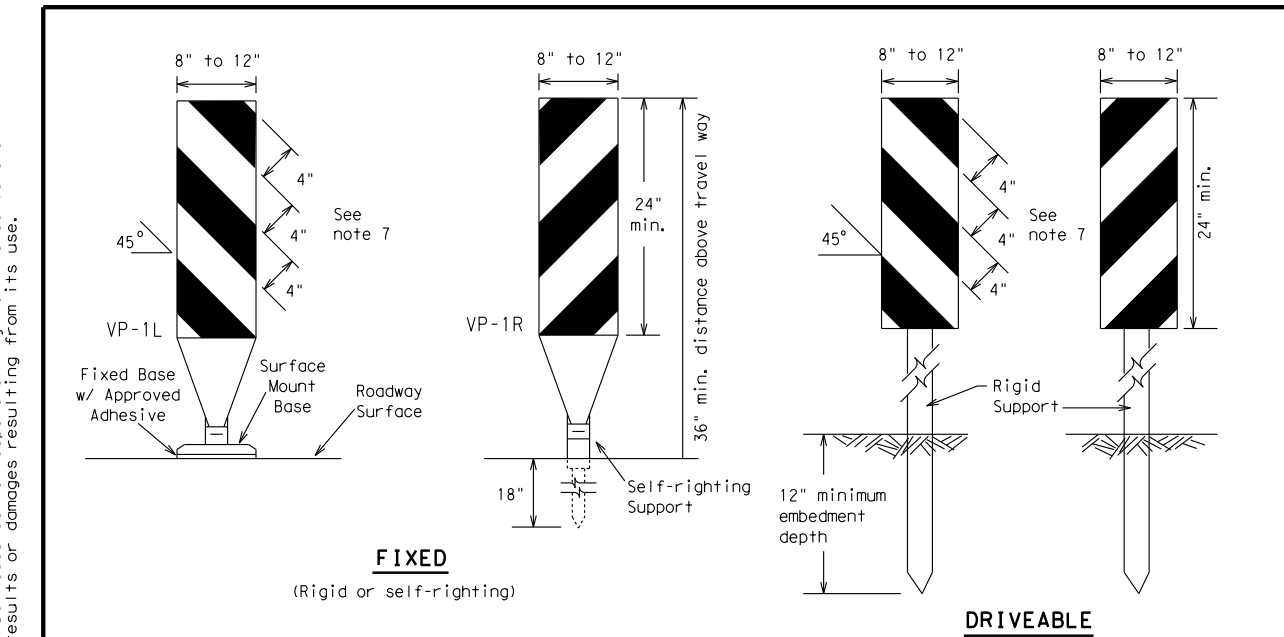
**Traffic
Operations
Division
Standard**

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 14

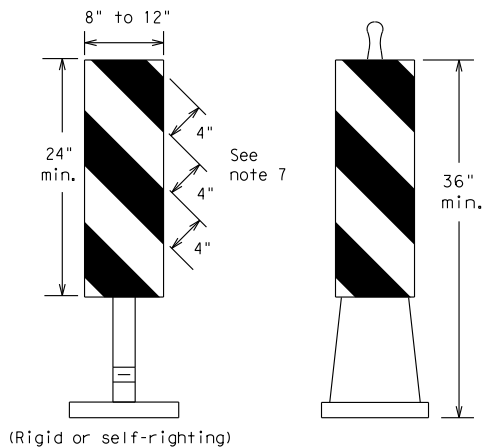
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FIXED
(Rigid or self-righting)

DRIVEABLE

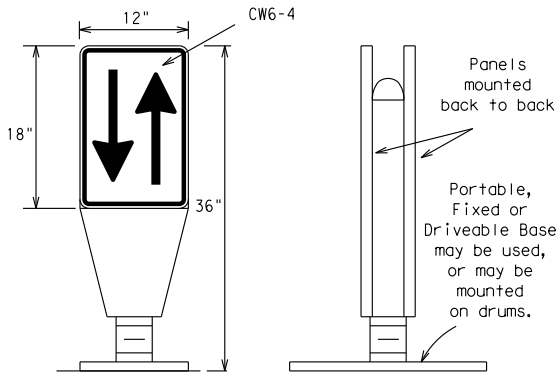


(Rigid or self-righting)

PORTABLE

VERTICAL PANELS (VPs)

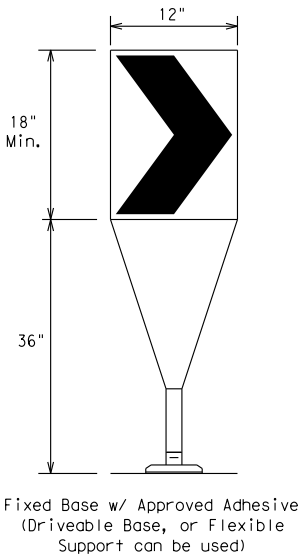
- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of VP's for drop-offs.
- VP's should be mounted back to back if used at the edge of cuts adjacent to two-way two lane roadways. Stripes are to be reflective orange and reflective white and should always slope downward toward the travel lane.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

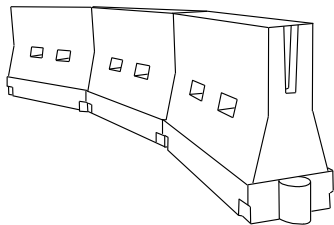
- Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- The OTLD shall be orange with a black non-reflective legend. Sheeting for the OTLD shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.

Williamson County, Texas



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
- Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
- To be effective, the chevron should be visible for at least 500 feet.
- Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B_{FL} or Type C_{FL} conforming to Departmental Material Specification DMS-8300, unless noted otherwise. The legend shall meet the requirements of DMS-8300.
- For Long Term Stationary use on tapers or transitions on freeways and divided highways self-righting chevrons may be used to supplement plastic drums but not to replace plastic drums.

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- LCDs used as barricades placed perpendicular to traffic should have at least one row of reflective sheeting meeting the requirements for barricade rails as shown on BC(10) placed near the top of the LCD along the full length of the device.

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
- Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

If used to channelize pedestrians, longitudinal channelizing devices or water ballasted systems must have a continuous detectable bottom for users of long canes and the top of the unit shall not be less than 32 inches in height.

HOLLOW OR WATER BALLASTED SYSTEMS USED AS LONGITUDINAL CHANNELIZING DEVICES OR BARRIERS

GENERAL NOTES

- Work Zone channelizing devices illustrated on this sheet may be installed in close proximity to traffic and are suitable for use on high or low speed roadways. The Engineer/Inspector shall ensure that spacing and placement is uniform and in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Channelizing devices shown on this sheet may have a driveable, fixed or portable base. The requirement for self-righting channelizing devices must be specified in the General Notes or other plan sheets.
- Channelizing devices on self-righting supports should be used in work zone areas where channelizing devices are frequently impacted by errant vehicles or vehicle related wind gusts making alignment of the channelizing devices difficult to maintain. Locations of these devices shall be detailed elsewhere in the plans. These devices shall conform to the TMUTCD and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- The Contractor shall maintain devices in a clean condition and replace damaged, nonreflective, faded, or broken devices and bases as required by the Engineer/Inspector. The Contractor shall be required to maintain proper device spacing and alignment.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- Pavement surfaces shall be prepared in a manner that ensures proper bonding between the adhesives, the fixed mount bases and the pavement surface. Adhesives shall be prepared and applied according to the manufacturer's recommendations.
- The installation and removal of channelizing devices shall not cause detrimental effects to the final pavement surfaces, including pavement surface discoloration or surface integrity. Driveable bases shall not be permitted on final pavement surfaces. The Engineer/Inspector shall approve all application and removal procedures of fixed bases.

Posted Speed *	Formula	Minimum Desirable Taper Lengths * *			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'
35		205'	225'	245'	35'	70'
40		265'	295'	320'	40'	80'
45	L = WS	450'	495'	540'	45'	90'
50		500'	550'	600'	50'	100'
55		550'	605'	660'	55'	110'
60		600'	660'	720'	60'	120'
65		650'	715'	780'	65'	130'
70		700'	770'	840'	70'	140'
75		750'	825'	900'	75'	150'
80		800'	880'	960'	80'	160'

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

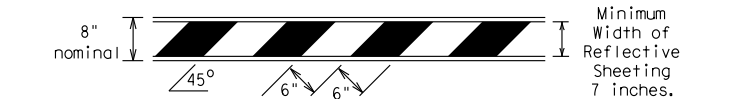
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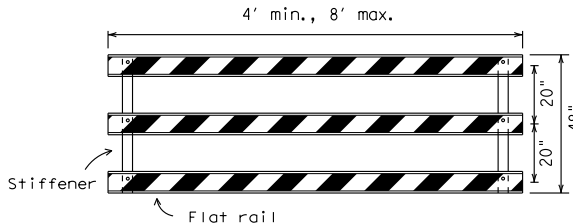
TYPE 3 BARRICADES

1. Refer to the Compliant Work Zone Traffic Control Devices List (CWZTCD) for details of the Type 3 Barricades and a list of all materials used in the construction of Type 3 Barricades.
2. Type 3 Barricades shall be used at each end of construction projects closed to all traffic.
3. Barricades extending across a roadway should have stripes that slope downward in the direction toward which traffic must turn in detouring. When both right and left turns are provided, the chevron striping may slope downward in both directions from the center of the barricade. Where no turns are provided at a closed road striping should slope downward in both directions toward the center of roadway.
4. Striping of rails, for the right side of the roadway, should slope downward to the left. For the left side of the roadway, striping should slope downward to the right.
5. Identification markings may be shown only on the back of the barricade rails. The maximum height of letters and/or company logos used for identification shall be 1".
6. Barricades shall not be placed parallel to traffic unless an adequate clear zone is provided.
7. Warning lights shall NOT be installed on barricades.
8. Where barricades require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand is recommended. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight. Sand bags shall not be stacked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.

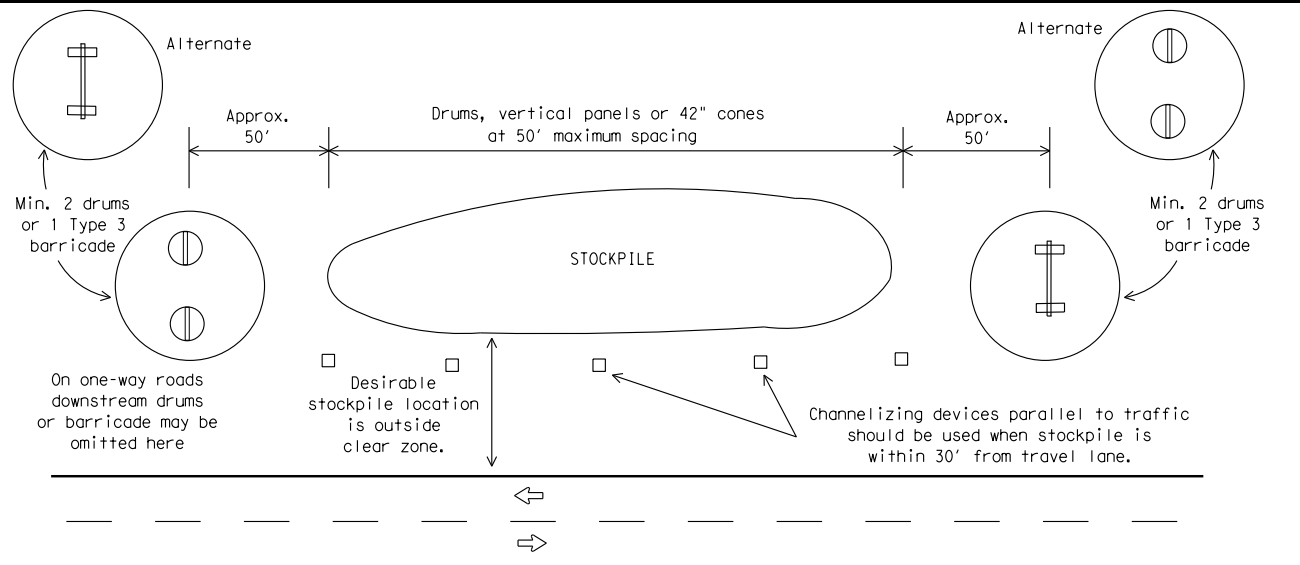


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

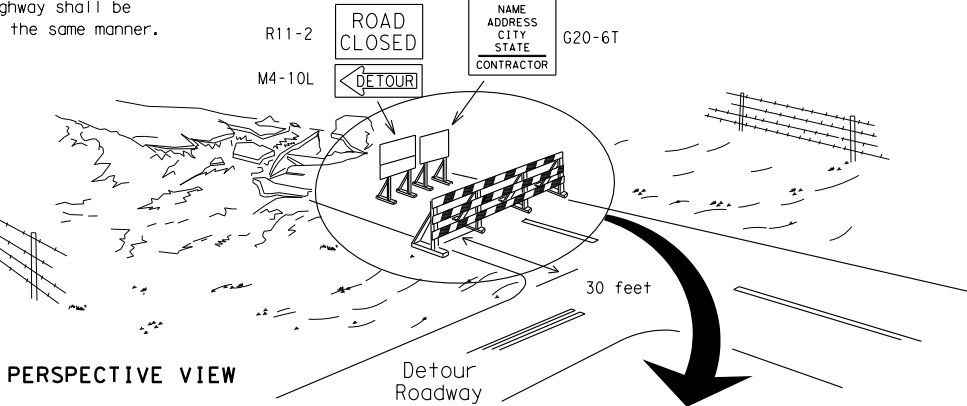
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Williamson County, Texas

Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

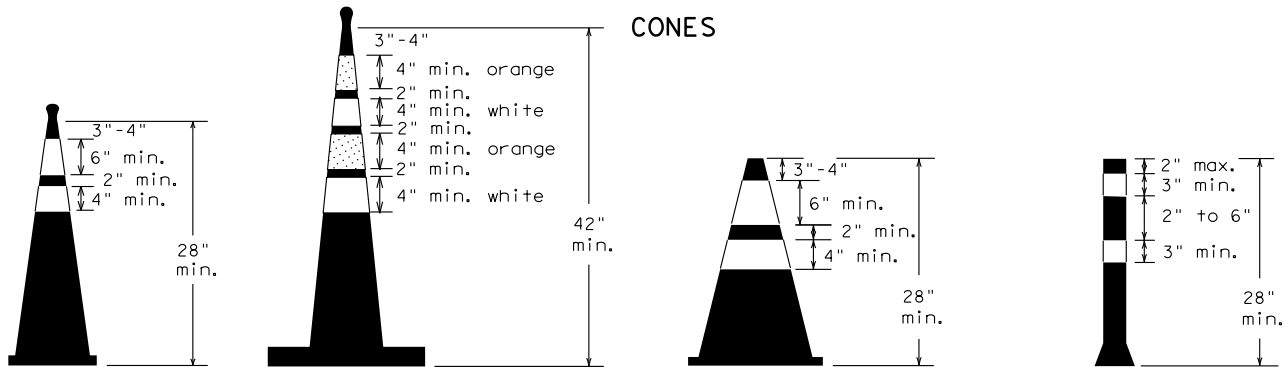
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

Barricade striping should slant downward in the direction of detour.

1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



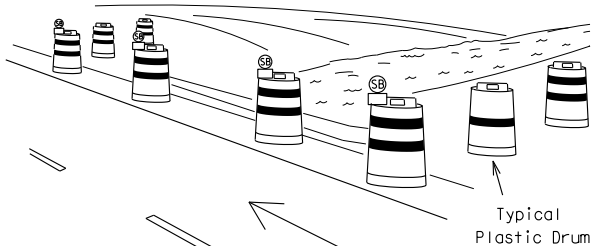
Two-Piece cones

One-Piece cones

Tubular Marker

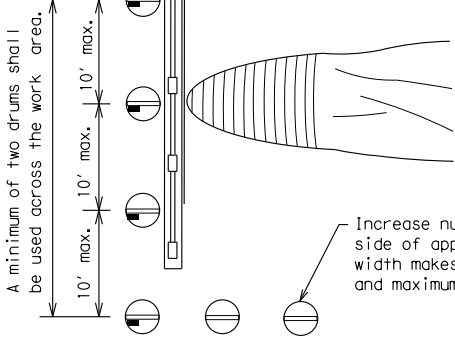
28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

1. Traffic cones and tubular markers shall be predominantly orange, and meet the height and weight requirements shown above.
2. One-piece cones have the body and base of the cone molded in one consolidated unit. Two-piece cones have a cone shaped body and a separate rubber base, or ballast, that is added to keep the device upright and in place.
3. Two-piece cones may have a handle or loop extending up to 8" above the minimum height shown, in order to aid in retrieving the device.
4. Cones or tubular markers used at night shall have white or white and orange reflective bands as shown above. The reflective bands shall have a smooth, sealed outer surface and meet the requirements of Departmental Material Specification DMS-8300 Type A.
5. 28" cones and tubular markers are generally suitable for short duration and short-term stationary work as defined on BC(4). These should not be used for intermediate-term or long-term stationary work unless personnel is on-site to maintain them in their proper upright position.
6. 42" two-piece cones, vertical panels or drums are suitable for all work zone durations.
7. Cones or tubular markers used on each project should be of the same size and shape.



PERSPECTIVE VIEW

These drums are not required on one-way roadway



PLAN VIEW

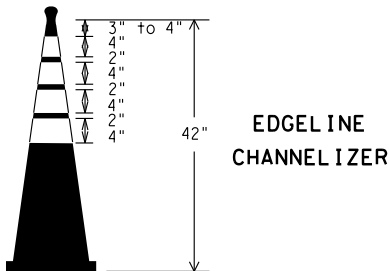
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

1. Where positive redirection capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder width is greater than 12 feet, steady-burn lights may be omitted if drums are used.
5. Drums must extend the length of the culvert widening.

LEGEND

	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
9-07 8-14				
7-13				
	DIST	COUNTY		SHEET NO.
				51

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WORK ZONE PAVEMENT MARKINGS

GENERAL

- 1. The Contractor shall be responsible for maintaining work zone and existing pavement markings, in accordance with the standard specifications and special provisions, on all roadways open to traffic within the CSJ limits unless otherwise stated in the plans.
- 2. Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- 3. Additional supplemental pavement marking details may be found in the plans or specifications.
- 4. Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 5. When short term markings are required on the plans, short term markings shall conform with the TMUTCD, the plans and details as shown on the Standard Plan Sheet WZ(STPM).
- 6. When standard pavement markings are not in place and the roadway is opened to traffic, DO NOT PASS signs shall be erected to mark the beginning of the sections where passing is prohibited and PASS WITH CARE signs at the beginning of sections where passing is permitted.
- 7. All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- 1. Raised pavement markers are to be placed according to the patterns on BC(12).
- 2. All raised pavement markers used for work zone markings shall meet the requirements of Item 672, "RAISED PAVEMENT MARKERS" and Departmental Material Specification DMS-4200 or DMS-4300.

PREFABRICATED PAVEMENT MARKINGS

- 1. Removable prefabricated pavement markings shall meet the requirements of DMS-8241.
- 2. Non-removable prefabricated pavement markings (foil back) shall meet the requirements of DMS-8240.

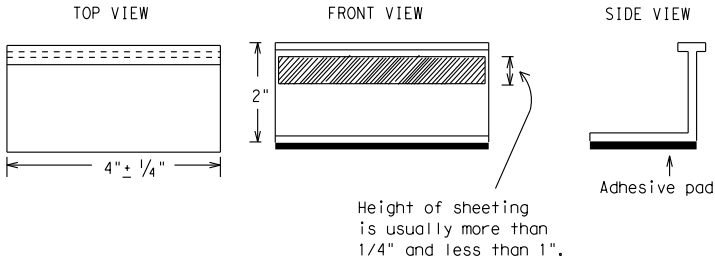
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 1. The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 2. Work zone pavement markings shall be inspected in accordance with the frequency and reporting requirements of work zone traffic control device inspections as required by Form 599.
- 3. The markings should provide a visible reference for a minimum distance of 300 feet during normal daylight hours and 160 feet when illuminated by automobile low-beam headlights at night, unless sight distance is restricted by roadway geometrics.
- 4. Markings failing to meet this criteria within the first 30 days after placement shall be replaced at the expense of the Contractor as per Specification Item 662.

REMOVAL OF PAVEMENT MARKINGS

- 1. Pavement markings that are no longer applicable, could create confusion or direct a motorist toward or into the closed portion of the roadway shall be removed or obliterated before the roadway is opened to traffic.
- 2. The above shall not apply to detours in place for less than three days, where flaggers and/or sufficient channelizing devices are used in lieu of markings to outline the detour route.
- 3. Pavement markings shall be removed to the fullest extent possible, so as not to leave a discernable marking. This shall be by any method approved by TxDOT Specification Item 677 for "Eliminating Existing Pavement Markings and Markers".
- 4. The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- 5. Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- 6. Blast cleaning may be used but will not be required unless specifically shown in the plans.
- 7. Over-painting of the markings SHALL NOT BE permitted.
- 8. Removal of raised pavement markers shall be as directed by the Engineer.
- 9. Removal of existing pavement markings and markers will be paid for directly in accordance with Item 677, "ELIMINATING EXISTING PAVEMENT MARKINGS AND MARKERS," unless otherwise stated in the plans.
- 10.Black-out marking tape may be used to cover conflicting existing markings for periods less than two weeks when approved by the Engineer.

Temporary Flexible-Reflective Roadway Marker Tabs



STAPLES OR NAILS SHALL NOT BE USED TO SECURE TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS TO THE PAVEMENT SURFACE

- 1. Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 2. Tabs detailed on this sheet are to be inspected and accepted by the Engineer or designated representative. Sampling and testing is not normally required, however at the option of the Engineer, either "A" or "B" below may be imposed to assure quality before placement on the roadway.
 - A. Select five (5) or more tabs at random from each lot or shipment and submit to the Construction Division, Materials and Pavement Section to determine specification compliance.
 - B. Select five (5) tabs and perform the following test. Affix five (5) tabs at 24 inch intervals on an asphaltic pavement in a straight line. Using a medium size passenger vehicle or pickup, run over the markers with the front and rear tires at a speed of 35 to 40 miles per hour, four (4) times in each direction. No more than one (1) out of the five (5) reflective surfaces shall be lost or displaced as a result of this test.
- 3. Small design variances may be noted between tab manufacturers.
- 4. See Standard Sheet WZ(STPM) for tab placement on new pavements. See Standard Sheet TCP(7-1) for tab placement on seal coat work.

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

- 1. Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- 2. All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 3. Adhesive for guidemarks shall be bituminous material hot applied or butyl rubber pad for all surfaces, or thermoplastic for concrete surfaces.

Guidemarks shall be designated as:
YELLOW - (two amber reflective surfaces with yellow body).
WHITE - (one silver reflective surface with white body).

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
TRAFFIC BUTTONS	DMS-4300
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY REMOVABLE, PREFABRICATED PAVEMENT MARKINGS	DMS-8241
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS	DMS-8242

A list of prequalified reflective raised pavement markers, non-reflective traffic buttons, roadway marker tabs and other pavement markings can be found at the Material Producer List web address shown on BC(1).

SHEET 11 OF 12

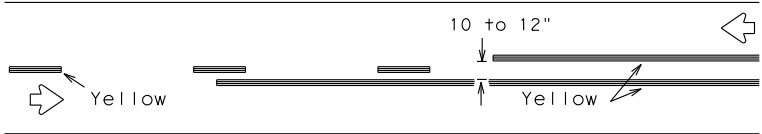


BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

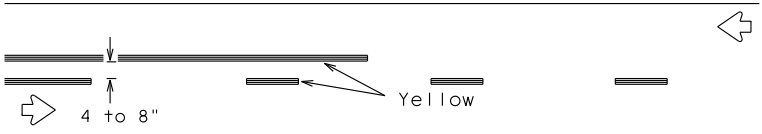
BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS				
2-98 9-07	DIST	COUNTY		SHEET NO.
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PAVEMENT MARKING PATTERNS

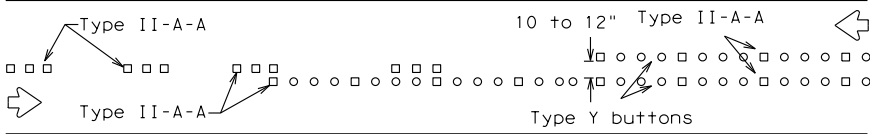


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

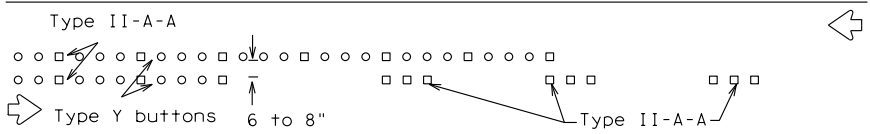


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

Pattern A is the TXDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectORIZED pavement markings.

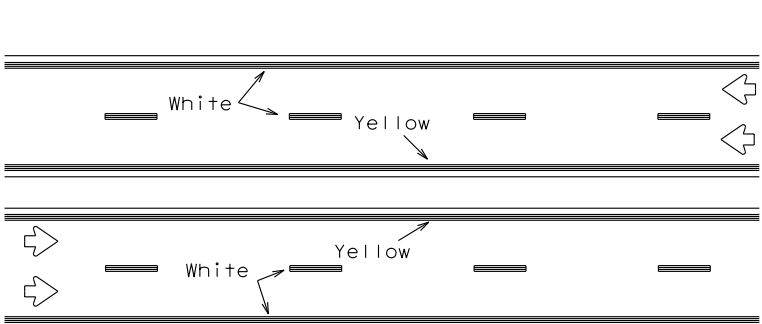


RAISED PAVEMENT MARKERS - PATTERN A



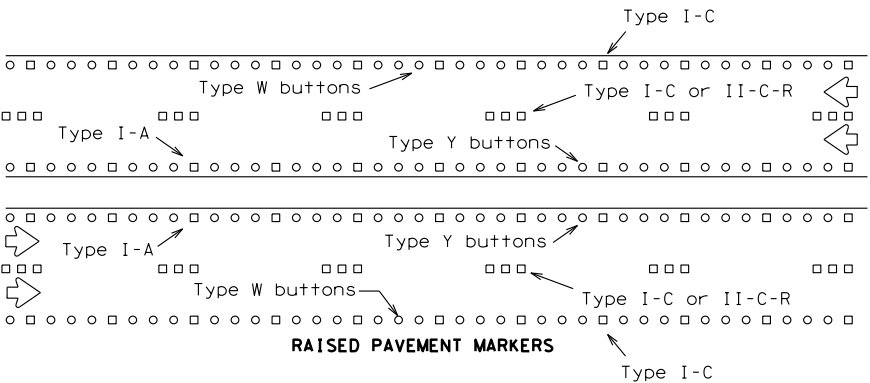
RAISED PAVEMENT MARKERS - PATTERN B

CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO-LANE, TWO-WAY HIGHWAYS



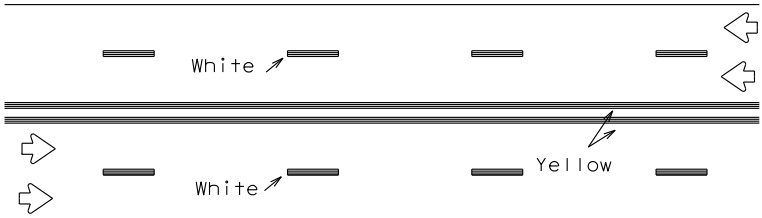
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



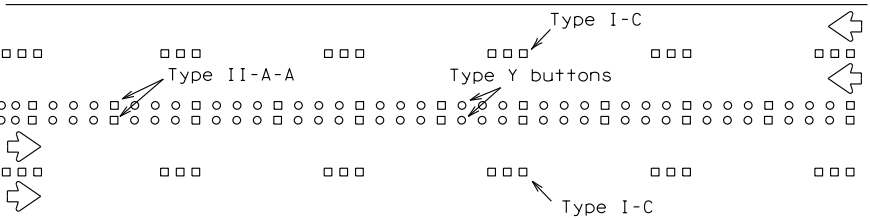
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



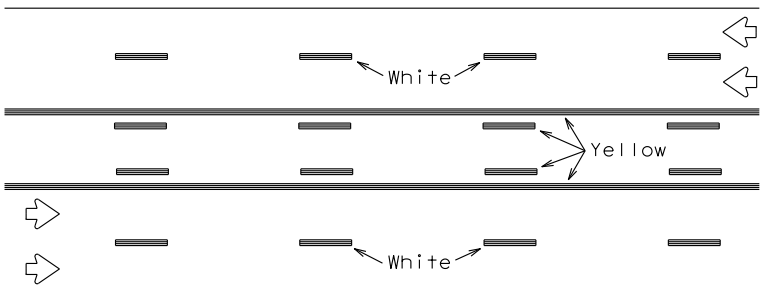
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



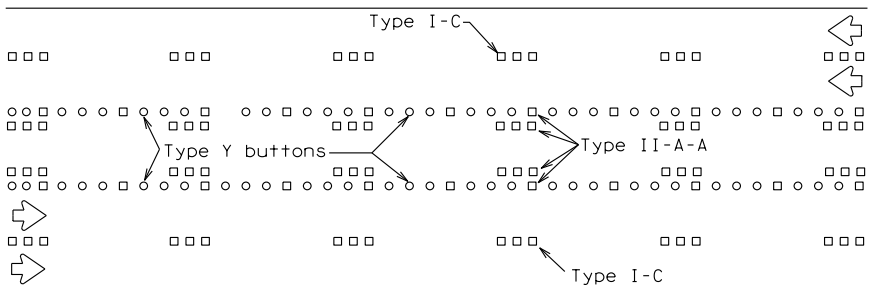
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

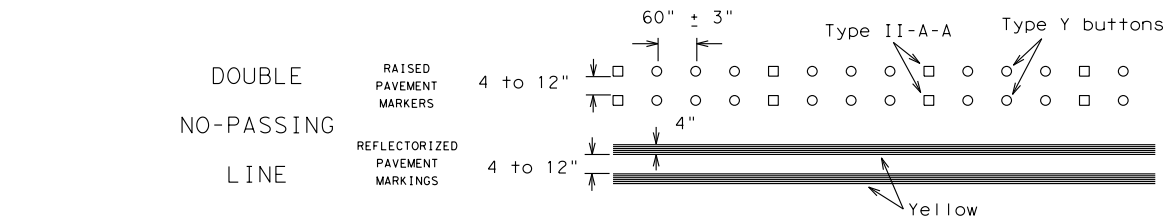
Prefabricated markings may be substituted for reflectORIZED pavement markings.



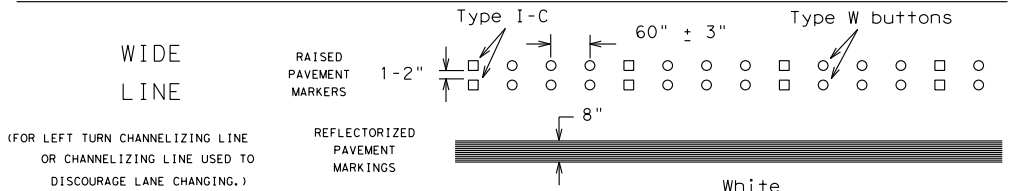
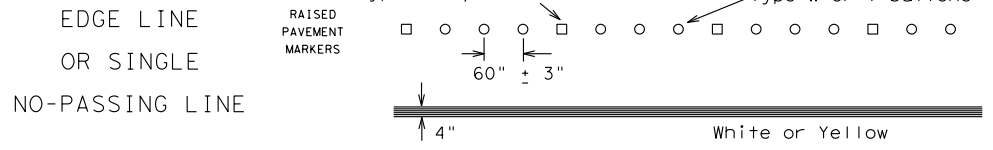
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

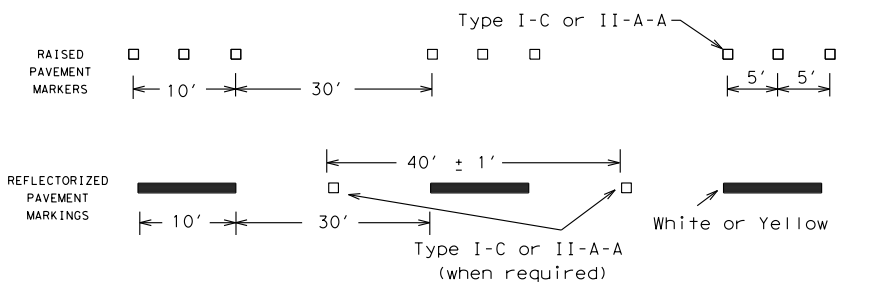
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



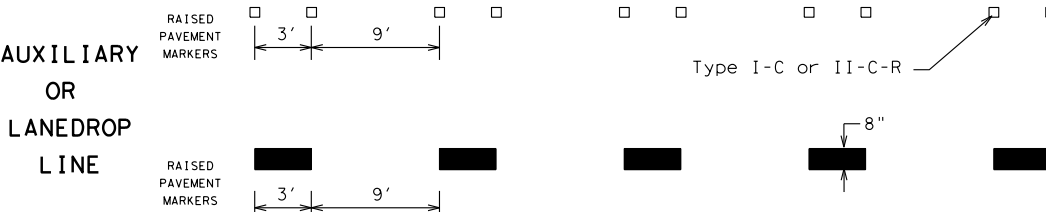
SOLID LINES



CENTER LINE OR LANE LINE

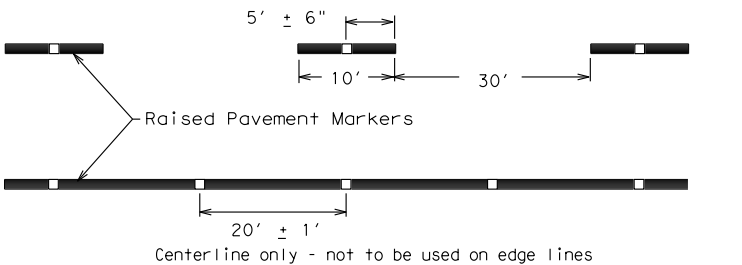


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

If raised pavement markers are used to supplement REMOVABLE markings, the markers shall be applied to the top of the tape at the approximate mid length of tape used for broken lines or at 20 foot spacing for solid lines. This allows an easier removal of raised pavement markers and tape.



SHEET 12 OF 12



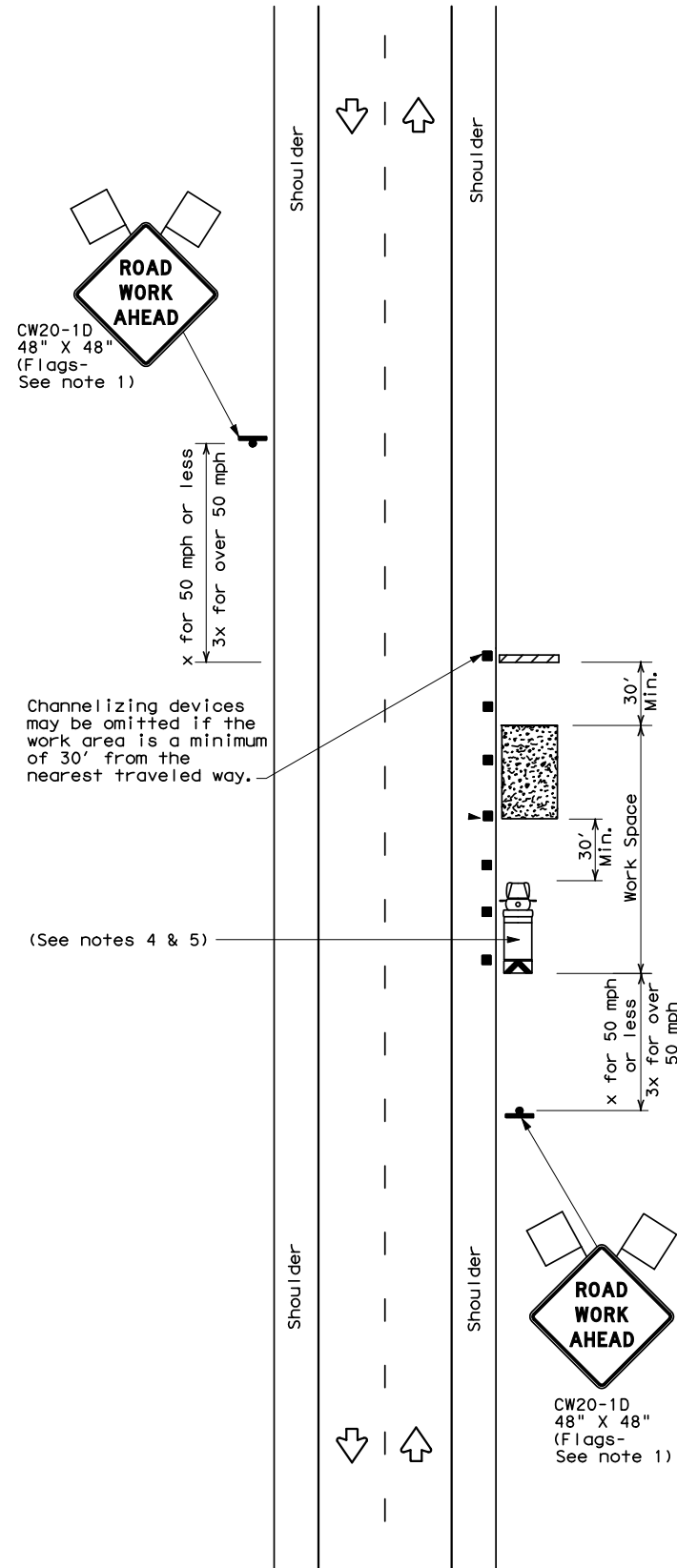
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
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REVISIONS				
1-97 9-07				
2-98 7-13				
11-02 8-14				
	DIST	COUNTY	SHEET NO.	
			53	

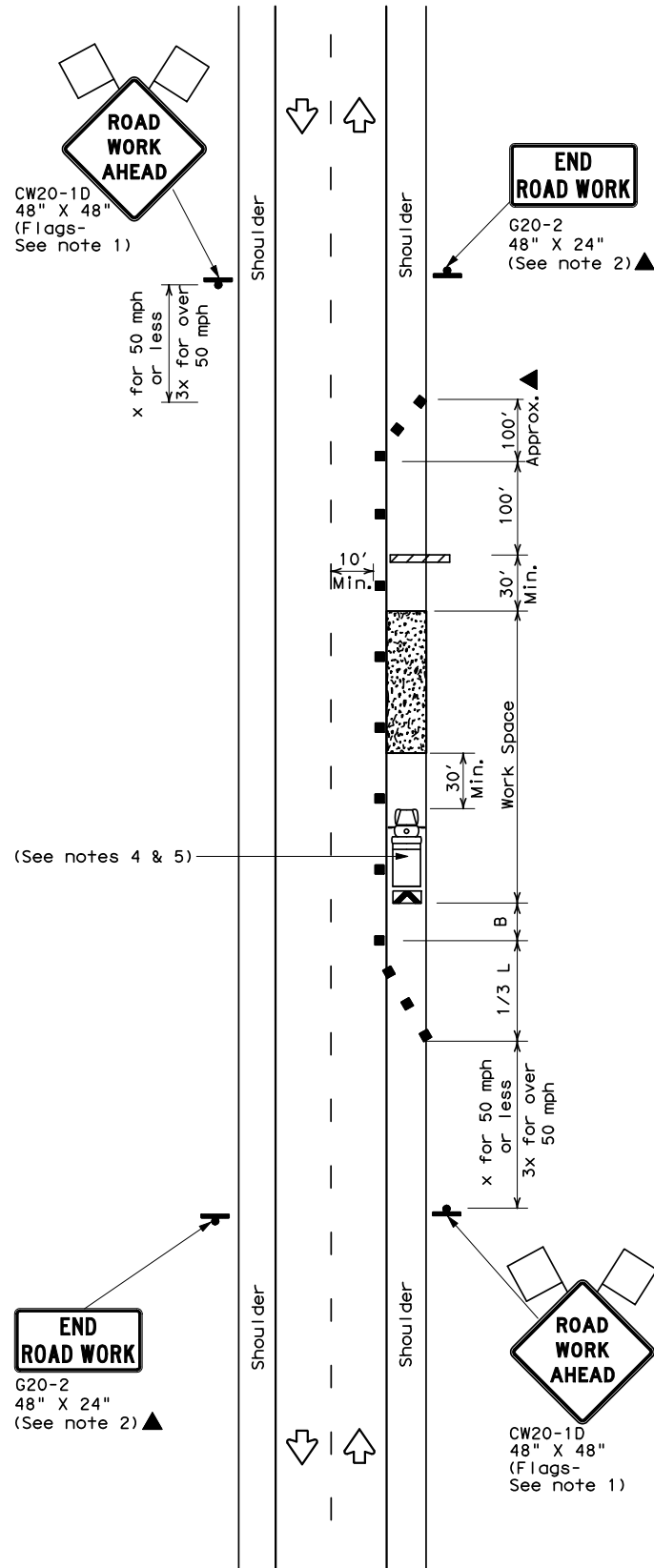
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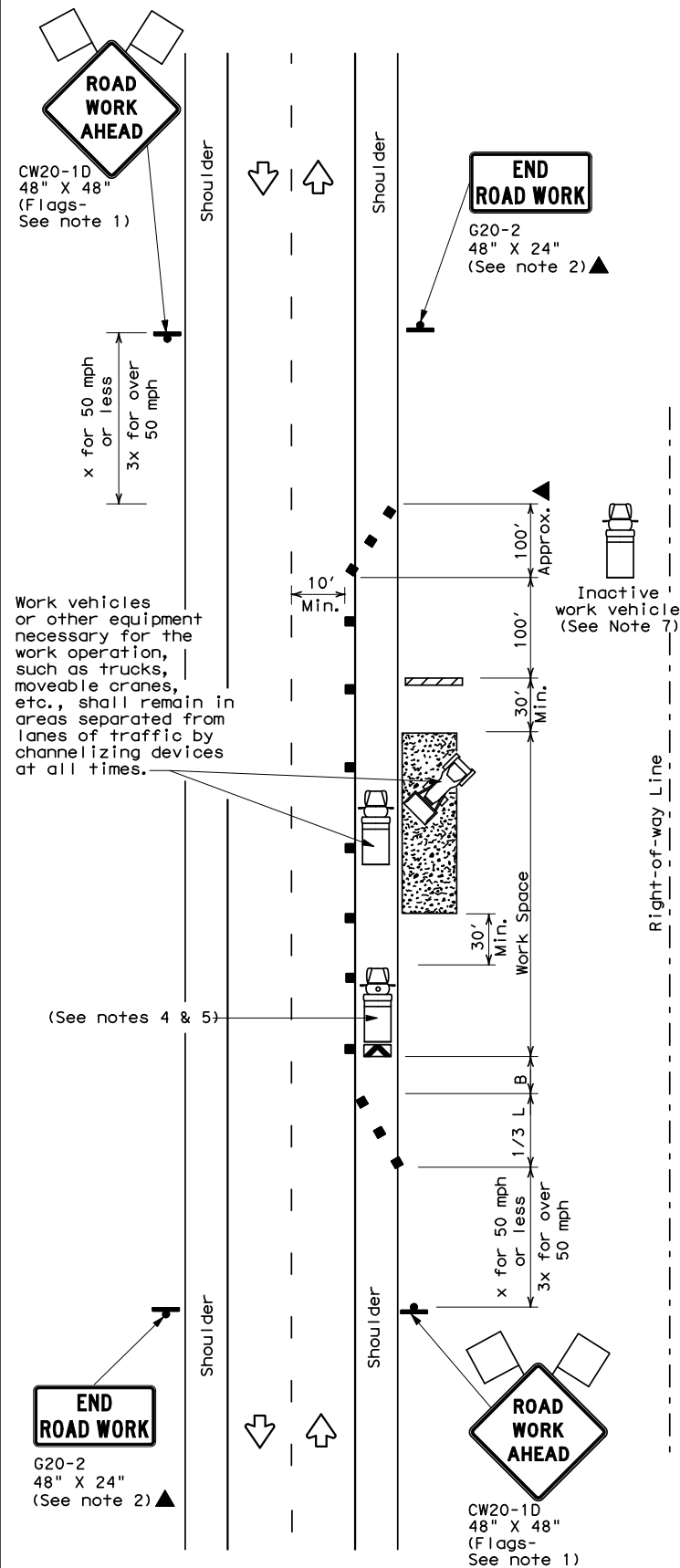
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths **			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

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

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

GENERAL NOTES

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

For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.



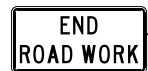
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (2-1) -12

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REVISIONS		CONT	SECT	JOB	HIGHWAY
2-94	2-12				
8-95					
1-97					
4-98					
		DIST	COUNTY		SHEET NO.
					54
					161



DATE: 11/29/2018
FILE: 812 AM



For construction or maintenance contract work, specific project requirements for shadow vehicles can be found in the project GENERAL NOTES for Item 502, Barricades, Signs and Traffic Handling.

Posted Speed *	Formula	Minimum Desirable Taper Lengths * *			Suggested Maximum Spacing of Channelizing Devices		Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent			
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L = WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

L=Length of Taper (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

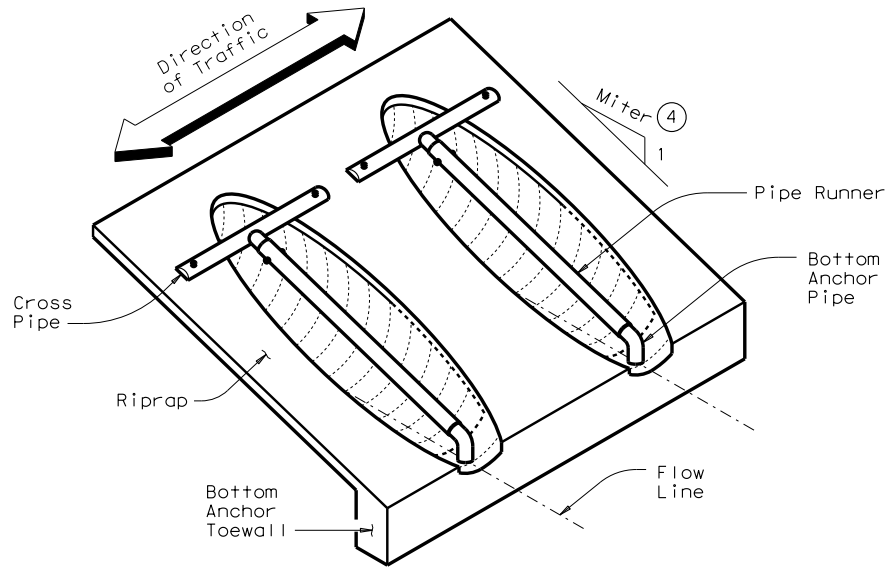
TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
	✓	✓	✓	

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

8. The R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work space should be no longer than one half city block. In rural areas, roadways with less than 2000 ADT, work space should be no longer than 400 feet.
9. The R1-2aP "YIELD TO ONCOMING TRAFFIC" sign shall be placed on a support at a 7 foot minimum mounting height.

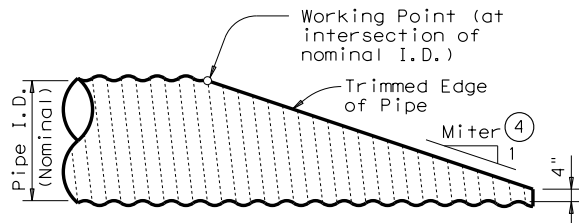
10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

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ISOMETRIC VIEW OF TYPICAL INSTALLATION

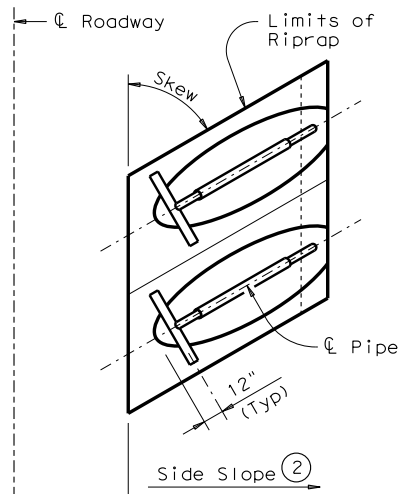
(Showing installation with no skew.)



NOTE: All Pipe Runners, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert. Details of Concrete Pipe Culvert are similar.)



PLAN OF SKEWED INSTALLATION

CROSS PIPE LENGTHS, PIPE RUNNER LENGTHS, & REQUIRED PIPE SIZES

CORRUGATED METAL PIPE CULVERTS

Design	Pipe Culvert+ Span	Pipe Culvert+ Rise	Pipe Culvert+ Spa ~ G	Cross Pipe Length	Pipe Runner Length											
					3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
					0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
1	17"	13"	1'- 0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	21"	15"	1'- 2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	28"	20"	1'- 5"	3'- 9"	N/A	N/A	3'- 5"	4'- 7"	N/A	N/A	4'- 11"	6'- 5"	N/A	N/A	7'- 11"	10'- 2"
4	35"	24"	1'- 8"	4'- 4"	3'- 10"	4'- 0"	4'- 7"	6'- 0"	5'- 5"	5'- 8"	6'- 6"	8'- 4"	8'- 8"	9'- 1"	10'- 3"	12'- 11"
5	42"	29"	1'- 11"	4'- 11"	5'- 1"	5'- 4"	6'- 1"	7'- 10"	7'- 2"	7'- 5"	8'- 6"	10'- 9"	11'- 2"	11'- 8"	13'- 2"	16'- 6"
6	49"	33"	2'- 2"	5'- 6"	6'- 2"	6'- 5"	7'- 4"	N/A	8'- 6"	8'- 10"	10'- 0"	N/A	13'- 3"	13'- 9"	15'- 6"	N/A
7	57"	38"	2'- 5"	6'- 2"	7'- 6"	7'- 9"	N/A	N/A	10'- 2"	10'- 7"	N/A	N/A	15'- 9"	16'- 4"	N/A	N/A

CONCRETE PIPE CULVERTS

Design	Pipe Culvert+ Span	Pipe Culvert+ Rise	Pipe Culvert+ Spa ~ G	Cross Pipe Length	Pipe Runner Length											
					3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
					0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
1	22"	13 1/2"	1'- 0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	26"	15 1/2"	1'- 2"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	28 1/2"	18"	1'- 5"	3'- 9 1/2"	N/A	N/A	2'- 10"	3'- 10"	N/A	N/A	4'- 2"	5'- 5"	N/A	N/A	6'- 9"	8'- 9"
4	36 1/4"	22 1/2"	1'- 8"	4'- 5 1/4"	3'- 5"	3'- 7"	4'- 2"	5'- 6"	4'- 11"	5'- 1"	5'- 11"	7'- 7"	7'- 11"	8'- 3"	9'- 5"	11'- 11"
5	43 3/4"	26 5/8"	1'- 11"	5'- 0 3/4"	4'- 6"	4'- 8"	5'- 5"	6'- 11"	6'- 4"	6'- 7"	7'- 6"	9'- 7"	10'- 0"	10'- 5"	11'- 9"	14'- 10"
6	51 1/8"	31 5/16"	2'- 2"	5'- 8"	5'- 9"	6'- 0"	6'- 10"	N/A	7'- 11"	8'- 3"	9'- 4"	N/A	12'- 4"	12'- 10"	14'- 6"	N/A
7	58 1/2"	36"	2'- 5"	6'- 3 1/2"	6'- 11"	7'- 3"	N/A	N/A	9'- 6"	9'- 11"	N/A	N/A	14'- 9"	15'- 4"	N/A	N/A

TYPICAL PIPE CULVERT MITERS

Side Slope	0° Skew	15° Skew	30° Skew	45° Skew
3:1	3:1	3.106:1	3.464:1	4.243:1
4:1	4:1	4.141:1	4.619:1	5.657:1
6:1	6:1	6.212:1	6.928:1	8.485:1

STANDARD PIPE SIZES & MAX PIPE RUNNER LENGTHS

Pipe Size	Pipe O.D.	Pipe I.D.	Max Pipe Runner Length
2" STD	2.375"	2.067"	N/A
3" STD	3.500"	3.068"	10'- 0"
4" STD	4.500"	4.026"	19'- 8"
5" STD	5.563"	5.047"	34'- 2"

CONDITIONS WHERE PIPE RUNNERS ARE NOT REQUIRED

Design	Single Pipe Culvert	Multiple Pipe Culverts
1 & 2	Skews thru 45°	Skews thru 45°
3	Skews thru 30°	Skews thru 15°
4	Normal (No Skew)	Always required
5 thru 7	Always required	Always required

GENERAL NOTES:

Pipe Runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

The Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Pipe Runners.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Pipe Runners, Cross Pipes, and Anchor Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

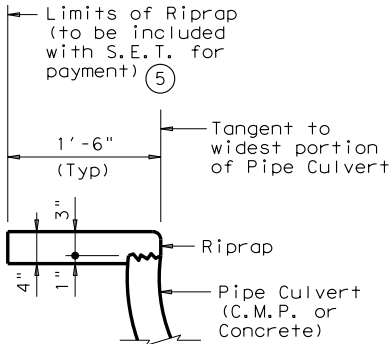
All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

SHEET 1 OF 3

					Bridge Division Standard	
SAFETY END TREATMENT						
FOR DESIGN 1 TO 7						
ARCH PIPE CULVERTS						
TYPE II ~ CROSS DRAINAGE						
SETP-CD-A						
FILE: setpcase.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF		
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY		
REVISIONS						
11-10: Add note for synthetic fibers.						
DIST		COUNTY			SHEET NO.	
					568	

ESTIMATED CONCRETE RIPRAP QUANTITIES (CY) ⑥
BOTH CORRUGATED METAL PIPE CULVERTS AND CONCRETE PIPE CULVERTS

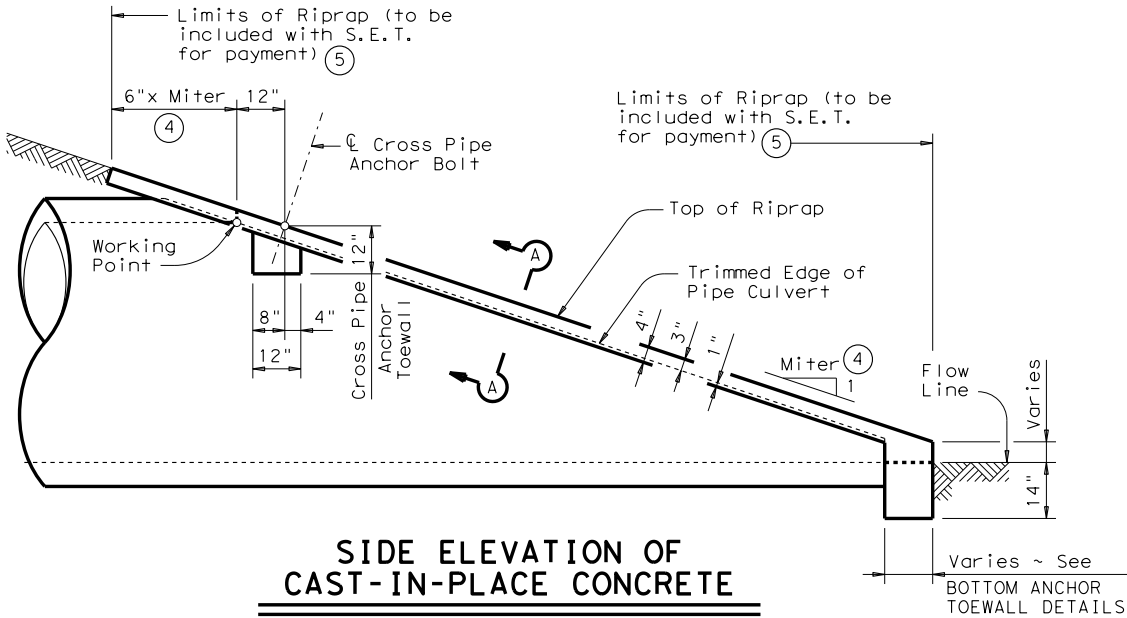
Design	3:1 Side Slope				4:1 Side Slope				6:1 Side Slope			
	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew	0° Skew	15° Skew	30° Skew	45° Skew
1	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.9
2	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	1.0
3	0.6	0.6	0.7	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.2
4	0.7	0.7	0.8	0.9	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.4
5	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.3	1.4	1.7
6	0.9	1.0	1.0	N/A	1.1	1.1	1.2	N/A	1.4	1.5	1.6	N/A
7	1.0	1.1	N/A	N/A	1.3	1.3	N/A	N/A	1.7	1.7	N/A	N/A



SHOWING TYPICAL PIPE CULVERT & RIPRAP

SECTION A-A

- ④ Miter = Slope of Mitered Pipe Culvert End
- ⑤ Riprap placed beyond the limits shown will be paid as Concrete Riprap in accordance with Item 432, "Riprap".
- ⑥ Quantities shown are for one end of one Pipe Culvert. For multiple Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert. Details of Corrugated Metal Pipe Culvert are similar. Pipe Runners not shown for clarity)

SHEET 2 OF 3



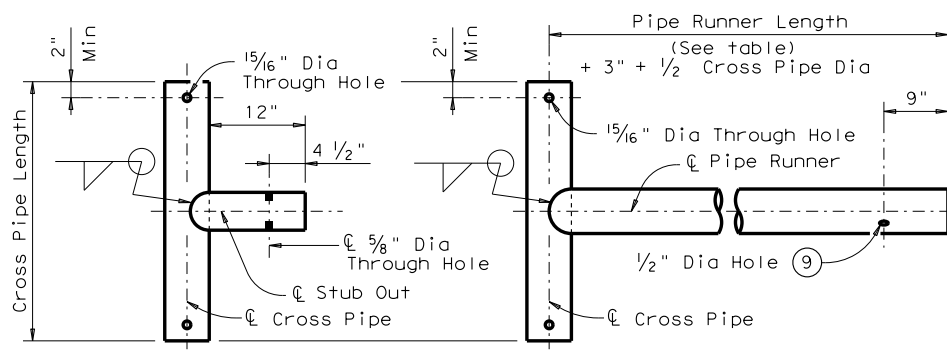
SAFETY END TREATMENT
FOR DESIGN 1 TO 7
ARCH PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD-A

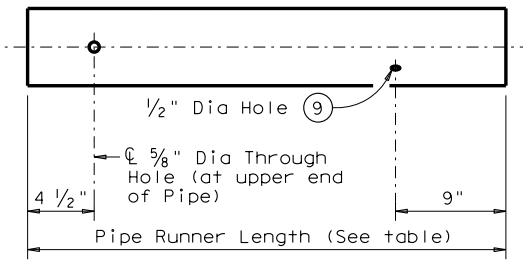
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Add note for synthetic fibers.	DIST	COUNTY		SHEET NO.

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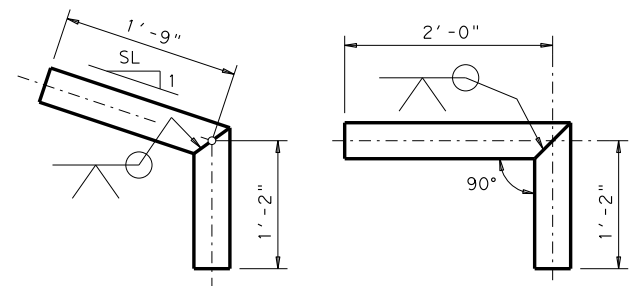


CROSS PIPE AND CONNECTIONS DETAILS

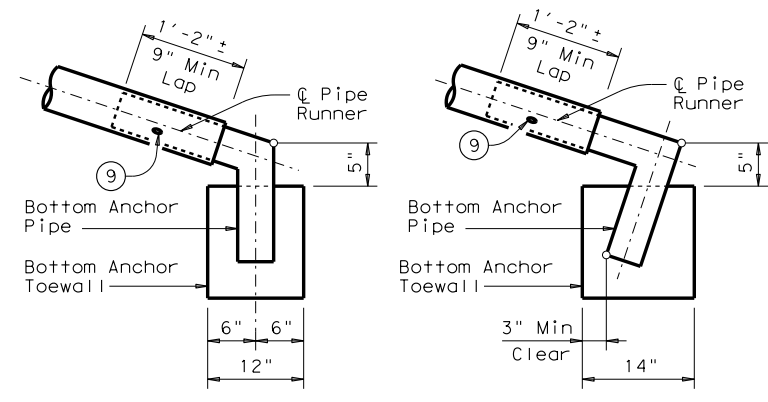


NOTE: The separate Pipe Runner shown is required when Cross Pipe Connection Option A1 is used.

PIPE RUNNER DETAILS

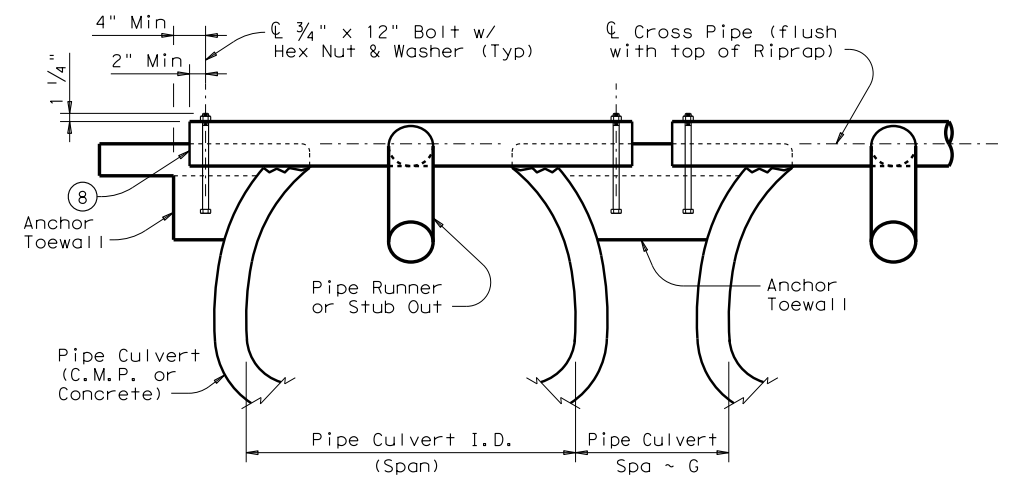


BOTTOM ANCHOR PIPE DETAILS

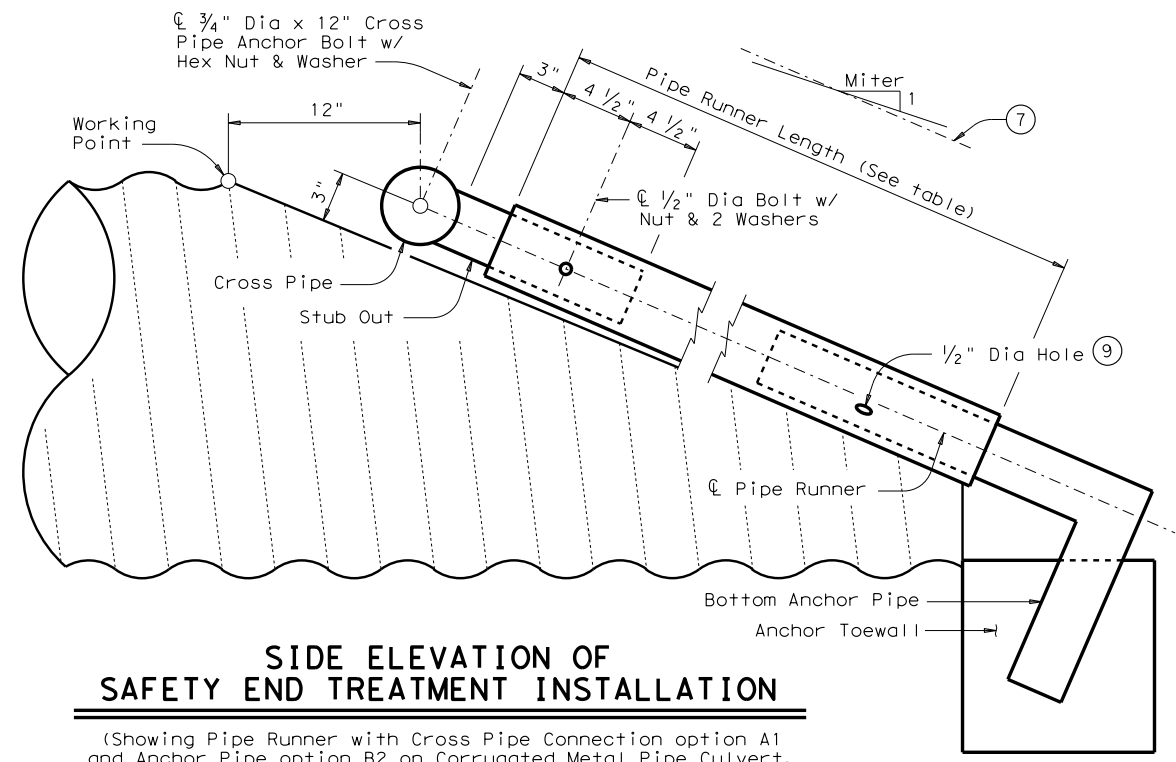


BOTTOM ANCHOR TOEWALL DETAILS

(Culvert & Riprap not shown for clarity)



SECTION A-A



SIDE ELEVATION OF SAFETY END TREATMENT INSTALLATION

(Showing Pipe Runner with Cross Pipe Connection option A1 and Anchor Pipe option B2 on Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Riprap not shown for clarity)

- ⑦ Note that actual slope of Pipe Runner may vary slightly from Side Slope of Riprap and trimmed Culvert Pipe edge.
- ⑧ Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access.
- ⑨ After installation, the 1/2 inch hole shall be inspected to ensure that the lap of the Pipe Runner with the Bottom Anchor Pipe is adequate.
- ⑩ At fabricator's option, a heat bend to a smooth 5 inch radius or a manufactured elbow (of the same material as the Runner) may be substituted for the mitered and welded joint in the Bottom Anchor Pipe.

SHEET 3 OF 3

Bridge Division Standard

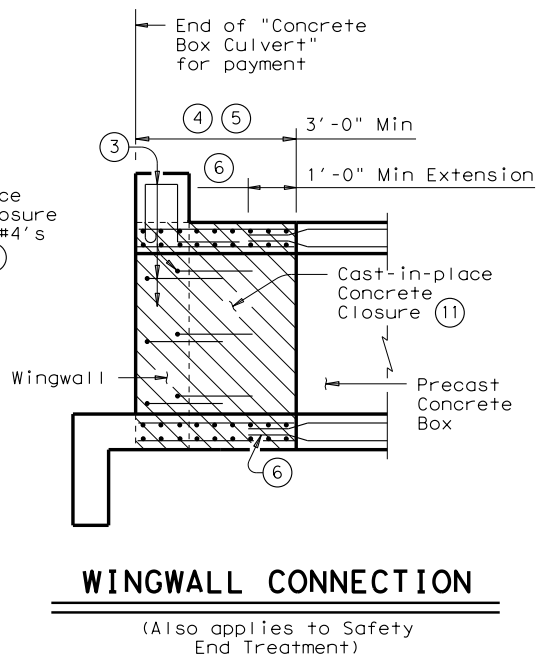
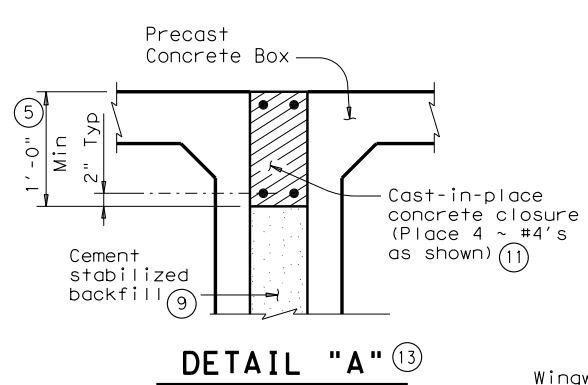
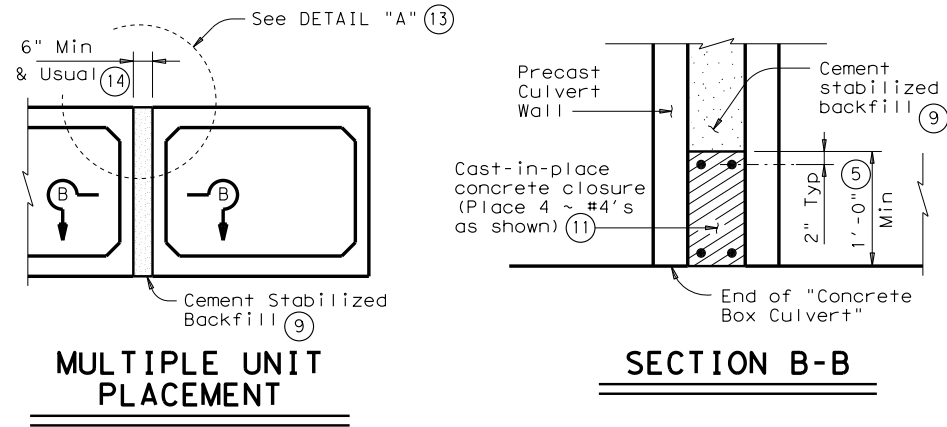
SAFETY END TREATMENT
FOR DESIGN 1 TO 7
ARCH PIPE CULVERTS
TYPE II ~ CROSS DRAINAGE

SETP-CD-A

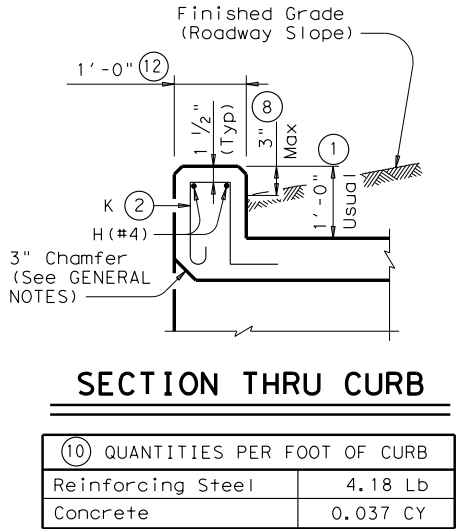
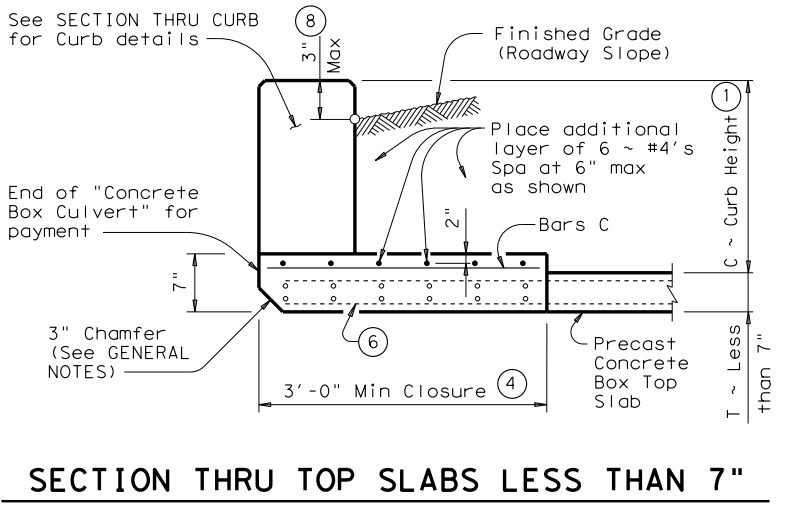
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
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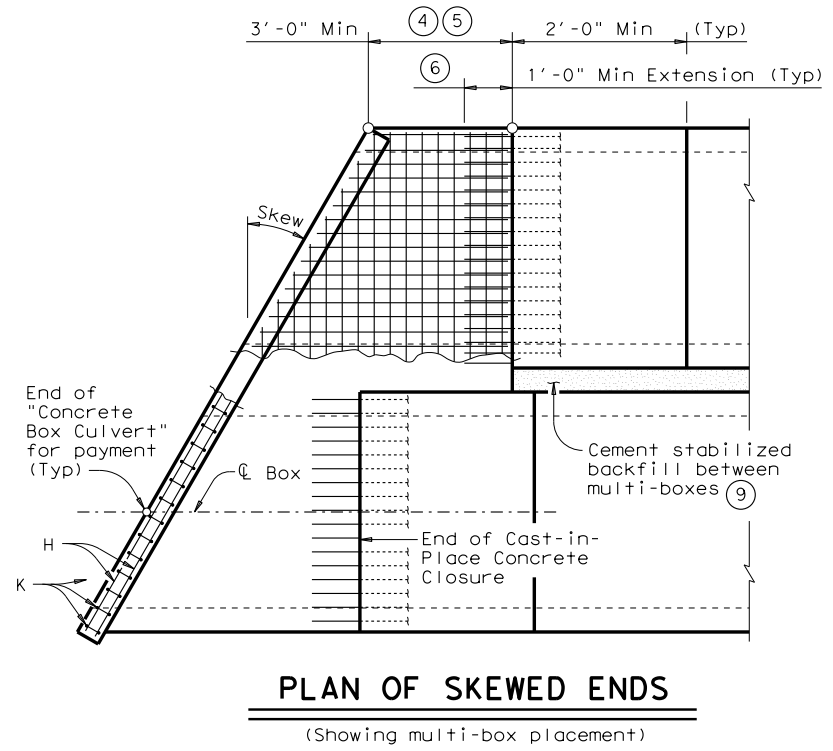
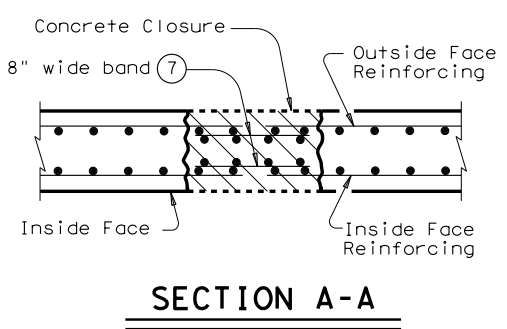
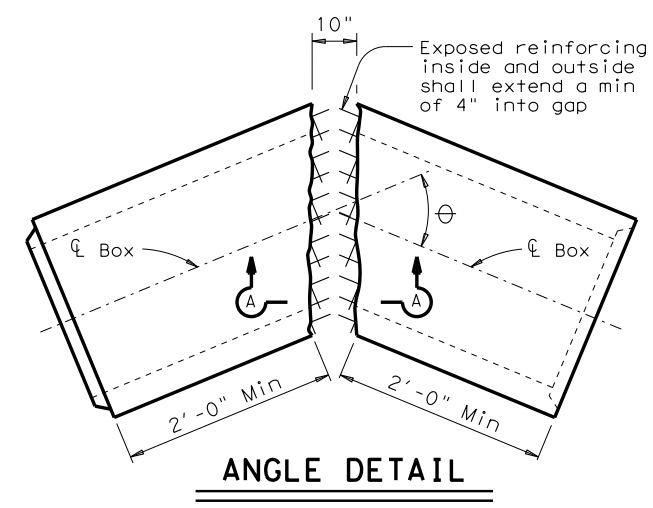
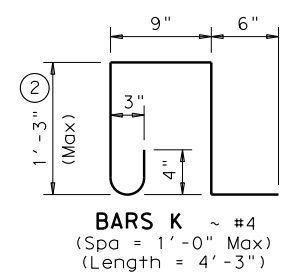


- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.
- Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.
- For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.
- Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).
- Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
 - For structures with bridge rail, curbs shall be flush with finished grade.Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.
- All curb concrete and reinforcing is considered part of the Box Culvert for payment.
- Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
- 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.
- For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".
- This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.



2'-9"

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



GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Substructures".

Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.

Refer to the Single Box Culverts Precast standard for details not shown.

The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.

HL93 LOADING

		Bridge Division Standard	
BOX CULVERTS			
PRECAST			
MISCELLANEOUS DETAILS			
SCP-MD			
FILE: scpmdsts.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT
©TxDOT February 2010	CONT	SECT	JOB
REVISIONS		DIST	COUNTY
		SHEET NO.	

9/2018 DATE: FILE:

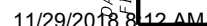
~~Williamson County, Texas~~

~~Bid 1811-281~~

- ① For Box Length = 8'-0"
- ② As1 thru As4, As7 and As8 are minimum required areas of reinforcement per linear foot of box length. As6 and As5 are minimum required areas of reinforcement per linear foot of box width.



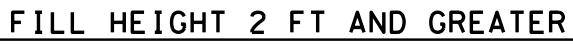
HL93 LOADING



SECTION DIMENSIONS					Fill Height (ft)	M (Min) (in)	REINFORCING (in ² /ft) ②								Lift Weight (Tons) ①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
10	5	10	10	10	<2	-	0.30	0.36	0.30	0.24	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2<3	58	0.35	0.39	0.34	0.24	-	-	-	-	17.5
10	5	10	10	10	3-5	53	0.28	0.31	0.30	0.24	-	-	-	-	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	-	-	-	-	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	-	-	-	-	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	-	-	-	-	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	-	-	-	-	17.5
10	6	10	10	10	<2	-	0.28	0.38	0.33	0.24	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2<3	58	0.32	0.42	0.37	0.24	-	-	-	-	18.5
10	6	10	10	10	3-5	52	0.26	0.34	0.33	0.24	-	-	-	-	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	-	-	-	-	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	-	-	-	-	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	-	-	-	-	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	-	-	-	-	18.5
10	7	10	10	10	<2	-	0.25	0.40	0.36	0.24	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2<3	58	0.30	0.45	0.40	0.24	-	-	-	-	19.5
10	7	10	10	10	3-5	58	0.24	0.36	0.35	0.24	-	-	-	-	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	-	-	-	-	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	-	-	-	-	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	-	-	-	-	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	-	-	-	-	19.5
10	8	10	10	10	<2	-	0.24	0.41	0.38	0.24	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2<3	64	0.27	0.47	0.43	0.24	-	-	-	-	20.5
10	8	10	10	10	3-5	58	0.24	0.38	0.38	0.24	-	-	-	-	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	-	-	-	-	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	-	-	-	-	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	-	-	-	-	20.5
10	9	10	10	10	<2	-	0.24	0.42	0.41	0.24	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2<3	70	0.26	0.50	0.46	0.24	-	-	-	-	21.5
10	9	10	10	10	3-5	64	0.24	0.40	0.40	0.24	-	-	-	-	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	-	-	-	-	2

DATE: 9/20/2008
FILE: 0808

- ① For Box Length = 8'-0"
- ② As1 thru As4, As7 and As8 are minimum required areas of reinforcement per linear foot of box length. As6 and As5 are minimum required areas of reinforcement per linear foot of box width.



GENERAL NOTES:

Designs shown conform to ASTM C1577.
Refer to ASTM C1577 for information or details not shown.

All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.

See SCP-PM standard sheet for miscellaneous details and notes not shown.

In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING



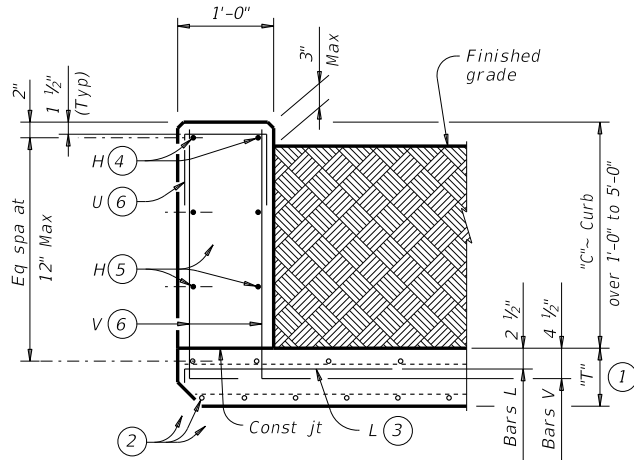
*SINGLE BOX CULVERTS
PRECAST
10'-0" SPAN*

Bridge Division Standard

SCP-10

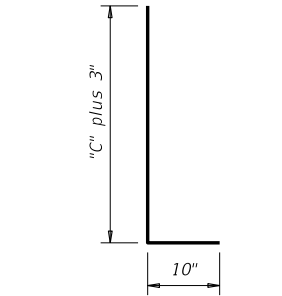
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©TxDOT	February 2010	CONT	SECT	JOB			HIGHWAY		
REVISIONS									
		DIST	COUNTY					SHEET NO.	
							61		
							p 1 of 3		

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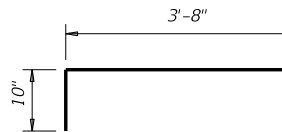
TYPICAL SECTION

Used for curbs over 1'-0" to 5'-0"



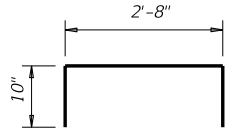
BARS V (#5)

Spaced at 12" Max



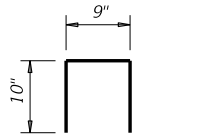
BARS L (#5)

Spaced at 12" Max



**OPTIONAL
BARS L (#5)**

Spaced at 12" Max



BARS U (#4)

Spaced at 12" Max

- ① "T" is equal to the culvert top slab thickness. For precast boxes with slabs less than 7" thick, see SCP-MD standard for additional details.
- ② Adjust normal culvert slab bars as necessary to clear obstructions.
- ③ Place bars L as shown. Tilt hook as necessary to maintain cover.
- ④ Place normal culvert curb bars H(#4) as shown. Adjust as necessary to clear obstructions.
- ⑤ Additional bars H(#4) as required to maintain 12" Max spacing.
- ⑥ Replace normal culvert curb bars K with one bar U and two bars V as shown spaced at 12" Max. Adjust length of bars V as necessary to maintain clear cover.
- ⑦ Optional bars L are to be used only for precast box culverts with 3'-0" closure pour.
- ⑧ Quantities shown are for Contractor's information only. Quantities are per linear foot of curb length. The value in table can be interpolated for intermediate values of curb height, "C". Quantity includes bars K (when applicable).

TABLE OF ESTIMATED CURB QUANTITIES ⑧		
Curb Height "C"	Conc (CY/LF)	Reinf Steel (Lb/LF)
1'-0"	0.037	8.9
1'-6"	0.056	14.3
2'-0"	0.074	15.4
2'-6"	0.093	17.7
3'-0"	0.111	18.8
3'-6"	0.130	21.2
4'-0"	0.148	22.2
4'-6"	0.167	24.6
5'-0"	0.185	25.6

- CONSTRUCTION NOTES:**
Adjust reinforcing steel as necessary to provide 1 1/4" cover.
For vehicle safety, top of the curb must not project more than 3" above the finished grade.
- MATERIAL NOTES:**
Provide Grade 60 reinforcing steel.
Provide Class "C" concrete (f'c = 3,600 psi) minimum for curbs.

- GENERAL NOTES:**
Designed according to AASHTO LRFD Bridge Design Specifications.
These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with PR1, PR2 and PR3 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
This Curb is considered as part of the Box Culvert for payment.

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

EXTENDED CURB DETAILS
FOR BOX CULVERTS WITH
CURBS OVER 1'-0" TO 5'-0" TALL

ECD

FILE: ecdstd1.dgn	DN: GAF	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
03-16: General Notes added T631-CM.	DIST		COUNTY	SHEET NO.

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[illegible]

NOTES:

Skew Angle = 0° for SW-0, FW-0, SETB-CD, SETB-SW-0, and SETB-FW-0 standards.
30° Maximum for Safety End Treatment

SL:1 = Horizontal:1 Vertical
Side Slope at culvert for Flared or Straight Wingwalls. Channel Slope for Parallel Wingwalls.
Slope shall be 3:1 or flatter for Safety End Treatments.

T = Box Culvert Top Slab Thickness. Dimension can be found on the applicable Box Culvert Standard.

U = Box Culvert Wall Thickness. Dimension can be found on the applicable Box Culvert Standard.

C = Curb Height.

See applicable wing or end treatment standards for calculations of Hw, A, B, Lw, Ltw, Atw, and Total Wingwall Area.

Hw = Height of Wingwall.

A = Distance from Face of Curb to End of Wingwall (Not applicable to Parallel or Straight Wingwalls).

B = Offset of End of Wingwall (Not applicable to Parallel or Straight Wingwalls).

Lw = Length of Longest Wingwall.

Ltw = Length of Culvert Toewall (Not applicable when using Riprap Apron).

Atw = Length of Anchor Toewall (Applicable to Safety End Treatment only).

Total Wingwall Area = Wingwall area in S.F. for two wingwalls (one structure end) if Lt or Rt.

Area for four wingwalls (two structure ends) if Both.

- ① The wall heights shown will be rounded to the nearest Foot for bidding purposes.
- ② Concrete volume shown is for box culvert curb only. For curbs using the RAC standard, quantities shown must be increased by a factor of 2. If Class "S" concrete is required for the top slab of the culvert, the curb concrete shall also be Class "S". Curb concrete is considered part of the Box Culvert for payment.
- ③ Concrete volume shown is total of wing, footing, culvert toewall (if any), anchor toewall (if any) and wingwall toewall. Riprap apron, culvert and curb quantities are not included.
- ④ Regardless of the type of culvert shown on this sheet, the Contractor shall have the option of furnishing cast-in-place or precast culverts unless otherwise shown elsewhere on the plans. If the Contractor elects to provide culverts of a different type than those shown on this sheet, it shall be the Contractor's responsibility to make the necessary adjustments to the dimensions and quantities shown.

SPECIAL NOTE:

This sheet is a supplement to the Box Culvert standards. It is to be filled out by the culvert specifier and provides dimensions for the construction of the Box Culvert Wingwalls and Safety End Treatments.

An Excel 97 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet shall be signed, sealed, and dated by a licensed Professional Engineer.



Texas Department of Transportation

**Bridge
Division
Standard**

BOX CULVERT SUPPLEMENT WINGS AND END TREATMENTS

BCS

FILE: bcsstdel.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	---	---	---	N/A
	DIST	COUNTY		SHEET NO
	6	WILLIAMSON		63

TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

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

TABLE OF WINGWALL
REINFORCING
(2~Wings)

Bar	Size	No.	Spa
DL	#5	~	1'-0"
DS	#5	~	1'-0"
E	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	4	~
M	#4	4	~
P	#4	~	1'-0"
RS	#5	3	~
RL	#5	3	~
V	#4	~	1'-0"

TABLE OF ESTIMATED
CULVERT TOEWALL
QUANTITIES

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

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

$$Hw = H + T + C - 0.250'$$

$$A = (Hw - 0.333') (SL)$$

$$B = (A) [\text{Tangent } (\theta + 15^\circ)]$$

$$Lw = (A) \div [\text{Cosine } (\theta + 15^\circ)]$$

For Cast-in-place culverts:

$$Ltw = [(N) (S) + (N+1) (U)] \div (\text{Cosine } \theta)$$

For Precast culverts:

$$Ltw = [(N) (2U+S) + (N-1) (0.500')] \div (\text{Cosine } \theta)$$

$$\text{Total Wingwall Area (Two Wings ~ S.F.)} = (0.5) (Hw + 0.333') (Lw + A)$$

Hw = Height of Wingwall

SL:1 = Side Slope Ratio (Horizontal:1 Vertical)

A = Length of Short Wingwall

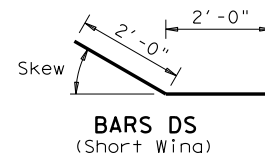
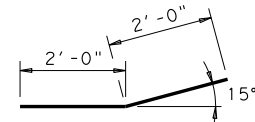
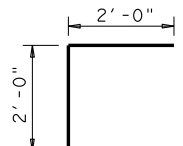
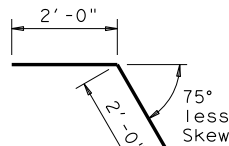
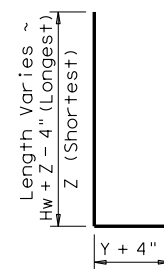
Lw = Length of Long Wingwall

Ltw = Culvert Toewall Length

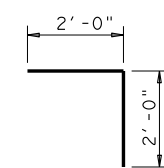
N = Number of Culvert Spans

 θ = Culvert Skew

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

BARS DS
(Short Wing)BARS DL
(Long Wing)BARS RS
(Short Wing)BARS RL
(Long Wing)

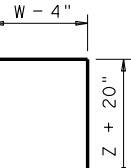
BARS J1



BARS L



BARS V



BARS J2

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

All reinforcing steel shall be Grade 60.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

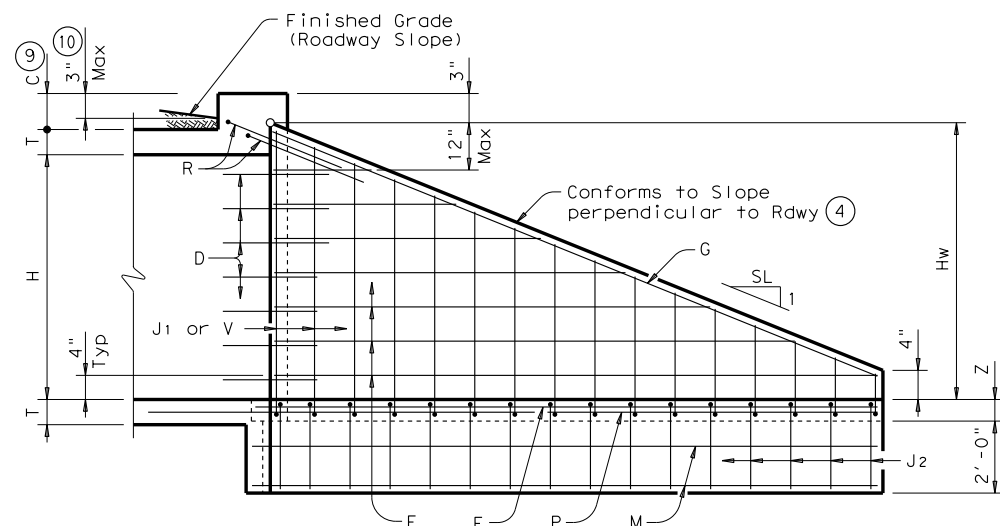
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

All reinforcing bars shall be adjusted to provide a minimum of 1 1/4" clear cover.

When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.

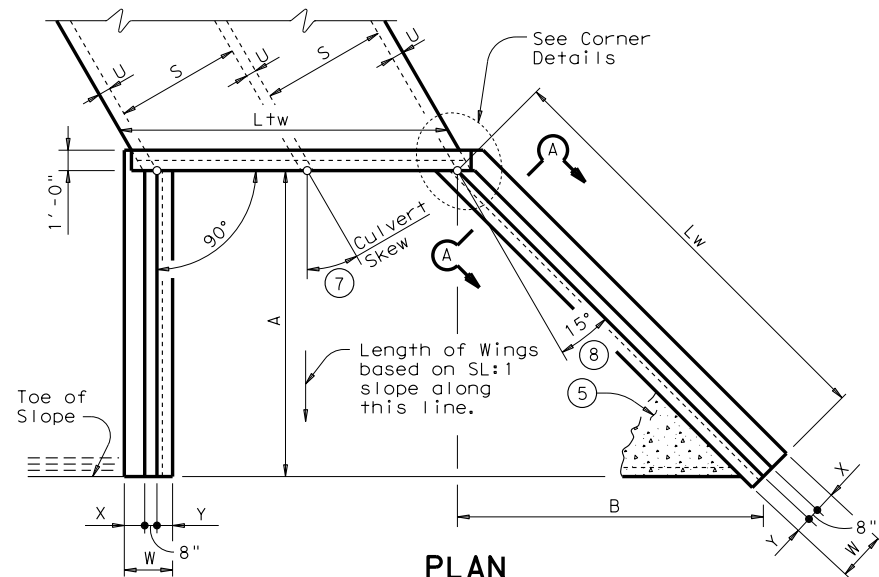
See BCS sheet for additional dimensions and information.

The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for Contractor's information only.

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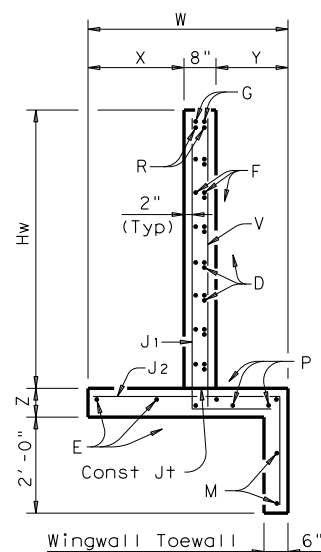
INSIDE ELEVATION

(Showing reinforcing. Culvert and Culvert Toewall reinforcing not shown for clarity.)

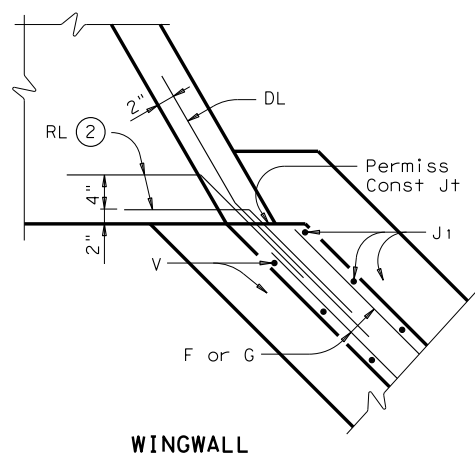


PLAN

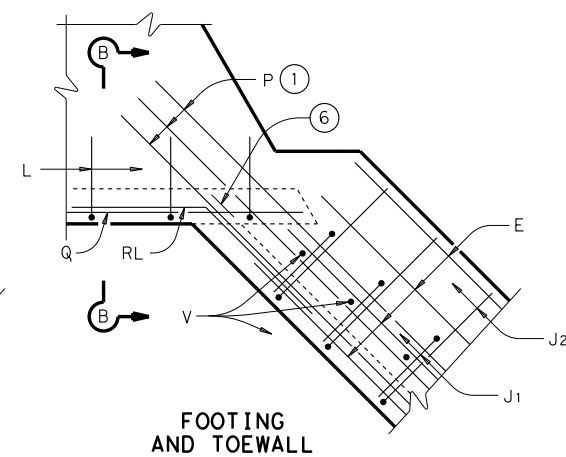
(Showing dimensions and 30° Skew.)



SECTION A-A

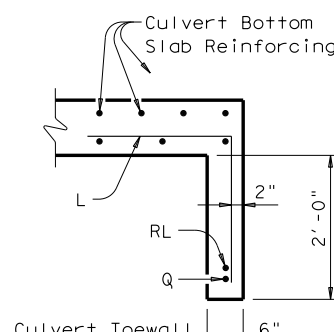


WINGWALL



CORNER DETAILS

(Culvert and Culvert Toewall reinforcing not shown for clarity.)

SECTION B-B⁽⁵⁾CONCRETE WINGWALLS
WITH FLARED WINGS FOR
SKEWED BOX CULVERTS

FW-S

FILE: fw-sstd.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Add note for synthetic fibers.	DIST	COUNTY		SHEET NO.

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TABLE OF DIMENSIONS & REINFORCING STEEL
(Wings for One Structure End)

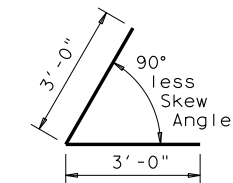
Dimensions					Variable Reinforcing		Estimated Quantities per ft of wing (2-Wings)	Estimated Quantities per ft of Toewall (1-Toewall)
	W	X	Y	Z	Bars J1	Bars J2		
Maximum Wingwall Height Hw					Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	48.64	0.406
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	49.31	0.424
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	49.98	0.444
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	53.32	0.462
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	53.98	0.480
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	55.77	0.532
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	59.77	0.568
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	63.45	0.632
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	67.46	0.668
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	80.67	0.730
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	85.05	0.768
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	92.15	0.864
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	96.54	0.902
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	139.04	0.962
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	144.47	1.000
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	156.93	1.136
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	196.27	1.234
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	230.13	1.438
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	283.41	1.592
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	348.72	1.804
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	432.94	2.046
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	489.52	2.302
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	505.72	2.448

TABLE OF WINGWALL REINFORCING
(2-Wings)

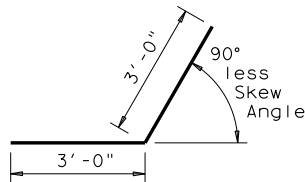
Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

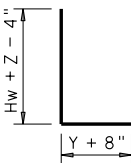
Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



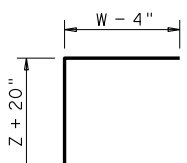
BARS D1



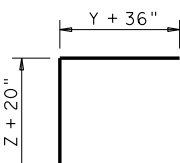
BARS D2



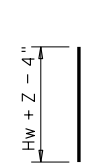
BARS J1



BARS J2



BARS J3



BARS V

WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

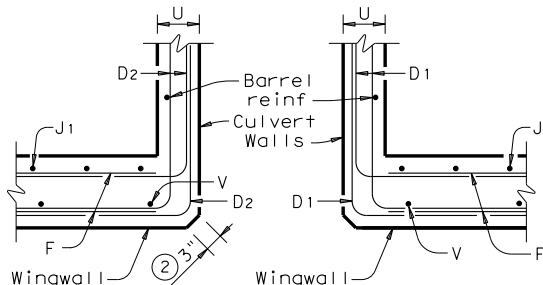
$Hw = H + T + C$
 $Lw = (Hw) (SL) \div \text{Cosine } \theta \text{ for Ty PW-1}$
 $= (Hw - 1') (SL) \div \text{Cosine } \theta \text{ for Ty PW-2 and } Hw \geq 4'$
 $= (Hw - 0.5') (SL) \div \text{Cosine } \theta \text{ for Ty PW-2 and } Hw < 4'$

For Cast-in-place culverts:
 $Ltw = [(N) (S) + (N + 1) (U)] \div \text{Cosine } \theta$

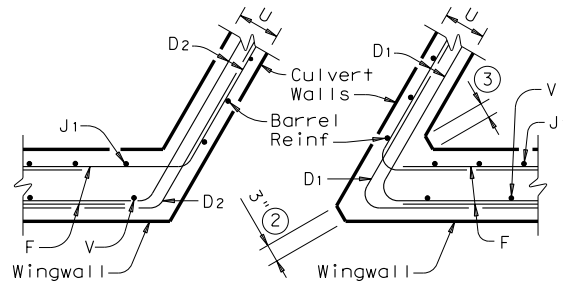
For Precast culverts:
 $Ltw = [(N) (2U + S) + (N - 1) (0.5')] \div \text{Cosine } \theta$
Total Wingwall Area (Two Wings ~ SF)
 $= (2) (Hw) (Lw) \text{ for Ty PW-1}$
 $= (2) (Hw) (Lw) - 6 \text{ SF for Ty PW-2 and } Hw \geq 4'$
 $= (2) (Hw) (Lw) - 1.5 \text{ SF for Ty PW-2 and } Hw < 4'$

Hw = Height of Wingwall
Lw = Length of Wingwall
Ltw = Culvert Toewall Length
N = Number of Culvert Spans
SL:1 = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
 θ = Culvert Skew

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



SECTION C-C

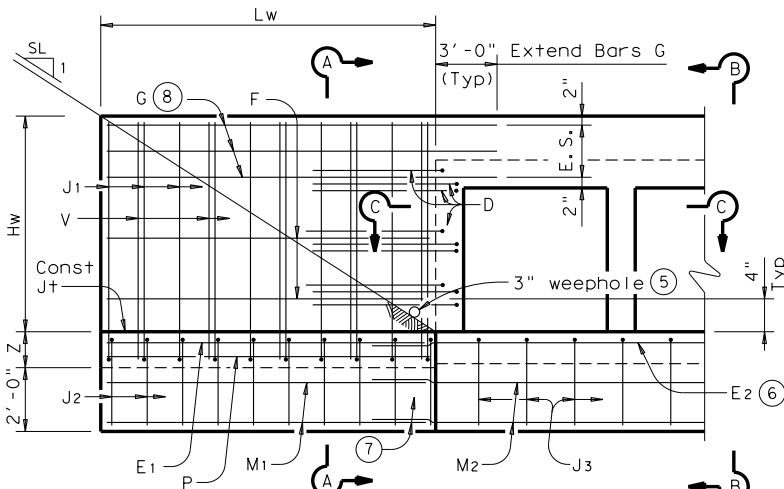


SECTION C-C

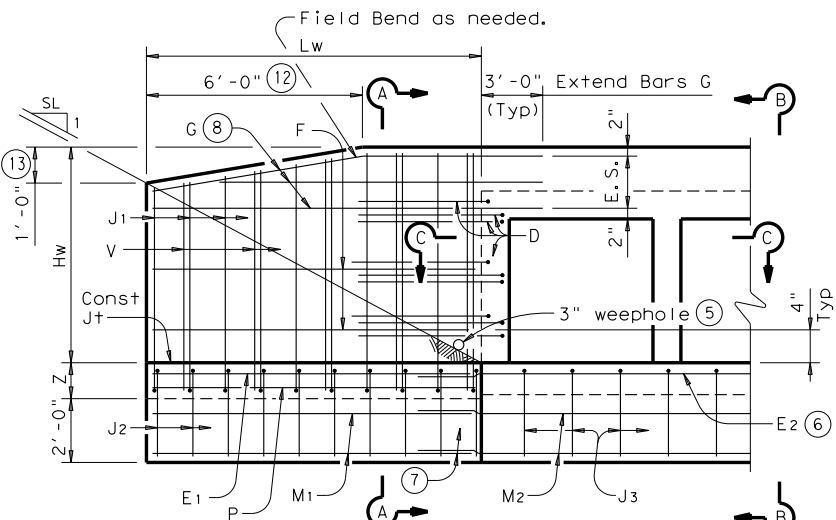
- Skew Angle = 0°
- At discharge end, chamfer may be 3/4".
- For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.
- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs cannot project more than 3" above finished grade.
 - For structures with bridge rail, build curbs flush with finished grade.Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
Provide 1 1/4" Min clear cover to reinforcing steel.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See BCS sheet for wingwall type and additional dimensions and information.
The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

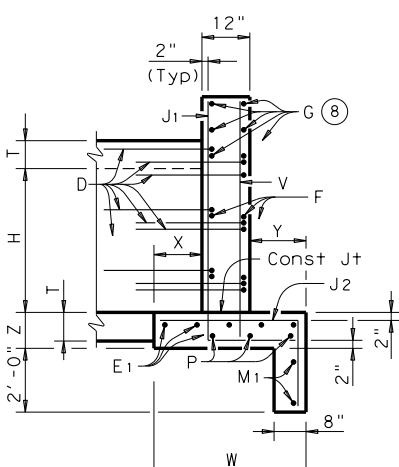
DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.



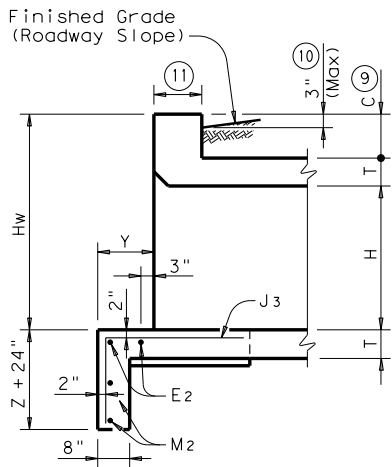
PARTIAL ELEVATION - PW-1



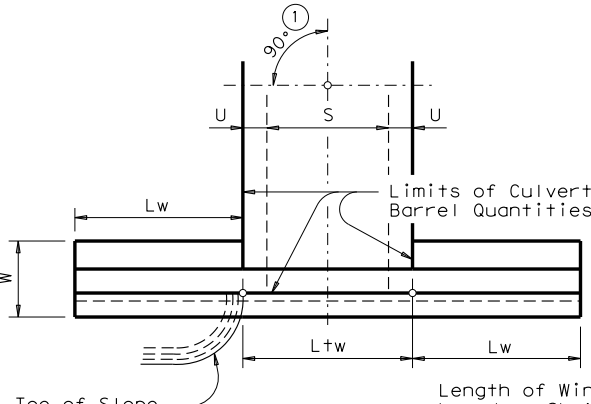
PARTIAL ELEVATION - PW-2



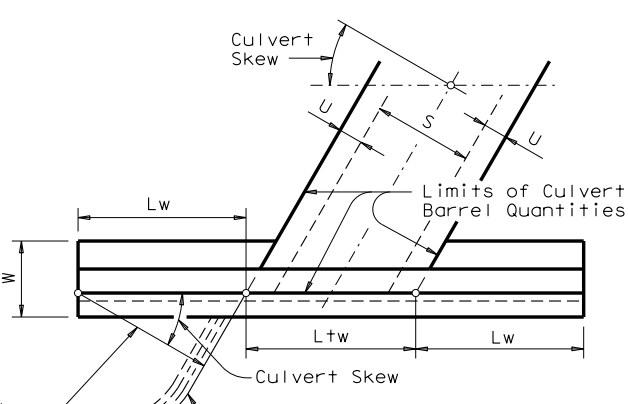
SECTION A-A
(Showing Wing Reinf)



SECTION B-B
(Showing Wing Reinf)



DETAILS FOR
NON-SKEWED BOX CULVERTS



DETAILS FOR
SKEWED BOX CULVERTS
(Showing 30° Skew)

Bridge Division Standard

CONCRETE WINGWALLS
WITH PARALLEL WINGS FOR
BOX CULVERTS
TYPES PW-1 AND PW-2

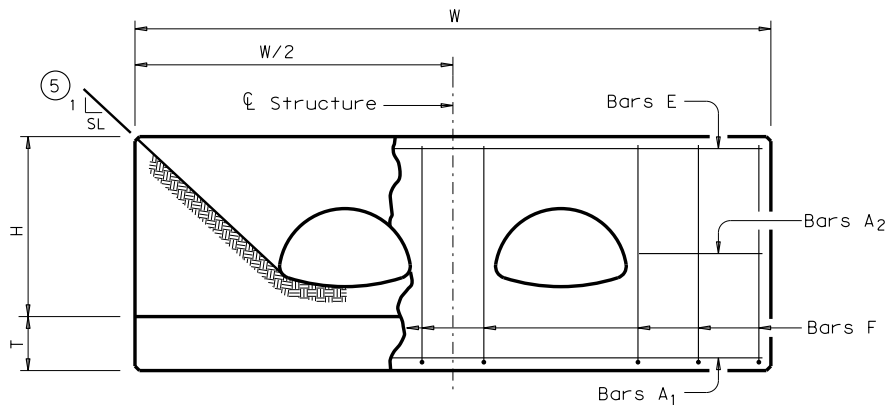
PW

FILE: pwstde01.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Reinforcing Quantities.				
01-12: PW-1 & PW-2.				
	DIST	COUNTY		SHEET NO.
				65

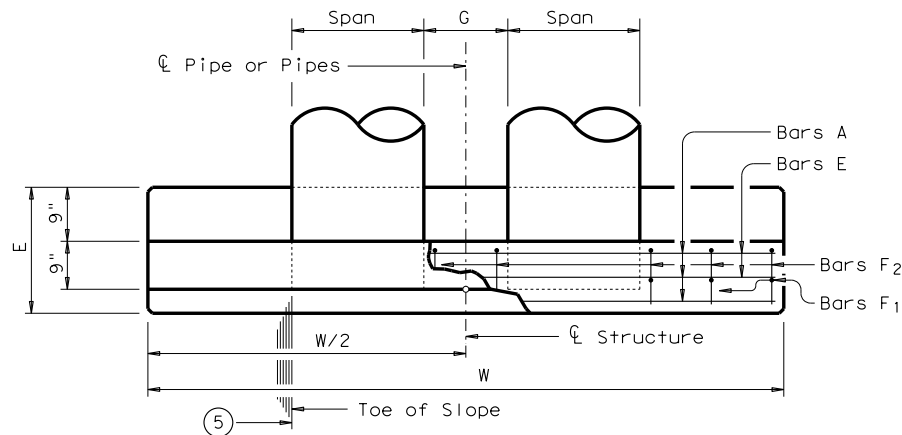
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TABLE OF VARIABLE DIMENSIONS
AND QUANTITIES FOR ONE HEADWALL ④

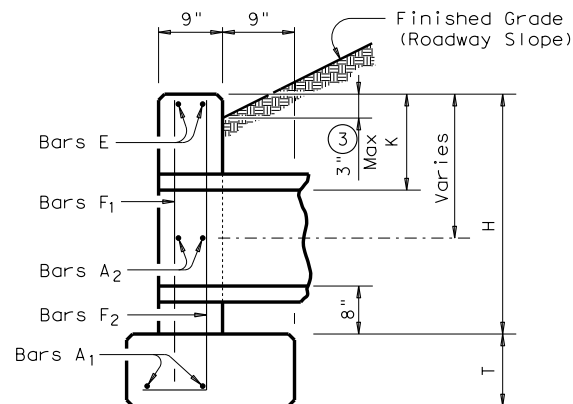
SLOPE	DESIGN	SIZE OF PIPE ARCH		Values for one Pipe			Values to be added for each add'tl Pipe		
				W	Reinf (Lbs) ①	Conc (CY) ②	W	Reinf (Lbs) ①	Conc (CY) ②
		Span	Rise						
2:1	1	17"	13"	9' - 9"	130	1.1	2' - 5"	28	0.3
	2	21"	15"	10' - 9"	139	1.3	2' - 11"	33	0.3
	3	28"	20"	13' - 0"	184	1.8	3' - 9"	43	0.5
	4	35"	24"	14' - 11"	249	2.2	4' - 7"	50	0.6
	5	42"	29"	17' - 2"	311	3.2	5' - 5"	69	0.9
	6	49"	33"	19' - 1"	342	3.8	6' - 3"	77	1.1
	7	57"	38"	21' - 5"	438	4.7	7' - 2"	86	1.4
	8	64"	43"	23' - 8"	508	5.6	8' - 2"	110	1.6
	9	71"	47"	25' - 7"	577	6.5	9' - 1"	120	2.0
3:1	1	17"	13"	13' - 11"	182	1.6	2' - 5"	28	0.3
	2	21"	15"	15' - 3"	196	1.8	2' - 11"	33	0.3
	3	28"	20"	18' - 4"	270	2.6	3' - 9"	42	0.5
	4	35"	24"	20' - 11"	356	3.2	4' - 7"	50	0.6
	5	42"	29"	24' - 0"	434	4.5	5' - 5"	70	0.9
	6	49"	33"	26' - 7"	499	5.4	6' - 3"	77	1.1
	7	57"	38"	29' - 9"	628	6.7	7' - 2"	87	1.4
	8	64"	43"	32' - 10"	715	7.9	8' - 2"	111	1.6
	9	71"	47"	35' - 5"	798	9.2	9' - 1"	120	2.0
4:1	1	17"	13"	18' - 1"	236	2.1	2' - 5"	28	0.3
	2	21"	15"	19' - 9"	268	2.4	2' - 11"	33	0.3
	3	28"	20"	23' - 8"	336	3.3	3' - 9"	42	0.5
	4	35"	24"	26' - 11"	460	4.2	4' - 7"	50	0.6
	5	42"	29"	30' - 10"	557	5.8	5' - 5"	69	0.9
	6	49"	33"	34' - 1"	653	6.9	6' - 3"	78	1.1
	7	57"	38"	38' - 1"	819	8.6	7' - 2"	87	1.4
	8	64"	43"	42' - 0"	950	10.2	8' - 2"	111	1.7
	9	71"	47"	45' - 3"	1053	11.9	9' - 1"	120	2.0
6:1	1	17"	13"	26' - 5"	343	3.1	2' - 5"	29	0.3
	2	21"	15"	28' - 9"	381	3.5	2' - 11"	33	0.3
	3	28"	20"	34' - 4"	504	4.9	3' - 9"	42	0.5
	4	35"	24"	38' - 11"	673	6.1	4' - 7"	50	0.6
	5	42"	29"	44' - 6"	823	8.5	5' - 5"	70	0.9
	6	49"	33"	49' - 1"	945	10.1	6' - 3"	78	1.1
	7	57"	38"	54' - 9"	1227	12.5	7' - 2"	87	1.4
	8	64"	43"	60' - 4"	1399	14.8	8' - 2"	110	1.7
	9	71"	47"	64' - 11"	1563	17.3	9' - 1"	119	2.0



ELEVATION



PLAN



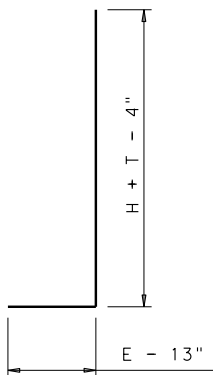
SECTION

TABLE OF DIMENSIONS
NOT VARIED WITH SLOPE

DESIGN	SIZE OF PIPE ARCH		G	K	H	T	E
	Span	Rise					
1	17"	13"	1'-0"	1'-0"	2'-7"	10"	1'-6"
2	21"	15"	1'-2"	1'-0"	2'-9"	10"	1'-6"
3	28"	20"	1'-5"	1'-0"	3'-2"	10"	1'-10"
4	35"	24"	1'-8"	1'-0"	3'-6"	10"	2'-0"
5	42"	29"	1'-11"	1'-0"	3'-11"	1'-0"	2'-4"
6	49"	33"	2'-2"	1'-0"	4'-3"	1'-0"	2'-6"
7	57"	38"	2'-5"	1'-0"	4'-8"	1'-0"	2'-10"
8	64"	43"	2'-10"	1'-0"	5'-1"	1'-0"	3'-0"
9	71"	47"	3'-2"	1'-0"	5'-5"	1'-0"	3'-4"

TABLE OF
REINFORCING STEEL ④

Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~



BARS F2

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.



Bridge
Division
Standard

CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR
NON-SKEWED ARCH PIPE CULVERTS

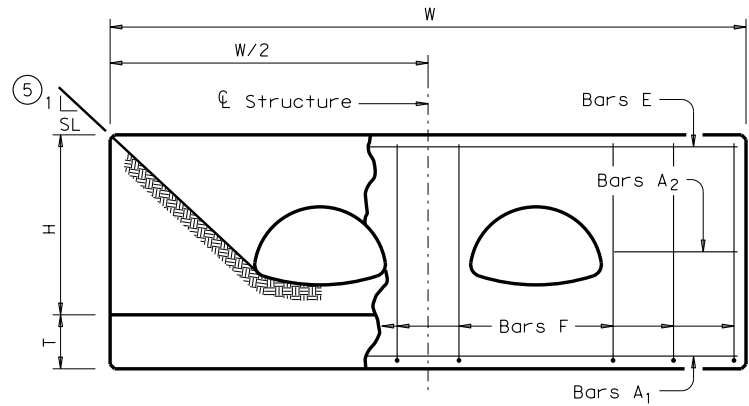
CH-PW-A-0

FILE: chpa0ste.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Removed Bars T.	DIST		COUNTY	SHEET NO.

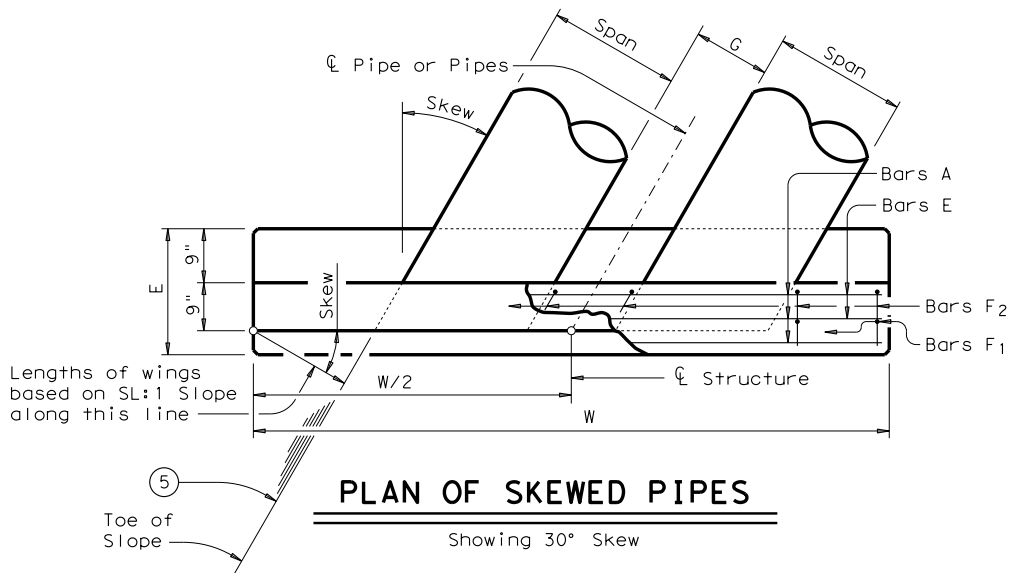
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TABLE OF VARIABLE DIMENSIONS
AND QUANTITIES FOR ONE HEADWALL ①

SLOPE	DESIGN	SIZE OF PIPE ARCH		15 Degrees						30 Degrees						45 Degrees					
				Values for one Pipe			Values to be added for each add't'l Pipe			Values for one Pipe			Values to be added for each add't'l Pipe			Values for one Pipe			Values to be added for each add't'l Pipe		
				Span	Rise	W	Reinf (Lbs)	Conc (CY)	W	Reinf (Lbs)	Conc (CY)	W	Reinf (Lbs)	Conc (CY)	W	Reinf (Lbs)	Conc (CY)	W	Reinf (Lbs)	Conc (CY)	W
		①	②			①	②	①	②	①	②	①	②	①	②	①	②	①	②		
2:1	1	17"	13"	10'- 1"	131	1.2	2'- 6"	28	0.2	11'- 3"	153	1.3	2'- 9 ¾"	30	0.3	13'- 9"	180	1.6	3'- 5"	33	0.4
	2	21"	15"	11'- 2"	142	1.3	3'- 0"	33	0.3	12'- 5"	164	1.5	3'- 4 ¼"	35	0.4	15'- 2"	195	1.8	4'- 1 ¾"	39	0.4
	3	28"	20"	13'- 6"	187	1.9	3'-10 ¼"	44	0.5	15'- 0"	214	2.1	4'- 4"	45	0.5	18'- 5"	252	2.5	5'- 3 ¾"	59	0.7
	4	35"	24"	15'- 5"	253	2.3	4'- 9"	51	0.6	17'- 3"	287	2.6	5'- 3 ½"	63	0.7	21'- 1"	335	3.2	6'- 5 ¾"	69	0.9
	5	42"	29"	17'- 9"	315	3.3	5'- 7 ¼"	70	0.9	19'-10"	355	3.7	6'- 3"	73	1.0	24'- 3"	411	4.5	7'- 8"	80	1.2
	6	49"	33"	19'- 9"	348	3.9	6'- 5 ½"	78	1.1	22'- 0"	388	4.3	7'- 2 ½"	82	1.2	27'- 0"	474	5.3	8'-10"	102	1.5
	7	57"	38"	22'- 2"	447	4.9	7'- 5"	87	1.4	24'- 9"	495	5.4	8'- 3 ¼"	93	1.6	30'- 3"	597	6.6	10'- 1 ¾"	115	1.9
	8	64"	43"	24'- 6"	515	5.8	8'- 5 ½"	112	1.7	27'- 4"	568	6.4	9'- 5 ¼"	117	1.9	33'- 6"	711	7.9	11'- 6 ½"	141	2.3
	9	71"	47"	26'- 6"	585	6.7	9'- 4 ¾"	121	2.1	29'- 6"	643	7.5	10'- 6"	127	2.3	36'- 2"	794	9.2	12'-10 ¼"	153	2.8
3:1	1	17"	13"	14'- 5"	185	1.7	2'- 6"	29	0.3	16'- 1"	209	1.9	2'- 9 ¾"	30	0.3	19'- 8"	257	2.3	3'- 5"	34	0.4
	2	21"	15"	15'- 9"	213	1.9	3'- 0 ¼"	34	0.3	17'- 7"	240	2.1	3'- 4 ¼"	35	0.4	21'- 7"	278	2.6	4'- 1 ¾"	39	0.4
	3	28"	20"	19'- 0"	273	2.7	3'-10 ¾"	43	0.5	21'- 2"	301	3.0	4'- 4"	46	0.5	25'-11"	366	3.6	5'- 3 ¾"	59	0.7
	4	35"	24"	21'- 8"	363	3.3	4'- 9"	51	0.6	24'- 2"	402	3.7	5'- 3 ½"	62	0.7	29'- 7"	481	4.5	6'- 5 ¾"	69	0.9
	5	42"	29"	24'-10"	441	4.7	5'- 7 ¼"	70	0.9	27'- 9"	506	5.2	6'- 3"	73	1.0	33'-11"	599	6.4	7'- 8"	82	1.2
	6	49"	33"	27'- 6"	507	5.5	6'- 5 ½"	78	1.1	30'- 8"	578	6.2	7'- 2 ½"	83	1.2	37'- 7"	703	7.6	8'-10"	102	1.5
	7	57"	38"	30'-10"	666	6.9	7'- 5"	88	1.4	34'- 4"	725	7.7	8'- 3 ¼"	93	1.6	42'- 1"	876	9.4	10'- 1 ¾"	115	1.9
	8	64"	43"	34'- 0"	754	8.2	8'- 5 ½"	112	1.7	37'-11"	847	9.1	9'- 5 ¼"	117	1.9	46'- 5"	1013	11.1	11'- 6 ½"	141	2.3
	9	71"	47"	36'- 8"	841	9.5	9'- 4 ¾"	121	2.1	40'-11"	942	10.6	10'- 6"	127	2.3	50'- 1"	1149	13.0	12'-10 ¼"	153	2.8
4:1	1	17"	13"	18'- 9"	240	2.2	2'- 6"	29	0.3	20'-11"	267	2.4	2'- 9 ¾"	30	0.3	25'- 7"	324	3.0	3'- 5"	33	0.4
	2	21"	15"	20'- 5"	272	2.5	3'- 0 ¼"	33	0.3	22'-10"	302	2.7	3'- 4 ¼"	35	0.4	27'-11"	362	3.4	4'- 1 ¾"	38	0.4
	3	28"	20"	24'- 6"	358	3.5	3'-10 ¾"	43	0.5	27'- 4"	391	3.9	4'- 4"	45	0.5	33'- 6"	480	4.7	5'- 3 ¾"	59	0.7
	4	35"	24"	27'-10"	468	4.3	4'- 9"	51	0.6	31'- 1"	533	4.8	5'- 3 ½"	62	0.7	38'- 1"	646	5.9	6'- 5 ¾"	69	0.9
	5	42"	29"	31'-11"	587	6.0	5'- 7 ¼"	70	0.9	35'- 7"	639	6.7	6'- 3"	74	1.0	43'- 7"	788	8.3	7'- 8"	82	1.2
	6	49"	33"	35'- 3"	664	7.2	6'- 5 ½"	79	1.1	39'- 4"	744	8.0	7'- 2 ½"	83	1.2	48'- 2"	910	9.8	8'-10"	102	1.5
	7	57"	38"	39'- 5"	860	8.9	7'- 5"	88	1.4	44'- 0"	956	9.9	8'- 3 ¼"	93	1.6	53'-10"	1156	12.2	10'- 1 ¾"	114	1.9
	8	64"	43"	43'- 6"	994	10.6	8'- 5 ½"	112	1.7	48'- 6"	1097	11.8	9'- 5 ¼"	117	1.9	59'- 5"	1344	14.4	11'- 6 ½"	141	2.3
	9	71"	47"	46'-10"	1096	12.3	9'- 4 ¾"	122	2.1	52'- 3"	1211	13.7	10'- 6"	127	2.3	64'- 0"	1509	16.8	12'-10 ¼"	152	2.8
6:1	1	17"	13"	27'- 4"	361	3.2	2'- 6"	29	0.3	30'- 6"	396	3.6	2'- 9 ¾"	30	0.3	37'- 4"	478	4.4	3'- 5"	33	0.3
	2	21"	15"	29'- 9"	402	3.6	3'- 0 ¼"	33	0.3	33'- 2"	437	4.0	3'- 4 ¼"	36	0.4	40'- 8"	542	4.9	4'- 1 ¾"	39	0.5
	3	28"	20"	35'- 7"	513	5.1	3'-10 ¾"	43	0.5	39'- 8"	570	5.6	4'- 4"	46	0.5	48'- 7"	694	6.9	5'- 3 ¾"	60	0.7
	4	35"	24"	40'- 3"	685	6.3	4'- 9"	51	0.6	44'-11"	759	7.0	5'- 3 ½"	64	0.7	55'- 0"	935	8.6	6'- 5 ¾"	70	0.9
	5	42"	29"	46'- 1"	857	8.8	5'- 7 ¼"	72	0.9	51'- 5"	944	9.8	6'- 3"	74	1.0	62'-11"	1172	12.0	7'- 8"	80	1.3
	6	49"	33"	50'-10"	981	10.5	6'- 5 ½"	79	1.1	56'- 8"	1101	11.7	7'- 2 ½"	82	1.2	69'- 5"	1349	14.3	8'-10"	101	1.5
	7	57"	38"	56'- 8"	1273	13.0	7'- 5"	88	1.4	63'- 3"	1420	14.5	8'- 3 ¼"	92	1.6	77'- 5"	1716	17.7	10'- 1 ¾"	114	1.9
	8	64"	43"	62'- 6"	1449	15.3	8'- 5 ½"	111	1.7	69'- 8"	1603	17.1	9'- 5 ¼"	116	1.9	85'- 4"	1985	21.0	11'- 6 ½"	140	2.3
	9	71"	47"	67'- 2"	1615	17.9	9'- 4 ¾"	120	2.1	75'- 0"	1812	20.0	10'- 6"	126	2.3	91'-10"	2190	24.4	12'-10 ¼"	152	2.8

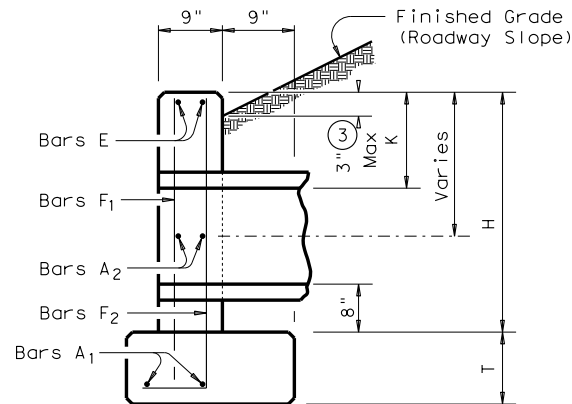


ELEVATION



PLAN OF SKEWED PIPES

Showing 30° Skew



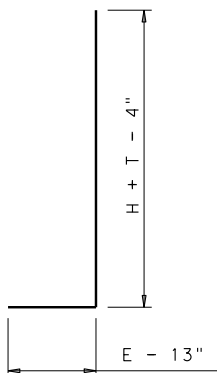
SECTION

TABLE OF DIMENSIONS
NOT VARIED WITH SLOPE

DESIGN	SIZE OF PIPE ARCH		G	K	H	T	E
	Span	Rise					
1	17"	13"	1'- 0"	1'- 0"	2'- 7"	10"	1'- 6"
2	21"	15"	1'- 2"	1'- 0"	2'- 9"	10"	1'- 6"
3	28"	20"	1'- 5"	1'- 0"	3'- 2"	10"	1'-10"
4	35"	24"	1'- 8"	1'- 0"	3'- 6"	10"	2'- 0"
5	42"	29"	1'-11"	1'- 0"	3'-11"	1'- 0"	2'- 4"
6	49"	33"	2'- 2"	1'- 0"	4'- 3"	1'- 0"	2'- 6"
7	57"	38"	2'- 5"	1'- 0"	4'- 8"	1'- 0"	2'-10"
8	64"	43"	2'-10"	1'- 0"	5'- 1"	1'- 0"	3'- 0"
9	71"	47"	3'- 2"	1'- 0"	5'- 5"	1'- 0"	3'- 4"

TABLE OF
REINFORCING STEEL ④

Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~



BARS F2

GENERAL NOTES:
Designed according to AASHTO LRFD Specifications.
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.

CONCRETE HEADWALLS
WITH PARALLEL WINGS FOR
SKEWED ARCH PIPE CULVERTS

CH-PW-A-S

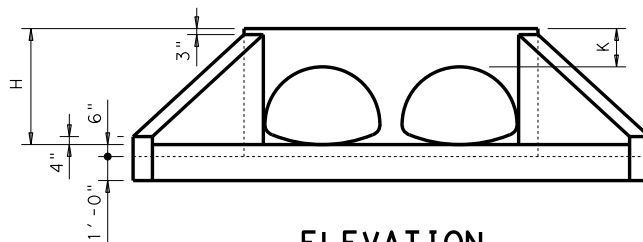
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©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
11-10: Removed Bars T.	DIST		COUNTY	SHEET NO.

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TABLE OF VARIABLE DIMENSIONS
AND QUANTITIES FOR ONE HEADWALL (4)

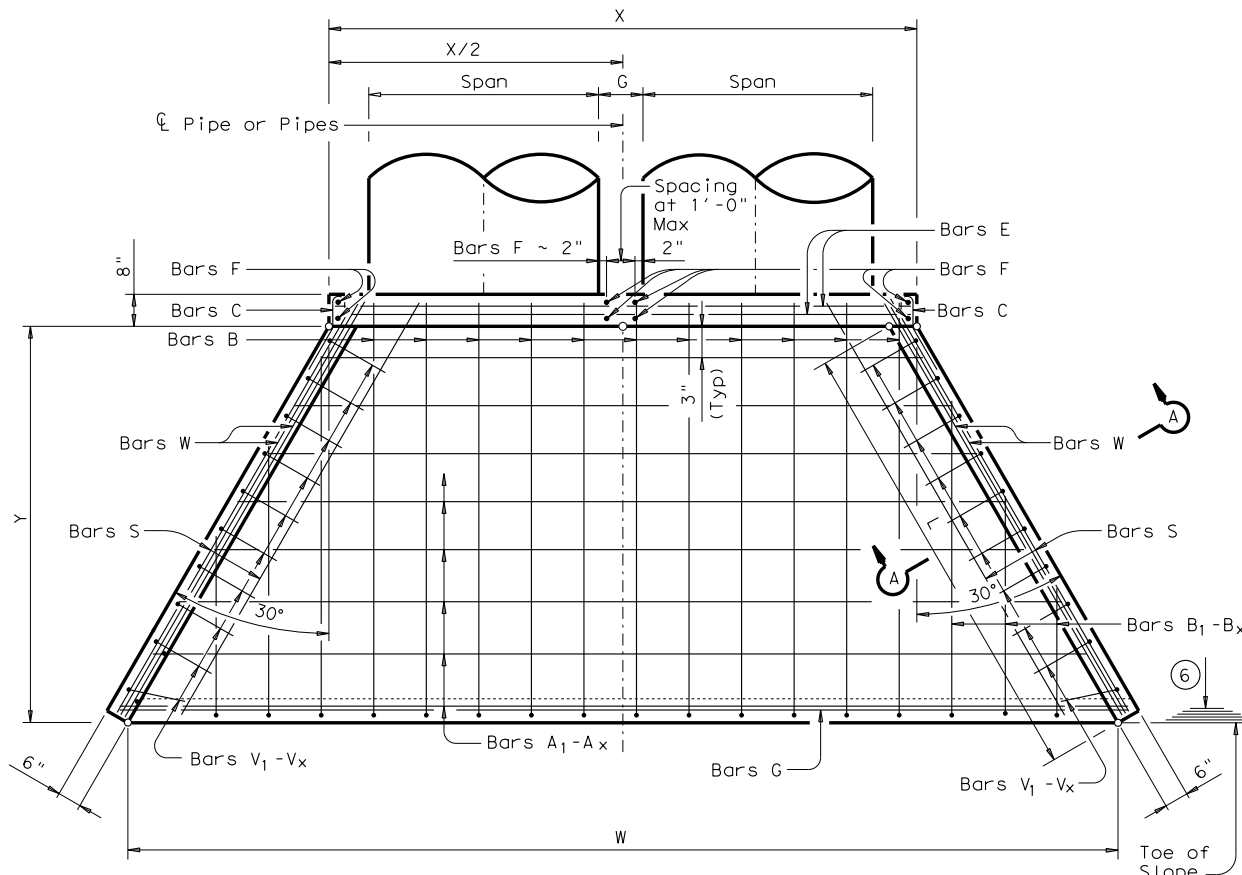
SLOPE	DESIGN	SIZE OF PIPE ARCH		Values for one Pipe						Values to be added for each add'l Pipe			
				W	X	Y	L	Reinf (Lbs)	Conc (CY)	X and W	Reinf (Lbs)	Conc (CY)	
		Span	Rise										
2:1	1	17"	13"	5'-0 1/2"	2'-8 3/4"	3'-0"	3'-5 1/2"	91	0.6	2'-5"	35	0.3	
	2	21"	15"	5'-9 1/4"	3'-0 3/4"	3'-4"	3'-10 1/4"	107	0.8	2'-11"	42	0.4	
	3	28"	20"	7'-3 3/4"	3'-7 3/4"	4'-2"	4'-9 3/4"	148	1.1	3'-9"	57	0.6	
	4	35"	24"	8'-8"	4'-2 3/4"	4'-10"	5'-7"	174	1.4	4'-7"	73	0.8	
	5	42"	29"	10'-2 1/2"	4'-9 3/4"	5'-8"	6'-6 1/2"	204	1.8	5'-5"	98	1.0	
	6	49"	33"	11'-6 3/4"	5'-4 3/4"	6'-4"	7'-3 3/4"	243	2.2	6'-3"	113	1.3	
	7	57"	38"	13'-2 1/4"	6'-0 3/4"	7'-2"	8'-3 1/4"	279	2.7	7'-2"	134	1.6	
	8	64"	43"	14'-8 3/4"	6'-7 3/4"	8'-0"	9'-2 3/4"	327	3.2	8'-2"	168	2.0	
	9	71"	47"	16'-1"	7'-2 3/4"	8'-8"	10'-0"	371	3.7	9'-1"	192	2.4	
3:1	1	17"	13"	6'-9 1/4"	2'-8 3/4"	4'-6"	5'-2 1/4"	127	0.9	2'-5"	38	0.4	
	2	21"	15"	7'-8 1/4"	3'-0 3/4"	5'-0"	5'-9 1/4"	142	1.1	2'-11"	48	0.5	
	3	28"	20"	9'-8 1/2"	3'-7 3/4"	6'-3"	7'-2 1/2"	201	1.6	3'-9"	64	0.7	
	4	35"	24"	11'-5 1/2"	4'-2 3/4"	7'-3"	8'-4 1/2"	237	2.1	4'-7"	83	1.0	
	5	42"	29"	13'-5 1/2"	4'-9 3/4"	8'-6"	9'-9 3/4"	295	2.7	5'-5"	113	1.3	
	6	49"	33"	15'-2 3/4"	5'-4 3/4"	9'-6"	10'-11 3/4"	339	3.3	6'-3"	130	1.7	
	7	57"	38"	17'-4"	6'-0 3/4"	10'-9"	12'-5"	394	4.2	7'-2"	159	2.1	
	8	64"	43"	19'-4 1/4"	6'-7 3/4"	12'-0"	13'-10 1/4"	471	5.1	8'-2"	199	2.6	
	9	71"	47"	21'-1 1/4"	7'-2 3/4"	13'-0"	15'-0 1/4"	523	5.9	9'-1"	226	3.1	
4:1	1	17"	13"	8'-6 1/4"	2'-8 3/4"	6'-0"	6'-11"	165	1.3	2'-5"	42	0.4	
	2	21"	15"	9'-7 1/4"	3'-0 3/4"	6'-8"	7'-8 1/2"	185	1.6	2'-11"	53	0.6	
	3	28"	20"	12'-1 1/2"	3'-7 3/4"	8'-4"	9'-7 1/2"	253	2.3	3'-9"	72	0.9	
	4	35"	24"	14'-3"	4'-2 3/4"	9'-8"	11'-2"	311	2.9	4'-7"	94	1.2	
	5	42"	29"	16'-9"	4'-9 3/4"	11'-4"	13'-1"	375	3.9	5'-5"	125	1.6	
	6	49"	33"	18'-10 1/2"	5'-4 3/4"	12'-8"	14'-7 1/2"	449	4.7	6'-3"	152	2.0	
	7	57"	38"	21'-5 1/2"	6'-0 3/4"	14'-4"	16'-6 3/4"	526	5.9	7'-2"	180	2.6	
	8	64"	43"	23'-11 3/4"	6'-7 3/4"	16'-0"	18'-5 3/4"	625	7.2	8'-2"	229	3.2	
	9	71"	47"	26'-1 1/4"	7'-2 3/4"	17'-4"	20'-0 1/4"	698	8.4	9'-1"	261	3.9	
6:1	1	17"	13"	11'-11 3/4"	2'-8 3/4"	9'-0"	10'-4 3/4"	239	2.1	2'-5"	49	0.6	
	2	21"	15"	13'-5 1/2"	3'-0 3/4"	10'-0"	11'-6 1/2"	272	2.6	2'-11"	61	0.8	
	3	28"	20"	16'-11 1/4"	3'-7 3/4"	12'-6"	14'-5 1/4"	388	3.8	3'-9"	87	1.2	
	4	35"	24"	19'-10"	4'-2 3/4"	14'-6"	16'-9"	464	5.0	4'-7"	112	1.6	
	5	42"	29"	23'-3 1/2"	4'-9 3/4"	17'-0"	19'-7 1/2"	581	6.6	5'-5"	154	2.2	
	6	49"	33"	26'-2 1/4"	5'-4 3/4"	19'-0"	21'-11 1/4"	705	8.2	6'-3"	187	2.8	
	7	57"	38"	29'-9"	6'-0 3/4"	21'-6"	24'-10"	846	10.3	7'-2"	233	3.5	
	8	64"	43"	33'-2 1/2"	6'-7 3/4"	24'-0"	27'-8 1/2"	990	12.6	8'-2"	289	4.4	
	9	71"	47"	36'-1 1/4"	7'-2 3/4"	26'-0"	30'-0 1/4"	1119	14.7	9'-1"	336	5.3	

Williamson County, Texas

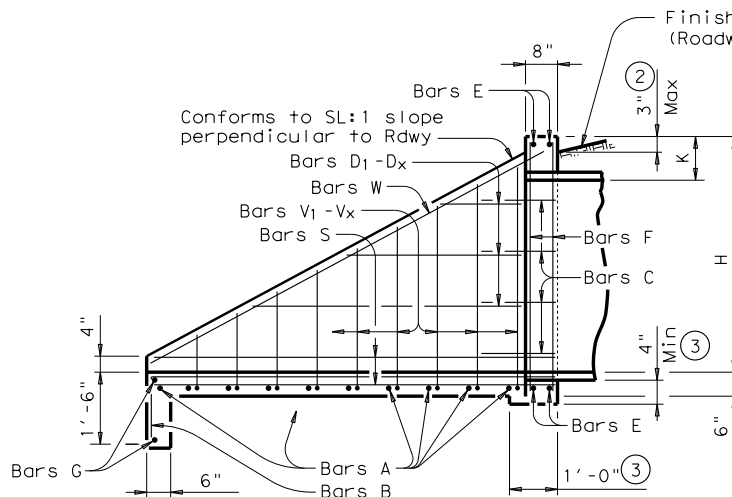


ELEVATION

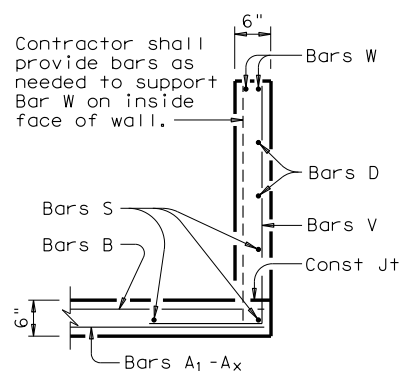
Showing dimensions



PLAN



TYPICAL WING ELEVATION



SECTION A-A

TABLE OF REINFORCING STEEL (4)

Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
C	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
S	# 4	~	6
V	# 4	1'-0"	~
W	# 5	~	4

TABLE OF DIMENSIONS NOT VARIED WITH SLOPE

DESIGN	SIZE OF PIPE ARCH		G	K	H
	Span	Rise			
1	17"	13"	1'-0"	1'-0"	2'-1"
2	21"	15"	1'-2"	1'-0"	2'-3"
3	28"	20"	1'-5"	1'-0"	2'-8"
4	35"	24"	1'-8"	1'-0"	3'-0"
5	42"	29"	1'-11"	1'-0"	3'-5"
6	49"	33"	2'-2"	1'-0"	3'-9"
7	57"	38"	2'-5"	1'-0"	4'-2"
8	64"	43"	2'-10"	1'-0"	4'-7"
9	71"	47"	3'-2"	1'-0"	4'-11"

- Quantities shown are for metal pipe and will decrease slightly for concrete pipe installations.
- For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.
- Quantities shown are for one structure end only (one headwall).
- Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right)$
Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right) - 1"$
- Lengths of wings based on SL:1 Slope along this line.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.
All reinforcing steel shall be Grade 60.
All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.
No bridge rails of any type may be mounted directly to these culvert headwalls.

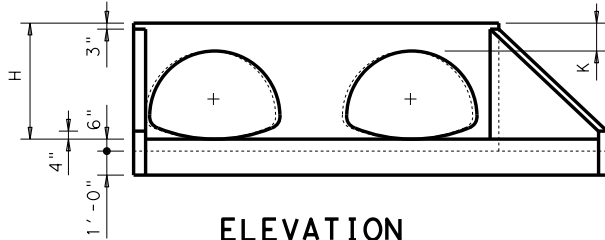
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CONCRETE HEADWALLS WITH FLARED WINGS FOR 0° SKEW ARCH PIPE CULVERTS			
CH-FW-A-0			
FILE: chfa00se.dgn	DN: TxDOT	CK: TxDOT	DN: TxDOT
©TxDOT February 2010	CONT	SECT	JOB
REVISIONS		HIGHWAY	
DIST		COUNTY	
		SHEET NO.	

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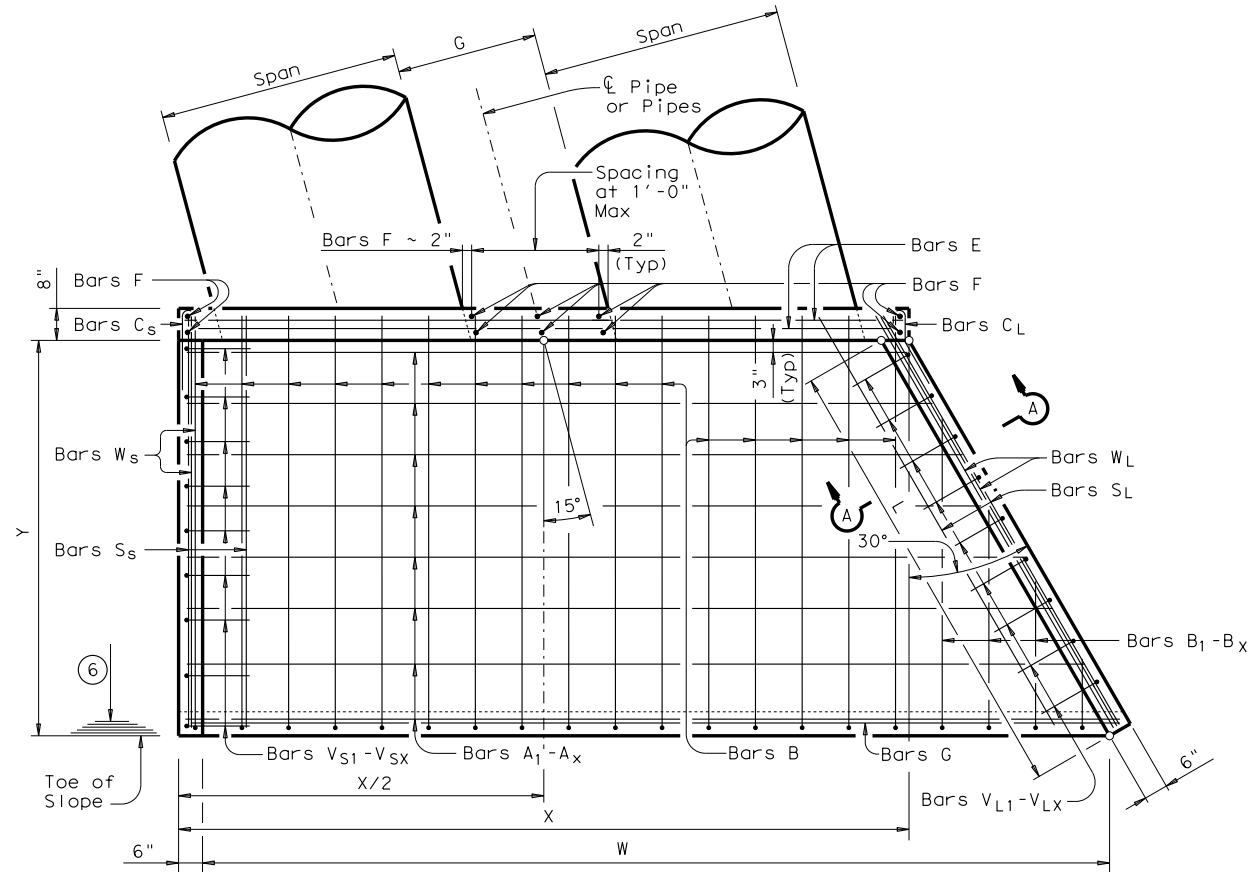
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DESIGN	SIZE OF PIPE ARCH		Values for one Pipe						Values to be added for each add'l Pipe			
				W	X	Y	L	Reinf (Lbs)	Conc (CY)	X and W	Reinf (Lbs)	Conc (CY)	(1)
		Span	Rise										
2:1	1	17"	13"	3'- 7 1/2"	2'-11 1/2"	3'- 0"	3'- 5 1/2"	89	0.6	2'- 6"	36	0.3	
	2	21"	15"	4'- 2"	3'- 3 3/4"	3'- 4"	3'-10 1/4"	101	0.7	3'- 0 1/4"	43	0.4	
	3	28"	20"	5'- 3"	3'-11"	4'- 2"	4'- 9 3/4"	139	1.0	3'-10 1/2"	60	0.6	
	4	35"	24"	6'- 2 3/4"	4'- 6 1/4"	4'-10"	5'- 7"	162	1.2	4'- 9"	76	0.8	
	5	42"	29"	7'- 3 3/4"	5'- 1 1/2"	5'- 8"	6'- 6 1/2"	194	1.6	5'- 7 1/4"	101	1.1	
	6	49"	33"	8'- 3 3/4"	5'- 8 3/4"	6'- 4"	7'- 3 3/4"	225	1.9	6'- 5 3/4"	115	1.3	
	7	57"	38"	9'- 5 3/4"	6'- 5"	7'- 2"	8'- 3 1/4"	258	2.4	7'- 5"	137	1.7	
	8	64"	43"	10'- 6 3/4"	7'- 0 1/4"	8'- 0"	9'- 2 3/4"	302	2.8	8'- 5 1/2"	172	2.1	
	9	71"	47"	11'- 6 1/2"	7'- 7 1/2"	8'- 8"	10'- 0"	340	3.3	9'- 4 3/4"	197	2.5	
3:1	1	17"	13"	4'- 5 3/4"	2'-11 1/2"	4'- 6"	5'- 2 1/4"	117	0.8	2'- 6"	38	0.4	
	2	21"	15"	5'- 1 1/2"	3'- 3 3/4"	5'- 0"	5'- 9 1/4"	132	1.0	3'- 0 1/4"	48	0.5	
	3	28"	20"	6'- 5 1/2"	3'-11"	6'- 3"	7'- 2 1/2"	181	1.4	3'-10 1/2"	67	0.8	
	4	35"	24"	7'- 7 1/2"	4'- 6 1/4"	7'- 3"	8'- 4 1/2"	214	1.8	4'- 9"	85	1.0	
	5	42"	29"	8'-11 1/2"	5'- 1 1/2"	8'- 6"	9'- 9 3/4"	266	2.3	5'- 7 1/4"	116	1.4	
	6	49"	33"	10'- 1 1/2"	5'- 8 3/4"	9'- 6"	10'-11 3/4"	304	2.8	6'- 5 3/4"	134	1.7	
	7	57"	38"	11'- 6 1/2"	6'- 5"	10'- 9"	12'- 5"	354	3.5	7'- 5"	164	2.2	
	8	64"	43"	12'-10 1/2"	7'- 0 1/4"	12'- 0"	13'-10 1/4"	418	4.2	8'- 5 1/2"	203	2.7	
	9	71"	47"	14'- 0 3/4"	7'- 7 1/2"	13'- 0"	15'- 0 1/4"	462	4.9	9'- 4 3/4"	233	3.2	
4:1	1	17"	13"	5'- 4 1/4"	2'-11 1/2"	6'- 0"	6'-11"	147	1.1	2'- 6"	43	0.5	
	2	21"	15"	6'- 1"	3'- 3 3/4"	6'- 8"	7'- 8 1/2"	167	1.3	3'- 0 1/4"	54	0.6	
	3	28"	20"	7'- 7 3/4"	3'-11"	8'- 4"	9'- 7 1/2"	226	1.8	3'-10 1/2"	74	0.9	
	4	35"	24"	9'- 0 1/4"	4'- 6 1/4"	9'- 8"	11'- 2"	274	2.4	4'- 9"	98	1.2	
	5	42"	29"	10'- 7"	5'- 1 1/2"	11'- 4"	13'- 1"	330	3.1	5'- 7 1/4"	127	1.7	
	6	49"	33"	11'-11 1/2"	5'- 8 3/4"	12'- 8"	14'- 7 1/2"	393	3.8	6'- 5 3/4"	156	2.1	
	7	57"	38"	13'- 7 1/2"	6'- 5"	14'- 4"	16'- 6 3/4"	453	4.7	7'- 5"	185	2.7	
	8	64"	43"	15'- 2 1/4"	7'- 0 1/4"	16'- 0"	18'- 5 3/4"	538	5.7	8'- 5 1/2"	233	3.3	
	9	71"	47"	16'- 6 3/4"	7'- 7 1/2"	17'- 4"	20'- 0 1/4"	595	6.7	9'- 4 3/4"	269	4.0	
6:1	1	17"	13"	7'- 1"	2'-11 1/2"	9'- 0"	10'- 4 3/4"	208	1.6	2'- 6"	49	0.6	
	2	21"	15"	8'- 0"	3'- 3 3/4"	10'- 0"	11'- 6 1/2"	236	2.0	3'- 0 1/4"	62	0.8	
	3	28"	20"	10'- 0 3/4"	3'-11"	12'- 6"	14'- 5 1/4"	332	2.9	3'-10 1/2"	91	1.2	
	4	35"	24"	11'- 9 3/4"	4'- 6 1/4"	14'- 6"	16'- 9"	389	3.7	4'- 9"	117	1.7	
	5	42"	29"	13'-10 1/4"	5'- 1 1/2"	17'- 0"	19'- 7 1/2"	491	5.0	5'- 7 1/4"	158	2.2	
	6	49"	33"	15'- 7 1/2"	5'- 8 3/4"	19'- 0"	21'-11 1/4"	582	6.1	6'- 5 3/4"	192	2.8	
	7	57"	38"	17'- 9"	6'- 5"	21'- 6"	24'-10"	689	7.6	7'- 5"	238	3.7	
	8	64"	43"	19'- 9 1/2"	7'- 0 1/4"	24'- 0"	27'- 8 1/2"	808	9.3	8'- 5 1/2"	297	4.6	
	9	71"	47"	21'- 6 3/4"	7'- 7 1/2"	26'- 0"	30'- 0 1/4"	910	10.9	9'- 4 3/4"	347	5.5	

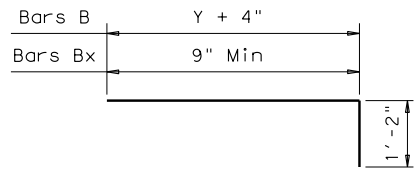
Williamson County, Texas



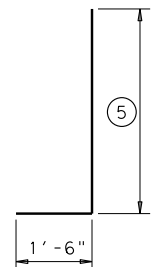
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Showing dimensions



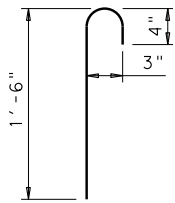
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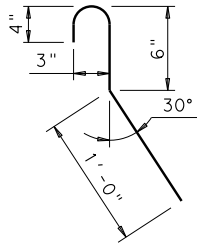
BARS B & B₁-B_x



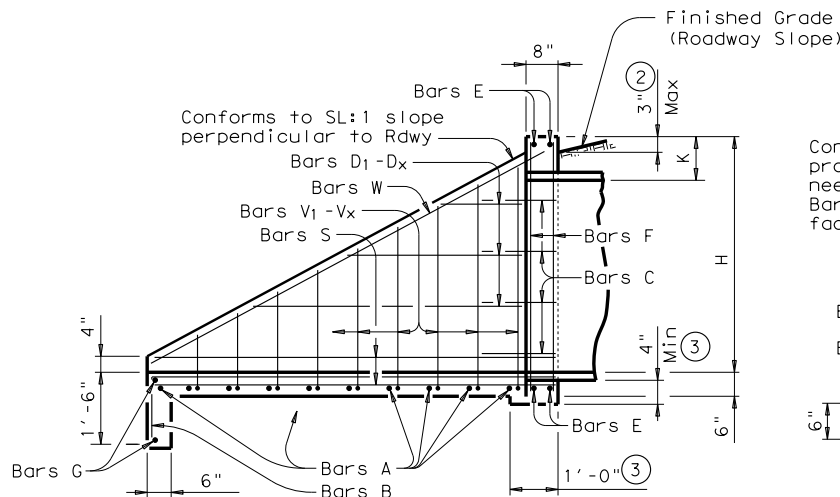
BARS V_S & V_L



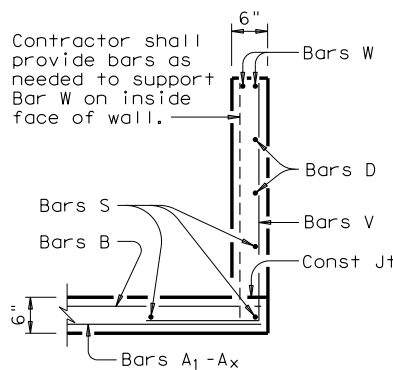
BARS C_s
(2'-0" long)



BARS C_L
(2'-0" long)



TYPICAL WING ELEVATION



SECTION A-A

TABLE OF REINFORCING STEEL (4)

Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
C	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
S	# 4	~	6
V	# 4	1'-0"	~
W	# 5	~	4

TABLE OF DIMENSIONS NOT VARIED WITH SLOPE

DESIGN	SIZE OF PIPE ARCH		G	K	H
	Span	Rise			
1	17"	13"	1'- 0"	1'- 0"	2'- 1"
2	21"	15"	1'- 2"	1'- 0"	2'- 3"
3	28"	20"	1'- 5"	1'- 0"	2'- 8"
4	35"	24"	1'- 8"	1'- 0"	3'- 0"
5	42"	29"	1'-11"	1'- 0"	3'- 5"
6	49"	33"	2'- 2"	1'- 0"	3'- 9"
7	57"	38"	2'- 5"	1'- 0"	4'- 2"
8	64"	43"	2'-10"	1'- 0"	4'- 7"
9	71"	47"	3'- 2"	1'- 0"	4'-11"

- Quantities shown are for metal pipe and will decrease slightly for concrete pipe installations.
- For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.
- Quantities shown are for one structure end only (one headwall).
- Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right)$
Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L} \right) - 1"$
- Lengths of wings based on SL:1 Slope along this line.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

All reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.



Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS
WITH FLARED WINGS FOR
15° SKEW ARCH PIPE CULVERTS

CH-FW-A-15

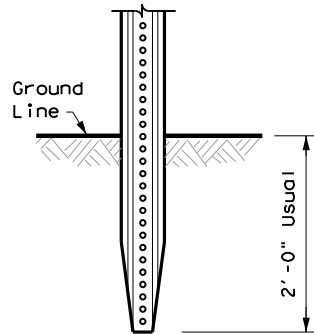
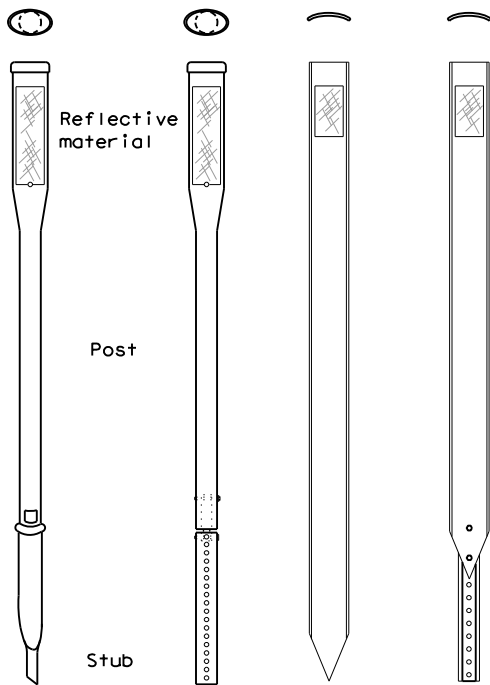
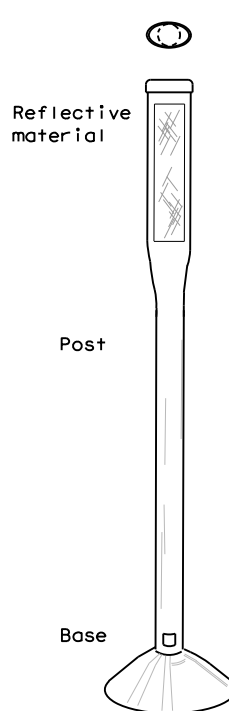
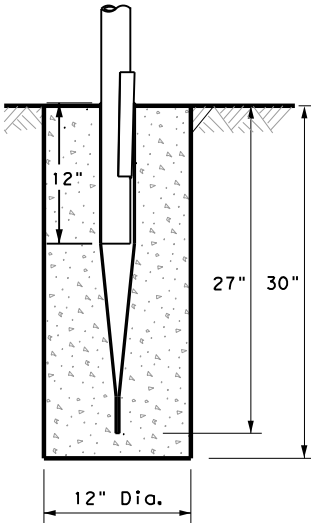
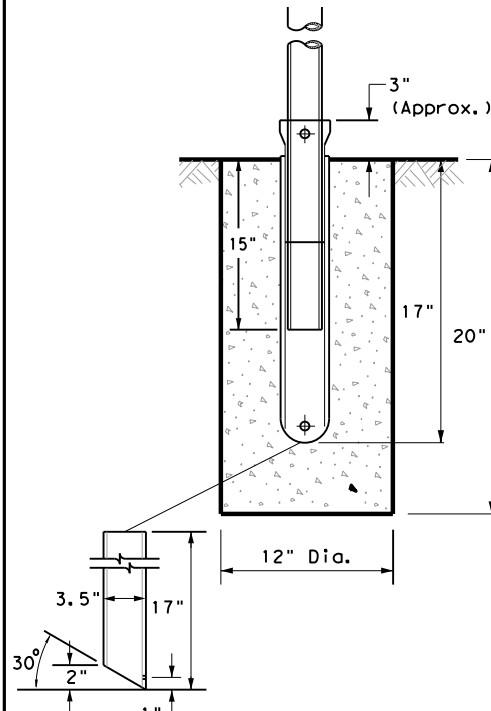
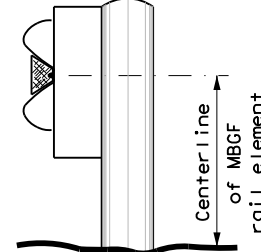
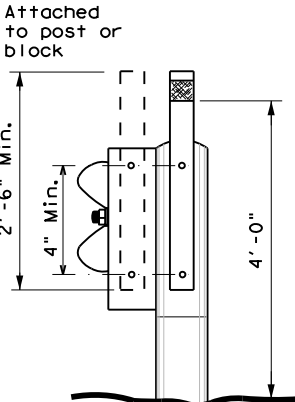
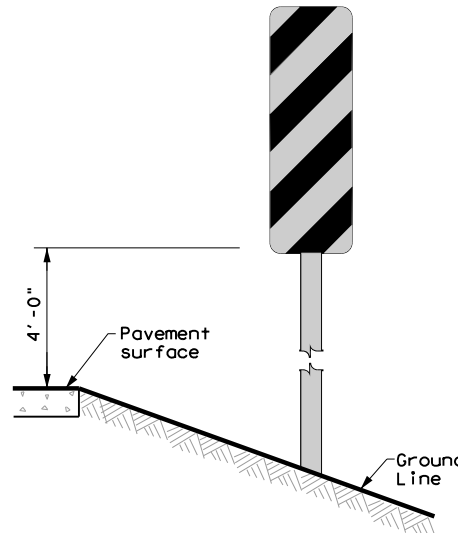
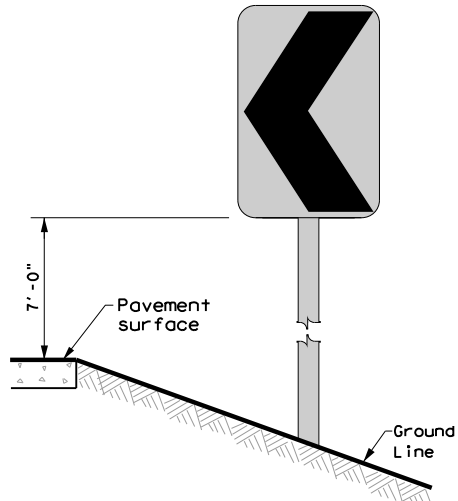
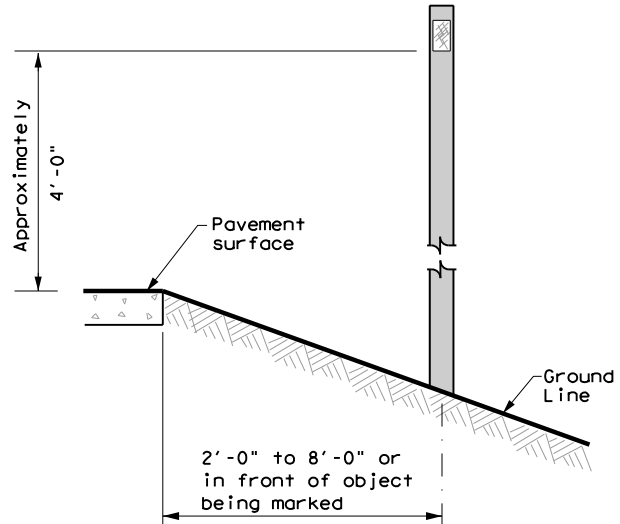
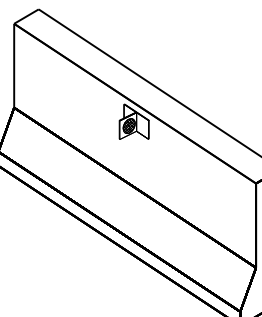

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REVISIONS	DIST	COUNTY	SHEET NO.	

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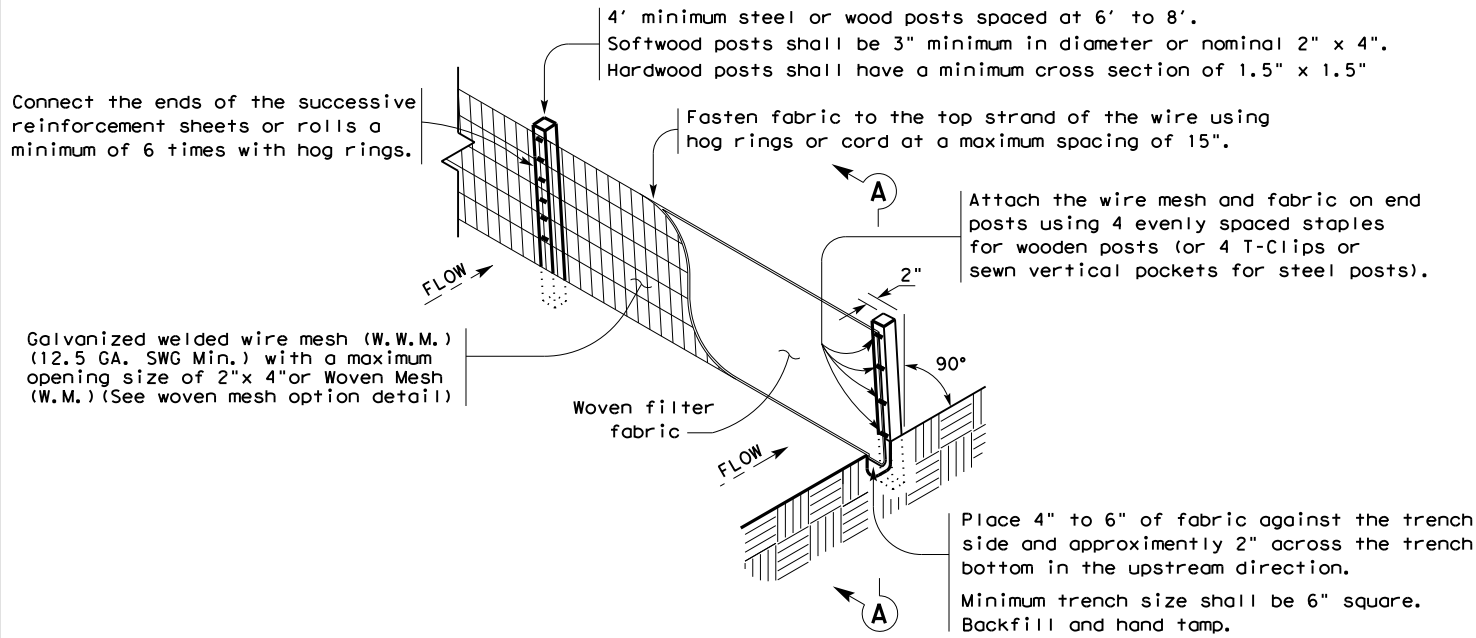
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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS					DELINEATORS				D & OM DESCRIPTIVE CODES																									
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	DEVICE	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXX)XXX(XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post FLX = Flexible Post BRF = Barrier Reflector TYPE OF MOUNT GND = Embedded (drivable or set in concrete) CTB = Concrete Barrier Mount GF1 or GF2 = Guard Fence Attachment SRF = Surface Mount DIRECTION If Required BI = Bi-Directional BR = Bi-Directional with red on back																								
SHEETING Yellow, White or Red Type B or C reflective sheeting					SHEETING	Yellow, White or Red Type B or C Reflective Sheeting				INSTL OM ASSM (OM-XX) (XXX)XXX(XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post FLX = Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional																								
NOTE 1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (fix). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.					POST TYPE	WC	FLX	WC	FLX				<div>DEPARTMENTAL MATERIAL SPECIFICATIONS</div> <table><tr><td>FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)</td><td>DMS-4400</td></tr><tr><td>SIGN FACE MATERIALS</td><td>DMS-8300</td></tr><tr><td>DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS</td><td>DMS-8600</td></tr></table>			FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400	SIGN FACE MATERIALS	DMS-8300	DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600													
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400																																	
SIGN FACE MATERIALS	DMS-8300																																	
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600																																	
OBJECT MARKERS																																		
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)																										
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4																										
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit																														
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			Red -Type B _{FL} or C _{FL} Sheeting																										
POST TYPE	TWT	WC	WC	FLX	TWT			TWT																										
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP																										
BARRIER REFLECTORS (BRF)		CHEVRONS				ONE DIRECTION LARGE ARROW			NOTE: Delineator and object marker backplates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.																									
DEVICE	GF1	GF2	CTB	DEVICE								DEVICE																						
					SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)		60" x 30" (Expressway & Freeway)																					
1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov .				MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"																								
SHEETING Yellow, White, Red				NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. The Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTIONAL LARGE ARROW (W1-6).																													
NOTE 1. Minimum 9 square inches of reflective sheeting surface area.																																		
<div>Texas Department of Transportation</div> <div>DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION</div> <div>D & OM(1)-15</div> <table><tr><td>FILE: dom1-15.dgn</td><td>DN: TXDOT</td><td>CK: TXDOT</td><td>DW: TXDOT</td><td>CK: TXDOT</td></tr><tr><td>© TXDOT August 2004</td><td>CONT</td><td>SECT</td><td>JOB</td><td>HIGHWAY</td></tr><tr><td colspan="2">REVISIONS</td><td colspan="3"></td></tr><tr><td>10-09 3-15</td><td>DIST</td><td colspan="2">COUNTY</td><td>SHEET NO.</td></tr><tr><td>4-10</td><td></td><td colspan="2"></td><td>702</td></tr></table>										FILE: dom1-15.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT	© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY	REVISIONS					10-09 3-15	DIST	COUNTY		SHEET NO.	4-10				702
FILE: dom1-15.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT																														
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY																														
REVISIONS																																		
10-09 3-15	DIST	COUNTY		SHEET NO.																														
4-10				702																														

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POST TYPE AND SUPPORT FOUNDATION DETAILS					TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (FLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT	
GND	GND	SRF	WAS	WAP	GF 1	GF 2
						
NOTES 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.	EMBEDDED		SURFACE MOUNT		STEEL	
	NOTES 1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices. 2. Install per manufacturer's recommendations. 3. Post length may vary to meet field conditions.		PLASTIC		NOTE 1. Install per manufacturer's recommendations.	
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS		CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN		DELINEATORS AND TYPE 2 OBJECT MARKERS		
 NOTE Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)		 NOTE Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTIONAL LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.		 See general notes 1, 2 and 3.		
CONCRETE BARRIER / BRIDGE RAIL						
CTB						
						
GENERAL NOTES 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.						
					Traffic Operations Division Standard	
DELINEATOR & OBJECT MARKER INSTALLATION					D & OM(2)-15	
FILE: dom2-15.dgn					DN: TxDOT	CK: TxDOT
© TxDOT August 2004					CONT	SECT
REVISIONS					JOB	HIGHWAY
10-09 3-15					DIST	COUNTY
4-10					SHEET NO.	

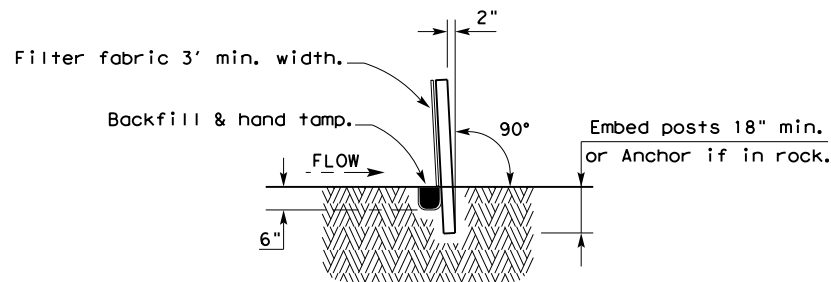
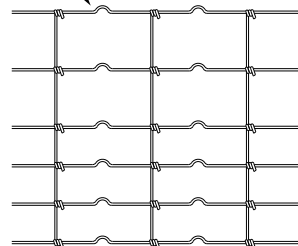
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TEMPORARY SEDIMENT CONTROL FENCE

SCF

Top of Fence



SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

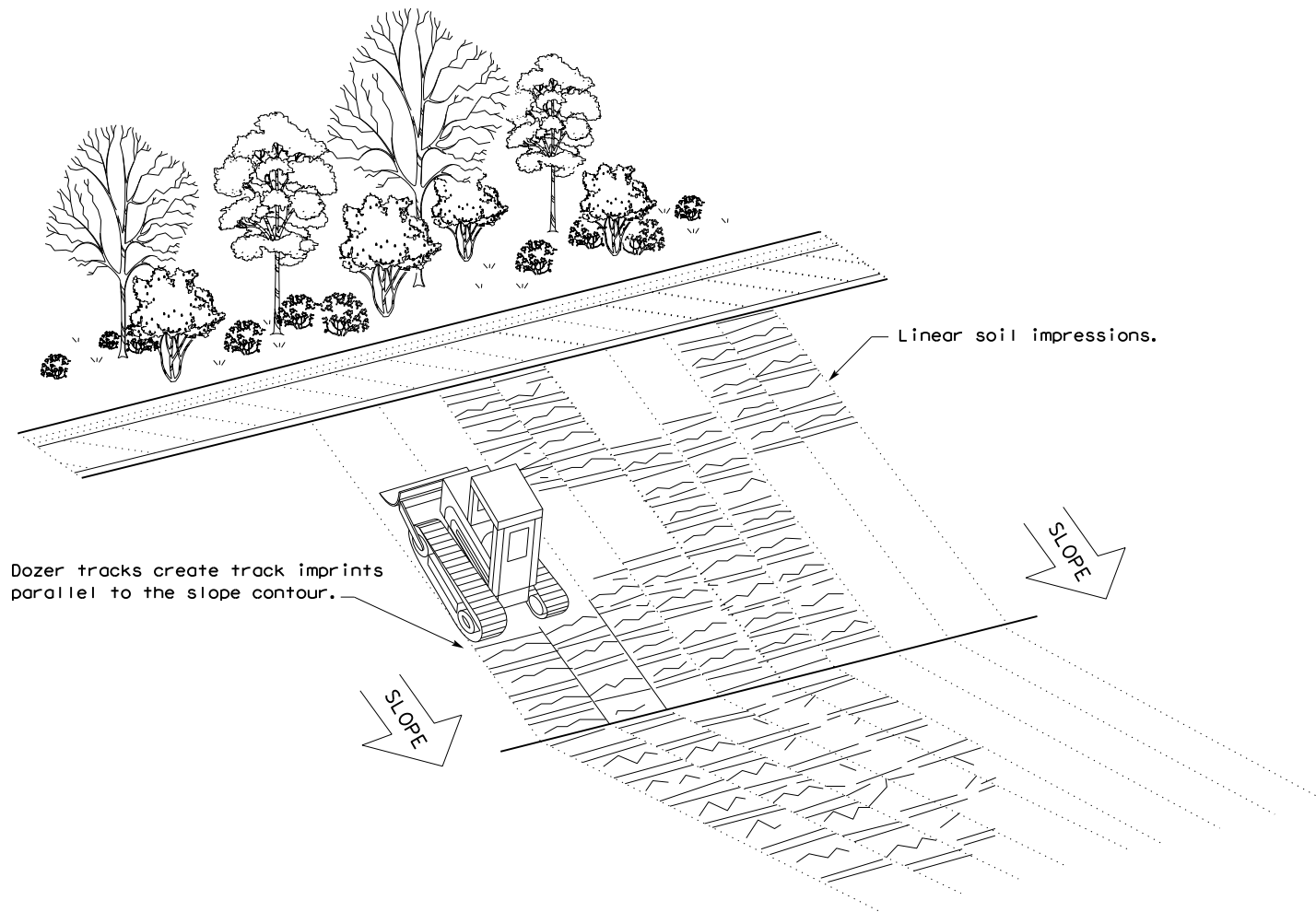
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

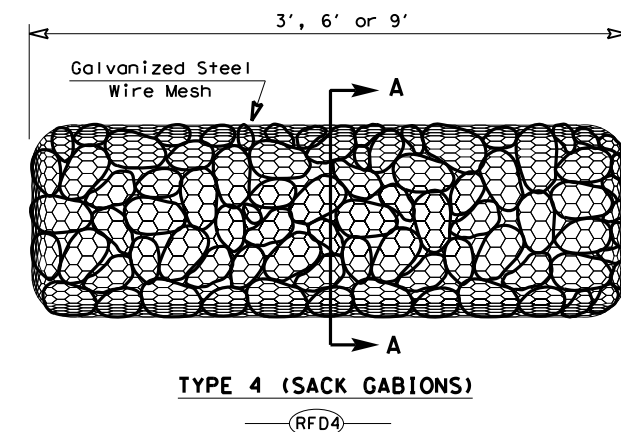
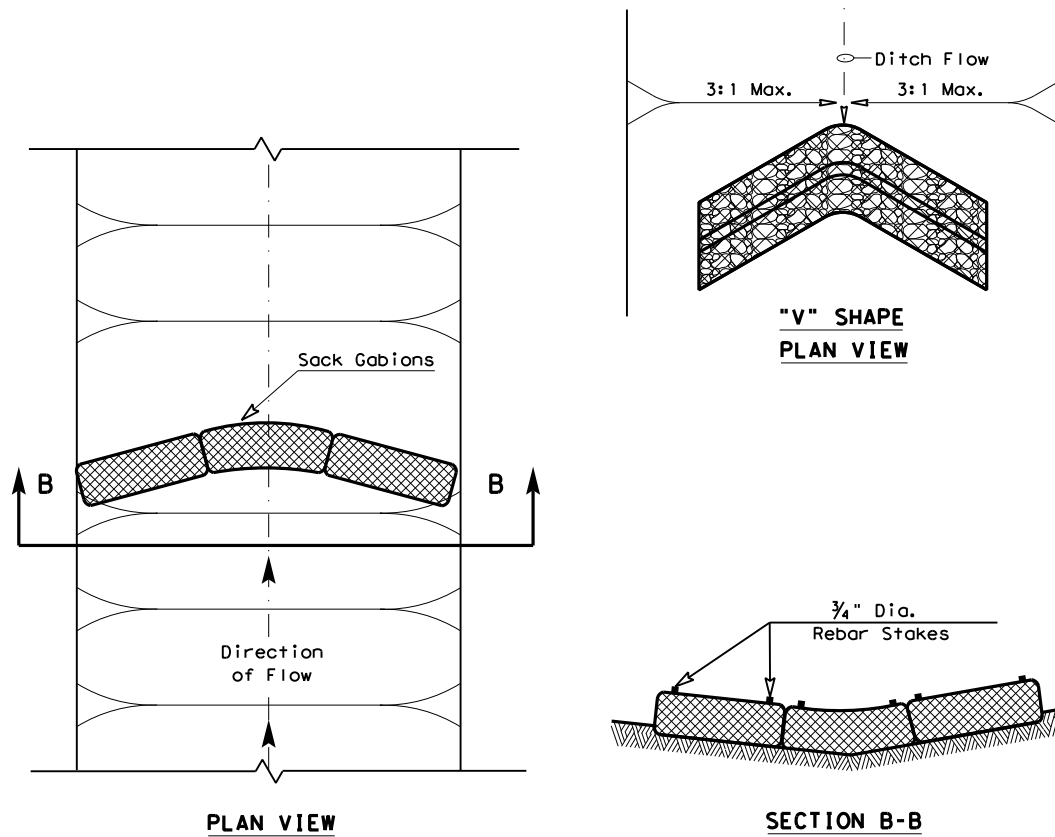
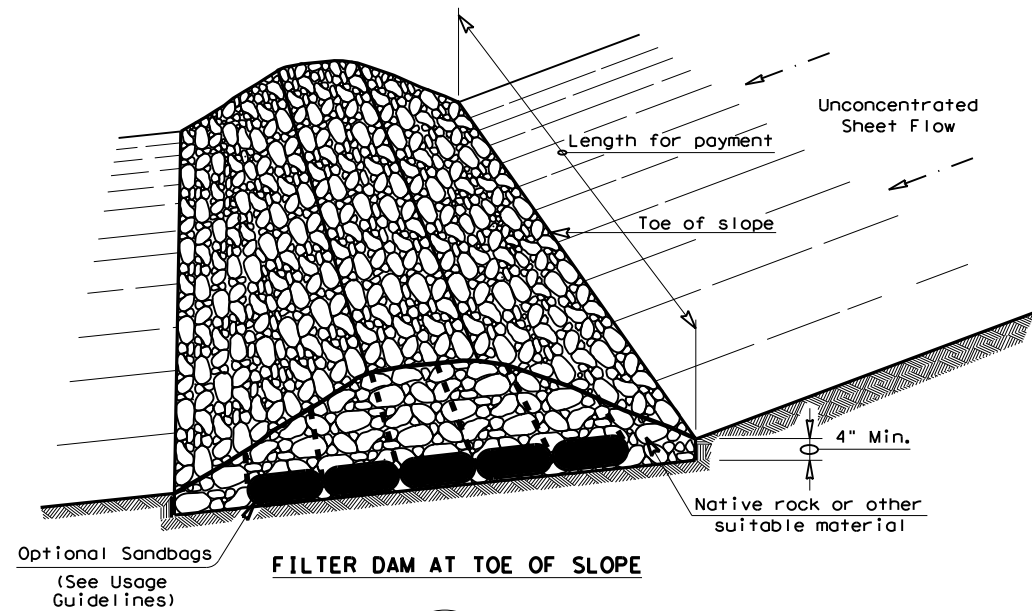
1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING					
EC(1)-16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		DIST	COUNTY	SHEET NO.	
				72	

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FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam — RFD1 —
Type 2 Rock Filter Dam — RFD2 —
Type 3 Rock Filter Dam — RFD3 —
Type 4 Rock Filter Dam — RFD4 —

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

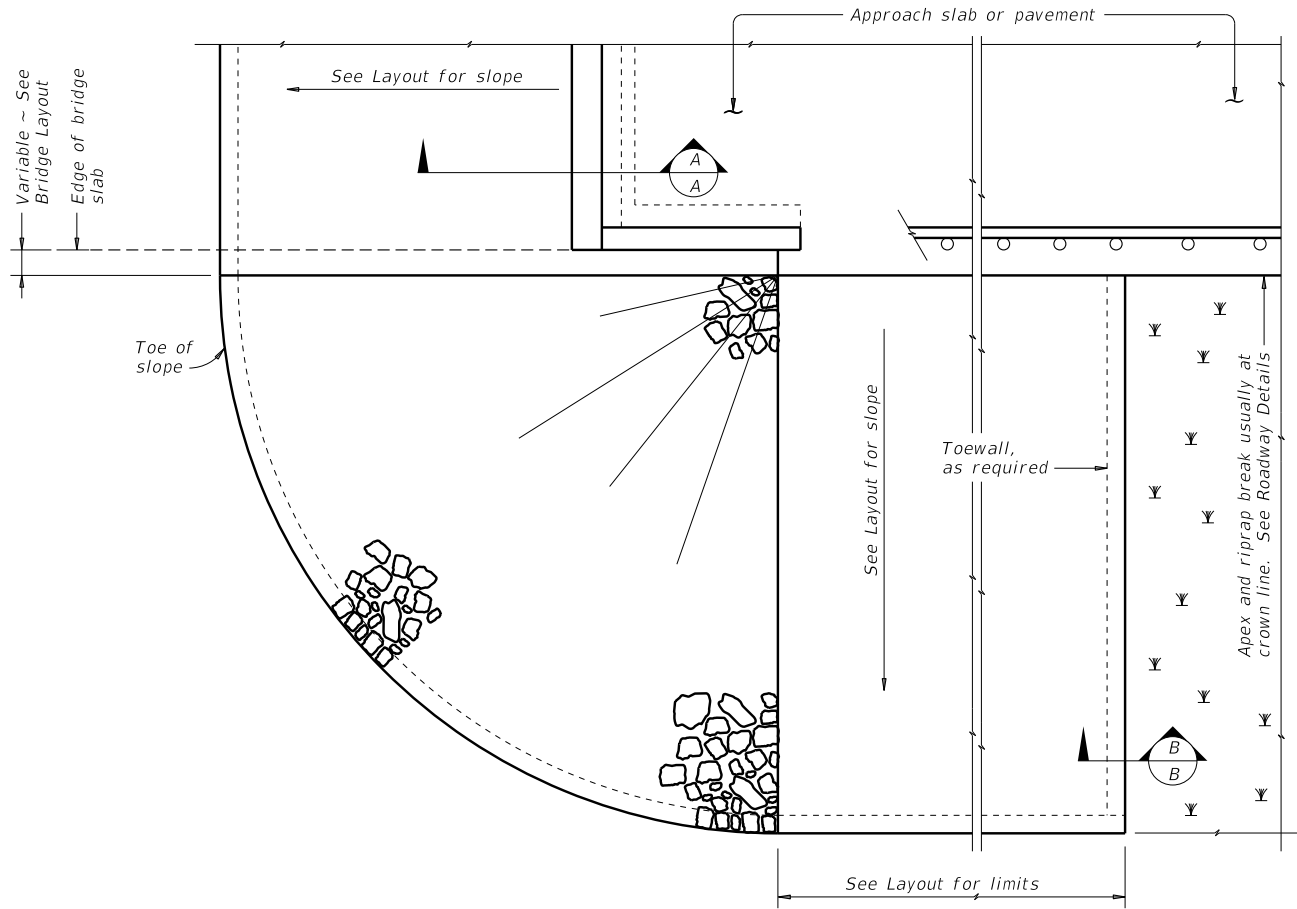
Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

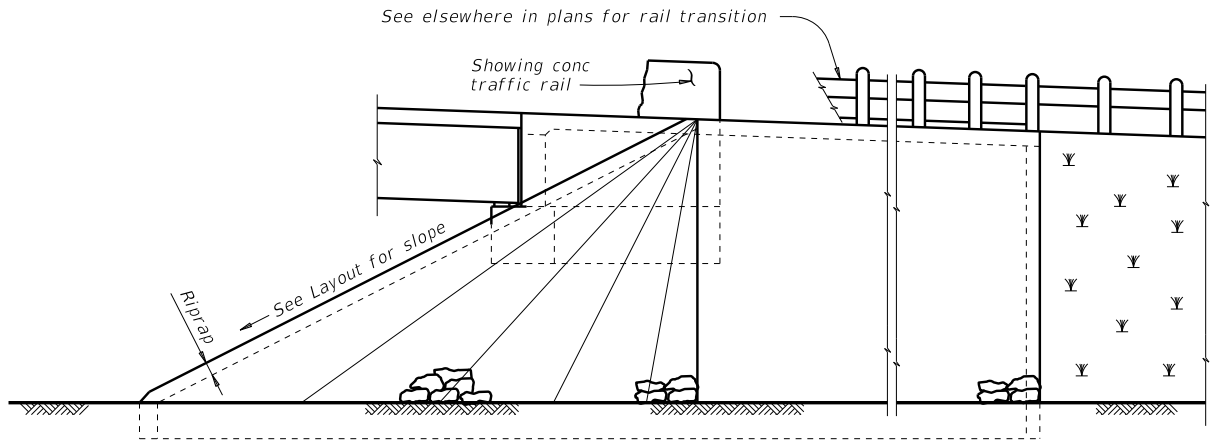
Type 5: Provide rock filter dams as shown on plans.

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
ROCK FILTER DAMS			
EC(2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS		DIST	COUNTY
		SHEET NO. 73	

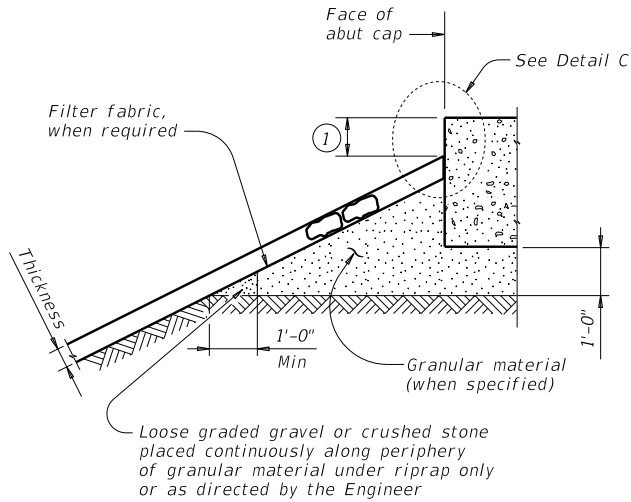
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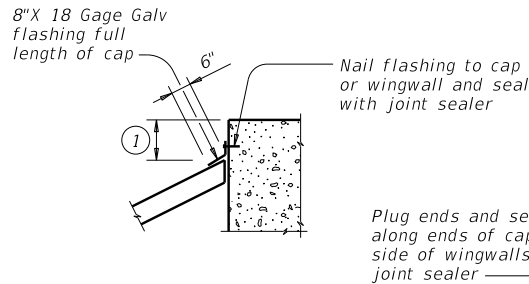
PLAN



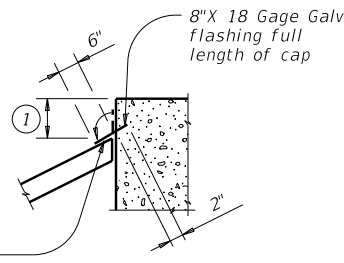
ELEVATION



SECTION A-A AT CAP

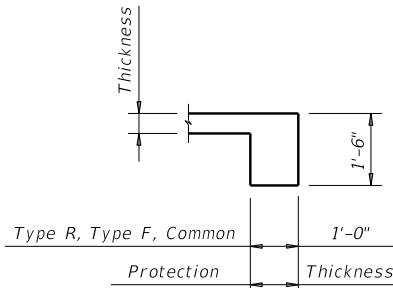


CAP OPTION A



CAP OPTION B


DETAIL C



GENERAL NOTES:
Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
See elsewhere in plans for locations and details of shoulder drains.

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

SHEET 1 OF 2



Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstd1.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS				
	DIST	COUNTY		
		SHEET NO.		
		746		

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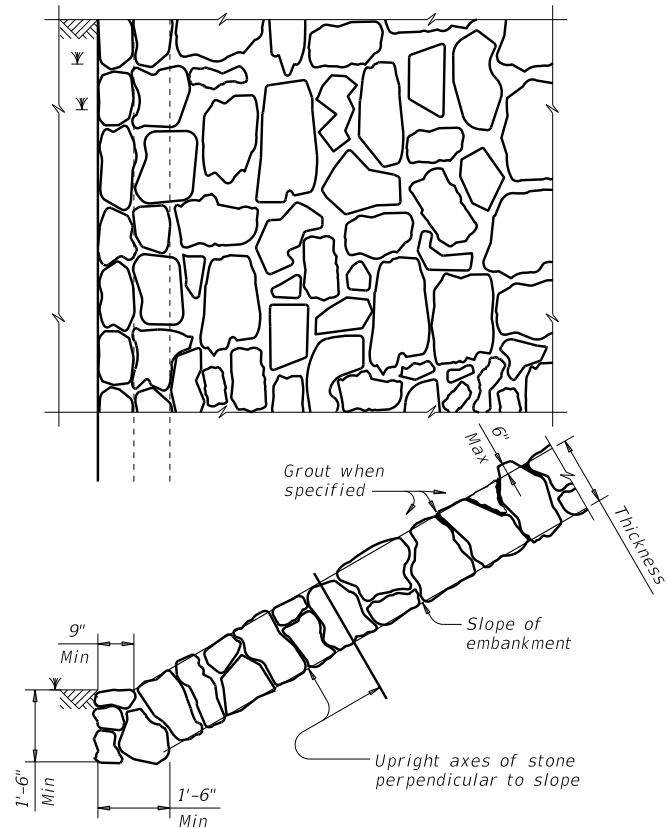


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

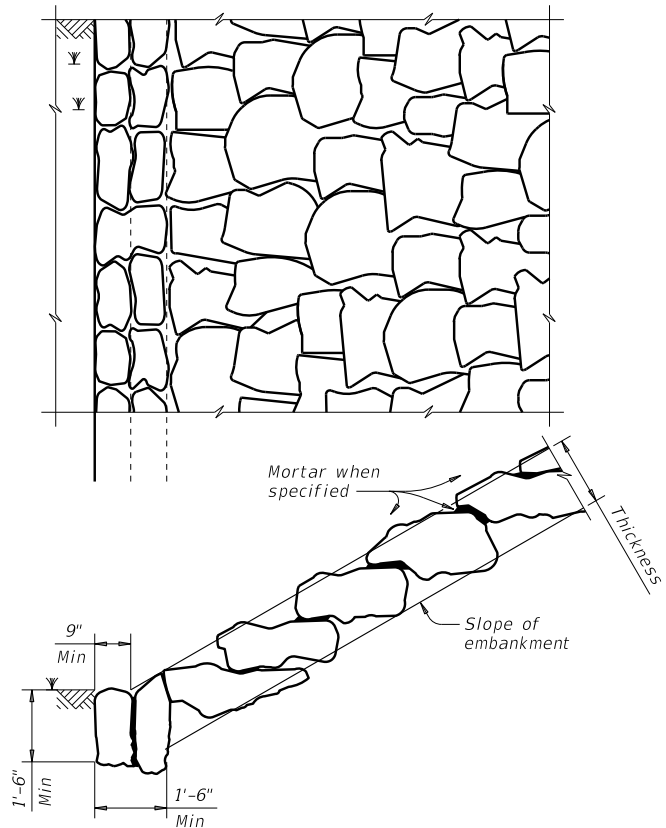


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

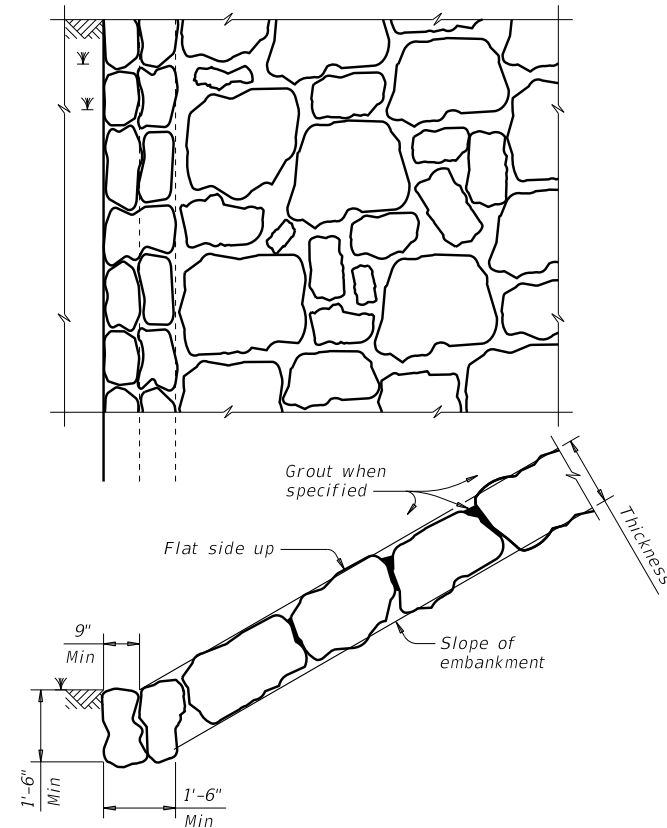


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

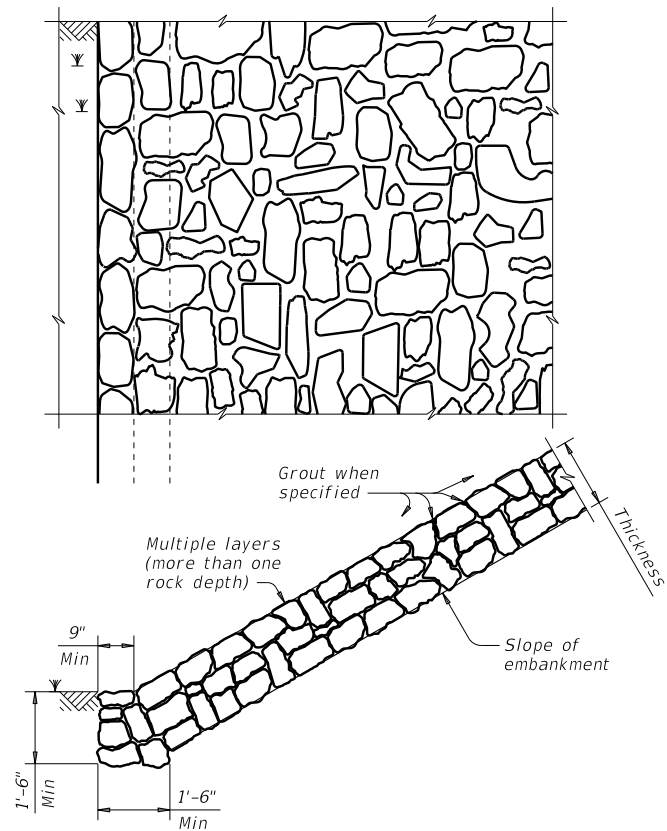


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

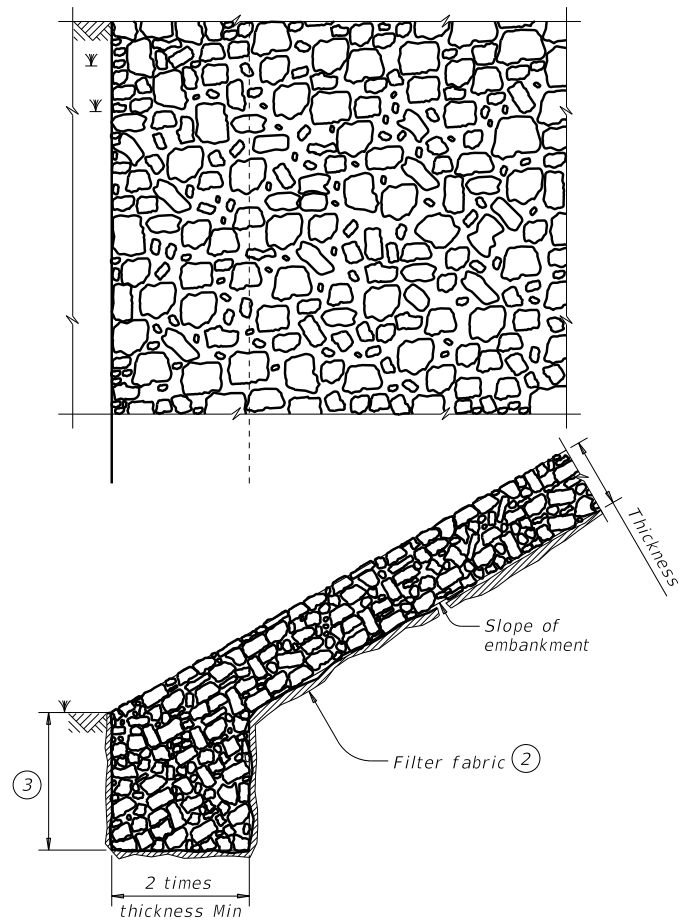


FIGURE 5 ~ PROTECTION STONE RIPRAP

- ② Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.
- ③ Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

SHEET 2 OF 2



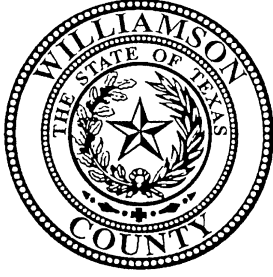
STONE RIPRAP

SRR

FILE: srrstd1.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	

BID FORM
FY19 CROSS CULVERT REPLACEMENTS
WILLIAMSON COUNTY, TEXAS

ITEM CODE		DESCRIPTION	UNITS	QUANTITY	UNIT PRICE	TOTAL PRICE
100	6001	PREPARING ROW	AC	2.74		
105	6037	REMOVING STAB BASE AND ASPH PAV(0"-16")	SY	202		
110	6001	EXCAVATION (ROADWAY)	CY	381		
132	6001	EMBANKMENT (FINAL)(ORD COMP)(TY A)	CY	384		
247	6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	CY	830		
334	6088	HMCL ACP TY-D AES-300	TON	23		
340	6004	D-GR HMA(SQ) TY-A PG64-22	TON	85		
340	6106	D-GR HMA(SQ) TY-D PG64-22	TON	295		
400	6001	STRUCT EXCAV	CY	1027		
402	6001	TRENCH EXCAVATION PROTECTION	LF	116		
432	6002	RIPRAP (CONC)(5 IN)	CY	40		
432	6027	RIPRAP (STONE COMMON)(DRY)(24 IN)	CY	116		
460	6011	CMP AR (GAL STL DES 4)	LF	116		
460	6012	CMP AR (GAL STL DES 5)	LF	122		
460	6024	CMP AR (GAL STL DES 7)	LF	0		
462	6021	CONC BOX CULV (8 FT X 6 FT)	LF	126		
462	6032	CONC BOX CULV (10 FT X 8 FT)	LF	96		
466	6063	HEADWALL (CH - FW - A - 0) (DES= 4)	EA	60		
466	6064	HEADWALL (CH - FW - A - 0) (DES= 5)	EA	2		
466	6066	HEADWALL (CH - FW - A - 0) (DES= 7)	EA	4		
466	6111	HEADWALL (CH - PW - A - 0) (DES= 4)	EA	2		
466	6123	HEADWALL (CH - PW - A - S) (DES= 7)	EA	2		
466	6123A	HEADWALL (CH - PW/FW - A - S) (DES= 7)	EA	1		
466	6169	WINGWALL (FW - S) (HW=8 FT)	EA	1		
466	6183	WINGWALL (PW - 1) (HW=8 FT)	EA	1		
466	6184	WINGWALL (PW - 1) (HW=9 FT)	EA	1		
467	6557	SET (TY II) (DES 5) (CMP) (4: 1) (C)	EA	2		
496	6006	REMOV STR (HEADWALL)	EA	10		
496	6007	REMOV STR (PIPE)	LF	574		
500	6001	MOBILIZATION	LS	1		
502	6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3		
506	6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	296		
506	6011	ROCK FILTER DAMS (REMOVE)	LF	296		
506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	546		
506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	515		
644	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	2		
658	6047	INSTL OM ASSM (OM-2Y)(WC)GND	EA	18		
666	6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	11		
666	6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	290		
PROJECT TOTAL COST:						



Agreement for Construction Services

This Agreement ("Agreement") between Williamson County, Texas, a political subdivision of the State of Texas ("Owner") and _____ ("Contractor") is entered into in accordance with the following terms and conditions:

ARTICLE 1 SCOPE OF WORK: The Owner desires to retain Contractor to provide the construction services described herein. The Contractor shall have the overall responsibility for and shall provide complete construction services and furnish all materials, equipment, tools and labor as necessary or reasonably inferable to complete the following described construction services, or any phase of such services, in accordance with the Owner's requirements and the terms of this Agreement (hereinafter collectively referred to as the "Work"):

As described in the _____ Solicitation # _____, _____; including the specifications set forth therein, which is incorporated herein as if copied in full.

ARTICLE 2 CONTRACT PRICE: Owner agrees to pay to the Contractor, for the satisfactory performance of the Work, the not-to-exceed amount of _____ (\$_____) in accordance with the terms and conditions of this Agreement.

ARTICLE 3 PLANS AND SPECIFICATIONS: The Work shall be performed pursuant to and in accordance with the following described plans and specifications, as well as any revisions made thereto:

As described in the _____ Solicitation # _____, including the specifications set forth therein, which is incorporated herein as if copied in full.

Additional Work: Should Owner choose to add additional work, such additional work shall be described in a separate written amendment to this Agreement wherein the additional work shall be described and the parties shall set forth the amount of compensation to be paid by Owner for the additional work. Contractor shall not begin any additional work and Owner shall not be obligated to pay for any additional work unless a written amendment to this Agreement has been signed by both parties.

ARTICLE 4 SUBSTANTIAL AND FINAL COMPLETION:

4.1 Commencement of Work. Contractor shall commence the Work upon instruction to do so from the Owner and Construction shall be deemed to have commenced on the date of such instruction.

4.2 Substantial Completion. "Substantial Completion" means the stage in the progress of the Work when the Work, or designated portions thereof, may still require minor modifications or adjustments but, in the Owner's opinion, the Work has progressed to the point such that all parts of the Work under consideration are fully operational and usable for intended purposes, as evidenced by a Certificate of Substantial Completion approved by the Owner. If a Certificate of Occupancy is required by public authorities having jurisdiction over the Work, said certificate shall be issued before the Work or any portion thereof is considered substantially complete. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall notify Owner's Designated Representative (sometimes referred to as the "ODR") and request a determination as to whether the Work or designated portion thereof is substantially complete. If the ODR does not consider the Work substantially complete, the ODR will notify the Contractor giving reasons therefore. Failure on the Owner's part to list a reason does not alter the responsibility of the Contractor to complete all Work in accordance with the terms of this Agreement. After satisfactorily completing items identified by Owner's Designated Representative, the Contractor shall then submit another request for the ODR to determine Substantial Completion. If The ODR considers the Work substantially complete, The ODR will prepare and deliver a certificate of Substantial Completion which shall establish the date of Substantial Completion, shall include a punch list of items to be completed or corrected before final completion and final payment, shall establish the time within which the Contractor shall finish the punch list, and shall establish responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, warranty and insurance. Failure to include an item on the punch list does not alter the responsibility of the Contractor to complete all Work in accordance with the terms and conditions of this Agreement. The certificate of Substantial Completion shall be signed by the Owner and the Contractor to evidence acceptance of the responsibilities assigned to them in such certificate.

Substantial Completion (as defined in this agreement) for all stages of the Work shall be achieved on or before the following Substantial Completion date:

DATE FOR SUBSTANTIAL COMPLETION: _____

Under no circumstances will the time for Substantial Completion exceed this date without a written amendment to this Agreement. **THE TIMES SET FORTH IN THE CONSTRUCTION DOCUMENTS ARE AN ESSENTIAL ELEMENT OF THE AGREEMENT. TIME LIMITS STATED IN THE CONTRACT DOCUMENTS ARE OF THE ESSENCE OF THIS AGREEMENT.**

4.3 Final Completion. The Work shall be fully and finally completed **on or before** _____; provided, however, Owner may extend said time period in the event bad weather affects the progress of the Work. Owner shall, at its sole discretion, determine when the Work has been fully and finally completed to its satisfaction.

4.4 Liquidated Damages. For each consecutive calendar day after the date of Substantial Completion that the Work is not Substantially Complete, the Owner may deduct the amount of _____ from any money due or that becomes due the Contractor, not as a penalty but as liquidated damages representing the parties' estimate at the time of contract execution of the damages that the Owner will sustain for late completion. The parties stipulate and agree that calculating Owner's actual damages for late completion of the Work would be impractical, unduly burdensome, and cause unnecessary delay and that the amount of daily liquidated damages set forth is reasonable.

ARTICLE 5 PAYMENT:

Contractor shall have a duty to submit to the ODR by the end of each month a statement showing the total value of the Work performed during such month. The statement shall also include the value of all sound materials delivered on the Work site and to be included in the Work and all partially completed Work, whether bid as a lump sum or a unit item, which in the opinion of the ODR is acceptable. The ODR shall examine and approve or modify and approve such statement. The Owner shall then pay the Contractor pursuant to Chapter 2251 of the Texas Government Code ("Texas Prompt Payment Act"), as set forth in Article 11.1 of this Agreement, the total amount of the approved statement less all previous payments and all further sums that may be retained by the Owner under the terms of this Agreement or under the law. **Statements are not considered "received" until reviewed by the ODR and an approved statement is submitted to the Williamson County Auditor's Office; therefore, Contractor must ensure timely delivery of statements for review and processing.**

At any time following the completion of all Work, including all punch list items, cleanup, and the delivery of record documents, the Contractor shall submit a certified application for final payment, including all sums held as retainage if any, to the ODR for its review and approval. Contractor shall submit, prior to or with the application for final payment, final copies of all close out documents, including maintenance and operating instructions, guarantees and warranties, certificates, and all other items required by this Agreement. Contractor shall also submit consent of surety to final payment, an affidavit that all payrolls, bills for materials and equipment, subcontracted work and other indebtedness connected with the Work, except as specifically noted, have been paid or will be paid or otherwise satisfied within the period of time required by Chapter 2251, Texas Government Code. Contractor shall furnish documentation establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims arising out of the Agreement. Owner is entitled to rely upon this affidavit and the Contractor may not submit a claim on behalf of a subcontractor or vendor if that claim has not been noted as an exception in the affidavit.

Owner may deduct from the final payment all sums due from Contractor for any reason, Liquidated Damages and all other deductions authorized by this Agreement.

Final payment shall constitute a waiver of all claims by the Contractor except those specifically identified in writing and submitted to the ODR prior to the application for final payment. Provided, however, that the Work shall not be deemed fully performed by the Contractor and closed until the expiration of all warranty periods.

ARTICLE 6 CONTRACTOR'S GENERAL RESPONSIBILITIES AND COVENANTS:

6.1 Contractor shall perform all services specifically allocated to it hereunder, as well as those services reasonably inferable and necessary for completion of the Work. The Contractor shall keep the Owner informed of the progress and quality of the Work. Contractor agrees and acknowledges that Owner is entering into this Agreement in reliance on Contractor's represented expertise and ability to provide the Work described in this Agreement. Contractor agrees to use its best efforts, skill, judgment, and abilities to perform its obligations in accordance with the highest standards used in the profession and to further the interests of Owner in accordance with Owner's requirements and procedures.

6.2 Contractor's duties as set forth herein shall at no time be in any way diminished by reason of any approval by the Owner nor shall the Contractor be released from any liability by reason of such approval by the Owner, it being understood that the Owner at all times is ultimately relying upon the Contractor's skill and knowledge in performing the services required hereunder.

6.3 Contractor is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. The safety program shall comply with all applicable requirements of the current federal Occupational Safety and Health Act and all other applicable federal, state and local laws and regulations.

6.4 Contractor shall be an independent contractor under this Agreement and shall assume all of the rights, obligations, liabilities, applicable to it as such independent contractor hereunder and any provisions in this agreement which may appear to give Owner the right to direct Contractor as to details of doing the Work herein covered or to exercise a measure of control over the Work shall be deemed to mean that Contractor shall follow the desires of Owner in the results of the Work only. Owner shall not retain or have the right to control the Contractor's means, methods or details pertaining to the Contractor's performance of the Work described herein, nor shall Owner have the power to direct the order in which Contractor's Work is performed under this agreement. Owner and Contractor hereby agree and declare that Contractor is an Independent Contractor and as such meets the qualifications of an Independent Contractor under Texas Worker's Compensation Act, Texas Labor Code, Section 406.141, that the Contractor is not an employee of Owner for purposes of this Agreement, and that the Contractor and its employees, agents and sub-subcontractors shall not be entitled to worker's compensation coverage or any other type of insurance coverage held by Owner.

6.5 As part of Contractor obligation to coordinate the Work, Contract shall:

- a. cooperate with the ODR and endeavor to further the interests of the Owner and the Work;
- b. provide an on-site, full-time superintendent for the duration of the Work;
- c. visit the Work site and inspect the existing facilities, systems and conditions to insure an accurate understanding of the existing conditions as required;
- d. at Owner's request, attend public meetings and hearings concerning the development of the Work;
- e. review all drawings, specifications, and other plans as they are developed by the Owner and/or its architect and advise Owner of any error, inconsistency or omission discovered in the drawings, specifications, and other plans;
- f. review the drawings, specifications, and other plans for compliance with all applicable laws and code requirements;
- g. advise Owner of any tests that should be performed;
- h. organize and maintain a competent, full-time staff at the Work site with clearly defined lines of authority and communication as necessary to coordinate construction activities, monitor and direct progress of the Work;
- i. attend Owner's regularly scheduled Work progress meetings and fully advise the ODR of the Work status including schedule, costs, quality and changes;
- j. assist Owner in obtaining building permits and obtain special permits for permanent improvements as required by law; and
- k. shall coordinate, monitor and inspect the Work of subcontractors to ensure conformance with the drawings, specifications, other plans and with the terms of this Agreement.

6.6 Contractor shall identify every subcontractor it intends to use for the Work to the Owner in writing at least ten (10) days before entering into any subcontract. Contractor shall not use any subcontractor to which Owner has a reasonable objection. If Owner does not object to a particular subcontractor with said ten (10) days, such subcontract may be considered acceptable to Owner. Following Owner's acceptance of a subcontractor, that subcontractor shall not be changed without Owner's written consent, which shall not be unreasonably withheld.

6.7 Contractor's designated representative, which is set forth below Contractor's signature herein below, shall be responsible for the day-to-day management of the Work on behalf of Contractor. The designated representative shall be the Owner's primary contact during the Work and shall be available as required for the benefit of the Work and the Owner. The contractor's designated representative shall be authorized to act on behalf of and bind the Contractor in all matters related to the Work including, but not limited to, execution of Change Orders.

6.8 NO ALTERATIONS OR CHANGES SHALL BE MADE, HOWEVER, EXCEPT UPON THE WRITTEN ORDER OF THE OWNER, OR THE ODR.

6.9 Contractor shall promptly correct any defective Work at Contractor's sole expense, unless the Owner specifically agrees, in writing, to accept the Work.

6.10 Contractor shall maintain and deliver the close out documents that describe changes or deviations from the original drawings, specifications and plans that occurred during construction and that reflect the actual "As Built" conditions of the completed Work.

COMMISSIONING AND WARRANTY RESPONSIBILITIES

6.11 Contractor shall provide commissioning, starting and check-out services for the systems installed as a part of the Work prior to completion and acceptance. Operation manuals and instructions will be provided to the Owner, the systems will be demonstrated and training provided to Williamson County's operators upon completion and prior to acceptance.

6.12 Contractor hereby warrants that the materials and equipment provided for the Work will be of good quality and new unless otherwise required or permitted by the Owner; that the construction will be free from faults and defects; and that the construction will conform with the requirements of the plans, specifications, drawings and the terms of this Agreement.

6.13 Contractor shall provide warranty services for the Work for a full **12 months** (30 months for Work involving mechanical services, if any) following Final Completion and final payment. Just before the warranty period expires, Contractor shall attend an on-site meeting with the Owner to ensure that all warranty issues have been identified and properly remedied.

ARTICLE 7 OWNER'S RESPONSIBILITIES

7.1 The Owner shall:

- a. provide the general schedule for the Work provided Owner is of the opinion such schedule is necessary. The general schedule will set forth the Owner's plan for milestone dates and completion of the Work;
- b. identify a person as its ODR who is authorized to act in the Owner's behalf with respect to the Work. The ODR shall examine the documents submitted by the Contractor and shall render decisions on behalf of the Owner to the extent allowed by Texas law;

- c. at Owner's cost, will secure the services of surveyors, soils engineers, existing facility surveys, testing and balancing, environmental surveys or other special consultants to develop such additional information as may be necessary for the design or construction of the Work;
- d. furnish required information and services and shall render approvals and decisions as expeditiously as is consistent with reasonable skill and care and the orderly progress of the Contractor's services and of the Work;
- e. shall have the right to reject any defective Work. Should Contractor refuse or neglect to correct any such Work within a reasonable time after notice, Owner may have the Work corrected and recover all expenses incurred from Contractor on demand; and
- f. Owner shall furnish to the Contractor a sufficient number of plans, drawings and specifications sets.

ARTICLE 8 INSURANCE AND INDEMNITY

8.1 Insurance. The Contractor shall carry insurance in the types and amounts indicated below for the duration of the Agreement, which shall include items owned by Owner in the care, custody and control of Contractor prior to and during construction. Contractor must also complete and file the declaration pages from the insurance policies with Owner whenever a previously identified policy period expires during the term of the Agreement, as proof of continuing coverage. Contractor shall update all expired policies prior to submission of any payment requests hereunder. Failure to update policies shall be reason for payment to be withheld until evidence for renewal is provided to the Owner.

8.1.1 The Contractor shall provide and maintain, until the Work covered in this Agreement is completed and accepted by the Owner, the minimum insurance coverage in the minimum amounts as described below. Coverage shall be written on an occurrence basis by companies authorized and admitted to do business in the State of Texas and rated A- or better by A.M. Best Company or otherwise acceptable to Owner.

Type of Coverage		Limits of Liability
a. Worker's Compensation		Statutory
b. Employer's Liability		
Bodily Injury by Accident		\$500,000 Ea. Accident
Bodily Injury by Disease		\$500,000 Ea. Employee
Bodily Injury by Disease		\$500,000 Policy Limit
c. Comprehensive general liability including completed operations and contractual liability insurance for bodily injury, death, or property damages in the following amounts:		
COVERAGE	PER PERSON	PER OCCURRENCE
Comprehensive General Liability (including premises, completed operations and contractual)	\$ 1,000,000	\$ 1,000,000
Aggregate policy limits:		\$2,000,000

- d. Comprehensive automobile and auto liability insurance (covering owned, hired, leased and non-owned vehicles):

COVERAGE	PER PERSON	PER OCCURRENCE
Bodily injury (including death)	\$1,000,000	\$1,000,000
Property damage	\$1,000,000	\$1,000,000
Aggregate policy limits	No aggregate limit	

- e. Builder's Risk Insurance
(*all risks*)

An all risks policy shall be in the amount equal at all times to 100% of the Contract Sum. The policy shall include coverage for loss or damage caused by certified acts of terrorism as defined in the Terrorism Risk Insurance Act. The policy shall be issued in the name of the Contractor and shall name his Subcontractors as additional insureds. The Owner shall be named as a loss payee on the policy. The builders risk policy shall have endorsements as follow:

1. This insurance shall be specific as to coverage and not considered as contributing insurance with any permanent insurance maintained on the present premises. If off-site storage is permitted, coverage shall include transit and storage in an amount sufficient to protect property being transported or stored.
2. For renovation projects and or portions of work contained within an existing structure, the Owner waives subrogation for damage by fire to existing building structure(s), if the Builder's Risk Policy has been endorsed to include coverage for existing building structure(s) in the amount described in the Special Conditions. However, Contractor shall not be required to obtain such an endorsement unless specifically required by the Special Conditions., in this Agreement. The aforementioned waiver of subrogation shall not be effective unless such endorsement is obtained.

- f. Umbrella coverage in the amount of not less than \$1,000,000.

8.1.2 The above insurance requirements are not intended to be compounded with the Contractor's standing insurance policies. If the Contractor already has in force insurance policies which provide the required coverage, there is no need to purchase duplicate coverage for this Work.

8.1.3 Policies must include the following clauses, as applicable.

- a. "This insurance shall not be canceled, limited in scope or coverage, or non-renewed until after thirty (30) days prior written notice, or ten (10) days for non-payment of premium, has been given to Williamson County."
- b. "It is agreed that the Contractor's insurance shall be deemed primary with respect to any insurance or self insurance carried by Williamson County for liability arising out of operations under the Agreement with Williamson County."
- c. "Williamson County, its officials, directors, employees, representatives, and volunteers are added as additional insured as respects operations and activities of, or on behalf of the named insured performed under Agreement with the Owner." This is not applicable to the workers' compensation policy.
- d. "The workers' compensation and employers' liability policy will provide a waiver of subrogation in favor of Williamson County."

8.1.4 Workers' Compensation Insurance Coverage:

In the event that Contractor employs any individual to perform any portion of the Work, Contractor shall comply with Texas Labor Code, §406.096, which requires workers' compensation insurance coverage for all employees providing services on a building or construction project for a governmental entity.

a. Definitions:

- (1) Certificate of Coverage ("certificate") - A copy of a certificate of insurance, a certificate of authority to self-insure issued by the Texas Workers' Compensation Commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the Duration of the Work.
- (2) Duration of the Work - includes the time from the beginning of the Work until the Work has been completed and accepted by the Owner.
- (3) Coverage – Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, §401.011(44).
- (4) Persons providing services relating to the Work ("subcontractor") - includes all persons or entities performing all or part of the services the Contractor has undertaken to perform the Work, regardless of whether that person contracted directly with the Contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services in relation to the Work. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the Work, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

b. The Contractor shall provide Coverage, based on proper reporting of classification codes and payroll amounts and filing of any Coverage agreements, which meets the statutory requirements of Texas labor Code, §401.011(44) for all employees of the Contractor providing services in relation to the Work, for the Duration of the Work.

c. The Contractor must provide a Certificate of Coverage to the Owner prior to or contemporaneously with the execution of this Agreement.

- d. If the Coverage period shown on the Contractor's current Certificate of Coverage ends during the Duration of the Work, the Contractor must, prior to the end of the Coverage period, file a new Certificate of Coverage with the Owner showing that Coverage has been extended.
- e. The Contractor shall obtain from each person providing services in relation to the Work, and provide to the Owner:
 - (1) a Certificate of Coverage, prior to that person beginning any of the Work, so the Owner will have on file Certificates of Coverage showing Coverage for all persons providing services in relation to the Work; and
 - (2) no later than seven days after receipt by the Contractor, a new Certificate of Coverage showing extension of Coverage, if the Coverage period shown on the current Certificate of Coverage ends during the Duration of the Work.
- f. The Contractor shall retain all required Certificates of Coverage for the Duration of the Work and for one year thereafter.
- g. The Contractor shall notify the Owner in writing by certified mail or personal delivery, within 10 days after the Contractor knew or should have known, of any change that materially affects the provision of Coverage of any person providing services in relation to the Work.
- h. The Contractor shall post on the Work site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services in relation to the Work that they are required to be covered, and stating how a person may verify Coverage and report lack of Coverage.
- i. By signing this Agreement or providing or causing to be provided a Certificate of Coverage, the Contractor is representing to the Owner that all employees of the Contractor who will provide services in relation to the Work and all persons providing services in relation to the Work will be covered by workers' compensation coverage for the Duration of the Work, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the Contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.
- j. The Contractor's failure to comply with any of these provisions is a breach of Agreement by the Contractor which entitles the Owner to declare the Agreement void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

8.1.5 The furnishing of the above listed insurance coverage must be tendered prior to execution of the Agreement, and in no event later than ten (10) calendar days from Notice of Award. Failure to provide the insurance in a timely fashion may result in loss of Contractor's bid bond.

8.1.6 The Contractor shall not cause or allow any of its required insurance to be canceled, nor permit any insurance to lapse during the term of the Agreement or as required in the Agreement. If the Contractor fails to obtain, maintain or renew any insurance required by this Agreement, the Owner may, among other remedies available hereunder or at law, obtain insurance coverage directly and recover the cost of that insurance from the Contractor or declare this Agreement void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

8.1.7 The Owner reserves the right to review the insurance requirements set forth in this Article during the effective period of the Agreement and to make reasonable adjustments to the insurance coverage and their limits when deemed necessary and prudent by the Owner based upon changes in statutory law, court decisions, or the claims history of the industry as well as the Contractor.

8.1.8 The Owner shall be entitled, upon request, and without expense, to receive complete copies of the policies with all endorsements and may make any reasonable requests for deletion, or revision or modification of particular policy terms, conditions, limitations, or exclusions, except where policy provisions are established by law or regulation binding upon the Parties or the underwriter of any of such policies. Damages caused by the Contractor and not covered by insurance shall be paid by the Contractor.

8.1.9 Contractor shall be responsible for payment of premiums for all of the insurance coverages required under this Agreement. Contractor further agrees that for each claim, suit or action made against insurance provided hereunder, with respect to all matters for which the Contractor is responsible hereunder, Contractor shall be solely responsible for all deductibles and self-insured retentions. **Any deductibles or self-insured retentions over \$50,000 in the Contractor's insurance must be declared and approved in writing by Owner in advance.**

8.1.10 The Contractor shall contractually require each person or entity with whom it contracts to provide services in relation to the Work, to comply with each and every insurance requirement that Contractor must comply with hereunder. More specifically, each person or entity with whom Contractor contracts to provide services on the in relation to the Work must comply with each insurance requirement under this Article 8 just as if such person or entity was the Contractor. Thus, every reference to Contractor under each insurance requirement of this Article 8 shall mean and include each person or entity with whom Contractor contracts to provide services in relation to the Work. If any such person or entity with whom Contractor contracts to provide services in relation to the Work fails to obtain, maintain or renew any insurance required by this Agreement, the Owner may, among other remedies available hereunder or at law, obtain insurance coverage directly and recover the cost of that insurance from the Contractor or declare this Agreement void if the Contractor does not remedy the breach within ten (10) days after receipt of notice of breach from the Owner.

8.2 INDEMNITY.

8.2.1 INDEMNIFICATION - EMPLOYEE PERSONAL INJURY CLAIMS. TO THE FULLEST EXTENT PERMITTED BY LAW, THE CONTRACTOR SHALL INDEMNIFY, DEFEND (WITH COUNSEL OF OWNER'S CHOOSING), AND HOLD HARMLESS OWNER, AND OWNER'S EMPLOYEES, AGENTS, REPRESENTATIVES, PARTNERS, OFFICERS, AND DIRECTORS (COLLECTIVELY, THE "INDEMNITEES") AND SHALL ASSUME ENTIRE RESPONSIBILITY AND LIABILITY (OTHER THAN AS A RESULT OF INDEMNITEES' GROSS NEGLIGENCE) FOR ANY CLAIM OR ACTION BASED ON OR ARISING OUT OF THE PERSONAL INJURY, OR DEATH, OF ANY EMPLOYEE OF THE CONTRACTOR, OR OF ANY SUBCONTRACTOR, OR OF ANY OTHER ENTITY FOR WHOSE ACTS THEY MAY BE LIABLE, WHICH OCCURRED OR WAS ALLEGED TO HAVE OCCURRED ON THE WORK SITE OR IN CONNECTION WITH THE PERFORMANCE OF THE WORK. CONTRACTOR HEREBY INDEMNIFIES THE INDEMNITEES EVEN TO THE EXTENT THAT SUCH PERSONAL INJURY WAS CAUSED OR ALLEGED TO HAVE BEEN CAUSED BY THE SOLE, COMPARATIVE OR CONCURRENT NEGLIGENCE OF THE STRICT LIABILITY OF ANY INDEMNIFIED PARTY. THIS INDEMNIFICATION SHALL NOT BE LIMITED TO DAMAGES, COMPENSATION, OR BENEFITS PAYABLE UNDER INSURANCE POLICIES, WORKERS COMPENSATION ACTS, DISABILITY BENEFITS ACTS, OR OTHER EMPLOYEES BENEFIT ACTS.

8.2.2 INDEMNIFICATION - OTHER THAN EMPLOYEE PERSONAL INJURY CLAIMS. TO THE FULLEST EXTENT PERMITTED BY LAW, CONTRACTOR SHALL INDEMNIFY, DEFEND (WITH COUNSEL OF OWNER'S CHOOSING), AND HOLD HARMLESS OWNER, AND OWNER'S EMPLOYEES, AGENTS, REPRESENTATIVES, PARTNERS, OFFICERS, AND DIRECTORS (COLLECTIVELY, THE "INDEMNITEES") FROM AND AGAINST CLAIMS, DAMAGES, LOSSES AND EXPENSES, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES, ARISING OUT OF OR ALLEGED TO BE RESULTING FROM THE PERFORMANCE OF THIS AGREEMENT OR THE WORK DESCRIBED HEREIN, TO THE EXTENT CAUSED BY THE NEGLIGENCE, ACTS, ERRORS, OR OMISSIONS OF CONTRACTOR OR ITS SUBCONTRACTORS, ANYONE EMPLOYED BY THEM OR ANYONE FOR WHOSE ACTS THEY MAY BE LIABLE, REGARDLESS OF WHETHER OR NOT SUCH CLAIM, DAMAGE, LOSS OR EXPENSE IS CAUSED IN WHOLE OR IN PART BY A PARTY INDEMNIFIED HEREUNDER.

8.3 Except for the obligation of Owner to pay Contractor the Contract Price pursuant to the terms of this Agreement, and to perform certain other obligations pursuant to the terms and conditions explicitly set forth herein, Owner shall have no liability to Contractor or to anyone claiming through or under Contractor by reason of the execution or performance of this Agreement. Notwithstanding any obligation or liability of Owner to Contractor, no present or future partner or affiliate of Owner or any agent, officer, director, or employee of Owner, Williamson County, or of the various departments comprising Williamson County, or anyone claiming under Owner has or shall have any personal liability to Contractor or to anyone claiming through or under Contractor by reason of the execution or performance of this Agreement.

ARTICLE 9 BONDS

9.1 Performance Bond. Upon execution of this Agreement, Contractor shall provide a Performance Bond in the amount of 100% of the Contract Price. The surety for a Performance Bond shall meet the requirements of Texas law.

9.2 Payment Bond. Upon execution of this Agreement, Contractor shall provide a Payment Bond in the amount of 100% of the Contract Price, as security for the true and faithful payment in full of all subcontractors and persons performing labor, services, materials, machinery, and fixtures in connection with the Work. The surety for a Payment Bond shall meet the requirements of Texas law.

9.3 Warranty Bond. Upon execution of this Agreement, Contractor shall provide a Warranty Bond in the amount of 20% of the Contract Price, as security for the true and faithful performance of all warranties set forth in Bid Documents and this Agreement.

ARTICLE 10 TERMINATION

10.1 Termination for Cause. If either party commits an Event of Breach (a breach of any of the covenants, terms and/or conditions of this Agreement), the non-breaching party shall deliver written notice of such Event of Breach to the breaching party. Such notice must specify the nature of the Event of Breach and inform the breaching party that unless the Event of Breach is cured within three (3) business days of receipt of the notice, additional steps may be taken to terminate this Agreement. If the breaching party begins a good faith attempt to cure the Event of Breach within three (3) business days, then and in that instance, the three (3) business day period may be extended by the non-breaching party, so long as the breaching party continues to prosecute a cure diligently to completion and continues to make a good faith attempt to cure the Event of Breach. If, in the opinion of the non-breaching party, the breaching party does not cure the breach within three (3) business days or otherwise fails to make any diligent attempt to correct the Event of Breach, the breaching party shall be deemed to be in breach and the non-breaching party may, in addition to seeking the remedies available hereunder and under the law, terminate this Agreement.

10.2 Termination for Convenience. The Owner may terminate this Agreement for convenience and without cause or further liability upon thirty (30) days written notice to Contractor. In the event of such termination, it is understood and agreed that only the amounts due to Contractor for goods, commodities and/or services provided and expenses incurred to and including the date of termination, will be due and payable. No penalty will be assessed for Owner's termination of this Agreement for convenience.

ARTICLE 11 MISCELLANEOUS PROVISIONS

11.1 Interest and Late Payments. Except as otherwise specifically set forth herein, Owner's payment for goods and services shall be governed by Chapter 2251 of the Texas Government Code. Interest charges for any overdue payments shall be paid by Owner in accordance with Texas Government Code Section 2251.025. More specifically, the rate of interest that shall accrue on a late payment is the rate in effect on September 1 of Owner's fiscal year in which the payment becomes due. The said rate in effect on September 1 shall be equal to the sum of one percent (1%); and (2) the prime rate published in the Wall Street Journal on the first day of July of the preceding fiscal year that does not fall on a Saturday or Sunday.

In the event that an error appears in an invoice/application for payment submitted by Contractor, Owner shall notify Contractor of the error not later than the twenty first (21st) day after the date Owner receives the invoice/application for payment. If the error is resolved in favor of Contractor, Contractor shall be entitled to receive interest on the unpaid balance of the invoice/application for payment submitted by Contractor beginning on the date that the payment for the invoice/application for payment became overdue. If the error is resolved in favor of the Owner, Contractor shall submit a corrected invoice/application for payment that must be paid in accordance within the time set forth above. The unpaid balance accrues interest as provided by Chapter 2251 of the Texas Government Code if the corrected invoice/application for payment is not paid by the appropriate date.

11.2 Assignment; Successors and Assigns. This Agreement is a personal service contract for the services of Contractor, and Contractor's interest in this Agreement, duties hereunder and/or fees due hereunder may not be assigned or delegated to a third party. This Agreement shall be binding upon and inure to the benefit of parties hereto and their respective successors and assigns.

11.3 Captions. The captions of paragraphs in this Agreement are for convenience only and shall not be considered or referred to in resolving questions of interpretation or construction.

11.4 Governing Law and Venue. This Agreement and all of the rights and obligations of the parties and all of the terms and conditions shall be construed, interpreted and applied in accordance with and governed by and enforced under the laws of the State of Texas without reference to its conflicts of law provisions. Williamson County where the Work site is located shall be the sole place of venue for any legal action arising from or related to this Agreement or the project in which the Owner is a party.

11.5 Waivers. No delay or omission by either party in exercising any right or power arising from non-compliance or failure of performance by the other party with any of the provisions of this Agreement shall impair or constitute a waiver of any such right or power. A waiver by either party of any covenant or condition of this Agreement shall not be construed as a waiver of any subsequent breach of that or of any other covenant or condition of the Agreement.

11.6 Interpretation. In the event of any dispute over the meaning or application of any provision of the Contract Documents, the Contract Documents shall be interpreted fairly and reasonably, and neither more strongly for or against any party, regardless of the actual drafter of the Contract Documents.

11.7 Binding Effect. This Agreement shall be binding upon and inure to the benefit of the parties and their respective permitted assigns and successors.

11.8 Appointment. Owner hereby expressly reserves the right from time to time to designate by notice to Contractor a representative(s) to act partially or wholly for Owner in connection with the performance of Owner's obligations. Contractor shall act only upon instructions from the designated representative(s) unless otherwise specifically notified to the contrary.

11.9 Audits. Contractor agrees that Owner or its duly authorized representatives shall, until the expiration of three (3) years after final payment under this Agreement, have access to and the right to examine and photocopy any and all books, documents, papers and records of Contractor which are directly pertinent to the services to be performed under this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions. Contractor agrees that Owner shall have access during normal working hours to all necessary Contractor facilities and shall be provided adequate and appropriate work space in order to conduct audits in compliance with the provisions of this section. Owner shall give Contractor reasonable advance notice of intended audits.

11.10 Severability. Should any term or provision of this Agreement be held invalid or unenforceable in any respect, the remaining terms and provisions shall not be affected and this Agreement shall be construed as if the invalid or unenforceable term or provision had never been included.

11.11 No Waiver of Immunities. Nothing in this Agreement shall be deemed to waive, modify or amend any legal defense available at law or in equity to Owner, its past or present officers, employees, or agents, nor to create any legal rights or claim on behalf of any third party. Owner does not waive, modify, or alter to any extent whatsoever the availability of the defense of governmental immunity under the laws of the State of Texas and of the United States.

11.12 Current Revenues. Under Texas law, a contract with a governmental entity that contains a claim against future revenues is void; therefore, each party paying for the performance of governmental functions or services must make those payments from current revenues available to the paying party.

11.13 Compliance with Laws. Contractor shall comply with all federal, state, and local laws, statutes, ordinances, rules and regulations, and the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance of this Agreement, including, without limitation, Worker's Compensation laws, minimum and maximum salary and wage statutes and regulations, licensing laws and regulations. When required, Contractor shall furnish the County with certification of compliance with said laws, statutes, ordinances, rules, regulations, orders, and decrees above specified.

11.14 Sales and Use Tax Exemption. Owner is a body corporate and politic under the laws of the State of Texas and claims exemption from sales and use taxes under Texas Tax Code Ann. § 151.309, as amended.

11.15 Texas Public Information Act. To the extent, if any, that any provision in this Agreement is in conflict with Tex. Gov't Code 552.001 *et seq.*, as amended (the "Public Information Act"), the same shall be of no force or effect. Furthermore, it is expressly understood and agreed that Owner, its officers and employees may request advice, decisions and opinions of the Attorney General of the State of Texas in regard to the application of the Public Information Act to any information or data furnished to Owner whether or not the same are available to the public. It is further understood that Owner, its officers and employees shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that Owner, its officers and employees shall have no liability or obligation to Contractor for the disclosure to the public, or to any person or persons, of any software or a part thereof, or other items or data furnished to Owner by Contractor in reliance of any advice, decision or opinion of the Attorney General of the State of Texas.

11.16 Force Majeure. If the party obligated to perform is prevented from performance by an act of war, order of legal authority, act of God, or other unavoidable cause not attributable to the fault or negligence of said party, the other party shall grant such party relief from the performance of this Agreement. The burden of proof for the need of such relief shall rest upon the party obligated to perform. To obtain release based on force majeure, the party obligated to perform shall file a written request with the other party.

11.17 Equal Opportunity in Employment. The parties to this Agreement agree that during the performance of the services under this Agreement they will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The parties to this Agreement will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; termination; rates of pay or other forms of compensation, and selection for training, including apprenticeship.

11.18 Reports of Accidents. Within 24 hours after Contractor becomes aware of the occurrence of any accident or other event which results in, or might result in, injury to the person or property of any third person (other than an employee of the Contractor), whether or not it results from or involves any action or failure to act by the Contractor or any employee or agent of the Contractor and which arises in any manner from the performance of this Agreement, the Contractor shall send a written report of such accident or other event to the County, setting forth a full and concise statement of the facts pertaining thereto. The Contractor shall also immediately send the County a copy of any summons, subpoena, notice, or other documents served upon the Contractor, its agents, employees, or representatives, or received by it or them, in connection with any matter before any court arising in any manner from the Contractor's performance of work under this Agreement.

11.19 Relationship of the Parties. Each party to this Agreement, in the performance of this Agreement, shall act in an individual capacity and not as agents, employees, partners, joint ventures or associates of one another. The employees or agents of one party shall not be deemed or construed to be the employees or agents of the other party for any purposes whatsoever.

11.20 Appropriation of Funds by Owner. Owner believes it has sufficient funds currently available and authorized for expenditure to finance the costs of this Agreement. Contractor understands and agrees that the Owner's payment of amounts under this Agreement is contingent on the Owner receiving appropriations or other expenditure authority sufficient to allow the Owner, in the exercise of reasonable administrative discretion, to continue to make payments under this Agreement.

11.21 Execution in Counterparts. This Agreement may be executed in counterparts, each of which, when executed and delivered, shall be deemed to be an original and all of which together shall constitute one and the same document.

11.22 Entire Agreement. This Agreement represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either oral or written. This Agreement may be amended only by written instrument signed by each party to this Agreement. NO OFFICIAL, EMPLOYEE, AGENT, OR REPRESENTATIVE OF THE OWNER HAS ANY AUTHORITY, EITHER EXPRESS OR IMPLIED, TO AMEND THIS AGREEMENT, EXCEPT PURSUANT TO SUCH EXPRESS AUTHORITY AS MAY BE GRANTED BY THE WILLIAMSON COUNTY COMMISSIONERS COURT.

BY SIGNING BELOW, the Parties have executed and bound themselves to this Agreement to be effective as of the date of the last party's execution hereof (Effective Date).

OWNER:

WILLIAMSON COUNTY, TEXAS,
a political subdivision of the state of Texas

By: _____

Printed Name: _____

Title: _____

Date: _____

Party Representatives

Owner’s Designated Representative (“ODR”):

Phone _____
Fax _____

CONTRACTOR:

By: _____

Printed Name: _____

Title: _____

Date: _____

Contractor’s Designated Representative:

Phone _____
Fax _____

BID AFFIDAVIT

This form must be completed, signed, notarized and returned with Bid package

The undersigned attests that the company named below, under the provisions of Subtitle F, Title 10, Texas Government Code Chapter 2270:

1. Does not boycott Israel currently; and
2. Will not boycott Israel during the term of the contract.

Pursuant to Section 2270.001, Texas Government Code:

1. "Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes; and
2. "Company" means a for-profit sole proprietorship, organization, association, corporation, partnership, joint venture, limited partnership, or any limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company or affiliate of those entities or business associations that exist to make a profit.

The undersigned certifies that the IFB and the Bidder's Bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all goods and/or services upon which prices are extended at the price Bid, and upon the conditions contained in the IFB.

I hereby certify that the foregoing Bid has not been prepared in collusion with any other Bidder or other person or persons engaged in the same line of business prior to the official opening of this Bid. Further, I certify that the Bidder is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the price of services/commodities Bid on, or to influence any person or persons to submit a Bid or not to submit a Bid thereon."

Name of Bidder:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
Address of Bidder:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
Email:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
Telephone:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
Printed Name of Person Submitting Affidavit:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>
Signature of Person Submitting Affidavit:	<div style="border: 1px solid black; height: 20px; width: 100%;"></div>

Cooperative Purchasing Program

Check one of the following options below. A non-affirmative Bid will in no way have a negative impact on the County's evaluation of the Bid.

<input type="checkbox"/>	I will offer the quoted prices to all authorized entities during the term of the County's Contract.
<input type="checkbox"/>	I will not offer the quoted prices to all authorized entities.

If no box is checked, the Bidder agrees to make best efforts in good faith to offer the quoted prices to all authorized entities.

BEFORE ME, the undersigned authority, a Notary Public, personally appeared [] (Name of Signer), who after being by me duly sworn, did depose and say: "I, [], (Name of Signer) am a duly authorized officer of/agent for [] (Name of Bidder) and have been duly authorized to execute the foregoing on behalf of the said [] (Name of Bidder).

SUBSCRIBED AND SWORN to before me by the above-named []
on this the [] day of [], 20[].

[]
Notary Public in and for

The State of []

The County of []

SIGNATURE AND NOTARY NOT REQUIRED IF COMPLETING IN BIDSYNCH ELECTRONICALLY.

CONFLICT OF INTEREST QUESTIONNAIRE**FORM CIQ****For vendor doing business with local governmental entity****OFFICE USE ONLY**

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

Date Received

1 Name of vendor who has a business relationship with local governmental entity.

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.** (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 Name of local government officer about whom the information is being disclosed.

Name of Officer

4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6 ☐ Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7 Signature is not required if completing in BIDS SYNC electronically;

Signature of vendor doing business with the governmental entity

Date

CONFLICT OF INTEREST QUESTIONNAIRE

For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at [http://www.statutes.legis.state.tx.us/ Docs/LG/htm/LG.176.htm](http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm). For easy reference, below are some of the sections cited on this form.

Local Government Code § 176.001(1-a): "Business relationship" means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

- (A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
- (B) a transaction conducted at a price and subject to terms available to the public; or
- (C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

Local Government Code § 176.003(a)(2)(A) and (B):

- (a) A local government officer shall file a conflicts disclosure statement with respect to a vendor if:

- (2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds \$2,500 during the 12-month period preceding the date that the officer becomes aware that

(i) a contract between the local governmental entity and vendor has been executed; or

(ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than \$100 in the 12-month period preceding the date the officer becomes aware that:

(i) a contract between the local governmental entity and vendor has been executed;

or (ii) the local governmental entity is considering entering into a contract with the vendor.

Local Government Code § 176.006(a) and (a-1)

- (a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity. (a-1)

The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

- (2) the date that the vendor:

(A) begins discussions or negotiations to enter into a contract with the local governmental entity; or

(B) submits to the local governmental entity an application, response to a request for proposal or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

- (3) the date the vendor becomes aware:

(A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);

(B) that the vendor has given one or more gifts described by Subsection (a); or (C) of a family relationship with a local government officer.

Form provided by Texas Ethics Commission

www.ethics.state.tx.us

Revised 11/30/2015

Bidder References

List the last (3) companies or governmental agencies, where the same or similar goods and/or services as contained in this IFB package, were recently provided by Bidder.

Reference 1

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: \$

Scope of Work:

	5
	6

Reference 2

Client Name:

Location:

Contact Name:

Title:

Phone:

E-mail

Contract Date To:

Contract Date From:

Contract Value: \$

Scope of Work:

	5
	6

Reference 3

Client Name:	Location:
<input type="text"/>	<input type="text"/>

Contact Name:	Title:
<input type="text"/>	<input type="text"/>

Phone:	E-mail
<input type="text"/>	<input type="text"/>

Contract Date To:	Contract Date From:	Contract Value: \$
<input type="text"/>	<input type="text"/>	<input type="text"/>

Scope of Work:
<div><div></div><div>5</div><div>6</div></div>

Question and Answers for Bid #1811-281 - FY 19 Cross Culvert Replacements

Overall Bid Questions

There are no questions associated with this bid.