

Solicitation 1708-187

Relocation of Williamson County Regional Raw Water Line

Bid Designation: Public



Williamson County, Texas

Bid 1708-187

Relocation of Williamson County Regional Raw Water Line

Bid Number 1708-187
 Bid Title Relocation of Williamson County Regional Raw Water Line
 Expected Expenditure **\$1,500,000.00** (This price is expected - not guaranteed)

Bid Start Date In Held
 Bid End Date Oct 25, 2017 10:00:00 AM CDT
 Question & Answer End Date Oct 20, 2017 5:00:00 PM CDT

Bid Contact Will Hutchinson
 Purchasing Specialist III
 512-943-1553
 will.hutchinson@wilco.org

Contract Duration 1 year
 Contract Renewal Not Applicable
 Prices Good for 365 days
 Pre-Bid Conference Oct 11, 2017 3:00:00 PM CDT
 Attendance is optional
 Location: 901 S. Austin Ave. Georgetown, TX 78626

Bid Comments **See Bid Requirements sheet.**

Item Response Form

Item 1708-187--01-01 - Attach Documents Here

Quantity 1 each

Prices are not requested for this item.

Delivery Location **Williamson County, Texas**

No Location Specified

Qty 1

Description

Attach Documents Here

Item 1708-187--01-02 - Total Bid Price

Quantity 1 lump sum

Unit Price

Delivery Location **Williamson County, Texas**

No Location Specified

Qty 1

Description

Total Bid Price (This does replace bid forms or any other required documentation)



PUBLIC ANNOUNCEMENT AND GENERAL INFORMATION

WILLIAMSON COUNTY PURCHASING DEPARTMENT SOLICITATION 1708-187 Relocation of Williamson County Regional Raw Water Line

**BIDS MUST BE RECEIVED ON OR BEFORE:
Oct 25, 2017 10:00:00 AM CDT**

**BIDS WILL BE PUBLICLY OPENED:
Oct 25, 2017 10:00:00 AM CDT**

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.

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>

3.11 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.

3.12 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.

3.13 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.

3.14 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.

3.15 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 the 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 in 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 to 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 Special Provisions 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.

CONFLICT OF INTEREST QUESTIONNAIRE For vendor or other person doing business with local governmental entity		Form CIQ
<p>This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the governmental entity.</p> <p>By law this questionnaire must be filed with the records administrator of the local government not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.</p> <p>A person commits an offense if the person violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.</p>		OFFICE USE ONLY Date Received <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
1	Name of person doing business with local governmental entity. <div style="border: 1px solid black; height: 20px; width: 100%;"></div>	
2	<p style="text-align: center;">Check this box if you are filing an update to a previously filed questionnaire.</p> <div style="display: flex; align-items: center;"> <input type="checkbox"/> <div style="margin-left: 10px;"> <p>(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)</p> </div> </div>	
3	<p>Describe each affiliation or business relationship with an employee or contractor of the local governmental entity who makes recommendations to a local government officer of the local governmental entity with respect to expenditure of money.</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right; position: relative; height: 100px;"> <div style="position: absolute; top: 0; right: 0; width: 20px; height: 20px; text-align: center;">5</div> <div style="position: absolute; bottom: 0; right: 0; width: 20px; height: 20px; text-align: center;">6</div> </div>	
4	<p>Describe each affiliation or business relationship with a person who is a local government officer and who appoints or employs a local government officer of the local governmental entity that is the subject of this questionnaire.</p> <div style="border: 1px solid black; height: 100px; width: 100%;"></div> <div style="text-align: right; position: relative; height: 100px;"> <div style="position: absolute; top: 0; right: 0; width: 20px; height: 20px; text-align: center;">5</div> <div style="position: absolute; bottom: 0; right: 0; width: 20px; height: 20px; text-align: center;">6</div> </div>	

CONFLICT OF INTEREST QUESTIONNAIRE For vendor or other person doing business with local governmental entity		Form CIQ Page 2
5	<p>Name of local government officer with whom filer has affiliation or business relationship. (Complete this section only if the answer to A, B, or C is YES.)</p> <p>This section, item 5 including subparts A, B, C & D, must be completed for each officer with whom the filer has affiliation or other relationship. Attach additional pages to this Form CIQ as necessary.</p> <p>A. Is the local government officer named in this section receiving or likely to receive taxable income from the filer of the questionnaire? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>B. Is the filer of the questionnaire receiving or likely to receive taxable income from or at the direction of the local government officer named in this section AND the taxable income is not from the local governmental entity? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10 percent or more? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>D. Describe each affiliation or business relationship.</p> <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>	
	<p>6. Describe any other affiliation or business relationship that might cause conflict of interest:</p> <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>	
7	<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 60%; border-bottom: 1px solid black; margin-bottom: 5px;"></div> <div style="width: 35%; border-bottom: 1px solid black; margin-bottom: 5px;"></div> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> Signature of person doing business with the governmental entity Date </div>	
	<p style="color: red;">Signature not required if completing in BIDSYNC electronically.</p>	



WILLIAMSON COUNTY
PROJECT CONSTRUCTION MANUAL
FOR

**Relocation of Williamson County Regional Raw Water Line
(WCRRWL)**

SOLICITATION 1708-187

**WILLIAMSON COUNTY, TEXAS
PURCHASING DEPARTMENT
901 SOUTH AUSTIN AVENUE
GEORGETOWN, TEXAS 78626**

September 2017



The enclosed Specifications, Special Specifications, Special Provisions, General Notes, and Specification Data in this document have been selected by me, or under my responsible supervision as being applicable to this project. Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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SECTION 1
ADDENDA



ADDENDUM NO. ____

Date:

Owner: **Williamson County, Texas**

Project Name:

Project No:

This Addendum forms a part of the Contract and clarifies, corrects or modifies the original Construction Documents, dated _____. Acknowledge receipt of this addendum in space provided on Bid Form. Failure to do so may subject bidder to disqualification.

DESCRIPTION OF ADDITION OR CHANGE:

This addendum consists of ____ page(s).

Approved by ENGINEER

END

SECTION 2
INVITATION FOR BIDS

PUBLIC NOTICE WILLIAMSON COUNTY INVITATION FOR BIDS

Williamson County Commissioner's Court invites the submission of sealed bids for:

RELOCATION OF WILLIAMSON COUNTY REGIONAL RAW WATER LINE

Williamson County is seeking qualified contractors to construct 1,100 feet of 48" waterline relocation. Estimated time of completion is sixty (60) calendar days to substantial completion, and thirty (30) calendar days to final completion, with an estimated cost of \$1,500,000.

Sealed bids will be publicly opened and read aloud in the Williamson County Purchasing Department, 901 South Austin Avenue, Georgetown, Texas on October 25, 2017 at 10:00 A.M.

Bids must be received on or before October 25, 2017 at 10:00 A.M.

Bid documents and plans may be viewed and responded to by registering with BIDSYNC at www.bidsync.com.

No fee is required to register with Bidsync as a Williamson County Supplier, or to participate in the County's solicitation process. The receipt of electronic bids will be registered in Bidsync.

The Time-Date Stamp Clock located at the Williamson County Purchasing Department will serve as the official clock for the purpose of verifying the date and time of receipt of Paper Bids.

There will be a Non-Mandatory Pre-Bid Conference on October 11, 2017 at 3:00 P.M. at Williamson County Purchasing Department, 901 South Austin Avenue, Georgetown, Texas.

BID BOND REQUIRED

A Cashier's Check, Certified Check, or acceptable Bidder's Bond in the amount of five percent (5%) of the Bid must accompany each Bid. Performance, Payment and Warranty Bonds will be required as designated in the bidding documents.

The Williamson County Commissioners' Court reserves the right to accept the lowest and best Bid as deemed by the Court, or reject any and/or all bids.

Bidder shall use per unit pricing. Payments will be made by check.

The designated Purchasing Agent for this Bid is Gary Stone, Senior Purchasing Specialist, under the direction of Randy Barker, Purchasing Agent for Williamson County, 512-943-3553.

This notice is issued by order of the Williamson County Commissioners' Court on October 3rd; Dan A. Gattis, County Judge.

SECTION 3
BID INSTRUCTIONS/REQUIREMENTS

Modified April 2016

Bid Instructions

BID INSTRUCTIONS/REQUIREMENTS

All Bids must be received in the Williamson County Purchasing Department either hardcopy or electronically through BidSync.

Williamson County prefers and requests electronic submittal of this bid.

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

All interested Respondents 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 BID.

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.

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.

If mailed or delivered in person, Bids are to be delivered in sealed envelope on or before the submittal deadline to:

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

Respondents should list the Bid Number, Bid Name, Name and Address of Respondent, and the Date of the Bid opening on the outside of the box or envelope.

Respondent should submit one (1) original; **AND** (2) two copies and (1) CD **OR** (1) USB copy of the Bid.

Williamson County will not accept any Bids received after the submittal deadline.

Williamson County will not accept any responsibility for Bids being delivered by third party carriers. Facsimile transmittals will NOT be accepted.

All questions should be submitted on the Bidsync site. Questions with their answers will be posted and updated on www.bidsync.com.

Any addenda and/or other information relevant to the Bid will be posted on: www.bidsync.com.

ALL BIDS MUST BE SUBMITTED ON THE FORMS PROVIDED IN THIS BID DOCUMENT. (May be replaced with a computer generated printout, if submitted in an identical format to the proposal).

FACSIMILE AND ELECTRONIC MAIL TRANSMITTALS SHALL NOT BE ACCEPTED.

1. 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. **This price must be good from the date of Bid opening through the completion of the project. Bids which do not state a fixed price will not be considered.** The Court may award a contract for the period implied or expressly stated in the lowest and best Bid.
2. 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 price, 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 point.
3. 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 materials and/or services covered in this Bid request, and to waive informalities or defects in the Bid or to accept such Bid it shall deem to be in the best interest of Williamson County.
4. Funding: Funds for payment have been provided through the Williamson County budget approved by Commissioners Court for the 2013 Road Bond Program.
5. Late Bid: Bids received after submission deadline will be considered VOID AND UNACCEPTABLE and will be returned to the bidder unopened. Williamson County is

not responsible for lateness or non-delivery of mail, carrier, etc. The date and time stamp of the Williamson County Purchasing Department shall be the official date and time of receipt.

6. Altering Bid: Bidders **cannot alter or amend bid** after submission deadline.
7. Sales Tax: Williamson County is by statute, exempt from the State Sales Tax and Federal Excise Tax.
8. Contract: This Bid, when properly accepted by Williamson County, shall constitute a contract equally binding between the successful bidder and Williamson County. No different or additional terms will become part of this contract.
9. Changes: No oral statement of any person shall modify or otherwise change, or affect the terms, conditions, plans and/or specifications stated in the Bid Package and or Bid Instructions/Requirements.
10. Delivery Times and Locations: The commodity and/or service covered by this Bid shall be as stated in the Bid Package.
11. Payments: The Construction Inspector will manage the Contractor payments. Invoices for the work specified in the Contract Documents will be submitted to the Construction Inspector. Upon satisfactory completion and acceptance of these invoices, the Construction Inspector will forward the invoices to the County via the GEC. County's payment for goods and services shall be governed by Chapter 2251 of the Texas Government Code. An invoice shall be deemed overdue the 31st day after the later of (1) the date County receives the goods under the Contract; (2) the date the performance of the service under the Contract is completed; or (3) the date the Williamson County Auditor receives an invoice for the goods or services. Interest charges for any overdue payments shall be paid by 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 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 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 submitted by Successful Bidder, County shall notify Successful Bidder of the error not later than the twenty first (21st) day after the date County receives the invoice. If the error is resolved in favor of Successful Bidder, Successful Bidder shall be entitled to receive interest on the unpaid balance of the invoice submitted by Successful Bidder beginning on the date that the payment for the invoice became overdue. If the error is resolved in favor of the County, 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 Chapter 2251 of the Texas Government Code if the corrected invoice is not paid by the appropriate date. As a minimum, invoices shall include:

- (1) Name, address, and telephone number of Contractor and similar information in the event the payment is to be made to a different address
- (2) County contract, Purchase Order, and/or delivery order number
- (3) Identification of items or service as outlined in the contract
- (4) Quantity or quantities, applicable unit prices, total prices, and total amount
- (5) Any additional payment information which may be called for by the Contract

Payment inquiries should be directed to the Williamson County Auditor's Office, Accounts Payable Department:
512-943-1573
accountspayable@wilco.org

12. 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 of January 1, 2006 Vendors are responsible for complying with

Local Government Code Title 5, Subtitle C, Chapter 176. Additional information may be obtained from the County website at the following link:

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

The Williamson County Conflict of Interest Questionnaire is attached as a fillable form. This form must be completed, signed, and submitted with your bid (attached to the first Line Item of this bid) or completed electronically and signed electronically when entering your password in Bidsync.

13. 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 Williamson County.
14. Minimum Standards for Responsible Bidders: A prospective bidder must affirmatively demonstrate bidder's responsibility. A prospective bidder must 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;
 - d. be otherwise qualified and eligible to receive an award.

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

15. References: Williamson County **REQUIRES** bidder to supply with this Bid, a list of at least **three (3) references** where like services have been supplied by their firm. The Bidder References Form is attached as a fillable form in this bid document. This form must be completed and attached to the first line item on your bid or included with an all paper bid.
16. Bidder shall provide with this Bid response, all documentation required by this Bid. Failure to provide this information may result in rejection of the Bid.

17. Termination for Default: Williamson County reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the County in the event of breach or default of this contract. Non-Performance of the bidder in terms of specifications shall be a basis for the termination of the contract by the County. The County shall not pay for commodities/services which are unsatisfactory. Contractors will be given a reasonable opportunity before termination to correct the deficiencies. This, however, shall in no way be construed as negating the basis for termination for non-performance.

18. Contract Administration: Under this contract, Robert Daigh, Williamson County Sr. Director of Infrastructure or designee, shall be the contract administrator with designated responsibility to ensure compliance with contract requirements, such as but not limited to, acceptance, inspection and delivery. The contract administrator will serve as liaison between Williamson County Commissioners Court and the successful bidder or the Construction Inspector.

19. Purchase Order: Williamson County may generate a purchase order(s) to the successful bidder as products and/or services are required. The purchase order number must appear on all itemized invoices and/or request for payment.

20. 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.

21. Contract Times and Liquidated Damages - Bidders must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the County, and to fully complete the project within the specified time stated in the proposal. Bidders must agree to pay liquidated damages in accordance with Special Provision 000-001 per day to County for

every day past the specified completion date stated in the proposal.

22. BIDS MUST BE: legible and of a quality that can be reproduced.
23. Bid forms that are included in the Bid package shall be used. **CHANGES to Bid forms made by bidders shall DISQUALIFY THE BID.** Exceptions to the Bid forms and or specifications shall be made on an **attachment** to the Bid package.
24. Workers Compensation Coverage Requirements: The Texas Labor Code, §406.096, requires workers' compensation insurance coverage for all persons providing services on a building or construction project for a governmental entity. The rule requires a governmental entity 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 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, §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 or proposal 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 South Austin Avenue
Georgetown, Texas 78626

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) 943-1553, or you may call the Texas Workers' Compensation Commission at (512) 804-4000.

A. Definitions: 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.

(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 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, §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, §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.

(5) Duration of the project - includes the time from the beginning of the work on the project until the contractor's/person's work on the project has been completed and accepted by the governmental entity.

(6) Persons providing services on the project ("subcontractor" in §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 Williamson 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 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 coverage to the governmental entity prior to being awarded the contract.
- 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 the governmental entity showing that coverage has been extended.
- E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:
 - (1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project;

(2) no later than seven (7) 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 Williamson 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;

(4) obtain from each other person with whom it contracts, and provide to the contractor:

(a) a certificate of coverage, prior to the other person beginning work on the project; &

(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 governmental entity 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 the governmental entity 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 governmental entity to declare the contract void if the contractor does not remedy the breach within ten (10) days after receipt of notice of breach from Williamson County.

25. PERFORMANCE AND PAYMENT

BONDS: Chapter 262.032 and Chapter 2253.021 of the Texas Government Code governs the requirements for performance bonds and payment 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. 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 within ten (10) days after receipt of written notification of award of contract prior to beginning work on the project and must be executed by a corporate surety or sureties in accordance with the Texas Insurance Code. In the event the bond exceeds \$100,000.00, the surety must also (1) hold a certificate of authority from the United States secretary of the treasury to qualify as a surety on obligations permitted or required under federal law; or (2) have obtained reinsurance for any liability in excess of \$100,000.00 from a reinsurer that is authorized and admitted as are insurer in this state and is the holder of a certificate of authority from the United States secretary of the treasury to qualify as a surety or reinsurer on obligations permitted or required under federal law.

In determining whether the surety or reinsurer holds a valid certificate of authority the County may rely on the list of companies holding certificates of authority as published in the Federal Register covering the date on which the bond is to be executed. 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. The purpose of a performance bond is for the protection of the government entity and is conditioned on the faithful performance of the work being done in accordance with the plans, specifications and contract documents. The payment bond is for the protection of persons supplying labor and materials to the contractor to ensure payment.

26. **BIDDERS BOND:** All bids shall be accompanied by a certified cashier's check upon a National or State bank in an amount not less than five percent (5%) of the total maximum bid price, payable without recourse to Williamson 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 performance and payment bonds, as stipulated by item 25 above, within ten (10) days after notice of award of contract to him. Bid guarantees must be submitted in the same sealed envelope with the bid. Bids submitted without check or bid bonds will not be considered.

Bidders are not required to use Surety 2000 for your Bid Bond supplier, however; when bidding electronically in Bidsync and using Surety 2000, you may import your bid bond directly from the Surety 2000 web site. To use a different bond provider you MUST:

1. Scan the completed bond
2. Download the completed bond to the line item of this bid with your other required documents.

Bid bonds must be attached to the line item of the electronic bid OR submitted in the same sealed envelope with a paper Bid.

27. All bid securities will be returned to the respective bidders within twenty-five (25) days after bids are opened, except those which the County elects to hold until the successful bidder has executed the contract. Thereafter, all remaining securities, including security of the successful bidder, will be returned within sixty (60) days.
28. Prior to submitting any bid, bidders are required to read the plans, specifications, bid, contract and bond forms carefully; to inform themselves by their independent research, test and investigation of the difficulties to be encountered and judge for themselves of the accessibility of the work and all attending circumstances affecting the cost of doing the work and the time required for its completion and obtain all information required to make an intelligent bid.
29. Should the bidder find discrepancies in, or omissions from the plans, specifications, or other documents, or should he/she be in doubt as to their meaning, he/she should notify at once the Project Engineer and may obtain clarification or addendum prior to submitting any bid.
30. In case of ambiguity or lack of clarity in the statement of prices in the bids, the county reserves the right to consider the most favorable analysis thereof, or to reject the bid. Unreasonable (or unbalanced) prices submitted in a bid may result in rejection of such bid or other bids.
31. Award of the contract, if awarded, will be made within sixty (60) days after opening of the bids and no bidder may withdraw his bid within said sixty (60) day period of time unless a prior award is made.
32. Within ten (10) days of written notification of award of the contract, the bidder shall execute and furnish to the County the performance bond, or letter of credit if applicable, and payment bond as required by item 25 above; and the Certificate of Insurance showing coverages in accordance with contract documents. Failure to execute contract, Bonds and Certificate of Insurance shall be just cause for the annulment of the award. In case of the annulment of the award, the bid guarantee shall become the property of Williamson County, not as a penalty, but as a liquidated damage.
33. Any quantities given in any portion of the contract documents, including the plans, are estimates only, and the actual amount of work required may differ somewhat from the estimates. The basis for the payment shall be the actual amount of work done and/or material furnished.

34. THE TEXAS HAZARD COMMUNICATION

ACT, Chapter 502 of the Health and Safety Code, Sec. 502.006, states that a chemical manufacturer or distributor shall provide appropriate Material Safety Data Sheets (MSDS) to employers who acquire hazardous chemicals in this state with each initial shipment and with the first shipment after a MSDS is updated. The MSDS must conform to the most current requirements of the OSHA standard in 29 CFR 1910.1200. By submitting your bid to the County you are acknowledging that this regulation is a part of this bid and that you will provide appropriate MSDS with each initial shipment and with the first shipment after a MSDS is updated.

35. THE WILLIAMSON COUNTY HAZARD COMMUNICATION PROGRAM POLICY

Under Revised Texas Hazard Communication Act (THCA) of 1993 states that it is the responsibility of all contractor/sub-contractors who bring hazardous chemicals onto county property to provide appropriate MSDS to the county at the work site. When exposure to a hazardous chemical is expected each contractor/sub-contractor shall be responsible for the appropriate training of their employees. For a copy of the Williamson County Hazard Communication Program Policy contact the Williamson County Unified Road & Bridge System Safety/Training Coordinator at 512/930-3330. By submitting your bid to the County you are acknowledging that this policy is a part of this bid and that you will provide appropriate MSDS to the county work site and provide for appropriate training as applicable.

36. CERTIFICATE OF INTERESTED PARTIES TEXAS ETHICS COMMISSION (FORM 1295)

As of January 1, 2016, 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 to Williamson County.

On January 1, 2016, the Texas Ethics Commission made 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

The Low Bidder must:

1. Use the online application to process the required information on Form 1295
2. Print a copy of the form which will contain a unique certification number
3. An authorized agent of the Bidder must sign the printed copy of the form
4. and have the form notarized
5. the completed Form 1295 and certification of filing must be filed (scanning and emailing form is sufficient) with Williamson County prior to award of the contract by Commissioners Court.

37. Ambiguity, Conflict, or other Errors in the IFB If Bidder discovers any ambiguity, conflict, discrepancy, omission or other error in this IFB, Bidder shall immediately notify Williamson 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 Williamson County prior to the date and time fixed for submission of Bids of an error or ambiguity in the IFB known to Bidder, or an error or ambiguity that reasonably should have been known to Bidder, then Bidder shall be deemed to have waived the error or ambiguity or its later resolution. Williamson County may also modify the IFB, no later than 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 1.

SECTION 4
BID FORM, BID AFFIDAVIT, BIDDER REFERENCES,
& CONFLICT OF INTEREST QUESTIONNAIRE

**ALL REQUIRED DOCUMENTS MUST BE
FILLED OUT AND SUBMITTED WITH BID**
www.bidsync.com

**FOLLOWING CONTRACT AWARD
REQUIRED DOCUMENTS WILL BE
INSERTED IN THIS SECTION**

SECTION 5
STANDARD FORM OF AGREEMENT

Approved December 2007

Agreement

STANDARD FORM OF AGREEMENT

STATE OF TEXAS

WILLIAMSON COUNTY

THIS STANDARD FORM OF AGREEMENT (the “Agreement”) is by and between WILLIAMSON COUNTY, TEXAS, a political subdivision of the State of Texas (hereinafter called “County”) and _____ (hereinafter called “Contractor”).

The County and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

Article 1. Work

Contractor shall complete all Work as specified or indicated in the Contract Documents. The “Project” is generally described as follows:

Project No. **1708-187 Relocation of Williamson County Regional Raw Waterline**

Article 2. Engineer of Record

The Project has been designed by **Cobb Fendley & Associates**, who is hereinafter called the “Engineer of Record” and who is to act as the County’s design professional.

Article 3. Contract Time

The Work shall be Substantially Completed in **60** calendar days (the “Contract Time”). Following Substantial Completion, the Contractor shall proceed expeditiously with adequate forces and shall achieve Final Completion within the time specified in the Special Conditions.

Article 4. Contract Price

County shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to paragraph 4.1 below (the “Contract Price”):

- 4.1 For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in the Bid Form, and as totaled below:

Approved December 2007

Agreement

TOTAL OF ALL UNIT PRICES _____ \$ _____ (dollars)
(insert words)

As provided in the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classification are to be made by the Engineer of Record.

Article 5. Contractor's Representations

In order to induce County to enter into this Agreement, Contractor makes the following representations:

- 5.1 Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents including the "technical data".
- 5.2 Contractor has visited the site and become familiar with and is satisfied as to the general, local and site conditions that may affect cost, progress, performance or furnishing of the Work.
- 5.3 Contractor is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress, performance and furnishing of the Work.
- 5.4 Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site which have been identified. Contractor acknowledges that such reports and drawings are not Contract Documents and may not be complete for Contractor's purposes. Contractor acknowledges that the County and Engineer of Record do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract Documents with respect to Underground Facilities at or contiguous to the site.
- 5.5 Contractor has correlated the information known to Contractor, information and observations obtained from visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.
- 5.6 Contractor has given Engineer of Record written notice of all conflicts, errors, ambiguities or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Engineer of Record is acceptable to Contractor, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

- 5.7 Contractor represents and agrees that there are no obligations, commitments, or impediments of any kind that will limit or prevent performance of its obligations under the Contract Documents.
- 5.8 Contractor warrants, represents, and agrees that if (i) it is a corporation or limited liability company, then it is a corporation duly organized, validly existing and in good standing under the laws of the State of Texas, or a foreign corporation or limited liability company duly authorized and in good standing to conduct business in the State of Texas, that it has all necessary corporate power and has received all necessary corporate approvals to execute and deliver this Agreement, and the individual executing the Agreement on behalf of Contractor has been duly authorized to act for and bind Contractor; or (ii) if it is a partnership, limited partnership, or limited liability partnership, then it has all necessary partnership power and has secured all necessary approvals to execute and deliver this Agreement and perform all its obligations under the Contract Documents; and the individual executing this Agreement on behalf of Contractor has been duly authorized to act for and bind Contractor.
- 5.9 Neither the execution and delivery of this Agreement by Contractor nor the performance of its obligations under the Contract Documents will result in the violation of any provision, if a corporation, of its articles of incorporation or by-laws, if a limited liability company, of its articles of organization or regulations, or if a partnership, by any partnership agreement by which Contractor is bound, or any agreement by which Contractor is bound or to the best of the Contractor's knowledge and belief, will conflict with any order or decree of any court or governmental instrumentality relating to Contractor.
- 5.10 Except for the obligation of the County to pay Contractor the Contract Price pursuant to the terms of the Contract Documents, and to perform certain other obligations pursuant to the terms and conditions explicitly set forth in the Contract Documents, County 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 County to Contractor, no present or future partner or affiliate of County or any agent, officer, director, or employee of County, or of the various departments comprising Williamson County, or anyone claiming under County 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 6. Contract Documents

The "Contract Documents," which comprise the entire agreement between the County and Contractor concerning the Work, consist of the following:

Approved December 2007

Agreement

- 6.1 This Standard Form of Agreement
- 6.2 Performance Bond
- 6.3 Payment Bond
- 6.4 Maintenance Bond
- 6.5 Certificate of Insurance
- 6.6 Wage Rates
- 6.7 General Conditions
- 6.8 Special Conditions
- 6.9 Technical Specifications
- 6.10 Plan Drawings
- 6.11 Addenda numbers _____ to _____, inclusive
- 6.12 Contractor's Bid Affidavit and Bid Form
- 6.13 Documentation submitted by Contractor prior to Notice of Award.
- 6.14 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying or supplementing the Contract Documents pursuant to applicable sections in the General Conditions.

The documents listed in paragraphs 6.2 et seq. above are attached to this Agreement (except as expressly noted otherwise above).

There are no Contract Documents other than those listed above in this Article 6. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions.

Article 7. Miscellaneous

- 7.1 Terms used in this Agreement, which are defined in the General Conditions, will have the meanings indicated in the General Conditions.
- 7.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that

- may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 7.3 The County and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect to all covenants, agreements and obligations contained in the Contract Documents.
- 7.4 Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon the County and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken position.
- 7.5 Each party to this Agreement hereby agrees and acknowledges that venue and jurisdiction of any suit, right, or cause of action arising out of or in connection with this Agreement shall lie exclusively in Williamson County, Texas. Furthermore, this Agreement shall be governed by and construed in accordance with the laws of the State of Texas, excluding, however, its choice of law rules.
- 7.6 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.
- 7.7 This Agreement is for the sole and exclusive benefit of the parties hereto, and nothing in this Agreement, express or implied, is intended to confer or shall be construed as conferring upon any other person any rights, remedies or any other type or types of benefits.
- 7.8 Each party to this Agreement acknowledges that it and its counsel have reviewed this Agreement and that the normal rules of construction are not applicable and there will be no presumption that any ambiguities will be resolved against the drafting party in the interpretation of this Agreement.
- 7.9 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

Approved December 2007

Agreement

- 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.
- 7.10 Nothing in this Agreement shall be deemed to waive, modify or amend any legal defense available at law or in equity to County, its past or present officers, employees, or agents or employees, nor to create any legal rights or claim on behalf of any third party. 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.
- 7.11 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 County, 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 County as to whether or not the same are available to the public. It is further understood that County's officers and employees shall have the right to rely on the advice, decisions and opinions of the Attorney General, and that 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 County by a party hereto, in reliance of any advice, decision or opinion of the Attorney General of the State of Texas.
- 7.12 County and Contractor have signed this Agreement in triplicate. One counterpart each has been delivered to the County, Contractor and Engineer of Record. All portions of the Contract Documents have been signed, initialed or identified by County and Contractor or identified by Engineer of Record on their behalf.
- 7.13 This Agreement and the Contract Documents represent 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 COUNTY HAS ANY AUTHORITY, EITHER EXPRESS OR IMPLIED, TO AMEND THIS CONTRACT, EXCEPT PURSUANT TO SUCH EXPRESS AUTHORITY AS MAY BE GRANTED BY THE WILLIAMSON COUNTY COMMISSIONERS COURT.

Approved December 2007

Agreement

This Agreement will be effective on _____, 20____ (which is the “Effective Date” of the Agreement).

COUNTY_____ CONTRACTOR_____

By:_____ By: _____
Dan A. Gattis,
Williamson County Judge Title: _____

[CORPORATE SEAL]

Attest_____ Attest_____

SECTION 6
WAGE RATES

WAGE RATES

Contractor must pay all workers not less than the prevailing wage rate for Williamson County, Texas.

General Decision Number: TX150016 01/02/2015 TX16

Superseded General Decision Number: TX20140016

State: Texas

Construction Types: Heavy and Highway

Counties: Atascosa, Bandera, Bastrop, Bell, Bexar, Brazos, Burleson, Caldwell, Comal, Coryell, Guadalupe, Hays, Kendall, Lampasas, McLennan, Medina, Robertson, Travis, Williamson and Wilson Counties in Texas.

HEAVY (excluding tunnels and dams, not to be used for work on Sewage or Water Treatment Plants or Lift / Pump Stations in Bell, Coryell, McClennon and Williamson Counties) and HIGHWAY Construction Projects

Note: Executive Order (EO) 13658 establishes an hourly minimum wage of \$10.10 for 2015 that applies to all contracts subject to the Davis-Bacon Act for which the solicitation is issued on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least \$10.10 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/02/2015

* SUTX2011-006 08/03/2011

	Rates	Fringes
CEMENT MASON/CONCRETE		
FINISHER (Paving and Structures).....	\$ 12.56	
ELECTRICIAN.....	\$ 26.35	
FORM BUILDER/FORM SETTER		
Paving & Curb.....	\$ 12.94	
Structures.....	\$ 12.87	
LABORER		
Asphalt Raker.....	\$ 12.12	
Flagger.....	\$ 9.45	

Laborer, Common.....	\$ 10.50
Laborer, Utility.....	\$ 12.27
Pipelayer.....	\$ 12.79
Work Zone Barricade	
Servicer.....	\$ 11.85
PAINTER (Structures).....	\$ 18.34

POWER EQUIPMENT OPERATOR:

Agricultural Tractor.....	\$ 12.69
Asphalt Distributor.....	\$ 15.55
Asphalt Paving Machine.....	\$ 14.36
Boom Truck.....	\$ 18.36
Broom or Sweeper.....	\$ 11.04
Concrete Pavement	
Finishing Machine.....	\$ 15.48
Crane, Hydraulic 80 tons	
or less.....	\$ 18.36
Crane, Lattice Boom 80	
tons or less.....	\$ 15.87
Crane, Lattice Boom over	
80 tons.....	\$ 19.38
Crawler Tractor.....	\$ 15.67
Directional Drilling	
Locator.....	\$ 11.67
Directional Drilling	
Operator.....	\$ 17.24
Excavator 50,000 lbs or	
Less.....	\$ 12.88
Excavator over 50,000 lbs...	\$ 17.71
Foundation Drill, Truck	
Mounted.....	\$ 16.93
Front End Loader, 3 CY or	
Less.....	\$ 13.04
Front End Loader, Over 3 CY.	\$ 13.21
Loader/Backhoe.....	\$ 14.12
Mechanic.....	\$ 17.10
Milling Machine.....	\$ 14.18
Motor Grader, Fine Grade....	\$ 18.51
Motor Grader, Rough.....	\$ 14.63
Pavement Marking Machine....	\$ 19.17
Reclaimer/Pulverizer.....	\$ 12.88
Roller, Asphalt.....	\$ 12.78
Roller, Other.....	\$ 10.50
Scraper.....	\$ 12.27
Spreader Box.....	\$ 14.04
Trenching Machine, Heavy....	\$ 18.48
Servicer.....	\$ 14.51
Steel Worker	
Reinforcing.....	\$ 14.00
Structural.....	\$ 19.29

TRAFFIC SIGNAL INSTALLER

Traffic Signal/Light Pole
 Worker.....\$ 16.00

TRUCK DRIVER

Lowboy-Float.....\$ 15.66
 Off Road Hauler.....\$ 11.88
 Single Axle.....\$ 11.79
 Single or Tandem Axle Dump
 Truck.....\$ 11.68
 Tandem Axle Tractor w/Semi
 Trailer.....\$ 12.81

WELDER.....\$ 15.97

 WELDERS - Receive rate prescribed for craft performing operation to which
 welding is incidental.

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Unlisted classifications needed for work not included within the scope of
 the classifications listed may be added after award only as provided in the
 labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates
 that have been found to be prevailing for the cited type(s) of construction
 in the area covered by the wage determination. The classifications are
 listed in alphabetical order of "identifiers" that indicate whether the
 particular rate is a union rate (current union negotiated rate for local),
 a survey rate (weighted average rate) or a union average rate (weighted
 union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted
 lines beginning with characters other than "SU" or "UAVG" denotes that the
 union classification and rate were prevailing for that classification in
 the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation
 identifier of the union which prevailed in the survey for this
 classification, which in this example would be Plumbers. 0198 indicates the
 local union number or district council number where applicable, i.e.,
 Plumbers Local 0198. The next number, 005 in the example, is an internal
 number used in processing the wage determination. 07/01/2014 is the
 effective date of the most current negotiated rate, which in this example
 is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the
 collective bargaining agreement (CBA) governing this classification and
 rate.

Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this

initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

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SECTION 7
PERFORMANCE BOND

Approved_December 2007

Performance Bond

PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: That _____

_____ of the City of _____

County of _____, and State of _____, as principal,
and_____
authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and
firmly bound unto Williamson County (County), in the penal sum of_____
Dollars(\$_____) for the payment whereof, the said Principal and Surety bind themselves, their
heirs, administrators, executors, successors, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written Agreement with the County, dated the
_____ day of _____, 20____ (the "Agreement"), to which
the said Agreement, along with the Contract Documents referenced therein are hereby referred to and
made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said
Principal shall faithfully perform said Agreement and shall in all respects duly and faithfully observe and
perform all and singular the covenants, conditions and agreements in and by the Agreement agreed and
covenanted by the Principal to be observed and performed, and according to the true intent and meaning
of said Agreement and the Contract Documents hereto annexed, then this obligation shall be void;
otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253
of the Texas Government Code, as amended and all liabilities on this bond shall be determined in
accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

SURETY, for value received, stipulates and agrees that no change, extension of time, alteration or
addition to the terms of the Agreement or to the work performed thereunder, or to the Contract
Documents referenced therein, shall in anyway affect the obligations on this bond, and it does hereby
waive notice of such change, extension of time, alteration or addition to the terms on the Agreement, or to
the work to be performed thereunder.

Approved_December 2007

Performance Bond

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

PRINCIPAL_____
SURETY_____
SIGNATURE_____
SIGNATURE_____
NAME & TITLE_____
NAME & TITLE_____
ADDRESS_____
ADDRESS_____
()
PHONE NUMBER_____
()
PHONE NUMBER

The name and address of the Resident Agency of Surety is:

()
PHONE NUMBER

SIGNATURE OF LICENSED LOCAL
RECORDING AGENT appointed to countersign
on behalf of Surety (Required by Art. 21.09 of
the Insurance Code)

I, _____, having executed Bonds
SIGNATURE

for _____ do hereby affirm I have
NAME OF SURETY

verified that said Surety is now certified with Authority from either: (a) the Secretary of the Treasury of the United States if the project funding includes Federal monies; or (b) the State of Texas if none of the project funding is from Federal sources; and further, said Surety is in no way limited or restricted from furnishing Bond in the State of Texas for the amount and under conditions stated herein.

**SECTION 8
PAYMENT BOND**

Approved_December 2007

Payment Bond

PAYMENT BOND

STATE OF TEXAS

COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: That _____

_____ of the City of _____

County of _____, and State of _____, as Principal
(hereinafter referred to as the "Principal"), and_____
authorized under the laws of the State of Texas to act as Surety on bonds for principals (hereinafter referred to as the "Surety"), are held and firmly bound unto Williamson County, (hereinafter referred to as the "County"), in the penal sum of

_____ Dollars

(\$_____) for the payment whereof, the said Principal and Surety bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written agreement with the County, dated the _____ day of _____, 20_____, to _____

_____ (hereinafter referred to as the "Agreement"), which said Agreement and the Contract Documents incorporated therein are hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the Work provided for in said Agreement, then, this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code, as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

SURETY, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement or to the Work performed thereunder, or to the other Contract Documents accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of such change, extension of time, alteration or addition to the terms of the Agreement, or to the work to be performed thereunder or to the other Contract Documents accompanying the same.

Approved_December 2007

Payment Bond

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument
this _____ day of _____, 20____.

PRINCIPAL_____
SURETY_____
SIGNATURE_____
SIGNATURE_____
NAME & TITLE_____
NAME & TITLE_____
ADDRESS_____
ADDRESS

(_____)_____
PHONE NUMBER(_____)_____
PHONE NUMBER

The name and address of the Resident Agency of Surety is:

(_____)_____
PHONE NUMBER

SIGNATURE OF LICENSED LOCAL
RECORDING AGENT appointed to countersign
on behalf of Surety (Required by Art. 21.09 of
the Insurance Code)

**SECTION 9
MAINTENANCE BOND**

Approved_December 2007

Maintenance Bond

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That _____
(NAME OF CONTRACTOR)

as principal, hereinafter called "CONTRACTOR" and _____
(NAME OF SURETY)

a corporation organized under the laws of _____
as Surety, hereinafter called "SURETY", do hereby expressly acknowledge themselves to be held and bound to pay unto WILLIAMSON COUNTY as Obligee, a political subdivision of the State of Texas, hereinafter called "COUNTY", the sum of (20% of total construction contract amount)

(INSERT WORDS)
_____ Dollars (\$ _____) for the payment of which sum well and truly to be made unto said COUNTY and its successors, said principal and sureties do hereby bind themselves, their assigns, and successors jointly and severally.

This obligation is conditioned, however, that whereas said CONTRACTOR has by written Agreement dated _____, 20 _____, entered into an agreement with said COUNTY to build and construct _____

_____ which said Agreement and the Contract Documents therein mentioned and adopted by the COUNTY are hereby expressly made a part thereof as though the same were written and embodied herein.

WHEREAS, under the terms and conditions of the Agreement, specifications and other Contract Documents, it is provided that the CONTRACTOR shall maintain and keep in good repair the Work constructed and/or equipment furnished by it as contemplated by the plan drawings, specifications, and other Contract Documents, and perform for a period of 2 years from the date of acceptance as shown on the "Certificate of Completion" issued by the ENGINEER, or the date of Final Payment by the COUNTY if a separate Certificate of Completion is not issued, all necessary repairs, reconstruction and renewal of any part of said construction, and to furnish the labor and materials to make good and to repair any defective condition growing out of or on account of the breakage or failure of any substance or the improper function of any part of the construction work. The CONTRACTOR shall reimburse the COUNTY for the costs of all engineering and special services required to be furnished by the COUNTY which are directly attributable to the restoration of the constructed work. Said maintenance contemplates the complete restoration of the constructed work to a functional use during the said period as set forth above. It is the intended purpose of this section to require the correction of all defective conditions resulting from materials furnished or work and labor performed by the CONTRACTOR under the conditions prescribed by the Agreement, plans and specifications and other Contract Documents; and in case the CONTRACTOR shall fail or refuse to commence and actively pursue such corrections within ten (10) days after proper written notifications have been furnished to it by the COUNTY, it is agreed that the COUNTY may do said work and supply such materials and the said CONTRACTOR and SURETY herein shall be liable for the payment of all costs thereby incurred.

NOW THEREFORE, if the said CONTRACTOR shall keep and perform its said agreement to maintain said work and keep the same in good repair for the said maintenance period as provided above, then these presents shall be null and void and have no further effect, but if default shall be made by the

Approved_December 2007

Maintenance Bond

CONTRACTOR in the performance of its Agreement to maintain and repair said work, then these presents shall have full force and effect and the COUNTY shall have and recover from the said CONTRACTOR and its sureties damages in the premises, as provided, and it is further understood and agreed that this obligation shall be a continuing one against the principal and sureties hereon, and that successive recoveries may be had hereon for successive breaches until the full amount shall have been exhausted; and it is further understood that the obligation herein to maintain said work shall continue throughout said maintenance period, and the same shall not be changed, diminished, or in any manner affected from any cause during said time.

IN WITNESS WHEREOF, this instrument is executed this _____ day of _____, 20 ____

_____ PRINCIPAL	_____ PHONE NO.
_____ SIGNATURE	_____ (SEAL)
_____ NAME & TITLE	_____ WITNESS OR ATTEST TO SEAL
_____ SURETY	_____ PHONE NO.
_____ SIGNATURE	_____ (SEAL)
_____ NAME & TITLE	_____ WITNESS OR ATTEST TO SEAL

SIGNATURE OF LICENSED LOCAL RECORDING AGENT
appointed to countersign on behalf of Surety

SECTION 10
CERTIFICATE OF INSURANCE

Approved_December 2007

Insurance

CERTIFICATE OF INSURANCE

TO:

DATE: _____

(COUNTY)

Project No.: _____

Type of _____

(ADDRESS)

Project: _____

THIS IS TO CERTIFY THAT _____
(Name and address of insured)

is, at the date of this certificate, insured by this Company with respect to the business operations hereinafter described for the types of Insurance and in accordance with the provisions of the standard policies used by this Company, and further hereinafter described. Exceptions to the standard policy noted on reverse side hereof.

POLICY NO.	TYPE OF INSURANCE		LIMITS OF LIABILITY
	EFFECTIVE	EXPIRES	
Workmen's Compensation		1 Person	\$ _____
Public Liability		1 Accident	\$ _____
Contingent Liability		1 Person	\$ _____
Property Damage		1 Accident	\$ _____
Builder's Risk			
Automobile			
Other			

The foregoing Policies (do) (do not) cover all sub-contractors.

Locations Covered: _____

Descriptions of Operations Covered: _____

The above policies either in the body thereof or by appropriate endorsement provide that they may not be changed or canceled by the insurer in less than five days after the insured has received written notice of such change or cancellation.

Where applicable local laws or regulations require more than five days actual notice of change or cancellation to the assured, the above policies contain such special requirements, either in the body thereof or by appropriate endorsement thereto attached.

(Name of Insurer)

By: _____

Phone No. () _____

Title: _____

SECTION 11
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- 8.01 Award of Subcontracts for Portions of the Work
- 8.02 Subcontractual Relations
- 8.03 Payments to Subcontractors

9. Protection of Persons and Property

- 9.01 Safety Precautions and Programs
- 9.02 Safety of Persons and Property
- 9.03 Location and Protection of Utilities

10. Termination

- 10.01 Termination by the County for Cause
- 10.02 Termination for Convenience
- 10.03 Obligations of Contractor Following Termination

11. Inspection and Audit

General Conditions of Agreement

1. Definition of Terms

For purposes of the Contract Documents, the following terms shall have the meanings set forth herein:

1.01 The Agreement

The term the “Agreement” shall mean Standard Form of Agreement by and between County and Contractor relating to the Work and the construction of the Project.

1.02 County

Williamson County, Texas, being a political subdivision of the State of Texas, is the entity identified in the Agreement and hereinafter referred to as the “County.” Nothing contained in the Contract Documents shall create any contractual or agency relationship between any parties other than the County and the Contractor.

1.03 Department

The “Department” shall mean the Texas Department of Transportation (TxDOT).

1.04 Contractor

The term the “Contractor” shall mean the successful bidder that enters into the Agreement with the County for the construction of the Work and the Project defined by the Contract Documents.

1.05 Engineer

The term the “Engineer” shall mean the County Engineer or the authorized representative of the County Engineer.

1.06 General Engineering Consultant (GEC)

The term the “General Engineering Consultant” or “GEC” shall mean the consulting engineering firm representing and assisting the County in the design, review, and coordination of the design and construction phases of the Project. The GEC shall be responsible for the construction oversight of the Project.

1.07 Construction Observer

The “Construction Observer” or the “Observer” shall mean the County’s employee or a contracted consultant who performs construction engineering and inspection services for the Project.

1.08 Construction Representative

The “Construction Representative” shall mean the GEC’s designated field representative

during construction of the Project which shall provide for coordination and assistance of the construction observation effort.

1.09 Engineer of Record

The term “Engineer of Record” shall mean the County's design professional, who shall provide professional engineering design services for the Project.

1.10 Contract Documents

The “Contract Documents” shall consist of the Special Conditions, Notice for Bidders, Proposal, the fully executed Agreement, Performance and Payment Bonds, Maintenance Bond, Special Bonds (when required), General Conditions, Technical Specifications or Specifications, Plans and all modifications thereof incorporated in any such documents before the execution of the Agreement and all modifications that are made, in accordance with the Contract Documents, following the execution of the Agreement.

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. In case of conflict between any of the Contract Documents, priority of interpretation shall be in the following order: Fully Executed Agreement, Performance and Payment Bonds, Maintenance Bond, Special Bonds (if any), Proposal, General Conditions, Special Conditions, Technical Specifications or Specifications, and Plans.

1.11 Subcontractor

The term “Subcontractor”, as employed herein, includes only those having a direct contract with the Contractor. It includes one who furnishes material worked to special design according to the plans or specifications of this work, but does not include one who merely furnishes material not so worked.

1.12 Sub-Subcontractor

The term “Sub-Subcontractor” means one who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. It includes one who furnishes material worked to a special design according to the plans or specifications of this work, but does not include one who merely furnishes material not so worked.

1.13 Written Notice

Written notice shall be deemed to have been duly served if delivered in person to the individual or to an officer of the entity for whom it is intended, or if delivered to or sent by registered mail to the last business address known to it who gives the notice.

1.14 Work

The Contractor shall provide and pay for all materials, machinery, equipment, tools, superintendence, labor, services, insurance, and all water, light, power, fuel, transportation and other facilities necessary for the execution and completion of the work covered by the Contract Documents (collectively known as the “Work”). Unless otherwise specified, all materials shall be new and both workmanship and materials shall be of a good quality. The

Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials. Materials or work described in words which, when so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards.

1.15 Extra Work

The term “Extra Work” as used in the Contract Documents shall be understood to mean and include all work that may be required by the County to be done by the Contractor to accomplish any change, alteration or addition to the Work shown upon the plans, or reasonably implied by the specifications, and not covered by the Contractor's Proposal, except as provided under Section 2.13 “Changes and Alterations” herein.

1.16 Working Day

The term “Working Day” is defined as any day not including Saturdays, Sundays or any legal holidays, in which weather or other conditions, not under the control of the Contractor, will permit construction of the principal units of the Work for a period of not less than seven (7) hours between 7:00 a.m. and 6:00 p.m.

1.17 Calendar Day

The term “Calendar Day” is defined as any day of the week or month, no days being excepted.

1.18 Substantially Completed

The term “Substantially Completed” or “Substantial Completion” shall be understood to mean that all Project Work (or the work for a specified phase of the Project) requiring lane or shoulder closures or obstructions is completed, and traffic is following the lane arrangement as shown on the plans for the finished roadway (or the specified phase of work). Additionally, all pavement construction, resurfacing, traffic control devices, and pavement markings shall be in their final position (or as called for on the plans for the specified phase of work) at such time; provided, however, the Engineer may make an exception as to the permanent pavement markings being in their final position provided that, in the Engineer’s sole discretion, the lack of markings does not cause a disruption to traffic flow or an unsafe condition for the traveling public, and work zone pavement markings are in place.

1.19 Notice of Substantial Completion

Notice issued to the Contractor by the Observer or County’s Representative acknowledging Substantial Completion of the Project, signifying the end of time charges.

1.20 Certificate of Completion

Certificate issued to the Contractor by the Observer acknowledging “Final Completion” of the Project, as determined by completion of the Punch List, from which time the warranty period for the Project shall begin. The issuance of the Certificate of Completion shall serve as evidence of “Final Completion” and such certificate shall relieve the Contractor of ownership responsibilities for the Project, except for repair of damage caused by the Contractor or by the Contractor’s operations to existing facilities or completed and substantially accepted work.

1.21 Certificate of Acceptance

Certificate issued to the Contractor by the County acknowledging final acceptance and purchase of the Project.

1.22 Project

The "Project" shall mean and include the Project defined, described and set forth in the Agreement.

1.23 Contract Time

The "Contract Time" shall mean the amount of time in which the Work shall be Substantially Completed. The number of days allotted for the Contract Time shall be specifically set forth in the Agreement.

1.24 Contract Price

The "Contract Price" shall mean the amount that the County shall pay the Contractor for completion of the Work in accordance with the Contract Documents. The specific amount of the Contract Price shall be determined pursuant to the terms of the Contract Documents.

2. Responsibilities of the Engineer and the Contractor**2.01 County-Observer Relationship**

The Observer will be the County's contracted consultant during construction. The duties, responsibilities and limitations of authority of the Observer as the County's representative during construction are as set forth in the Contract Documents and/or the Agreement for Construction Engineering and Inspection Services and shall not be extended or limited without written consent of the County or the Observer. The Observer will advise and consult with the County and the GEC, and all of the County's instructions to the Contractor shall be issued through the Observer.

2.02 Professional Observation by the Construction Observer

The Observer shall be on the jobsite when work is being performed to provide construction engineering inspections of the Work performed by the Contractor. In addition to performing material testing on behalf of the County, the Observer shall review the progress of the executed Work and to determine if such Work meets the essential performance and design features and the technical and functional engineering requirements of the Contract Documents; provided and except, however, that the Observer shall not be responsible, directly or indirectly, for the Contractor's construction means, methods, techniques, sequences, quality, procedures, programs, safety precautions or lack of same incident thereto or in connection therewith. Notwithstanding any other provision of the Contract Documents, the Engineer and the Observer shall not be responsible or liable for any acts, errors, omissions or negligence of the Contractor, any Subcontractor or any of the Contractor's or Subcontractor's agents, servants or employees or any other person, firm or corporation performing or attempting to perform any of the Work.

2.03 Payments for Work

The Observer shall review the Contractor's applications for payment and supporting data, determine the amount owed to the Contractor and recommend, in writing to the GEC for review, payment to the Contractor in such amounts; such recommendation of payment to the Contractor constitutes a representation to the County of the Observer's professional judgment that the Work has progressed to the point indicated to the best of its knowledge, information and belief, but such recommendation of an application for payment to the Contractor shall not be deemed as a representation by the Observer that the Observer has made any examination to determine how or for what purpose the Contractor has used the monies paid on account of the Contract Price.

2.04 Initial Determinations

The Observer initially shall determine all claims, disputes and other matters in question between the Contractor and the County relating to execution or progress of the Work or interpretation of the Contract Documents. The Observer's decision shall be rendered in writing to the GEC for review within a reasonable time, which shall not be construed to be less than ten (10) days.

2.05 Objections

In the event the Observer renders any decision which, in the opinion of either party hereto, is not in accordance with the meaning and intent of the Contract Documents, either party may file with the Observer its written objection to the decision within thirty (30) days of such decision by the Observer, and by such action may reserve the right to submit the question so raised to litigation as hereinafter provided.

2.06 Lines and Grades

Unless otherwise specified, all lines and grades shall be furnished by the Contractor at its own expense. Whenever necessary, construction work shall be suspended to permit performance of this work, but such suspension will be as brief as practicable and the Contractor shall be allowed no extra compensation therefore.

2.07 Contractor's Duty and Superintendence

The Contractor shall give adequate attention to the faithful prosecution and completion of the Work subject of the Contract Documents and shall keep on the Project site, at all times during its progress, a competent Superintendent and any necessary assistants to supervise and direct the Work. The Superintendent shall represent the Contractor in its absence and all directions given to the Superintendent shall be as binding as if given to the Contractor.

The Contractor is and at all times shall remain an independent contractor, solely responsible for the manner and method of completing its work under the Contract Documents, with full power and authority to select the means, method and manner of performing such work, so long as such methods do not adversely affect the completed improvements, the County and the Observer being interested only in the result obtained and conformity of such completed improvements with the Contract Documents.

Likewise, the Contractor shall be solely responsible for the safety of itself, its employees and other persons, as well as for the protection and safety of the improvements being erected and its property or any other person's property, as a result of its operations under the Contract Documents. Engineering construction drawings and specifications, as well as any additional information concerning the Work to be performed passing from or through the Observer, shall not be interpreted as requiring or allowing the Contractor to deviate from the Contract documents, the plans and specifications; the intent of such drawings, specifications and any other such information being to define with specificity the agreement of the parties as to the Work the Contractor is to perform.

Any review of work in process, or any visit or observation and inspection during construction, or any clarification of plans and specifications, by the Observer or the County, or any agent, employee, or representative of either of them, whether through personal observation or inspection on the Project site or by means of approval of shop drawings for temporary construction or construction processes, or by other means or methods, is agreed by the Contractor to be for the purpose of observing the extent and nature of work completed or being performed, as measured against the drawings and specifications constituting the Contract Documents, or for the purpose of enabling the Contractor to more fully understand the plans and specifications so that the completed construction work will conform thereto, and shall in no way relieve the Contractor from full and complete responsibility for the proper performance of its work on the Project, including but not limited to the propriety of means and methods of the Contractor in performing in accordance with the Contract Documents, and the adequacy of any designs, plans or other facilities for accomplishing such performance. Deviation by the Contractor from plans and specifications that may have been in evidence during any such visitation or observation by the Observer, the Engineer, or any of their representatives, whether called to the Contractor's attention or not, shall in no way relieve the Contractor from its responsibility to complete all work in accordance with the Contract Documents.

2.08 Contractor's Understanding

It is understood and agreed that the Contractor has, by careful examination, satisfied itself as to the nature and location of the Work, the conformation of the ground, the character, quality and quantity of the materials to be encountered, the character of equipment and facilities needed preliminary to and during the prosecution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under the Contract Documents.

2.09 Character of Workers

The Contractor agrees to employ only orderly and competent workers, skillful in the performance of the type of work required under the Contract Documents, to do the Work; and agrees that whenever the Observer shall inform it in writing that any workers on the Work are, in its opinion, incompetent, unfaithful or disorderly, or refuse instructions from the Observer in the absence of the Superintendent, such worker shall be discharged from the Work and shall not again be employed on the Work without the Observer's written consent. No illegal alien may be employed by any Contractor for work on this Project, and a penalty

of \$500.00 per day will be assessed for each day and for each illegal alien who works for the Contractor at this Project.

2.10 Shop Drawings

The Contractor shall submit to the Observer, with such promptness as to cause no delay in its own work or in that of any other contractor, a minimum of four (4) stamped/reviewed copies, unless otherwise specified, of all shop and/or setting drawings and schedules required for the work of the various trades, and the Engineer of Record shall pass upon them with reasonable promptness, making desired corrections. Note: A single copy of the reviewed drawings shall be retained by the reviewer, the County, and the County's Representative for their records. The Contractor may not submit more than four different shop drawing plans for review in any one week. The Engineer of Record shall return the shop drawings to the Contractor, via the GEC, within three (3) weeks of its having received them, with appropriate comments. The Contractor shall make any corrections required by the Engineer of Record, file with it two (2) corrected copies and furnish such other copies as may be needed. The Engineer of Record's approval of such drawings or schedules shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless the Contractor has in writing called the Engineer of Record's attention to such deviations at the time of submission, nor shall it relieve Contractor from responsibility for errors of any sort in shop drawings or schedules. It shall be the Contractor's responsibility to fully and completely review all shop drawings to ascertain their effect on its ability to perform the required work in accordance with the Contract Documents and within the time for completion thereof. Any shop drawings which are required for temporary supports must be signed and sealed by an Engineer registered in the State of Texas.

Such review by the Engineer of Record shall be for the sole purpose of determining the sufficiency of said shop drawings or schedules to result in finished improvements in conformity with the plans and specifications, and shall not relieve the Contractor of its duties and obligations, as an independent contractor, set forth in the Contract Documents. It is hereby expressly understood and agreed that the Engineer of Record does not assume any duty to pass upon the propriety or adequacy of such drawings or schedules, or any means or methods reflected thereby, in relation to the safety of either person or property during the Contractor's performance hereunder.

2.11 Preliminary Approval

The Observer shall not have the power to waive the obligations of the Contract Documents for the furnishing by the Contractor of good material, and of its performing good work as herein described, and in full accordance with the Contract Documents. No failure or omission of the Observer to discover, object to or condemn any defective work or material shall release the Contractor from the obligations to fully and properly perform in full accordance with the Contract Documents, including without limitation, the obligation to at once tear out, remove and properly replace any defective work or material at any time prior to final acceptance upon the discovery of said defective work or material; provided, however, that the Observer shall, upon request of the Contractor, inspect and accept or reject any material furnished, and in the event the material has been once accepted by the Observer,

such acceptance shall be binding on the County unless it can be clearly shown that such material furnished does not meet the specifications for this work.

Any questioned work may be ordered to be taken up or removed for re-examination by the Observer, prior to final acceptance, and if found not in accordance with the plans and/or specifications for said work, all expenses relating to the removing, re-examination and replacement shall be solely borne by the Contractor. Otherwise, if the questioned work is found to be in accordance with the plans and/or specifications for said work, the expense thus incurred shall be allowed as Extra Work and shall be paid for by the County; provided, however, where inspection or approval is specifically required by the specifications prior to performance of certain work, should the Contractor proceed with such work without requesting prior inspection or approval, the Contractor shall bear all expense of taking up, removing, and replacing this work if so directed by the Observer.

2.12 Defects and Their Remedies

It is further agreed that if the Work or any part thereof, or any material brought on the site of the Work for use in the Work or selected for the same, shall be deemed by the Observer as unsuitable or not in conformity with the Contract Documents, or the intent thereof, the Contractor shall, after receipt of notice thereof from the Observer, forthwith remove such material and rebuild or otherwise remedy such work so that it shall be in full accordance with the Contract Documents.

2.13 Changes and Alterations

The Contractor further agrees that the County may make such changes and alterations as the County may see fit in the line, grade, form, dimensions, plans or materials for the Work herein contemplated, or any part thereof, either before or after the beginning of the construction, without affecting the validity of the Contract Documents.

If such changes or alterations diminish the quantity of the Work to be done, they shall not constitute the basis for a claim for damages or anticipated profits on the Work that may be dispensed with, except as provided for unit price items under Section 5 "Measurement and Payment". If the amount of work is increased, and the Work can fairly be classified under the specifications, such increase shall be paid for according to the quantity actually done and at the unit price, if any, established for such work under the Contract Documents, except as provided for unit price items under Section 5 "Measurement and Payment". Otherwise, such additional work shall be paid for as provided under Extra Work. In the event the County makes such changes or alterations as shall make useless any work already done or material already furnished or used in said work, then the County shall compensate the Contractor for any material or labor so used, and for any actual loss occasioned by such change, due to actual expense incurred in preparation for the Work as originally planned.

3. General Obligations and Responsibilities

3.01 Keeping of Plans and Specifications Accessible and Keeping a Superintendent on the Project Site

The Contractor shall keep one (1) copy of the plans and specifications constantly accessible on the Work, with the latest revisions noted thereon. The Contractor shall give the Work its constant attention to facilitate the progress thereof and shall cooperate with the Construction Observer in every way possible. The Contractor shall designate, to the Construction Observer in writing, the name of a Superintendent, employed by the firm, regardless of how much of the Work may be sublet. The Superintendent will be available at all time. In the event a competent superintendent is not available, the Construction Observer may suspend work until one is available.

3.02 Ownership of Documents

All drawings, specifications and copies thereof furnished by the Engineer of Record shall not be reused on other work, and, with the exception of the signed contract sets, are to be returned to the Engineer of Record on request, at the completion of the work. All models, drawings, specifications and copies thereof are the property of the County.

3.03 Adequacy of Design

It is understood that the County believes it has employed competent engineers and designers. It is therefore agreed that the County and Engineer shall be responsible for the adequacy of the design, sufficiency of the Contract Documents, the safety of the structure and the practicability of the operations of the completed project provided that the Contractor has complied with the requirements of the said Contract Documents, all approved modifications thereof, and additions and alterations thereto approved in writing by the County. The burden of proof of such compliance shall be upon the Contractor to show that it has complied with the said requirements of the Contract Documents, approved modifications thereof, and all approved additions and alterations thereto.

The paper copies of the Contract Documents are considered to be the official contract documents. Any request by the Contractor and use thereof of electronic or digital information, including engineering design and survey files, shall be at the sole risk and legal responsibility of the Contractor. Neither the County nor the Engineer of Record makes any warranty or representation as to the compatibility of the files provided with other software programs, nor shall they be held responsible for subsequent uses of the data by the Contractor or anyone who may obtain the data from the Contractor. **THE CONTRACTOR SHALL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD THE COUNTY ITS AGENTS, EMPLOYEES, OR REPRESENTATIVES AND THE ENGINEER OF RECORD HARMLESS FROM ANY AND ALL CLAIMS, SUITS, LIABILITY, DEMANDS OR COSTS ARISING OUT OF OR RESULTING FROM SUCH USE.** Because data stored on electronic media can deteriorate undetected or be modified undetected, neither the County nor the Engineer of Record can be held liable for the completeness or correctness of the electronic data once in possession of the Contractor.

3.04 Contractor's Responsibility for Work

Until the issuance of the Certificate of Completion for the Project, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non execution of the Work.

In case of suspension of work for any cause, the Contractor shall be responsible for the preservation of all materials. The Contractor shall provide suitable drainage of the roadway in good and passable condition until Final Completion, except as outlined below for opening the roadway to traffic.

Whenever, in the opinion of the Observer, any roadway or portion thereof is in suitable condition for travel, it shall be opened to traffic; provided, however, such opening shall not be held to be, in any way, the final acceptance of the roadway or any part thereof or be held as a waiver of any of the provisions of the Contract Documents. Where it is considered by the Observer to be in the public interest and so ordered in writing by the Observer, any Substantially Completed roadway or portion thereof may be opened to traffic as follows:

- (1) When both required by plans, job sequence or the approved traffic control plan, and when the County accepts responsibility for maintaining such portion of the roadway opened to traffic.
- (2) When work is suspended for a period of time at the convenience of the County, the County will assume the responsibility for maintaining the entire roadway during the period of suspension; or
- (3) When the roadway or portion thereof is opened to traffic during construction operations at the convenience of the County, the County will assume responsibility for the maintenance of the traveled way and shoulders during the period in which it is opened to traffic.

The County, in assuming responsibility for maintenance under this provision, may require the Work to be done in accordance with Section 6, "Extra Work and Claims".

Except for damage by the Contractor or damage caused by the Contractor's operations, the Contractor will not be responsible for repair of damage to existing facilities or damage to completed and accepted work such as guard fence, bridge wings, railing, illumination assemblies, underpass structure, traffic barriers, delineator assemblies, signs, sign bridges, changeable message signs, vehicle impact attenuators (crash cushions and guardrail end treatments) and traffic signals, where such damage is caused by (a) motor-vehicle, seacraft or aircraft that are not being operated by Contractor; (b) railroad-train collision (c) vandalism; (d) Acts of God, such as earthquake, tidal wave, tornado, hurricane, or other cataclysmic phenomena of natures; or (e) Acts of Governmental Authorities.

Upon completion of all work provided for in the Contract Documents for any individual limits, control or project, the Observer may make an inspection, and if the Work is found to be satisfactory, the Contractor will be released from further maintenance on that portion of

the Work, except for damage caused by the Contractor or its operations. Such partial acceptance must be made in writing and shall in no way void or alter any terms of the Contract Documents. Other specific units of the Project will be accepted on an individual basis when shown on the plans or as approved, in writing, by the Observer.

3.05 Protection Against Accident to Employees and the Public

The Contractor shall at all times exercise reasonable precautions for the safety of employees and others on or near the Work and shall comply with all applicable provisions of federal, state, and municipal safety laws and building and construction codes. All machinery and equipment and other physical hazards shall, except where incompatible with federal, state, or municipal laws or regulations, be guarded in accordance with the "Manual of Accident Prevention in Construction" of the Associated General Contractors of America. The Contractor shall provide such machinery guards, safe walkways, ladders, bridges, gangplanks, and other safety devices. The safety precautions actually taken and their adequacy shall be the sole responsibility of the Contractor, acting at its discretion as an independent contractor.

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 anyone, 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 the Work, the Contractor shall send a written report of such accident or other event to the County and the Observer, setting forth a full and concise statement of the facts pertaining thereto. Such statement shall include a written recordation of the location of the event and the circumstances surrounding the event through photographs, interviewing witnesses, obtaining of medical reports and other documentation that defines the event. The Contractor shall also provide to the County a copy of any and all accident reports received from safety officials or agencies. Copies of such documentation shall be provided to the County and the Observer for their records. The Contractor shall also immediately send the County and the Observer 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 the Work.

3.06 Performance and Payment Bonds

Unless otherwise specified, it is further agreed by the parties to the Contract Documents that the Contractor will execute separate performance and payment bonds, each in the sum of one hundred (100%) percent of the total Contract Price, on forms acceptable to County, guaranteeing faithful performance of the Work and the fulfillment of any guarantee required, and further guaranteeing payment to all persons supplying labor and materials or furnishing Contractor with any equipment in the execution of the Work subject of the Contract Documents. It is agreed that the Contractor shall have no rights under the Contract Documents until such performance and payment bonds are furnished to and approved by the County.

Unless otherwise specified, the cost of the premium for the performance and payment bonds shall be included in the price bid by the Contractor for the Work subject of the Contract Documents, and no extra payment for such bonds will be made by the County.

Each bond shall be executed by a corporate surety or corporate sureties, with an A.M. Best rating of "B" or better, duly authorized to do business and to issue surety bonds in the State of Texas. If any surety upon any bond furnished in connection herewith becomes insolvent, or otherwise not authorized to do business in this state, the Contractor shall promptly furnish equivalent security to protect the interests of the County and of persons supplying labor, materials and equipment in the prosecution of the Work subject of the Contract Documents. Furthermore, the surety company underwriting the bonds must be acceptable to the County.

Each bond shall be accompanied by a valid Power of Attorney (issued by the surety company and attached, signed and sealed, with the corporate embossed seal, to the bond) authorizing the agent who signs the bond to commit the company to the terms of the bond, and stating on the face of the Power of Attorney the limit, if any, in the total amount for which such agent is empowered to issue a single bond.

3.07 Protection of Adjoining Property

The Contractor shall take proper means to protect the adjacent or adjoining property or properties, in any way encountered, which might be injured or seriously affected by any process of construction to be undertaken pursuant to the Contract Documents, from any damage or injury by reason of said process of construction; and the Contractor shall be liable for any and all claims for such damage on account of its failure to fully protect all adjoining property. **THE CONTRACTOR AGREES TO INDEMNIFY, SAVE AND HOLD HARMLESS THE COUNTY, THE OBSERVER THE GEC AND THE ENGINEER OF RECORD, AS WELL AS ANY OF THEIR AGENTS, REPRESENTATIVES, OFFICERS OR EMPLOYEES AGAINST ANY CLAIM OR CLAIMS FOR DAMAGES DUE TO ANY INJURY TO ANY ADJACENT OR ADJOINING PROPERTY, ARISING OR GROWING OUT OF THE PERFORMANCE OF THE WORK, BUT ANY SUCH INDEMNITY SHALL NOT APPLY TO ANY CLAIM OF ANY KIND ARISING SOLELY OUT OF THE EXISTENCE OR CHARACTER OF THE WORK.**

3.08 Protection Against Claims of Subcontractors, Laborers, Materialmen and Furnishers of Machinery, Equipment and Supplies

THE CONTRACTOR AGREES THAT IT WILL INDEMNIFY, DEFEND AND SAVE HARMLESS THE COUNTY, THE OBSERVER, THE GEC AND THE ENGINEER OF RECORD, AS WELL AS ANY OF THEIR AGENTS, REPRESENTATIVES, OFFICERS OR EMPLOYEES FROM ALL CLAIMS GROWING OUT THE LAWFUL DEMANDS OF SUBCONTRACTORS, LABORERS, WORKERS, MECHANICS, MATERIALMEN AND FURNISHERS OF MACHINERY, MACHINERY PARTS, EQUIPMENT, POWER TOOLS, AND ALL SUPPLIES, INCLUDING COMMISSARY, INCURRED IN THE FURTHERANCE OF THE PERFORMANCE OF THE WORK SUBJECT OF THE CONTRACT DOCUMENTS. When so desired by the County, the Contractor shall furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged or waived. If the Contractor fails to furnish such evidence to County's complete satisfaction, then the County may either pay directly any unpaid bills of which the County has written notice of, or may withhold from

the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to liquidate any and all such lawful claims. When satisfactory evidence is furnished that all liabilities have been fully discharged, payments to the Contractor shall be resumed in full in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligation upon the County by either the Contractor or its surety.

3.09 Protection Against Royalties or Patented Invention

The Contractor shall pay all royalties and license fees, and shall provide for the use of any design, device, material or process covered by letter patent or copyright by suitable legal agreement with the patentee or owner. **THE CONTRACTOR SHALL DEFEND ALL SUITS OR CLAIMS FOR INFRINGEMENT OF ANY PATENT OR COPYRIGHT RIGHTS AND SHALL INDEMNIFY AND SAVE HARMLESS THE COUNTY, THE OBSERVER THE GEC AND THE ENGINEER OF RECORD, AS WELL AS ANY OF THEIR AGENTS, REPRESENTATIVES, OFFICERS OR EMPLOYEES FROM ANY LOSS ON ACCOUNT THEREOF, EXCEPT THAT THE COUNTY SHALL DEFEND ALL SUCH SUITS AND CLAIMS AND SHALL BE RESPONSIBLE FOR ALL SUCH LOSS WHEN A PARTICULAR DESIGN, DEVICE, MATERIAL OR PROCESS OR THE PRODUCT OF A PARTICULAR MANUFACTURER OR MANUFACTURERS IS SPECIFIED OR REQUIRED BY THE COUNTY; PROVIDED, HOWEVER, IF CHOICE OF ALTERNATE DESIGN, DEVICE, MATERIAL OR PROCESS IS ALLOWED TO THE CONTRACTOR, THEN THE CONTRACTOR SHALL INDEMNIFY AND SAVE THE COUNTY HARMLESS FORM ANY LOSS ON ACCOUNT THEREOF.** If the material or process specified or required by the County is known by the Contractor to be an infringement, the Contractor shall be responsible for such loss unless it promptly gives such information to the County.

3.10 Laws and Ordinances

The Contractor shall at all times observe and comply with all federal, state and local laws, ordinance and regulations, which in any manner affect the Contract Documents or the Work, and **SHALL INDEMNIFY AND SAVE HARMLESS THE COUNTY, THE OBSERVER THE GEC AND THE ENGINEER OF RECORD, AS WELL AS ANY OF THEIR AGENTS, REPRESENTATIVES, OFFICERS OR EMPLOYEES AGAINST ANY CLAIM ARISING FROM THE VIOLATION OF ANY SUCH LAWS, ORDINANCES, AND REGULATIONS WHETHER BY THE CONTRACTOR OR ITS EMPLOYEES, EXCEPT WHERE SUCH VIOLATIONS ARE CALLED FOR BY THE PROVISIONS OF THE CONTRACT DOCUMENTS.** If the Contractor observes that the plans and specifications are at variance therewith, it shall promptly notify the Observer, in writing, and any necessary changes shall be prepared as provided in the Contract Documents for changes in the Work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Observer, the Contractor shall bear all costs arising therefrom.

In case the County is a body politic and corporate, the law from which it derives its powers, insofar as the same regulates the objects for which, or the manner in which, or the conditions under which the County may enter into contract, shall be controlling and shall be considered as part of the Contract Documents to the same effect as though embodied herein.

3.11 Assignment and Subletting

The Contractor further agrees that it will retain personal control and will give its personal attention to the fulfillment of the Work strictly in accordance with the Contract Documents and that Contractor will not assign, by Power of Attorney or otherwise, or sublet any right or interest it may have under the Contract Documents without the written consent of the Observer, and that no part or feature of the Work will be sublet to anyone objectionable to the Observer or the County. The Contractor further agrees that the subletting of any portion or feature of the Work, or materials required in the performance of the Work, shall not relieve the Contractor from its full obligations to the County as provided in the Contract Documents.

3.12 Indemnification

THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS THE COUNTY, THE OBSERVER, THE GEC AND THE ENGINEER OF RECORD AND THEIR RESPECTIVE OFFICERS, AGENTS AND EMPLOYEES, FROM AND AGAINST ALL DAMAGES, CLAIMS, LOSSES, DEMANDS, SUITS, JUDGMENTS AND COSTS, INCLUDING REASONABLE ATTORNEYS' FEES AND EXPENSES, ARISING OUT OF OR RESULTING FROM THE PERFORMANCE OF THE WORK, PROVIDED THAT ANY SUCH DAMAGE, CLAIM, LOSS, DEMAND, SUIT, JUDGMENT, COST OR EXPENSE:

- (1) IS ATTRIBUTABLE TO BODILY INJURY, SICKNESS, DISEASE OR DEATH OF ANY PERSON INCLUDING CONTRACTOR'S EMPLOYEES AND ANY SUBCONTRACTOR'S EMPLOYEES AND ANY SUB-SUBCONTRACTOR'S EMPLOYEES, OR TO INJURY TO OR DESTRUCTION OF TANGIBLE PROPERTY INCLUDING CONTRACTOR'S PROPERTY (OTHER THAN THE WORK ITSELF) AND THE PROPERTY OF ANY SUBCONTRACTOR OF SUB-SUBCONTRACTOR INCLUDING THE LOSS OF USE RESULTING THEREFROM; AND,**
- (2) IS CAUSED IN WHOLE OR IN PART BY ANY INTENTIONAL OR NEGLIGENT ACT OR OMISSION OF THE CONTRACTOR, ANY SUBCONTRACTOR, ANY SUB-SUBCONTRACTOR OR ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY ONE OF THEM OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE.**

THE OBLIGATION OF THE CONTRACTOR UNDER THIS PARAGRAPH SHALL NOT EXTEND TO THE LIABILITY OF THE OBSERVER, THE ENGINEER, THE GEC, THE ENGINEER OF RECORD THEIR AGENTS OR EMPLOYEES ARISING OUT OF THE PREPARATION OF MAPS, PLANS, REPORTS, SURVEYS, CHANGE ORDERS, DESIGNS OR SPECIFICATIONS, OR THE APPROVAL OF MAPS, PLANS, REPORTS, SURVEYS, CHANGE ORDERS, DESIGNS OR SPECIFICATIONS OR THE ISSUANCE OF OR THE FAILURE TO GIVE DIRECTIONS OR INSTRUCTIONS BY THE OBSERVER, ITS AGENTS OR EMPLOYEES, PROVIDED SUCH IS THE SOLE CAUSE OF THE INJURY OR DAMAGE.

IN ANY AND ALL CLAIMS AGAINST THE COUNTY, THE OBSERVER THE GEC OR THE ENGINEER OF RECORD OR ANY OF THEIR AGENTS OR EMPLOYEES BY ANY EMPLOYEE OF THE CONTRACTOR, ANY SUBCONTRACTOR, ANY SUB-SUBCONTRACTOR, ANYONE DIRECTLY OR INDIRECTLY EMPLOYED BY ANY OF THEM, OR ANYONE FOR WHOSE ACTS ANY OF THEM MAY BE LIABLE, THE INDEMNIFICATION OBLIGATION UNDER SECTION 3.12 SHALL NOT BE

LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE BY OR FOR THE CONTRACTOR OR ANY SUBCONTRACTOR OR SUB-SUBCONTRACTOR UNDER WORKERS' COMPENSATION ACTS, DISABILITY BENEFIT ACTS OR OTHER EMPLOYEE BENEFIT ACTS.

3.13 Insurance

The Contractor at its own expense shall purchase, maintain and keep in force such insurance as will protect Contractor from claims set forth below which may arise out of or result from the Contractor's operations under the Contract Documents, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

- (1) Workman's compensation claims, disability benefits and other similar employee benefit acts;
- (2) Claims for damages because of body injury, occupational sickness or disease, or death of its employees, and claims insured by usual bodily injury liability coverages;
- (3) Claims for damages because of bodily injury, sickness or disease, or death of any person other than its employees, and claims insured by usual bodily injury liability coverages; and
- (4) Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

CERTIFICATE OF INSURANCE. Before commencing any of the Work, Contractor shall file with the County valid Certificates of Insurance acceptable to the County and the Observer. Such Certificates shall contain a provision that coverages afforded under the policies will not be canceled until at least thirty (30) days prior written notice has been given to the County.

The Contractor shall also file with the County valid Certificates of Insurance covering all Sub-contractors of the Contractor.

3.14 Final Clean-up

Upon the completion of the Work and before acceptance and Final Payment will be made, the Contractor shall clean and remove from the site of the Work all surplus and discarded materials, temporary structures and debris of every kind. The Contractor shall leave the site of the Work in a neat and orderly condition at least equal to that which originally existed. Surplus and waste materials removed from the site of the Work shall be disposed of at locations that are both satisfactory to the Observer and in accordance with the laws pertaining to the disposal of such surplus, debris and waste materials.

In the event the Contractor fails or refuses to clean and remove surplus materials and debris as provided above, the County or the Observer may do so, or cause same to be done, at the

Contractor's expense, and the reasonable cost thereof shall be deducted from any amounts that are owing to the Contractor.

4. Prosecution and Progress

4.01 Time and Order of Completion

It is the meaning and intent of the Contractor Documents, unless otherwise specifically provided, that the Contractor shall be allowed to prosecute its work at such times and seasons, in such order of precedence, and in such manner as shall be most conducive to the economy of construction; provided, however, that the order and the time of prosecution shall be such that the Work shall be substantially completed, as a whole and in part, in accordance with the Contract Documents and within the time of completion designated in the Contractor's bid or proposal; provided, however, when the County is having other work done on the same Project or an adjoining project, either by contract or by its own force, the Observer may direct the time and manner of constructing the Work done under the Contract Documents, so that conflict will be avoided and the construction of the various works and projects being performed for the County shall be harmonized.

Unless otherwise specified, the Contractor shall plan to begin work 10 calendar days from the authorization date to begin work as designated by the Notice to Proceed.

The Contractor shall submit, at such times as may reasonably be requested by the Observer, schedules which shall show the order in which the Contractor proposes to carry on the Work, the dates at which the Contractor will start the several parts of the Work, and estimated dates of completion of the several parts.

Nighttime work is allowed only when shown on the plans or directed or allowed by the Engineer. Nighttime work is defined as work performed from 30 min. after sunset to 30 min. before sunrise.

4.02 Extension of Time

Should the Contractor be delayed in the completion of the Work by any act or neglect of the County, the Observer or the Engineer of Record, or of any employee of either, or by other contractors employed by the County, or by changes ordered in the Work, or by strikes, lockouts, fires, and unusual delays by common carriers, or unavoidable cause or causes beyond the Contractor's control, or by any cause which the Observer shall decide justifies the delay, then an extension of time shall be allowed for completing the Work, sufficient to compensate for the delay, the amount of the extension to be determined by the Observer; provided, however, before the Observer may decide whether or not to allow such an extension of time, the Contractor must tender a prompt written request for an extension of time wherein the Contractor shall give the Observer a written description of the cause of such delay. Adverse weather conditions will not be justification for extension of time on "Calendar Days" contracts.

4.03 Hindrances and Delays

No claims shall be made by the Contractor for damages resulting from hindrances or delays from any cause (except where the Work is stopped by order of and for the convenience of the County) during the progress of any portion of the Work embraced in the Contract Documents. In case said work shall be stopped by the act of the County, then such expense, as in the sole judgment of the Observer is caused by such stoppage of said work, shall be paid by the County to the Contractor.

5. Measurement and Payment

5.01 Quantities and Measurements

No extra or customary measurements of any kind will be allowed. Rather the actual measured and/or computed length, area, solid contents, number and weight only shall be considered, unless otherwise specifically provided otherwise in the Contract Documents.

5.02 Estimated Quantities

The Contract Documents are intended to show clearly all work to be done and material to be furnished hereunder. Where the estimated quantities are shown for the various classes of work to be done and material to be furnished under the Contract Documents, they are approximate and are to be used only as a basis for estimating the probable cost of the Work and for comparing the proposals offered for the Work. It is understood and agreed that the actual amount of work to be done and material to be furnished under the Contract Documents may differ somewhat from these estimates.

Plans quantities may or may not represent the exact quantity of work performed or material moved, handled, or placed during the execution of the Work. For plans quantity measurement items, the estimated bid quantities are designated as final payment quantities, unless revised by the governing specifications. If the actual quantity measured as outlined under "Measurement" varies by more than 5% (or as stipulated under "Measurement" for specific Items) from the total estimated quantity for an individual Item originally shown in the Contract Documents, an adjustment may be made to the quantity of authorized work done for payment purposes. The party requesting the adjustment will provide field measurements and calculations showing the revised quantity. When approved, this revised quantity will constitute the final quantity for which payment will be made. Payment for revised quantity will be made at the unit price bid for that Item, except as provided for in the Contract Documents. When quantities are revised by a change in design approved by the County, by change order, or to correct an error on the plans, the plans quantity will be increased or decreased by the amount involved in the change, and the 5% variance will apply to the new plans quantity.

Where payment is based on the unit price method, the Contractor agrees that it will make no claim for damages, anticipated profits or otherwise on account of any differences which may be found between the quantities of work actually done, the material actually furnished under the Contract Documents and the estimated quantities contemplated and contained in the proposal; provided, however, that in case the actual quantity of any major item should

become as much as twenty-five percent (25%) more than or twenty-five percent (25%) less than the estimated or contemplated quantity for such items, then either party to the Agreement, upon demand, shall be entitled to revised consideration upon the portion of the Work above or below twenty-five percent (25%) of the estimated quantity.

A "Major Item" shall be construed to be any individual bid item incurred in the proposal that has a total cost equal to or greater than five percent (5%) of the total contract cost, computed on the basis of the proposal quantities and the contract unit prices.

Any revised consideration is to be determined by agreement between the parties, otherwise by the terms of the Contract Documents, as provided under Section 6.03 "Extra Work".

5.03 Price of Work

In consideration of the furnishing of all the necessary labor, equipment and material, and the completion of all of the Work by the Contractor, and on the completion of all of the Work and on the delivery of all material in full conformity with the specifications and stipulations contained in the Contract Documents, the County agrees to pay the Contractor the Contract Price that is set forth in the Agreement. The Contractor hereby agrees to receive such Contract Price in full for furnishing all material and all labor required for the Work, also for all expense incurred by Contractor, and for well and truly performing the same and the whole thereof in the manner with and in accordance to the Contract Documents.

5.04 Partial Payments

On or before the first Wednesday of each month, the Contractor shall submit to the Observer a statement showing the total value of the Work performed up to and including the last day of the preceding month. The statement shall also include the value of all sound materials delivered on the job 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 Observer, is acceptable. The Observer shall either examine and approve by signature or modify and approve such modified statement.

The County shall then pay the Contractor, within 30 days of the statement submittal, the total amount of the approved statement, less ten percent (10%) of the amount thereof, which ten percent (10%) shall be retained until Final Payment, and further less all previous payments and all further sums that may be retained by the County under the terms of the Contract Documents and/or under state or federal law. It is understood, however, that in case the whole work be near to completion and some unexpected and unusual delay occurs due to no fault or neglect on the part of the Contractor, then the County may, upon written recommendation of the Observer, pay a reasonable and equitable portion of the retained percentage to the Contractor; or the Contractor, at the County's option, may be relieved of the obligation to fully complete the Work and, thereupon, the Contractor shall receive payment of the balance due Contractor under the contract subject to the terms and conditions stated in the Contract Documents.

- (1) When work progress is fifty percent (50%) complete, as determined by the value of the work completed to date against the original or revised contract amount, whichever is greater, the County may reduce the amount retained to five percent (5%) of the value of all work satisfactorily complete to date, including the value paid for materials on hand, provided, in the sole opinion of the Observer, the Contractor is making satisfactory progress toward completion of the project in a timely manner and there is no other cause to retain a greater percentage.
- (2) Upon issuance of the NOTICE OF SUBSTANTIAL COMPLETION and agreement to final project quantities, the percent retained may be further reduced, at the discretion of the Engineer and the Observer, to two percent (2%) of the total value of all work completed to date. This amount shall be retained until Final Payment and close out of the project.

5.05 Punch List

The Contractor shall notify the Observer in writing when, in the Contractor's opinion, the Work has been "Substantially Completed" and when so notifying the Observer, the Contractor shall furnish to the Observer, in writing, a detailed list of unfinished work, also known as the Punch List. The Observer will review the Punch List and will add any items that the Contractor failed to include on said list. The fact that a structure or facility has been "Substantially Completed" shall not excuse the Contractor from performing all of the Work undertaken, whether such work is of a minor or major nature. Furthermore, the Contractor shall remain obligated to fully complete the Work and perform its obligations under the Contract Documents after the Work has been Substantially Completed.

5.06 Final Completion and Acceptance

The Contractor shall have a specified time period for completion of the Punch List items, as set forth in Section XI of the Special Conditions, "Completion of Work on Time." Within ten (10) days after the Contractor has given the Observer written notice that the Punch List has been completed, the Observer shall inspect the Work and within said time, if the Work is found to be completed in accordance with the Contract Documents, the Observer shall issue to the Contractor its Certificate of Completion. In the event the Punch List has not been completed, the Observer shall advise the Contractor, in writing, of the Observer's basis for deeming the Punch List incomplete. Following the Contractor's receipt of the Observer's notice that the Punch List is incomplete, the Contractor shall complete the remaining items prior to the expiration of the above referenced specified time period for completion of the Punch List items. Upon satisfactory completion of the Punch List and the issuance of the Certificate of Completion, it shall be the Contractor's responsibility to submit the contract close-out documents, which shall include the record drawings, maintenance bond and Affidavit of All Bills Paid, and thereupon it shall be the duty of the County to issue a Certificate of Acceptance (Final Acceptance) to the Contractor.

5.07 Final Payment

Upon the issuance of the Notice of Substantial Completion, the Observer shall proceed to make final measurements and prepare final statement for the value of all work performed and materials furnished under the terms of the Contract Documents and shall certify same to the

County, and, then, Final Payment shall be made to the Contractor. At the County's sole discretion, this payment may include payment for work remaining to be performed in association with the removal of temporary erosion controls or the establishment of permanent stabilization measures. On or after the 30th day, and before the 35th day after the date of the Certificate of Acceptance, the balance due the Contractor under the terms of the Contract Documents shall be paid. Neither the Certificate of Acceptance nor the Final Payment, nor any provision in the Contract Documents, shall relieve the Contractor of the obligation for fulfillment of any warranty which may be required.

5.08 Payments Withheld

The County may, on account of subsequently discovered evidence, withhold or nullify the whole or part of any certificate to such extent as may be necessary to protect itself from loss on account of:

- (a) Defective work not remedied or other obligations hereunder not completed.
- (b) Claims filed or reasonable evidence indicating the probable or potential filing of claims.
- (c) Failure of the Contractor to make payments properly to Subcontractors or for material or labor.
- (d) Damage to the County or another contractor's work, material or equipment.
- (e) Reasonable doubt that the Work can be completed for the unpaid balance of the contract amount or Contract Price.
- (f) Reasonable indication that the Work will not be completed within the contract time.
- (g) Other causes affecting the performance of the Work subject of the Contract Documents.

When the above grounds are removed or the Contractor provides a surety bond satisfactory to the County, which will protect the County in the amount withheld, payment shall be made for amounts withheld because of them.

5.09 Delayed Payments

Should the County fail to make payment to the Contractor of the sum named in any partial or final statement, when such payment is due, then the County shall pay to the Contractor, in addition to the sum shown as due by such statement, interest thereon 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 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 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. County's payment of the amount due plus said interest shall fully liquidate any injury to the Contractor growing out of such delay in payment. It is expressly agreed that delay by the County in making payment to the Contractor of the sum named in any partial or final statement shall not constitute, on the part of the County, a breach under the Contract Documents, nor shall it serve as an abandonment by the County. Furthermore, any delay by the County in making payment to the Contractor of the sum named in any partial or final statement shall not, to any

extent or for any time, relieve the Contractor of its obligations to fully and completely perform pursuant to the terms of the Contract Documents.

6. Extra Work and Claims

6.01 Change Orders

Without invalidating the Agreement or any terms of the Contract Documents, the County may, at any time or from time to time, order additions, deletions or revisions to the Work. Any such additions, deletions or revisions to the Work may only be effectuated and authorized by written Change Order. The said written Change Order shall be prepared by the GEC for execution by the County and the Contractor. The Change Order shall set forth the basis for any change in Contract Price, as hereinafter set forth in Section 6.03, Extra Work, and for any change in contract time which may result from the change.

In the event the Contractor shall refuse to execute a Change Order which has been prepared by the GEC and executed by the County, the GEC may, in writing, instruct the Contractor to proceed with the Work as set forth in the Change Order and the Contractor shall thereafter proceed with such work. The Contractor may make claim against the County for Extra Work involved under the Change Order, as hereinafter provided.

6.02 Minor Changes

The Observer may authorize minor changes in the Work which are not inconsistent with the overall intent of the Contract Documents and which do not involve an increase in Contract Price. If the Contractor believes that any minor change or alteration authorized by the Observer involves Extra Work which entitles it to an increase in the Contract Price, the Contractor shall make written request to the Observer for a written Field Order. For purposes of this section, a "Field Order" shall mean the Contractor's cost proposal for the Extra Work that the Contractor believes would increase the Contract Price.

In such case, the Contractor, by copy of its communication to the Observer or by separate writing, shall advise the County of its request to the Observer for a written Field Order. The Contractor's notice to the County shall inform the County that the work subject of the written Field Order may result in an increase in the Contract Price.

Any request by the Contractor for a change in Contract Price shall be made prior to commencing the work covered by the proposed change.

6.03 Extra Work

It is agreed that the basis of compensation to the Contractor for work either added or deleted by a change order or for which a claim for Extra Work is made shall be determined by the unit prices upon which the Work and Project was bid to the extent such work can be fairly classified within the various work item descriptions. For work that cannot be fairly classified within the said various work item descriptions, the basis of compensation to the Contractor

for work either added or deleted by a change order or for which a claim for Extra Work is made shall be determined by one or more of the following methods:

Method (A)

By agreed unit prices; or

Method (B)

By agreed lump sum; or

Method (C)

If neither Method (A) nor Method (B) is agreed upon before the Extra Work is commenced, then the Contractor shall be paid the "actual field cost" of the Work, plus fifteen percent (15%).

In the event said Extra Work is performed and paid for under Method (C), then the provisions of this paragraph shall apply and the "actual field cost" is hereby defined to include the cost to the Contractor of all workmen, such as foremen, timekeepers, mechanics and laborers, and materials, supplies, trucks, rentals on machinery and equipment, for the time actually employed or used on such Extra Work, plus actual equipment, for the time actually employed or used on such Extra Work, plus actual transportation charges necessarily incurred, together with all power, fuel, lubricants, water and similar operating expenses, also all necessary incidental expenses incurred directly on account of such Extra Work, including Social Security, Old Age Benefits and other payroll taxes, and a rateable proportion of premiums on performance and payment bonds and maintenance bonds, public liability and property damage and workers' compensation, and all other insurance as may be required by any law or ordinance, or directed or agreed to by the County. The Observer may direct the form in which accounts of the "actual field cost" shall be kept and the records of these accounts shall be made available to the Observer. The Observer or the County may also specify, in writing before the Extra Work commences, the method of doing the Extra Work and the type and kind of machinery and equipment to be used; otherwise these matters shall be determined by the Contractor. Unless otherwise agreed upon, the prices for the use of machinery and equipment shall be determined by using one hundred percent (100%), unless otherwise specified, of the latest schedule of Equipment ownership Expense adopted by the Associated General Contractors of America. Where practicable the terms and prices for the use of machinery and equipment shall be incorporated in the written Extra Work order. The fifteen percent (15%) of the "actual field cost" to be paid the Contractor shall cover and compensate Contractor for its profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the "actual field cost" as herein defined, save that where the Contractor's camp or field office must be maintained primarily on account of such Extra Work; then the cost to maintain and operate the same shall be included in the "actual field cost."

No claim for Extra Work of any kind will be allowed unless ordered, in writing, by the Observer. In case any orders or instructions, either oral or written, appear to the Contractor to involve Extra Work for which Contractor should receive compensation or an adjustment in

the construction time, Contractor shall make written request to the Observer for written order authorizing such Extra Work. Should a difference of opinion arise as to what does or does not constitute Extra Work, or as to the payment therefor, and the Observer insists upon its performance, the Contractor shall proceed with the Work after making written request for written order and shall keep an accurate account of the "actual field cost" thereof, as provided under Method (C).

6.04 Time of Filing Claims

The County and Contractor hereby agree and acknowledge that all questions of dispute or adjustment presented by the Contractor shall be in writing and filed with the Observer within thirty (30) days after the Observer has given any directions, order or instruction to which the Contractor desires to take exception. The Observer shall reply within thirty (30) days to such written exceptions by the Contractor and render the Observer's final decision in writing. In case the Contractor should appeal from the Observer's decision, the Contractor may file with the County its objection. It is further agreed that the acceptance by the Contractor of the Final Payment shall serve as a bar to any claims that the Contractor may have for matters arising prior to or after the Contractor's acceptance of the Final Payment.

6.05 Continuing Performance

The Contractor shall continue performance of the Work during all disputes or disagreements with the County. The production or delivery of goods, the furnishing of services and the construction of projects or facilities shall not be delayed, prejudiced or postponed pending resolution of any disputes or disagreements, except as the County may otherwise agree in writing.

7. Abandonment of Contract

7.01 Abandonment by Contractor

In case the Contractor should abandon and fail or refuse to resume work within ten (10) days after written notification from either the County or the Observer, or if the Contractor fails to comply with the orders of the Observer when such orders are consistent with the Contract Documents, then and in such case where performance bonds exist, the appropriate sureties on these bonds shall be provided with a notice of abandonment and notice for completion whereby (i) the sureties are notified of the Contractor's abandonment or Contractor's failure or refusal to resume work; and (ii) the sureties are directed to complete the Work. A copy of the notice of abandonment and notice for completion shall be delivered to the Contractor.

After receiving a copy of the above described notice of abandonment and notice for completion, the Contractor shall not remove from the Project any machinery, equipment, tools, materials or supplies that then currently exist on the Project site, but the same, together with any materials and equipment under contract for the Work, may be held for use on the Project by the County or the surety on the performance bond, or another contractor in completion of the Work; and the Contractor shall not receive any rental or credit therefor (except when used in connection with Extra Work, where credit shall be allowed as provided for under Section 6, Extra Work and Claims, herein), it being understood that the use of such

equipment and materials will ultimately reduce the cost to complete the Work and be reflected in the final settlement.

Where there is no performance bond provided or in case the surety should fail to commence compliance within ten (10) days after service of the herein above provided notice of abandonment and notice for completion, then the County may provide for completion of the Work in either of the following elective manners:

- (1) The County may thereupon employ such force of men and use such machinery, equipment, tools, materials and supplies as the County may deem necessary to complete the Work and charge the expense of such labor, machinery, equipment, tools, materials and supplies to the Contractor, and expense so charged shall be deducted and paid by the County out of such monies as may be due, or that may thereafter at any time become due to the Contractor under and by virtue of the Contract Documents. In case such expense is less than the sum which would have been payable under the Contract Documents if the same had been completed by the Contractor, then the Contractor shall receive the difference. In case such expense is greater than the sum which would have been payable under the Contract Documents if the same had been completed by the Contractor, then the Contractor and/or its surety shall pay the amount of such excess to the County, or
- (2) The County, under sealed bids, after five (5) days notice published one or more times in a newspaper having general circulation in the area of the location of the Project, may let a contract for the completion of the Work under substantially the same terms and conditions which are provided in the Contract Documents. In case there is any increase in cost to the County under the new contract as compared to what would have been the cost under the Contract Documents, such increase shall be charged to the Contractor and the surety shall be and remain bound therefor. However, should the cost to complete any such contract prove to be less than what would have been the cost to complete under the Contract Documents, the Contractor and/or its surety shall be credited therewith.

When the Work shall have reached Final Completion, the Contractor and its surety shall be so notified and Certificates of Completion and Acceptance, as provided in Section 5.06 herein above, shall be issued. A complete itemized statement of the contract accounts, certified by the Observer as being correct, shall then be prepared and delivered to the Contractor and its surety, whereupon the Contractor and/or its surety, or the County as the case may be, shall pay the balance due as reflected by said statement within fifteen (15) days after the date of such Certificate of Completion.

In the event the statement of accounts shows that the cost to complete the Work is less than that which would have been the cost to the County had the Work been completed by the Contractor under the terms of the Contract Documents, or when the Contractor and/or its surety shall pay the balance shown to be due by them to the County, then all machinery, equipment, tools, materials or supplies left on the site of the Project shall be turned over to the Contractor and/or its surety.

Should the cost to complete the Work exceed the amount the County would have been obligated to pay the Contractor had the Work been completed by the Contractor under the terms of the Contract Documents, and should the Contractor and/or its surety fail to pay the amount due the County within the time designated hereinabove, and should there remain any machinery, equipment, tools, materials or supplies on the site of the Project, notice thereof, together with an itemized list of such equipment and materials, shall be mailed to the Contractor and its surety at the respective addresses designated in the Contract Documents. After properly tendering such notice, such property shall be held at the risk of the Contractor and its surety subject only to the duty of the County to exercise ordinary care to protect such property. After fifteen (15) days from the date of said notice, the County may sell such machinery, equipment, tools, materials or supplies and apply the net sum derived from such sale to the credit of the Contractor and its surety. Such sale may be made at either public or private sale, with or without notice, as the County may elect. The County shall release, to their proper owners, any machinery, equipment, tools, materials, or supplies, which remain on the Project and which belong to persons other than the Contractor or its surety. The books on all operations provided herein shall be opened to the Contractor and its surety.

7.02 Abandonment by the County

In the event that the County should fail, within ten (10) days after receiving written notification from the Contractor, to comply with the terms of the Contract Documents, then the Contractor may suspend or wholly abandon the Work, and may remove therefrom all machinery, tools and equipment, and all materials on the Project site that have not been included in payments to the Contractor and have not been wrought into the Work. Thereupon, the Observer shall make an estimate of the total amount earned by the Contractor, which estimate shall include the value of all work actually completed by said Contractor (at the prices stated in the Contract Documents), the value of all partially completed work at a fair and equitable price, and the amount of all Extra Work performed at the prices agreed upon, or provided for by the terms of the Contract Documents. The Observer shall then make a final statement of the balance due the Contractor by deducting from the above estimate all previous payments by the County and all other sums that may be retained by the County under the terms of the Agreement and the Contract Documents and the Observer shall certify same to the County who shall pay to the Contractor on or before thirty (30) days after the date of the Observer's certification.

8. Subcontractors

8.01 Award of Subcontracts for Portions of the Work

Unless otherwise specified in the Contract Documents or in the Instructions to Bidders, the Contractor, as soon as practicable after the award of the contract, shall furnish to the Observer, in writing for acceptance by the County, a list of the names of the Subcontractors proposed for the principal portions of the Work. The Observer shall promptly notify the Contractor, in writing, if the County, after due investigation, has objection to any Subcontractor on such list and does not accept such Subcontractor.

The Contractor shall not contract with any Subcontractor or any person or organization (including those who are to furnish materials or equipment fabricated to a special design) proposed for portions of the Work designated in the Contract Documents or in the Instructions to Bidders or, if none is so designated, with any Subcontractor proposed for the principal portions of the Work who has been rejected by the County. The Contractor will not be required to contract with any Subcontractor or person or organization against whom the Contractor has a reasonable objection.

If the County refuses to accept any Subcontractor or person or organization on a list submitted by the Contractor in response to the requirements of the Contract Documents or the Instructions to Bidders, the Contractor shall submit an acceptable substitute and the Contract Price shall be increased or decreased by the difference in cost occasioned by such substitution and an appropriate change order shall be issued; however, no increase in the Contract Price shall be allowed for any such substitution unless the Contractor has acted promptly and responsively in submitting for acceptance any list or lists of names as required by the Contract Documents or the Instructions to Bidders.

If the County requires a change of any proposed Subcontractor or person or organization previously accepted by them, the Contract Price shall be increased or decreased by the difference in cost occasioned by such change and an appropriate change order shall be issued.

The Contractor shall not make any substitution for any Subcontractor or person or organization that has been accepted by the County, unless the substitution is acceptable to the County.

8.02 Subcontractual Relations

All work performed for the Contractor by a Subcontractor shall be pursuant to an appropriate written agreement between the Contractor and the Subcontractor (and where appropriate between Subcontractors and Sub-subcontractors) which shall contain provisions that:

- (1) preserve and protect the rights of the County, the Observer, the GEC and the Engineer of Record under the contract with respect to the Work to be performed under the subcontract so that the subcontracting thereof will not prejudice such rights;
- (2) require that such work be performed in accordance with the requirements of the Contract Documents;
- (3) require submission to the Contractor of the applications for payment under each subcontract to which the Contractor is a party, in reasonable time to enable the Contractor to apply for payment in accordance with the Contract Documents;
- (4) require that all claims for additional costs, extensions of time, damages for delays or otherwise with respect to subcontracted portions of the Work shall be submitted to the Contractor (via any Subcontractor or Sub-subcontractor where appropriate) in sufficient time so that the Contractor may comply in the manner provided in the Contract Documents for like claims by the Contractor upon the County;
- (5) obligate each subcontractor specifically to consent to the provisions of this section.

A copy of all such signed subcontract agreements shall be filed by the Contractor with the Observer before the Subcontractor shall be allowed to commence work.

8.03 Payments to Subcontractors

The Contractor shall pay each Subcontractor, upon receipt of payment from the County, an amount directly based upon the value of the Work performed and allowed to the Contractor on account of such Subcontractor's work, less the percentage retained from payments to the Contractor. The Contractor shall also require each Subcontractor to make similar payments to its subcontractors.

If the Observer fails to approve a payment for any cause which is the fault of the Contractor and not the fault of a particular Subcontractor, the Contractor shall pay the Subcontractor, on demand made at any time after the Certificate for Payment should otherwise have been issued, for its work to the extent completed, less the retained percentage, if any.

The Observer may, on request and at its discretion, furnish to any Subcontractor, if practicable, information regarding percentages of completion certified to the Contractor on account of work done by such Subcontractors.

Neither the County, the Observer nor the Engineer shall have any obligation to pay or to see to the payment of any monies to such Subcontractor except as may otherwise be required.

9. Protection of Persons and Property

9.01 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

9.02 Safety of Persons and Property

The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to:

- (1) all employees on the Work and all other persons who may be affected thereby;
- (2) all the Work and all materials and equipment to be incorporated therein, whether in storage or off the site, under the care, custody or control of the Contractor or any of its Subcontractors or Sub-subcontractors; and
- (3) other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, fences, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety

and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities.

When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

All blasting, including methods of storing and handling explosives and highly inflammable materials, shall conform to federal, state, local laws and ordinances.

The following is a list of requirements in addition to federal, state, and local laws and ordinances:

- (1) The Contractor shall furnish the County with a Certificate of Blasting Insurance in the amount of \$300,000.00 for each contract, at least twenty-four (24) hours prior to using explosives. A blasting permit must be obtained from the appropriate jurisdictions at least five (5) days prior to use of explosives. If blasting is covered under the Contractor's General Insurance Certificate for each contract, a separate blasting certificate will not be required.
- (2) The following public utility companies and departments will be notified by the Contractor, on every occasion, at least twenty-four (24) hours prior to the use of explosives: Water and Wastewater, Electric, Gas, Telephone and the County Engineering Department.
- (3) Explosive materials to be used shall be limited to blasting agents and dynamite, unless prior approval of other materials is obtained in writing from the Engineering Department.
- (4) During blasting, all reasonable precautions shall be taken to protect pedestrians, passing vehicles, and public or private property. Blasting mats or protective cover shall be used when required by the Observer, the permit, or by safe blasting practices.
- (5) All explosives shall be stored in accordance with all applicable laws and codes.
- (6) The Engineer or its representative shall have the right to limit the use of explosives and/or blasting methods which in its opinion are dangerous to the public or nearby property of any kind.
- (7) The Contractor, at its expense, shall promptly repair or replace all items known to be damaged as a result of blasting. All claims of damage shall be investigated by the County or by consulting firms approved by the County.
- (8) The Contractor shall maintain accurate records throughout the blasting operations showing the type explosive used, number of holes, pounds per hole, depth of hole, total pounds per shot, delays used, date and time of blast and initials of the Observer. The Contractor is fully responsible for all claims resulting from its blasting operation.

All damage or loss to any property referred to in this article caused, in whole or in part, by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, shall be

remedied by the Contractor, except damage or loss attributable solely to faulty drawings or specifications or solely to the acts or omissions of the County its agents, employees, or representatives or anyone employed by either of them, and not attributable in any degree to the fault or negligence of the Contractor.

The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the County.

9.03 Location and Protection of Utilities

Notwithstanding any other provision of the Contract Documents, the Contractor shall be solely responsible for the location and protection of any and all public utility lines and utility customer service lines in the Project 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 areas. Upon request, the County shall provide such information as it has about the location and grade of water, sewer, gas, and telephone 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 it shall cause such damage to be repaired at its expense.

10. Termination

10.01 Termination by the County for Cause

Conditions for termination are as follows:

- (A) Without prejudice to any other legal or equitable right or remedy which it would otherwise possess hereunder or as a matter of law, the County shall be entitled, by giving Contractor five (5) days prior written notice, to terminate the Agreement in its entirety at any time:
 - (1) If the Contractor becomes insolvent, voluntarily files for bankruptcy, is the subject of an involuntary petition for bankruptcy commenced by its creditors, makes a general assignment for the benefit of creditors or becomes the subject of any other proceeding commenced under any statute or law for the relief of debtors; or
 - (2) If a receiver trustee or liquidator of any of the property or income of Contractor shall be appointed; or
 - (3) If Contractor:
 - (a) Shall fail to prosecute the Work or any part thereof with diligence necessary to insure its progress and completion as prescribed by the time schedules; and shall fail to take such steps to remedy such default within ten (10) days after written notice thereof from the County; or
 - (4) If Contractor:
 - (a) Shall commit a default under any of the terms, provisions, conditions, or covenants contained in the Contract Documents; and

- (b) Shall fail to take such steps to remedy such default within ten (10) days after written notice thereof from the County.
- (B) In the event of County's termination for cause, Contractor shall only be paid its reimbursable costs incurred prior to the effective date of the termination notice and shall not be entitled to receive any further fixed fee payments hereunder and shall be further subject to any claim the County may have against Contractor under other provisions of the Contract Documents or as a matter of law, including the refund of any overpayment of reimbursable costs and/or fixed fee.
- (C) If the Agreement is terminated for cause, the County shall have the right, but shall not be obligated, to complete the Work itself or by others; and to this end, the County shall be entitled to take possession of and use such equipment and materials as may be on the Project site, and to exercise all rights, options, and privileges of Contractor under its subcontracts, purchase orders, or otherwise; and Contractor shall promptly assign such rights, options and privileges to the County. If the County elects to complete the Work itself or by others, pursuant to the foregoing, the Contractor will reimburse the County 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 work by Contractor which fails to meet contract requirements.

Nothing contained in the preceding sections shall require the County to pay for any of the Work which is unsatisfactory, as determined by the Observer or which is not submitted in compliance with the terms of the Contract Documents. The County shall not be required to make any payments to Contractor when Contractor is in default under the Contract Documents.

This Article shall not constitute a waiver of any right, at law or at equity, which the County may have if Contractor is in default, including the right to bring legal action for damages or to force specific performance of the terms and conditions of the Contract Documents.

10.02 Termination for Convenience

In connection with the Work outlined in the Contract Documents, it is agreed and fully understood by Contractor, that the County may cancel or indefinitely suspend further work hereunder or terminate the Agreement for the convenience of the County, upon fifteen (15) days written notice to Contractor. In the event the County terminates the Agreement for convenience, it is hereby understood and acknowledged by the Contractor that immediately upon receipt of the County's notice of termination, all work and labor being performed under the Contract Documents shall cease. Contractor shall invoice the County for all work satisfactorily completed and shall be compensated in accordance with the terms of the Contractor Documents for work accomplished prior to the receipt of said notice. No amount shall be due for lost or anticipated profits. However, no cost incurred after the effective date of the notice of termination shall be treated as reimbursable costs unless it relates to carrying out the un-terminated portion or taking closeout measures.

10.03 Obligations of Contractor Following Termination

After receipt of a notice of termination, whether such termination be for cause or convenience, Contractor shall, in good faith and to the best of its ability, do all things necessary to assure the efficient proper closeout of the terminated work (including the protection of County property). Among other things, the Contractor shall, except as otherwise directed or approved by the County:

- (1) Stop the Work on the date and to the extent specified in the notice of termination.
- (2) Place no further orders for subcontracts for services, equipment or materials, except as may be necessary for completion of such portion of the Work as is not terminated.
- (3) Terminate all orders and subcontracts to the extent that they relate to the performance of the Work terminated by the notice of termination.
- (4) Assign to the County, in the manner and to the extent directed by it, all right title, and interest of Contractor under the orders or subcontracts so terminated; in which case, the County shall have the right to settle or pay any or all claims arising out of such termination of such orders and/or subcontracts.
- (5) With the approval of the County, settle all outstanding liabilities and all claims arising out of such termination or orders and subcontracts.
- (6) Deliver to the County, all documents, property, plans, field surveys, maps, cross sections and other data, designs and work related to the Project, which shall become the property of the County upon termination. The delivery of such items shall be made in a reasonably organized form, without restriction on future use. Should the County subsequently contract with a new contractor for continuation of services on the Project subject of the Contract Documents, Contractor shall cooperate in providing information to the County and the new contractor.

11. Inspection and Audit

Contractor's records shall be subject to audit and such records shall include, but not be limited to accounting records, written policies and procedures; subcontract files (including proposals of successful and unsuccessful bidders, bid recaps, etc.); original estimates; estimating work sheets; correspondence; change order files (including documentation covering negotiated settlements); back charge logs and supporting documentation; general ledger entries detailing cash and trade discounts earned, insurance rebates and dividends; and any other Contractor records which may have a bearing on matters of interest to the County in connection with the contractor's work for the County. All of the foregoing, hereinafter referred to as "records," shall be open to inspection and subject to audit and/or reproduction by County or its authorized representative to the extent necessary to adequately permit evaluation and verification of:

- (a) Contractor compliance with the Contract Documents,
- (b) compliance with County's business ethics policies,
- (c) compliance by other contractors or subcontractors with contracts with County or Contractor, and
- (d) compliance with provisions for pricing change orders, invoices or claims submitted by the Contractor or any of its payees.

Other specific records subject to audit include all information, materials and data of every kind and character such as documents, subscriptions, recordings, computerized information, agreements, purchase orders, leases, contracts, commitments, arrangements, notes, daily diaries, superintendent reports, drawings, receipts, vouchers and memoranda, and any and all other agreements, sources of information that may, in County's judgment, have any bearing on or pertain to any matters, rights, duties or obligations under or covered by the Contract Documents. Such records subject to audit shall also include those records necessary to evaluate and verify direct and indirect costs, (including overhead allocations) as they may apply to costs associated with this Project. In those situations where Contractor's records have been generated from computerized data (whether mainframe, mini-computer, or PC based computer systems), Contractor agrees to provide County's representatives with extracts of data files in computer readable format on data disks or suitable alternative computer data exchange formats.

The County or its designee shall be entitled to audit all of the Contractor's records for a period of three (3) years after final payment or a longer period if required by law.

Contractor shall require all payees (including those entering into lump sum subcontracts and lump sum major material purchase orders), to comply with the provisions of this article by insertion of the requirements hereof in a written contract agreement between Contractor and payee. Requirements to include flow-down audit provisions in contracts with payees will apply to Subcontractors, Sub-Subcontractors, material suppliers, etc. when working under any type of contract including lump sum agreement, unit price agreements, time and material agreements, cost plus agreements, or other agreements. Contractor will cooperate fully and will cause all payees to cooperate fully in furnishing or in making available to County from time to time whenever requested in an expeditious manner any and all such information, materials and data required by this section.

County's agent or its authorized representative shall have access to the Contractor's facilities, shall be allowed to interview all current or former employees to discuss matters pertinent to the performance of the Work, shall have access to all necessary records, and shall be provided adequate and appropriate work space, in order to conduct audits in compliance with this section.

SECTION 12
SPECIAL CONDITIONS OF AGREEMENT

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I. County

Williamson County, a political subdivision of the State of Texas, acting through its County Judge, or his designee, agents or employees, whom Contractor has entered into the Agreement and for whom the Work is to be performed, is referred to as "County". The County shall be contacted through its Purchasing Department for contract related subjects and through the County Engineer's office for design and construction related subjects:

Purchasing Department
Williamson County
901 South Austin Avenue
Georgetown, TX 78626

County Engineer
Williamson County
3151 SE Inner Loop
Georgetown, TX 78626

II. Program Manager

Prime Strategies, Inc. is the County's Program Manager for the Project. The Program Manager represents the County and oversees the planning, design, review, and coordination of the design and construction phases of the Project.

III. General Engineering Consultant (GEC)

HNTB Corporation is the consulting engineering firm representing and assisting the County in the design, review, and coordination of the design and construction phases of the project, including oversight of the construction engineering and inspection services performed on the Project.

IV. The Construction Observer

Williamson County or Representative is the "Construction Observer" referred to herein and in the Contract Documents. The Construction Observer will be responsible for performing construction observation services on the Project.

V. Engineer of Record

Cobb Fendley & Associates is the County's design professional, who shall provide professional engineering services as defined in the Texas Government Code Chapter 2254, Subchapter A, and referred to as the "Engineer of Record" in the "General Conditions of Agreement" contained in the Contract Documents. Nothing contained in the Contract Documents shall create any contractual or agency relationship between the Engineer of Record and the Contractor.

VI. Insurance

The Contractor will carry Workmen's Compensation Insurance, Public Liability and Property Damage Insurance, and Automobile Insurance sufficient to provide adequate protection against damage claims which may arise from operations under the Contract Documents, in compliance with the following:

Contractors Insurance: Without limiting any of the other obligations or liabilities of the Contractor, during the term of the Agreement and prior to Final Completion, the Contractor

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and each subcontractor, at their own expense, shall purchase and maintain the herein stipulated minimum insurance with companies duly approved to do business in the State of Texas and satisfactory to the County. Certificates of each policy shall be delivered to the County before any work is started, along with a written statement from the issuing company stating that said policy shall not be canceled, non-renewed or materially changed without 30 days advance written notice being given to the County. Prior to the effective date of cancellation, Contractor must deliver to the County a replacement certificate of insurance or proof of reinstatement. A model Certificate of Insurance is illustrated herein. Coverage shall be of the following types and not less than the specified amounts:

- (a) workers' compensation as required by Texas law, with the policy endorsed to provide a waiver of subrogation as to the County; employer's liability insurance of not less than \$500,000 for each accident, \$500,000 disease--each employee, \$500,000 disease-policy limit.
- (b) commercial general liability insurance, including independent contractor's liability, completed operations and contractual liability covering, but not limited to, the liability assumed under the indemnification provisions of the Contract Documents, fully insuring Contractor's (or subcontractor's) liability for injury to or death of County's employees and third parties, extended to include personal injury liability coverage with damage to property of third parties, with minimum limits as set forth below:

General Aggregate	\$1,000,000
Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$600,000
Each Occurrence	\$600,000
Fire Damage (any one fire)	\$50,000
Medical Expense (any one person)	\$5,000

The policy shall include coverage extended to apply to completed operations, asbestos hazards (if this project involves work with asbestos) and XCU (explosion, collapse and underground) hazards. The completed operations coverage must be maintained for a minimum of one year after Final Completion and acceptance of the Work, with evidence of same filed with County.

- (c) comprehensive automobile and truck liability insurance, covering owned, hired and non-owned vehicles, with a combined bodily injury and property damage minimum limit of \$600,000 per occurrence; or separate limits of \$250,000 for bodily injury (per person), \$500,000 bodily injury (per accident) and \$100,000 for property damage. Such insurance shall include coverage for loading and unloading hazards.

"Umbrella" Liability Insurance: The Contractor shall obtain, pay for and maintain umbrella liability insurance during the contract term, insuring Contractor for an amount of not less than \$1,000,000 per occurrence combined limit for bodily injury and property damage that follows form and applies in excess of the primary liability coverages required herein above. The policy shall provide "drop down" coverage where underlying primary insurance

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coverage limits are insufficient or exhausted. County and Project Engineer shall be named as additional insured.

Policy Endorsements and Special Conditions

- (a) Each insurance policy to be furnished by Contractor shall include the following conditions by endorsement to the policy:
 - (1) name the County, the Program Manager, the County's Representatives, the GEC, the Construction Observer and the Engineer of Record as an additional insured as to all applicable coverage;
 - (2) each policy shall require that 30 days prior to the cancellation, non-renewal or any material change in coverage, a notice thereof shall be given to County by certified mail.
 - (3) the term "County" shall include all authorities, boards, bureaus, commissions, divisions, departments and offices of the County and individual members, employees and agents thereof in their official capacities, and/or while acting on behalf of the County;
 - (4) the "Program Manager" represents and assists the County in the planning, design, review, and coordination of the design and construction phases of the project.
 - (5) the policy phrase "other insurance" shall not apply to the County where the County is an additional insured on the policy; and
 - (6) all provisions of the Contract Documents concerning liability, duty and standard of care together with the indemnification provision, shall be underwritten by contractual liability coverage sufficient to include such obligations within applicable policies.
- (b) Insurance furnished by the Contractor shall also be in accordance with the following requirements:
 - (1) any policy submitted shall not be subject to limitations, conditions or restrictions deemed inconsistent with the intent of the insurance requirements to be fulfilled by Contractor. The County's decision thereon shall be final;
 - (2) all policies are to be written through companies duly licensed to transact that class of insurance in the State of Texas; and
 - (3) all liability policies required herein shall be written with an "occurrence" basis coverage trigger.
- (c) Contractor agrees to the following:
 - (1) Contractor hereby waives subrogation rights for loss or damage to the extent same are covered by insurance. Insurers shall have no right of recovery or subrogation against the County, it being the intention that the insurance policies shall protect all parties to the Agreement and be primary coverage for all losses covered by the policies;
 - (2) companies issuing the insurance policies and Contractor shall have no recourse against the County for payment of any premiums or assessments for any deductibles, as all such premiums and deductibles are the sole responsibility and risk of the Contractor;

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- (3) approval, disapproval or failure to act by the County regarding any insurance supplied by the Contractor (or any subcontractors) shall not relieve the Contractor of full responsibility or liability for damages and accidents as set forth in the contract documents. Neither shall the bankruptcy, insolvency or denial of liability by the insurance company exonerate the Contractor from liability; and
- (4) no special payments shall be made for any insurance that the Contractor and subcontractors are required to carry; all are included in the contract price and the contract unit prices.

Any of such insurance policies required under the Contract Documents may be written in combination with any of the others, where legally permitted, but none of the specified limits may be lowered thereby.

The Contractor shall furnish the County with satisfactory proof that it has provided adequate insurance coverage in amounts and by approved carriers as required by the Contract Documents.

VII. Record ("As-Built") Drawings

The Contractor shall mark all changes and revisions on all of its copies of the working drawings during the course of the Project as they occur. Upon completion of the Project and prior to Final Acceptance and Payment, the Contractor shall submit to the Construction Observer one set of its working drawings, dated and signed by the Contractor and its project superintendent and labeled as "As-Built", that shows all changes and revisions outlined above and that shows field locations of all above ground appurtenances including, but not limited to valves, fire hydrants and manholes. These as-built drawings shall be forwarded to the GEC and then to the County and become the property of the County. Each appurtenance shall be located by at least two (2) horizontal distances measured from existing, easily identifiable, immovable appurtenances such as fire hydrants or valves. Property pins can be used for as-builts tie-ins provided no existing utilities as previously described are available. Costs for delivering as-built drawings shall be subsidiary to other bid items.

VIII. Limit of Financial Resources

The County has a limited amount of financial resources committed to this Project; therefore, it shall be understood by Contractor that the County may be required to change and/or delete any items which it may feel is necessary to accomplish all or part of the scope of work within its limit of financial resources. Contractor shall be entitled to no claim for damages or anticipated profits on any portion of work that may be omitted. At any time during the duration of the Project, the County reserves the right to omit any work from the Contract Documents. Unit prices for all items previously approved in the Contract Documents shall be used to delete or add work per change order.

IX. Limits of Work and Payment

It shall be the obligation of the Contractor to complete all work included in the Contract Documents, so authorized by the County, as described in the Contract Documents and

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Technical Specifications. Any question arising as to the limits of work shall be left up to the interpretation of the Engineer and/or Observer.

X. State Sales Tax

On a contract awarded by a governmental entity for the construction of a publicly-owned improvement in a street right-of-way or other easement which has been dedicated to the public and to the an Organization which qualifies for exemption pursuant to the provisions of Article 20.04 (F) of the Texas Limited Sales, Excise and Use Tax Act, the Contractor can probably be exempted in the following manner:

The Contractor may buy tax-free any materials incorporated into the project by issuing a resale certificate in lieu of paying the sales tax at the time of purchase. The Contractor may then accept an exemption certificate from the City for the materials.

Even with a separated contract, the rental of equipment and the purchase of items which do not ultimately become part of the physical structure will still be subject to state and local sales taxes.

XI. Completion of Work on Time

The Contractor agrees that time is of the essence and that the definite value of damages which would result from delay would be incapable of ascertainment and uncertain, so that for each day of delay beyond the number of days herein agreed upon for the Substantial Completion of the Work specified in the Contract Documents and contracted for, after due allowance for such extension of time as is provided for under the provisions of Section 4.02 of the General Conditions, the County may withhold permanently from the Contractor's total compensation, not as penalty but as liquidated damages, the sum as specified in Special Specification 000-001 per calendar day.

Furthermore, it is agreed by the Contractor that the time period between Substantial Completion and Final Completion shall be no longer than **30** calendar days. This separate time period shall be for completion of the Punch List, as set forth in Section 5.06 of the General Conditions, Final Completion and Acceptance. In the event that Contractor fails to attain Final Completion on or before the expiration of the above said time period, the Contractor shall be subject to the remedies set forth in the Contract Documents. More specifically, the Contractor shall be subject to the terms set forth under Section 7.01 of the General Conditions, Abandonment by the Contractor. In addition to exercising its rights and remedies under the Contract Documents, the County may also exercise any remedy that may be available to it under the law or in equity.

XII. Layout and Construction Stakes

All construction staking shall be performed by the Contractor at the Contractor's expense.

XIII. Safety

The Contractor must use methods of construction that meet or exceed Occupational Safety and Health Administration Standards and any other local, state or federal regulations for

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safety that are in effect. The Contractor will have a trench safety plan prepared and sealed by Contractor's registered professional engineer.

XIV. Maintenance Bond Term & Amount

The required Maintenance Bond amount for this Project shall be twenty percent (20%) of the total amount bid and the bond period shall be two years from date of acceptance of completion, as noted on the Certificate of Completion.

XV. Safety Restrictions - Work Near High Voltage Lines

The following procedures shall be followed for work near high voltage lines on the Project.

- (a) A warning sign not less than five (5) inches by seven (7) inches, painted yellow with black letters that are legible at twelve (12) feet shall be placed inside and outside vehicles such as cranes, derricks, power shovels, drilling rigs, pile drivers, hoisting equipment or similar apparatus. The warning sign shall read as follows: "Warning-Unlawful to Operate This Equipment Within Six Feet of High Voltage Lines".
- (b) Equipment that may be operated with ten (10) feet of high voltage lines shall have an insulating cage guard around the boom or arm (except backhoes or dippers), and insulator links on the lift hook connections.
- (c) When necessary to work within six (6) feet of high voltage electrical lines, notify the power company. The electric company will erect temporary mechanical barriers, de-energize the line, or raise or lower the line. All such work done by the power company shall be at the expense of the contractor. The contractor shall maintain an accurate log of all such calls to the electric company.
- (d) No person shall work within six (6) feet of high voltage lines without protection measures having been taken as outlined in Paragraph C.

XVI. Erosion Control

Contractor shall comply with all laws prohibiting the pollution of any lake, stream, river, or wetland by the dumping of any refuse, rubbish, dredge material, or debris therein.

The Contractor will file the Notice of Intent (NOI) and the Notice of Termination (NOT) as the Project's operator. All required Permits and Notices shall be posted by the Contractor at the Project site.

Contractor shall apply temporary and/or permanent erosion and sedimentation controls, as specified in the plans or directed to disturbed roadside areas, fifteen feet and beyond from road pavement, prior to initiating road base operations. Following asphalt paving of road pavement, apply temporary and/or permanent erosion and sedimentation controls to remaining disturbed areas, as specified in the plans or as directed.

Contractor shall be responsible for the maintenance of all temporary and permanent water quality and erosion control measures proposed under the Storm Water Pollution Prevention Plan (SWPPP) or the Water Pollution Abatement Plan (WPAP) for the duration of the Project construction. Upon completion of construction and before the Construction Observer issues the Certificate of Completion, Contractor shall be responsible for the removal of all temporary measures and the cleaning and resetting of all permanent measures. All costs associated with this work shall be considered subsidiary to other bid items and no additional compensation shall be allowed.

Contractor shall take special precautions during all periods of heavy rainfall and at all locations where storm water, groundwater and/or mud and debris may enter the sewer systems. All mud, stones, and debris that enter the sewer systems due to Contractor's operations, or Contractor's neglect, shall be cleaned from the system by Contractor. It shall be Contractor's responsibility to see that such storm water, groundwater and debris do not enter the sewer system. All costs for such work shall be merged in the unit prices bid and no additional compensation shall be allowed.

If it is necessary in the prosecution of the Work to interrupt existing surface drainage, sewers, or under drainage, temporary drainage shall be provided until permanent drainage work is completed. The construction of all temporary drainage installations shall be considered as incidental to the construction of the Work. Drainage ways shall be kept clear or other satisfactory provisions made for drainage.

Contractor shall be responsible for and shall take all reasonable and necessary precautions to preserve and protect all existing tile drains, sewers, and other subsurface drains, or parts thereof, which may be continued in service without

change. Contractor shall repair, at its own expense, any and all damage to such facilities resulting from negligence or carelessness on the part of its operations.

The Construction Observer shall be responsible for the monitoring and inspection of the erosion control measures by completion of the Construction Pollution Prevention Plan Inspection and Maintenance Report, as required for coverage under the Texas Pollutant Discharge Elimination System (TPDES) General Construction Permit (TXR150000).

XVII. Discovery of Hazardous Materials

If, during the course of the Work, the existence of hazardous material, including asbestos containing material, is observed in the work area, the Contractor shall immediately notify the County in writing. The Contractor shall not perform any work pertinent to the hazardous material prior to receipt of special instructions from the County. Asbestos containing material includes transit pipe.

XVIII. Submittals – Certificate of Compliance

The Contractor shall submit to the Construction Observer a Certificate of Compliance from the manufacturer and/or supplier of each and every specified material or manufactured equipment item. The said certificate shall state that the material or the item of equipment to be furnished has been manufactured with materials in accordance with the applicable sections of all required codes, specifications, and standards as required by the specifications.

XIX. Unavailability of Materials

If the Contractor is unable to furnish or use any of the materials or equipment specified because of any order by a governmental agency limiting the manufacture or use, or because of the supply situation in the general market for such material or equipment, the Contractor shall offer substitutes therefor. The substitutes shall be suitable for the purpose, considering the factors of quality, serviceability, appearance, and maintenance. No substitute shall be used until the Engineer has approved it.

No consideration will be given to the use of substitutes on account of market conditions unless the Contractor demonstrates that, for the item in question, the Contractor placed its order without delay, that it has shown due diligence in attempting to locate the item as specified, and that the unavailability is due to market conditions in general throughout the particular industry.

If substitutes are used in the Work, the compensation to be paid to the Contractor shall be subject to review and adjustment. As a general principle, if the Engineer shall determine that the substitute will be less satisfactory, the Contractor shall allow a credit to the County; only under unusual circumstances shall there be an increase in compensation to the Contractor on account of substitution. The basis upon which the amount of price and adjustments will be founded shall be the cost of the appropriate items at the time the bids for the Project were opened.

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XX. Traffic Control

Access shall be provided for residents and emergency vehicles at all times. When it becomes necessary to restrict access, the Contractor shall notify all applicable agencies (i.e. Fire Department, E.M.S., Public Works, etc.) a minimum of five (5) working days in advance of the proposed restrictions. At the end of each day, two lanes of traffic shall be opened to the public, unless otherwise stated in the Contract Documents.

XXI. Temporary Traffic Handling Devices

The Contractor shall furnish, erect and maintain all necessary barricades, lights, warning signs and temporary pavement markings as shown on the Plans and/or in accordance with the Texas Manual on Uniform Traffic Control Devices and with the Specifications in the Contract Documents. In addition, the Contractor shall provide flag-persons and take necessary precautionary measures for the protection of persons, property and the Work, when deemed necessary by the County or the Construction Observer.

The Construction Observer shall be responsible for the monitoring and inspection of the traffic control measures by completion of the Traffic Control Devices Inspection Report (TCDIR), and the Contractor shall be responsible for compliance with the terms of the TCDIR procedures.

XXII. Roadway Signs

All permanent and temporary roadway signage designated in the Contract Documents shall be in accordance with the Texas Manual on Uniform Traffic Control Devices.

XXIII. Project Signs

The Contractor shall erect at the site of construction, and maintain during construction, signs satisfactory to the County identifying the Project and indicating that the government is participating in the development of the Project. The project signs must be temporary signs, mounted in such a way that they can be moved and do not pose a safety issue. Two project signs will be required for the Project. The two said signs shall be 8' X 4' and made out of white 10 mm corrugated plastic with pressure sensitive vinyl lettering or approved equivalent to include: Road Bond Program, Your County Tax Dollars at Work!, with the Williamson County Seal, the Project's name, and a brief description relating to the estimated date of completion, website address and the appropriate Williamson County Commissioner's name and precinct number. Furnishing, installing and maintaining these signs shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling". The Contractor may use any manufacturer; however, the manufacturer must meet Williamson County standards.

XXIV. Permits

The Contractor shall be responsible for obtaining any and all required construction permits. Contractor agrees to comply with all conditions of the permits and to

maintain copies of the permits at the site at all times while the Work is in progress. The County shall be responsible for obtaining Section 404 permits from the U.S. Army Corps of Engineers as part of the Project design. When Contractor-initiated changes in the construction method changes the impacts to waters of the U.S., Contractor shall be responsible for obtaining new or revised Section 404 permits.

XXV. Landscape Restoration

If not designated as a specific pay item in bid package, the Contractor shall take the means necessary to protect all trees, shrubbery and sod. Protection, removal and replacement of existing landscaping will be in accordance with the Contract Documents.

XXVI. Existing Fencing

All fences encountered during construction within the right-of-way (ROW) shall be removed by the Contractor under "Preparing Right-of-Way." Permanent fencing, designating the ROW, will be provided by others, unless otherwise shown in the Contract Documents. The Contractor will be required to coordinate preparing ROW operations and fence removal and installations with the landowners as needed.

XXVII. Easements

Any easements, both temporary and permanent, required for the Project will be provided by the County as shown in the Contract Documents. Other easements required or desirable by the Contractor shall be arranged by the Contractor at its sole expense. The easements shall be cleaned after use and restored to their original conditions, or better by the Contractor. In the event additional work is required by the Contractor, it shall be the Contractor's responsibility to obtain written permission from the property owners involved for the use of additional property required. No additional payment will be allowed for this item.

XXVIII. Limits of Contractor's Operation

The Contractor shall limit construction operations to within the ROW or the easement unless otherwise directed by the County or its authorized representative.

XXIX. Maintenance of Pedestrian Walkways

The Contractor will be required to maintain clear walkways for pedestrians during construction in a manner to provide access in the most convenient and safest manner consistent with essential construction operations. Specifically, the following will be enforced.

Pedestrian traffic may be blocked at a location where work is actually in progress. Signs, barricades, and warning devices must be placed at nearest crosswalks approaching the construction site from every direction advising pedestrians of the blockage and advising them to use alternate routes.

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Access to doorways and pedestrian entrances must be maintained at all times during hours that access is needed by business. Paving by sections or providing temporary access may be required.

No more than one corner of any intersection may be under construction at any one time. Work must be completed and opened for use by pedestrians before starting work on any other corner of an intersection.

The Contractor will be expected to diligently pursue construction from start to completion at every location to avoid prolonged and unnecessary disruptions to pedestrian traffic.

This work shall be considered incidental and not a separate pay item, unless provided otherwise in the Contract Documents.

XXX. Spoil

All excavated material unfit for backfill, waste material accumulated on the job, and any material surplus to that needed in the prosecution of the Work shall be removed from the site by the Contractor and properly and legally disposed of at its expense, unless otherwise directed by the Observer. **THE CONTRACTOR SHALL INDEMNIFY AND SAVE HARMLESS THE COUNTY, ALL OF ITS OFFICERS, AGENTS, AND EMPLOYEES FROM ALL SUITS, ACTIONS, OR CLAIMS OF ANY CHARACTER RESULTING FROM ITS ARRANGEMENTS FOR THE DISPOSAL OF SPOIL.** This shall be incidental and not a separate pay item.

XXXI. Materials Testing

Quality Control testing of all materials, construction items or products incorporated in the work shall be performed by the Contractor at the Contractor's expense, and shall be performed in accordance with the Quality Control (QC) / Quality Assurance (QA) program outlined in Appendix A.

Quality Assurance sampling and testing for acceptance may be required for quality assurance of used materials as directed by the Construction Observer or the County. The cost of such tests will be incurred by the County and coordinated by the Construction Observer through funds made available to the Construction Observer under his/her agreement with the County for the professional services related to construction engineering and inspection on the Project.

The Contractor shall furnish for review by the Construction Observer, not later than 10 days after receipt of notice to proceed, a Quality Control Plan consisting of plans, procedures, and organization necessary to produce an end product which complies with the contract documents. The Contractor will be allowed the latitude to develop standards of control subject to approval by the County. As a minimum, the plan shall include description of the type and frequency of inspection staffing,

materials handling and control, and testing deemed necessary to measure and control quality as specified by the contract documents.

XXXII. Pre-Construction Conference

Before the Project work order is issued, a pre-construction conference shall be held with representatives of the County and the Contractor. The Contractor shall plan to submit a schedule of operations at the pre-construction conference, unless otherwise notified. See Section XXXVI-Prosecution and Progress for additional construction schedule requirements.

XXXIII. Weight Tickets

The Contractor will be responsible for providing asphalt and aggregate tickets for quantity verifications on all asphaltic concrete used for the Project.

XXXIV. Confined Space Entry Program

It shall be the responsibility of the Contractor to implement and maintain a variable "Confined Space Entry Program" which must meet OSHA requirements for all its employees and subcontractors at all times during construction. OSHA defines all active sewer manholes, regardless of depth, as "permit required confined spaces". Contractors shall submit an acceptable "Confined Space Entry Program" for all applicable manholes and maintain an active file for these manholes. The cost of complying with this program shall be subsidiary to the pay items involving work in confined spaces.

XXXV. Tree and Plant Protection

Scope: Provide complete protection and maintenance of existing trees, shrubs, and grass areas designated to remain within construction limits and/or right-of-way.

Coordination: Coordinate protection of existing trees, shrubs and grass areas with other trades so as to prevent damage to these items.

Payment for Damages: If existing trees, shrubs or grass areas are destroyed, killed or badly damaged as a result of construction observations, Contract sum will be reduced by the amount of assessed damages. Damages will be evaluated by the Construction Observer, using the following:

Trees: International Shade Tree Conference Standards and following formula – measurement of a cross section of tree trunk will be made at a point 2 feet above existing grade level to determine cross section area in square inches. Assessment for damage will be \$27.00 per square inch.

Shrubs and Grass Areas: An initial fine of \$1,000 shall be imposed for any unauthorized disturbance within the boundaries of the shrub and grass areas to remain within the right-of-way and outside the limits of disturbance. This disturbance includes but is not limited to: parking or intrusion of equipment or

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vehicles; storage of any materials, and any unauthorized damage and/or removal of vegetation. In addition to the initial fine, a base fine of \$8.00 for every square foot of area of damaged vegetation within any areas designated to remain on the plans shall be imposed. The areas covered under this section include but are not limited to: areas designated to remain or no-work areas. In determining the amount of fine, the Construction Observer shall consider the degree and extent of harm caused by the violation, the cost of rectifying the damage, and whether the violation was committed willfully.

Materials: Tree Protection lumber dimensions shall be 4X4 and 2X4 sizes.

Protection: The Contractor shall protect existing trees, shrubs, and grass areas within construction limits from the following damage:

- (1) Compaction of root area by equipment, vehicles or material storage;
- (2) Trunk damage by moving equipment material storage, nailing or bolting;
- (3) Strangling by tying ropes or guy wires to trunks or large branches;
- (4) Poisoning by pouring solvents, gas, paint or other chemicals on or around trees and roots;
- (5) Cutting of roots by excavating or ditching;
- (6) Damage of branches by improper pruning;
- (7) Drought from failure to water or by cutting or changing normal drainage pattern past roots;
- (8) Changes of soil pH factor by disposal of lime base materials such as concrete or plaster;
- (9) Do not cut roots 1-1/2" in diameter or over. Excavation and earthwork within drip line of trees shall be done by hand.

Install barricade protection around trees and shrubs, constructed of 4X4 posts and 2X4 stringers top and bottom. Install protection prior to demolition or excavation operations. Leave protection until construction operations are essentially complete.

Maintenance:

- (1) Water trees and shrubs within construction limits as required to maintain their health during course of construction operations.
- (2) Pruning will be performed by County.

XXXVI. Prosecution and Progress

At the pre-construction meeting, the Contractor shall submit for acceptance a schedule of all planned work activities and sequences that is intended to be followed in order to both substantially and fully complete the Work within the allotted time periods (the "Project Schedule"). The purpose of the County requiring the Project Schedule shall be to:

- (1) Ensure adequate planning during the prosecution and progress of the work in accordance with the allowable number of working/ calendar days and all milestones;
- (2) Assure coordination of the efforts of the Contractor, County, Program Manager, Construction Observer, utilities and others that may be involved in the Project;
- (3) Assist the Contractor, County, Program Manager and Construction Observer in monitoring the progress of the Work and evaluating proposed changes to the Contract Documents; and
- (4) Assist the County, Program Manager and Construction Observer in administering the time requirements set forth in the Contract Documents.

A Type B Schedule will be required on all projects. Following is the schedule requirements:

Type B Schedule:

The Contractor shall create and maintain a Critical Path Method (CPM) Project Schedule showing the manner of prosecution of work that it intends to follow in order to both substantially and fully complete the Work within the allotted time periods. The Project Schedule shall employ computerized CPM for the planning, scheduling and reporting of the work as described in this specification. The CPM Project Schedule shall be prepared using the Precedence Diagram Method (PDM). No direct compensation will be allowed for fulfilling these requirements, as such work is considered subsidiary to the various bid items of the Project.

- (1) Personnel. The Contractor shall provide an individual, referred to hereinafter as the Scheduler, to create and maintain the CPM schedule. He or she shall be proficient in CPM analysis and shall be able to perform required tasks on the software. The Scheduler shall be made available for discussion or meetings when requested by the County, Construction Observer or Program Manager.
- (2) Schedule. The Project Schedule shall show the sequence and interdependence of activities required for complete performance of the work. The Contractor shall be responsible for assuring all work sequences are logical and show a coordinated plan of the Work.

Each activity on the schedule shall be described by: An activity number utilizing an alphanumeric designation system tied to the traffic control plans, and that is agreeable to the County, Program Manager, or Construction Observer; concise description of the Work represented by the activity; and activity durations in whole working days with a maximum of

twenty (20) working days. Durations greater than twenty (20) working days may be used for non-construction activities (mobilization, submittal preparation, curing, etc.), and other activities mutually agreeable between the Contractor and County, Program Manager or Construction Observer. The Contractor shall provide a legend for all abbreviations. The activities shall be coded so that organized plots of the schedule may be produced. Typical activity coding includes: Traffic control phase, location and work type.

The activity durations shall be based on the quantity for the individual work activity divided by a production rate. An estimated production rate for each activity shall also be shown.

The Contractor shall plan and incorporate major resources into the schedule. Major resources are defined as crews and equipment that constrain the Contractor from pursuing available work. The resources shall accurately represent the Contractor's planned equipment and manpower to achieve the productivity rates specified above.

Seasonal weather conditions shall be considered and included in the CPM schedule for all work influenced by temperature and/or precipitation. Seasonal weather conditions shall be determined by an assessment of average historical climatic conditions. Average historical weather data is available through the National Oceanic and Atmospheric Administration (NOAA). These effects will be simulated through the use of work calendars for each major work type (i.e., earthwork, concrete paving, structures, asphalt, drainage, etc.) Project and work calendars should be updated each month to show days actually able to work on the various work activities.

“Total float” is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every activity in the schedule. Float time in the schedule is a shared commodity between the County and the Contractor.

Only responsible delays in activities that affect milestone dates or the Project's completion date, as determined by CPM analysis, will be considered for a time extension.

The schedule shall show the sequence and interdependence of activities required for complete performance of the work. The schedule shall be prepared and maintained in accordance with the scheduling requirements stated in this Section and shall include two (2) organized plots with the activities logically grouped using the activity coding. The Contractor shall also provide an electronic copy of the schedule via e-mail.

The schedule shall encompass the time from the start of the Contract Time to the Project's Final Completion. The longest path through the schedule shall be readily discernable on the plot of the schedule.

- (3) Joint Review, Revision and Acceptance. Within twenty (20) calendar days of receipt of the Contractor's proposed schedule, the County or its authorized agents shall evaluate the schedule for compliance with this specification, and notify the Contractor of the findings. If the County or its authorized personnel request a revision or justification, the Contractor shall provide a satisfactory revision or adequate justification to the satisfaction of the Construction Observer or County authorized personnel within seven (7) calendar days.

If the Contractor submits a CPM schedule for acceptance which is based on a sequence of work not in the Contract Documents, then the Contractor shall notify the County or its authorized entities in writing, separate from the schedule submittal.

The County's review and acceptance of the Contractor's Project Schedule is for conformance to the requirements of the Contract Documents only. Review and acceptance by the County or other authorized personnel of the Contractor's Project Schedule does not relieve the Contractor of any of its responsibility for the Project Schedule, or of the Contractor's ability to meet interim milestone dates (if specified) and the Final Completion date, nor does such review and acceptance expressly or by implication warrant, acknowledge or admit the reasonableness of the logic, durations, manpower or equipment loading of the Contractor's Project Schedule. In the event the Contractor fails to define any element of work, activity or logic and the County's review does not detect this omission or error, such omission or error, when discovered by the Contractor or County and its authorized personnel, shall be corrected by the Contractor at the next monthly schedule update and shall not affect the project completion date.

- (4) Updates. The Project Schedule shall be updated on a monthly basis and shall be required as a basis for the pay application approval. The Project Schedule update shall be submitted with the pay application. The Contractor shall meet with the Construction Observer or County authorized personnel each month at a scheduled update meeting to review actual progress made through the data date of the schedule update. The review of progress will include dates activities actually started and/or completed, and the percentage of work completed or remaining duration on each activity started and/or completed. The percentage of work complete shall be calculated by utilizing the quantity and productivity rate information. The Project Schedule update shall include one (1) copy of the following information:

- a) Electronic copy of the updated schedule including revisions and changes via e-mail.
 - b) One (1) logically organized plot of the schedule update if requested by the County or its authorized personnel.
- (5) Project Schedule Revisions. If the Contractor desires to make major changes in the Project Schedule, the Contractor shall notify the County or Construction Observer in writing. The written notification shall include the reason for the proposed revision, what the revision is comprised of, and how the revision was incorporated into the schedule. In addition to the written notification of the revision, the Contractor shall provide an electronic copy and one logically organized plot of the schedule including the revision if requested by the County or Construction Observer.

Major changes are hereby defined as those that may affect compliance with the requirements of the Contract Documents or those that change the critical path. All other changes may be accomplished through the monthly updating process.

- (6) Time Impact Analysis. The Contractor shall notify the County or Construction Observer when an impact may justify an extension of Contract Time or adjustment of milestone dates. This notice shall be made in writing as soon as possible, but no later than the end of the next estimate period after the commencement of an impact or the notice for a change is given to the Contractor. Not providing notice to the County or Construction Observer by the end of the next estimate period will indicate the Contractor's approval of the time charges as shown on that time statement. Future consideration of that statement will not be permitted and the Contractor forfeits its right to subsequently request a time extension or time suspension unless the circumstances are such that the Contractor could not reasonably have knowledge of the impact by the end of the next estimate period.

When changes are initiated or impacts are experienced, the Contractor shall submit to the County or Construction Observer a written time impact analysis describing the influence of each change or impact.

A time impact analysis is an evaluation of the effects of changes in the construction sequence, contract, plans, or site conditions on the Contractor's plan for constructing the Project, as represented by the Project Schedule. The purpose of the time impact analysis is to determine if the overall Project has been delayed, and if necessary, to provide the Contractor and the County a basis for making adjustments to the time allotted for Substantial Completion and Final Completion.

A time impact analysis shall consist of one or all of the steps listed below.

Step 1. Establish the status of the Project before the impact using the most recent Project Schedule update prior to the impact occurrence.

Step 2. Predict the effect of the impact on the most recent Project Schedule update prior to the impact occurrence. This requires estimating the duration of the impact and inserting the impact into the schedule update. The Contractor shall demonstrate how the impact was inserted into the schedule showing the added or modified activities and the added or modified relationships. Any other changes made to the schedule including modifications to the calendars or constraints shall be noted.

Step 3. Track the effects of the impact on the schedule during its occurrence. Note any changes in sequencing, and mitigation efforts.

Step 4. Compare the status of the Work prior to the impact (Step 1) to the prediction of the effect of the impact (Step 2), and to the status of the work during and after the effects of the impact are over (Step 3). Note that if an impact causes a lack of access to a portion of the Project, the effects of the impact may extend to include a reasonable period for remobilization.

The time impact analysis shall include an electronic copy of the complete schedule prepared in Step 2. If the Project Schedule is revised after the submittal of a time impact analysis but prior to its approval, the Contractor shall promptly indicate in writing to the County or Construction Observer the need for any modification to its time impact analysis.

Only one (1) copy of each time impact analysis shall be submitted within fourteen (14) calendar days after the completion of an impact. The County or Construction Observer may require Step 1 and Step 2 of the time impact analysis be submitted at the commencement of the impact, if needed to make a decision regarding the suspension of Contract Time.

Approval or rejection of each time impact analysis by the County, Construction Observer or Program Manager shall be made within fourteen (14) calendar days after receipt unless subsequent meetings and negotiations are necessary.

The time impact analysis shall be incorporated into and attached to any relevant change order(s) and/or supplemental agreement(s).

XXXVII. Sanitary Provisions

Provide and maintain adequate, neat, and sanitary toilet accommodations for employees, including County employees and representatives, in compliance with the requirements and regulations of the Texas Department of Health or other authorities having jurisdiction.

XXXVIII. Work Near Railroads**(A) General.**

If the work crosses or is in close proximity to a railroad, do not interfere with the use or operation of the railroad company's trains or other property. Assign responsible supervisory personnel to ensure that tracks and adjacent areas are clear of debris, road materials, and equipment. It is the Contractor's responsibility to contact the railroad to determine the railroad's requirements for work within the railroad right of way and to comply with the requirements. The County will not reimburse the Contractor for any cost associated with these requirements. If the work requires construction within 25 ft. horizontally of the near rail or if the tracks may be subject to obstruction due to construction operations, notify the Engineer and the Railroad Company at least 3 days before performing work. The railroad company will provide flaggers during this work. If railroad flaggers will be needed longer than 2 consecutive days, request them at least 30 days before performing work within the railroad right of way. Flaggers provided by the railroad company will be paid for by the County. Do not store material or equipment in the Railroad's right of way within 15 ft. of the centerline of any track. Do not place any forms or temporary falsework within 8.5 ft. horizontally from the centerline or 22 ft. vertically above the top of rails of any track, unless otherwise shown in the Contract Documents.

(B) Temporary Crossings.

If a temporary crossing is needed, obtain permission from the railroad company before crossing the tracks. Execute the "Agreement for Contractor's Temporary Crossing" if required by the Railroad Company. The Contractor shall ensure that the tracks are left clear of equipment and debris that would endanger the safe operation of railroad traffic. Provide a crossing guard on each side of the crossing to direct equipment when hauling across the tracks. The Contractor shall stop construction traffic a safe distance away from the crossing upon the approach of railroad traffic. Work for temporary crossings will not be paid for directly, but shall be subsidiary to items of the Work subject of the Contract Documents. Work performed by the Railroad Company for the temporary crossing, except flaggers, will be at the Contractor's expense.

SECTION 13
TECHNICAL SPECIFICATIONS

Williamson County**Sheet:****Project: 1708-187**

Relocation of Williamson County Regional Raw Water Line (WCRRWL)

GENERAL NOTES: April 21, 2017 Version

Basis of Estimate				
Item	Description	**Rate	Basis	Quantity
164	Seed for Erosion Control (Item 164) (Temp & Perm) (TY 7)	4840 SY/AC	3730 SY	0.77 AC

** For Informational Purposes Only

GENERAL

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed shall be free of organic material prior to placing any section of the pavement structure.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Provide a smooth, clean saw-cut along the existing asphalt pavement structure, as directed. Consider subsidiary to the pertinent Items.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Construction Observer.

Protect all areas of the right of way, which are not included in the actual limits of the proposed construction areas, from disturbance. Restore any area disturbed because of the Contractor's operations to a condition as good as, or better than, before the beginning of work at no cost.

Damage to existing pipes and SETs due to Contractor operations shall be repaired at Contractor's expense.

Williamson County**Sheet:****Project: 1708-187** Relocation of Williamson County Regional Raw Water Line (WCRRWL)

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the TXDOT/county and various public utility companies as required.

The Project Superintendent will be capable of speaking English and will be available to contact at all times when work is being performed, including subcontractor work. The Superintendent will be available and on-call 24 hours a day.

Use materials from prequalified material producers list as shown on the Texas Department of Transportation (TxDOT) – Construction Division's (CST) materials producers list. Refer to TxDOT's website for list of pre-qualified manufacturers. No substitutions will be allowed for materials found on the list. Submit list of approved suppliers/materials from TxDOT website to show items are TxDOT approved. Submit this list with request for material approval.

When any abandoned well is encountered, cease construction operations in this area and notify the Engineer who will coordinate the proper plugging procedures. A water well driller licensed in the State of Texas must be used to plug a well.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period exceeding 14 calendar days. Track all exposed soil, stockpiles, and slopes. Tracking consists of operating a tracked vehicle or equipment up and down the slope, leaving track marks perpendicular to the direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Maintain positive drainage for permanent and temporary work for the duration of the project. Be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

RELOCATION OF WILLIAMSON COUNTY REGIONAL RAW WATER LINE (WCRRWL)**WILLIAMSON COUNTY
GOVERNING SPECIFICATIONS**

(STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND SPECIAL SPECIFICATIONS)

WHERE DISCREPANCIES 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.

< > REFERENCE ITEMS NOT USED ON THIS CONTRACT
() REFERENCE ITEMS USED ON THIS CONTRACT

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 164	SEEDING FOR EROSION CONTROL
ITEM 402	TRENCH EXCAVATION PROTECTION
ITEM 500	MOBILIZATION
ITEM 502	BARRICADES, SIGNS, AND TRAFFIC HANDLING
ITEM 506	TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS
	<161><432><556>
ITEM 512	PORTABLE TRAFFIC BARRIER
ITEM 552	WIRE FENCE

SPECIAL PROVISIONS: THE CONTENT OF THE SPECIAL PROVISIONS ARE INCLUDED ON THE FOLLOWING PAGES.

SPECIAL PROVISION	000-001 LIQUIDATED DAMAGES
SPECIAL PROVISION TO ITEM 164	(164-WC001) SEEDING FOR EROSION CONTROL (160-WC001)
	(161-WC001) (168-WC001) <636> <644>
SPECIAL PROVISION TO ITEM 500	(500-WC01) MOBILIZATION
SPECIAL PROVISION TO ITEM 502	(502-WC01) BARRICADES, SIGNS, AND TRAFFIC HANDLING
SPECIAL PROVISION TO ITEM 506	(506-WC001) TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

SPECIAL SPECIFICATIONS: THE CONTENT OF THE SPECIAL SPECIFICATIONS ARE INCLUDED ON THE FOLLOWING PAGES.

ITEM WCRRWL 100 WILLIAMSON COUNTY REGIONAL RAW WATER LINE (WCRRWL)

GENERAL: THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH PAYMENT IS TO BE MADE. THESE, TOGETHER WITH SUCH OTHER PERTINENT ITEMS, IF ANY, AS MAY BE REFERRED TO IN THE ABOVE-LISTED SPECIFICATION ITEMS, AND INCLUDING THE SPECIAL PROVISIONS AND SPECIAL SPECIFICATIONS LISTED ABOVE, CONSTITUTE THE COMPLETE SPECIFICATIONS FOR THIS PROJECT.

000-001

Special Provision to Item 000

Schedule of Liquidated Damages



Table1
Schedule of Liquidated Damages

For Dollar Amount of Original Contract		Dollar Amount of Daily Contract
From More Than	To and Including	Administration Liquidated Damages per Working Day
0	100,000	570
100,000	500,000	590
500,000	1,000,000	610
1,000,000	1,500,000	685
1,500,000	3,000,000	785
3,000,000	5,000,000	970
5,000,000	10,000,000	1125
10,000,000	20,000,000	1285
20,000,000	Over 20,000,000	2590

164-WC001

Special Provision 164-WC001

Seeding for Erosion Control



For this project, Item 164, "Seeding for Erosion Control," of the Standard Specifications, is hereby voided and replaced in its entirety with the clauses and requirements below.

PART 1 – GENERAL

1.1 DESCRIPTION

Provide and install native grass seeding as shown in the plans or as directed.

1.2 RELATED ITEMS

- A. Item 161-WC001, "Compost"
- B. Item 168-WC001, "Vegetative Watering"
- C. Item 160-WC001, "Topsoil"
- D. Item 636, "Aluminum Signs"
- E. Item 644, "Small Roadside Sign Supports and Assemblies"

1.3 REFERENCES

- A. Federal Seed Act
- B. Texas Seed Law
- C. Texas Fertilizer Law

1.4 MEASUREMENT

This item will be measured by the square yard.

1.5 PAYMENT

- A. The work performed and the materials furnished in accordance with the seeding Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Seeding for Erosion Control." This price is full compensation for furnishing materials, including seed, fertilizer, mowing, labor, equipment, maintenance, tools, supplies, and incidentals.
- B. When humic acid or MycoApply Endo are specified on the plans as a pay item, the work performed and the material furnished will be paid for at the unit price bid for "Humic Acid" or "MycoApply Endo" at the application rates specified. This price is full compensation for furnishing materials, labor, equipment, water, tools, supplies, and incidentals.

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1.6 QUALITY CONTROL SUBMITTALS

- A. Submit seeding product data, including plant tags and seed certification for native grass seed mix for approval.
- B. Submit seed planting equipment method, manufacturer, and data for approval.
- C. Submit product data and sample for sign in accordance with Tex-726-I.
- D. Submit humic acid and MycoApply Endo product data and supplier's information for approval.
- E. Submit fertilizer analysis, manufacturer, and product data for approval.

PART 2 – PRODUCTS**2.1 MATERIALS****A. Native Grass Seed**

Provide seed as shown in the plans or as directed, using Tables 1 – 11 to determine the appropriate seed mix and rates, and meeting the requirements of the Federal Seed Act and Texas Seed Law, including the testing and labeling for pure live seed (PLS = Purity and Germination). Minimum purity shall be 50%. The seed test to be conducted by the State Seed Laboratory, and a seed test report shall be submitted in accordance with 1.6, "Quality Control Submittals." Each type (mix) of seed must be mixed by the supplier and delivered in labeled and unopened bags or containers, unless otherwise approved by the Owner's representative. Do not blend the seed mixes on site. Use within twelve (12) months from that date of analysis. When Buffalograss is specified, use seed treated with KNO₃ (potassium nitrate) to overcome dormancy.

Parts A and B of the seed mix tables are the primary seed mixes for application. Part A is not required unless shown in the plans. In the event that a species in Part A or B of the mixes is not seasonally available, coordinate with the seed supplier to designate substitute species and quantities in the mix using Part C of the tables. Substitutions will only be allowed at the discretion of the County.

Seeds must be stored in a dry, well-ventilated location away from contaminants. Seed storage humidity level should be lower than 75%. Store any unused seed in a water resistant container. If seed will be stored longer than one (1) year, the optimal temperature range would be 40°F – 60°F.

During transit (from storage to sowing), seed should be protected from dramatic temperature fluctuations day after day; temperature cannot exceed 100°F at any time. Seed must remain dry and protected from sun exposure. The transit period may not exceed ten (10) days.

Obtain native grass seed from any three of the approved providers:

- 1. Native American Seed, Junction TX
(800) 728-4043
- 2. Wildseed Farms, Fredericksburg, TX
(800) 848-0078
- 3. Douglass King Company, San Antonio, TX
(888) 357-3337

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Table 1: Type 1 – Tall Native Grass Seed Mix with Wildflowers for Edward's Plateau and Blackland Prairie Eco-Regions

Part A: Wildflowers		
Species	Common Name	lbs. per acre
Cassia (Chamaecrista) fasciculata	Partridge Pea	5.00
Centaurea americana	American Basketflower	5.00
Coreopsis tinctoria	Plains Coreopsis	2.00
Desmanthus illinoensis	Illinois Bundleflower	3.75
Engelmannia pinnatifida (Engelmannia peristenia)	Engelmann Daisy (Cutleaf Daisy)	9.00
Gaillardia pulchella	Indian Blanket	7.50
Helianthus maximiliani	Maximilian Sunflower	2.00
Ipomopsis rubra	Standing Cypress	3.00
Monarda citriodora	Lemon Mint	1.50
Oenothera speciosa	Pink Evening Primrose	0.50
Rudbeckia hirta	Black-eyed Susan	0.50
Thelesperma filifolium	Greenthread	2.00
		41.75
Part B: Grasses		
Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats Grama	14.00
Bouteloua gracilis	Blue Grama	15.00
Buchloe dactyloides	Buffalograss	6.00
Elymus canadensis	Canada (Prairie) Wildrye	10.00
Leptochloa dubia	Green Sprangletop	4.00
Panicum virgatum	Switchgrass (Upland)	2.00
Schizachyrium scoparium	Little Bluestem	4.00
Sorghastrum nutans	Indian Grass	3.00
		58.00
Part C: Replacement Species and/or Species Added for Increased Diversity		
Species	Common Name	lbs. per acre
Andropogon gerardii	Big Bluestem	4.00
Argemone albiflora	White Prickly Poppy	3.00
Bothriochloa laguroides	Silver Bluestem	
Bouteloua rigidiseta	Texas Grama Grass	2.70
Callirhoe leiocarpa	Annual Winecup	1.20
Castilleja indivisa	Indian Paintbrush	0.15
Dalea candida (Petalostemon candidus)	White Prairie Clover	1.00
Eragrostis trichoides	Sand Lovegrass	0.50
Ilixis mucronata	Gayfeather	2.50
Lindheimera texana	Texas Yellow Star	3.00
Oenothera missouriensis	Missouri Primrose	0.50
Oenothera speciosa	Pink Evening Primrose	0.50
Salvia azurea	Pitcher Sage	0.25
Salvia farinacea	Mealy Blue Sage	1.50
Simsia calva	Bush Sunflower	1.75
Solidago nemoralis	Grey Goldenrod	1.75
"Midway Mix" (Native American Seed)	Grasses 1 ft. – 2 ft. tall	2.50

Source: Lady Bird Johnson Wildflower Center, 2010

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Table 2: Type 2 – Tall Native Grass Seed Mix with Wildflowers for Post Oak Savanna Eco-Region

Part A: Wildflowers		
Species	Common Name	lbs. per acre
Cassia (Chamaecrista) fasciculata	Partridge Pea	5.00
Centaurea americana	American Basketflower	5.00
Coreopsis tinctoria	Plains Coreopsis	1.00
Desmanthus illinoensis	Illinois Bundleflower	3.75
Engelmannia pinnatifida (Engelmannia peristenia)	Engelmann Daisy (Cutleaf Daisy)	9.00
Ipomopsis rubra	Standing Cypress	3.00
Monarda citriodora	Lemon Mint	1.50
Oenothera speciosa	Pink Evening Primrose	0.25
Rudbeckia hirta	Black-eyed Susan	0.50
Thelesperma filifolium	Greenthread	2.00
		31.00
Part B: Grasses		
Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats Grama	14.00
Bouteloua gracilis	Blue Grama	15.00
Buchloe dactyloides	Buffalograss	6.00
Elymus canadensis	Canada Wildrye	10.00
Eragrostis trichoides	Sand Lovegrass	0.50
Panicum virgatum	Switchgrass (Upland)	10.00
Schizachyrium scoparium	Little bluestem (Native)	4.00
Sporobolus cryptandrus	Sand Dropseed	1.00
Sorghastrum nutans	Indian Grass	3.00
		63.5
Part C: Replacement Species and/or Species added for Increased Diversity		
Species	Common Name	lbs. per acre
Andropogon gerardii	Big Bluestem Grass	2.00
Argemone albiflora	White Prickly Poppy	2.00
Asclepias tuberosa	Butterfly Weed	2.50
Bouteloua rigidiseta	Texas Grama Grass	2.25
Callirhoe leiocarpa	Annual Winecup	1.00
Castilleja indivisa	Indian Paintbrush	0.15
Corydalis curvisiliqua	Scrambled Eggs	0.50
Iatris mucronata	Gayfeather	2.25
Lindheimera texana	Texas Yellow Star	3.00
Salvia azurea	Pitcher Sage	1.50
Salvia farinacea	Mealy Blue Sage	1.50
Simsia calva	Bush Sunflower	1.25
Tridens flavus	Purpletop (Grass)	2.25
"Midway Mix" (Native American Seed)	Grasses 1 ft. – 2 ft. tall	2.00

Source: Lady Bird Johnson Wildflower Center, 2010

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Table 3: Type 3 – Riparian Native Grass Seed Mix for Edward's Plateau, Blackland Prairie, and Post Oak Savannah Eco-Regions

Part A: Wildflowers		
Species	Common Name	lbs. per acre
<i>Centaurea Americana</i>	American Basketflower	5.00
<i>Coreopsis tinctoria</i>	Plains Coreopsis	4.00
<i>Desmanthus illinoensis</i>	Illinois Bundleflower	7.50
<i>Engelmannia pinnatifida</i> (<i>Engelmannia peristenia</i>)	Engelmann Daisy (Cutleaf Daisy)	9.00
<i>Helianthus maximiliani</i>	Maximilian Sunflower	2.00
<i>Oenothera speciosa</i>	Pink Evening Primrose	0.50
<i>Rudbeckia (Dracopis) amplexicaulis</i>	Clasping Coneflower	3.00
		31.00
Part B: Grasses		
Species	Common Name	lbs. per acre
<i>Bouteloua curtipendula</i>	Sideoats Grama	14.00
<i>Bouteloua gracilis</i>	Blue Grama	15.00
<i>Buchloe dactyloides</i>	Buffalograss	6.00
<i>Elymus canadensis</i>	Canada (Prairie) Wildrye	10.00
<i>Leptochloa dubia</i>	Green Sprangletop	4.00
<i>Panicum virgatum</i>	Switchgrass (Upland)	2.00
<i>Schizachyrium scoparium</i>	Little Bluestem	4.00
<i>Sorghastrum nutans</i>	Indian Grass	3.00
<i>Tripsacum dactyloides</i>	Eastern Gamagrass	10.00
		68.00
Part C: Replacement Species and/or Species Added for Increased Diversity		
Species	Common Name	lbs. per acre
<i>Andropogon gerardii</i>	Big Bluestem	1.00
<i>Andropogon glomeratus</i>	Bushy Bluestem Grass (for moist areas)	0.50
<i>Chasmanthium latifolium</i>	Inland Sea Oats	1.50
<i>Physostegia intermedia</i>	Obedient Plant	0.50
<i>Solidago altissima (S. canadensis)</i>	Tall Goldenrod	0.75
<i>Solidago gigantea</i>	Giant Goldenrod	0.75
<i>Salvia azurea</i>	Pitcher Sage	0.75
"Midway Mix" (Native American Seed)	Grasses 1 ft. – 2 ft. tall	2.50

Source: Lady Bird Johnson Wildflower Center, 2009

Table 4: Type 4 – Cool Season Native Grass Seed Mix for Edward's Plateau, Blackland Prairie, and Post Oak Savannah Eco-Regions

Species	Common Name	lbs. per acre
<i>Elymus canadensis</i>	Prairie Wildrye	10.00
<i>Pascopyrum smithii</i>	Western Wheatgrass	9.00
<i>Dalea candida (var. candida)</i>	White Prairie Clover	3.00
		22.00

Source: Lady Bird Johnson Wildflower Center, 2009

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Table 5: Type 5 – Standard Native Grass Seed Mix for Edward's Plateau and Blackland Prairie Eco-Regions

Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats grama	14.00
Bouteloua gracilis	Blue grama	15.00
Buchloe dactyloides	Buffalograss	6.00
Elymus canadensis	Canada wildrye	10.00
Leptochloa dubia	Green sprangletop	4.00
Panicum virgatum	Switchgrass (upland variety)	2.00
Schizachyrium scoparium	Little bluestem (native)	4.00
Sorghastrum nutans	Indian grass	3.00
		58.00

Source: Lady Bird Johnson Wildflower Center, 2009

Table 6: Type 6 – Standard Native Grass Seed Mix for Post Oak Savannah Eco-Region

Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats grama	14.00
Bouteloua gracilis	Blue grama	15.00
Buchloe dactyloides	Buffalograss	6.00
Elymus canadensis	Canada wildrye	10.00
Eragrostis trichoides	Sand lovegrass	0.50
Panicum virgatum	Switchgrass (upland variety)	10.00
Schizachyrium scoparium	Little bluestem (native)	4.00
Sporobolus cryptandrus	Sand dropseed	1.00
Sorghastrum nutans	Indian grass	3.00
		63.50

Source: Lady Bird Johnson Wildflower Center, 2009

Table 7: Type 7 – Standard Short Native Grass Seed Mix for Edward's Plateau and Blackland Prairie Eco-Regions

Part A: Wildflowers		
Species	Common Name	lbs. per acre
Cassia (Chamaecrista) fasciculata	Partridge Pea	5.00
Coreopsis tinctoria	Plains Coreopsis	1.00
Lupinus texensis	Bluebonnet	15.00
Gaillardia pulchella	Indian Blanket	10.00
Mondarda citriodora	Lemon Mint	3.00
Oenothera speciosa	Pink Evening Primrose	0.50
Rudbeckia hirta	Black-eyed Susan	2.00
Thelesperma filifolium	Greenthread	1.50
		38.00
Part B: Grasses		
Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats Grama	21.00
Bouteloua gracilis	Blue Grama	35.00
Buchloe dactyloides	Buffalograss	50.00
Elymus Canadensis	Prairie Wildrye	10.00
Eragrostis trichoides	Sand Lovegrass	0.50
		116.5

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Part C: Replacement Species and/or Species added for Increased Diversity		
Species	Common Name	lbs. per acre
<i>Bouteloua rigidiseta</i>	Texas Gama Grass	2.25
<i>Callirhoe leiocarpa</i>	Annual Winecup	1.00
<i>Castilleja indivisa</i>	Indian Paintbrush	0.15
<i>Corydalis curvisiliqua</i>	Scrambled Eggs	0.50
<i>liatris mucronata</i>	Gayfeather	2.25
<i>Oenothera missouriensis</i>	Missouri Primrose	1.75
<i>Dalea candida</i> (<i>Petalostemon candidus</i>)	White Prairie Clover	0.75
<i>Salvia farinacea</i>	Mealy Blue Sage	1.50
<i>Simsia calva</i>	Bush Sunflower	1.75
"Midway Mix" (Native American Seeds)	Grasses 1 ft. – 2 ft. tall	2.50

Source: Lady Bird Johnson Wildflower Center, 2010

Table 8: Type 8 – Standard Short Native Grass Seed Mix For Post Oak Savannah Eco-Region

Part A: Wildflowers		
Species	Common Name	lbs. per acre
<i>Cassia (Chamaecrista) fasciculata</i>	Partridge Pea	5.00
<i>Centaurea americana</i>	American Basketflower	5.00
<i>Coreopsis tinctoria</i>	Plains Coreopsis	2.00
<i>Desmanthus illinoensis</i>	Illinois Bundleflower	3.75
<i>Engelmannia pinnatifida</i>	Engelmann Daisy (Cutleaf Daisy)	9.00
<i>Gaillardia pulchella</i>	Indian Blanket	7.50
<i>Ipomopsis rubra</i>	Standing Cypress	3.00
<i>Mondardo citriodora</i>	Lemon Mint	1.50
<i>Oenothera speciosa</i>	Pink Evening Primrose	0.25
<i>Rudbeckia herta</i>	Black-eyed Susan	0.50
<i>Thelesperma filifolium</i>	Greenthread	2.00
		39.50
Part B: Grasses		
Grasses	Species	lbs. per acre
<i>Bouteloua curtipendula</i>	Sideoats Grama	14.00
<i>Bouteloua gracilis</i>	Blue Grama	15.00
<i>Buchloe dactyloides</i>	Buffalograss	6.00
<i>Elymus canadensis</i>	Canada Wildrye	10.00
<i>Schizachyrium scoparium</i>	Little Bluestem (Native)	8.00
		53.00
Part C: Replacement Species and/or Species added for Increased Diversity		
Grasses	Species	lbs. per acre
<i>Argemone albiflora</i>	White Prickly Poppy	2.50
<i>Bouteloua rigidiseta</i>	Texas Grama Grass	2.75
<i>Callirhoe leiocarpa</i>	Annual Winecup	1.00
<i>Castilleja indivisa</i>	Indian Paintbrush	0.15
<i>Eragrostis trichoides</i>	Sand Lovegrass	0.50
<i>liatris mucronata</i>	Gayfeather	2.50

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Lindheimera texana	Texas Yellow Star	3.00
Oenothera missouriensis	Missouri Primrose	0.50
Oenothera speciosa	Pink Evening Primrose	0.25
Salvia azurea	Pitcher Sage	0.75
Salvia farinacea	Mealy Blue Sage	1.50
Simsia calva	Bush Sunflower	1.25
"Midway Mix" (Native American Seeds)	Grasses 1 ft. – 2 ft. tall	2.50

Source: Lady Bird Johnson Wildflower Center, 2010

Table 9: Type 9 – Bare Patch Repair Mix for Edward's Plateau, Blackland Prairie, and Post Oak Savannah Eco-Regions

Species	Common Name	lbs. per acre
Bouteloua curtipendula	Sideoats grama	25.00
Bouteloua gracilis	Blue grama	10.00
Leptochloa dubia	Green sprangletop	10.00
		45.00

Source: Lady Bird Johnson Wildflower Center, 2009

Table 10: Type 10 – Warm Season Mix for Edward's Plateau, Blackland Prairie, and Post Oak Savannah Eco-Regions

Species	Common Name	lbs. per acre
Scleria italica	Foxtail Millet	34
		34

Table 11: Type 11 – Substitute Standard Mix for Blackland Prairie Eco-Regions

Species	Common Name	lbs. per acre
Cynodon dactylon	Bermuda	10
		10

B. Cool Season Temporary Cover Seed

If native grass seed is to be installed during the winter period of November 8th to February 14th, then Table 4 (temporary cool season mix) must be incorporated into the native grass seed mix, as specified on the plans, or as directed.

C. Warm Season Temporary Cover Seed

Between the dates of May 1st to August 31st, use Temporary Warm Season Seeding (Type 10) as specified on the plans, or as directed.

D. Warm Season Permanent Cover Seed Substitute

For installation in areas with curb and gutter, substitute applicable Type 7 or Type 8 Standard Short Native Grass Seed in lieu of Tall Native selections.

E. Substitute Standard Mix for Blackland Prairie Eco-Regions

Table 11 (Type 11) may be substituted in areas where adjacent private property employs the use of herbicides which limits the plant establishment of specified seasonal seeding.

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F. Compost Manufactured Topsoil (CMT) and Erosion Control Compost (ECC)

As specified in Item 161–WC001, "Compost."

G. Topsoil

As specified in Item 160–WC001, "Topsoil."

H. Humic Acid

Humic Acid can be obtained from the following supplier or approved equal:

1. Medina Agriculture Products
(830) 426-3011

I. Fertilizer

Use a complete fertilizer containing nitrogen (N), phosphoric acid (P), and potash (K) nutrients. Ensure at least 50% of the nitrogen component is a slow-release sulfur-coated urea. Ensure that fertilizer is in an acceptable condition for distribution in containers labeled with product analysis. Fertilizer is subject to testing in accordance with Texas Fertilizer Law. Deliver and apply the complete fertilizer uniformly, as a dry material, at a rate equal to 60 lbs. of nitrogen per acre or at the analysis and rate specified on the plans.

J. Mycorrhizal Fungi

MycoApply Endo, produced by Mycorrhizal Applications, Inc., can be obtained from the following supplier or approved equal:

1. Horizon Distributors, Inc.
(512) 282-2331

This product will require de-chlorinated, clean, fresh water for application.

K. Vegetative Watering

Clean, fresh, and free of substances or matter that could inhibit vigorous growth of plants. As specified in Item 168–WC001, "Vegetative Watering."

L. No Mowing Notice Sign

As specified in Item 636, "Aluminum Signs."

M. Sign Support

As specified in Item 644, "Small Roadside Sign Supports and Assemblies."

PART 3 – EXECUTION**3.1 SEQUENCING**

- A. Following fine grading and topsoil or compost/fertilizer installation, initiate seed installation as specified in the plans or as directed to disturbed roadside areas and channels. If road base operations have not been completed, exclude seeding install fifteen (15) ft. from the road pavement.

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- B. Following road pavement, initiate seed installation following grading and topsoil or compost/fertilizer installation to remaining disturbed areas, as specified in the plans or as directed.
- C. Install no mowing notice signs in accordance with the plans or as directed at time of Final Acceptance.

3.2 CONSTRUCTION**A. Installation**

- 1. Remove and dispose of objectionable material from the topsoil source before beginning the work.

B. Site Preparation

- 1. Remove all invasive species.
 - a. Invasive weeds, either living plants or weed seed, shall be minimized at the site using appropriate herbicide application and/or weed-free soil amendments. Mow, burn, or apply herbicides as needed to control unwanted vegetation as directed.
- 2. Seed should not be installed onto compacted soil. Scarify or break the surface of the soil with a flexible tine one (1) to two (2) inches in depth in the area to be seeded.
- 3. Apply specified compost/fertilizer and/or topsoil to the seeding surface (refer to plans for required depth).
- 4. Humic Acid concentrate shall be mixed with clean, fresh water prior to application. Apply humic acid and water mixture to all areas to receive any type of native grass seeding at the rate of one (1) gallon of humic acid concentrate per acre (or 0.16 teaspoons per square yard).
- 5. MycoApply Endo shall be mixed with de-chlorinated, clean, fresh water prior to application. The water MUST be de-chlorinated or the fungi in the MycoApply Endo will die. Apply MycoApply Endo mixture to all areas to receive any type of native grass seeding at the rate of 10 lbs. per acre (or 0.0336 ounces per square yard).
- 6. The humic acid and the MycoApply Endo can be mixed together with de-chlorinated water and applied to areas to receive any native grass seeding at the same time. The water MUST be de-chlorinated or the fungi in the MycoApply Endo will die.
- 7. Seed area in accordance with the plans or as directed, with regard to installation specification below.

C. Installation

Apply the entire specified amount of seed to the area to be seeded. Application rates should be set to allow at least two complete passes over seeding area so the area is completely and evenly covered. Lightly rake compost and/or topsoil to ensure good seed contact. Seeds should not be buried at a depth over ¼ inches.

1. Broadcast Seeding

All areas shown to be seeded in the plans must be broadcast unless otherwise directed by the Engineer. Broadcast seed using hand or mechanical distribution in a uniform manner. Coordinate the application rate setting with the Owner's Representative prior to application. Apply seed on the surface of compost or topsoil. The seedbed should be culti-packed or rolled before and after seeding to ensure seed contact with the soil. Roll the seeding areas along slope contours. Wind speed should be fifteen (15) mph or less during seeding. Up to one-third ($\frac{1}{3}$) of the seed may remain on top of the soil surface.

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2. No-Till Drill Seeding

No-till drill seeding should only be used when directed by the Engineer. Use a no-till drill to reduce the risk of erosion and loss of seed. Ensure the drill opening size is adequate to allow free movement of full range of seed sizes being planted. Coordinate the application rate setting with the Owner's Representative prior to application. Plant seed parallel to the contour of the slopes.

3. Pre-mixing Seed with Compost (CMT and ECC)

Apply uniform dry mixture of seed and compost pneumatically only as directed by the Engineer in areas shown in the plans to a depth not to exceed two (2) inches. Pre-mixing the seed with compost will aid in a uniform application of seed.

D. Seeding Schedule

1. The preferred time to seed is from September 21st to November 7th to take advantage of winter rains.

2. Native Grass Seeding Schedule:

Table 12: Seeding Schedule

	OPTIMUM PLANTING TIME			
	Fall Seeding	Winter Seeding	Spring Seeding	Summer Seeding
Seeding Dates	Sept. 21 st – Nov. 7 th	Nov. 8 th – Feb. 14 th	Feb. 15 th – June 15 th	June 16 th – Sept. 20 th
Grass Type	Type 1 Type 2 Type 5 Type 7 Type 8 Type 9 Type 11	Type 1 Type 2 Type 5 Type 6 Type 7 Type 9 Type 11	Type 5 or 6	Type 10
		PLUS	PLUS (Only if Directed)	PLUS
Supplemental Grass		Apply the Table 4: Type 4 Cool Season Non-Native Grass Seed Mix	Apply the Table 2: Type 2 Wildflower Seed Mix in the next Fall Seeding Time Period	Apply the Permanent Type 1, Type 3, or Type 5 Grass Mix in the Fall Seeding Time Period

E. Vegetative Watering

Provide vegetative watering to seeded areas shown on the plan immediately after seed installation for healthy vegetative establishment, in accordance with Item 168-WC001, "Vegetative Watering" or as directed.

F. No Mow Signs

At final acceptance, post signs at locations indicated on the plans or as directed to prevent mowing of established native grass stands.

3.3 MAINTENANCE

A. Requirements

1. Maintain the native grass areas during and after construction until the certificate of completion is issued.

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2. Maintain the ECC if the seeding time falls in the summer period. Seed the specified grass mix when the fall seeding period begins.
 3. Maintain native grass areas to establish vigorous growth and plant establishment of native grass mix. Establish an overall vegetative cover of 70% – 80% minimum with no single bare area larger than 100 SF. Areas should have at least 30% of species diversity and be four (4) to six (6) inches in height.
 4. Watering of the native grass seed shall be in accordance with Item 168-WC001, "Vegetative Watering."
 5. Posted signs should be repaired or replaced immediately if found to be damaged or missing.
- B. Schedule
1. Inspect the grass areas weekly and within 24 hours after each rain event of one-half (½) inch or more. Restore eroded areas to finished grade and reseed.
 2. Reseed areas that have not established if grass cover is less than 80% of coverage (TCEQ, 2005).
 3. Inspect seeded areas every two weeks during establishment phase to check for invasive species, refer to Invasive Species Control.

END OF SECTION

500-WC01

Special Provision to Item 500

Mobilization



Item 500, "Mobilization," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 500.3., "Payment." The 6th and 7th bullet is deleted and replaced by the following:

- Upon Final Completion, 97% of the mobilization lump sum bid will be paid. Previous payments under this Item will be deducted from this amount, and
- Payment for the remainder of the lump sum bid for "Mobilization" will be made with the Final Payment after all submittals are received, final quantities have been determined, and when any separate vegetative establishment and maintenance, test, and performance periods provided for in the Contract have been successfully completed and the County has issued the Certificate of Acceptance.

502-WC01

Special Provision to Item 502

Barricades, Signs, and Traffic Handling



For this project, Item 502, "Barricades, Signs, and Traffic Handling," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 502.4.1.3., "Maximum Total Payment Prior to Acceptance" is voided and replaced by the following:

Maximum Total Payment Prior to Completion. The total payment for this Item will not exceed 10% of the total Contract amount before final completion in accordance with General Conditions of Agreement, Section 5.06, "Final Completion and Acceptance." The remaining balance will be paid in accordance with Section 502.4.1.5, "Balance Due."

Article 502.4.1.5., "Balance Due" is voided and replaced by the following:

Balance Due. If all work is complete in accordance with General Conditions of Agreement, Section 5.06, "Final Completion and Acceptance," before payment of the amount allowed by this Article, the balance due will be paid with the Final Payment.

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Temporary Erosion, Sedimentation, and Environmental Controls



For this project, Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," of the Standard Specifications, is hereby voided and replaced with the following.

PART 1 – GENERAL

1.1 DESCRIPTION

Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants in accordance with the Storm Water Pollution Prevention Plan (SW3P) in the plans and the Texas Pollutant Discharge Elimination System (TPDES) General Permit TXR150000.

1.2 MEASUREMENT

A. Rock Filter Dams

Installation or removal of rock filter dams will be measured by the foot or by the cubic yard. The measured volume will include sandbags when used.

1. Linear Measurement

When rock filter dams are measured by the foot, measurement will be along the centerline of the top of the dam.

2. Volume Measurement

When rock filter dams are measured by the cubic yard, measurement will be based on the volume of rock computed by the method of average end areas.

a. Installation: Measurement will be made in final position.

b. Removal: Measurement will be made at the point of removal.

B. Temporary Pipe Slope Drains

Temporary pipe slope drains will be measured by the foot.

C. Temporary Paved Flumes

Temporary paved flumes will be measured by the square yard of surface area. The measured area will include the energy dissipater at the flume outlet.

D. Construction Exits

Construction exits will be measured by the square yard of surface area.

E. Earthwork for Erosion and Sediment Control

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1. Equipment and Labor Measurement

Equipment and labor used will be measured by the actual number of hours the equipment is operated and the labor is engaged in the work.

2. Volume Measurement

a. In Place

i. Excavation

Excavation will be measured by the cubic yard in its original position and the volume computed by the method of average end areas.

ii. Embankment

Embankment will be measured by the cubic yard in its final position by the method of average end areas. The volume of embankment will be determined between:

- the original ground surfaces or the surface upon that the embankment is to be constructed for the feature and
- the lines, grades, and slopes of the accepted embankment for the feature.

b. In Vehicles

Excavation and embankment quantities will be combined and paid for under "Earthwork (Erosion and Sediment Control, In Vehicle)." Excavation will be measured by the cubic yard in vehicles at the point of removal. Embankment will be measured by the cubic yard in vehicles measured at the point of delivery. Shrinkage or swelling factors will not be considered in determining the calculated quantities.

F. Construction Perimeter Fence

Construction perimeter fence will be measured by the foot.

G. Sandbags for Erosion Control

Sandbags will be measured as each sandbag or by the foot along the top of sandbag berms or dams.

H. Temporary Sediment-Control Fence

Installation or removal of temporary sediment-control fence will be measured by the foot.

I. Biodegradable Erosion Control Logs

Installation or removal of biodegradable erosion control logs will be measured by the foot along the centerline of the top of the control logs.

J. Vertical Tracking

Vertical tracking will not be measured or paid for directly, but is considered subsidiary to this Item.

1.3 PAYMENT

The following will not be paid for directly, but are subsidiary to pertinent Items:

- erosion-control measures for Contractor project-specific locations (PSLs) inside and outside the right-of-way (such as construction and haul roads, field offices, equipment and supply areas, plants, and material sources);

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- removal of litter, unless a separate pay item is shown on the plans;
- repair to devices and features damaged by Contractor operations;
- added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls;
- removal and reinstallation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the device; and
- minor adjustments including, but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature, or moving small numbers of sandbags.

Stabilization of disturbed areas will be paid for under pertinent Items.

Furnishing and installing pipe for outfalls associated with sediment traps and ponds will not be paid for directly, but is subsidiary to the excavation and embankment under this Item.

A. Rock Filter Dams

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

1. Installation

Installation will be paid for as "Rock Filter Dams (Install)" of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

2. Removal

Removal will be paid for as "Rock Filter Dams (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

When the Owner directs that the rock filter dam installation or portions thereof be replaced, payment will be made at the unit price bid for "Rock Filter Dams (Remove)" and for "Rock Filter Dams (Install)" of the type specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

B. Temporary Pipe Slope Drains

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Pipe Slope Drains" of the size specified. This price is full compensation for furnishing materials, removal and disposal, furnishing and operating equipment, labor, tools, and incidentals.

Removal of temporary pipe slope drains will not be paid for directly, but is subsidiary to the installation Item. When the Owner directs that the pipe slope drain installation or portions thereof be replaced, payment will be made at the unit price bid for "Temporary Pipe Slope Drains" of the size specified, which is full compensation for the removal and reinstallation of the pipe drain.

Earthwork required for the pipe slope drain installation, including construction of the sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

Riprap concrete or stone, when used as an energy dissipater or as a stabilized sediment trap, will be measured and paid for in accordance with Item 432, "Riprap."

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C. Temporary Paved Flumes

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Paved Flume (Install)" or "Temporary Paved Flume (Remove)." This price is full compensation for furnishing and placing materials, removal and disposal, equipment, labor, tools, and incidentals.

When the Owner directs that the paved flume installation or portions thereof be replaced, payment will be made at the unit prices bid for "Temporary Paved Flume (Remove)" and "Temporary Paved Flume (Install)." These prices are full compensation for the removal and replacement of the paved flume and for equipment, labor, tools, and incidentals.

Earthwork required for the paved flume installation, including construction of a sediment trap, will be measured and paid for under "Earthwork for Erosion and Sediment Control."

D. Construction Exits

Contractor-required construction exits from off right-of-way locations or on right-of-way PSLs will not be paid for directly, but are subsidiary to pertinent Items.

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" for construction exits needed on right-of-way access to work areas required by the Owner will be paid for at the unit price bid for "Construction Exits (Install)" of the type specified or "Construction Exits (Remove)." This price is full compensation for furnishing and placing materials, excavating, removal and disposal, cleaning vehicles, labor, tools, and incidentals.

When the Owner directs that a construction exit or portion thereof be removed and replaced, payment will be made at the unit prices bid for "Construction Exit (Remove)" and "Construction Exit (Install)" of the type specified. These prices are full compensation for the removal and replacement of the construction exit and for equipment, labor, tools, and incidentals.

Construction of sediment traps used in conjunction with the construction exit will be measured and paid for under "Earthwork for Erosion and Sediment Control."

E. Earthwork for Erosion and Sediment Control

1. Initial Earthwork for Erosion and Sediment Control

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Erosion and Sediment Control, In Place)," "Embankment (Erosion and Sediment Control, In Place)," "Excavation (Erosion and Sediment Control, In Vehicle)," "Embankment (Erosion and Sediment Control, In Vehicle)," or "Earthwork (Erosion and Sediment Control, In Vehicle)."

This price is full compensation for excavation and embankment, including hauling, disposal of material not used elsewhere on the project; embankments, including furnishing material from approved sources and construction of erosion-control features; and equipment, labor, tools, and incidentals.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

2. Maintenance Earthwork for Erosion and Sediment Control for Cleaning and Restoring Control Measures

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid under a Contractor Force Account Item from invoice provided to the Owner.

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This price is full compensation for excavation, embankment, and re-grading, including removal of accumulated sediment in various erosion control installations as directed, hauling, and disposal of material not used elsewhere on the project, excavation for construction of erosion-control features, embankments, including furnishing material from approved sources and construction of erosion-control features, and equipment, labor, tools, and incidentals.

Earthwork needed to remove and obliterate erosion-control features will not be paid for directly, but is subsidiary to pertinent Items unless otherwise shown on the plans.

Sprinkling and rolling required by this Item will not be paid for directly, but will be subsidiary to this Item.

F. Construction Perimeter Fence

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Construction Perimeter Fence." This price is full compensation for furnishing and placing the fence, digging, fence posts, wire, and flagging, removal and disposal, and materials, equipment, labor, tools, and incidentals.

Removal of construction perimeter fence will be not paid for directly, but is subsidiary to the installation Item. When the Owner directs that the perimeter fence installation or portions thereof be removed and replaced, payment will be made at the unit price bid for "Construction Perimeter Fence," which is full compensation for the removal and reinstallation of the construction perimeter fence.

G. Sandbags for Erosion Control

Sandbags will be paid for at the unit price bid for "Sandbags for Erosion Control" (of the height specified when measurement is by the foot). This price is full compensation for materials, placing sandbags, removal and disposal, equipment, labor, tools, and incidentals.

Removal of sandbags will not be paid for directly but is subsidiary to the installation Item. When the Owner directs that the sandbag installation or portions thereof be replaced, payment will be made at the unit price bid for "Sandbags for Erosion Control," which is full compensation for the reinstallation of the sandbags.

H. Temporary Sediment-Control Fence

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

1. Installation

Installation will be paid for as "Temporary Sediment-Control Fence (Install)." This price is full compensation for furnishing and operating equipment, finish backfill and grading, lacing, proper disposal, labor, materials, tools, and incidentals.

2. Removal

Removal will be paid for as "Temporary Sediment-Control Fence (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

I. Biodegradable Erosion Control Logs

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid as follows:

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1. Installation

Installation will be paid for as "Biodegradable Erosion Control Logs (Install)" of the size specified. This price is full compensation for furnishing and operating equipment, finish backfill and grading, staking, proper disposal, labor, materials, tools, and incidentals.

2. Removal

Removal will be paid for as "Biodegradable Erosion Control Logs (Remove)." This price is full compensation for furnishing and operating equipment, proper disposal, labor, materials, tools, and incidentals.

J. Vertical Tracking

Vertical tracking will not be measured or paid for directly, but is considered subsidiary to this Item.

PART 2 – PRODUCTS**2.1 MATERIALS**

Furnish materials in accordance with the following:

- Item 161, "Compost"
- Item 432, "Riprap"
- Item 556, "Pipe Underdrains"

A. Rock Filter Dams

1. Aggregate

Furnish aggregate with hardness, durability, cleanliness, and resistance to crumbling, flaking, and eroding acceptable to the Owner. Provide the following:

- a. Type 1, Type 2, and Type 4 rock filter dams: Use three (3) inches to six (6) inches aggregate.
- b. Type 3 rock filter dams: Use four (4) inches to eight (8) inches aggregate.

2. Wire

Provide minimum twenty (20) gauge galvanized wire for the steel wire mesh and tie wires for Types 2 and Type 3 rock filter dams. Type 4 dams require:

- a. a double-twisted, hexagonal weave with a nominal mesh opening of 2½ inches by 3¼ inches;
- b. minimum 0.0866 inches steel wire for netting;
- c. minimum 0.1063 inches steel wire for selvages and corners; and
- d. minimum 0.0866 inches for binding or tie wire.

3. Sandbag Material

Furnish sandbags meeting Section 506.2.8., "Sandbags," except that any gradation of aggregate may be used to fill the sandbags.

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B. Temporary Pipe Slope Drains

Provide corrugated metal pipe, polyvinyl chloride (PVC) pipe, flexible tubing, watertight connection bands, grommet materials, prefabricated fittings, and flared entrance sections that conform to the plans. Recycled and other materials meeting these requirements are allowed if approved.

Furnish concrete in accordance with Item 432, "Riprap."

C. Temporary Paved Flumes

Furnish asphalt concrete, hydraulic cement concrete, or other comparable non-erodible material that conforms to the plans. Provide rock or rubble with a minimum diameter of six (6) inches and a maximum volume of one-half (½) ft.³ for the construction of energy dissipaters.

D. Construction Exits

Provide materials that meet the details shown on the plans and this Section.

1. Rock Construction Exit

Provide crushed aggregate for long-term and short-term construction exits. Furnish aggregates that are clean, hard, durable, and free from adherent coatings such as salt, alkali, dirt, clay, loam, shale, soft or flaky materials, and organic and injurious matter. Use four (4) inch to eight (8) inch aggregate for Type 1. Use two (2) inch to four (4) inch aggregate for Type 3.

2. Timber Construction Exit

Furnish No. 2 quality or better railroad ties and timbers for long-term construction exits, free of large and loose knots, and treated to control rot. Fasten timbers with nuts and bolts or lag bolts, of at least one-half (½) inch diameter, unless otherwise shown on the plans or allowed. Provide plywood or pressed wafer board at least one-half (½) inch thick for short-term exits.

3. Foundation Course

Provide a foundation course consisting of flexible base, bituminous concrete, hydraulic cement concrete, or other materials as shown on the plans or directed.

E. Embankment for Erosion Control

Provide rock, loam, clay, topsoil, or other earth materials that will form a stable embankment to meet the intended use.

F. Pipe

Provide pipe outlet material in accordance with Item 556, "Pipe Underdrains," and details shown on the plans.

G. Construction Perimeter Fence

1. Posts

Provide essentially straight wood or steel posts that are at least sixty (60) inches long. Furnish soft wood posts with a minimum diameter of three (3) inches or use nominal two (2) inch by four (4) inch boards. Furnish hardwood posts with a minimum cross-section of 1½ inches by 1⅞ inches. Furnish T-shaped or L-shaped steel posts with a minimum weight of 0.5 lbs. per foot.

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2. Fence

Provide orange construction fencing as approved.

3. Fence Wire

Provide eleven (11) gauge or larger galvanized smooth or twisted wire. Provide sixteen (16) gauge or larger tie wire.

4. Flagging

Provide brightly-colored flagging that is fade-resistant and at least ¾ inches wide to provide maximum visibility both day and night.

5. Staples

Provide staples with a crown at least one-half (½) inch wide and legs at least one-half (½) inch long.

6. Used Materials

Previously used materials meeting the applicable requirements may be used if approved.

H. Sandbags

Provide sandbag material of polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of four (4) oz. per square yard, a Mullen burst-strength exceeding 300 psi, and an ultraviolet stability exceeding 70%.

Use natural coarse sand or manufactured sand meeting the gradation given in Table 1 to fill sandbags. Filled sandbags must be twenty-four (24) inches to thirty (30) inches long, sixteen (16) inches to eighteen (18) inches wide, and six (6) inches to eight (8) inches thick.

Table 1: Sand Gradation

Sieve #	Retained (% by Weight)
4	Maximum 3%
100	Minimum 80%
200	Minimum 95%

Aggregate may be used instead of sand for situations where sandbags are not adjacent to traffic. The aggregate size shall not exceed ¾ inch.

I. Temporary Sediment Control Fence

Provide a net-reinforced fence using woven geo-textile fabric. Logos visible to the traveling public will not be allowed.

1. Fabric

Provide fabric materials in accordance with DMS-6230, "Temporary Sediment Control Fence Fabric."

2. Posts

Provide essentially straight wood or steel posts with a minimum length of 48 inches, unless otherwise shown on the plans. Furnish soft wood posts at least three (3) inches in diameter or use nominal two (2) inch by four (4) inch boards. Furnish hardwood posts with a minimum cross-section of 1½ inches by 1½ inches. Furnish T-shaped or L-shaped steel posts with a minimum weight of 1.3 lbs. per foot.

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3. Net Reinforcement

Provide net reinforcement of at least 12½ gauge galvanized welded wire mesh, with a maximum opening size of two (2) inches by four (4) inches, at least twenty-four (24) inches wide, unless otherwise shown on the plans.

4. Staples

Provide staples with a crown at least ¾ inch wide and legs one-half (½) inch long.

5. Used Materials

Use recycled material meeting the applicable requirements if approved.

J. Biodegradable Erosion Control Logs

1. Core Material

Furnish core material that is biodegradable or recyclable. Use compost, mulch, aspen excelsior wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or any other acceptable material unless specifically called out on the plans. Permit no more than 5% of the material to escape from the containment mesh. Furnish compost meeting the requirements of Item 161, "Compost."

2. Containment Mesh

Furnish containment mesh that is 100% biodegradable, photodegradable, or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or any other acceptable material.

Furnish biodegradable or photodegradable containment mesh when log will remain in place as part of a vegetative system.

Furnish recyclable containment mesh for temporary installations.

3. Size

Furnish biodegradable erosion control logs with diameters shown on the plans or as directed. Stuff containment mesh densely so logs do not deform.

PART 3 – EXECUTION**3.1 Construction****A. Contractor Responsibilities**

Implement the Owner's SW3P for the project in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed by the Owner. Develop and implement an SW3P for project-specific material supply plants within and outside of the Owner's right-of-way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.

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B. General

1. Phasing

Implement control measures in the area to be disturbed before beginning construction or as directed. Limit the disturbance to the area shown on the plans or as directed. If, in the opinion of the Owner, the Contractor cannot control soil erosion and sedimentation resulting from construction operations, the Owner will limit the disturbed area to that which the Contractor is able to control. Minimize disturbance to vegetation.

2. Maintenance

Immediately correct ineffective control measures. Implement additional controls as directed. Remove excavated material within the time requirements specified in the applicable storm water permit.

3. Stabilization

Stabilize disturbed areas where construction activities will be temporarily stopped in accordance with the applicable storm water permit. Establish a uniform vegetative cover. The project will not be accepted until a 70% density of existing adjacent undisturbed areas is obtained, unless otherwise shown on the plans. When shown on the plans, the Owner may accept the project when adequate controls are in place that will control erosion, sedimentation, and water pollution until sufficient vegetative cover can be established.

4. Finished Work

Upon acceptance of vegetative cover, remove and dispose of all temporary control measures, temporary embankments, bridges, matting, falsework, piling, debris, or other obstructions placed during construction that are not a part of the finished work or as directed.

5. Restricted Activities and Required Precautions

Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on-site to prevent actual or potential water pollution. Manage, control, and dispose of litter on-site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only as described in the TPDES General Permit TXR150000. Utilize appropriate controls to minimize the off-site transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

C. Installation, Maintenance, and Removal Work

Perform work in accordance with the SW3P, according to manufacturers' guidelines, and in accordance with the TPDES General Permit TXR150000. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Owner. If a device ceases to function as intended, repair or replace the device or portions thereof as necessary. Remove sediment, debris, and litter. When approved, sediments may be disposed of within embankments, or in the right-of-way in areas where the material will not contribute to further siltation. Dispose of removed material in accordance with federal, state, and local regulations.

Remove devices upon approval or as directed. Finish-grade and dress the area upon removal. Stabilize disturbed areas in accordance with the permit and as shown on the plans or as directed. Materials removed are considered consumed by the project. Retain ownership of stockpiled material and remove it from the project when new installations or replacements are no longer required.

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1. Rock Filter Dams for Erosion Control

Remove trees, brush, stumps, and other objectionable material that may interfere with the construction of rock filter dams. Place sandbags as a foundation when required or at the Contractor's option.

Place the aggregate to the lines, height, and slopes specified, without undue voids for Types 1, 2, 3, and 5. Place the aggregate on the mesh and then fold the mesh at the upstream side over the aggregate and secure it to itself on the downstream side with wire ties or hog rings for Types 2 and Type 3, or as directed. Place rock filter dams perpendicular to the flow of the stream or channel unless otherwise directed. Construct filter dams according to the following criteria unless otherwise shown on the plans:

a. Type 1: Non-reinforced

- i. Height: At least eighteen (18) inches measured vertically from existing ground to top of filter dam
- ii. Top Width: At least two (2) ft.
- iii. Slopes: No steeper than 2:1

b. Type 2: Reinforced

- i. Height: At least eighteen (18) inches measured vertically from existing ground to top of filter dam
- ii. Top Width: At least two (2) ft.
- iii. Slopes: No steeper than 2:1

c. Type 3: Reinforced

- i. Height: At least thirty-six (36) inches measured vertically from existing ground to top of filter dam
- ii. Top Width: At least two (2) ft.
- iii. Slopes: No steeper than 2:1

d. Type 4: Sack Gabions

Unfold sack gabions and smooth out kinks and bends. Connect the sides by lacing in a single loop-double loop pattern on four (4) inch to 5 inch spacing for vertical filling. Pull the end lacing rod at one end until tight, wrap around the end, and twist four (4) times. Fill with stone at the filling end, pull the rod tight, cut the wire with approximately six (6) inches remaining, and twist wires four (4) times.

Place the sack flat in a filling trough, fill with stone, connect sides, and secure ends as described above for horizontal filling.

Lift and place without damaging the gabion. Shape sack gabions to existing contours.

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

2. Temporary Pipe Slope Drains

Install pipe with a slope as shown on the plans or as directed. Construct embankment for the drainage system in eight (8) inch lifts to the required elevations. Hand-tamp the soil around and under the entrance section to the top of the embankment as shown on the plans or as directed. Form the top of the embankment or earth dike over the pipe slope drain at least one (1) ft. higher than the top of the inlet pipe at all points. Secure the pipe with hold-downs or hold-down grommets spaced a maximum of ten (10) ft. on

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center. Construct the energy dissipaters or sediment traps as shown on the plans or as directed. Construct the sediment trap using concrete or rubble riprap in accordance with Item 432, "Riprap," when designated on the plans.

3. Temporary Paved Flumes

Construct paved flumes as shown on the plans or as directed. Provide excavation and embankment (including compaction of the subgrade) of material to the dimensions shown on the plans unless otherwise indicated. Install a rock or rubble riprap energy dissipater, constructed from the materials specified above, to a minimum depth of nine (9) inches at the flume outlet to the limits shown on the plans or as directed.

4. Construction Exits

Prevent traffic from crossing or exiting the construction site or moving directly onto a public roadway, alley, sidewalk, parking area, or other right-of-way areas other than at the location of construction exits when tracking conditions exist. Construct exits for either long-term or short-term use.

a. Long-Term

Place the exit over a foundation course as required. Grade the foundation course or compacted subgrade to direct runoff from the construction exits to a sediment trap as shown on the plans or as directed. Construct exits with a width of at least fourteen (14) ft. for one-way and twenty (20) ft. for two-way traffic for the full width of the exit or as directed.

i. Type 1: Construct to a depth of at least eight (8) inches using crushed aggregate as shown on the plans or as directed.

ii. Type 2: Construct using railroad ties and timbers as shown on the plans or as directed.

b. Short-Term

i. Type 3: Construct using crushed aggregate, plywood, or wafer board. This type of exit may be used for daily operations where long-term exits are not practical.

ii. Type 4: Construct as shown on the plans or as directed.

5. Earthwork for Erosion Control

Perform excavation and embankment operations to minimize erosion and to remove collected sediments from other erosion control devices.

a. Excavation and Embankment for Erosion Control Features

Place earth dikes, swales, or combinations of both along the low crown of daily lift placement, or as directed, to prevent runoff spillover. Place swales and dikes at other locations as shown on the plans or as directed to prevent runoff spillover or to divert runoff. Construct cuts with the low end blocked with undisturbed earth to prevent erosion of hillsides. Construct sediment traps at drainage structures in conjunction with other erosion control measures as shown on the plans or as directed.

Create a sediment basin, where required, providing 3,600 cu. ft. of storage per acre drained, or equivalent control measures for drainage locations that serve an area with ten (10) or more disturbed acres at one time, not including off-site areas.

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b. Excavation of Sediment and Debris

Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed.

6. Construction Perimeter Fence

Construct, align, and locate fencing as shown on the plans or as directed.

a. Installation of Posts

Embed posts eighteen (18) inches deep or adequately anchor in rock, with a spacing of eight (8) ft. to ten (10) ft.

b. Wire Attachment

Attach the top wire to the posts at least three (3) ft. from the ground. Attach the lower wire midway between the ground and the top wire.

c. Flag Attachment

Attach flagging to both wire strands midway between each post. Use flagging at least eighteen (18) inches long. Tie flagging to the wire using a square knot.

7. Sandbags for Erosion Control

Construct a berm or dam of sandbags that will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow. Fill each bag with sand so that at least the top six (6) inches of the bag is unfilled to allow for proper tying of the open end. Place the sandbags with their tied ends in the same direction. Offset subsequent rows of sandbags one-half (½) the length of the preceding row. Place a single layer of sandbags downstream as a secondary debris trap. Place additional sandbags as necessary or as directed for supplementary support to berms or dams of sandbags or earth.

8. Temporary Sediment-Control Fence

Provide temporary sediment-control fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the fence into erosion-control measures used to control sediment in areas of higher flow. Install the fence as shown on the plans, as specified in this Section, or as directed.

a. Installation of Posts

Embed posts at least eighteen (18) inches deep, or adequately anchor if in rock, with a spacing of six (6) ft. to eight (8) ft. and install on a slight angle toward the runoff source.

b. Fabric Anchoring

Dig trenches along the uphill side of the fence to anchor six (6) inches to eight (8) inches of fabric. Provide a minimum trench cross-section of six (6) inches by six (6) inches. Place the fabric against the side of the trench and align approximately two (2) inches of fabric along the bottom in the upstream direction. Backfill the trench, then hand-tamp.

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c. Fabric and Net Reinforcement Attachment

Attach the reinforcement to wooden posts with staples, or to steel posts with T-clips, in at least four (4) places equally spaced unless otherwise shown on the plans. Sewn vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement by hog rings or cord every fifteen (15) inches or less.

d. Fabric and Net Splices

Locate splices at a fence post with a minimum lap of six (6) inches attached in at least six (6) places equally spaced unless otherwise shown on the plans. Do not locate splices in concentrated flow areas.

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

- i. fabric with minimal or no visible signs of biodegradation (weak fibers);
- ii. fabric without excessive patching (more than one (1) patch every fifteen (15) ft. to twenty (20) ft.);
- iii. posts without bends; and
- iv. backing without holes.

9. Biodegradable Erosion Control Logs

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

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

10. Vertical Tracking

Perform vertical tracking on slopes to temporarily stabilize soil. Provide equipment with a track undercarriage capable of producing a linear soil impression measuring a minimum of twelve (12) inches long by two (2) inches to four (4) inches wide by one-half ($\frac{1}{2}$) inch to two (2) inches deep. Do not exceed twelve (12) inches between track impressions. Install continuous linear track impressions where the twelve (12) inches length impressions are perpendicular to the slope. Vertical tracking is required on projects where soil disturbing activities have occurred unless otherwise approved.

END OF SECTION

Special Specification WCRRWL 100

Williamson County Regional Raw Water Line (WCRRWL)



1. DESCRIPTION

This Item will govern for all materials and work necessary for the construction of the Williamson County Regional Raw Waterline (WCRRWL) as shown on the waterline plans. Wherever, in the City of Georgetown Specification reference is made to City of Georgetown and its representatives, such reference shall be taken to mean Williamson County and its representatives. Wherever, in the City of Austin Specification reference is made to City of Austin and its representatives, such reference shall be taken to mean Williamson County and its representatives. The Contractor shall obtain necessary permits, provide testing as necessary, and request inspection of the completed water lines prior to being placed in service.

2. MATERIALS

Furnish materials of the type as shown on the plans and in accordance with City of Georgetown Standard Technical Specifications as listed below and included herein:

- A. Item Section CIP11 "Trench Safety Requirements"
- B. Item Section CIP12 "Testing of Pipelines and Manholes"
- C. Item Section G4 "Pipe Excavation, Trenching, Embedment, Encasement and Backfilling"
- D. Item Section G5 "Granular Fill Materials"
- E. Item Section W1 "Ductile Iron Pipe and Fittings"
- F. Item Section W3 "Valves, Hydrants and Appurtenances"
- G. Item Section W4 "Encasement Pipe"
- H. Item Section C9 "Flowable Backfill"

Furnish materials of the type as shown on the plans and in accordance with City of Austin Standard Technical Specifications as listed below and included herein:

- A. Item 501S "Jacking or Boring Pipe 9-26-12"

3. CONSTRUCTION

The water distribution will be constructed in accordance with the City of Georgetown Standard Technical Specifications and amendment to these specifications included herein.

Pipe Delivery and Inspection. Each load of pipe delivered to the job site will be checked to assure that it meets specifications. When a load of pipe is found to have inadequate wall thickness or tolerances greater than specified, randomly selected samples of the pipe shall be immediately taken to an approved testing laboratory with instructions to check the pipe for compliance with applicable product standards, AWWA specifications, ASTM specifications, and other specifications for the specific Contract. When the testing laboratory reports concur that the pipe does not meet specifications, it is to be understood that all of the defective pipe delivered to the site will be immediately removed and replaced by the Contractor at no additional cost to the County.

Coordination of Work. This contract involves the modifications and/or improvements to existing facilities; therefore, all waterline work schedules must be submitted to the Construction Observer for approval prior to beginning work so as to maintain water service to the area.

Preservation of Property Corners. If the corners of the land owner's property have been marked with an iron pin in the ground, then these corners must be protected from the construction process. If any property corner is disturbed, then the Contractor shall arrange for the corner or corners to be replaced by a Registered Professional Land Surveyor (R.P.L.S.).

Applicable Specifications. All references to the following standard specifications contained in this specification shall mean the most current revision or addition of these specifications for the specific item, material, or work described, in effect at the time of the receipt of the bids:

- American Society for Testing Materials
- American Water Works Association
- Texas Department of Transportation Standard Specifications

General Construction Information for Contractor.

1. The contractor must submit a step-by-step plan on how they will execute construction work. The plan should include the labor and equipment resources they will dedicate to the project. This plan will be submitted for review before construction can begin.
2. Based on record pipe layout sheets, the existing 48" BWP raw waterline was laid such that the bell ends face north and the spigot ends face south parallel to IH 35. The contractor shall field verify existing pipe layout prior to making connections.
3. The installation of Type II waterline markers at gate and fence crossings shall be subsidiary to the cost of gate and fence. The installation of danger signs near combination air-relief valves shall be subsidiary to the cost of combination air-relief valves.
4. The contractor shall test shut the existing valves to determine if they have a problem before shutting down the waterline to make connections.
5. The contractor shall notify the BRA when ready to have the existing 48" raw waterline drained in order to make connections. The BRA will allow two 72-hour shutdowns provided that there is a minimum of 7 calendar days between the end of the first shutdown and the beginning of the second shutdown.
6. After receiving notification from the contractor to shut down the existing 48" waterline, BRA Operations personnel will open the combination air-relief valve (CAV) and blow-off valves in the vicinity of the shutdown and the majority of the waterline will be drained overnight with only minor residual water remaining in local low spots, which the contractor is responsible for removing if it affects their work area.
 - a. For the relocation at CR 305, the BRA will open the blow-off valves at stations 660+79.60 and 700+75.00 (per 2000 as-builts) and the CAV at station 678+59.27.
 - b. For the relocation at Ronald Reagan Blvd., the BRA will open blow-off valves at stations 951+25.82 and 998.25 and the CAV at station 964.50.

7. For the water required for the pressure testing of the new 48" ductile iron raw waterlines, the BRA is willing to offer the contractor a raw water tap at their existing combination air-relief valves (CAV) in the vicinity of the two relocations (Sta. 678+59.27 and 964+50 per 2000 as-builts), provided that 1) the BRA is pumping at the time of the tests, and 2) that the contractor provides a 2 working day notice prior to tapping. The existing combination air-relief valves have isolation valves that can be made available by the BRA for tapping purposes. In the event that the BRA is not pumping at the time of the tests, the contractor will be required to provide their own water.
8. For connection to existing BWP raw waterline, the contractor shall contact Hanson pipe manufacturer for BWP transition coupling. This is subsidiary to cost of bid item WCRRWL-6, "48" connection to Existing BWP..."

4. MEASUREMENT

The water distribution will be measured in accordance with the City of Georgetown Standard Technical Specifications and amendment to these specifications included herein.

5. PAYMENT

The water distribution will be constructed in accordance with the City of Georgetown Standard Technical Specifications and amendment and City of Austin Standard Technical Specifications and amendment to these specifications included herein.

For this project, City of Georgetown Item Section CIP12, "Testing of Pipelines and Manholes", of the City of Georgetown Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this item are waived or changed.

CIP.12.05 D2 DURATION OF TEST AND ALLOWABLE LEAKAGE

Add the following parameters for 39" to 48" diameter pipe to the table:

Pipe Diameter	Minimum Time	Length for Minimum Time	Time for Longer Length
(inches)	(seconds)	(feet)	(seconds)
39"	2210	60	36.619(L)
42"	2380	54	43.579(L)
45"	2550	50	51.861(L)
48"	2720	46	61.717(L)

For this project, City of Georgetown Item Section G4, "Pipe Excavation, Trenching, Embedment, Encasement, and Backfilling", of the City of Georgetown Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this item are waived or changed.

G4.05.TEST PROCEDURES FOR PRESSURE PIPELINES

Bullet E.1 is deleted and replaced with the following:

E. Backfilling Operation

1. Backfilling operation outside of pavement shall be compacted to the required density without damaging the pipe or bedding. Backfill under non-paved areas, two feet outside of any structure or utilities and excluding lines within a floodplain, streams and watercourses shall be compacted to 95% of the maximum dry density in accordance Tex-114-E. Areas within two feet of structures or existing utilities and areas within a floodplain, streams and water courses shall be compacted to 95% in accordance with Tex-114-E. Prior to any compaction, moisture shall be within +3% of the optimum moisture content.

For this project, City of Georgetown Item Section W1, "Ductile Iron Pipe and Fittings", of the City of Georgetown Standard Specifications is amended with respect to clauses cited below. No other clauses or requirements of this item are waived or changed.

W1.07. LAYING DUCTILE IRON PIPE AND FITTINGS

Bullet F. is added:

- F. Abandoning existing waterline pipe shall be done with grout. All labor, materials, and other incidentals necessary to complete the abandonment of pipe shall be subsidiary to the cost of pipe installed.

W1.15. CONNECTIONS AND APPURTENANCES

Bullet D. is added:

- D. When connecting Ductile Iron to prestressed concrete pressure, such as Bar-Wrapped Concrete Cylinder Pipe (BWP), the Contractor shall take appropriate steps to confirm the pipe types involved. This may include excavating the existing concrete pressure pipe to confirm the pipe type and joint configuration (ie. Bell or spigot ring). When connecting to existing bar-wrapped concrete cylinder pipe, the connection must be made at a joint. This type of pipe cannot be cut in mid-barrel to effect a connection. Adapter fittings for connecting to existing BWP shall be obtained from an experienced prestressed concrete pressure pipe manufacturer. The Contractor may need to employ the services of a Field Service Representative from the prestressed concrete pressure pipe manufacturer to assist with the identification of existing prestressed concrete pressure pipe.

Fabrication:

1. Steel thickness of all adapter fittings shall be designed in accordance with Chapter 9 of the AWWA M9 Manual for Concrete Pressure Pipe. Adapter fittings shall be designed for the same conditions as the adjacent pipe.
2. Fabrication of the adapters shall be as per AWWA M9 Manual and the AWWA C301 Standard for the Manufacture of Prestressed Concrete Steel Cylinder Pipe.
3. Interior and exterior concrete/mortar coating shall be as per the AWWA C301 Standard.

W1.16. LEAKAGE TESTING AND STERILIZATION

Bullet A. is deleted and replaced with the following:

- A. All Ductile Iron Pipe shall be leak tested according to Section CIP12 – "Testing of Pipelines and Manholes". It should be noted that the installation of raw water lines do not require sterilization.

W1.17 PAYMENT

Bullet C., D., E., and F. is added:

- C. Ductile iron fittings, furnished in accordance with these specifications, will be measured by the ton and paid for at the unit price bid per ton, complete in place, according to the schedule of weights meeting AWWA C-110 weight schedule C-110. Bolts, glands, and gaskets will not be measured or paid for separately and shall be included in the contract unit price for fittings. Ductile iron fittings will be measured as shown in Table 1 "Pay Items".
- D. The AWWA C303 BWP transition coupling adapter, complete in place, including cleanup, will be measured for payment per each coupling installed. Installation of the transition couplings will be paid for at the unit contract price

per each as provided in the Proposal and Bid Schedule. Payment of the unit contract price for the transition coupling shall be the total compensation for furnishing all labor, material, tools, equipment and incidentals and performing all work that is necessary for the installation and testing of the adapter in accordance with the Plans and the provisions of the Specifications. The transition coupling will be measured as shown in Table 1 "Pay Items".

Table 1 - Pay Items

Bid Item Description	Unit	Pay Item No.
Ductile Iron Fittings (C-110 Weight Schedule)	TON	WCRRWL-1
___" Connection to Existing BWP, including ___" AWWA C303 BWP Custom Transition Coupling Manufactured by Hanson or approved equivalent, Complete in Place	EA	WCRRWL-6

* Replace ___ with diameter (in inches) of pipe

- E. During the shut out of the raw water line, the contractor may be required to provide their own water for testing purposes in the event that the water line is not pumping at the time of the shut out. If this occurs, then bid item for water used for testing purposes shall be utilized. Water – including labor, storage, materials, supplies, off-site transportation, and all other incidentals necessary to complete the work – will be measured by the gallon and paid for at the unit price bid per gallon. Only the amount of water necessary to complete required tests shall be transported and used. Water for testing purposes will be measured as shown in Table 2.

Table 2 – Bid Items

Bid Item Description	Unit	Pay Item No.
Water for testing purposes – including labor, materials, supplies, storage, off-site transportation, and all other incidentals necessary to complete the work	GAL	WCRRWL-9

- F. Manways complete in place as shown on the Plans and as specified, will be subsidiary to the cost of pipe.

For this project, Item W3 "Valves, Hydrants, and Appurtenances", of the City of Georgetown Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this item are waived or changed.

W3.21 PAYMENT

Bullet A. is deleted and replaced with the following:

- A. Gate valves, tapping sleeves and tapping valves, fire hydrants, and air and vacuum relief valves complete in place as shown on the Plans and as specified, will be paid for at the unit contract price per each as provided in the Proposal and Bid Schedule. The measurement and payment of the air release valve shall include the complete-in-place installation of the air release valve, flanged outlet, drain, concrete, manhole, flowable fill, lid, and all other components associated with this valve as shown on the detail in the plan set.

Bullet E. is added:

- E. Corrosion test stations complete in place as shown on the Plans and as specified shall be subsidiary to the cost of combination air-relief valves.

For this project, Item W4 "Encasement Pipe", of the City of Georgetown Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this item are waived or changed.

W4.04 MATERIALS

Add the following parameters for 66" diameter encasement pipe to the table under W4.04.A:

Carrier Size	Minimum Encasement Steel Casing Size	Minimum Casing Thickness
(Inner Diameter)	(Inner Diameter)	(Inches)
48"	66"	0.500

Bullet C. and D. is added:

- C. Provide steel casing sections for split casing in lengths a maximum of 20 feet. Ensure that each section is split in half sections. Bevel the ends and split sections for field butt-welding.

W4.05 PAYMENT

Bullet C. is added:

- C. Split steel encasement pipe complete-in-place as shown on the Plans and as specified will be paid for at the unit contract price per linear foot as called on the Plans and set forth in the Proposal and Bid Schedule. All costs incurred for furnishing and installing split steel encasement pipe shall include all labor, materials, tools, equipment, and incidentals necessary to perform all work or whatever nature required to complete the specific operation. Split steel encasement pipe will be measured as follows:

Table 1 - Pay Items

Bid Item Description	Unit	Pay Item No.
Split Encasement Pipe, ___" Dia, Steel	LF	WCRRWL-7

* Replace ___ with diameter (in inches) of encasement pipe

For this project, Item 501S, "Jacking or Boring Pipe 9-26-12" of the City of Austin Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this item are waived or changed.

501S.3 MATERIALS

Bullet A. is deleted and replaced with the following:

A. Pipe

Carrier pipe and encasement pipe shall conform to City of Georgetown Standard Technical Specification Item Section W1 "Ductile Iron Pipe and Fittings", W2 "Polyvinyl Chloride (PVC) Pipe - Water", and W4 "Encasement Pipe" shall be size, type materials, thickness and class indicated on the Drawings, unless otherwise specified.

Section 501S.3. is deleted and replaced with the following:

501S.3 PAYMENT

The work performed and materials furnished as prescribed by this item and measured as provided under "Measurement" will be paid for at the unit bid price per linear foot for "Jacking or Boring Pipe" as the case may be, of type, size and class of encasement pipe indicated on the Drawings. The price shall include full compensation for furnishing, preparing, hauling and installing required materials, encasement pipe, end seals, for grouting and for labor, tools, equipment and incidentals necessary to complete work, including excavation, backfilling and disposal of surplus material. The Carrier pipe shall be paid at the unit price bid for City of Georgetown Standard Technical Specification Item W1 "Ductile Iron Pipe", W1 "Ductile Iron Pipe and Fittings ". Payment when included as a Bid Item will be made under the following:

Bid Item Description	Unit	Pay Item No.
Jacking or Boring ____In. Pipe, Class____	LF	WCRRWL-8

* Replace ____ with diameter (in inches) of pipe and type of pipe material

City of Georgetown Referenced Specifications

TECHNICAL SPECIFICATIONSSECTION CIP11 – TRENCH SAFETY REQUIREMENTS

CIP11.01

SCOPE OF WORK

- A. This specification covers the requirements to plan, design, construct, install, maintain, monitor, modify as necessary, and remove upon completion, a Trench Safety System as specified herein.
- B. The requirements of this Section apply to all trenches which equal or exceed a depth of five (5) feet, measured from the ground surface at the highest side of the trench to the trench bottom.
- C. All applicable and non-conflicting portions of Section G4- TRENCHING, BACKFILLING AND COMPACTION apply as appropriate.

CIP11.02

SUBMITTALS

- A. Within 30 days after the Notice to Proceed, but not less than 10 calendar days prior to execution of any trench excavation operations, the Contractor shall submit a site specific Trench Safety System Conformance Affidavit stating that operations will be conducted in full conformance with the OSHA Standards.
 - 1. The Conformance Letter shall also describe the Trench Safety System techniques proposed to be used on the Project.
 - 2. Specific references to the applicable OSHA Standards sections shall be included for each technique to be used.
- B. The Trench Safety System Plan shall be in writing, site specific and sufficiently detailed and clear to be understandable and usable by all personnel who will be executing, supervising and witnessing the trenching operations. A copy of the Trench Safety System Plan shall be available at the site of trenching operations at all times.
- C. If borings and/or detailed geotechnical analyses are required to develop the Trench Safety System Plan, they shall be executed by the Contractor at his cost.
- D. For trenches having depths greater than the various limits given in the OSHA Standards (8, 12 or 20 feet, depending on the techniques used), a site specific protective system shall be designed by a Registered Professional Engineer, registered in the State of Texas experienced in soil mechanics and structural design. The design shall be signed, sealed and dated by the Professional Engineer, and it shall identify those specific locations where the design is applicable.

CIP11.03

GENERAL

- A. All materials and products incorporated into the Trench Safety System shall be suitable for their intended uses; shall meet all design criteria and parameters used by the Trench Safety System designer; and shall meet all applicable requirements of OSHA Standards.

CIP11.04

METHODS OF PROVIDING FOR TRENCH SAFETY

- A. Protective systems referenced in this Section shall be as defined and described in 29 CFR 1962.652, "Requirements for Protective Systems."
- B. It is the duty, responsibility and prerogative of the Contractor to determine the specific applicability of a proposed Trench Safety System for each field condition encountered on the Project. Contractor specifically holds the City, Engineer, and any of their designated representatives harmless in any actions resulting from the failure or inadequacy of the Trench Safety System used to complete the Project.
- C. Unless otherwise noted on the drawings or excluded below, Sloping/Benching, Trench Shielding with trench boxes, and/or Sheet piling/Shoring/Bracing protective systems may be used on this Project.

D. Restrictions on the use of the various protective systems for this Project are as follows:

1. Sloping or Benching. Allowed with prior approval from the City.
2. Trench Shields/Boxes. No restrictions.
3. Sheet piling/Shoring/Bracing. No restrictions.

CIP11.05

INSPECTION DUTIES OF CONTRACTOR

- A. Provide a Competent Person, as defined in the OSHA Standards, to make frequent inspections of the trenching operations and the Trench Safety System in full conformance with the OSHA Standards.
- B. If evidence of a possible cave-in or landslide is apparent, all work in the trench shall immediately cease and not be resumed until all necessary precautions have been taken to safeguard personnel entering the trench.
- C. In an emergency situation, which may threaten or affect the safety or welfare of any persons or properties, the Contractor shall act at his discretion to prevent possible damage, injury or loss. Any additional compensation or time extension claimed for such actions shall be considered in view of the cause of the emergency and in accordance with the General Conditions.

CIP11.06

MEASUREMENT AND PAYMENT

- A. Payment for the Trench Safety Plan shall be on a Lump Sum price basis, the Lump Sum price being as given in the Bid Proposal.
- B. Payment for the Trench Safety Plan Implementation shall be on a unit price basis, the unit price being as given in the Bid Proposal, and the unit of measure being linear feet of trench and/or square foot of bore pit or structure, without regard to whether specific trench safety precautions are required or used for the trench reach being measured.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION CIP12 □ TESTING OF PIPELINES AND MANHOLESCIP12.01 SCOPE OF WORK

- A. This specification covers the requirements to perform ex-filtration testing and deflection testing of gravity pipelines and to perform pressure and leakage testing of pressure pipelines.

CIP12.02 SUBMITTALS

- A. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer or the City for approval, technical product literature including a description of the deflection test procedure for flexible pipe greater than 27-inches in diameter, video inspection of gravity wastewater lines, and all other pertinent data to illustrate conformance to the specification found within.

CIP12.03 GENERAL

- A. The entire length of the installed gravity line and the force main shall be field tested for water tightness. Gravity wastewater lines shall be video taped by camera.
- B. Hydrostatic pressure and leakage tests shall be made on all pressure pipelines carrying wastewater or water.
- C. All labor and equipment, including, but not limited to test pump with regulated by-pass meters and gauges required for conducting pipeline tests, shall be furnished by the Contractor. The Contractor shall furnish equipment and necessary piping as required to transport water used in testing from source to test location.
- D. Time and sequence of testing shall be scheduled by the Contractor, subject to observation and approval by the City. The Contractor shall provide adequate labor, tools and equipment to operate valves and to locate and repair any leaks discovered during the initial filling of the pipeline prior to actual testing or during the course of the tests.

CIP12.04 CLEANING

- A. At the conclusion of the work, thoroughly clean all pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered the pipes during the construction period. Debris cleaned from the lines shall be removed from the low end of the pipeline. If after this cleaning, obstructions remain, they shall be removed. After the pipelines are cleaned and if the groundwater level is above the pipe or following a heavy rain, the Engineer will examine the pipes for leaks. If any defective pipes or joints are discovered, they shall be repaired, and/or replaced by the Contractor at his expense.

CIP12.05 TEST PROCEDURES FOR GRAVITY PIPELINES, FORCE MAINS AND MANHOLES

- A. Scope: After sewers and manholes have been installed and backfilled, subject newly laid gravity lines and manholes to a leakage test. Contractor to furnish all labor, materials, tools and equipment to test lines. Take such precautions as required to prevent damage to lines and appurtenances being tested. Repair any damage resulting from test at Contractor's expense. Conduct test in presence of Engineer or designated City Representative.
- B. Test Procedures for Leakage Test of Gravity Sewer: Contractor, at his option, may test lines by hydrostatic or low pressure air test as specified below. However, the Engineer may direct a specific test be performed in specified areas of the Project.

C. Infiltration or Exfiltration Test (for Gravity Sewer)

1. Preparation: Seal ends of line section being tested with water tight plugs, equipped with pipe riser inserted and braced in the inlet of the manholes. Fill section with water 24-hours prior to start of test. Fill slowly from downstream manhole in test section so that no air is trapped in the line. Leave outlets of stacks and service lines exposed and unplugged until after exfiltration test has been made. Outlets terminating below level of test water surface to be temporarily extended upward by installing additional lengths of pipe. After completion of satisfactory test, remove lengths of pipe added for test.
2. Duration of Test: Test for 24-hours. Minimum head of either two (2) feet measured above the crown, inside pipe at upper end of section or four (4) feet measured above trench water table, whichever is higher, so that a net positive of two (2) feet TCEQ is used for testing.
3. Allowable Leakage: Allowable leakage or exfiltration in any individual section under construction shall not exceed 10 gallons per inch of inside diameter per mile of pipe per 24 hours.

D. Low Pressure Air Test

1. Preparation: Clean pipe to be tested by propelling snug fitting inflated rubber ball through the pipe with water or by use of water jet cleaning equipment. After manhole to manhole reach of pipe has been backfilled and cleaned, pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psig. Add air slowly to the section under test until the internal pressure of 4.0 psig is obtained. Allow at least two (2) minutes for air temperature to stabilize, adding only the amount of air required to maintain pressure.

2. Duration of Test and Allowable Leakage

Decrease pressure to 3.5 psig and start stopwatch. Determine the time in seconds that is required for the internal air pressure to reach 2.5 psig. Minimum permissible pressure holding times are indicated in seconds and shall be computed by the following equation:

$$T = (0.085 \times D \times K) / Q$$

T = time for pressure to drop 1.0 pound per square inch gauge in seconds

K = $0.000419 \times D \times L$, but not less than 1.0

D = average inside diameter in inches

L = length of line of same pipe size being tested, in feet

Q = rate of loss assume 0.0015 cubic feet per minute per square foot internal surface shall be used

Since K value of less than 1.0 shall not be used, there are minimum times for each pipe diameter as outlined below:

Pipe Diameter	Minimum Time	Length for Minimum Time	Time for Longer Length
(inches)	(seconds)	(feet)	(seconds)
6	340	398	0.855(L)
8	454	298	1.520(L)
10	567	239	2.374(L)
12	680	199	3.419(L)
15	850	159	5.342(L)
18	1020	133	7.693(L)
21	1190	114	10.471(L)
24	1360	100	13.676(L)

Pipe Diameter	Minimum Time	Length for Minimum Time	Time for Longer Length
27	1530	88	17.309(L)
30	1700	80	21.369(L)
33	1870	72	25.856(L)
36	2040	66	30.771(L)

The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure. Lines with a 27-inch average inside diameter and larger may be air tested at each joint. If the joint test is used, a visual inspection of the joint shall be performed immediately after testing. The pipe is to be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe. Once the pressure has stabilized, the minimum time allowable for the pressure to drop from 3.5 psi gauge to 2.5 psi gauge shall be 10 seconds.

E. Test Procedures for Hydrostatic Test for Manholes

1. Manholes shall be tested for leakage separately and independently of the wastewater lines by hydrostatic exfiltration testing, or other methods acceptable to the City. If a manhole fails a leakage test, the manhole must be made water tight and retested. The maximum leakage for hydrostatic testing shall be 0.025 gallon per vertical foot per hour. Alternative test methods must ensure compliance with the above allowable leakage. Hydrostatic exfiltration testing shall be performed as follows: all wastewater lines coming into the manhole shall be sealed with an internal pipe plug, then the manhole shall be filled with water and maintained full for at least one (1) hour. For concrete manholes a wetting period of 24-hours may be used prior to testing in order to allow saturation of the concrete.

F. Test Procedures for Vacuum Testing Manholes

1. In lieu of the hydrostatic exfiltration test, manholes may be tested by vacuum. Manholes tested by vacuum shall be performed by the Contractor in compliance with these specifications.
2. Manholes shall be tested after installation of all connections (existing and/or proposed) in place. All lift holes shall be plugged with an approved non-shrink grout and all drop connections and gas sealing connections shall be installed prior to testing. The lines entering the manhole shall be temporarily plugged with the plugs braced to prevent them from being drawn into the manhole. The plugs shall be installed in the lines beyond the drop-connections, gas sealing connections, etc. The test head shall be placed inside the frame at the top of the manhole and inflated in accordance with the manufacturer's recommendations. A vacuum of 10-inches of mercury shall be drawn, and the vacuum pump shall be turned off. With the valve closed, the level of vacuum shall be read after the required test time as shown in the following table. If the drop in the level is less than one (1) inch of mercury (final vacuum of nine (9) inches of mercury), the manhole will have passed the vacuum test. The required test time shall be 120- seconds.
3. Manholes which have a final vacuum of nine (9) inches of mercury after the time indicated will be accepted. Any manhole which fails the vacuum test as described above shall be repaired with an approved non-shrink grout or other material acceptable to the Engineer and the City based on the material from which the manhole is constructed. The manhole shall be retested as described above until a successful test is made.

G. Exfiltration Test

1. Preparation: Seal ends of manhole being tested with watertight plugs. Fill manhole 24-hours prior to start of test. Manholes to be filled to top of manhole cone section.
2. Duration of Test: The test shall be performed for a 24-hour duration.
3. Allowable Leakage: No leakage is allowed. The water elevation shall be the same at beginning and end of test period.

H. Deflection Testing

1. Deflection tests shall be performed on all flexible pipes. For pipes with inside diameters less than 27-inches, a rigid mandrel shall be used to measure deflection. For pipelines with an inside diameter of 27-inches and greater, the Contractor shall submit to the Engineer the proposed method, with which shall provide a precision of \pm two tenths of one percent (0.2%) deflection, for review and approval by the Texas Commission on Environmental Quality. The test shall be conducted after final backfill has been in place at least 30 days in the presence of a representative of the City's Utilities Department. No pipe shall exceed a deflection of five percent (5%). If a pipe should fail to pass the deflection test, the problem shall be corrected and a second test shall be conducted after the final backfill has been in place an additional 30 days. Test shall be performed without mechanical pulling devices.
 2. Mandrel Sizing: The rigid mandrel shall have an outside diameter (O.D.) equal to 95% of the inside diameter (I.D.) of the pipe. The inside diameter of the pipe, for the purpose of determining the outside diameter of the mandrel, shall be the average outside diameter of the pipe minus two minimum wall thickness for O.D. controlled pipe and the average inside diameter for the I.D. Controlled pipe, all dimensions shall be per appropriate standard. Statistical or other ☐tolerance packages☐ shall not be considered in mandrel sizing.
 3. Mandrel Design: The rigid mandrel shall be constructed of a metal or rigid plastic material that can withstand 200 psi without being deformed. The mandrel shall have nine or more ☐runners☐ or ☐legs☐ as long as the total number of legs is an odd number. The barrel section of the mandrel shall have a length of at least 75% of the inside diameter of the pipe. A proving ring shall be provided and used for each size mandrel in use.
 4. Method Options: Adjustable or flexible mandrels are prohibited. A television inspection is not a substitute for the deflection test. A deflectometer may be approved provided the Contractor notifies the Engineer in a timely manner and submits adequate information for the Engineer to submit to the Texas Commission on Environmental Quality for review and approval. Mandrels with removable legs or runners may also be approved provided the Contractor notifies the Engineer in a timely manner and submits adequate information for the Engineer to submit to the Texas Commission on Environmental Quality for review and approval.
- I. Repairs of Lines: Remove and replace or make approved corrective repairs to any section of line or manhole which has leakage that exceeds above amounts. Repair any individual leaks that may appear whether or not overall section meets leakage requirements. Individual leaks will ordinarily be revealed by looking through sewer with a light while groundwater level is over sewer, during water tamping operations or immediately after water leakage is emptied from sewer.
- J. Retest: Sewers and/or manholes failing to meet requirements of leakage test will, after repair by Contractor, be tested again for leakage. No sewer or manhole will be accepted until leakage is less than allowable amount.

K. Video Inspection

1. The use of a television camera for inspection prior to placing the sewer in service will be required. Video inspection is at the cost of the Contractor, and copies of the DVD will be presented to the City prior to final acceptance. One (1) copy of the DVD shall be submitted to the City.
2. Post construction video of the gravity wastewater lines will be evaluated on a case-by-case basis for acceptance. Preparation for video taping of wastewater line shall be as follows:
 - a. Flush and clean the gravity wastewater line prior to video taping.
 - b. The videotape shall display the station, in accordance with the Plans and Standards, and counter on the screen. Manhole numbers and stations shall correspond to the contract documents.
 - c. If debris is evident in the line during the video, the line will be flushed and cleaned to allow a clean video.
 - d. All manholes will be identified at the beginning and end of the video corresponding to contract documents with upstream and downstream ends identified.
 - e. Additional video inspections shall be performed prior to completion of one-year warranty period and submitted on DVD.

L. Force Main

1. Force Main shall be pressure tested one and one-half (1 1/2) times the maximum output of the pumps. The allowable hydrostatic leakage rate shall be based on CIP 12.06 Table 6A.

CIP12.06

TEST PROCEDURES FOR PRESSURE PIPELINESA. General

1. After the pipe has been laid and backfilled and the backfill has been otherwise consolidated, all newly laid pipe, or any valved section thereof, shall be subjected to the hydrostatic pressure specified below for that particular type of pipe. The duration of the hydrostatic test shall be at least two (2) hours. Unless otherwise specified or noted on the Plans. All meters, fixtures, devices or appliances which are connected to the pipeline system and which might be damaged if subjected to the specified test pressure shall be disconnected and the ends of the branch lines plugged or capped during the testing procedures.
2. Each valved (capped or plugged) section of pipe shall be filled slowly with water and all air shall be expelled. If permanent air vents are not located at all high points, the Contractor shall install, at his own expense, corporation or blow-off cocks at such points so that air can be expelled as filling takes place. After verification that all air has been expelled, the cocks shall be closed and the pipe kept filled until tested. All exposed pipe, fittings, valves, hydrants and joints shall be examined while under test pressure and all visible leaks shall be stopped. Any cracked or defective pipe, fittings, valves or hydrants discovered during testing shall be removed and replaced by the Contractor. Replacement shall be with sound material and the test shall be repeated until satisfactory to the City.

B. Special Requirements: Where any section of pipeline is provided with concrete reaction blocking, the hydrostatic pressure shall not be made until at least five (5) days have elapsed after installation of the blocking. However, if high-early-strength cement is used in the concrete, two (2) days shall have elapsed prior to testing.

C. Leakage Test: A Leakage Test will be conducted on each valved section over the entire Project. The leakage test shall be at 150 psi for at least four (4) hours. Fire lines shall be tested at 200 psi for two (2)

hours with 0 loss.

D. Allowable Leakage

1. The allowable hydrostatic leakage rate shall be based on the following formula:

Fire lines 0 loss

$$L = \frac{SD}{\sqrt{P}} \sqrt{133,200}$$

L = testing allowance in gallons per hour

S = length of pipe tested in feet

D = nominal diameter of the pipe in inches

P = average test pressure during the hydrostatic test in pounds per square inch (gauge)

Table 6A

Hydrostatic testing allowance per 1,000 ft of pipeline* - *gph*[□]

Avg. Test Pressure <i>psi</i>	Nominal Pipe Diameter □ in.																	
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54	60	64
450	.48	.64	.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19
400	.45	.60	.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61
350	.42	.56	.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99
300	.39	.52	.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32
275	.37	.50	.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97
250	.36	.47	.71	.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60
225	.34	.45	.68	.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21
200	.32	.43	.64	.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80
175	.30	.40	.59	.80	.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36
150	.28	.37	.55	.74	.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88
125	.25	.34	.50	.67	.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37
100	.23	.30	.45	.60	.75	.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80

If the pipeline under test contains sections of various diameters, the testing allowance will be the sum of the testing allowance for each size.

□ Calculated on the basis of Eq. 1.

- a. These formulas are based on a testing allowance of 11.65 gpd/mi/in. (1.079 L/d/km/mm) of nominal diameter at a pressure of 150 psi (1,034 kPa).
- b. 5.2.1.6.1 Testing allowance at various pressures is shown in Tables 6A and 6B.
- c. 5.2.1.6.2 When testing against closed metal-seated valves, an additional testing allowance per closed valve of 0.0078 gal/h/in. (1.2 mL/h/mm) of nominal valve size shall be allowed.
- d. 5.2.1.6.3 When hydrants are in the test section, the test shall be made against the main valve in the hydrant.
- e. 5.2.1.7 Acceptance of installation. Acceptance shall be determined on the basis of testing allowance. If any test of laid pipe discloses a testing allowance greater than that specified in Sec. 5.2.1.6, repairs or replacements shall be accomplished in accordance with the specifications.
- f. 5.2.1.7.1 All visible leaks are to be repaired regardless of the allowance used for

testing.

2. If such testing discloses leakage in excess of this specified allowable, the Contractor, at his expense, shall locate and correct all defects in the pipeline until the leakage is within the specified allowance. All known leaks, regardless of this test, shall be repaired.
- E. Pressure Test: After satisfactorily completing the leakage test, each valved section over the entire project, shall be tested at 200 psi for a sufficient period (approximately 10 min) to discover all leaking or defective materials and/or workmanship.
- F. Disinfecting Water Mains: The Contractor shall disinfect all water mains before the new facilities are placed into service. Disinfection must be performed in accordance with AWWA C651, latest revision and water samples must be submitted to a laboratory approved by the Texas Department of Health. Sample must be collected by the Contractor or his representative in the presence of the City or his representative. The Contractor shall be responsible for delivering the samples to an approved laboratory for testing. Sample results must indicate the facility is free of microbiological contamination before it is placed into service. It shall be the Contractor's responsibility to obtain a current copy of AWWA C651 to determine the correct forms of chlorine for disinfection, the basic disinfection procedure, preventive and corrective measures during construction, methods of chlorination, final flushing procedures, procedures for bacteriological tests, procedures for re-disinfection and disinfection procedures when cutting into existing mains. The Contractor, at its expense, will supply the concentrated chlorine disinfecting material, the City's personnel will supervise and direct the overall sterilization procedure. The Contractor, at his own expense, shall provide all other equipment, supplies and necessary labor to perform the sterilization under general supervision by the City.
- G. General
1. All valves shall be arranged to prevent the strong disinfecting dosage from flowing back into the existing water supply piping. The new pipeline shall then be completely filled with disinfecting solution by feeding the concentrated chlorine and approved water from the existing system uniformly into the new piping in such proportions that every part of the line has a minimum concentration of chlorine as prescribed in AWWA C651.
 2. Unless otherwise identified, all quantities called for herein refer to measurements by the testing procedures in the current edition of ☐ Standard Methods of Examination of Water and Wastewater ☐. The chlorine concentration of each step in the sterilization procedure shall be verified by chlorine residual determinations. This disinfecting solution shall be retained in the piping for at least twenty-four (24) hours, and all valves, hydrants, etc., shall be operated to disinfect all their parts. After this retention period, the water shall contain no less than the chlorine residual prescribed in AWWA C651 throughout the treated section of the pipeline.
 3. This heavily chlorinated water shall then be carefully flushed from the line until the chlorine concentration is not higher than the residual generally prevailing in the existing distribution system, or approximately 1.0 parts per million. Proper planning and appropriate preparations to handle, dilute and dispose of this strong chlorine solution without causing injury or damage to the public, the water system, the environment must be approved by the City before flushing of the line may begin, and the flushing shall be witnessed by an authorized representative of the City.
- H. Bacteriological Testing
1. After final flushing of the strong disinfecting solution, water samples from the line shall be tested for bacteriological quality, at the Contractor's expense, and must be found free of coliform organisms before the pipeline may be placed in service. One (1) test sample shall be drawn from the end of the main and additional samples collected at intervals of not more than one-thousand (1,000) feet along the pipeline. A minimum of three (3) samples must be collected.
 2. The Contractor, at his own expense, shall install sufficient sampling taps at proper locations along the pipeline. Each sampling tap shall consist of a standard corporation cock installed in

the line and extended with a copper tubing gooseneck assembly. After samples have been collected, the gooseneck assembly shall be removed and retained for future use.

3. Samples for bacteriological analysis shall be collected only from suitable taps, in sterile bottles. Collection of the test samples shall be made in the presence of City personnel. If the initial disinfection fails to produce acceptable sample tests, the disinfection procedure shall be repeated (without extra compensation) until satisfactory test results have been obtained, before the piping may be placed in service.

CIP12.07

FINAL ACCEPTANCE

- A. No pipe installation will be accepted until all known leaks have been repaired whether or not leakage is within allowable limits. Locating and repairing of leaks shall be performed by the Contractor at no additional cost to the City.
- B. The City will certify that all required pressure and leakage tests have been successfully completed before the pipeline is accepted.

CIP12.08

PAYMENT

- A. No separate payment will be made for work completed in accordance with this specification, and the cost thereof will be included in the appropriate items of the Proposal and Bid Schedule.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION G4 - PIPE EXCAVATION, TRENCHING, EMBEDMENT,
ENCASEMENT AND BACKFILLINGG4.01 SCOPE OF WORK

- A. This specification covers the requirements for furnishing all labor, equipment and material and performing all work necessary, in connection with excavation, trenching, embedment, encasement, and backfilling, for the installation of water lines, storm sewer lines, wastewater lines, etc. in this Project.

G4.02 SUBMITTALS

- A. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer or the City for approval, technical product literature including a Trench Safety Plan (which shall be sealed by a Professional Engineer registered in the State of Texas, if required) embedment material (source, gradation and type), backfill material (source, gradation and type), encasement material (if required), equipment and all other pertinent data to illustrate conformance to the specification found within.

G4.03 EXCAVATIONA. General

1. Excavation shall include the removal of any trees, stumps, brush, debris, or other obstacles that may obstruct the line of work, and the excavation and removal of all earth, rock or other materials to the extent necessary to install the pipe and appurtenances in conformance with the line and grades shown in the Plans, or as specified.

B. Maximum and Minimum Width of Trenches

1. The sides of all trenches shall be cut as nearly vertical as possible. Unless otherwise specified on the Plans, the minimum width of trench in which the pipe may be installed shall not be less than 12-inches plus the outside diameter of the pipe, and the maximum width shall not be more than 24-inches plus the outside diameter of the pipe, measured at an elevation in the trench which is 12-inches above the top of the pipe when it is laid to grade.
2. Wherever the prescribed maximum trench width is exceeded, the Contractor shall use the class embedment or encasement required by the Engineer to provide the load carrying capacity for the trench width as actually cut, and the additional cost incurred will be borne by the Contractor.

C. Sheeting and Shoring

1. Where required in the Contractor's Trench Safety System, or where required for other reasons in caving ground, or in wet, saturated or flowing materials, the sides of all trenches and excavations shall be adequately sheeted and braced so as to maintain the excavation free from slides or cave-ins.
2. Shoring and sheeting shall not be left in place unless its removal is impractical.

D. Dewatering Excavations

1. There shall be sufficient pumping equipment, in good working order, available at all times to remove any water that accumulates in excavations. Where the pipeline crosses natural drainage channels, the work shall be conducted in such a manner that unnecessary damage or delays in the prosecution of the work will be prevented. Provisions shall be made for the

satisfactory disposal of surface water pumped so as to prevent damage to public or private property. The Contractor shall be responsible for maintaining safe working conditions and suitable construction techniques.

E. Disposal of Excavated Materials

1. Suitable excavated materials may be piled adjacent to the work to be used for backfilling. Excavated materials unsuitable for backfilling, or in excess of that required for backfilling, shall be disposed of by the Contractor. Desirable topsoil, sod, etc. shall be carefully removed and piled separately adjacent to the work when required. Excavated materials shall be handled at all times in such a manner as to cause a minimum of inconvenience to public travel. Suitable selected bedding or backfill material shall be provided at no additional cost to the City.

F. Trench Depth

1. Excavation for the pipeline shall be removed to a depth below the pipe barrel and pipe bell as shown in the Plans for the type of embedment specified, and the bottom of the trench brought to true subgrade with the embedment or encasement shown in the Plans.

G. Soft Subgrade

1. Where soft or spongy material is encountered in the excavation at subgrade level, it shall be removed to such a depth that a stable foundation is achieved by replacing the unsuitable material with tamped gravel, brought to the level of the bottom of bedding.
2. Gravel used shall be washed gravel or crushed stone and may fit any gradation of size up to three (3) inches. The particular gradation shall take into consideration the actual field conditions.

H. Excavated Materials

1. Excavated materials shall be piled adjacent to the work to be used for backfilling as required. After the trench has been refilled, topsoil shall be replaced to the extent that rock excavated from the trench will be completely covered and the area is returned to its original condition.
2. Where required on the Plans or when otherwise specified, desirable topsoil shall be piled separately in a careful manner and replaced in its original position.
3. Where a trench is required to cross a paved area, the asphalt or concrete shall be saw cut and removed for a total width that is two (2) feet greater than the trench width. The Contractor shall dispose of all excavated concrete, asphalt and subgrade material that is unsuitable for backfilling or in excess of that required for backfilling.

I. Damage to Existing Utilities

1. Where existing utilities are damaged, they shall be replaced immediately with material equal to or better than the existing material. Such work shall be at the entire expense of the Contractor.

G4.04

EMBEDMENT AND ENCASEMENT

A. General

1. Embedment shall be as required in the Plans or Standards. All embedment materials shall be free of grass, roots, vegetation, and other deleterious materials. Embedment Standards are shown on the Plans or Standards.

2. When the pipe has been checked for line and grade, the trench shall be backfilled with enough granular material or concrete on both sides to hold the pipe firmly in position. When placing granular material or concrete around the pipe, care shall be taken to fill all voids around the pipe. The pipe shall not be floated. The embedment or encasement material shall be carefully tamped to assure uniform pipe support and density.

B. Embedment Materials

1. Material for embedment shall conform to the following sieve analysis:

<u>Sieve Size</u>	<u>$\frac{3}{8}$" F % Retained</u>	<u>$\frac{1}{2}$" D % Retained</u>
$\frac{1}{2}$ "	0	0
$\frac{3}{8}$ "	0-2	5-25
4m	40-85	80-100
10m	95-100	96-100

C. Concrete Embedment and Encasement

1. Concrete embedment and encasement and cap shall have a minimum compressive strength of 2,000 pounds per square inch at 28 days.
2. Dry mix will not be permitted. The concrete cushion portion of the embedment or encasement will be mixed moist or damp to give a slump of not more than one (1) inch. Concrete for the sides and top, if specified, shall be mixed to obtain a slump of not less than one (1) inch or more than three (3) inches.
3. After pipe joints are completed, the voids at the joints in the embedment section shall be filled with concrete, and the embedment shall be brought up to proper grade. Where concrete is placed over or along the pipe, it shall be placed in such a manner as not to damage or injure the joints or displace the pipe. Care shall be taken in the placement of concrete to assure that a uniform pad, free of voids and of specified thickness, is constructed under the entire pipe section.
4. A cleavage line between the base concrete and the side embedment concrete will not be allowed. Backfilling shall be done in a careful manner and at such time, after concrete embedment or encasement has been placed, as not to damage the concrete in any way.

G4.05 BACKFILLING

A. General

1. Backfilling shall include the refilling and consolidating of the fill in trenches and excavations up to the surrounding ground surface or road grade at crossings. No backfill shall be placed until the Engineer, the City or his authorized Inspector has inspected the trench and pipe in place and has authorized the placing of backfill.
2. Backfilling shall be done with select material or concrete backfill as described hereafter and shown on the Plans. No material of a perishable, spongy or otherwise unsuitable nature shall be used in backfilling.

B. Select Backfill Material

1. Unless otherwise shown on the Plans, or approved by the Engineer, the select material backfill shall be Specification Section SD4 Flexible Base, Type A Grade 1.

2. If approved by the Engineer, good, sound earth may be used as select material for backfill over the pipe. Good, sound earth as defined as gravel, sandy loam or loam, free from excessive clay. Select material shall not have rocks with an average dimension larger than one (1) inch, and no dimension greater than two (2) inches.
3. An alternative to the flexible base as select backfill will be on-site or imported select material so long as it is properly moisture-conditioned, placed and compacted.
4. It shall be the full responsibility of the Contractor to explore the project and subsurface materials to determine if the trench excavation will be suitable for use as select materials and to follow as closely as possible this Specification to insure a good, sound pipeline when completed.

C. Concrete Trench Cap

1. Where 36-inch minimum cover cannot be obtained or due to potential surface loading, the City may require a cap to be installed.

D. Concrete Backfill

1. Where shown on the Plans, concrete backfill shall consist of selected rock material or granular sand material mixed with a minimum of three sacks of cement per cubic yard. All material shall be mixed in a concrete mixer or transit mixed unless otherwise approved by the City.

E. Backfilling Operation

1. Backfilling operation outside of pavement shall be compacted to the required density without damaging the pipe or bedding. Backfill under non paved areas, two feet outside of any structure or utilities and excluding lines within a floodplain, streams and watercourses shall be compacted to 90% of the maximum dry density in accordance Tex-114-E. Areas within two feet of structures or existing utilities and areas within a floodplain, streams and water courses shall be compacted to 95% in accordance with Tex-114-E. Prior to any compaction, moisture shall be within $\pm 3\%$ of the optimum moisture content.
2. All trenches under proposed or existing concrete roadways, driveways and sidewalks, paved waterways, brick roadways, asphaltic roadways with concrete base, gravel roadways, and roadways with gravel base and asphalt surface, shall be backfilled to the required density in six (6) inch maximum lifts without damaging the pipe or bedding except the first lift over the pipe bedding will be twelve (12) inches in depth. Swelling soils (soils with a plasticity index of 20 or more) shall be sprinkled as required to provide not less than optimum moisture nor more than 3% over the optimum moisture content to the extent necessary to provide not less than 95% nor more than 102% of the maximum dry density as determined in accordance with Tex-114-E. Non-swelling soils (soils with a plasticity index less than 20) shall be sprinkled as required and compacted to the extent necessary to provide not less than 95% of the optimum dry density with the moisture within $\pm 3\%$ of the optimum moisture content in accordance with Tex-114-E. Jetting with water will not be permitted. Flexible base used as select backfill shall be compacted to 95% of Tex-113E at $\pm 3\%$ of the optimum moisture content.
3. After the trench has been refilled, topsoil shall be replaced to the extent that rock excavated from the trench will be completely covered or removed and the area is returned to its original condition, except that in cultivated areas a minimum of six (6) inches of topsoil shall be replaced.

G4.06

PAYMENT

G4-4

PIPE EXCAVATION, TRENCHING,
EMBEDMENT, ENCASEMENT
AND BACKFILLING

- A. No separate payment will be made for work performed under this Specification for excavating, trenching, embedment, and backfilling. All costs incurred shall be included in the contract price for the appropriate items in the Proposal and Bid Schedule.
- B. No separate payment will be made for the bedding used in embedment. All costs incurred shall be included in the contract price for the appropriate bid item.
- C. Separate payment, if authorized by the City, will be made for crushed stone or washed gravel as described in these specifications under Section G4.02(G), SOFT SUBGRADE, at the contract unit price per cubic yard as provided in the Proposal and Bid Schedule under "Extra Gravel for Embedment."
- D. Separate payment will be made for 2,000 psi Concrete Encasement or Backfill at the contract unit price per cubic yard or linear foot as provided in the Proposal and Bid Schedule under 2,000 psi Concrete Encasement. Concrete and three (3) sack granular sand or rock material mix backfill will be measured in cubic yards or linear feet actually placed based on actual trench width not to exceed the specified maximum trench width and will be paid for at the contract price per cubic yard or linear foot as provided in the Proposal and Bid Schedule.
- E. Where authorized by the Engineer, gravel used to replace unsuitable material will be paid for at the unit bid price for Extra Gravel for embedment.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION G5 – GRANULAR FILL MATERIALSG5.01 SCOPE OF WORK

- A. This specification covers the requirements for the use of granular fill materials for this Project.

G5.02 SUBMITTALS

- A. Within 30 days after the Notice to Proceed, the Contractor shall submit to Engineer or the City for approval, technical product literature including the source of the material, gradation, type of material, and all other pertinent data to illustrate conformance to the specification found within.

G5.03 GENERAL

- A. Granular fill materials are specified in this Section, but their use for bedding pipe, pavement base, are specified in detail in sections G4 TRENCHING, BACKFILLING AND COMPACTION and SD4 FLEXIBLE BASE. The Engineer may respectively order the use of fill materials for purposes other than those specified in other Sections if, in his/her opinion, such use is advisable.

G5.04 MATERIALS

- A. Common fill shall consist of mineral soil, substantially free of clay, organic material, loam, wood, trash, and other objectionable material which may be compressible, or which cannot be compacted properly. Common fill shall not contain stones larger than six (6) inches in any dimension, broken concrete, masonry, rubble, asphalt pavement, or other similar materials. It shall have physical properties, as approved by the Engineer, such that it can be readily spread and compacted.
- B. Select common fill shall be as specified above for common fill except that the material shall contain no stones larger than two (2) inches in its largest dimension.
- C. Crushed Stone Backfill shall consist of hard, durable, particles of proper size and gradation, free from sand, loam, clay, excess fines and deleterious materials. The size of the particles shall be uniformly graded such that the following bedding specifications are met:

<u>Sieve Size</u>	<u>$\frac{3}{8}$" F % Retained</u>	<u>$\frac{1}{2}$" D % Retained</u>	<u>Washed Gravel % Retained</u>
$\frac{1}{2}$ "	0	0	0
$\frac{3}{8}$ "	0-2	5-25	---
4m	40-85	80-100	---
10m	95-100	96-100	---
$\frac{3}{4}$ "	---	---	100

- D. Crushed Stone Base shall consist of sound, durable stone, free of any foreign material, angular in shape, free from structural defects and comparatively free of chemical decay. This material shall comply with Texas Department of Transportation Item 248, Type "A", Grade 1 unless otherwise shown on the Plans or Standards. The stone shall have a maximum size of $\frac{7}{8}$ inch.
- E. Cement Stabilization Sand Backfill shall consist of a mixture of ASTM C33 fine aggregate and Type I cement. The mix shall be proportioned of two (2) sacks of cement per cubic yard.

G5.05 PAYMENT

- A. No separate payment will be made for work performed in accordance with this specification, and the cost thereof shall be included in the proper items of the Proposal and Bid Schedule.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION W1 – DUCTILE IRON PIPE AND FITTINGSW1.01 SCOPE OF WORK

- A. This specification covers the requirements to furnish and install ductile iron pipe and ductile iron pipe fittings including bracing, pipe laying, jointing, testing, blocking, and any other work that is required or necessary to complete the installation as shown on the Plans and as specified herein.

W1.02 SUBMITTALS

- A. Within 30 days of the Notice to Proceed, the Contractor shall submit to the Engineer for approval, technical product literature including the name of the pipe and fitting suppliers and a list of materials to be furnished, completely detailed working drawings and schedules of all ductile-iron pipe and fittings required, prior to each shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and ANSI/AWWA Standards specified herein.

W1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
1. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs 60,000 PSI Tensile Strength.
- B. American Water Works Association (AWWA)
1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pressure Pipe and Fittings.
 2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
 3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-inch Through 48-in for Water and Other Liquids.
 4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
 5. AWWA C115 - Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
 6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
 7. AWWA C153 - Ductile-Iron Compact Fittings, 3-inch Through 16-inch for Water and Other Liquids.
 8. AWWA C600 - Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances.
 9. AWWA C651 - Disinfection Water Mains
- C. American National Standards Institute (ANSI)
1. ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.
- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

W1.04 QUALITY ASSURANCE

- A. All ductile-iron pipe and fittings shall be from a single Manufacturer. All ductile-iron pipe to be installed under this Contract may be inspected at the foundry for compliance with these Specifications by an independent testing laboratory provided by the City. The Contractor shall require the Manufacturer's cooperation in these inspections. The cost of foundry inspection of all pipe approved for this Contract, plus the cost of inspection of disapproved pipe will be borne by the Contractor.
- B. Inspection of the pipe will be made by the Engineer or other representatives of the City after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though pipes may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery shall be marked for identification and shall immediately be removed from the job.

W1.05

MATERIALS

- A. Ductile iron pipe shall conform to AWWA C151, be manufactured from metal having a minimum tensile strength of 60,000 psi, a minimum yield strength of 42,000 psi, and a minimum elongation of 10 percent (60–42–10), and be provided in the following minimum pressure classes:
 - 1. 12-inch and smaller, Class 350.
 - 2. 14-inch through 20-inch, Class 250.
 - 3. 24-inch, Class 200.
 - 4. 30-inch and larger, Class 150.
- B. Ductile iron fittings shall conform to AWWA C110 or C153.
- C. All pipe and fittings shall have a bituminous outside coating in accordance with AWWA C151 and C110, respectively. All pipe and fittings shall be cement-mortar lined and seal coated in accordance with AWWA C104. Cement mortar lining shall be double thickness.
- D. Ductile iron pipe with push-on or mechanical joints shall be centrifugally cast pipe in accordance with AWWA C150 and C151.
- E. Restrained joints shall be restrained push-on joints, TR Flex by U.S. Pipe and Foundry; Lok-Fast by American Cast Iron Pipe Company, or equal. Joints shall be suitable for 250 psi working pressure and be fabricated of heavy section ductile iron casting. Bolts and nuts shall be low carbon steel conforming to ASTM A307, Grade B.
- F. Sleeve type couplings shall be of steel and shall be Style 38 by Dresser Manufacturing Division, Smith-Blair or equal. Couplings shall be furnished with black steel bolts and nuts and with pipe stop removed. Gaskets shall be of a material suitable for exposure to liquid within the pipe.

W1.06

POLYETHYLENE ENCASEMENT

- A. All buried ductile iron pipe and metallic fittings shall be encased with 8 mil, Type I, Grade E-1, polyethylene film conforming to AWWA C105. Class usage shall be:
 - 1. Class A - Natural Color where exposure to weather (including sunlight) is less than 48 hours total before burial.
 - 2. Class C - Black where exposure to weather (including sunlight) may be more than 48 hours.
- B. Exposure to weather shall be kept to a minimum, and in no case shall it exceed 10 days. The Class of polyethylene used shall be approved by the Engineer.
- C. Polyethylene encasement shall not be paid for separately, but the cost there of shall be included in the appropriate item of the Proposal and Bid Schedule.

W1.07

LAYING DUCTILE IRON PIPE AND FITTINGS

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe, lining or coatings. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe linings or coatings shall be repaired as directed by the Engineer. Handling and laying of pipe and fittings shall be in accordance with the Manufacturer's instruction and as specified herein.
- B. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work, and when laid, shall conform to the lines and grades required. Pipe shall not be laid unless the subgrade is free of water and in a satisfactory condition. Ductile iron pipe and fittings shall be installed in accordance with the requirements of AWWA C600 except as otherwise provided herein. All piping on this project regardless of size or class shall be placed in the embedment as shown on the detail sheets in the Plans. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner by the Contractor, at his own expense.
- C. All pipe shall be sound and clean before laying. When laying is not in progress, including lunchtime, the open ends of the pipe shall be closed by watertight plugs or other approved means. Good alignment shall be preserved in laying. The deflection at joints shall not exceed that recommended by the Manufacturer. Fittings, in addition to those shown on the Plans, shall be provided, if required, for crossing utilities which may be encountered upon opening the trench. Solid sleeves shall be used only where approved by the Engineer and the City.
- D. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be joined with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged.
- E. Joints shall be protected by eight (8) mil. Polyethylene film prior to placing concrete. Concrete shall be placed against undisturbed material, and shall not cover joints, bolts or nuts, or interfere with the removal of any joint.

W1.08

PUSH-ON JOINTS

- A. Push-on joints shall be made in accordance with AWWA C111 and the Manufacturer's instructions. Pipe shall be laid with bell ends in the direction of trenching. A rubber gasket shall be inserted in the groove of the bell end of the pipe, and the joint surfaces cleaned and lubricated. The plain end of the pipe to be laid shall then be aligned and inserted in the bell of the pipe to which it is to be joined and pushed home with a jack or by other means. After joining the pipe, a metal feeler shall be used to make certain that the rubber gasket is correctly located.

W1.09

MECHANICAL JOINTS

- A. Mechanical joints shall be made in accordance with Appendix "A" of AWWA C111 and the Manufacturer's instructions. Thoroughly clean and lubricate the joint surfaces and rubber gasket with soapy water before assembly. Bolts shall be tightened to the specified torque. Under no conditions shall extension wrenches or pipe over the handle of ordinary ratchet wrench be used to secure greater leverage.

W1.10 RESTRAINED JOINTS

- A. Restrained joints shall be installed where shown on the Plans. The joint assemblies shall be made in accordance with the Manufacturer's recommendations.

W1.11 SLEEVE TYPE COUPLINGS

- A. Couplings shall be installed where shown on the Plans. Couplings shall not be assembled until adjoining push-on joints have been assembled. After installation, apply a heavy bitumastic coating to bolts and nuts.

W1.12 POLYETHYLENE ENCASEMENT

- A. The polyethylene encasement shall be installed in accordance with either method specified in AWWA C105.

W1.13 CONCRETE AND BLOCKING

- A. 2,500 psi concrete shall be placed for blocking at each change in direction in the pipeline, in such manner as will substantially brace the pipe against undisturbed trench walls. Concrete blocking, made from Type I cement, shall have been in place four (4) days prior to testing the pipeline as hereinafter specified. Test may be made in two (2) days after completion of blocking if Type III cement is used.
- B. At all points where wet connections are made to existing lines, the existing lines shall be adequately blocked and the tapping connection fittings shall be supported by blocking up to the spring line with 2,500 psi concrete.
- C. Concrete blocking will not be measured or paid for as a separate item but the cost thereof shall be included in the proper items listed in the Proposal and Bid Schedule.

W1.14 CLEANING

- A. At the conclusion of the work thoroughly clean all of the new pipelines by flushing with water or other means to remove all dirt, stones, pieces of wood or other material which may have entered during the construction period. If obstructions remain after this cleaning, the obstructions shall be removed.

W1.15 CONNECTIONS AND APPURTENANCES

- A. The Contractor shall make the alterations and the necessary connections to existing water mains as shown on the Plans. Such connection shall be made at such time and in a manner approved by the City; in each case, when the work is started, it shall be prosecuted expeditiously and continuously until completed.
- B. Fittings, bends, plugs and valves shall be of standard manufacture and mechanical joint type to fit AWWA pipe specifications in Classes A, B, C and D, unless otherwise shown on the Plans.
- C. Payment for fittings and gate valves shall be restrained and shall be made separately under the appropriate bid items listed in the Proposal and Bid Schedule.

W1.16 LEAKAGE TESTING AND STERILIZATION

- A. All Ductile Iron Pipe shall be leak tested and sterilized according to Section CIP12 – TESTING OF PIPELINES.

W1.17

PAYMENT

- A. The pipeline, complete in place, including cleanup, will be measured for payment in linear feet along the centerline of the pipe actually installed. Measurement shall be through all fittings, specials, valves, etc., and no deduction in length shall be made for such appurtenances. Installation of the pipeline will be paid for at the unit contract price per linear foot as provided in the Proposal and Bid Schedule.
- B. Payment of the unit contract price for the items of work performed shall be the total compensation for furnishing all labor, materials, tools, equipment and incidentals and performing all work that is necessary for the installation, testing, and sterilization of the pipe, fittings, connections, blocking, embedment or placing in encasement pipe and all other appurtenances in accordance with the Plans and the provisions of the Specifications.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION W3 – VALVES, HYDRANTS AND APPURTENANCESW3.01 SCOPE OF WORK

- A. This specification covers the requirements to provide all buried valves, valves in manholes and underground vaults, hydrants and appurtenances complete with actuators and all accessories as shown on the Plans and as specified herein.

W3.02 SUBMITTALS

- A. Within 30 days of the Notice to Proceed, the Contractor shall submit to the Engineer or the City for approval, technical product literature including Manufacturer's literature, illustrations, specifications and engineering data which includes dimensions, size, materials of construction, weight, protection coating, and all other pertinent data to illustrate conformance to the specification found within. The Contractor shall also submit four (4) copies of all certified shop test results specified herein, complete operation and maintenance manuals including all copies of all approved shop drawings, and certificates of compliance where required by referenced standards: For each valve specified to be manufactured and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests, and certification of proper installation.

W3.03 REFERENCE STANDARDS

- A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.
- B. American Water Works Association (AWWA)
1. AWWA C515 - Gate Valves, three (3)-inch through 48-inch NPS, for Water and Sewage Systems.
 2. AWWA C502 - Dry-Barrel Fire Hydrants.
 3. AWWA C509 - Resilient-Seated Gate Valves, three (3) inch through 12-inch NPS, for Water and Sewage Systems.
- C. American National Standards Institute (ANSI)
1. ANSI B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings.
 2. ANSI C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- D. American Society for Testing and Materials (ASTM)
1. ASTM A48 - Gray Iron Castings.
 2. ASTM A126 - Gray Iron Castings for Valves, Flanges and Pipe Fittings
 3. ASTM A153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 4. ASTM A276 - Standard Specification for Stainless and Heat Resisting Steel Bars and Shapes.
 5. ASTM A536 - Ductile Iron Castings.
- E. Steel Structures Painting Council (SSPC)
1. SSPC SP-6 - Commercial Blast Cleaning

- F. Where reference is made to one (1) of the above standards, the revision in effect at the time of bid opening shall apply.

W3.04

DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the work.
- B. Protect threads and seats from corrosion and damage. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until time of use.
- C. Provide covers for all openings.
1. All valves three (3) inches and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.
 2. All valves smaller than three (3) inches shall be shipped and stored as above except that heavy card board covers may be furnished instead of wood.
- D. Store equipment to permit easy access for inspection and identification. Any corrosion in evidence at the time of City acceptance shall be removed, or the valve shall be removed from the job.
- E. Store all equipment in covered storage off the ground.

W3.05

COORDINATION

- A. Review installation procedures under other Sections and coordinate with the work which is related to this Section including buried piping installation and site utilities.
- B. Contractor shall coordinate the location and placement of concrete thrust blocks when required.

W3.06

GENERAL

- A. All valves shall open counter-clockwise.
- B. The use of a Manufacturer's name and/or model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- C. Valves shall be of the size shown on the Plans or as noted, and as far as possible equipment of the same type shall be identical and from one Manufacturer.
- D. Valves shall have the name of the maker, nominal size, flow directional arrows, working pressure for which they are designed and standard to which they are manufactured cast in raised letters on some appropriate part of the body.
- E. Unless otherwise noted, valves shall have a minimum working pressure of 200 psi or be of the same working pressure as the pipe they connect to, whichever is higher, and suitable for the pressures noted where they are installed.
- F. Valves shall be of the same nominal diameter as the pipe or fittings they are connected to. Except as otherwise noted, joints shall be mechanical joints, with joint restraint where the adjacent piping is required to be restrained.
- G. Valves shall be constructed for buried service.

W3.07

VALVE BOXES

- A. All gate valves shall be provided with extension shafts (where the operating nut is greater than five (5) feet below grade), operating nuts and valve boxes as follows:

1. Extension shafts shall be steel and the operating nut shall be two (2) inches square. Shafts shall be designed to provide a factor of safety of not less than four (4). Operating nuts shall be pinned to the shafts.
2. Valve boxes shall be a heavy-pattern cast iron, three (3) piece, telescoping type box with dome base suitable for installation on the buried valves. Inside diameter shall be at least 5¼-inches. Barrel length shall be adapted to the depth of cover, with a lap of at least six (6) inches when in the most extended position. Covers shall be cast iron with integrally-cast direction-to-open arrow and "WATER" shall be cast in the cover when used on a water line or "SEWER" when used on a wastewater force main. Aluminum or plastic are not acceptable. A means of lateral support for the valve extension shafts shall be provided in the top portion of the valve box. The valve box lid shall be furnished with a pentagon-head bolt for locking.
3. The upper section of each box shall have a bottom flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the stuffing box and operating nut of the valve and shall be oval.
4. An approved operating key or wrench shall be provided.
5. All fasteners shall be Type 304 stainless steel.

W3.08

RESILIENT SEATED GATE VALVES

- A. Valves shall be manufactured in accordance with AWWA C509.

Acceptable Gate Valves are:

1. American Flow Control – Series 2500
 2. Mueller – 2360 Series
 3. Clow
- B. Valves shall be provided with a minimum of two (2) O-ring stem seals.
- C. Bonnet and gland bolts and nuts shall be either fabricated from a low alloy-steel for corrosion resistance or electroplated with zinc or cadmium. The hot-dip process in accordance with ASTM A153 is not acceptable.
- D. Wedges shall be totally encapsulated with rubber.
- E. Units shall be, in addition, UL and FM approved.
- F. Resilient wedge gate valves shall be furnished and installed in sizes and shall be manufactured in accordance with the latest AWWA C-509 and cast iron shall conform to the latest ASTM A-126 standards. Gate valves furnished under these specifications shall be of the solid wedge, resilient seat type with cast iron/ductile iron body and bronze stem designed for 250 pounds per square inch working pressure. All gate valves shall be tested hydrostatically to 400 pounds per square inch. Gate valves shall meet the latest AWWA standard specifications (C-509).
- G. The seat shall be made of Styrene Butadiene rubber and provide a positive water tight seal. The seat shall be permanently bonded or mechanically attached to the wedge with stainless steel screws. If bonded, ASTM P-429 requirements shall be followed. Non-rising stem gate valves shall be equipped with "O" ring type packing gland consisting of at least two (2) "O" rings. The thrust collar shall work in an "O" ring seal lubricant reservoir or against bearings or washers, above and below constructed of Delrin or approved equal material. Gate valve stems, shall be fabricated from solid bronze rod having a tensile strength of not less than 60,000 pounds per square inch, and a minimum yield strength of 30,000 pounds per square inch.

- H. Cast iron body shall be of iron with an even grain and shall possess a tensile strength of not less than 32,000 pounds per square inch. All bronze castings, except the stem, shall have a tensile strength of not less than 30,000 pounds per square inch. The entire internal valve body surfaces shall be coated with a factory applied two (2) component epoxy system or approved equal. The seating surface shall be machined or otherwise constructed to provide a smooth, even surface for the resilient seat. All valves shall open left (counter clockwise) and have a two (2) inch square wrench nut unless specified otherwise.

W3.09

TAPPING SLEEVES AND TAPPING VALVES

- A. Tapping sleeves shall be of cast iron epoxy coated, designated for working pressure not less than 200 psi. Armored end gaskets shall be provided for the full area of the sleeve flanges. Sleeves shall be as manufactured by A.P. Smith Division of U.S. Pipe, Mueller, Clow, or equal. Nuts and bolts shall be Type 304 stainless steel.
- B. Size-on-Size tapping sleeve shall be ductile iron or cast iron.
- C. Tapping valves shall conform to the requirements specified above for gate valves except that one (1) end shall be flanged and one (1) mechanical. Tapping valves shall be provided with an oversized opening to permit the use of full size cutters. Tapping valves shall be Ford B81-777 or equal.

W3.10

CHECK VALVESA. Controlled Closing Swing Check Valves (lever & weight)

1. Check valves shall be of the controlled closing swing type. The controlled closing swing check valves shall be guaranteed to operate under severe conditions as check valves. The valve shall be designed to open smoothly, provide full pipe line flow, permit minimum head loss and close at a controlled rate of speed for the final predetermined portion of its stroke. All bolts and nuts used in the assembly shall be steel, commercial.
2. The valve body shall be Cast Iron ASTM A126-B/ductile iron ASTM A536. The disc arm and chamber level shall be of heavy steel construction and keyed to the hinge shaft. The hinge shaft shall be of 18-8 stainless steel and of adequate diameter to withstand a complete hydraulic unbalance pressure of 125 psi on the valve disc. A single cushioning device mounted on the external side of the valve shall control the valve closure by way of the interchange of oil to and from an oil reservoir. The use of air or gas pressurized oil reservoir shall not be permitted. The oil plunger assembly shall be rigidly attached to the valve body by shoulder bolts or dowel pins to prevent fretting.
3. The Manufacturer, if required by the Engineer or the City, shall submit design calculations of principle component stresses to substantiate the integrity of the valve for the working pressure involved.
4. The valve when closed shall be tight seating by way of a resilient replaceable seat against a bronze seat ring in the body.

5. Valves shall be as manufactured by GA Industries or Series 6000 as manufactured by APCO. The City reserves the right to inspect all valves before shipment is made. Any failure of valves to operate satisfactorily during the first year of installation due to faulty workmanship or defective material shall be replaced and made good by the Manufacturer. Under these specifications, any valve stuffing box that leaks for any reason or because of excessive wear or deterioration of packing, shall be reason for classification as defective material.

B. Slanted / Tilted Check Valves

1. Slanted or tilted check valves shall be furnished and installed where shown on the Plans.
2. The body of the valve shall be ductile iron or cast iron with access ports to the disc. The disc shall be cast iron. The seat and disc rings shall be bronze. Pivot pins and bushings shall be bronze or stainless steel. The valve shall include a localized indicator of the position of the valve.
3. The valves shall include a top mounted oil dash pot to prevent slamming of the disc. The dash pot shall control the last 10% of closure of the disc. The speed of closure within this 10% shall be adjustable.
4. Valves shall be APCO Slanting Disc, Valmatic or Golden Anderson Tilted Disc or approved equal.

W3.11 FLANGES

- A. Flanges shall be cast solid and faced accurately at right angles to the axis of the casting. Dimensions and drilling of flanges shall be in accordance with the American Standard Association for a working pressure of 125 pounds per square inch. Special drilling shall be provided where necessary.

W3.12 FIRE HYDRANTS

- A. Fire hydrants shall be dry-barrel type conforming to the requirements of the latest revision of AWWA C502. Hydrants shall be designed such that the hydrant valve closes with line pressure preventing loss of water and consequent flooding in the event of traffic damage.
- B. Hydrants shall have six (6)-inch mechanical joint inlet connections, two 2½-inch hose connections and one 4½-inch pumper connection. Threads for the hose and pumper connections shall be in accordance with National Standard Thread. Hydrants shall be according to Manufacturer's standard pattern. Hydrants shall be equipped with "O" ring packing. Each nozzle cap shall be provided with a Buna-N rubber washer.
- C. Hydrants shall be so arranged that the direction of outlets may be turned 90 degrees without interference with the drip mechanism or obstructing the discharge from any outlet. The body of the hydrant shall be equipped with a breakable flange, or breakable cast iron flange bolts, just above the grade line.
- D. A bronze or rustproof steel nut and check nut shall be provided to hold the main hydrant valve on its stem.
- E. Hydrant valve opening shall have an area at least equal to that area of a 4½-inch minimum diameter circle and be obstructed only by the valve rod. Each hydrant shall be able to deliver 500 gallons minimum through its two 2½-inch hose nozzles when opened together with a loss of not more than two (2) psi in the hydrant.
- F. Hydrants shall be designed for installation in a trench that will provide minimum cover as noted on Plans and for the flange to be 3 ½-inches above ground surface. Hydrant extensions shall be as manufactured by the company furnishing the hydrants and of a style appropriate for the hydrants as furnished.
- G. Hydrants shall be provided with an automatic and positively operating, non-corrodible drain or drip valve so as to drain the hydrant completely when the main valve is shut. A drain valve operating by

springs or gravity is not acceptable.

- H. Operating stems whose threads are located in the barrel or waterway shall be of manganese bronze, everdur, or other high-quality non-corrodible metal, and all working parts in the waterway shall be bronze to bronze.
- I. Hydrants shall open by turning operating nut to left (counter-clockwise) and shall be marked with a raised arrow and the word "open" to indicate the direction to turn stem to open hydrant.
- J. Hydrants shall be furnished with caps, double galvanized steel hose cap chain, galvanized steel pumper hose cap chain, a galvanized steel chain holder and any other hooks and/or appurtenances required for proper use.
- K. Hydrant operating nut shall be AWWA Standard pentagonal type measuring 1½-inch point to flat.
- L. Hydrants shall be hydrostatically tested as specified in AWWA C502.
- M. Hydrants shall be of the following:
 - 1. Kennedy – K81
 - 3. American Darling – B84B
 - 2. Clow Medallion
- N. All iron work to be set below ground, after being thoroughly cleaned, shall be painted with two (2) coats of asphalt varnish specified in AWWA C502. Iron work to be left above ground shall be factory primed and painted silver using a high grade enamel paint of quality and color to correspond to the present standard of the City.
- O. Fire hydrants shall be installed on the same side of the street or roadway as the water main and shall be installed plumb and true.
- P. Heel and thrust blocks shall be placed in undisturbed soil as shown in the details of the Plans.
- Q. Double blue reflector "HYE – LITES" brand as manufactured by pavement markers ink shall be installed at the centerline of the street or roadway perpendicular to the hydrant.

W3.13

CORPORATION STOPS

- A. Corporation stops shall be brass, not less than 1-inch in diameter and shall be installed where shown, specified or required.
- B. Provide corporation stops as manufactured by the following:
 - 1. Ford Company

W3.14

COMBINATION AIR-VACUUM RELIEF VALVES

- A. The air-vacuum release valves shall be installed as shown on the Plans. The valve body shall be of cast iron ASTM A126-B; the floats, float guide, and stem shall be of Type 316 stainless steel. The resilient seat shall be of Buna N. The valve shall be suitable for 150 psig working pressure. Valve shall have standard NPT inlets and outlet ports with diameters as indicated on the Plans. Valve shall be Model 200A Series by APCO Valve and Primer Corporation, Schaumburg, IL, or approved equal.

W3.15

SURFACE PREPARATION AND SHOP COATINGS

- A. The interior ferrous metal surfaces, except finished or bearing surfaces, shall be blast cleaned in accordance with SSPC SP-6 and painted with two (2) coats of an approved two (2) component coal tar

epoxy coating specifically formulated for potable water use. The coating used must appear on the current edition of the United States Environmental Protection Agency's list entitled "Accepted Categories and Subcategories of Coatings, Liners and Paints for Potable Water Usage."

- B. Exterior ferrous metal surfaces of all buried valves and hydrants shall be blast cleaned in accordance with SSPC SP-6 and given two (2) shop coats of a heavy coat tar enamel or an approved two (2) component coat tar epoxy paint.

W3.16

INSPECTION AND PREPARATION

- A. During installation of all valves and appurtenances, the Contractor shall verify that all items are clean, free of defects in material and workmanship and function properly.
- B. All valves shall be closed and kept closed until otherwise directed by the Engineer or the City.

W3.17

INSTALLATION OF BURIED VALVES AND VALVE BOXES

- A. Buried valves shall be cleaned and manually operated before installation. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the valve box. Valves shall be set on a firm foundation and supported by tamping pipe bedding material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade. The valve box shall be set so as not to transmit traffic loads to the valve.
- B. Before backfilling, all exposed portions of any bolts shall be coated with two (2) coats of bituminous paint.

W3.18

INSTALLATION OF TAPPING SLEEVES AND VALVES

- A. The City of Georgetown shall be contacted and their permission granted prior to tapping a line. The required procedures and time table shall be followed exactly.
- B. Installation shall be made under pressure and flow shall be maintained. The diameters of the tap shall be a minimum of $\frac{1}{4}$ -inch less than the inside diameter of the branch line.
- C. The entire operation shall be conducted by workers experienced in the installation of tapping sleeves and valves. The tapping machine shall be furnished by the Contractor.
- D. Determine the location of the line to be tapped to confirm that the proposed location will be satisfactory and that no interference will be encountered such as joints or fittings. No tap or sleeve will be made closer than three (3) feet from a pipe joint.
- E. A tapping sleeve and valve with boxes shall be set squarely centered on the line to be tapped. Adequate support shall be provided under the sleeve and valve during the tapping operation. Thrust blocks or other permanent restraint acceptable to the Engineer and the City shall be provided behind all tapping sleeves. Proper tamping of supporting pipe bedding material around and under the valve and sleeve is mandatory for buried installations.
- F. After completing the tap, the valve shall be flushed to ensure that the valve seat is clean. All proper regulatory procedures (including disinfection) shall be followed exactly.

W3.19

INSTALLATION OF FIRE HYDRANTS

- A. Fire hydrants shall be set at the locations as shown on the Plans and bedded on a firm foundation. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing pipe. A drainage pit as detailed on the Plans shall be filled with $\frac{3}{4}$ -inch washed rock gravel and compacted. The hydrants shall be set upon a slab of concrete not less than four (4)-inches thick and 15-inches square. During backfilling, additional screened gravel shall be brought up around and six (6) inches over the drain port. Each hydrant shall be set in true vertical alignment and properly braced.

- B. 2,500 psi concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Plans. Eight (8) mil. Polyethylene film shall be placed around the hydrant elbow before placing concrete. CARE SHALL BE TAKEN TO ENSURE THAT CONCRETE DOES NOT PLUG THE DRAIN PORTS.
- C. All connections from the main to the fire hydrants shall be anchoring mechanical joints designed to prevent movement due to thrust or pressure.
- D. The hydrant shall be tied to the pipe with suitable rods or clamps, and shall be coated with Koppers 300 or approved equal at a minimum of 8 mil. thick. Bolts shall have a zinc bolt cover per AWWA. Hydrant paint shall be touched up as required after installation.
- E. Fire hydrants shall be factory primed and painted silver using a high grade enamel.
- F. Fire sprinkler lines shall be protected by a reduced pressure zone (RPZ). All fire lines shall be ductile iron pipe. All private fire lines shall be separated by double detecta check.

W3.20

FIELD TESTS AND ADJUSTMENTS

- A. Conduct a functional field test of each valve, including actuators and valve control equipment, in presence of Engineer or the Representative of the City to demonstrate that each part and all components together function correctly. All testing equipment required shall be provided by the Contractor at his/her sole expense.

W3.21

PAYMENT

- A. Gate valves, tapping sleeves and tapping valves, fire hydrants, and air and vacuum relief valves complete in place as shown on the Plans and as specified, will be paid for at the unit contract price per each as provided in the Proposal and Bid Schedule.
- B. The unit price per each installation shall be the total compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work including excavation, base blocking, disposal of surplus materials and backfill in conformance with the Plans and these specifications. The six (6) inch connection pipe, six (6) inch gate valve, test station, concrete collar, thrust block, drain pit, concrete pad, rods, bolts, paint, protective coatings, and fittings for fire hydrants shall not be paid for separately.
- C. Fire hydrants shall be furnished with the proper length of barrel to comply with these specifications. Barrel extensions will not be measured and paid for separately.
- D. No separate payment shall be made for work performed in accordance with this specification, other than that listed in Parts A-C of this subsection, and the cost thereof shall be included in the proper items of the Proposal and Bid Schedule.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION W4 – ENCASEMENT PIPEW4.01 SCOPE OF WORK

- A. This specification covers the requirements for furnishing and installing encasement pipe complete in place including any required spacers and end plugs as shown on the plans and specified herein.

W4.02 SUBMITTALS

- A. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer for approval, technical product literature including type and Manufacturer of pipe, spacers, and end plugs, and all other pertinent data to illustrate conformance to the specification found within.

W4.03 GENERAL

- A. Where pipe is required to be installed under highways, streets, or other facilities, construction shall be made in such a manner that will not interfere with the operation of the street, highway, or other facility, and shall not weaken or damage any embankment or structure.
- B. All carrier pipe shall be laid to the required line and grade within the specified limits through the encasement pipe. Carrier pipe shall be handled and placed in the encasement pipe by use of proper skids, wedges, guide fails or other approved means. Care shall be taken that once the pipe is in place to line and grade, it shall not be disturbed or become displaced. All carrier pipe shall have restrained joints.

W4.04 MATERIALS

- A. Encasement pipe shall be smooth steel 35,000 psi yield strength with thickness according to the following table:

Carrier Size	Minimum Encasement Steel Casing Size	Minimum Casing Thickness
(Inner Diameter)	(Inner Diameter)	(Inches)
4"	14"	0.2500
6"	16"	0.2500
8"	18"	0.2500
10"	20"	0.3125
12"	24"	0.3175
14"	24"	0.375
16"	30"	0.4375
18"	30"	0.4375
20"	36"	0.500
24"	42"	0.500
27"	42"	0.500
30"	48"	0.500
33"	48"	0.500
36"	54"	0.500
39"	60"	0.500
42"	60"	0.500

- B. Casing spacers shall be bolt-on style with a shell made in two (2) sections of Heavy T-304 stainless steel. Connecting flanges shall be ribbed for extra strength. Casing spacers shall have runners made of ultra high molecular weight polymer, with a minimum height of two (2) inches. Wedges shall not be used between the top of the carrier pipe and the inside of the encasement pipe. Casings spacers shall have a minimum of one (1) inch clear distance between the runners on top of the casing spacers and the inside of the encasement pipe. Prior to inserting the carrier pipe, all water shall be pumped out of the encasement pipe to at least a point where no more than two (2) inches of water remains. Spacers shall be required within at least three (3) feet from both openings of the encasement pipe and spaced no greater than six (6) feet through out the encasement pipe. Casing spacers will not be paid for directly but shall be considered subsidiary to the bid item of encasement pipe. . Casing spacers shall be made by Cascade Waterworks MFG Company or approve equal.
- C. End Plugs shall be provided as required and as specified by the pipe manufacturer.

W4.05

PAYMENT

- A. Separate payment will be made for Steel Encasement Pipe per linear foot as called for on the Plans and set forth in the Proposal and Bid Schedule.
- B. All costs incurred for furnishing and installing encasement pipe shall include all labor, materials, tools, equipment and incidentals necessary to perform all work or whatever nature required to complete the specific operation.

END OF SECTION

TECHNICAL SPECIFICATIONSSECTION C9 – FLOWABLE BACKFILLC9.01 SCOPE OF WORK

- A. This specification covers the requirements for the furnishing and placing of flowable backfill as indicated on the Plans.

C9.02 SUBMITTALS

- A. Within 30 days after the Notice to Proceed, the Contractor shall submit to the Engineer or the City for approval, technical product literature including flowable backfill mix design, curing method, and all other pertinent data to illustrate conformance to the specification found within.

C9.03 CONSTRUCTION METHODS

- A. All trenches to be backfilled shall be properly prepared according to the Plans and Specifications prior to placement of flowable backfill.

C9.04 FLOWABLE BACKFILL

- A. Flowable backfill shall be placed in accordance with the details and to the dimensions shown on the Plans or as established by the City.
- B. The mixture shall consist of 188 pounds of Type III Portland cement, 94 pounds of fly ash and 3,000 pounds of sand per cubic yard of flowable backfill.
- C. The minimum allowable slump for flowable backfill is 6-inches.
- D. Immediately following the placement of flowable backfill, it shall be cured in accordance with Section C1- CONCRETE STRUCTURES.

C9.05 PAYMENT

- A. Payment for flowable backfill shall be subsidiary to the appropriate bid items of the Proposal and Bid Schedule.

END OF SECTION

City of Austin Referenced Specifications

ITEM NO. 501S - JACKING OR BORING PIPE 9-26-12

501S.1 - Description

This item shall govern furnishing and installing of encasement pipe by methods of jacking or boring as indicated on the Drawings and in conformity with this specification. This item shall also include, but not be limited to other constructions activities such as traffic control measures, excavation, removal of all materials encountered in jacking or boring pipe operations, disposal of all material not required in the work, grouting, end seal installation, backfilling and re-vegetation.

This specification is applicable for projects or work involving either inch-pound or SI units. Within the text and accompanying tables, the inch-pound units are given preference followed by SI units shown within parentheses.

501S.2 - Submittals

The submittal requirements for this specification item shall include:

- A. Shop drawings identifying proposed jacking or boring method complete in assembled position
- B. Trench Safety Plan including pits, trenches and sheeting or bracing if necessary,
- C. Design for jacking or boring head,
- D. Installation of jacking or boring supports or back stop,
- E. Arrangement and position of jacks and pipe guides, and
- F. Grouting plan,

501S.3 - Materials

A. Pipe

Carrier pipe and encasement pipe shall conform to Standard Specification Item Nos. W4, "Encasement Pipe" ,W2, "Polyvinyl Chloride Pipe" , and W1, "Ductile Iron Pipe", and shall be size, type materials, thickness and class indicated on the Drawings, unless otherwise specified.

B. Grout

Grout for void areas shall consist of 1 part Portland cement and 4 parts fine, clean sand mixed with water.

501S.4 - Construction Methods

A. General

The Contractor is responsible for:

1. Adequacy of jacking and boring operations,
2. Installation of support systems as indicated on the Drawings,
3. Provision of encasement and carrier pipe, and
4. Execution of work involving the jacking operation, the wet or dry method of boring and the installation of encasement pipe simultaneously.

The Contractor shall have sole responsibility for the safety of the jacking and boring operations and for persons engaged in the work. The Contractor's attention is directed to the Construction Industry Occupational Safety and Health Administration (OSHA) Standards (29 FR 1926/1920) as published in U.S. Department of Labor publication OSHA 2207, latest revision, with particular attention to Subpart S. The Contractor shall conform to the requirements in accordance with Standard Specification Item 509S, "Trench Safety System" and shall provide an appropriate Trench Safety Plan.

When the grade of the pipe at the jacking or boring end is below the ground surface, suitable pits or trenches shall be excavated to provide sufficient room to conduct the jacking or boring operations and for placement of end joints of the pipe. In order to provide a safe and stable work area, the excavated area shall be securely sheeted and braced to prevent earth caving in accordance with the Trench Safety Plan.

The location of the work pit and associated traffic control measures required for the jacking or boring operations shall conform to the requirements of the City of Austin Transportation Criteria Manual and TxDOT Manual on Uniform Traffic Control Devices.

Where installation of pipe is required under railroad embankments, highways, streets, or other facilities by jacking or boring methods, construction shall be undertaken in such a manner that it will not interfere with operation of any railroad, street, highway, utility or other facility and shall not weaken or damage any embankment or structure. All appropriate permits shall be acquired prior to the initiation of the work.

During construction operations, and until the work pits are backfilled and fill material compacted, traffic barricades and warning lights to safeguard traffic and pedestrians shall be furnished and maintained by the Contractor. The Contractor shall submit the proposed pit location and traffic control plan for review by the Engineer or designated representative. The Review by the Engineer or designated representative, however, will not relieve the Contractor of the responsibility to obtain specified results in a safe, professional manner.

When grade of pipe at jacking or boring end is below ground surface, suitable pits or trenches shall be excavated for the purpose of conducting the jacking or boring operations and for joining pipe. Work shall be securely sheeted and braced as indicated on the Trench Safety Plan to prevent earth caving and to provide a safe and stable work area.

The pipe shall be jacked or bored from the low or downstream end, if possible. Minor lateral or vertical variation in the final position of pipe from line and grade established by Engineer or designated representative will be permitted at the discretion of Engineer or designated representative provided that such variation is regular and occurs only in one direction and that the final grade of the flow line conforms to the specified direction.

When conforming to details indicated on the drawings, but the bottom of the work pit is unstable or excessively wet or the installation of water and wastewater pipe will result in less than 30 inches (750 mm) of cover, the Contractor shall notify the Engineer or designated representative. The Engineer or designated representative may require the Contractor to install a concrete seal, cradle, cap or encasement or other appropriate action.

Immediately after jacking or boring is complete and the encasement pipe is accurately positioned and approved for line and grade, the clear space between the pipe and the surrounding excavated material shall be completely filled by pressure grouting for entire length of installation if the encasement pipe is 36 inches or larger in diameter.

After placement of the carrier pipe is complete, the ends of the encasement pipe shall be sealed with end seals meeting SPL WW-575A.

As soon as possible after the carrier pipe(s) and end seals are completed, the work pits or trenches, which are excavated to facilitate these operations, shall be backfilled. The backfill in the street ROW

shall be compacted to not less than 95 percent of the maximum density conforming to TxDOT Test Method Tex-114-E, "Laboratory Compaction Characteristics & Moisture-Density Relationship of Subgrade & Embankment Soil". Field density measurements will be made in accordance with TxDOT Test Method Tex-115-E, "Field Method for Determination of In-Place Density of Soils and Base Materials".

Where the characteristics of soil, size or size of proposed pipe dictate that tunneling is more satisfactory than jacking or boring, a tunneling method may be submitted for acceptance by Engineer or designated representative.

B. Jacking

Heavy duty jacks suitable for forcing the pipe through the embankment shall be provided. In operating the jacks, an even pressure shall be applied to all jacks used so that the pressure will be applied to the pipe uniformly around the ring of the pipe. A suitable jacking frame or back stop shall be provided. The pipe to be jacked shall be set on guides properly braced together, to support the section of the pipe and to direct it in the proper line and grade. The complete jacking assembly shall be placed in order to line up with the direction and grade of the pipe. In general, the embankment material shall be excavated just ahead of the pipe, the material removed through the pipe and the pipe forced through embankment by jacking, into the space thus provided.

The excavation for the underside of the pipe, for at least 1/3 of the circumference of the pipe, shall conform to the contour and grade of the pipe. A clearance of no more than 2 inches (50 mm) may be provided for the upper half of the pipe. This clearance shall be tapered to zero at the point where excavation conforms to contour of pipe.

The distance that excavation shall extend beyond the end of the pipe depends on the character of material encountered, but it shall not exceed 2 feet (0.6 meter) in any case. This distance shall be decreased, when directed by the Engineer or designated representative, if the character of the material being excavated makes it desirable to keep the advance closer to the end of the pipe.

The Contractor may use a cutting edge of steel plate around head end of the pipe extending a short distance beyond the end of pipe with inside angles or lugs to keep cutting edge from slipping back onto the pipe.

When jacking of the pipe is begun, all operations shall be carried on without interruption, insofar as practical, to prevent the pipe from becoming firmly set in the embankment.

Any pipe damaged in jacking operations shall be removed and replaced by the Contractor at its entire expense.

C. Boring

The boring shall proceed from a work pit provided for the boring equipment and workers. Excavation for the work pits and the installation of shoring shall be as outlined in the Trench Safety Plan. The location of the pit shall be approved by the Engineer or designated representative. The boring shall be done mechanically using either a pilot hole or the augur method.

In the pilot hole method an approximate 2 inch (50 mm) pilot hole shall be bored the entire length of the crossing and shall be checked for line and grade on the opposite end of the bore from the work pit. This pilot hole shall serve as the centerline of the larger diameter hole to be bored.

When the augur method is used, a steel encasement pipe of the appropriate diameter equipped with a cutter head to mechanically perform the excavation shall be used. Augurs shall be of sufficient diameter to convey the excavated material to the work pit.

Excavated material will be removed from the working pit and disposed of properly. The use of water or other fluids in connection with the boring operation will be permitted only to the extent to lubricate cuttings. Water jetting will not be permitted.

In unstable soil formations, a gel-forming colloidal drilling fluid, that consists of at least 10 percent of high grade carefully processed bentonite, may be used to consolidate the drill cuttings, seal the walls of the hole and furnish lubrication to facilitate removal of the cuttings from the bore.

D. Tunneling

Where the characteristics of the soil, the size of the proposed pipe, or the use of monolithic sewer would make the use of tunneling more satisfactory than jacking or boring; or when indicated on the drawings, a tunneling method may be used, with the approval of the Engineer or designated representative.

E. Joints

If reinforced concrete pipe is used, the joints shall be in accordance with TxDOT Specification Item 464, "Reinforced Concrete Pipe".

501S.5 - Measurement

Jacking or boring pipe will be measured by the linear foot (meter: 1 meter equals 3.281 feet) of pipe complete in place. Such measurement will be made between the ends of the pipe along the central axis as installed.

501S.6 - Payment

The work performed and materials furnished as prescribed by this item and measured as provided under "Measurement" will be paid for at the unit bid price per linear foot for "Jacking or Boring Pipe" as the case may be, of type, size and class of encasement pipe indicated on the Drawings. The price shall include full compensation for furnishing, preparing, hauling and installing required materials, encasement pipe, end seals, for grouting and for labor, tools, equipment and incidentals necessary to complete work, including excavation, backfilling and disposal of surplus material.

The Carrier pipe shall be paid at the unit price bid for Standard Specification Item W1, "Ductile Iron Pipe", W2, "Polyvinyl Chloride (PVC) Pipe - Water".

Payment when included as a contract pay item, will be made under one of the following:

Pay Item No. SS501S-___	Jacking or Boring _____ In. Pipe, Class _____	Per Linear Foot.
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APPENDIX A
QUALITY CONTROL / QUALITY ASSURANCE PROGRAM

Approved December 2007

Appendix A

Quality Control / Quality Assurance Program

Section 1. Overview

Introduction

Williamson County has established the following Quality Control (QC) / Quality Assurance (QA) Program to assure that the materials and workmanship incorporated into any roadway or highway construction project are in reasonable conformity with the requirements of the approved plans and specifications, including any approved changes. It consists of an "Acceptance Program" and a "QA Program" based on test results obtained by qualified persons and equipment.

This QC/QA Program allows for the use of validated contractor-performed QC test results as part of an acceptance decision. It also allows for the use of test results obtained by commercial laboratories in the QA Program in acceptance decisions, as well. The effectiveness of the "Acceptance Program" shall be the responsibility of the Construction Observer.

Definitions

Acceptance Program - All factors that comprise the Williamson County's determination of the quality of the product as specified in the contract requirements. These factors include QC and QA verification sampling and testing, and inspection.

Quality Control Program - The contractor's systematic program detailing the control measures and reporting requirements necessary to achieve reasonable conformance with the requirements of the approved plans and specifications.

Quality Assurance Program - Activities that are an unbiased and independent evaluation of all the inspection, sampling and testing procedures used in the acceptance program.

Proficiency Samples - Homogenous samples that are distributed and tested by two or more laboratories and/or personnel. The test results are compared to assure that the laboratories and/or personnel are obtaining the same results.

Qualified Laboratories - Laboratories that are capable as defined by appropriate programs established by Williamson County and as indicated in the "Laboratory Qualification Program". As a minimum, the qualification program shall include provisions for checking testing equipment and the laboratory shall keep records of calibration checks.

Qualified Sampling and Testing Personnel - Personnel who are capable as defined by appropriate programs established as stated in Section 6 of this Appendix.

Quality Assurance – All those planned and systematic actions necessary to provide confidence that a product or service will satisfy given requirements for quality.

Quality Control - All contractor/vendor operational techniques and activities that are performed or conducted to fulfill the contract requirements.

Vendor – A supplier of project-produced material that is not the contractor.

Verification Sampling and Testing - Sampling and testing performed to validate the quality of the product, which consists of the QC and QA sampling and testing.

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Section 2. Acceptance Program

Materials incorporated into any roadway or highway construction project shall be subject to verification sampling and testing, and inspection as part of the QC program outlined below:

- Quality Control Inspection
 - ◆ Contractor-performed QC Inspection will be required as part of the acceptance decision. Inspection check lists for the following structural items shall be completed and submitted as part of the acceptance program:

- Item 400 – Excavation & Backfill
 - Item 416 – Drilled Shaft Foundations
 - Item 420 – Concrete Structures
 - Item 421 – Hydraulic Cement Concrete
 - Item 422 – Bridge Deck
 - Item 423 – Retaining Wall
 - Item 425 – Precast Pre-stressed Concrete Structural Members
 - Item 440 – Reinforcing Steel
 - Item 442 – Metal for Structures
 - Item 462 – Concrete Box Culverts
 - Item 464 – Reinforced Concrete Pipe

Sample Inspection check lists are included at the end of this Appendix.

- ◆ The contractor shall designate individual(s) responsible for the QC Inspection for the project or each work element thereof. The designated QC individual(s) will maintain responsibility for providing reports detailing the compliance of each work element to the requirements of the approved project plans and specifications.
 - ◆ The QC report will detail requirements of the approved project plans and specifications and measures initiated to ensure reasonable conformity.
 - ◆ The contractor shall submit the QC Plan for acceptance detailing the individuals & methods(s) intended to be used to obtain reasonable conformance to the approved project plans and specifications.
- Quality Control Sampling, Testing and frequency
 - ◆ Contractor-performed QC sampling and testing will be used as part of an acceptance decision.
 - ◆ The frequency and location will be according to the "Project Test" frequency as shown in Appendix B. This project has been designed utilizing TxDOT Specifications; therefore, the 2005 TxDOT Guide Schedule for Sampling and Testing has been adopted for the testing program. As a County-developed project, all references to TxDOT in the testing program shall be understood to mean Williamson County, and all references to the Engineer shall be understood to mean the County Engineer or his designated representative(s).
 - ◆ These QC sampling and testing personnel, laboratories, and equipment shall be qualified according to the "Sampling and Testing Personnel Qualification Program" and the "Laboratory Qualification Program" and shall be evaluated under the "Quality Assurance Program" contained herein.

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- ◆ Any equipment used to perform QC sampling and testing shall be subject to an evaluation by QA sampling and testing personnel. This evaluation shall include calibration checks and split or proficiency sample tests. The requirements for, and frequency of, equipment calibration are shown in Appendix B. Acceptable tolerance limits for the comparison of test results from split or proficiency samples are shown in "Acceptable Tolerance Limits for Independent Assurance."
- ◆ Any individual who performs verification or QC sampling and testing shall be evaluated by QA sampling and testing personnel. This evaluation shall include observations and split or proficiency sample testing. Acceptable tolerance limits for the comparison of test results for split or proficiency samples are shown in "Acceptable Tolerance Limits for Quality Assurance."
- ◆ Furthermore, these QC test results may be validated by verification test results obtained from independently taken samples at the direction of the Construction Observer or the County.

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Section 3. Quality Assurance Program

This Quality Assurance Program; as deemed necessary by the County or the Construction Observer; shall evaluate all QC inspection, sampling and testing procedures, personnel, and equipment used as part of the acceptance program.

- QA Inspection
 - ◆ The Construction Observer will be responsible for QA inspection. The inspection will be performed at periodic intervals to assure compliance with the accepted QC program, as well as to assure reasonable close conformity to the approved project plans and specifications.
- Sampling and Testing Frequency and Location
 - ◆ Quality Assurance sampling and testing shall be performed at the same location and frequency established for the Project Tests in the "Guide Schedule of Sampling and Testing" found in Appendix B.
 - ◆ The frequency for the "Independent Assurance Tests" shall be as directed by the Construction Observer.
- Testing Equipment
 - ◆ Laboratory testing equipment used for QA sampling and testing shall be qualified according to the "Laboratory Qualification Program."
 - ◆ All laboratories used for QA sampling and testing must be AASHTO accredited and listed as an accepted Lab by the County.
 - ◆ The frequency for qualifying QA sampling and testing equipment shall not exceed one (1) year or as directed by the Construction Observer.
 - ◆ Calibration/verification is required whenever the laboratory or equipment is moved.
 - ◆ The QA equipment shall be other than that used for performing verification or QC testing.
- Testing Personnel
 - ◆ Laboratory personnel who perform QA sampling and testing shall be in accordance with the "Sampling and Testing Personnel Qualification Program" Included herein.
 - ◆ The individuals performing QA sampling and testing shall be other than those who perform other verification or QC testing.
- Comparison of QC and QA Test Results
 - ◆ Acceptable tolerance limits for the comparison of test results from split and proficiency samples are shown in "Acceptable Tolerance Limits for Independence Assurance."
 - ◆ If the comparison of the test results do not comply with the tolerances, an engineering review of the test procedures and equipment shall be performed immediately to determine the source of the discrepancy.
 - ◆ Corrective actions must be identified and incorporated as appropriate.

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Test results from all samples involved in the Quality Assurance Program shall be documented and reported in the project files.

- Dispute Resolution System
 - ◆ Testing disputes arising between the Construction Observer, or his/her designated agents, and the Contractor shall be resolved in a reliable, unbiased manner. The decision of the County, the Construction Observer, or their authorized representatives will be final.

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Section 4. Materials Certification

The Independent Assurance agency shall submit a "Certificate of Materials" to the Construction Observer indicating the conformity of tested materials to the approved plans and specifications including any exceptions, if applicable.

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Section 5. Conflict of Interest

To avoid an appearance of a conflict of interest, sampling and testing of materials under the QA program shall be performed at a qualified laboratory other than the laboratory used for project testing by the Contractor.

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Section 6. Sampling and Testing Personnel Qualification Program

Purpose

This program provides uniform Countywide procedures for sampling and testing personnel qualification to ensure that tests required by the specifications are performed according to the prescribed sampling and testing methods.

Sampling and Testing Personnel Qualification

Sampling and testing personnel will be qualified to perform tests for the acceptance of materials in the areas of Portland cement concrete, soils and aggregates and bituminous materials. The test methods for which individuals can be qualified include, but are not limited to, the following.

(* Denotes tests on which split or proficiency sample evaluations are required.)

Soils & Aggregates (100-E Series & 400-A Series)

Tex-101-E, Preparing Soil and Flexible Base Materials for Testing

Tex-102-E, Determining Slaking Time

Tex-103-E, Determining Moisture Content in Soil Materials

Tex-104-E, Determining Liquid Limit of Soils*

Tex-105-E, Determining Plastic Limit of Soils*

Tex-106-E, Calculating the Plasticity Index of Soils*

Tex-107-E, Determining the Bar Linear Shrinkage of Soils*

Tex-108-E, Determining the Specific Gravity of Soils

Tex-110-E, Particle Size Analysis of Soils*

Tex-111-E, Determining the Amount of Material in Soils Finer than 75 μ m (No.200) Sieve

Tex-113-E, Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials

Tex-114-E, Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade and Embankment Soils

Tex-115-E, Field Method for Determining In-Place Density of Soils and Base Materials

Tex-116-E, Ball Mill Method for Determining the Disintegration of Flexible Base Material

Tex-117-E, Triaxial Compression Tests for Disturbed Soils and Base Materials

Tex-120-E, Soil-Cement Testing

Tex-121-E, Soil-Lime Testing

Tex-126-E, Molding, Testing, and Evaluating Bituminous Black Base Materials*

Tex-127-E, Lime Fly-Ash Compressive Strength Test Methods

Tex-128-E, Determining Soil pH

Tex-129-E, Measuring the Resistivity of Soil Materials

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Tex-140-E, Measuring Thickness of Pavement Layer

Tex-400-A, Sampling Stone, Gravel, Sand, and Mineral Aggregates

Tex-401-A, Sieve Analysis of Fine and Coarse Aggregate*

Tex-402-A, Fineness Modulus of Fine Aggregate

Tex-403-A, Saturated Surface Dry Specific Gravity and Absorption of Aggregates

Tex-404-A, Determining Unit Mass (Weight) of Aggregates

Tex-405-A, Determining Percent Solids and Voids in Concrete Aggregates

Tex-406-A, Material Finer Than 75 μ m (No. 200) Sieve in Mineral Aggregates (Decantation Test for Concrete Aggregates)

Tex-408-A, Organic Impurities in Fine Aggregate for Concrete

Tex-409-A, Free Moisture and Water Absorption in Aggregate for Concrete

Tex-409-A, Free Moisture and Water Absorption in Aggregate for Concrete

Tex-411-A, Soundness of Aggregate by Using Sodium Sulfate or Magnesium Sulfate

Tex-413-A, Determining Deleterious Materials in Mineral Aggregates

Tex-425-A, Determining Moisture Content in Fine Aggregate by the "Speedy" Moisture Method

Tex-460-A, Determining Crushed Face Particle Count

Bituminous (200-F Series)

Tex-200-F, Sieve Analysis of Fine and Coarse Aggregate*

Tex-201-F, Bulk Specific Gravity and Water Absorption of Aggregate

Tex-202-F, Apparent Specific Gravity of Material Finer than 180 μ m (No. 80) Sieve

Tex-203-F, Sand Equivalent Test*

Tex-204-F, Design of Bituminous Mixtures

Tex-205-F, Laboratory Method of Mixing Bituminous Mixtures

Tex-206-F, Compacting Test Specimens of Bituminous Mixtures*

Tex-207-F, Determining Density of Compacted Bituminous Mixtures*

Tex-208-F, Test for Stabilometer Value of Bituminous Mixtures*

Tex-210-F, Determining Asphalt Content of Bituminous Mixtures by Extraction*

Tex-211-F, Recovery of Asphalt from Bituminous Mixtures by the Abson Process

Tex-212-F, Determining Moisture Content of Bituminous Mixtures

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Tex-213-F, Determining Hydrocarbon-Volatile Content of Bituminous Mixtures

Tex-217-F, Determining Deleterious Material and Decantation Test for Coarse Aggregates

Tex-221-F, Sampling Aggregate for Bituminous Mixtures, Surface Treatments and Limestone Rock Asphalt

Tex-222-F, Sampling Bituminous Mixtures

Tex-224-F, Determining Flakiness Index

Tex-226-F, Indirect Tensile Strength Test

Tex-227-F, Theoretical Maximum Specific Gravity of Bituminous Mixtures*

Tex-228-F, Determining Asphalt Content of Bituminous Mixtures by the Nuclear Method*

Tex-229-F, Combined HMAC Cold-Belt Sampling and Testing Procedure

Tex-236-F, Determining Asphalt Content from Asphalt Paving Mixtures by the Ignition Method*

Concrete (400-A Series)

Tex-407-A, Sampling Freshly-Mixed Concrete

Tex-414-A, Air Content of Freshly Mixed Concrete by the Volumetric Method*

Tex-415-A, Slump of Portland Cement Concrete*

Tex-416-A, Air Content of Freshly Mixed Concrete by the Pressure Method*

Tex-417-A, Unit Weight, Yield, and Air Content (Gravimetric) of Concrete

Tex-418-A, Compressive Strength of Cylindrical Concrete Specimens*

Tex-419-A, Compressive Strength of Concrete Using Portions of Beams Broken in Flexure

Tex-424-A, Obtaining and Testing Drilled Cores of Concrete

Tex-436-A, Measuring Texture Depth by the Sand Patch Method

Tex-437-A, Test for Flow of Grout Mixtures (Flow Cone Method)

Tex-447-A, Making and Curing Concrete Test Specimens

Tex-448-A, Flexural Strength of Concrete Using Simple Beam Third-Point Loading*

Tex-450-A, Capping Cylindrical Concrete Specimens

Tex-460-A, Determining Crushed Face Particle Count

Asphalt (500-C Series)

Tex-502-C, Penetration of Bituminous Materials (refer to AASHTO T 49)

Tex-530-C, Effect of Water on Bituminous Paving Mixtures

Approved December 2007

Tex-531-C. Prediction of Moisture-Induced Damage to Bituminous Paving Materials Using Molded Specimens

Tex-1000-S. Operating Pavement Profilograph and Evaluating Profiles

Who Must Be Qualified?

Any individual who performs tests on materials for acceptance must be qualified.

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Qualification of Sampling and Testing Personnel

All sampling and testing personnel for approved laboratories shall be qualified to do the work in accordance with "Laboratory Qualification Program".

Each laboratory shall maintain a minimum of one (1) qualified individual for each test procedure performed.

Approved December 2007

Section 7. Laboratory Qualification Program

Purpose

This program provides uniform countywide procedures to ensure that laboratory facilities and equipment are adequate for the performance of required sampling and testing methods.

Laboratories

All laboratories that perform testing for Williamson County must be accredited under the AASHTO Laboratory Accreditation Program. These include, but are not limited to the following:

- Area/project laboratories (includes field laboratories)
- Commercial laboratories
- Contractor laboratories
- Vendor laboratories (material suppliers).

The most current AASHTO accredited laboratories in the State of Texas can be obtained at http://patapsco.nist.gov/aashto/amrl/services/aap_intro.htm. In addition, Appendix C includes a list of AASHTO accredited laboratories obtained at the time this document was prepared.

Laboratory Qualification Responsibility

The Construction Observer or his/her authorized representatives will be responsible to ensure all QA laboratories used for project and QA testing and sampling are qualified.

Qualification Process

The laboratory qualifying authority will:

- identify the scope of testing to be performed
- verify that manuals and/or test methods used to perform tests are available and up-to-date
- document that the laboratory has the required equipment to perform the tests
- check the calibration/verification records for each piece of equipment, to include:
 - ◆ description of equipment
 - ◆ identification of any traceable standard used
 - ◆ frequency of calibration
 - ◆ date of last calibration
 - ◆ date of next calibration
 - ◆ procedure used to calibrate equipment
 - ◆ procedure used to identify equipment not in compliance.

In addition, all equipment may be subjected to calibration verification or other inspection by the qualifying authority.

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Calibration Standards and Frequencies for Laboratory Equipment

The standards for calibration and the frequencies for laboratory equipment calibrations shall be in accordance with appropriate testing equipment measures as indicated in the Texas Department of Transportation Manual of Testing Procedures. 100-E (Soils), 200-F (Bituminous), and 400-A (Concrete) series of TxDOT's *Manual of Testing Procedures*.

Frequency for Laboratory Qualification

Laboratories shall be qualified at an interval not to exceed six (6) months, or as directed by the Construction Observer. Calibration/verification is required whenever the laboratory or equipment is moved.

Non-Compliance

A laboratory that does not meet the above requirements is subject to disqualification. Any equipment in a qualified laboratory failing to meet specified equipment requirements for a specific test method shall not be used for that test method.

Documentation

The Construction Observer will be responsible for verifying that laboratories are qualified to perform material testing. Documentation will be required to be kept by the qualified laboratory. Calibration records will be maintained for three (3) years, unless directed otherwise by the Construction Observer.

Dispute Resolution

The County will have the final decision regarding all disputes of the laboratory qualification and calibration of testing equipment.

Approved December 2007

Section 8. Acceptable Tolerance Limits for Quality Assurance

The following tables indicate the acceptable tolerance limits for the specified material.

Embankment

Embankment		
Procedure	Texas Test Method	Tolerance
In-place Density	" <u>Tex-115-E</u> , Field Method for Determining In-Place Density of Soils and Base Materials"	± 2.5% Field Density

Untreated & Treated Sub-base and Base Courses

Untreated & Treated Sub-base and Base Courses		
Procedure	Texas Test Method	Tolerance
In-place Density	" <u>Tex-115-E</u> , Field Method for Determining In-Place Density of Soils and Base Materials"	± 2.5% Field Density
Gradation:	" <u>Tex-110-E</u> , Particle Size Analysis of Soils"	-
> No. 4 ≤ No. 4	-	± 5% ± 3%
Liquid Limit	" <u>Tex-104-E</u> , Determining Liquid Limit of Soils"	15% of the mean*
Plasticity Index	" <u>Tex-106-E</u> , Calculating the Plasticity Index of Soils"	20% of the mean*

Asphalt Stabilized Base

Asphalt Stabilized Base		
Procedure	Texas Test Method	Tolerance
Gradation:	" <u>Tex-200-F</u> , Sieve Analysis of Fine and Coarse Aggregates"	-
> No. 4 ≤ No. 4	-	± 5% ± 3%
Liquid Limit	" <u>Tex-104-E</u> , Determining Liquid Limit of Soils"	15% of the mean*
Plasticity Index	" <u>Tex-106-E</u> , Calculating the Plasticity Index of Soils"	20% of the mean*
Percent Asphalt	" <u>Tex-210-F</u> , Determining Asphalt Content of Bituminous Mixtures by Extraction"	± 0.3%
-	" <u>Tex-228-F</u> , Determining Asphalt Content of Bituminous Mixtures by the Nuclear Method"	± 0.3%

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-	"Tex-126-E, Molding, Testing, and Evaluating Bituminous Black Base Materials"	± 0.3%
-	"Tex-229-F, Combined HMAC Cold-belt Sampling and Testing Procedure"	± 0.3%
-	"Tex-236-F, Determining Asphalt Content from Asphalt Paving Mixtures by the Ignition Method"	± 0.3%
In-place Density (Cores)	"Tex-207-F, Determining Density of Compacted Bituminous Mixtures"	± 1% Field Density

Surface Treatment Aggregates

Surface Treatment Aggregates		
Procedure	Texas Test Method	Tolerance
Gradation:	"Tex-200-F, Sieve Analysis of Fine and Coarse Aggregates"	-
> No. 4 ≤ No. 4	-	± 5% ± 3%

Portland Cement Concrete Coarse Aggregate

Portland Cement Concrete Coarse Aggregate		
Procedure	Texas Test Method	Tolerance
Gradation:	"Tex-401-A, Sieve Analysis of Fine and Coarse Aggregate"	-
> No. 4 ≤ No. 4	-	± 5% ± 3%

Portland Cement Concrete Fine Aggregate

Portland Cement Concrete Fine Aggregate		
Procedure	Texas Test Method	Tolerance
Gradation (3/8" through No. 200)	"Tex-401-A, Sieve Analysis of Fine and Coarse Aggregate"	± 3%
Sand Equivalent	"Tex-203-F, Sand Equivalent Test"	± 10

Portland Cement Concrete Complete Mixture

Portland Cement Concrete Complete Mixture		
Procedure	Texas Test Method	Tolerance
Flexural Strength Compressive	1. "Tex-448-A, Flexural Strength of Concrete Using Simple Beam Third-Point Loading" 2. "Tex-418-A, Compressive Strength of Cylindrical Concrete Specimens"	20% of the mean*

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Slump	" <u>Tex-415-A</u> , Slump of Portland Cement Concrete"	± 1.0"
Entrained Air	3. " <u>Tex-414-A</u> , Air Content of Freshly Mixed Concrete by the Volumetric Method" 4. " <u>Tex-416-A</u> , Air Content of Freshly Mixed Concrete by the Pressure Method"	± 1%

Asphaltic Concrete Coarse Aggregate

Asphaltic Concrete Coarse Aggregate		
Procedure	Texas Test Method	Tolerance
Gradation:	" <u>Tex-200-F</u> , Sieve Analysis of Fine and Coarse Aggregates"	-
> No. 10 ≤ No. 10	-	± 5% ± 3%
Deleterious Material	" <u>Tex-217-F</u> , Determining Deleterious Material and Decantation Test for Coarse Aggregates"	± 0.3 %
Decantation	" <u>Tex-217-F</u> , Determining Deleterious Material and Decantation Test for Coarse Aggregates"	20% of the mean*

Asphaltic Concrete Fine Aggregate

Asphaltic Concrete Fine Aggregate		
Procedure	Texas Test Method	Tolerance
Gradation (No. 10 through No. 200)	" <u>Tex-200-F</u> , Sieve Analysis of Fine and Coarse Aggregates"	± 3%
Bar Linear Shrinkage	" <u>Tex-107-E</u> , Determining the Bar Linear Shrinkage of Materials"	± 2

Asphaltic Concrete Combined Aggregate

Asphaltic Concrete Combined Aggregate		
Procedure	Texas Test Method	Tolerance
Gradation:	" <u>Tex-200-F</u> , Sieve Analysis of Fine and Coarse Aggregates"	-
> 5/8" 5/8" through No. 200 Passing No. 200	-	± 5% ± 3% ± 1.5%
Sand Equivalent	" <u>Tex-203-F</u> , Sand Equivalent Test"	± 10

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Asphaltic Concrete Complete Mixture

Asphaltic Concrete Complete Mixture		
Procedure	Texas Test Method	Tolerance
Asphalt Content	"Tex-210-F, Determining Asphalt Content of Bituminous Mixtures by Extraction"	$\pm 0.3\%$
-	"Tex-228-F, Determining Asphalt Content of Bituminous Mixtures by the Nuclear Method"	$\pm 0.3\%$
-	"Tex-229-F, Combined HMAC Cold-belt Sampling and Testing Procedure"	$\pm 0.3\%$
-	"Tex-236-F, Determining Asphalt Content from Asphalt Paving Mixtures by the Ignition Method"	$\pm 0.3\%$
Maximum Theoretical Specific Gravity	"Tex-227-F, Theoretical Maximum Specific Gravity of Bituminous Mixtures"	± 0.020
Laboratory Molded Density	"Tex-207-F, Determining Density of Compacted Bituminous Mixtures"	$\pm 1.0\%$
Laboratory Molded Bulk Specific Gravity	"Tex-207-F, Determining Density of Compacted Bituminous Mixtures"	± 0.020
Stability	"Tex-208-F, Test for Stabilometer Value of Bituminous Mixtures"	5 points
Moisture	"Tex-212-F, Determining Moisture Content of Bituminous Mixtures"	± 0.2 mL
In-place Air Voids (Core)	"Tex-207-F, Determining Density of Compacted Bituminous Mixtures"	$\pm 1.0\%$

NOTE: The above tolerances are to be used when comparison of test results is by split samples. A tolerance of plus or minus two (2) standard deviations shall be used when comparison of test results is by proficiency samples.

*The difference between compared test results shall not exceed the indicated percentage of the mean of the compared test results - the mean being the average of the two test results.

EXAMPLE: Plasticity Index	
Job Control test value	18
IA Test value	22
Mean	20
20% difference	4

Both values are within 20% of the mean.

Approved December 2007



Williamson County Road Bond Program
Construction Quality Control & Quality Assurance Program
Inspection Check Lists



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	400 – Excavation & Backfill for Structures	Report No.:	
Description:		Date:	
Location:		Time:	

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Excavation and Backfill for Structures

Yes No NA

I. Excavation (400.3)

- | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Whenever excavating for installing structures across private property beyond the limits of the embankment, is the top soil removed prior excavation and kept separate and later replaced, as nearly as feasible, in its original position? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|

- | | | | |
|-----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 2. If trench excavation deeper than five (5) feet, is trench protection required? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|



Williamson County Road Bond Program Inspection Check Lists

	Yes	No	NA
3. When old or abandoned structures or foundations are encountered in the excavation, are they removed for the full width of the excavation and to a depth of one (1) foot below the bottom of the excavation? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. During construction, did the contractor receive approval from the Engineer of Record before laying any structures in the presence of water? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If the excavation cannot be dewatered to the point where the subgrade is free of mud, was a concrete mixture with not less than three (3) sacks of cement per cubic yard (or other material approved by the Engineer of Record) placed a minimum of three (3) inches in depth in the bottom of the excavation? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. For all culverts where the soil encountered at established footing grade is an unstable or incompressible material is the procedure shown in Item 400.3.A.4 followed unless other methods are called for in the plans? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Unless otherwise shown on the plans, are all sewer pipe structures constructed in an open cut with vertical sides to a point one (1) foot above the pipe? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are all vertical sides sheeted and braced when necessary to maintain the required vertical excavation throughout the construction? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. For pipe to be installed in a fill section was the embankment constructed to one (1) foot above the top of the pipe and then excavated for the pipe? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

	Yes	No	NA
10. Is the trench excavated to the width and elevations as shown in the plans? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Is the pipe, culvert, etc., properly centered in the trench? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 II. Shaping and Bedding (400.3.B)			
1. For precast box sections and pipe, is the bedding in accordance with Item 400.3.B unless otherwise shown on the plans? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. For precast pipe and box sections where cement stabilized backfill is indicated on the plans, is the excavation undercut a minimum 4 inches and backfilled with stabilized material to support the pipe at the required grade? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 III. Backfill – General (400.3.C)			
1. Is backfill material free from stones of such size as to interfere with compaction, large or frozen lumps which will not break down readily under compaction; and wood or other extraneous material? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. a. Is backfill in areas not supporting any portion of the completed roadbed, retaining wall or embankment, placed in layers not more than ten (10) inches in depth (loose measurement)? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Is backfill which will support any portion of the roadbed, retaining wall or embankment, placed in uniform layers not to exceed eight (8) inches in depth (loose measurement)? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Yes No NA

3. Is each layer of backfill material to the moisture content needed to obtain the required density?

☐ ☐ ☐

4. If a cohesionless material, such as sand, is used, is it compacted with vibratory equipment, water ponding or a combination of both?

☐ ☐ ☐

IV. Backfill – Bridge Foundations, Retaining Walls and Culverts (400.3.C.2)

1. Is the material used for backfilling free of any appreciable amount of gravel or stone particles more than four (4) inches in greatest dimension and of a gradation that permits thorough compaction?

☐ ☐ ☐

2. Are mechanical tamps or rammers required when the structure being backfilled could sustain damage from other compacting operations?

☐ ☐ ☐

3. Are any special density requirements for backfill under or adjacent to structures met?

☐ ☐ ☐

V. Backfill – Pipe (400.3.C.3)

1. After the bedding and pipes have been installed as required, is the selected backfill materials brought to proper moisture condition, placed along both sides of the pipe equally, in uniform layers not exceeding eight (8) inches in depth (loose measurement), and thoroughly compacted mechanically?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Yes **No** **NA**

2. Is the method of backfill in question 1 above continued in this manner to the top of pipe elevation and compacted in accordance with Item 400.3.C.1?

☐ ☐ ☐

VI. Cement Stabilized Backfill (400.3.C.4)

1. When required by plans, is cement stabilized backfill or flowable backfill placed equally along all sides of the structure, so as to prevent strain on or displacement of the structure; and are all voids filled?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	416 – Drilled Shaft Foundations	Report No.:	
Description:		Date:	
Location:		Time:	

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

416 – Drilled Shaft Foundations

Yes No NA

I. Materials (416.2)

- | | | | |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Did the Contractor incorporate materials into this project that meet the requirements of referenced items in Section 416.2? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 2. Does concrete for Drilled Shafts meet the requirements of Table 1 and Table 2 for concrete class and slump? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 3. If drilling slurry is used, does it meet the requirements of Table 3, as determined by Tex-130 E? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

Yes No NA

4. Do Chemical Admixtures meet the requirements of DMS-4620?

☐ ☐ ☐

II. Construction (416.3)

A. Excavation

1. When excavating, was satisfactory founding material encountered at plan elevation?

☐ ☐ ☐

If not, was the bottom of the shaft adjusted, or the foundation altered, as determined by the Engineer of Record, to satisfactorily comply with the design requirements?

2. Is the shaft vertical alignment measured and found to be within a tolerance of 1 inch per 10 feet of depth? **(Hold Point)**

☐ ☐ ☐

3. Is the center of shaft location measured and found to be not more than 1 inch from the horizontal position shown on the plans? **(Hold Point)**

☐ ☐ ☐

If not, was a structural review performed?

4. Did the Contractor provide suitable access and lighting for proper inspection of the completed excavation?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

	Yes	No	NA
5. For abutment drill shafts, is the embankment at the bridge ends completed to grade and thoroughly compacted prior to drilling?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

 B. Requirements for Slurry Displacement Method			
1. If the slurry method is used to construct drilled shaft, is slurry mixed at the project site or is it premixed in a reservoir adjacent to the excavation (not in the shaft excavation or other hole)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. During and after drilling was a head of slurry maintained in the shaft excavation at or near ground level or higher as necessary to counteract ground water pressure?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Just prior to placement of reinforcing steel, was an airlift or proper size cleanout bucket used to remove accumulated material on the bottom after the completion of drilling? (Hold Point)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Was concrete placement started within 4 hours of shaft excavation? If not, was shaft reprocessed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Is the slurry agitated if the placement of concrete is delayed to keep it liquefied?			



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

C. Reinforcing Steel

- | | Yes | No | NA |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Is the cage of reinforcing steel completely assembled according to plans and placed in the drill shaft as a unit immediately prior to concrete placement?
(Hold Point)
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Where spiral reinforcement is used, is it tied to longitudinal bars (not welded) at a spacing not to exceed 24 inches?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. In uncased shafts, are concrete spacer blocks or steel chairs placed at sufficient intervals to insure concentric spacing for the entire length of the cage?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. In cased shafts, are steel chair spacers or bent pieces of steel bars placed at sufficient intervals to insure concentric spacing inside the casing?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. Is the cage adequately supported to control vertical displacement and racking and distortion of the steel during concrete placement and/or extraction of the casing?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. a. Is the elevation of the steel cage checked before and after concrete placement or after casing extraction when casing is used?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Did the downward movement of the steel not exceed 6 inches per 20 feet of shaft length?
<hr/> <hr/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

	Yes	No	NA
c. Did the upward movement of the steel not exceed 6 inches? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Were the dowel bars checked for proper lap length between the shaft and column? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 D. Concrete (Perform all work in accordance with the requirements of Item 420, “Concrete Structures”.)			
1. For dry shafts 24” in diameter or smaller, is concrete placed continuously through the entire length of the shaft through a suitable tube or tremie (limit freefall to 25 feet) to prevent segregation of materials? (Note: For dry shafts over 24” diameter concrete freefall is unlimited; use 3 foot drop tube.) _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Does the elapsed time from the beginning of concrete placement into the cased portion of the shaft until the completion of extraction of the casing exceed one hour? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. At the time the concrete is placed, is the excavated drill shaft free from accumulated seep water? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Has all loose material been removed from the bottom of the excavation prior to placing concrete? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

	Yes	No	NA
E. Additional Requirements for Slurry Displacement or Underwater Concrete Placement Methods			
1. Is the concrete placed through a closed tremie or pumped to the bottom of the excavation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. If a tremie is used, is it kept full of concrete and well submerged in the previously placed concrete at all times?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How is this determined?			

3. During the placement of concrete was the tremie raised, as necessary, to maintain the free flow of concrete and the stability of any casing used?			

4. Was additional concrete placed to ensure the removal of any contaminated concrete at the top of the shaft?			

5. For pours over water, was a collar used to capture the slurry and the top portion of concrete flushed from the shaft?			

6. If the tremie seal (separating layer between the concrete and contaminated bottom hole material) is lost, was the tremie removed, the bottom resealed and the tremie re-inserted at least 5 feet below the new seal before continuing concrete placement?			



Williamson County
Road Bond Program
Inspection Check Lists

Drilled Shaft Foundations – Item 416

	Yes	No	NA
F. Load Testing			
1. If required, were the poured drill shafts load tested after curing in accordance with Item 405, "Foundation Test Load"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

Drilled Shaft Record Form No. 416

DRILLED SHAFT				BELL FTG.		Date Drilled	Casing Used	Drilling Mud	Slurry Plmt.	Remarks
No.	Dia. (in)	Top of Shaft Elev.	Length (ft)	Dia. (CY)	Vol. (CY)					
Bent No.	Design Load			Tons per shaft						
Bent No.	Design Load			Tons per shaft						
Bent No.	Design Load			Tons per shaft						
Bent No.	Design Load			Tons per shaft						
Bent No.	Design Load			Tons per shaft						
Summary for Payment				Comments						
Total this sheet		Total this structure								
size of shaft	Length (ft.)	size of shaft	Length (ft.)							
Total Vol of Bells		Total Vol of Bells								



Williamson County Road Bond Program Inspection Check Lists

Drilled Shaft Foundations – Item 416

Signature/Date: _____



Williamson County Road Bond Program Inspection Check Lists

Spec Item: 420 – Concrete Structures	Report No.: _____
Description: _____	Date: _____
Location: _____	Time: _____

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Concrete Structures

Yes No NA

- | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| I. Materials (420.2) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1. Were concrete structures constructed from materials conforming to TxDOT's Department Material Specifications in accordance with Section 420.2? | | | |

II. Construction (420.4)

A. Schedule Restrictions



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
1. Did the Contractor comply with the schedule restrictions of Section 420.4.A, prior to erecting forms, removing forms, placement of materials, equipment and bridge rail, opening to construction or full traffic, post-tensioning or backfilling, ensure the previously placed concrete attained the minimum compressive strength or curing time? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Falsework and Forms			
1. Are the working drawings for forms and falsework signed and sealed by a Registered Professional Engineer, licensed in the state of Texas? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Were the falsework and forms placed braced and alignments checked to ensure placement in accordance with the plans signed/sealed working drawings? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Reinforcement (provided under Item 440)			
1. Was reinforcing steel supports welded to I-beams or girders or to reinforcing steel as shown in the plans? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is the installation of dowels and anchor bolts in accordance with Section 420.4.G.10? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Placing Concrete - General			
1. Is the temperature of structural concrete at the time of placement between 50° and 95° F? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
2. Is the temperature of each truck load of concrete for bridge slabs and top slabs of direct traffic culverts being checked and is it between 50° and 85°F? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Does the transporting time from the Batching Plant to the placing of concrete in the forms conform to the specification or requirements? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. If a pump is used to deliver concrete from the truck to the structure, is sampling for testing done at the discharge or was correlation testing performed and documented to ensure that specifications are met at the discharge end? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are all forms, pre-stressed concrete panels, T-beams and concrete box beams wetted thoroughly and remaining puddles of excess water removed prior to concrete placement? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Does the method of handling, placing and consolidation of concrete minimize segregation of the concrete and displacement of the reinforcement? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Does the concrete have a free fall of five (5) feet or less except in the case of thin walls or as specified otherwise? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
8. Is the concrete deposited in the forms in uniform layers not more than thirty-six (36) inches in thickness unless otherwise directed by the Engineer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
9. Is the sequence of successive layers or adjacent portions of concrete such that they can be vibrated into a homogenous mass with the previously placed concrete before it sets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
10. Is the construction sequence arranged so that cold joints in a monolithic placement is avoided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
11. Is the concrete vibrated immediately after placement to consolidate the concrete and have the mortar flushed to the form surfaces?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
12. Is at least one stand-by vibrator provided for emergency use in addition to those required for placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
13. Is the rate of placement and finish satisfactory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
14. Unless otherwise shown on the plans, for monolithic mass placements having a least dimension greater than five (5) feet, did the contractor submit a detailed plan to minimize temperature differential and meet the requirements of the Specification?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
E. Construction Joints			
1. Are all construction joints in bridge slabs of the type and at the locations shown on the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
2. Are there additional bridge slab construction joints placed that are not shown on the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
3. Was written authorization from the Engineer given for additional joints in these members?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
F. Placing Concrete in Cold Weather			
1. Is concrete placed only when the ambient temperature in the shade is 35°F and rising or above 40°F?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
2. Is the temperature maintained after placement in accordance with Section 420.4.G.11?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
G. Placing Concrete in Hot Weather			
1. Unless otherwise directed by the Engineer, is an approved retarding agent used in all concrete pours for superstructures and top slabs of direct traffic culverts when the air temperature is above 85°F?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
H. Placing Concrete in Water			
1. Are all classes of concrete placed under water, except Class E and Class SS, redesigned to contain an additional sack of cement per cubic yard?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
2. Is the concrete placed with a tremie meeting the requirements of Section 420.4.G.13, and is it not permitted to fall freely through the water nor disturbed after being placed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
I. Placing Concrete in Superstructure			
1. For simple span bridge slabs, what type of finishing machine was used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
2. If other than a mechanical longitudinal screed or a self-propelled transverse finishing machine was used, was approval given by the Engineer for small placements or unusual conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
J. Finish of Bridge Slabs			
1. Did QC Reviewer witness the dry-run with the Contractor to ensure dead load deflection, screed profile, steel elevation, tying of rebar, armor joint elevation, depth of cover, etc. was checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
2. Was the concrete worked with a float to ensure a smooth finish?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
3. Did QC Reviewer perform sufficient checks with a 16-ft. straight edge on the plastic concrete to ensure final surface is within specified tolerances?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
4. Did QC Reviewer continue checking and floating until the deck surface was true to grade, free of depressions, high spots, voids and rough spots?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
5. Was the surface finish achieved by using a carpet drag, burlap drag or broom?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
6. Was the finished concrete surface coated within 10 minutes with a single application of evaporation retardant at the rate recommended by the manufacturer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
7. Is the final bridge deck surface given a grooved steel tine finish approximately 1/8 to 3/16 inches deep approximately 1/8 inches wide, randomly spaced approximately 3/4 to 1 inch apart?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
8. Did the bridge deck finish meet the ride quality tolerance of 1/8 inch in ten (10) feet (10 feet straight edge test)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
9. Was the bridge deck grooved by saw-cutting in accordance with Section 420.4.I?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420

	Yes	No	NA
K. Curing Concrete			
1. Were the curing requirements of Item 420.4.J met? (Note: See Table 1 – Please note “Exceptions to 4-Day Curing?”)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
L. Removal of Forms and Falsework			
1. Did the Contractor remove the forms and falsework in accordance with Section 420.4.K?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/>			
<hr/>			
M. Ordinary Surface Finish			
1. Unless noted otherwise in the plans, did the exposed surfaces for the following items receive an ordinary finish in accordance with Section 420.4.M?			
a. Inside and top of inlets?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Inside and top of manholes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Inside of sewer appurtenances?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Inside of culvert barrels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Bottom of bridge slab between girders or beams?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Vertical and bottom surfaces of interior concrete beams or girders?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Note: Form marks and chamfer edges do not need to be smoothed for inside of culvert barrels and bottom of bridge slabs between girders or beams.			
N. Surface Finishes for Concrete (Item 427)			
1. Was the surface cleaned and patched in preparation to receive the finish coating as shown in the plans: was this work performed in accordance with the requirements of Item 427?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Concrete Structures – Item 420



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	421 – Hydraulic Cement Concrete	Report No.:	
Description:		Date:	
Location:		Time:	

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Portland Cement Concrete

Yes No NA

I. Materials (421.2)

1. Do the materials used in all mixed concrete placed on the job conform to TxDOT's Department Material Specifications and other requirements of Section 421.2?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------	--------------------------	--------------------------

2. Is the concrete mix visually checked for uniformity from the beginning to the end of each load?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
----------------------------------------------------------------------------------------------------	--------------------------	--------------------------	--------------------------



Williamson County Road Bond Program Inspection Check Lists

Hydraulic Cement Concrete – Item 421

Yes No NA

II. Construction (421.4)

A. Classification and Mix Design

- | | | | |
|------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Are the requirements for entrained air met as outlined in Section 421.4.A.4 (Table 7)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 2. Are the requirements of Table 8 – “Slump Requirements” being met? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 3. Is the maximum water-cement ratio exceeded? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 4. If question 3 is “yes”, is the ratio regularly exceeded; was a new design performed? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 5. Is no water added to the concrete once discharge has begun to ensure that the maximum water-cement ratio is not exceeded? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |

B. Job Testing and Documentation

- | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Was the concrete checked at the beginning of the load for slump or entrained air to prohibit placement of non-conforming material? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |
| 2. Is the required job site testing (strength, slump, entrained air, concrete temperature, etc.) being performed at the required frequency using proper TxDOT testing methods? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| _____ | | | |
| _____ | | | |



Williamson County Road Bond Program Inspection Check Lists

Hydraulic Cement Concrete – Item 421

	Yes	No	NA
3. Are the concrete tickets properly completed? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the amount of water withheld (based on the design water-cement ratio) at the plant shown on the concrete ticket? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. If concrete is pumped, where is sampling and testing being performed? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Were comparison tests recorded between the haul unit and the point of unit discharge after pump? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 C. Truck Mounted Paving Mixers and Transit Mix Trucks			
1. Is each truck delivered concrete batch mixed not less than 70 nor more than 100 revolutions of the drum at the mixing speed designated by the manufacturer to produce a uniform concrete mix? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. When water is added at the job site, is the batch mixed a minimum of 25 revolutions at mixing speed? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

AT PLANT									
Plant		Des. No.				Truck No.			
CY	County	Project				CCSJ			
Class	Air Temp	°F	Mixer Chg'd.		<input type="checkbox"/> AM <input type="checkbox"/> PM	MAX TIME			
*%Moist	CA ₁	CA ₂	CA ₃	CA ₄	FA ₁	FA ₂			
Water:	Added (gal).		Ice. (lbs)		Max. (gal)				
Rev. Const.:	Beg.	End				Mix Rev.			
Remarks									
Plant Inspector Signature									
AT JOBSITE									
Structure		Location in Str.							
Water	Added (gal).		Ice (lbs).						
Rev. Constr.	Beg.	End.				Mix Rev.			
*Slump	%Air		*Conc. Temp		°F	*Unit Weight		Lbs/ft ³	
*Bm. Or Cyl. Nos	Target Value		psi		Mixer Unloaded		<input type="checkbox"/> AM <input type="checkbox"/> PM		
Remarks									
Plant Inspector Signature									

Concrete Batch Ticket



Ticket No:

Date:

Material Information

MAT'L	Identification*	Am't Batched
AEA		oz.
RA		oz.
WRA		oz.
		oz.
CA ₁		lbs.
CA ₂		lbs.
FA ₁		lbs.
Cement		lbs.
Fly Ash		lbs.
		lbs.
		lbs.
		lbs.



Williamson County Road Bond Program Inspection Check Lists

Spec Item: <u>422 – Reinforced Concrete Slab</u>	Report No.: _____
Description: _____	Date: _____
Location: _____	Time: _____

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Reinforced Concrete Slab

Yes No NA

I. Materials (422.2)

1. Are the materials furnished by the Contractor in accordance with the referenced Items of work and meet the requirements of Section 422.2? ☐ ☐ ☐

II. Construction (422.3)

A. Pre-placement

1. Is all placing, finishing and curing equipment in place and operational? ☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Reinforced Concrete Slab – Item 422

	Yes	No	NA
2. Has a dry runoff the equipment been done? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Has the proper clear cover for the rebar been checked? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Does screed clear at the armor joints? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Are drains and grates at plan location and elevation? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is sufficient plastic and curing blankets available in case of inclement weather after the pour begins? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Are forms, deck panels, beams and every element that the fresh concrete will come in contact with properly wetted? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
 B. During Placement			
1. Has placement begun at the low end on spans with a profile grade of 1.5% or more? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Are proper clear cover depths being checked at the frequency shown in the Test Guide Schedule? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Reinforced Concrete Slab – Item 422

	Yes	No	NA
3. Is concrete being placed between exterior and adjacent beams prior to placing concrete on overhangs? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the application of evaporation retardant and curing compound being applied at the times required by specification and at the rates identified by the manufacturer? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Post Placement			
1. Is the final surface within specification tolerances when checked with a 16-ft straightedge? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Has concrete attained a compressive strength in accordance with Section 420.4.A and Table 5 of Section 421.4 prior to removing forms or introducing loads? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. If deck grooves are saw cut, were they installed in accordance with Section 420.4.I? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Spec Item: <u>423 – Retaining Wall</u>	Report No.: _____
Description: _____	Date: _____
Location: _____	Time: _____

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Retaining Wall

Yes No NA

I. Materials (432.2)

1. Do the materials furnished by the Contractor meet the requirements of the referenced Items of work and other requirements of Section 432.2?

2. For non-reinforced cast-in-place, was “Class A” concrete used?

☐ ☐ ☐

3. For reinforced cast-in-place, was “Class C” concrete used?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Retaining Wall – Item 423

	Yes	No	NA
4. Are precast panels fabricated with “Class H” concrete with compressive strength breaks of 4,000 psi or greater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
5. If machine-made concrete block units are used, were they cast in accordance with ASTM C-90, Class 1, Type II and meet the 28-day compressive strength of 4,000 psi with maximum moisture absorption of 7%?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
6. If machine-made concrete block units are used, were they sampled and tested in accordance with ASTM C-140 and are the molded dimensions within 1/8” tolerance, except where height must be within 1/16”?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
7. For filter fabric used in the Retaining Wall System, is it UV-resistant and does the material meet the requirements of DMS-6200?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
8. Are approved joint fillers, pads, waterstops, etc. used as shown in the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
9. Does the retaining wall design service life meet the requirements of Section 423.3B?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
10. Does the backfill material conform to the gradation and other requirements stated in the plans and/or Item 423.C.2: Table 2 and Item 423.3.C.3: Table 3?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			



Williamson County Road Bond Program Inspection Check Lists

Retaining Wall – Item 423

II. Construction (423.2)

Yes No NA

1. Is the foundation for the structure graded level and compacted with a roller approved prior to wall construction? (Hold Point)

☐ ☐ ☐

2. Are any foundation soils found to be unsuitable removed and replaced?

☐ ☐ ☐

3. Is filter fabric placed behind all wall joints, and at the intersection of retaining walls with other structures, including riprap?

☐ ☐ ☐

4. Does the filter fabric cover joints a minimum of 6 inches on each side and is it positively held in place?

☐ ☐ ☐

5. As select fill material is placed behind the wall panels, are the panel alignments maintained by acceptable bracing methods?

☐ ☐ ☐

6. Do vertical tolerances and horizontal alignment tolerance not exceed $\frac{3}{4}$ " when measured along the wall with a 10-foot straight edge?

☐ ☐ ☐

7. Is the overall vertical tolerance of the wall (plumbness from top to bottom) within $\frac{1}{2}$ " per 10-feet of wall height?

☐ ☐ ☐

8. Does the backfill placement closely follow the erection of each lift of panels, and is it placed in 8" lifts and compacted to 95% of density?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Retaining Wall – Item 423

	Yes	No	NA
9. At each reinforcement level, is the backfill leveled and compacted before placing the reinforcement? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Is adjacent embankment placed to approximately the same level as the backfill material? Note: Do not create a continuous, distinct, vertical joint between the select and embankment backfill. _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Is compaction in the 3-foot strip adjacent to the backside of the wall accomplished with hand operated or walk-behind compacter? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. If rock backfill is used as select material, was a filter fabric layer placed before placing the last 2 feet of backfill immediately below the pavement structure or top of wall? Note: Overlap splices by at least 18". _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Does the upper 2 feet of rock backfill contain no stones larger than 3" in their greatest dimension and is it composed of material with sufficient fines to fill the voids in a compacted state? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Is the wall being constructed in accordance with the details shown on the plan sheets and/or construction drawings? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. If construction drawings are used to show the construction details, does the Reviewer have (or have access to) a copy of these drawings? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Retaining Wall – Item 423

	Yes	No	NA
16. Are proper spacers provided between panels? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Is grading and drainage maintained adjacent to the wall during construction? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. If temporary MSE walls are used, were the walls constructed in accordance with Section 423.3.F requirements? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. If Concrete Block Retaining Walls are used, were the walls constructed in accordance with Section 423.3.G? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	425 – Precast Pre-stressed Concrete Structural Members	Report No.:	
Description:		Date:	
Location:		Time:	
QC Reviewer: _____			
Results:	<input type="checkbox"/> Accepted	<input type="checkbox"/> Not Accepted	
Remarks:			
QC Reviewer Signature: _____			

Precast/Pre-stressed Concrete Structural Members

Yes No NA

I. Materials (425.2)

- | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Do the materials incorporated in the Precast Pre-stressed Concrete Structural Members conform to the reference items of work, TxDOT's Department Material Specifications and other requirements of Section 425.2?

_____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Did the Contractor provide manufacturer's certifications for bedding strips and use adhesives or bonding agents as recommended by the polystyrene manufacturer?

_____ | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |



Williamson County Road Bond Program Inspection Check Lists

Precast Pre-stressed Concrete Structural Members – Item 425

	Yes	No	NA
II. Construction (425.3)			
1. Are beams, bridge deck panels and bearing pads approved by TxDOT and is the TxDOT stamp on them?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
2. Do beams have any signs of damage such as cracks, spalling and/or “honeycombs”?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
3. Are dimensions correct?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
4. During erection of beams, did the Contractor securely tie or brace all beams in accordance with minimum erection and bracing standards?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
5. Are any safety hazards apparent (power lines, traffic hazards or other construction activities)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
6. Have beams been erected to proper alignment as shown on the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
7. Are beams positioned with the proper clearance from the abutment back-wall and adjacent beam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	440 – Reinforcing Steel	Report No.:	
Description:		Date:	
Location:		Time:	

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Reinforcing Steel

Yes No NA

I. Materials (440.2)

- | | | | |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 1. Does the reinforcing steel to be welded comply with ASTM A706 or have a carbon equivalency of not more than 0.55%? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|

- | | | | |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 2. Do the electrodes used for welding conform to the requirements of Item 448.2 for the type of reinforcing steel used? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|



Williamson County Road Bond Program Inspection Check Lists

Reinforcing Steel – Item 440

	Yes	No	NA
3. Does the person performing the welding operation have welder certification paper issued by TxDOT that covers the type of work he/she is performing? (448.4) <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is an oven used to dry and store electrodes with low hydrogen coverings for the times and at the temperatures required? (448.4.C) <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is the rebar used on the job from an approved Mill as required by Section 440.2.A? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Unless otherwise shown on the plans, is the deformed rebar Grade 60 as required by Section 440.2.B? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. For Epoxy Coated Rebar, is the coated reinforcing steel in accordance with Table 3 (440.2.F)? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are mechanical couplers used when reinforcing steel is spliced? <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Are all couplers furnished by the Contractor produced by a pre-qualified manufacturer? (DMS-4510) <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Before being used, are the couplers sampled and tested as required in Item 440.2.G and do they meet all requirements? (DMS-4510) <hr/> <hr/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Reinforcing Steel – Item 440

	Yes	No	NA
II. Construction (440.3.C)			
1. Is steel reinforcement adequately stored above the surface of the ground upon platforms, skids or other supports and protected from damage and deterioration? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. In final placement, is the reinforcement free from dirt, paint, grease, oil or other foreign materials and from defects such as cracks and delaminations? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Are lap-splice, weld-splice, or mechanically spliced bars placed as shown on the plans and meet the requirements of Section 440.3.D and Table 5 “Minimum Lap Requirements by Bar Size”? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If not, was written approval given by the Engineer for additional splices? _____			
4. In the plane of the steel parallel to the nearest surface of concrete, do the bars vary from plan placement by not more than 1/12 of the spacing between bars? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. In the plane of the steel perpendicular to the nearest surface of concrete, do the bars vary from plan placement by not more than 1/4”? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is the depth of cover (concrete) to the nearest surface of steel at least 1” unless otherwise shown on the plans? _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Reinforcing Steel – Item 440

	Yes	No	NA
7. For bridge slabs, is the clear cover tolerance for the top mat of reinforcement 0" to 1/2"?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Are bars of the proper size, location and quantity as shown on the plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. a. What type of bar supports are used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

b. Are the bar supports adequate in strength and number to hold the reinforcement in place, before and during concrete placement?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If not, is concrete placement halted until corrective measures are taken?			

c. If individual bar supports are used, are they placed in rows at 4 ft. maximum spacing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

d. If continuous type bar supports are used, are they placed in rows at 4 ft. maximum spacing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

e. Are continuous type bar supports used when permanent metal deck forms are used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Reinforcing Steel – Item 440

	Yes	No	NA
10. Are all accessories used with epoxy coated reinforcement such as tie wires, bar chairs, supports or clips made of steel, fully coated with epoxy or plastic? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Has all visible damage to the coating been repaired in accordance with Section 440.3.F.3 before the reinforcement is used? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Is any cutting of coated reinforcement done only by sawing or shear cutting with permission of the Engineer? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Have all cut ends been coated before the reinforcement is used? _____ _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	442 – Metal for Structures	Report No.:	
Description:		Date:	
Location:		Time:	

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____

Metal for Structures

Yes No NA

I. Materials (442.2)

A. Non-Bridge Structures:

1. Was the structural steel delivered and used within the project tested in accordance with ASTM A370? ☐ ☐ ☐

2. Does the type and grades of steel used by the Contractor in accordance with the listing in Section 442.2.2.A or as shown on the plans? ☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Metal for Structures – Item 442

Yes No NA

3. Have tension members and other components listed in Section 442.2.2.B been impact tested and do the test results conform with the Charpy V-notch (CVN) requirements of Table 1 within the above stated section?

☐ ☐ ☐

B. Other Components such as Shear Connectors, Anchors, Fasteners, Slip-resistant Deck Plates and Rail Posts:

1. Do the materials supplied to the project under this section have a certification of material properties from the manufacturer?

☐ ☐ ☐

2. Do the materials meet the ASTM requirements as shown in Section 442.2.3 per category description and tested in accordance with section requirements?

☐ ☐ ☐

C. Forgings, Castings and Extrusions (442.2.B, C, D, E, F, G):

1. Do the components under this category meet the ASTM, class, grade and/or alloy-temper as required in accordance by Section 442.2.B, C, D, E, F, G?

☐ ☐ ☐

II. Construction Methods (442.3)

1. Was the structural metal fabricated, welded and erected in accordance with Item 441, "Steel Structures"; Item 447, "Structural Bolting; Item 448, "Structural Field Welding"; and applicable AWS welding codes?

☐ ☐ ☐

2. Were the fabricated and erected structural metal members painted in accordance with Item 446, "Cleaning and Painting Steel"?

☐ ☐ ☐



Williamson County
Road Bond Program
Inspection Check Lists

Metal for Structures – Item 442

Yes No NA

3. When specified in the plans, was the fabricated steel items galvanized in accordance with Item 445, “Galvanizing”?

☐ ☐ ☐

4. Were field repairs to the painting or galvanizing of fabricated and erected steel items performed in accordance with Item 446, “Cleaning and Painting” or Item 445, “Galvanizing”?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Spec Item:	462 – Concrete Box Culverts & Storm Drains	Report No.:
	464 – Reinforced Concrete Pipe	
Description:		Date:
Location:		Time:

QC Reviewer: _____

Results: ☐ Accepted ☐ Not Accepted

Remarks: _____

QC Reviewer Signature: _____ :

Concrete Box Culverts & Storm Drains/Reinforced Concrete Pipe

Yes No NA

I. Materials (462.2 and 464.2)

A. Reinforced Concrete Pipe, Concrete Box Culverts and Storm Drains

1. Were the individual sections of pipe or pre-cast boxes inspected and rejected if they do not have the Division of Materials and Tests monogram on them?

☐ ☐ ☐

2. For cast-in-place or pre-cast box culverts and storm drains, do the materials and method of fabrication comply with the requirements of Section 462.2.A, B?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

	Yes	No	NA
3. For cast-in-place box culverts and storm drains, during fabrication, did test specimens meet the requirements of Item 421, “Hydraulic Cement Concrete”; Item 440, “Reinforcing Steel” and conform to the requirements of Item 420, “Concrete Structures”?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
4. Were the individual sections of pipe or pre-cast boxes inspected at the project site and repaired or rejected if any of the defects are found?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
5. Were pre-cast sections inspected to ensure they meet the tolerance in accordance with Section 462.2.F?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
6. Are cracks which extend into the plane of the reinforcing steel repaired in an approved manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
7. Are small damaged or honeycombed areas which are purely surface in nature repaired to the satisfaction of the Engineer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
8. Are precast sections stored on level blocking in a manner acceptable to the Engineer?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			
9. Are lifting holes larger than 3” diameter?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<hr/> <hr/>			



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

B. Jointing Materials

Yes No NA

1. For all jointing materials except mortar, has the Contractor furnished the Engineer the Manufacturer's Certificate of Compliance that complies with the requirements in Section 464.2.I?

☐ ☐ ☐

II. Construction (462.3 and 464.3)

A. Laying Pipe and Pre-cast Boxes

1. Unless otherwise authorized by the Engineer, did the Contractor start the laying of pipe or present boxes on the bedding at the outlet end with the spigot or tongue pointing downstream and proceed toward the inlet end with the abutting sections properly matched, true to the established lines and grade?

☐ ☐ ☐

2. Is proper equipment provided for hoisting and lowering the sections of pipe or pre-cast boxes into the trench without disturbing the bedding and the sides of the trench?

☐ ☐ ☐

3. Are the ends of the pipe or precast boxes carefully cleaned, if necessary?

☐ ☐ ☐

4. Is the pipe or pre-cast boxes fitted and matched so that when laid in the bed, it forms a smooth uniform conduit?

☐ ☐ ☐

5. Are multiple installations of reinforced concrete pipe (RCP) laid with the center lines of individual barrels parallel?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

Yes No NA

6. Unless otherwise shown on the plans for multiple installations for RCP, are the clear distances between outer surfaces of adjacent pipes as shown in Item 464.3.B (Table 5)?

☐ ☐ ☐

7. Is the area for placement of structures excavated, shaped and the structures bedded and backfilled in accordance with Item 400, "Excavation and Backfill Structures"?

☐ ☐ ☐

8. Unless otherwise shown on the plans or permitted in writing by the Engineer, did heavy earth moving equipment haul over the structure before a minimum of 4-feet of compacted fill was placed over the top of the structure?

☐ ☐ ☐

9. Is pipe or pre-cast boxes damaged by the Contractor's equipment removed and replaced or repaired by an approved method by the Engineer?

☐ ☐ ☐

B. Jointing for Pipes, Concrete Box Culverts and Storm Drains

1. Does the mortar consist of one part cement, two parts sand, and sufficient water to make a plastic mix?

☐ ☐ ☐

2. Are the structure ends cleaned and wetted before making the joint?

☐ ☐ ☐

3. After the structures are tightly jointed, is the mortar packed into the joint from both inside and outside the structure, and then the inside finished smooth and flush with adjacent joints of structure?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

Yes No NA

4. Are mortar joints cured by keeping the joints wet for at least 48 hours or until the backfill operation begins after the mortar joint has cured for at least 6 hours?

☐ ☐ ☐

5. Is no mortar jointing done when the atmospheric temperature is at or below 40°F?

☐ ☐ ☐

6. Are mortared joints protected against freezing by backfilling or other approved methods for at least 24 hours?

☐ ☐ ☐

C. Joints using Cold-Applied, Plastic Asphalt Sewer Joint Compound

1. Are both ends of the structure clean and dry at the time the joint is made?

☐ ☐ ☐

2. Was a ½" thick layer of the compound troweled or otherwise placed in the groove end of the structure covering not less than two-thirds of the joint face around the entire circumference before the tongue end of the next structure is shoved home with sufficient pressure to make a tight joint?

☐ ☐ ☐

3. After the joint is made, is any excess mastic projecting into the structure removed?

☐ ☐ ☐

D. Joints Using Rubber Gasket

1. Where rubber gasket joints are required by the plans, is the joint assembly made according to the recommendations of the gasket manufacturer?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

Yes No NA

2. When using rubber gaskets, are the joints water tight?

☐ ☐ ☐

E. Joints Using Pre-formed Flexible Joint Sealants

1. Are the joints placed according to the procedure shown in Article 464.3.C.4 and the manufacturer's recommendations?

☐ ☐ ☐

2. Is the joint sealer placed in such manner that no dirt or other deleterious materials will come in contact with the joint sealing material?

☐ ☐ ☐

3. When the atmospheric temperature is below 60°F, are plastic joint seal gaskets either stored in an area warmed to above 70°F or artificially warmed to this temperature in a manner satisfactory to the Engineer?

☐ ☐ ☐

F. Connections and Stub Ends for Pipes, Concrete Box Culverts and Storm Drains

1. Is the bottom of existing structures mortared or concreted if necessary to eliminate any drainage pockets created by the connections?

☐ ☐ ☐

2. Is any damage to the existing structure resulting from making the connection satisfactorily repaired by the Contractor?

☐ ☐ ☐

3. Unless otherwise shown on the plans, are the connections between concrete pipe and corrugated metal pipe made with a suitable concrete collar having a minimum thickness of 4"?

☐ ☐ ☐



Williamson County Road Bond Program Inspection Check Lists

Concrete Box Culverts & Storm Drains – Item 462 Reinforced Concrete Pipe – Item 464

	Yes	No	NA
4. Are stub ends, for connections to future work not shown on the plans, finished by installing watertight plugs into the free end of the pipe?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. For precast boxes, fill lifting holes with mortar or concrete and cure or precast concrete mortar plugs may be used. Have the holes been filled accordingly prior to backfill?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX B
GUIDE SCHEDULE OF SAMPLING AND TESTING

GUIDE SCHEDULE OF SAMPLING & TESTING

MAY 2016



Using the Guide Schedule

Research of sampling and testing rates listed for project tests in the following Guide Schedule show that the Department's and the Contractor's risk of either rejecting "good" material or accepting "bad" material range from 20% to 40%.

To reduce this risk, we recommend that the sampling rate be increased during initial production. A four-fold increase in testing frequency will generally reduce risk to approximately 5%. The intent of increasing testing at the start of production is to insure that the Contractor's processes are in control and to establish acceptability requirements early.

There is a need to increase the frequency of testing for high-variability materials and when testing results do not meet specifications. The Engineer may require the Contractor to reimburse the Department for costs resulting from failing test results, in accordance with the specifications.

Materials incorporated in TxDOT projects are subjected to various quality assurance procedures such as testing (as outlined in this document), certification, quality monitoring, approved lists, etc. The Engineer and testing staff should familiarize themselves with materials to be used before work begins by reviewing the specifications and this document. Discuss material testing requirements with the Contractor.

Other testing required by the specifications, but not shown in the Guide Schedule, should be performed at a frequency necessary to provide adequate confidence that materials meet specifications.

NOTE: For projects subject to FHWA construction oversight activities, use the "[Letter of Certification of Materials Used](#)" to document reasons for material acceptance when a test fails. For all other projects, document the justification and explanation for acceptance of materials that fail project tests in the project file.

Assuring the quality of the product and proper incorporation of materials into the project begins with proper sampling practices. Sampling, testing, and construction inspection must be performed collaboratively to assure the specific attributes of the finished product reflect quality workmanship. Sampling guidance for hot-mixed asphalt is contained in Tex-225-F, "Random Selection of Bituminous Mixture Samples," and the respective specification for that material. All remaining materials are covered by method and materials specifications, to which the following applies.

For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows:

- Soils/flexible base: Vary sampling between stockpiling operations, completed stockpile, windrow, and project site. Vary the time of day sampling is performed.
- Aggregates: Sample aggregates nearest the point of incorporation into the work. Vary sampling between stockpiling operations, completed stockpile, belt sampling, and if deemed necessary, railroad cars/trucks. Vary the time of day sampling is performed.
- Concrete (structural and miscellaneous): Always sample as near as practicable to the point of placement. For strength testing, vary the time of day or the number of truck from which the concrete is sampled. Tests for slump, air, and temperature should be done often to ensure the consistent control of the concrete production (not applicable to miscellaneous concrete).

This Guide Schedule is applicable to all contracts associated with the 2014 Standard Specifications.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (F)	REMARKS
EMBANKMENT (CUTS & FILLS)	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or project site (B)	Materials with PI \leq 15: 10,000 CY	For Type A embankment or when required by the plans. This test may be waived for embankment cuts as directed by the Engineer. Determine a new liquid limit and plasticity index for each different material or notable change in material.
	Plasticity Index (A)	Tex-106-E		Materials with PI > 15: 5,000 CY	Sample in accordance with Tex-100-E.
	Gradation	Tex-110-E		Each 10,000 CY	When shown on plans. This test may be waived for embankment cuts, as directed by the Engineer. Sample in accordance with Tex-100-E.
	Moisture/Density	Tex-114-E		As directed by the Engineer	Not required for ordinary compaction. Determine a new optimum moisture and maximum density for each different material or notable change in material. Sample in accordance with Tex-100-E.
	In-place Density (A)	Tex-115-E	As designated by the Engineer	Fill: each 5,000 CY min. 1 per lift.	Not required for ordinary compaction. Determine a new optimum moisture and maximum density according to Tex-114-E for each different material or notable change in material.
				Cut: each 6,000 LF	Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material and adjust the density accordingly. Materials such as RAP, gypsum, lime, cement, and iron ore tend to bias the counts for nuclear density gauges.
RETAINING WALL (NON-SELECT BACKFILL)	As shown above for Embankment (Cuts and Fills)		As shown above for Embankment (Cuts and Fills)	As shown above for Embankment (Cuts and Fills)	Sample in accordance with Tex-100-E.
RETAINING WALL (SELECT BACKFILL)	Gradation	Tex-110-E	During stockpiling operations, from completed stockpile, or project site (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Resistivity (A)	Tex-129-E	During stockpiling operations, from completed stockpile, or project site (B)	Each 5,000 CY	For material with resistivity between 1,500 and 3,000 ohm-cm, determine chloride and sulfate content, as specified in Item 423. Sample in accordance with Tex-400-A.
	pH (A)	Tex-128-E	During stockpiling operations, from completed stockpile, or project site (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (F)	REMARKS
RETAINING WALL (SELECT BACKFILL) (continued)	Soundness	Tex-411-A	During stockpiling operations, or from completed stockpile	1 per source, per project	Test when backfill sources appear to contain particles such as shale, caliche, or other soft, poor-durability particles. Sample in accordance with Tex-400-A.
	In-place Density (A)	Tex-115-E	As designated by the Engineer.	1 per backfill lift, per wall	Not required for rock backfill. For walls greater than 500 ft. in length, perform one test per lift for every 500 ft. in length. (F) Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E for each different material or notable change in material and adjust the density accordingly.
UNTREATED BASE COURSES	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Plasticity Index (A)	Tex-106-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	
	Gradation (A)	Tex-110-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Moisture/Density	Tex-113-E	From completed stockpile at the source (E)	Each 20,000 CY	Not required for ordinary compaction. Sample in accordance with Tex-400-A.
	Wet Ball Mill (A)	Tex-116-E	From completed stockpile at the source (E)	Each 20,000 CY	As required by the plans. Sample in accordance with Tex-400-A.
	Strength (A)	Tex-117-E	From completed stockpile at the source (E)	Each 20,000 CY	As required by the plans. When base material is from a source where the District has a record of satisfactory triaxial results, the frequency of testing may be reduced to one per 30,000 CY. If any one test falls below the minimum value required, the frequency of testing will return to the original frequency of 20,000 CY. Sample in accordance with Tex-400-A.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (F)	REMARKS
UNTREATED BASE COURSES	In-place Density (A)	Tex-115-E	As designated by the Engineer	Each 3,000 CY, min. 1 per lift	Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material and adjust the density accordingly. Materials such as RAP, gypsum, lime, cement, and iron ore tend to bias the counts for nuclear density gauges.
	Thickness (A)	Tex-140-E	As designated by the Engineer	Each 3,000 CY	Not required where survey grade control documents compliance.
TREATED SUBGRADE AND BASE COURSES	SUBGRADE BEFORE TREATMENT	Organic Content	Tex-148-E	As designated by the Engineer	1 per 500 linear feet or 5,000 CY Required for existing subgrade material and material imported from a borrow source. Soil survey and geologic maps may be used to determine sampling locations. Sample in accordance with Tex-100-E.
		Sulfate Content	Tex-145-E	As designated by the Engineer	1 per 500 linear feet or 5,000 CY Required for existing subgrade material and material imported from a borrow source. Soil survey and geologic maps may be used to determine sampling locations. Sample in accordance with Tex-100-E.
	NEW BASE MATERIAL	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY When central mix site or plant is used, windrow sampling may be waived. Sample in accordance with Tex-400-A.
		Plasticity Index (A)	Tex-106-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY
		Gradation (A)	Tex-110-E	During stockpiling operations, from completed stockpile, or windrow (B)	Each 5,000 CY Sample in accordance with Tex-400-A.
		Wet Ball Mill (A)	Tex-116-E	From completed stockpile at the source (E)	Each 20,000 CY As required by the plans. Sample in accordance with Tex-400-A.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (F)	REMARKS
TREATED SUBGRADE AND BASE COURSES	NEW BASE MATERIAL	Strength (A)	Tex-117-E	From completed stockpile at the source (E)	Each 20,000 CY	As required by the plans. When base material is from a source where the District has a record of satisfactory triaxial results, the frequency of testing may be reduced to one per 30,000 CY. If any one test falls below the minimum value required, the frequency of testing will return to the original frequency of 20,000 CY.
	LIME	Compliance with DMS-6350	Tex-600-J	During delivery to project	Commercial Lime Slurry: each 200 tons of lime Carbide Lime Slurry: each 100 tons of lime	Sample in accordance with Tex-400-A. Verify the source is listed on the current Material Producer List for Lime. Only materials appearing on the Material Producer List will be accepted. Sample frequency for Carbide Lime Slurry may be increased as directed by the Engineer. For Hydrated Lime and Quick Lime project testing is not required but it is encouraged to sample and test the material at a rate of 1 per project as a best practice.
	CEMENT	Compliance with DMS-4600		Railroad car, truck, or cement bins		Verify the source is listed on the current Material Producer List for Cement. If not, sample and test in accordance with DMS-4600. (C)
	FLY ASH MATERIAL	Compliance with DMS-4615		Project samples at location designated by the Engineer		Verify the source is listed on the current Material Producer List for Fly Ash. Only materials from CST/M&P approved sources appearing on the Material Producer List for Fly Ash will be accepted. Project testing is not required but it is encouraged to sample and test the material at a rate of 1 per project as a best practice. (C)
	COMPLETE MIXTURE	Pulverization Gradation	Tex-101-E Part III	Roadway, after pulverization and mixing	As necessary for control	At the beginning of the project, one test must be made for each 4,500 CY or 6,000 tons until the Engineer is satisfied that acceptable pulverization results are being obtained. Sample in accordance with Tex-100-E.
		Soil-Cement Testing Soil-Lime Testing	Tex-120-E, Part II, or Tex-121-E, Part II	From roadway windrow after treatment (E)	Each 20,000 CY	Not required for ordinary compaction. Determine a new moisture/density curve for each different or notable change in material. Perform Tex-120-E, Part II, for Cement Treated Material, and Tex-121-E, Part II, for Lime, Lime-Fly Ash, or Fly Ash Treated Material. If Tex-120-E, Part I, Tex-121-E, Part I, or Tex-127-E is performed prior to the project, this test may be waived. Sample in accordance with Tex-100-E.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE I – EMBANKMENTS, SUBGRADES, BACKFILL, AND BASE COURSES

			PROJECT TESTS			
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (F)	REMARKS
TREATED SUBGRADE AND BASE COURSES	COMPLETE MIXTURE	Soil-Cement Testing Soil-Lime Testing	Tex-120-E, Part I, Tex-121-E, Part I, or Tex-127-E	From roadway windrow after treatment	As necessary for control	Perform Tex-120-E, Part I, on cement treated material, and Tex-121-E, Part I, for lime-fly ash or fly ash treated material. Verifies the field strength by comparing results from the mix design. Performed at the discretion of Engineer. Sample in accordance with Tex-100-E.
		In-place Density (A)	Tex-115-E	As designated by the Engineer	Each 3,000 CY, min 1 per lift	Determine the appropriate moisture/density curve for each different material or notable change in material. Correct the moisture contents measured by nuclear density gauge in Tex-115-E with the moisture contents determined in accordance with Tex-103-E, as necessary for control, for each different material or notable change in material and adjust the density accordingly. Stabilizers and materials such as RAP, gypsum, and iron ore tend to bias the counts for nuclear density gauges.
		Thickness (A)	Tex-140-E	As designated by the Engineer	Each 3,000 CY	Not required where survey grade control documents are used for compliance
RECLAIMED ASPHALT PAVEMENT (RAP), CRUSHED CONCRETE, and RECYCLED MATERIALS		Sulfate Content	Tex-145-E	During stockpiling operations, from completed stockpile, or windrow	Each 5,000 CY	Required only for contractor furnished recycled material, including crushed concrete. Not required for RAP. Sample in accordance with Tex-400-A.
		Deleterious Material	Tex-413-A		Each 5,000 CY	Required only for contractor furnished recycled material, including crushed concrete. Sample in accordance with Tex-400-A.
		Decantation	Tex-406-A	During stockpiling operations, from completed stockpile, or windrow	Each 5,000 CY	Required only for contractor furnished RAP. Sample in accordance with Tex-400-A.

TABLE I – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	Engineer will select any of these locations or any combinations thereof with the provision that the initial sample will be obtained from the completed stockpile at the source and at least one out of ten consecutive samples will be taken at the project site (from the windrow for treated and untreated bases and embankments when possible).
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

D	<p>For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows:</p> <ul style="list-style-type: none">• Soils/Flexible Base: For gradation, liquid limit, and plastic limit, vary sampling between stockpiling operations, completed stockpile, windrow, and project site. Vary the time of day sampling is performed.• Aggregates: Sample aggregates nearest the point of incorporation into the work. Vary sampling between stockpiling operations, completed stockpile, belt sampling, and if deemed necessary, railroad cars/trucks. Vary the time of day sampling is performed.
E	The Engineer will sample from the completed stockpile at the source and test prior to placement.
F	Each test performed that is based on a quantity of material is considered "or fraction thereof" for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE IA – ASPHALT STABILIZED BASE (Plant Mix)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (C)	FREQUENCY OF SAMPLING (D)	REMARKS
AGGREGATE	Gradation (A)	Tex-200-F, Part I	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Liquid Limit (A)	Tex-104-E	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	Sample in accordance with Tex-400-A.
	Plasticity Index (A)	Tex-106-E	During stockpiling operations, from completed stockpile, or prior to mixing	Each 5,000 CY	
	Wet Ball Mill or L. A. Abrasion (A)	Tex-116-E or Tex-410-A	During stockpiling operations, from completed stockpile, or prior to mixing	Each 20,000 CY	When L. A. Abrasion is specified, tests are not required when the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. Sample in accordance with Tex-400-A. (B)
	Coarse Aggregate Angularity (A)	Tex-460-A, Part I	During stockpiling operations, from completed stockpile, or prior to mixing	1 per project, per source	Not required for crushed stone sources. Sample in accordance with Tex-400-A.
	Sand Equivalent	Tex-203-F	Hot aggregate bins, feeder belt, or stockpile	1 per project, per source	When designated by the Engineer, test may be run on combined aggregates when multiple sources are used. Sample in accordance with Tex-400-A.
LIME	Compliance with DMS-6350		During delivery to the project	Hydrated Lime: 1 per project Commercial Lime Slurry: each 200 tons of lime (D) Carbide Lime Slurry: each 100 tons of lime (D) Quick Lime: 1 per project	On projects requiring less than 50 tons, material from CST/M&P approved sources may be accepted on the basis of Producer's Certification without sampling.
RECLAIMED ASPHALT PAVEMENT (RAP), and RECYCLED AGGREGATE	Decantation	Tex-217-F, Part II	During stockpiling operations, from completed stockpile, or prior to mixing	Each 10,000 CY	Sample in accordance with Tex-400-A.

This is a guide for minimum sampling and testing.

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TABLE IA – ASPHALT STABILIZED BASE (Plant Mix)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (C)	FREQUENCY OF SAMPLING (D)	REMARKS
RECYCLED ASPHALT SHINGLES (RAS)	Decantation	Tex-217-F, Part III	During stockpiling operations, from completed stockpile, or prior to mixing	Each 10,000 CY	Sample in accordance with Tex-400-A.
ASPHALT BINDER	Compliance with Item 300 – Binder and Tack Coat		Sampled, tested and preapproved by CST/M&P. Take project samples when designated by the Engineer.	1 each for binder and tack coat per project, per grade, per source	Test at least one sample taken from the project. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
COMPLETE MIXTURE	Laboratory Density (A)	Tex-126-E	Plant Mix (C)	20,000 CY (25,000 tons)	Sample in accordance with Tex-222-F.
	Percent Asphalt (A)	Tex-236-F	Plant Mix (C)	Each 1,500 CY (2,000 tons) or days production	Determine asphalt content correlation factors for ignition oven at a minimum of one per project. Sample in accordance with Tex-222-F.
	Indirect Tensile Strength – Dry	Tex-226-F	Plant Mix	1 per project, per design	Sample in accordance with Tex-222-F.
	Moisture Susceptibility	Tex-530-C	As designated by the Engineer	1 per project, per design	This test may be waived, when shown on the plans. Sample in accordance with Tex-222-F.
ROADWAY	In-Place Air Voids (A)	Tex-207-F	Roadway cores, as designated by the Engineer (C, D)	Each 2,500 CY (3,000 tons) or days production	Not required for ordinary compaction or when air void requirements are waived. Sample in accordance with Tex-222-F.

TABLE IA – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	Engineer will select any of these locations or any combinations thereof with the provision that at least one out of ten consecutive samples will be taken at the project site (from the windrow for treated and untreated bases and embankments when possible).
C	For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows: <ul style="list-style-type: none"> • Soils/flexible base: Vary sampling between stockpiling operations, completed stockpile, windrow, and project site. Vary the time of day sampling is performed. • Aggregates: Sample aggregates nearest the point of incorporation into the work. Vary sampling between stockpiling operations, completed stockpile, belt sampling, and if deemed necessary, railroad cars/trucks. Vary the time of day sampling is performed.
D	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE II – SEAL COAT					
			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (C)	FREQUENCY OF SAMPLING (D)	REMARKS
AGGREGATE	Gradation (A)	Tex-200-F, Part I	Stockpile (At source or at point of delivery)	One each 1,000 CY	Rate may be reduced to one each 2,000 CY if the Engineer approves a contractor quality control plan. Sample in accordance with Tex-221-F.
	L. A. Abrasion (A)	Tex-410-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample and test at 1 per 20,000 CY prior to use. Sample in accordance with Tex-221-F. (B)
	Magnesium Soundness (A)	Tex-411-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample and test at 1 per 20,000 CY prior to use. Sample in accordance with Tex-221-F. (B)
	Surface Aggregate Classification (A)	Tex-612-J, Tex-411-A	Stockpile	1 per 20,000 CY	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample and test at 1 per 20,000 CY prior to use. Sample in accordance with Tex-221-F. (B)
	Pressure Slake (A)	Tex-431-A	Stockpile	1 per 20,000 CY	Same as above. Required only for lightweight aggregate. Sample in accordance with Tex-221-F.
	Freeze Thaw (A)	Tex-432-A	Stockpile	1 per 20,000 CY	Same as above. Required only for lightweight aggregate. Sample in accordance with Tex-221-F.
	Unit Weight	Tex-404-A	Stockpile	1 per 20,000 CY	Same as above. Required only for lightweight aggregate. Sample in accordance with Tex-221-F.
	24 hr Water Absorption (A)	Tex-433-A	Stockpile	1 per 20,000 CY	Same as above. Required only for lightweight aggregate. Sample in accordance with Tex-221-F.
	Coarse Aggregate Angularity	Tex-460-A	Stockpile	1 per 20,000 CY	Only required for crushed gravel. Sample in accordance with Tex-221-F.
	Deleterious Material (A)	Tex-217-F, Part I	Stockpile	1 per 10,000 CY	Not required for lightweight aggregate. Sample in accordance with Tex-221-F.
	Decantation (A)	Tex-406-A	Stockpile	1 per 10,000 CY	Sample in accordance with Tex-221-F.
	Flakiness Index	Tex-224-F	Stockpile	Frequency as directed by the Engineer	Sample in accordance with Tex-221-F.

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Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE IA – ASPHALT STABILIZED BASE (Plant Mix)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (C)	FREQUENCY OF SAMPLING (D)	REMARKS
	Micro Deval	Tex-461-A	Stockpile	1 per project or as necessary for control	Compare result to published value listed on the current Material Producer List for BRSQC . Submit sample to CST/M&P for Soundness and L.A. Abrasion testing when results differ by more than 3% points, unless otherwise directed by the Engineer. Sample in accordance with Tex-221-F.
	White Rock Count	Tex-220-F	Stockpile		Required only for Limestone Rock Asphalt. Not required when CST/M&P provides inspection at the plant. Sample in accordance with Tex-221-F.
	Naturally Impregnated Bitumen Content	Tex-236-F	Stockpile		Required only for Limestone Rock Asphalt. Not required when CST/M&P provides inspection at the plant. Sample in accordance with Tex-221-F.
PRECOATED AGGREGATE	Asphalt Content	Tex-236-F	Stockpile	Frequency as directed by the Engineer when a target value is specified	Sample in accordance with Tex-221-F.
ASPHALT	Compliance with Item 300		Sampled, tested, and preapproved by CST/M&P. Take project samples when designated by the Engineer from the distributor or transport.	1 per project, per grade, per source	Sample in accordance with Tex-500-C. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.

TABLE II – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
C	For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows: <ul style="list-style-type: none"> Aggregates: Sample aggregates nearest the point of incorporation into the work. Vary sampling between stockpiling operations, completed stockpile, belt sampling, and if deemed necessary, railroad cars/trucks. Vary the time of day sampling is performed.
D	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

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Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)						
				PROJECT TESTS		
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (E)	REMARKS
MINERAL AGGREGATE	COARSE AGGREGATE	Decantation (B)	Tex-406-A	From stockpile at concrete plant	Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Sieve Analysis (A) (B)	Tex-401-A		Each 1,000 CY of concrete (each source)	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Deleterious Materials (B)	Tex-413-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A.
		Los Angeles Abrasion (A) (B)	Tex-410-A		Two, each source	Verify the value of the source, as listed on the current Material Producer list for CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A. (C)
		5-cycle Magnesium Sulfate Soundness (A) (B)	Tex-411-A		Two, each source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. (C)
	FINE AGGREGATE	Sand Equivalent (B)	Tex-203-F	From stockpile at concrete plant	1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Organic Impurities (B)	Tex-408-A		1 per project, per source	Sample in accordance with Tex-400-A.
		Sieve Analysis (A) (B)	Tex-401-A		Each 1,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Fineness Modulus (B)	Tex-402-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used. Test to confirm material variability when strength values are in question.
		Deleterious Material (B)	Tex-413-A		1 per project or as necessary for control	Sample in accordance with Tex-400-A. Test to confirm material variability when strength values are in question.
		Acid Insoluble Residue (A) (B)	Tex-612-J		Two, each source	Only for concrete subject to direct traffic. Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A. (C)
SILICA FUME		Compliance with DMS-4630 (A)		Railroad car, truck, bags or silos	1 per project, per class of concrete (For each type and brand)	Sample in accordance with Tex-320-D.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (E)	REMARKS
METAKAOLIN	Compliance with DMS-4635 (A)		Railroad car, truck or silos	1 per project, per class of concrete (For each type and brand)	
MIX DESIGN	Compliance with Standard Specification Item 421.4.A		At source (if not approved)	Min. 1 design per class, per source	Verify if cement, fly ash, slag cement, and chemical admixture sources are listed on the Material Producer Lists. If not, sample and submit to CST/M&P for testing. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT). Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash.
JOINT MATERIAL	Compliance with DMS-6300				Sample in accordance with Tex-500-C. Verify the source is listed on the Material Producer List for Joint Sealers . If not, sample and test prior to use in accordance with DMS-6310. (C)
CURING COMPOUND	Compliance with DMS-4650		Sampled at jobsite; tested by CST/M&P. See remarks.	When requested by CST	Only products listed on the Material Producer List for Concrete Curing Compounds will be allowed. When sample is requested by CST, sample in accordance with Tex-718-I. Ensure container has been agitated and mixed prior to sampling. (C)
EVAPORATION RETARDANTS	Compliance with DMS-4650				Only products listed on the Material Producer list for Evaporation Retardants will be allowed. (C)
REINFORCING STEEL	Compliance with the Std. Specifications & Spec. Provisions	As Specified			Only materials from CST/M&P approved sources listed on the Material Producer Lists for Reinforcing Steel Mills and Seven Wire Steel Strand will be allowed. (C)
MECHANICAL COUPLERS	Compliance with DMS-4510	Tex-743-I	Sampled at jobsite; Tested by CST/M&P	3 couplers per lot (500 couplers) for each type, model, bar size and grade	Only materials from CST/M&P approved sources listed on the Material Producer List for Mechanical Couplers will be allowed. (C)
LATEX	Compliance with DMS-4640 for concrete chemical admixtures		Sampled at jobsite.	Min. of 1 test per project	Sample in accordance with Tex-321-E.
EPOXY	Compliance with DMS-6100, unless otherwise specified		Sampled at jobsite if not pre-approved by CST/M&P.	1 per batch or shipment	Verify the source is listed on the Material Producer List for Epoxies and Adhesives . If not, sample and test prior to use in accordance with DMS-6100. Sample in accordance with Tex-734-I. (C)

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TABLE III – HYDRAULIC CEMENT CONCRETE – STRUCTURAL (Classes: C, F, H, S, CO, K, LMC, or SS)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (D)	FREQUENCY OF SAMPLING (E)	REMARKS
CONCRETE	Compressive Strength (A)	Tex-418-A	At point of concrete placement	4 cylinders for each 60 CY per class, per day (For bridge railing and traffic railing, testing may be reduced to 4 cylinders per 180 CY per class regardless of days)	Sampling must be in accordance with Tex-407-A. Test two cylinders at 7 days, and if the average value is below the design strength as defined in Item 421 Table 8, test the remaining 2 cylinders at 28 days. If the average value of the 2 cylinders tested at 7 days meets the minimum design strength listed in Item 421 Table 8, the 2 remaining cylinders are not required to be tested.
CONCRETE	Slump	Tex-415-A		1 test per 4 strength specimens	Sample in accordance with Tex-407-A. Perform slump and temperature tests on the same load from which strength test specimens are made. Perform entrained air test only when entrained air concrete is specified in the plans. Check temperature of every load for bridge slabs and mass concrete placements. Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.
	Entrained Air (A)	Tex-416-A or Tex-414-A			
	Temperature of Concrete (A)	Tex-422-A			
	Slab Thickness and Depth of Reinforcement	Tex-423-A, Part II	During dry run and during concrete placement (Bridge decks and direct traffic culverts)	1 per span	Min 6–Max 18 locations per span

TABLE III – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	These Project Tests may be used for one or more projects being furnished concrete from the same plant during the same period.
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
D	For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows: <ul style="list-style-type: none"> Aggregates: Sample aggregates nearest the point of incorporation into the work. Vary sampling between stockpiling operations, completed stockpile, and if deemed necessary, railroad cars/trucks. Vary the time of day sampling is performed. Concrete (structural): Always sample as near as practicable to the point of placement. For strength testing, vary the time of day or the number of truck from which the concrete is sampled. Test often for slump, air, and temperature to ensure the consistent control of the concrete production.
E	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

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TABLE IV – HYDRAULIC CEMENT CONCRETE – NON-STRUCTURAL CONCRETE (Classes: A, B, or E)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING (B)	FREQUENCY OF SAMPLING (C)	REMARKS
CONCRETE	Compressive Strength (A)	Tex-418-A	At point of concrete placement	2 cylinders per 180 CY, per class	Sampling must be in accordance with Tex-407-A. Strength will be determined by 7-day specimens.
MIX DESIGN	Compliance with the Standard Specification		At source if not approved.	Min. 1 design per class, per source	Verify if cement, fly ash, slag cement, and chemical admixture sources are listed on the Material Producer Lists. If not, sample and submit to CST/M&P for testing. Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT).
SILICA FUME	Compliance with DMS-4630		Railroad car, truck, bags or silos	1 test per project, per class (for each type and brand)	Sample in accordance with Tex-320-D.
METAKAOLIN	Compliance with DMS-4635		Railroad car, truck or silos	1 test per project, per class (for each type and brand)	

TABLE IV – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	For acceptance testing, especially that which directly determines payment for the Contractor, sampling personnel should provide randomness in sampling by avoiding patterned sampling routines. Examples of such sampling practices are as follows: <ul style="list-style-type: none"> Concrete (miscellaneous): Always sample as near as practicable to the point of placement. For strength testing, vary the time of day or the number of truck from which the concrete is sampled.
C	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)

			PROJECT TESTS			
MATERIAL OR PRODUCT		TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
MINERAL AGGREGATE	COARSE AGGREGATE	Decantation	Tex-406-A	From stockpile at concrete plant	Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		As necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Deleterious Materials	Tex-413-A		Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		L.A. Abrasion (A)	Tex-410-A		Two, each source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A. (C)
		5-Cycle Magnesium Sulfate Soundness (A)	Tex-411-A			
	FINE AGGREGATE	Sand Equivalent	Tex-203-F	From stockpile at concrete plant	Each 3,000 CY of concrete (Each source or combination of sources)	Sample in accordance with Tex-400-A. Test combined aggregate when used. No less than one per week's production.
		Organic Impurities	Tex-408-A		1 per project, per source	Sample in accordance with Tex-400-A.
		Sieve Analysis (A)	Tex-401-A		As necessary for control	Sample in accordance with Tex-400-A. Test combined aggregate when used.
		Fineness Modulus (B)	Tex-402-A			
		Deleterious Material (B)	Tex-413-A		Each 20,000 CY of concrete (each source)	Sample in accordance with Tex-400-A.
		Acid Insoluble (A)	Tex-612-J		1 per project, per source	Verify the value of the source, as listed on the current CRSQC, meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-400-A. (C)
MIX DESIGN		Compliance with the Standard Specifications Item 421.4.A		At source, if not approved	Min. 1 design, per class, per source	Verify if cement, fly ash, ground granulated blast furnace slag, and admixture sources are listed on the Material Producer List. If not, sample and submit to CST/M&P for testing. Sample in accordance with Tex-300-D for cement and in accordance with Tex-733-I for fly ash. Water testing is contracted by the concrete supplier (commercial lab report to be reviewed by TxDOT).

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Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
SILICA FUME	Compliance with DMS-4630		Railroad car, truck, bags or silos	1 per project per class of concrete (For each type and brand)	Sample in accordance with Tex-320-D.
METAKAOLIN	Compliance with DMS-4635		Railroad car, truck or silos	1 per project per class of concrete (For each type and brand)	Sample in accordance with Tex-320-D.
JOINT MATERIAL	Compliance with DMS-6310		Sampled at jobsite if not sampled at source by CST/M&P; tested by CST/M&P. See remarks.	1 per batch or shipment	Sample in accordance with Tex-500-C. Sampling may be waived when the source is listed on the Material Producer List for Joint Sealers . (C)
CURING COMPOUND	Compliance with DMS-4650		Sampled at jobsite; tested by CST/M&P. See remarks.	When requested by CST	Only products listed on the Material Producer List for Concrete Curing Compounds will be allowed. When sample is requested by CST, sample in accordance with Tex-718-I. Ensure container has been agitated and mixed prior to sampling. (C)
EVAPORATION RETARDANTS	Compliance with DMS-4650				Only products listed on the Material Producer List for Evaporation Retardants will be allowed. (C)
REINFORCING STEEL	Compliance with the Std. Specifications & Spec. Provisions	As Specified			Only materials from CST/M&P approved sources listed on the Material Producer List for Reinforcing Steel Mills and Seven Wire Steel Strand will be accepted. (C)
MULTIPLE PIECE TIE BARS	Compliance with DMS-4515	Tex-712-I	Sampled at jobsite if not sampled at source by CST/M&P; tested by CST/M&P. See remarks.	Refer to Tex-711-I for sampling rates	Only materials from CST/M&P approved sources listed on the Material Producer List for Multiple Piece Tie-bars for Concrete Pavements will be allowed. Sample in accordance with Tex-734-I.
EPOXY	Compliance with DMS-6100		Sampled at jobsite if not pre-approved by CST/M&P. See remarks.	1 batch per shipment	Verify the source is listed on the Material Producer List for Epoxyes and Adhesives . If not, sample and test prior to use in accordance with DMS-6100. Sample in accordance with Tex-734-I. (C)

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE V – HYDRAULIC CEMENT CONCRETE PAVEMENT (Classes: P or HES)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OR TIME OF SAMPLING	FREQUENCY OF SAMPLING (D)	REMARKS
CONCRETE	Strength (A) (B)	Tex-448-A or Tex-418-A	At point of concrete placement	2 cylinders for every 10 contractor job control tests	<p>Sample in accordance with Tex-407-A.</p> <p>When the contract requires the project testing to be by the Engineer, the frequency and job control testing will be in accordance with the item of work.</p> <p>Split sample verification testing used when contractor performs job control testing.</p> <p>When job control testing by the contractor is waived by the plans, the frequency of sampling will be one test (2 specimens) for each 3,000 SY of concrete or fraction thereof or per day and split sample verification testing will be waived.</p> <p>Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.</p>
	Slump	Tex-415-A	At time and location strength specimens are made	1 test for every 10 contractor job control tests.	<p>Sample in accordance with Tex-407-A.</p> <p>Slump is not required for slip-formed pavement.</p> <p>Perform slump and temperature tests on the same load from which the strength specimens are made.</p> <p>Perform entrained air test only when entrained air concrete is specified in the plans.</p> <p>Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.</p>
	Entrained Air (A)	Tex-416-A or Tex-414-A			
	Temperature	Tex-422-A			
	Thickness	Tex-423-A	Center of paving machine	Every 500 feet	Methods other than Tex-423-A may be shown on the plans.
	Ride Quality Surface Test Type B (A)	Tex-1001-S	Final riding surface of travel lanes		<p>Engineer may verify contractor's results for surface test Type B. For traditional design-bid-build TxDOT projects, CST has contracted with TTI to perform random ride verification at 10% frequency.</p> <p>Results from surface test Type A are not required to be reported.</p>

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TABLE V – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	When a project test does not meet the specified strength requirements and a reduced pay factor is assigned, document the analysis on the Letter of Certification of Materials Used.
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
D	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – ASPHALT CONCRETE PAVEMENT (Items 341, 342, 344, 346, 347 and 348)

(All testing as noted in Table VI may be waived for exempt production as defined by specification.)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION (Per Design)	FREQUENCY OF SAMPLING (E)	REMARKS
COARSE AGGREGATE	L. A. Abrasion (A)	Tex-410-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer list for BRSQC , meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. (C)
	Magnesium Sulfate Soundness (A)	Tex-411-A		1 per project, per source	
	Surface Aggregate Classification (A)	Tex-499-A		1 per project, per aggregate source	Not required when the Rated Source Soundness Magnesium loss is 15 or less as listed on the current published BRSQC . If testing is required, sample in accordance with Tex-221-F.
	Micro Deval	Tex-461-A			
COMBINED AGGREGATE	Sand Equivalent	Tex-203-F	Stockpiles, hot bins or feeder belts	1 per project, per source, per design	Does not apply to Item 342. Sample in accordance with Tex-221-F. The timing of when the test is performed is at the discretion of the Engineer.
ASPHALT BINDER	Compliance with Item 300 Binder & Tack Coat (A)		Sampled, tested and pre-approved by CST/M&P. Project test sampled at the Plant for Binder & Road for Tack Coat	1 each for binder and tack coat per project, per grade, per source	Test a minimum of one sample taken from the project. Sample tack coat at the distributor on the roadway in accordance with Tex-500C, Part III. Sample binder at hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
MIX DESIGN	Compliance with applicable specification	Tex-204-F	At source (if not approved)	Min 1 design per Mix Type and Asphalt Grade	Verify that aggregates, recycled asphalt pavement, recycled asphalt shingles, mineral filler, asphalt binder, anti-stripping additives, and warm mix systems are on the Material Producer List where applicable and that they meet project specification requirements. Project sampling and testing may be conducted on individual materials as necessary for control.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – ASPHALT CONCRETE PAVEMENT (Items 341, 342, 344, 346, 347 and 348)

(All testing as noted in Table VI may be waived for exempt production as defined by specification.)

			PROJECT TESTS		PROJECT INDEPENDENT ASSURANCE TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY (Per Design)	LOCATION	FREQUENCY	REMARKS
COMPLETE MIXTURE	Asphalt Content (%) (A)	Tex-236-F	Engineer Truck Sample (D)	Minimum 1 per Lot			Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Voids in Mineral Aggregates (VMA)	Tex-207-F	Truck Sample Plant Produced (D)	1 per Sublot	Truck	1 per 10 Lots only if compactor is shared by Contractor and State	Sample in accordance with Tex-222-F. Does not apply to Item 342, "Permeable Friction Course." Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.
	Gradation (A)	Tex-236-F	Engineer Truck Sample (D)	Minimum 1 per 12 Sublots (E)			Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Boil Test	Tex-530-C	Truck Sample	1 per project			Sample in accordance with Tex-222-F. Unless waived by the Engineer.
	Indirect Tensile Strength – Dry	Tex-226-F					Sample in accordance with Tex-222-F. Unless waived by the Engineer. Does not apply to Items 342, 346, and 348.
	Moisture Content	Tex-212-F, Part II	Engineer Truck Sample				Sample in accordance with Tex-222-F.
	Lab Molded Density (A)	Tex-207-F	Truck Sample (D)	1 per Sublot 1 per Lot for Item 347	Truck	1 per 10 Lots only if compactor is shared by Contractor and State	Sample in accordance with Tex-222-F. Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.
	Drain Down Test (A)	Tex-235-F	Engineer Truck Sample	1 per project 1 per Lot for Item 342			Sample in accordance with Tex-222-F. Not required for Item 341 and Item 344.
	Hamburg Wheel Test (A)	Tex-242-F	Engineer Truck Sample	1 per project			Sample in accordance with Tex-222-F. Sample during production. Does not apply to Item 348.
	Overlay Test	Tex-248-F	Engineer Truck Sample	1 per project			Sample in accordance with Tex-222-F. Does not apply to Items 341, 344, and 348.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VI – ASPHALT CONCRETE PAVEMENT (Items 341, 342, 344, 346, 347, and 348)

(All testing as noted in Table VI may be waived for exempt production as defined by specification.)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY (Per Design)	REMARKS
ROADWAY	In-Place Air Voids (A)	Tex-207-F	Roadway (D)	2 cores per Sublot	Two cores taken per Sublot and averaged. Sample in accordance with Tex-222-F. Does not apply to Items 342, 347, and 348.
ROADWAY	Segregation Profile (A)	Tex-207-F, Part V	Roadway	1 per project	Not required when Contractor uses thermal imaging system. Does not apply to Items 342, 347, and 348.
	Joint Density (A)	Tex-207-F, Part VII	Roadway	1 per project	
	Thermal Profile	Tex-244-F	Immediately behind paver	1 per project	Not required when Contractor uses thermal imaging system.
	Ride Quality Test Type B (A)	Tex-1001-S	Final riding surface of travel lanes	1 per project	Engineer may verify Contractor's results for surface test Type B. For traditional design-bid-build TxDOT projects, CST has contracted with TTI to perform random ride verification at 10% frequency. Results for surface test Type A are not required to be reported.
	Permeability	Tex-246-F	Roadway	1 per project	Only applies to Items 342, 347, and 348.
FABRIC UNDERSEAL	Compliance with DMS-6220		Sampled, tested, and approved by CST/M&P		Sampling must be in accordance with Tex-735-I. Verify the source is listed on the current Material Producer List for Silt Fence, Filter Fabric, and Fabric Underseals . If not, sample and test prior to use in accordance with DMS-6220.

TABLE VI – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field. This letter is required only for Asphalt Content and/or Gradation when production of complete mixture is suspended as required by QC/QA specifications.
B	Sampling may be performed at the plant, quarry, or both. Aggregate properties may be re-tested at any time during the project. These project tests may be used for one or more projects furnishing hot mix with the same aggregate source.
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
D	Perform random sampling as specified in Tex-225-F, "Random Selection of Bituminous Mixture Samples."
E	Each test performed that is based on a quantity of material is considered "or fraction thereof" for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VII – ASPHALT CONCRETE PAVEMENT (Items 334)**(Refer to DMS-9210, "Limestone Rock Asphalt (LRA)," for testing requirements for Item 330.)**

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY (Per Design) (F)	REMARKS
COARSE AGGREGATE	L. A. Abrasion (A)	Tex-410-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. (D)
	Magnesium Sulfate Soundness (A)	Tex-411-A			
	Micro Deval	Tex-461-A			Sample in accordance with Tex-221-F. Testing frequency may be reduced or eliminated based on a satisfactory test history.
	Surface Aggregate Classification (A)	Tex-499-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. SiteManager Quality Monitoring test documentation is accomplished by attaching an approved mix design.
COMBINED AGGREGATE	Sand Equivalent	Tex-203-F	Stockpiles, hot bins or feeder belts	1 per project, per source	Sample in accordance with Tex-221-F. The timing of when the test is performed is at the discretion of the Engineer.
ASPHALT BINDER	Compliance with Item 300 Binder & Tack Coat (A) (C)		Sampled, tested and pre-approved by CST/M&P. Project test sampled at the Plant for Binder & Road for Tack Coat	1 each for binder and tack coat per project, per grade, per source	Test a minimum of one sample from production. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
MIX DESIGN	Compliance with applicable specification	Tex-204-F	At source (if not approved)	Min 1 design per Mix Type and Asphalt Grade	Verify that aggregates, recycled asphalt pavement, recycled asphalt shingles, mineral filler, asphalt binder, anti-stripping additives, and warm mix systems are on the Material Producer List where applicable and that they meet project specification requirements. Project sampling and testing may be conducted in individual materials as necessary for control.
COMPLETE MIXTURE	Asphalt Content (%) (A)	Tex-236-F	Engineer Truck Sample (E)	Minimum of 1 per 5,000 tons	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Voids in Mineral Aggregates (VMA)	Tex-207-F	Truck Sample Plant Produced (E)	1 per 5,000 tons	Sample in accordance with Tex-222-F.
	Gradation (A)	Tex-236-F	Truck Sample	Minimum 1 per 5,000 tons	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Boil Test	Tex-530-C		1 per project	Sample in accordance with Tex-222-F. The timing of when the test is performed is at the discretion of the Engineer.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VII – ASPHALT CONCRETE PAVEMENT (Items 334)

(Refer to DMS-9210, "Limestone Rock Asphalt (LRA)," for testing requirements for Item 330.)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY (Per Design) (F)	REMARKS
COMPLETE MIXTURE	Moisture Content	Tex-212-F, Part II	Truck Sample	1 per 5,000 tons	Sample in accordance with Tex-222-F. Performed by CST/M&P at the point of production for payment calculations.
	Hydrocarbon-Volatile Content	Tex-213-F		1 per 5,000 tons	Sample in accordance with Tex-222-F. The timing of when the test is performed is at the discretion of the Engineer.
	Lab Molded Density (A)	Tex-207-F		1 per 5,000 tons	Sample in accordance with Tex-222-F.
	Hveem Stability (A)	Tex-208-F		1 per 5,000 tons	Sample in accordance with Tex-222-F. The timing of when the test is performed is at the discretion of the Engineer.
ROADWAY	Ride Quality Test Type B (A)	Tex-1001-S	Final riding surface of travel lanes		Engineer may verify Contractor's results for surface test Type B. For traditional design-bid-build TxDOT projects, CST has contracted with TTI to perform random ride verification at 10% frequency. Results from surface test Type A are not required to be reported.

TABLE VII – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field.
B	Sampling may be performed at the plant, quarry, or both. Aggregate properties may be re-tested at any time during the project.
C	Or as called for in the Specifications.
D	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
E	Perform random sampling as specified in Tex-225-F, "Random Selection of Bituminous Mixture Samples."
F	Each test performed that is based on a quantity of material is considered "or fraction thereof" for calculating number of tests.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VIII – ASPHALT CONCRETE PAVEMENT (Item 340)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY	REMARKS
COARSE AGGREGATE	L. A. Abrasion (A)	Tex-410-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer List for BRSQC , meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. (C)
	Magnesium Sulfate Soundness (A)	Tex-411-A			
	Micro Deval	Tex-461-A	Stockpile (B)	1 per project, per source	Sample in accordance with Tex-221-F. Testing frequency may be reduced or eliminated based on a satisfactory test history.
	Surface Aggregate Classification (A)	Tex-499-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer list for BRSQC , meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. (C)
COMBINED AGGREGATE	Sand Equivalent	Tex-203-F	Stockpiles, hot bins or feeder belts	1 per project, per design	Sample in accordance with Tex-221-F.
ASPHALT BINDER	Compliance with Item 300 Binder & Tack Coat (A)		Sampled, tested and pre-approved by CST/M&P. Plant for Binder & Road for Tack Coat	1 each for binder and tack coat per project, per grade, per source	Test a minimum of 1 sample taken from the project. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at hot mix plant in accordance with Tex-500-C, Part II. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
MIX DESIGN	Compliance with applicable specification	Tex-204-F	At source (if not approved)	Min. 1 design per Mix Type and Asphalt Grade	Verify that aggregates, recycled asphalt pavement, recycled asphalt shingles, mineral filler, asphalt binder, anti-stripping additives, and warm mix systems are on the Material Producer List where applicable and that they meet project specification requirements. Project sampling and testing may be conducted in individual materials as necessary for control.
COMPLETE MIXTURE	Asphalt Content (%)	Tex-236-F	Truck Sample (D)	Minimum of 1 per day	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Voids in Mineral Aggregates (VMA)	Tex-207-F	Truck Sample Plant Produced (D)	1 per day	Sample in accordance with Tex-222-F.
	Gradation (A)	Tex-236-F	Truck Sample	Minimum 1 per day	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Boil Test	Tex-530-C		1 per project	Sample in accordance with Tex-222-F. Unless waived by the Engineer.
	Indirect Tensile Strength – Dry	Tex-226-F		1 per project, per design	Sample in accordance with Tex-222-F. Unless waived by the Engineer.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE VIII – ASPHALT CONCRETE PAVEMENT (Item 340)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION	FREQUENCY	REMARKS
COMPLETE MIXTURE	Lab Molded Density (A)	Tex-207-F	Truck Sample	1 per day	Sample in accordance with Tex-222-F.
	Hamburg Wheel Tracker (A)	Tex-242-F		1 per project	Sample in accordance with Tex-222-F. Sample during production.
ROADWAY	Air Voids (A)	Tex-207-F	Selected by the Engineer (D)	1 per day (2 Cores)	Sample in accordance with Tex-222-F.
	Ride Quality Test Type B (A)	Tex-1001-S	Final riding surface of travel lanes		Engineer may verify Contractor's results for surface test Type B. For traditional design-bid-build TxDOT projects, CST has contracted with TTI to perform random ride verification at 10% frequency. Results from surface test Type A are not required to be reported.
FABRIC UNDERSEAL	Compliance with DMS-6220		Sampled, tested, and approved by CST/M&P		Sample in accordance with Tex-735-I. Verify the source is listed on the current Material Producer List for Silt Fence, Filter Fabric, and Fabric Underseals . If not sample and submit to CST/M&P for testing prior to use in accordance with DMS-6220.

TABLE VIII – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field. This letter is required only for Asphalt Content and/or Gradation when production of complete mixture is suspended as required by QC/QA specifications.
B	Sampling may be performed at the plant, quarry, or both. Aggregate properties may be re-tested at any time during the project. These project tests may be used for one or more projects furnishing hot mix with the same aggregate source.
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
D	Perform random sampling as specified in Tex-225-F, "Random Selection of Bituminous Mixture Samples."

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE IX – MICROSURFACING (Item 350)

			PROJECT TESTS		
MATERIAL OR PRODUCT	TEST FOR	TEST NUMBER	LOCATION OF SAMPLING	FREQUENCY (Per Design)	REMARKS
AGGREGATE	5-Cycle Magnesium Sulfate Soundness (A)	Tex-411-A	Stockpile (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer list for BRSQC meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing at 1 per project, per source. (C)
	Gradation	Tex-200-F, Part II		1 per project, per source	Sample in accordance with Tex-221-F.
	Crushed Face Count	Tex-460-A		1 per project, per source	Sample in accordance with Tex-221-F.
	Acid Insoluble (A)	Tex-612-J		1 per project, per source	Verify the value of the source, as listed on the current BRSQC , meets the project specifications. If not, sample and submit to CST/M&P for testing prior to use in accordance with Tex-499-A. Sample in accordance with Tex-221-F. (C)
	Surface Aggregate Classification	Tex-499-A	Stockpile, or BRSQC (B)	1 per project, per source	Verify the published value of the source, as listed on the current Material Producer list for BRSQC meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CST/M&P for testing at 1 per project, per source. (C)
COMBINED BLEND	Sand Equivalent	Tex-203-F	Stockpile (B)	1 per project, per source	Sample in accordance with Tex-221-F.
ASPHALT BINDER	Compliance with Item 300 Binder & Tack Coat (A)		Sampled, tested, and pre-approved by CST/M&P. Project test sampled at the Plant for Binder & Road for Tack Coat	1 each for binder and tack coat per project, per grade, per source	Test a minimum of one sample during production. Sample tack coat at the distributor on the roadway in accordance with Tex-500-C, Part III. Sample binder at microsurfacing machine in accordance with Tex-500-C, Part III. Binder should arrive on the project pre-approved. If not pre-approved, sample binder before use.
CEMENT	Compliance with DMS-4600				Verify the source is listed on the current Material Producer List for Cement . If not, sample and submit to CST/M&P for testing prior to use in accordance with DMS-4600.
COMPLETE MIX	Asphalt Content	Tex-236-F	During production	1 per day	Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven using Tex-236-F at a minimum of one per project.
	Gradation	Tex-200-F, Part II Tex-236-F			Sample in accordance with Tex-222-F. Determine correlation factors for ignition oven use at a minimum of one per project.

This is a guide for minimum sampling and testing.

Testing frequency may need to be increased for high material variability or when test results approach specification limits.

TABLE IX – FOOTNOTES

A	When this project acceptance test fails but the product is accepted, document the reasons for acceptance on the Letter of Certification of Materials Used or in the SiteManager Remarks field. This letter is required only for Asphalt Content and/or Gradation when production of complete mixture is suspended as required by QC/QA specifications.
B	Sampling may be performed at the plant, quarry, or both. Aggregate properties may be re-tested at any time during the project. These project tests may be used for one or more projects furnishing hot mix with the same aggregate source.
C	Attach the corresponding QM test report for SiteManager projects to satisfy project sampling and testing requirements.
D	Each test performed that is based on a quantity of material is considered “or fraction thereof” for calculating number of tests.

APPENDIX C
AASHTO ACCREDITED LABORATORIES

AASHTO Accredited CMT Laboratories in Texas

* Directory of accredited laboratories and scope of testing is maintained on the AASHTO Materials Reference Laboratory website at: <http://www.amrl.net>. Laboratory must be accredited for each specific test performed.

WILLIAMSON COUNTY

RELOCATION OF 48" WILLIAMSON COUNTY REGIONAL RAW WATER LINE (WCRRWL) PRECINCT NUMBER 3

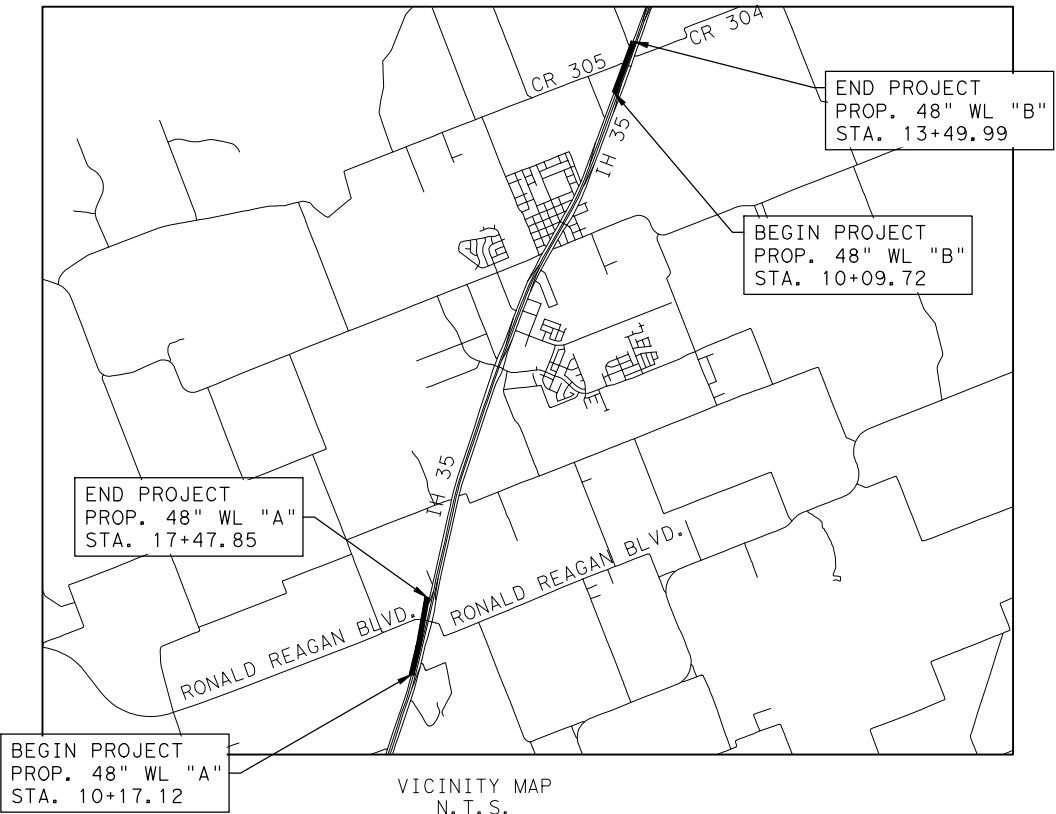
INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

NET LENGTH OF PROJECT = WATER LINE "A" = 731 FT (0.138 MILES)
WATER LINE "B" = 340 FT (0.064 MILES)

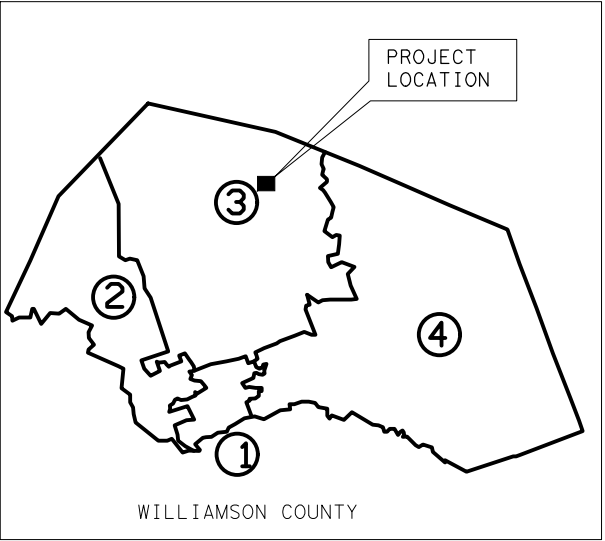
LIMITS: RONALD REAGAN BLVD. AT IH 35 AND CR 305 AT IH 35

TYPE: RELOCATION OF 48" WATER LINE AT RONALD REAGAN BLVD. AT IH 35
AND CR 305 AT IH 35.
CONSISTING OF: 48" DUCTILE IRON PIPE, FITTINGS, VALVES, AND APPURTENANCES



REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION NOT REQUIRED
TDLR NO. EABPRJ _____

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.



NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSINGS
WATERSHEDS: GRANGER LAKE-SAN GABRIEL RIVER AND BERRY
CREEK (RONALD REAGAN BLVD.); SALADO CREEK (CR 305)
AREA OF DISTURBANCE: 0.70 AC

PREPARED BY: COBBFENDLEY

LANCE PARISHER, P.E.
PROJECT MANAGER

9/25/2017
DATE



APPROVED BY:
WILLIAMSON COUNTY

DAN A GATTIS
WILLIAMSON COUNTY JUDGE

DATE

APPROVED BY:
WILLIAMSON COUNTY

VALERIE COVEY
WILLIAMSON COUNTY COMMISSIONER, PRECINCT 3

DATE

APPROVED BY:
HNTB CORPORATION

RICHARD L RIDINGS, PE
ROAD BOND MANAGEMENT TEAM

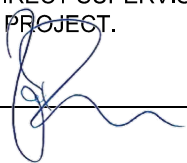
DATE

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\24 Ronald Reagan Blvd. @ IH 35 Phase \Design\C-002--GNOT.dwg -- Tab: INDEX OF SHEETS -- Plotted: 9/25/2017 11:50 AM By: KRISTEN VAN HOOSIER

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
C-001	COVER SHEET
C-002	INDEX OF SHEETS
C-003 - C-004	GENERAL NOTES
C-005	SUMMARY OF QUANTITIES
C-100	KEY MAP - RONALD REAGAN BLVD. AT IH 35
C-101	KEY MAP - CR 305 AT IH 35
C-102	PROP. 48" WL "A" P&P - STA. 10+00 TO 14+00
C-103	PROP. 48" WL "A" P&P - STA. 14+00 TO END
C-104	PROP. 48" WL "B" P&P - STA. 10+00 TO END
C-501	EMBEDMENT AND ENCASEMENT DETAILS
C-502	CORROSION TEST STATION, GATE, AND FENCE DETAILS
C-503	ARV AND MARKER DETAILS
C-504	BWP TRANSITION COUPLING AND MANWAY DETAILS
C-505	SILT FENCE AND TREE PROTECTION DETAILS
C-506	TRAFFIC CONTROL DETAIL (TCP(2-2)-12)
C-507 - C-518	BARRICADE AND CONSTRUCTION DETAILS (BC(1)-14 - BC(12)-14)
C-519 - C-520	LOW PROFILE CONCRETE BARRIER TY 1 & 2 DETAILS (LPCB-13)

THE STANDARD DRAWINGS SHOWN IN THE INDEX OF SHEETS ABOVE AND IDENTIFIED HEREIN BY THE SYMBOL * HAVE BEEN SELECTED BY ME OR UNDER MY DIRECT SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.


 P.E. DATE 9/25/2017

REV. NO.

REVISION DESCRIPTION

APPROVED BY:

DATE




CobbFendley

10000 W. BRIDLE TRAIL, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

INDEX OF SHEETS

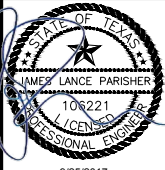
WCRRWL 48" RAW WATER LINE RELOCATION -
RONALD REAGAN AND CR 305 AT IH 35
WILLIAMSON COUNTY, TEXAS



WILLIAMSON COUNTY

1848

PROJ. NO. 1703-011-01
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: S. FEES
APPR: L. PARISHER
DATE: September 25, 2017



THESE DESIGN DOCUMENTS ARE NOT TO BE
USED FOR CONSTRUCTION PRIOR TO
REGULATORY SIGNATURE AND PERMIT.

SHEET

C-002

2 of 30

9/28/2017 8:05 AM

p. 308

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\24 Ronald Reagan Blvd. @ IH 35 Phase \Design\C-002--GNOT.dwg -- Tab: GENERAL NOTES -- Plotted: 9/25/2017 11:50 AM By: KRISTEN VAN HOOSIER

GENERAL NOTES

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ALL EXISTING PAVEMENTS, CURBS, DRIVEWAYS, SIDEWALKS, GRAVEL ROADWAYS, PIPE CULVERTS, CULVERT HEADWALLS, FENCES, BILLBOARDS, AND MISCELLANEOUS ITEMS WHERE REQUIRED TO COMPLETE THE CONSTRUCTION.
- 2. CONTRACTOR SHALL REPAIR TO ORIGINAL CONDITION ANY DAMAGE INCURRED DURING CONSTRUCTION AT NO EXPENSE TO OWNER.
- 3. CONTRACTOR SHALL FIELD VERIFY THE TYPE, LOCATION AND DEPTH OF ALL UTILITY CROSSINGS PRIOR TO CONSTRUCTION IN ORDER TO ADJUST PIPE GRADE IF NECESSARY AND AVOID DAMAGING THOSE UTILITIES. ADJUSTMENTS SHALL BE APPROVED BY THE CONSTRUCTION OBSERVER.
- 4. CONTRACTOR SHALL NOTIFY PIPELINE COMPANIES, TELEPHONE, COMPANIES, POWER COMPANIES, AND ALL OTHER PERTINENT UTILITIES 7 DAYS BEFORE DIGGING IN AREA OF UTILITY.
- 5. KNOWN UTILITIES ARE SHOWN BY LINE DRAWN PERPENDICULAR TO PIPELINE AT THE POINT OF INTERSECTION. ACTUAL ALIGNMENT OF UTILITIES SHOULD BE VERIFIED BY CONTRACTOR PRIOR TO EXCAVATING NEAR THE UTILITY.
- 6. TYPE I WATERLINE MARKERS SHALL BE PLACED ON THE RIGHT-OF-WAY LINE NEAREST THE TRANSMISSION LINE AT ALL HIGHWAY AND COUNTY ROAD CROSSINGS. WATERLINE MARKER LOCATIONS TO BE APPROVED BY THE CONSTRUCTION OBSERVER.
- 7. TYPE II WATERLINE MARKERS SHALL BE ATTACHED TO ALL FENCE CROSSINGS AND GATES.
- 8. PROVIDE RESTRAINED JOINTS AT ALL TEES, BENDS, CROSSES, PLUGS, REDUCERS AND WHERE IDENTIFIED ON PLANS.
- 9. CONTRACTOR SHALL TAKE APPROPRIATE ACTION TO ENSURE THAT ACCESS TO EXISTING RESIDENCES AND PROPERTY IS NOT IMPAIRED. CONTRACTOR SHALL PROVIDE TEMPORARY DRIVEWAY ACCESS FOR ALL PROPERTY OWNERS ADJACENT TO CONSTRUCTION AREAS DURING PERIODS WHEN CONSTRUCTION IN THE AREA IS NOT IN PROGRESS.
- 10. ACCESS TO THE PIPELINE RIGHT-OF-WAY SHALL BE ALONG EXISTING ROADS OR ALONG PERMANENT AND CONSTRUCTION EASEMENTS ONLY. IF ADDITIONAL AREAS ARE NEEDED FOR THE STORAGE OF EQUIPMENT OR SUPPLIES, THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR OBTAINING SUCH AREAS AND SHALL NOTIFY THE CONSTRUCTION OBSERVER OF ALL SUCH ARRANGEMENTS.
- 11. ALL GATES AND FENCES SHALL BE SECURED AND CLOSED AT ALL TIMES WHEN NOT IN USE.
- 12. COVER FOR ALL BURIED PIPE SHALL BE A MINIMUM OF FOUR (4) FEET UNLESS OTHERWISE SHOWN ON THE PLANS. ANY DEVIATION IN MINIMUM COVER REQUIREMENTS CAUSED BY DIMENSIONAL OR ELEVATION CALL OUTS MUST BE REPORTED TO THE CONSTRUCTION OBSERVER PRIOR TO CONSTRUCTION.
- 13. ALL CONSTRUCTION OPERATIONS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH APPLICABLE REGULATIONS.
- 14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAKING PROVISIONS FOR TEST SECTIONS AND/OR OTHER FACILITIES REQUIRED FOR TESTING THE PIPELINE. SUCH FACILITIES WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE PIPE.
- 15. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION OBSERVER OF ANY UNREPORTED OBSTACLES THAT MAY IMPEDE OR PREVENT THE CONSTRUCTION OF THE PIPELINE.
- 16. PIPE BENDS GREATER THAN 45 DEGREES SHALL BE MADE USING A MINIMUM OF TWO FITTINGS.
- 17. PIPE JOINTS DEFLECTIONS SHALL BE NO GREATER THAN 80% OF THE MANUFACTURER’S RECOMMENDED MAXIMUM DEFLECTION, UNLESS OTHERWISE NOTED ON THE PLANS. CONTRACTOR SHALL PROVIDE APPROPRIATE JOINTS OR FITTINGS WHEREVER REQUIRED FOR THE PARTICULAR TYPE OF PIPE MATERIAL PROPOSED EVEN IF THEY ARE NOT CALLED OUT ON THE PLANS.

- 18. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION OBSERVER 24 HOURS IN ADVANCE OF COMMENCING CONSTRUCTION STAKING. THE CONTRACTOR SHALL NOTIFY APPROPRIATE AUTHORITIES 48 HOURS PRIOR TO THE COMPLETION OF CONSTRUCTION STAKING.
- 19. ANY PORTION OF THE PROJECT IMPROPERLY PLACED AND/OR CONFLICTING WITH ANY EXISTING STRUCTURE SHALL BE REMOVED AND CORRECTLY PLACED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL ASSOCIATED COSTS.
- 20. CONSTRUCTION OPERATIONS SHALL BE CONDUCTED IN SUCH A MANNER AS TO PROTECT EXISTING FACILITIES AT ALL TIMES.
- 21. USE OF EXPLOSIVES WILL NOT BE PERMITTED.
- 22. THE CONTRACTOR MUST RECORD AND SUPPLY TO THE CONSTRUCTION OBSERVER THE FOLLOWING INFORMATION:
 - A. LOCATION AND ELEVATION OF ALL APPURTENANT CONNECTIONS.
 - B. "AS-BUILT" INVERTS AND PROFILE OF CONSTRUCTED PIPELINE.
 - C. THE NEW LOCATION AND DEPTH OF ALL RELOCATED AND/OR ADJUSTED UTILITIES.
- 24. CONTRACTOR SHALL REMOVE OR CAMOUFLAGE ANY UNATTRACTIVE NUISANCES AS REQUESTED BY THE CONSTRUCTION OBSERVER.
- 25. ALL HOLES, TRENCHES, AND OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY BARRICADES, LIGHTS, OR OTHER PROTECTIVE DEVICES.
- 26. REMOVAL OF EXCAVATED MATERIALS AND DAILY CLEANUP OPERATIONS SHALL BE PERFORMED PER THE SPECIFICATIONS AND TO THE SATISFACTION OF THE CONSTRUCTION OBSERVER.
- 27. ALL ROCKS, BRUSH, TIMBER AND OTHER DEBRIS THAT IS CLEARED FROM THE RIGHT OF WAYS SHALL BE REMOVED FROM THE PREMISES AND SHALL NOT BE PLACED ON ADJOINING LANDS, EXCEPT WHERE ARRANGEMENTS FOR SUCH PLACEMENT OR DISPOSAL ARE MADE IN WRITING WITH THE APPROPRIATE PROPERTY OWNERS. ALL CLEARING SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
 - A. ON THE PERMANENT EASEMENT TRACTS, ALL TREES, EXCEPT MESQUITE OR CEDARS, THAT HAVE TRUNKS THAT ARE 4 INCHES IN DIAMETER OR LARGER, MEASURED 2 FEET ABOVE THE GROUND, SHALL BE LEFT UNDISTURBED, IF POSSIBLE, EXCEPT FOR SUCH TRIMMING AS IS REQUIRED TO ACCOMMODATE THE PASSAGE OF EQUIPMENT. ADDITIONALLY, TREES IN YARDS, ORCHARDS OR WHICH ARE SPECIFICALLY IDENTIFIED ON THE PLANS SHALL NOT BE DISTURBED WITHOUT THE OBSERVER’S APPROVAL. ALL TREES DESIGNATED TO REMAIN SHALL BE PROTECTED PER THE TREE PROTECTION PLANS SHOWN ON SHEET C-505.
 - B. ON ALL TEMPORARY EASEMENT TRACTS, NO TREES SHALL BE CUT, DAMAGED OR OTHERWISE DISTURBED. ALL TREES, EXCEPT MESQUITE OR CEDARS THAT HAVE TRUNKS THAT ARE 4 INCHES IN DIAMETER OR LARGER MEASURED 2 FEET ABOVE THE GROUND SHALL BE PROTECTED PER THE TREE PROTECTION PLANS SHOWN ON SHEET C-505. BRUSH, SPROUTS AND SMALL SAPLINGS MAY BE CUT; HOWEVER, ALL CUTTINGS MUST BE REMOVED FROM THE PREMISES OR DISPOSED OF IN AN APPROVED MANNER.
- 28. ALL TREE PROTECTION AND EROSION AND SEDIMENTATION CONTROLS SHALL BE IMPLEMENTED BEFORE CONSTRUCTION COMMENCES AND SHALL NOT BE REMOVED UNTIL REVEGETATION HAS BEEN COMPLETED.
- 29. THERE IS NO PAY ITEM FOR DEWATERING AND NO SEPARATE PAYMENT WILL BE MADE FOR DEWATERING. ANY DEWATERING OF THE TRENCH REQUIRED IS THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE PIPE.
- 30. CONTRACTOR SHALL UNCOVER AND FIELD VERIFY HORIZONTAL AND VERTICAL DIMENSIONS FOR CONNECTIONS TO EXISTING PIPE PRIOR TO MANUFACTURING NEW PIPE.
- 31. FOR TESTING PROCEDURES, REFER TO ITEM WCRRWL 100.
- 32. REFER TO ITEM WCRRWL 100 FOR PIPELINE INFORMATION.

EROSION AND SEDIMENTATION CONTROL NOTES

- 1. EROSION CONTROL MEASURES, SITE WORK, AND RESTORATION WORK SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
- 2. ALL SLOPES SHALL BE SODDED OR SEEDED WITH THE APPROPRIATE GRASS, GRASS MIXTURE OR GROUND COVER SUITABLE TO THE AREA AND SEASON TO WHICH THEY ARE APPLIED.
- 3. SILT FENCES, HAY BAILS, SEDIMENTATION BASINS AND SIMILARLY RECOGNIZED TECHNIQUES AND MATERIALS SHALL BE EMPLOYED DURING CONSTRUCTION TO PREVENT POINT SOURCE SEDIMENTATION LOADING OF DOWNSTREAM FACILITIES. SUCH INSTALLATION SHALL BE REGULARLY INSPECTED FOR EFFECTIVENESS. ADDITIONAL MEASURES MAY BE REQUIRED IF, IN THE OPINION OF THE COUNTY, THEY ARE WARRANTED.
- 4. ALL TEMPORARY EROSION CONTROL MEASURES SHALL NOT BE REMOVED UNTIL FINAL INSPECTION AND APPROVAL OF THE PROJECT BY THE OWNER. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAINTAIN ALL THE TEMPORARY EROSION CONTROL STRUCTURES AND TO REMOVE EACH STRUCTURE AS APPROVED BY THE OWNER.

TRAFFIC CONTROL NOTES

- 1. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ANY REQUIRED TRAFFIC CONTROL DEVICES DURING CONSTRUCTION IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF TRANSPORTATION’S TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS.
- 2. ALL TRAFFIC PLANS WILL BE DESIGNED AND SEALED BY AN ENGINEER LICENSED IN THE STATE OF TEXAS.
- 3. ALL TRAFFIC PLANS MUST BE DESIGNED USING THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- 4. TWO LANES OF TRAFFIC SHALL BE MAINTAINED FOR COUNTY ROAD 305 AND RONALD REAGAN BLVD. CROSSINGS IN WILLIAMSON COUNTY.
- 5. ANY OTHER PLACE THAT HAS WORK BEING PERFORMED IN TXDOT ROW, AT LEAST ONE LANE OF TRAFFIC MUST BE MAINTAINED.
- 6. DURING BORING OF 48” WATERLINE UNDER RONALD REAGAN BLVD., PORTABLE TRAFFIC BARRIERS SHALL BE USED TO PROTECT BORE PITS ADJACENT TO RONALD REAGAN BLVD.. ADDITIONALLY, IF THE WATERLINE IS WITHIN THE 30’ CLEAR ZONE, PORTABLE TRAFFIC BARRIERS SHALL BE USED.

VALVE SALVAGING NOTES

- 1. ANY COMBINATION AIR-RELIEF VALVE (CAV) THAT IS CALLED OUT IN THE PLANS TO BE REMOVED, SALVAGED, AND TURNED OVER TO THE BRAZOS RIVER AUTHORITY AFTER NOTIFICATION BY THE COUNTY. THIS SHALL BE SUBSIDIARY TO COST OF PIPE.

PROJ. NO. 1703-011-01
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: S. FEES
APPR: L. PARISHER
DATE: September 25, 2017

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SHEET
C-003
3 of 30

GENERAL NOTES

WCRRWL 48" RAW WATER LINE RELOCATION -
RONALD REAGAN AND CR 305 AT IH 35
WILLIAMSON COUNTY, TEXAS

WILLIAMSON COUNTY
1848

CobbFendley
505 EAST HUNTLAND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

DATE: 9/25/2017

APPROVED BY:

REVISION DESCRIPTION

Dwg Info: G:\CFA\2014\0308801_Williamson_County_2013_Road_Bond\MUN\24 Ronald Reagan Blvd. © IH 35 Phase \Design\C-002--GNOT.dwg -- Tab: GENERAL NOTES (2) -- Plotted: 9/25/2017 12:58 PM By: KRISTEN VAN HOOSIER

GENERAL NOTES: VERSION APRIL 21, 2017

BASIS OF ESTIMATE

Item	Description	**Rate	Basis	Quantity
164	Seed for Erosion Control (Item 164) (Temp & Perm) (TY 7)	4840 SY/AC	3730 SY	0.77 AC

** FOR INFORMATIONAL PURPOSES ONLY.

GENERAL
REFERENCES TO MANUFACTURER’S TRADE NAME OR CATALOG NUMBERS ARE FOR THE PURPOSE OF IDENTIFICATION ONLY. SIMILAR MATERIALS FROM OTHER MANUFACTURERS ARE PERMITTED IF THEY ARE OF EQUAL QUALITY, COMPLY WITH THE SPECIFICATIONS FOR THIS PROJECT, AND ARE APPROVED.

IF WORK IS PERFORMED AT CONTRACTOR’S OPTION, WHEN INCLEMENT WEATHER IS IMPENDING, AND THE WORK IS DAMAGED BY SUBSEQUENT PRECIPITATION, THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPLACING THE WORK, IF REQUIRED.

THE ROADBED SHALL BE FREE OF ORGANIC MATERIAL PRIOR TO PLACING ANY SECTION OF THE PAVEMENT STRUCTURE.

EQUIP ALL CONSTRUCTION EQUIPMENT USED IN ROADWAY WORK WITH HIGHLY VISIBLE OMNIDIRECTIONAL FLASHING WARNING LIGHTS.

PROVIDE A SMOOTH, CLEAN SAW–CUT ALONG THE EXISTING ASPHALT (OR CONCRETE) PAVEMENT STRUCTURE, AS DIRECTED. CONSIDER SUBSIDIARY TO THE PERTINENT ITEMS.

SUPPLY LITTER BARRELS IN ENOUGH NUMBERS AT LOCATIONS AS DIRECTED TO CONTROL LITTER WITHIN THE PROJECT. CONSIDER SUBSIDIARY TO PERTINENT ITEMS.

USE A SELF–CONTAINED VACUUM BROOM TO SWEEP THE ROADWAY AND KEEP IT FREE OF SEDIMENT AS DIRECTED. THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY SWEEPING ABOVE AND BEYOND THE NORMAL MAINTENANCE REQUIRED TO KEEP FUGITIVE SEDIMENT OFF THE ROADWAY AS DIRECTED BY THE CONSTRUCTION OBSERVER.

PROTECT ALL AREAS OF THE RIGHT OF WAY, WHICH ARE NOT INCLUDED IN THE ACTUAL LIMITS OF THE PROPOSED CONSTRUCTION AREAS, FROM DISTURBANCE. RESTORE ANY AREA DISTURBED BECAUSE OF THE CONTRACTOR’S OPERATIONS TO A CONDITION AS GOOD AS, OR BETTER THAN, BEFORE THE BEGINNING OF WORK AT NO COST.

DAMAGE TO EXISTING PIPES AND SET’S DUE TO CONTRACTOR OPERATIONS SHALL BE REPAIRED AT CONTRACTOR’S EXPENSE.

ALL LOCATIONS USED FOR STORING CONSTRUCTION EQUIPMENT, MATERIALS, AND STOCKPILES OF ANY TYPE, WITHIN THE RIGHT OF WAY, WILL BE AS DIRECTED. USE OF RIGHT OF WAY FOR THESE PURPOSES WILL BE RESTRICTED TO THOSE LOCATIONS WHERE DRIVER SIGHT DISTANCE TO BUSINESSES AND SIDE STREET INTERSECTIONS IS NOT OBSTRUCTED AND AT OTHER LOCATIONS WHERE AN UNSIGHTLY APPEARANCE WILL NOT EXIST. THE CONTRACTOR WILL NOT HAVE EXCLUSIVE USE OF RIGHT OF WAY BUT WILL COOPERATE IN THE USE OF THE RIGHT OF WAY WITH THE TXDOT/COUNTY AND VARIOUS PUBLIC UTILITY COMPANIES AS REQUIRED.

THE PROJECT SUPERINTENDENT WILL BE CAPABLE OF SPEAKING ENGLISH AND WILL BE AVAILABLE TO CONTACT AT ALL TIMES WHEN WORK IS BEING PERFORMED, INCLUDING SUBCONTRACTOR WORK. THE SUPERINTENDENT WILL BE AVAILABLE AND ON–CALL 24 HOURS A DAY.

USE MATERIALS FROM PREQUALIFIED MATERIAL PRODUCERS LIST AS SHOWN ON THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) – CONSTRUCTION DIVISION’S (CST) MATERIALS PRODUCERS LIST. REFER TO TXDOT’S WEBSITE FOR LIST OF PRE–QUALIFIED MANUFACTURERS. NO SUBSTITUTIONS WILL BE ALLOWED FOR MATERIALS FOUND ON THE LIST. SUBMIT LIST OF APPROVED SUPPLIERS/MATERIALS FROM TXDOT WEBSITE TO SHOW ITEMS ARE TXDOT APPROVED. SUBMIT THIS LIST WITH REQUEST FOR MATERIAL APPROVAL.

WHEN ANY ABANDONED WELL IS ENCOUNTERED, CEASE CONSTRUCTION OPERATIONS IN THIS AREA AND NOTIFY THE ENGINEER WHO WILL COORDINATE THE PROPER PLUGGING PROCEDURES. A WATER WELL DRILLER LICENSED IN THE STATE OF TEXAS MUST BE USED TO PLUG A WELL.

EROSION CONTROL AND STABILIZATION MEASURES MUST BE INITIATED IMMEDIATELY IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. TRACK ALL EXPOSED SOIL, STOCKPILES, AND SLOPES. TRACKING CONSISTS OF OPERATING A TRACKED VEHICLE OR EQUIPMENT UP AND DOWN THE SLOPE, LEAVING TRACK MARKS PERPENDICULAR TO THE DIRECTION OF THE SLOPE. RE–TRACK SLOPES AND STOCKPILES AFTER EACH RAIN EVENT OR EVERY 14 DAYS, WHICHEVER OCCURS FIRST. THIS WORK IS SUBSIDIARY.

PERFORM MAINTENANCE OF VEHICLES OR EQUIPMENT AT DESIGNATED MAINTENANCE SITES. KEEP A SPILL KIT ON–SITE DURING FUELING AND MAINTENANCE. THIS WORK IS SUBSIDIARY.

MAINTAIN POSITIVE DRAINAGE FOR PERMANENT AND TEMPORARY WORK FOR THE DURATION OF THE PROJECT. BE RESPONSIBLE FOR ANY ITEMS ASSOCIATED WITH THE TEMPORARY OR INTERIM DRAINAGE AND ALL RELATED MAINTENANCE. THIS WORK IS SUBSIDIARY.

SUSPEND ALL ACTIVITIES NEAR ANY SIGNIFICANT RECHARGE FEATURES, SUCH AS SINKHOLES, CAVES, OR ANY OTHER SUBTERRANEAN OPENINGS THAT ARE DISCOVERED DURING CONSTRUCTION OR CORE SAMPLING. DO NOT PROCEED UNTIL THE DESIGNATED GEOLOGIST OR TCEQ REPRESENTATIVE IS PRESENT TO EVALUATE AND APPROVE REMEDIAL ACTION.

GENERAL CONSTRUCTION INFORMATION FOR CONTRACTOR

1. THE CONTRACTOR MUST SUBMIT A STEP–BY–STEP PLAN ON HOW THEY WILL EXECUTE CONSTRUCTION WORK. THE PLAN SHOULD INCLUDE THE LABOR AND EQUIPMENT RESOURCES THEY WILL DEDICATE TO THE PROJECT. THIS PLAN WILL BE SUBMITTED FOR REVIEW BEFORE CONSTRUCTION CAN BEGIN.
2. BASED ON RECORD PIPE LAYOUT SHEETS, THE EXISTING 48” BWP RAW WATERLINE WAS LAID SUCH THAT THE BELL ENDS FACE NORTH AND THE SPIGOT ENDS FACE SOUTH PARALLEL TO IH 35. CONTRACTOR SHALL FIELD VERIFY PIPE LAYOUT PRIOR TO MAKING CONNECTIONS.
3. INSTALLATION OF WATERLINE MARKERS, WHEN NECESSARY, SHALL BE SUBSIDIARY TO COST OF PIPE. SEE SHEET C–503 FOR DETAILS PERTAINING TO PLACEMENT OF WATERLINE MARKERS.
4. THE CONTRACTOR SHALL TEST SHUT THE EXISTING VALVES TO DETERMINE IF THEY HAVE A PROBLEM BEFORE SHUTTING DOWN THE WATERLINE TO MAKE CONNECTIONS.
5. CONTRACTOR SHALL NOTIFY THE BRA WHEN READY TO HAVE THE EXISTING 48” RAW WATERLINE DRAINED IN ORDER TO MAKE CONNECTIONS. THE BRA WILL ALLOW TWO 72–HOUR SHUTDOWNS PROVIDED THAT THERE IS A MINIMUM OF 7 CALENDAR DAYS BETWEEN THE END OF THE FIRST SHUTDOWN AND THE BEGINNING OF THE SECOND SHUTDOWN.
6. AFTER RECEIVING NOTIFICATION FROM THE CONTRACTOR TO SHUT DOWN THE EXISTING 48” RAW WATERLINE, BRA OPERATIONS PERSONNEL WILL OPEN THE COMBINATION AIR–RELIEF VALVE (CAV) AND BLOW–OFF VALVES IN THE VICINITY OF THE SHUTDOWN AND THE MAJORITY OF THE WATERLINE WILL BE DRAINED. CONTRACTOR IS RESPONSIBLE FOR REMOVING ANY RESIDUAL WATER NOT DRAINED.
 - 6.1. FOR THE RELOCATION AT CR 305, THE BRA WILL OPEN THE BLOW–OFF VALVES AT STATIONS 660+79.60 AND 700+75.00 (PER 2000 AS–BUILTS) AND THE CAV AT STATION 678+59.27.
 - 6.2. FOR THE RELOCATION AT RONALD REAGAN BLVD., THE BRA WILL OPEN THE BLOW–OFF VALVES AT STATIONS 951+25.82 AND 998+25 AND THE CAV AT STATION 964+50.
7. FOR THE WATER REQUIRED FOR THE PRESSURE TESTING OF THE NEW 48” DUCTILE IRON RAW WATERLINES, THE BRA IS WILLING TO OFFER THE CONTRACTOR A RAW WATER TAP AT THEIR EXISTING COMBINATION AIR–RELIEF VALVES (CAV) IN THE VICINITY OF THE TWO RELOCATIONS (STA. 678+59.27 AND 964+50 PER 2000 AS–BUILTS), PROVIDED THAT 1) THE BRA IS PUMPING AT THE TIME OF THE TESTS, AND 2) THAT THE CONTRACTOR PROVIDES A 2 WORKING DAY NOTICE PRIOR TO TAPPING. THE EXISTING COMBINATION AIR–RELIEF VALVES HAVE ISOLATION VALVES THAT CAN BE MADE AVAILABLE BY THE BRA FOR TAPPING PURPOSES. IN THE EVENT THAT THE BRA IS NOT PUMPING AT THE TIME OF THE TESTS, THE CONTRACTOR WILL BE REQUIRED TO PROVIDE THEIR OWN WATER. SEE THE PROJECT MANUAL FOR MORE INFORMATION AND ADDITIONAL ALTERNATIVE BID ITEM.
8. FOR CONNECTION TO EXISTING BWP RAW WATERLINE, THE CONTRACTOR SHALL CONTACT HANSON PIPE MANUFACTURER FOR BWP TRANSITION COUPLING. THIS IS SUBSIDIARY TO COST OF BID ITEM WCRRWL–6, ”48” CONNECTION TO EXISTING BWP...”.

APPROVED BY:

REVISION DESCRIPTION

REV. NO.

DATE

1703-011-01

CobbFendley

505 EAST MOUNTAIN DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

GENERAL NOTES

WCRRWL 48" RAW WATER LINE RELOCATION -
RONALD REAGAN AND CR 305 AT IH 35
WILLIAMSON COUNTY, TEXAS

WILLIAMSON COUNTY

1848

PROJ. NO. 1703-011-01
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: S. FEES
APPR: L. PARISHER
DATE: September 25, 2017

STATE OF TEXAS

JAMES LANCE PARISHER

106221

PROFESSIONAL ENGINEER

9/25/2017

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9/28/2017 8:05 AM

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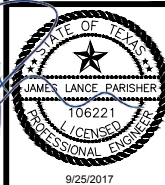
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LOCATION	100-6001	164-WC07	402-6001	500-6001	502-6001	506-6022	506-6024	506-6038	506-6039	512-6009	512-6010	512-6057	512-6058	552-6003	552-6005	WCRRWL-1	WCRRWL-2	WCRRWL-3	WCRRWL-4	WCRRWL-5	WCRRWL-6	WCRRWL-7	WCRRWL-8
	PREPARING RIGHT OF WAY	SEEDING FOR EROSION CONTROL (TEMP & PERM) (TY 7)	TRENCH EXCAVATION SAFETY PROTECTION	MOBILIZATION	BARRICADES, SIGNS, TRAFFIC HANDLING	CONSTRUCTION EXT (INSTALL) (TY 3)	CONSTRUCTION EXT (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	PORT CTB (FRN & INSTL) (LOW PROF) (TY 1)	PORT CTB (FRN & INSTL) (LOW PROF) (TY 2)	PORT CTB (REMOVE) (LOW PROF) (TY 1)	PORT CTB (REMOVE) (LOW PROF) (TY 2)	WIRE FENCE (TY C)	GATE (TY 1)	DUCTILE IRON FITTINGS (C-110 WEIGHT SCHEDULE)	48" DUCTILE IRON PIPE WITH RESTRAINED JOINTS, COMPLETE IN PLACE	VALVE, COMBINATION AIR/VACUUM RELIEF VALVE, 16 IN. DUAL BODY, INCLUDING TY 3 CORROSION TEST STATION	ENCASEMENT PIPE, 66" DIA, STEEL	REMOVE EXISTING 48" BWP PIPE	48" CONNECTION TO EXISTING BWP, INCLUDING 48" AWWA C303 BWP CUSTOM TRANSITION COUPLING MANUFACTURED BY HANSON, COMPLETE IN PLACE	SPLIT ENCASEMENT PIPE, 66" DIA, STEEL	JACKING OR BORING 66" PIPE, STEEL
	AC	SY	LF	LS	MO	SY	SY	LF	LF	LF	LF	LF	LF	LF	EA	TON	LF	EA	LF	LF	EA	LF	LF
RONALD REAGAN, AT IH-35																							
C-102 - WATERLINE "A"	0.17	1203.33	370			56	56	361	361	200	80	200	80			6.50	383	1	186.5	84	1		97
C-103 - WATERLINE "A"	0.19	1220	400					366	366							5.00	348		255	52	1	20	
C-104 - WATERLINE "B" - CR 305	0.20	1306.67	445			67	67	392	392					40	1	10.00	340		190	105	2		
PROJECT TOTALS	0.56	3730	1215	1	3	123	123	1119	1119	200	80	200	80	40	1	21.5	1071	1	632	241	4	20	97

[illegible]

SUMMARY OF QUANTITIES



PROJ. NO. 1703-011-01
DESIGN: K. VAN HOOSIER
DRAWN: K. VAN HOOSIER
CHECK: S. FEES
APPR: L. PARISHER
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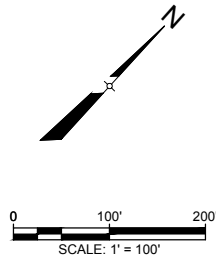
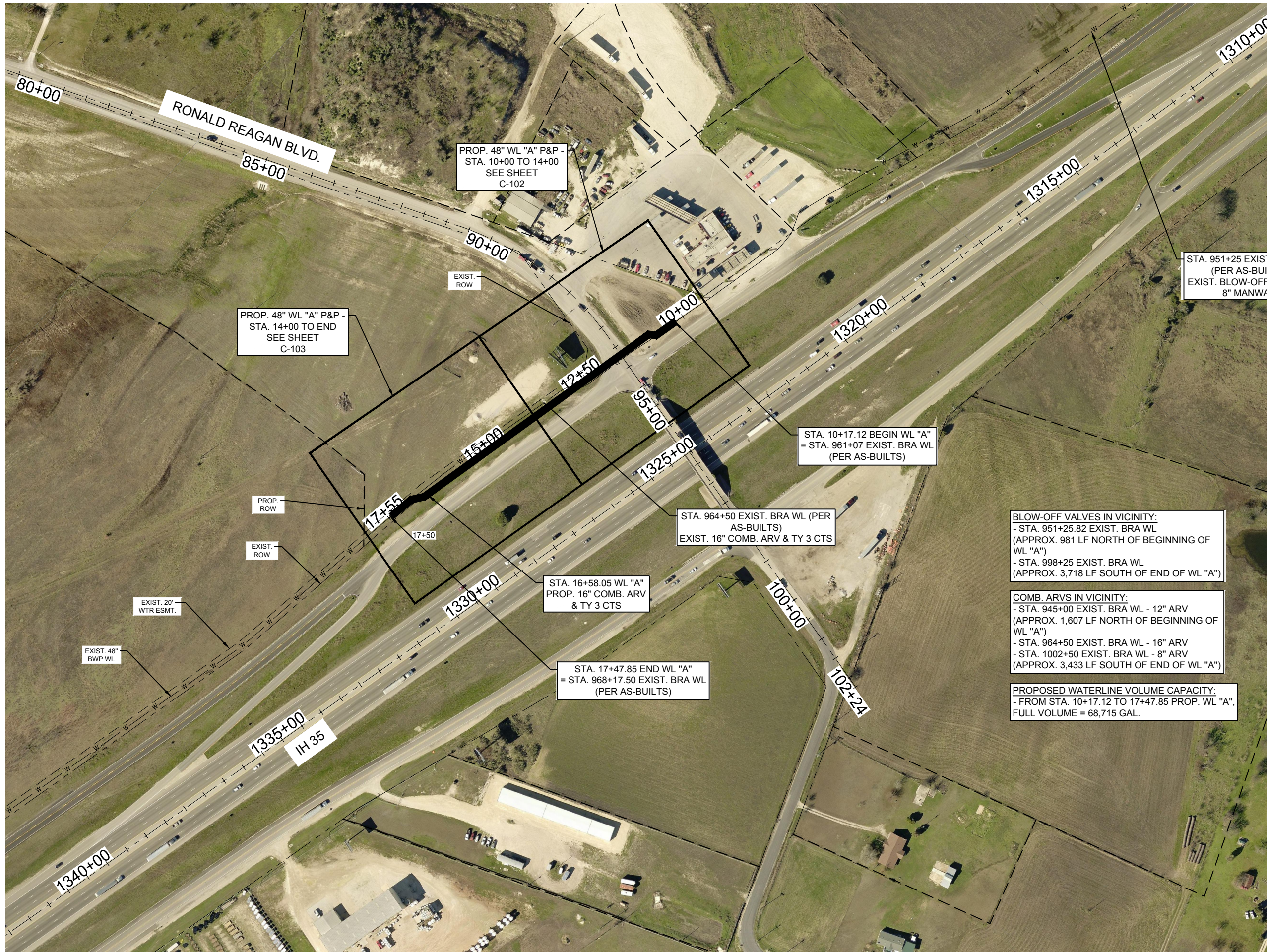
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5 of 30

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9/28/2017 8:05 AM

Williamson County, Texas



REV. NO.	REVISION DESCRIPTION	APPROVED BY:	DATE
1	1703-011-01		9/25/2017

CobbFendley
512.834.9798 | FAX 512.834.7727
505 EAST HUNT AND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
WWW.COBBFENDLEY.COM

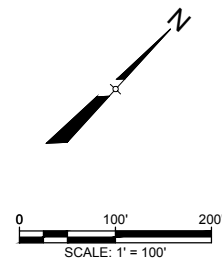
KEY MAP - RONALD REAGAN BLVD. AT IH 35

WCRRWL 48" RAW WATER LINE RELOCATION - RONALD REAGAN AND CR 305 AT IH 35 WILLIAMSON COUNTY, TEXAS

WILLIAMSON COUNTY
1848

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SHEET
C-100
6 of 30

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KEY MAP - CR 305 AT IH 35

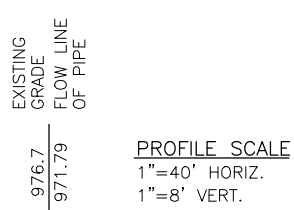
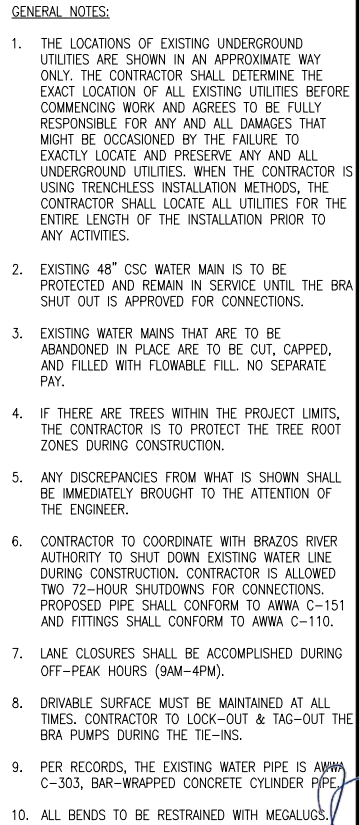


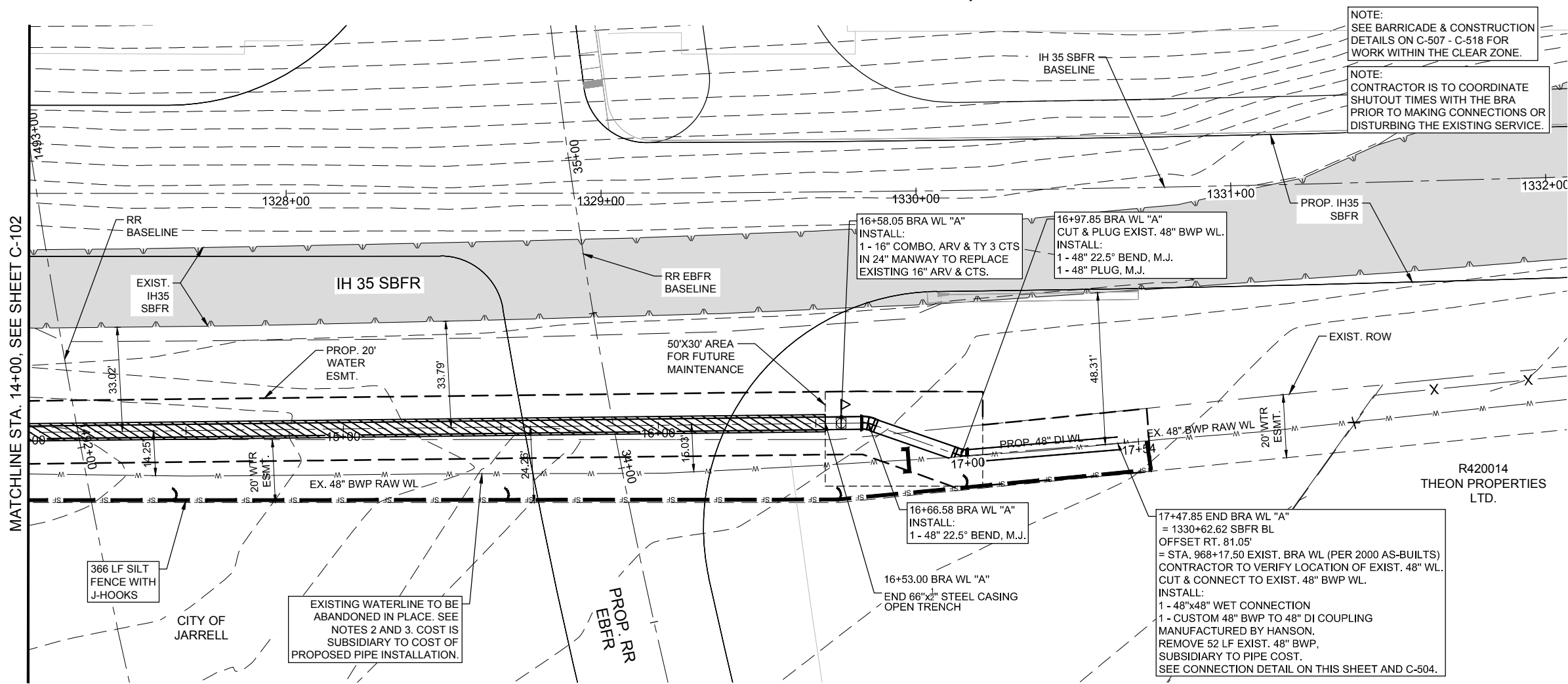
PROJ. NO. 1703-011-01
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DRAWN: K. VAN HOOSIER
CHECK: S. FEES
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C-101
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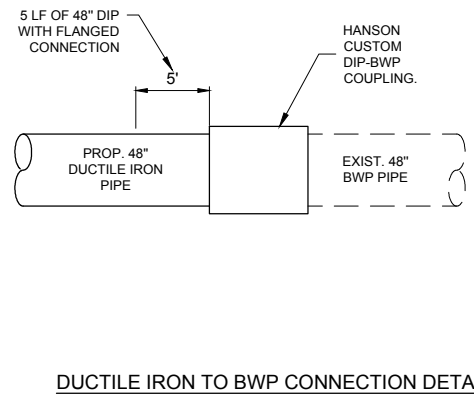
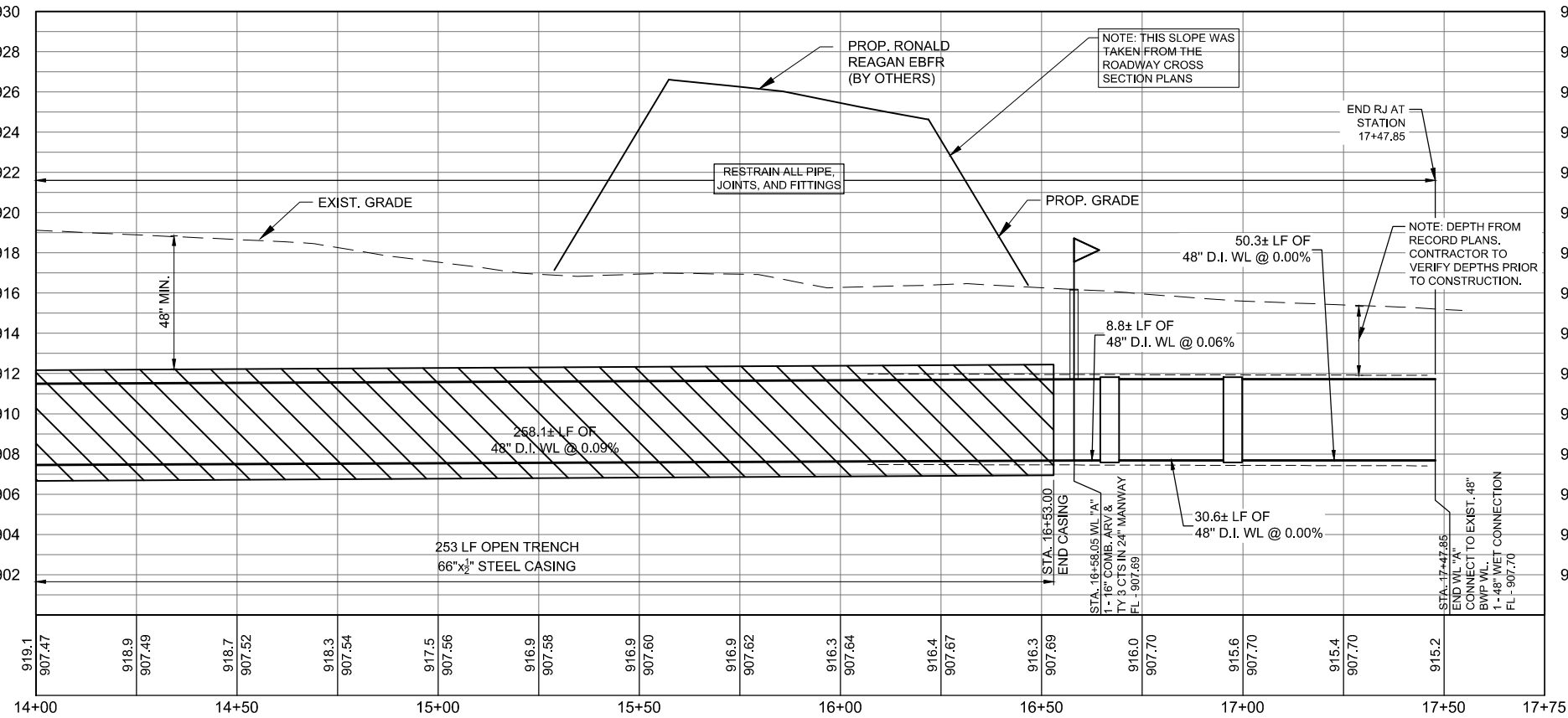


LEGEND

---	PROP. WATER LINE
---	EXISTING R.O.W.
---	PROPOSED R.O.W.
---	EXIST. WTR ESMT.
---	PROP. WTR ESMT.
---	FUTURE MAINT. AREA
---	EXIST. WATER LINE
---	EXIST. OH ELECTRIC
---	EXIST. U.G. TELECOM
---	PROP. SILT FENCE
---	EXIST. WIRE FENCE
---	PROP. ASPHALT
---	EXIST. ASPHALT

GENERAL NOTES:

- THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES THAT MIGHT BE OCCASIONED BY THE FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHEN THE CONTRACTOR IS USING TRENCHLESS INSTALLATION METHODS, THE CONTRACTOR SHALL LOCATE ALL UTILITIES FOR THE ENTIRE LENGTH OF THE INSTALLATION PRIOR TO ANY ACTIVITIES.
- EXISTING 48" CSC WATER MAIN IS TO BE PROTECTED AND REMAIN IN SERVICE UNTIL THE BRA SHUT OUT IS APPROVED FOR CONNECTIONS.
- EXISTING WATER MAINS THAT ARE TO BE ABANDONED IN PLACE ARE TO BE CUT, CAPPED, AND FILLED WITH FLOWABLE FILL. NO SEPARATE PAY.
- IF THERE ARE TREES WITHIN THE PROJECT LIMITS, THE CONTRACTOR IS TO PROTECT THE TREE ROOT ZONES DURING CONSTRUCTION.
- ANY DISCREPANCIES FROM WHAT IS SHOWN SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.
- CONTRACTOR TO COORDINATE WITH BRAZOS RIVER AUTHORITY TO SHUT DOWN EXISTING WATER LINE DURING CONSTRUCTION. CONTRACTOR IS ALLOWED TWO 72-HOUR SHUTDOWNS FOR CONNECTIONS. PROPOSED PIPE SHALL CONFORM TO AWWA C-151 AND FITTINGS SHALL CONFORM TO AWWA C-110.
- LANE CLOSURES SHALL BE ACCOMPLISHED DURING OFF-PEAK HOURS (9AM-4PM).
- DRIVABLE SURFACE MUST BE MAINTAINED AT ALL TIMES. CONTRACTOR TO LOCK-OUT & TAG-OUT THE BRA PUMPS DURING THE TIE-INS.
- PER RECORDS, THE EXISTING WATER PIPE IS AWWA C-303, BAR-WRAPPED CONCRETE CYLINDER PIPE.
- ALL BENDS TO BE RESTRAINED WITH MEGALUGS.



PROFILE SCALE

1"=40' HORIZ.
1"=8' VERT.

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WILLIAMSON COUNTY

1848

PROJ. OF TEXAS

106221
LICENSED PROFESSIONAL ENGINEER

9/25/2017

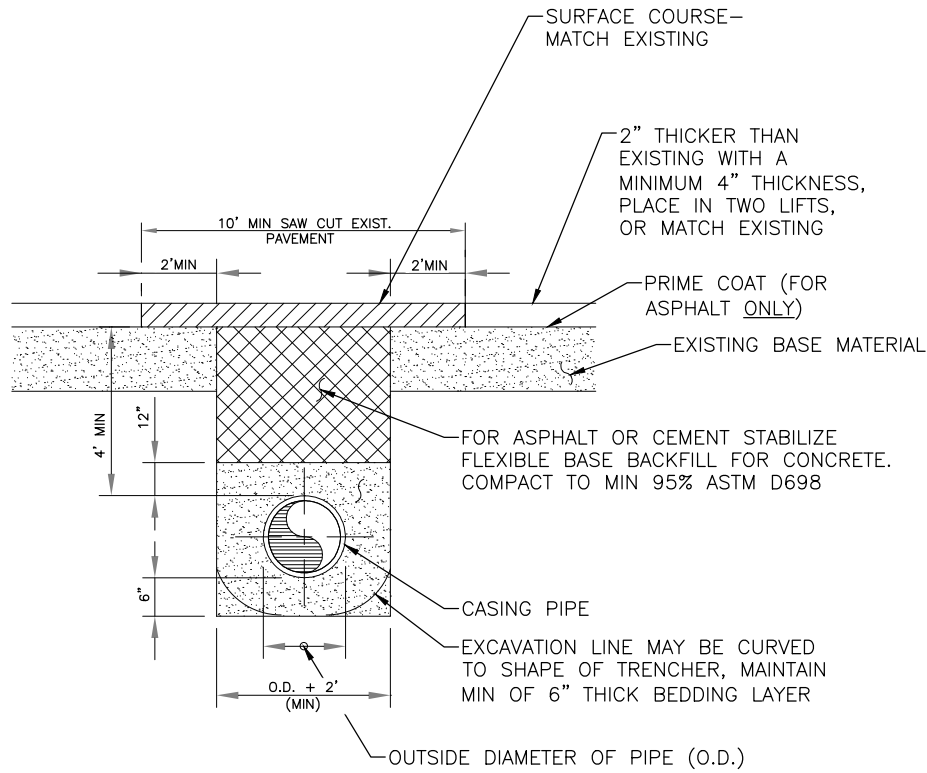
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SHEET C-103

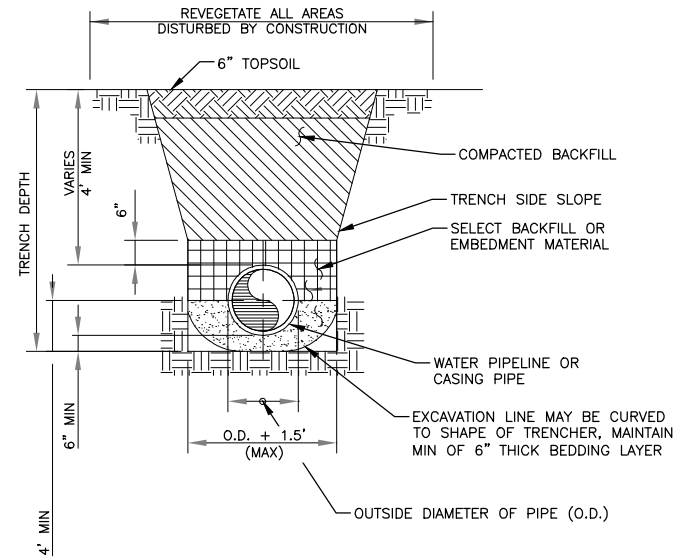
9 of 30

PROP. 48" WL "A" P&P - STA. 14+00 TO END

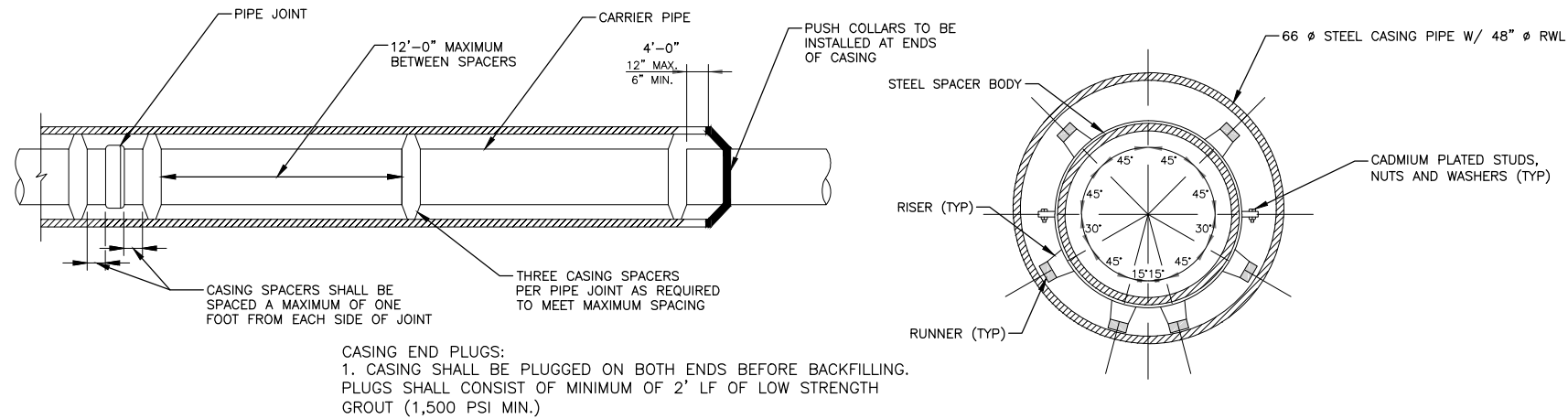
WCRWL 48" RAW WATER LINE RELOCATION - RONALD REAGAN AND CR 305 AT IH 35 WILLIAMSON COUNTY, TEXAS



ASPHALT/CONCRETE ROAD TRENCH AND REPAIR DETAIL
NOT TO SCALE



TYPICAL DUCTILE IRON PIPE EMBEDMENT DETAIL
NOT TO SCALE



TYPICAL PIPELINE ENCASEMENT DETAIL
NOT TO SCALE

SEQUENCE OF WORK FOR SPLIT ENCASEMENT ON C-102

1. INSTALL 48" WL IN 66" ENCASEMENT NORTH AND SOUTH OF 20 LF SEGMENT THAT RUNS THROUGH EXISTING 48" BWP WL. THIS PORTION OF 48" WL WILL BE INSTALLED WHEN EXISTING WL IS SHUT-OUT.
2. INSTALL 20 LF 48" DI WL AND THEN SPLIT-ENCASE WITH 66" SPLIT STEEL ENCASEMENT.
3. INSTALL CASING SPACERS AND BELL JOINT RESTRAINTS ON CARRIER PIPE.
4. PREPARE 66" SPLIT STEEL ENCASEMENT.
5. INSTALL CASING AROUND CARRIER PIPE, SPACERS, AND RESTRAINTS.
6. BOLT CASING HALVES TOGETHER. THE CASING SHOULD BE POSITIONED TO PLACE WELDS AT SPRINGLINE.
7. INSTALL GRAVEL BEDDING AND BACKFILL IN ACCORDANCE WITH WCRRWL 100.

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DRAWN: K. VAN HOOSIER	CHECK: S. FEES	
APPR: L. PARISHER		
DATE: September 25, 2017		

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APPROVED BY:	REVISION DESCRIPTION	REV. NO.

CobbFendley
ENGINEERS, ARCHITECTS, PLANNERS, AND ENVIRONMENTAL CONSULTANTS
 505 EAST HUNTLAND DRIVE, SUITE 100
 AUSTIN, TEXAS 78752
 512.834.9798 | FAX 512.834.7127
 WWW.COBBFENDLEY.COM

EMBEDMENT AND ENCASEMENT DETAILS
 WCRRWL 48" RAW WATER LINE RELOCATION -
 RONALD REAGAN AND CR 305 AT IH 35
 WILLIAMSON COUNTY, TEXAS

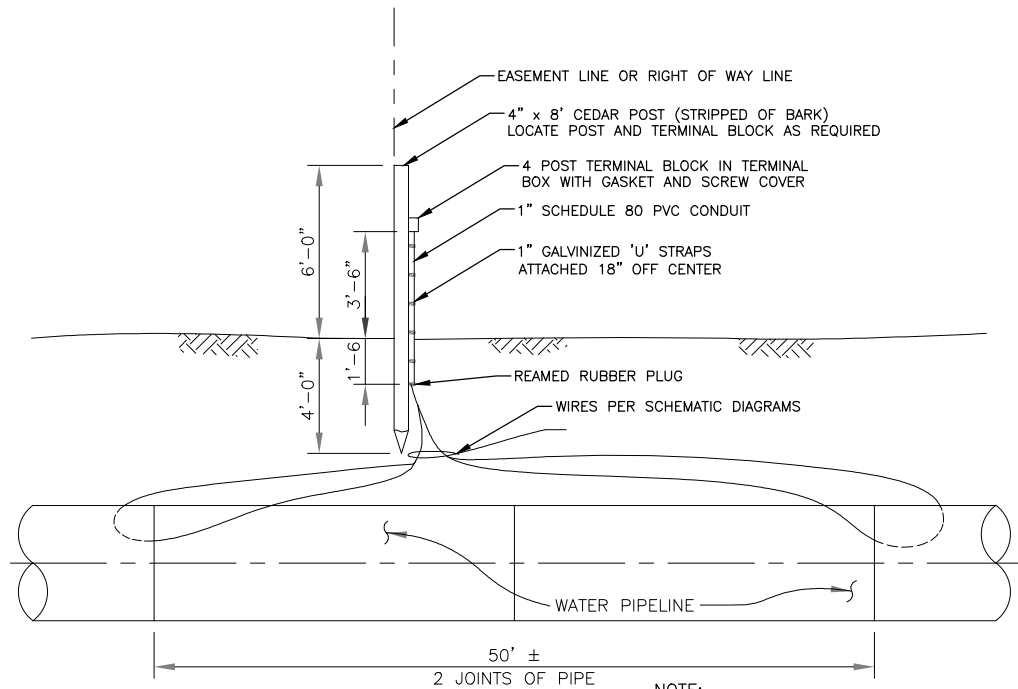
WILLIAMSON COUNTY
1848

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9/28/2017 8:05 AM

Williamson County, Texas



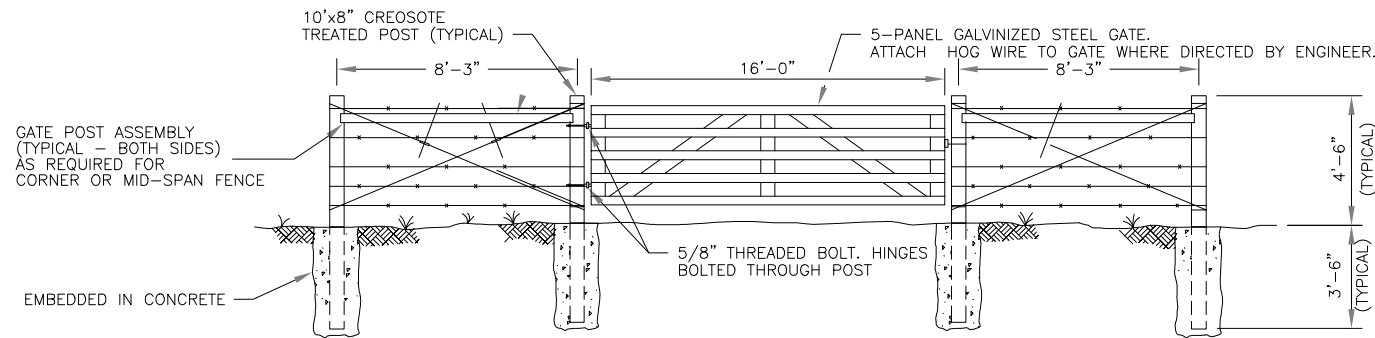
- NOTE:
1. NORMAL WIRE - #12 AWG TYPE TW.
 2. HEAVY WIRE - #0 AWG TYPE TW.
 3. SEE SCHEMATIC PLAN FOR SITING.
 4. LOCATE AS APPROVED BY PROJECT MANAGER

TERMINAL BLOCK

CORROSION TEST STATION DETAILS

SCALE: NONE

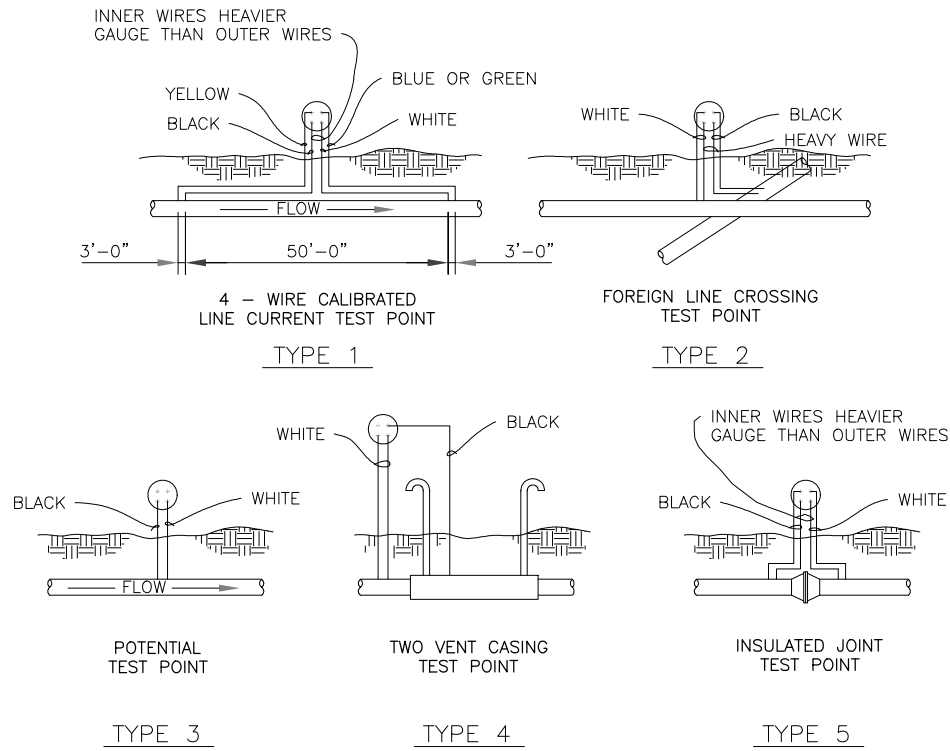
*SUBSIDIARY TO COST OF
COMB. ARV



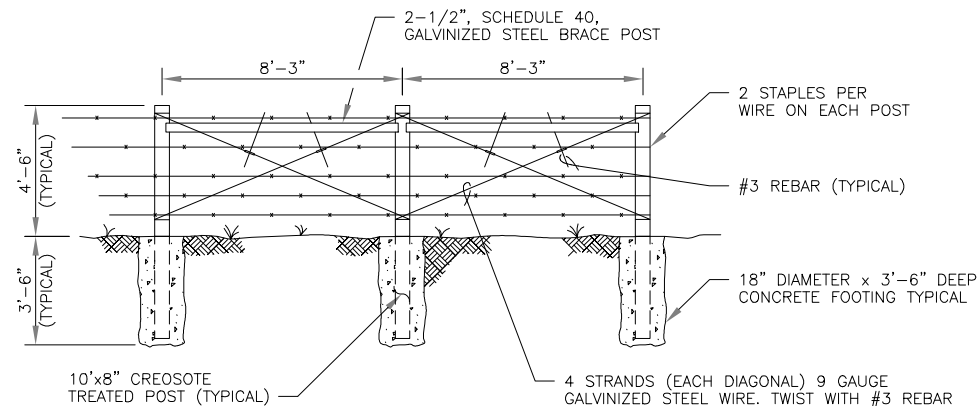
- NOTE:
1. POSITION GATE IN FENCE SO THAT THE CENTER OF THE GATE IS DIRECTLY ABOVE THE CENTERLINE OF PROPOSED WATERLINE OR AS CLOSE TO THE CENTER AS POSSIBLE IF GATE TO BE INSTALLED AT FENCE CORNER.

TYPICAL GATE INSTALLATION

SCALE: NONE



WIRING DIAGRAMS



- NOTE:
- INSTALL PULL OR CORNER POST ASSEMBLIES AT ALL CORNERS, ANGLE POINTS, AND INTERVALS NOT EXCEEDING 1000 FT.

GATE, CORNER, OR PULL POST ASSEMBLY

SCALE: NONE

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CobbFendley
10000 N. MICHIGAN AVE., SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

CORROSION TEST STATION, GATE, AND FENCE DETAILS

WCRRWL 48" RAW WATER LINE RELOCATION -
RONALD REAGAN AND CR 305 AT IH 35
WILLIAMSON COUNTY, TEXAS

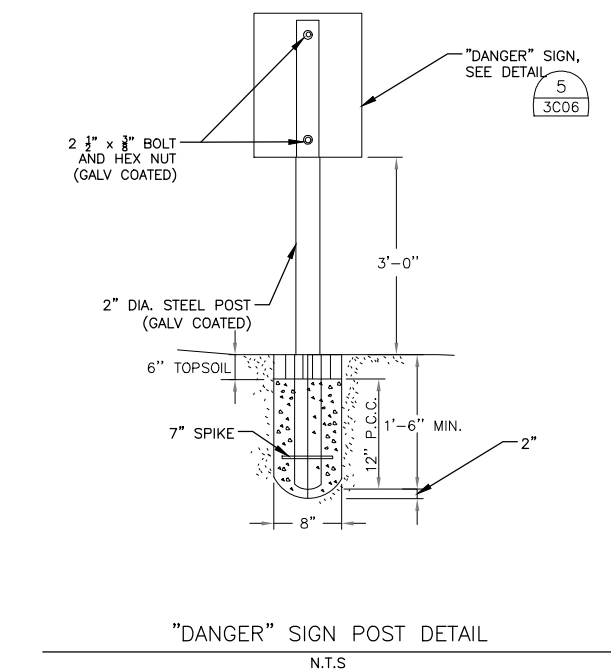
WILLIAMSON COUNTY
1848

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DRAWN: K. VAN HOOSIER
CHECK: S. FEES
APPR: L. PARISHER
DATE: September 25, 2017

JAMES LANCE PARISHER
106221
LICENSED PROFESSIONAL ENGINEER
9/25/2017

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TYPE II WATERLINE MARKER DETAIL

SCALE: NONE



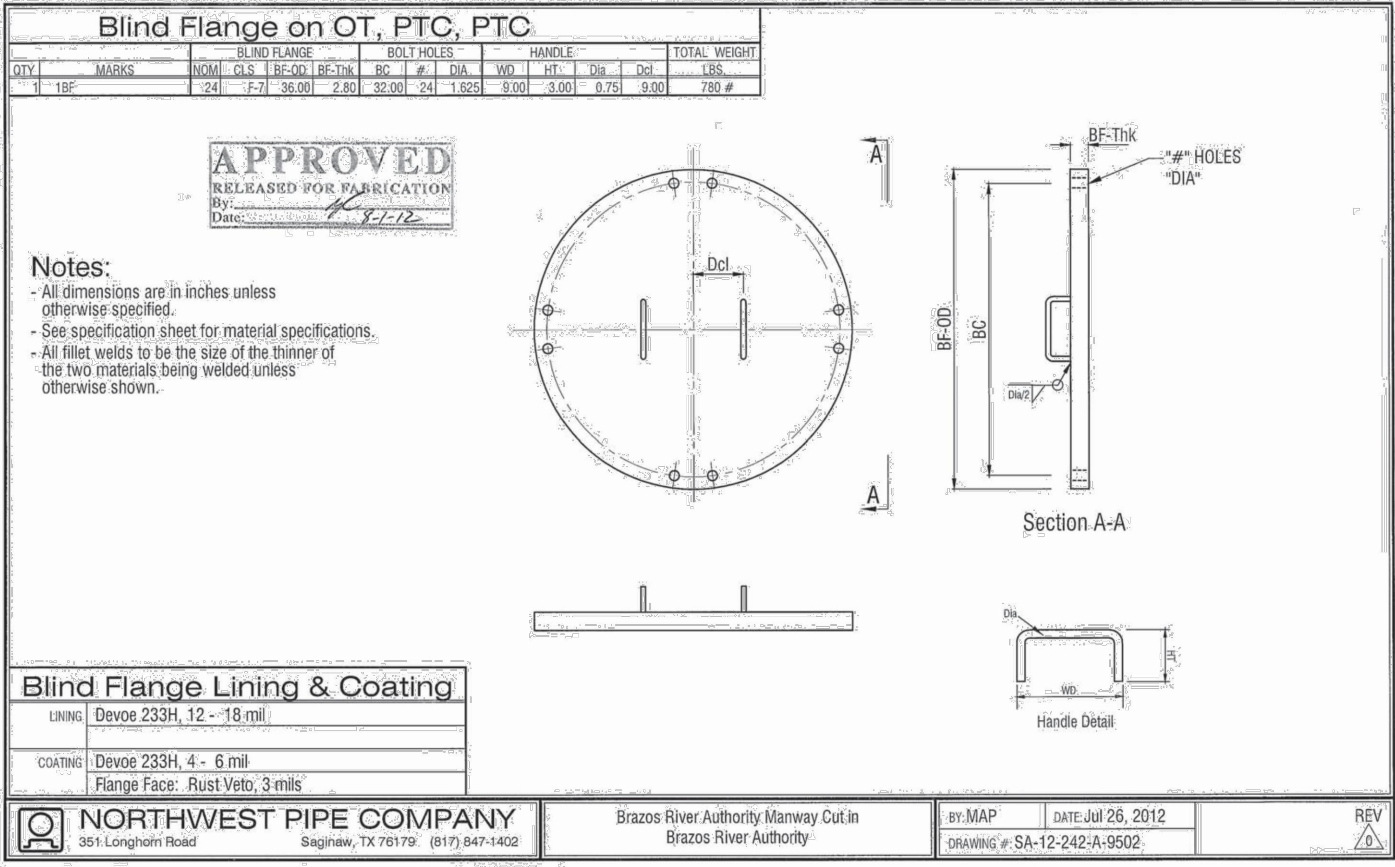
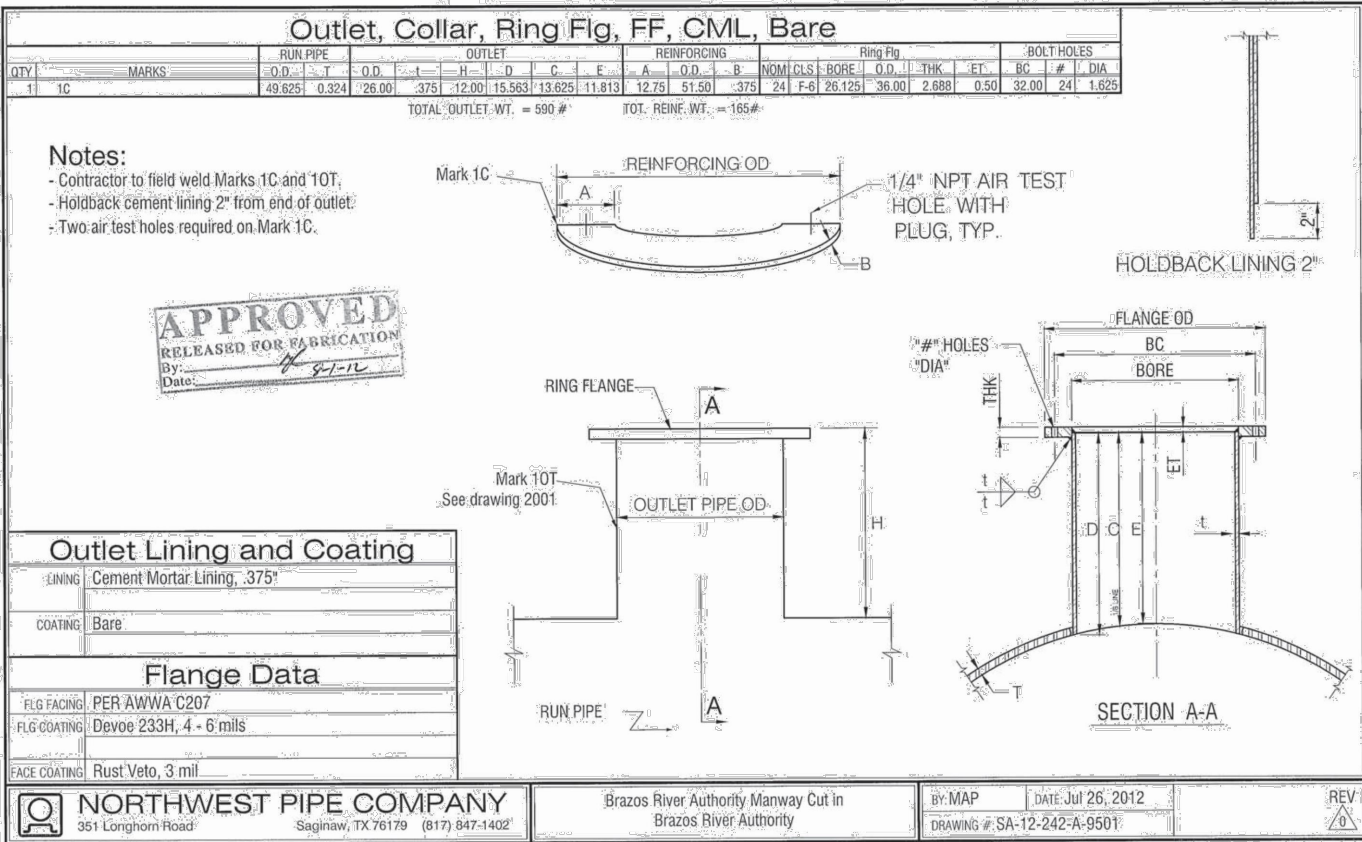
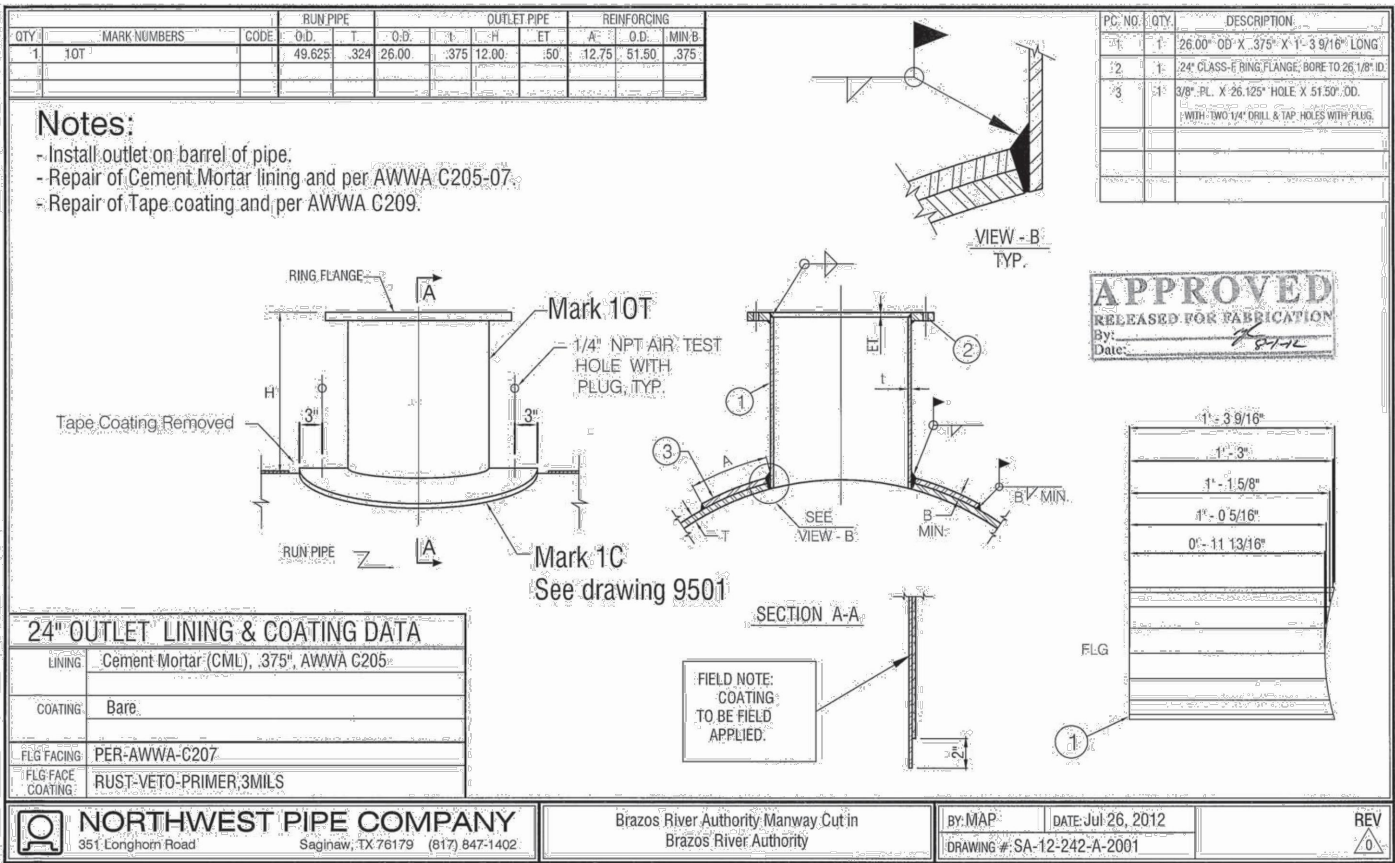
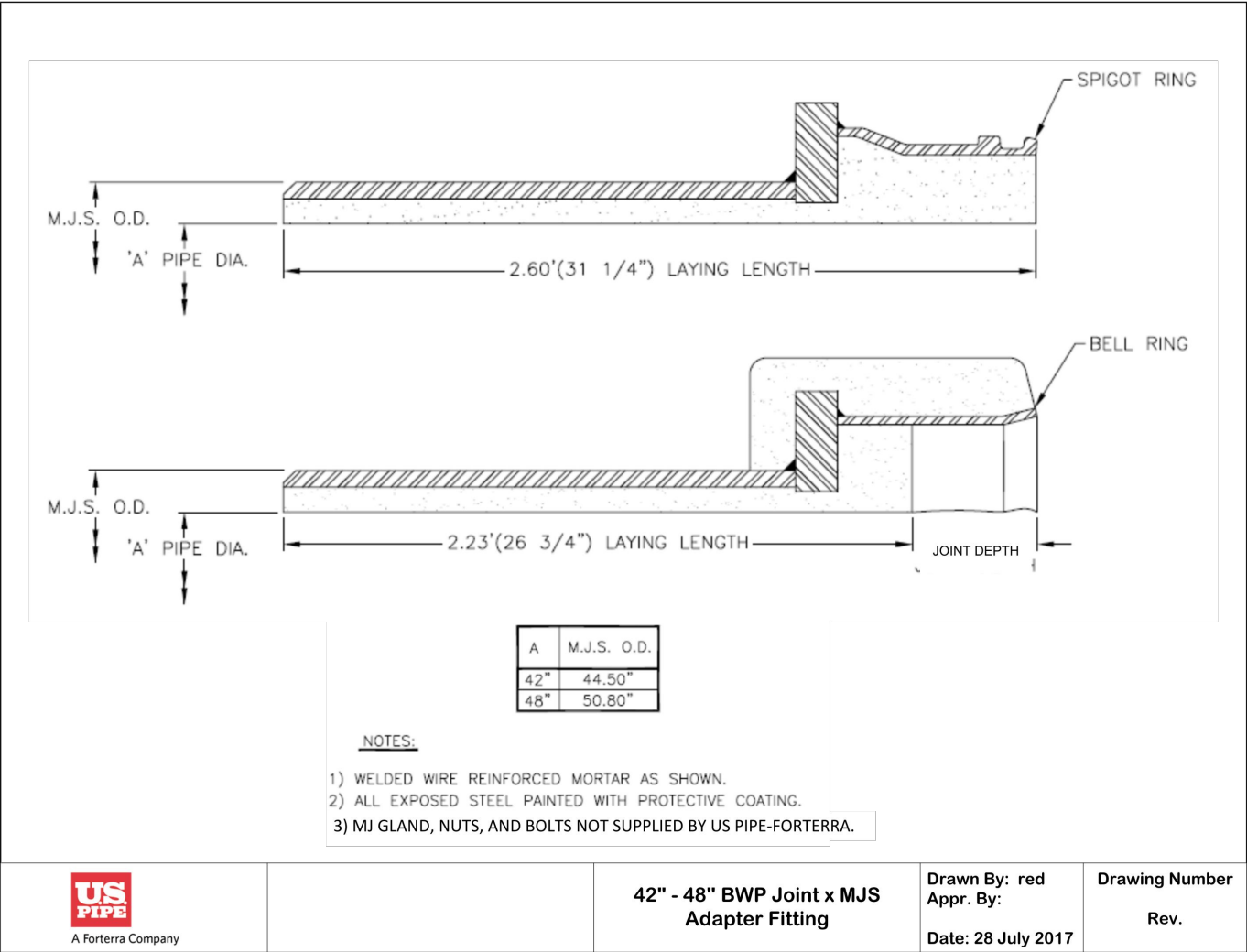
INSTALL ONE OF EACH DANGER
SIGNS NEAR EACH COMBINATION
AIR RELEASE/VACUUM RELIEF VALVE

*SUBSIDIARY TO COST OF
COMB. ARV

"DANGER" SIGN DETAIL

N.T.S

Dwg Info: G:\CFA\2014\0308801_Williamson_County\2013_Road_Bond\MUN\24 Ronald Reagan Blvd. @ IH 35 Phase \Design\C-501-DET.dwg -- Tab: DETL-06 -- Plotted: 9/25/2017 11:55 AM By: KRISTEN VAN HOOSIER



APPROVED BY: [Signature]

DATE: 9/25/2017

REVISION DESCRIPTION

REV. NO.

CobbFendley
CobbFendley & Associates, Inc.
505 EAST HUNT AND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7727
WWW.COBBFENDLEY.COM

BWP TRANSITION COUPLING AND MANWAY DETAILS

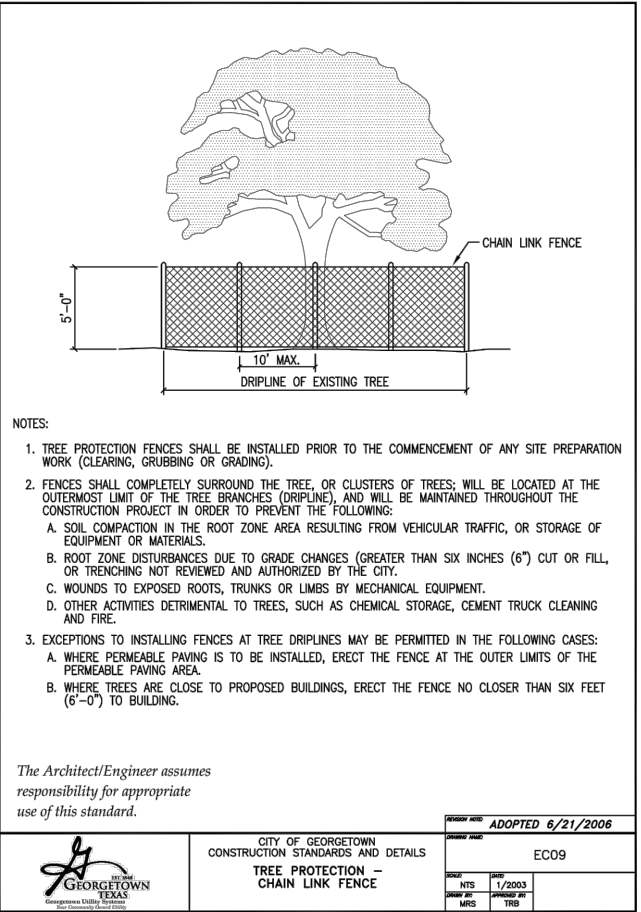
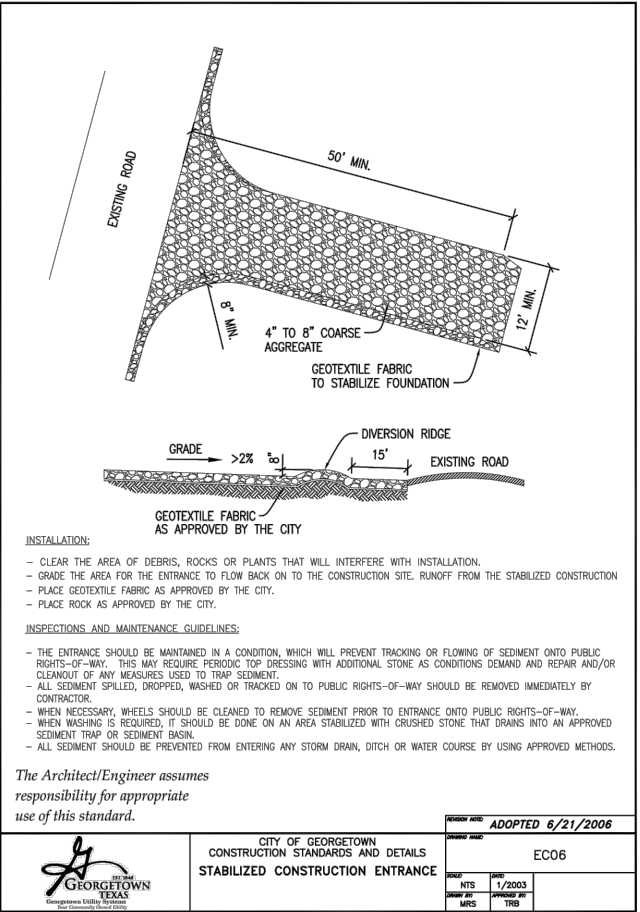
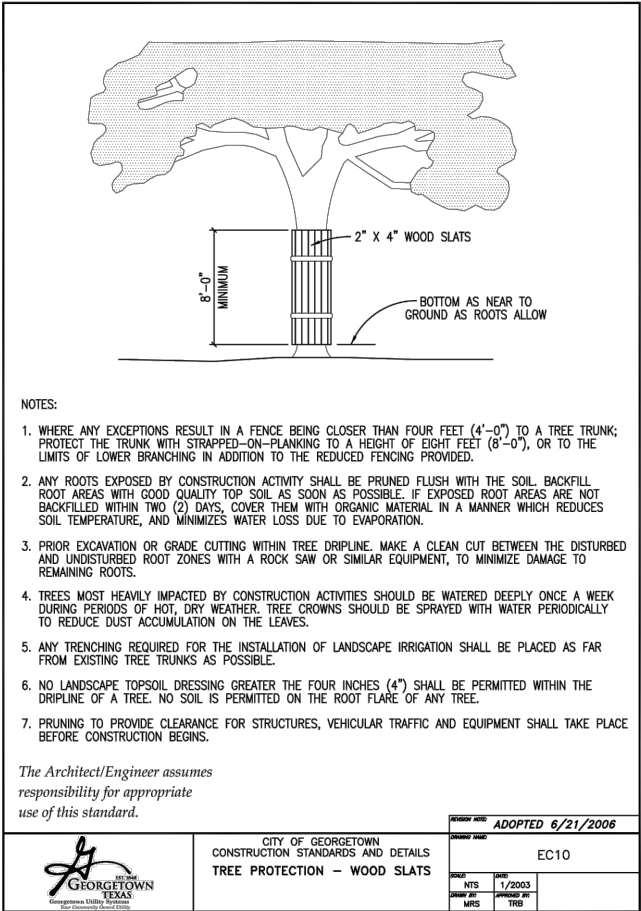
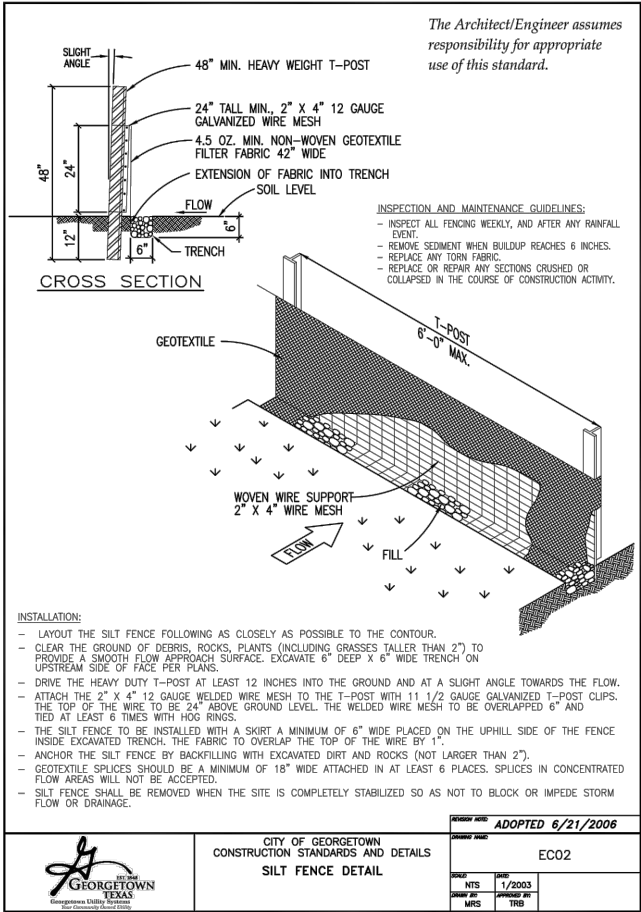
WCRWL 48" RAW WATER LINE RELOCATION - RONALD REAGAN AND CR 305 AT IH 35 WILLIAMSON COUNTY, TEXAS

WILLIAMSON COUNTY
1848

PROJ. NO. 1703-011-01
DESIGN: K. VAN HOOSIER
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CHECK: S. FEES
APPR: L. PARISHER
DATE: September 25, 2017

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106221
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9/25/2017

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C-504
14 of 30
p. 320



REV. NO.	DATE	APPROVED BY:	REVISION DESCRIPTION

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CITY OF GEORGETOWN, TEXAS
505 EAST HUNT AND DRIVE, SUITE 100
AUSTIN, TEXAS 78752
512.834.9798 | FAX 512.834.7227
WWW.COBBFENDLEY.COM

SILT FENCE AND TREE PROTECTION DETAILS

WCRRWL 48" RAW WATER LINE RELOCATION -
RONALD REAGAN AND CR 305 AT IH 35
WILLIAMSON COUNTY, TEXAS

WILLIAMSON COUNTY
1848

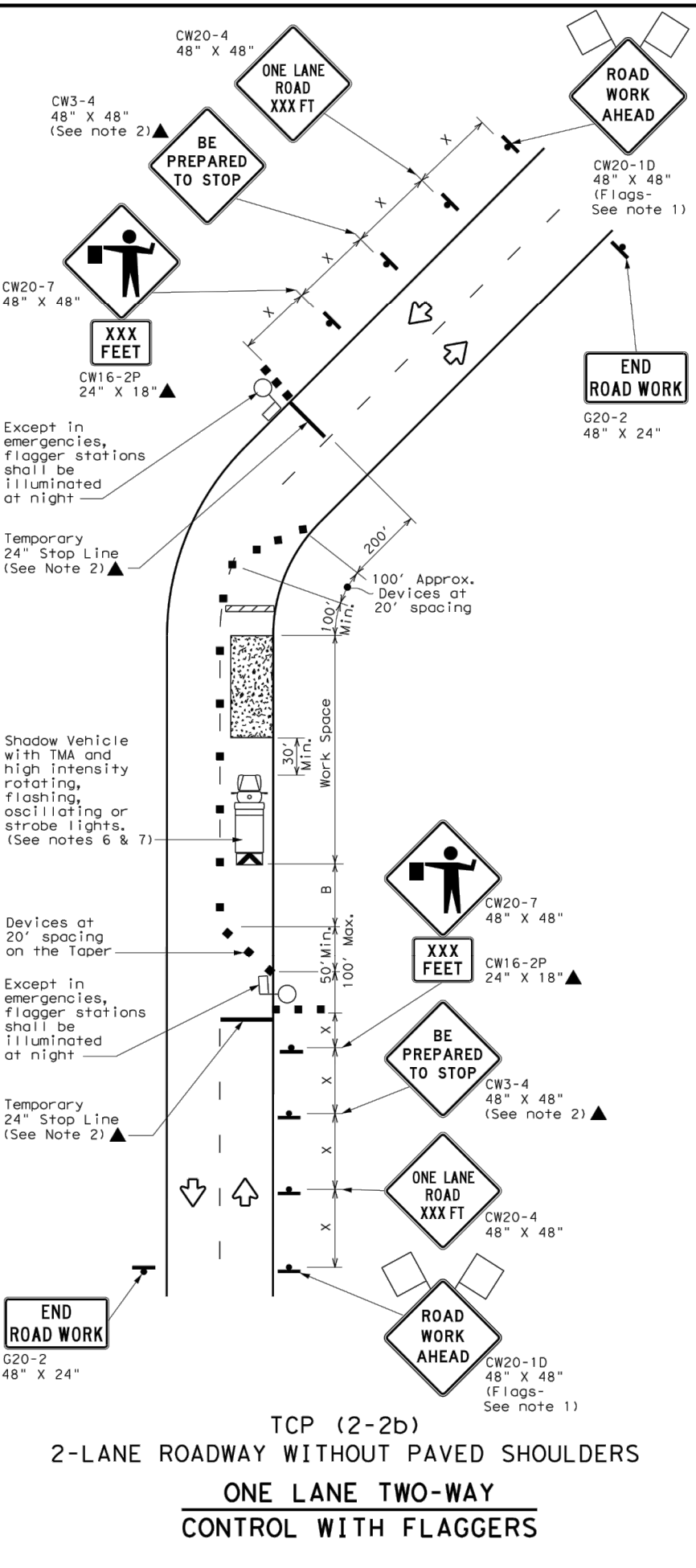
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9/25/2017

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DATE: _____
FILE: _____



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© TxDOT December 1985		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISED		CONT	SECT	JOB	HIGHWAY
8-95	2-12				
1-97					
4-98					
3-03		DIST	COUNTY		SHEET NO.

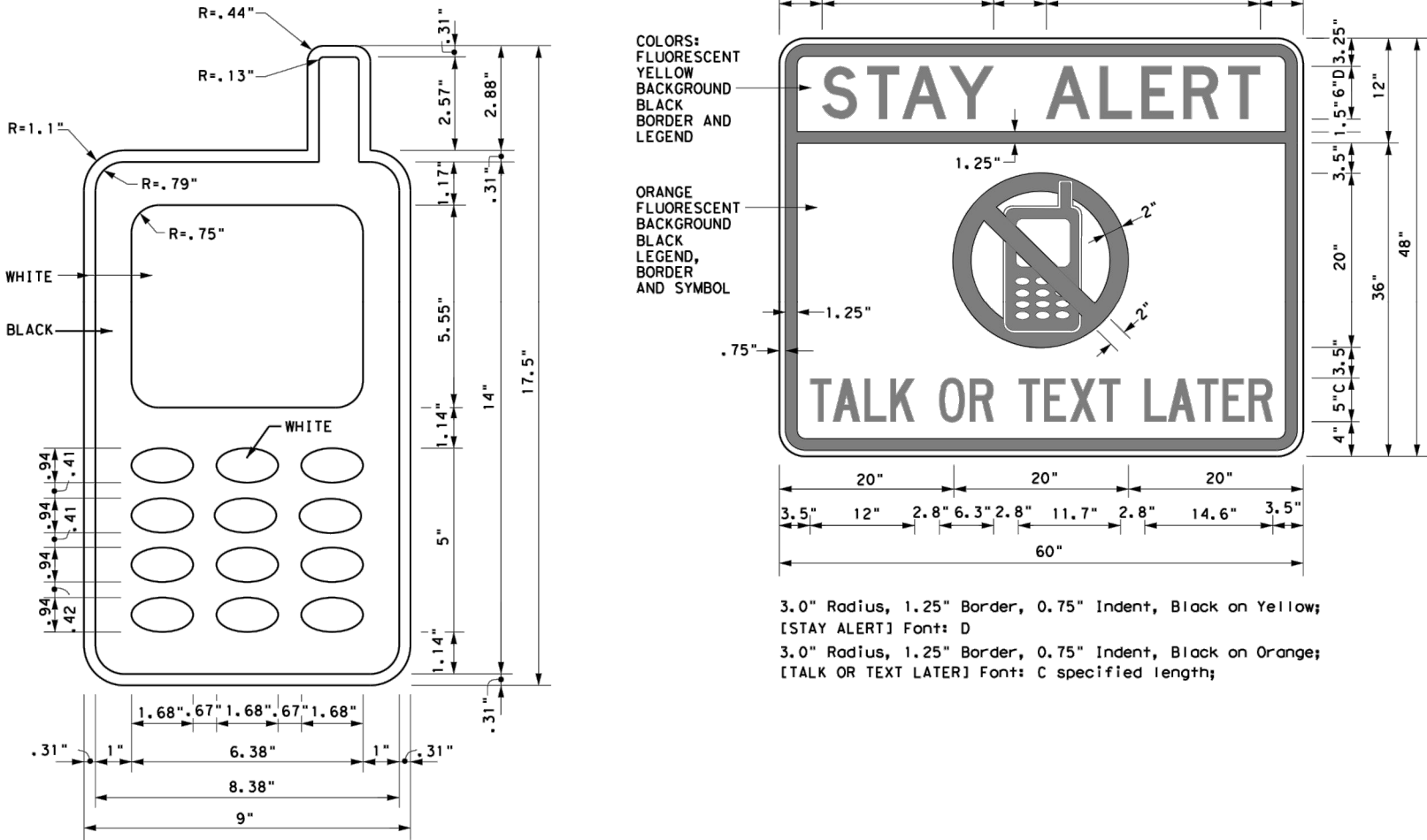
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY APPAREL NOTES:

1. Workers on foot who are exposed to traffic or to construction equipment within the right-of-way shall wear high-visibility safety apparel meeting the requirements of ISEA "American National Standard for High-Visibility Apparel," or equivalent revisions, and labeled as ANSI 107-2004 standard performance for Class 2 or 3 risk exposure. Class 3 garments should be considered for high traffic volume work areas or night time work.



SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION
GENERAL NOTES
AND REQUIREMENTS

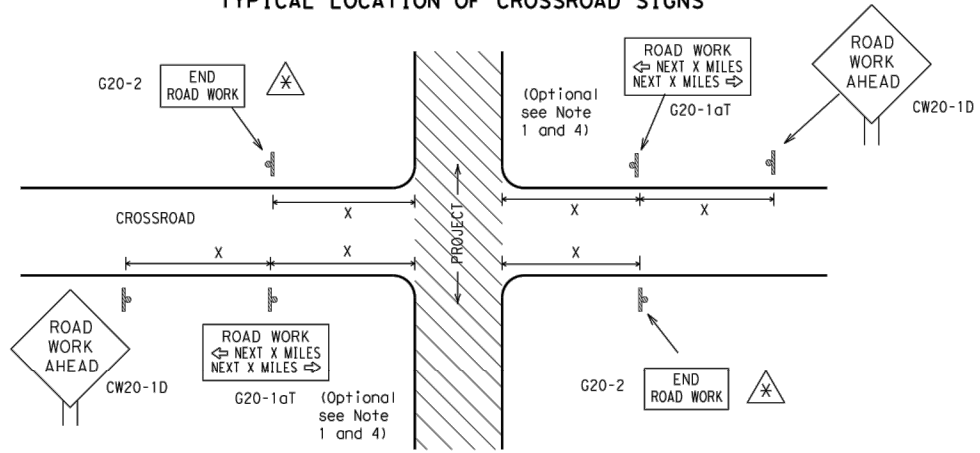
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BC(1)-14

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

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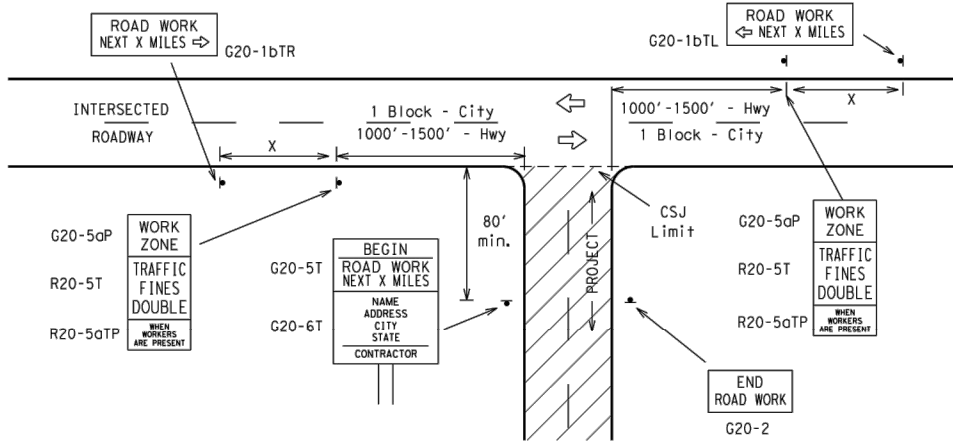
TYPICAL LOCATION OF CROSSROAD SIGNS



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

1. 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.
2. 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.
3. 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.
4. 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.
5. Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
6. 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

1. 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.
2. 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.

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

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

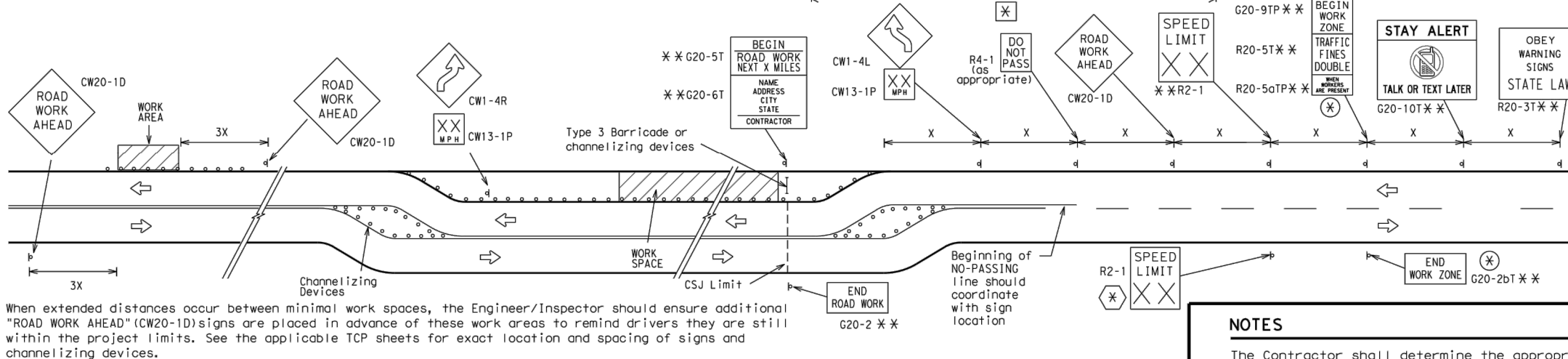
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

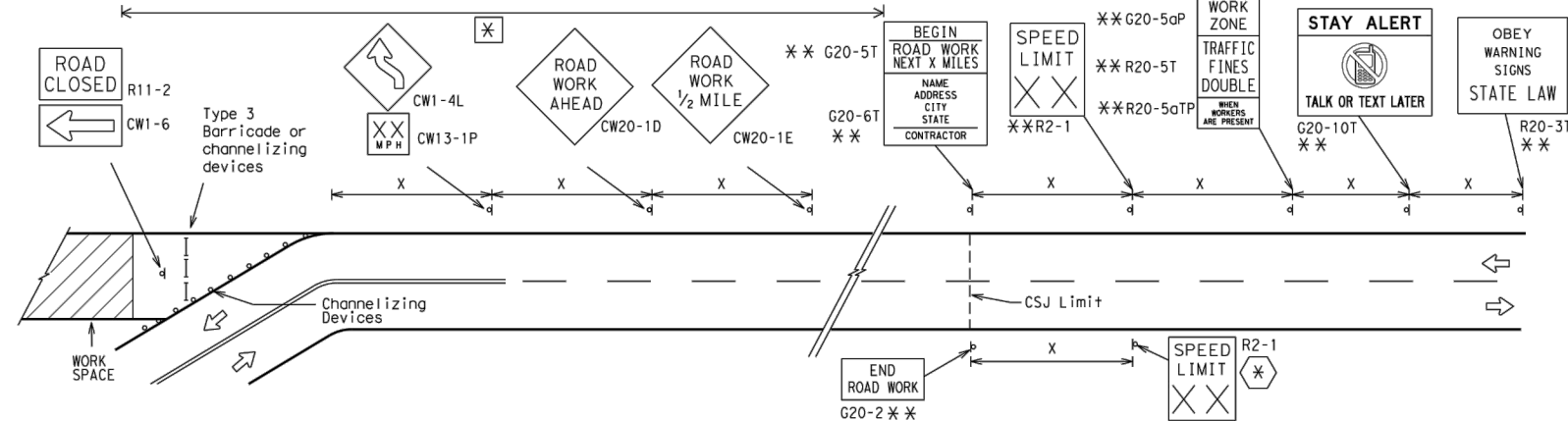
GENERAL NOTES

1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 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".
5. Only diamond shaped warning sign sizes are indicated.
6. 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.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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.

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

**Texas Department of Transportation**

BARRICADE AND CONSTRUCTION PROJECT LIMIT

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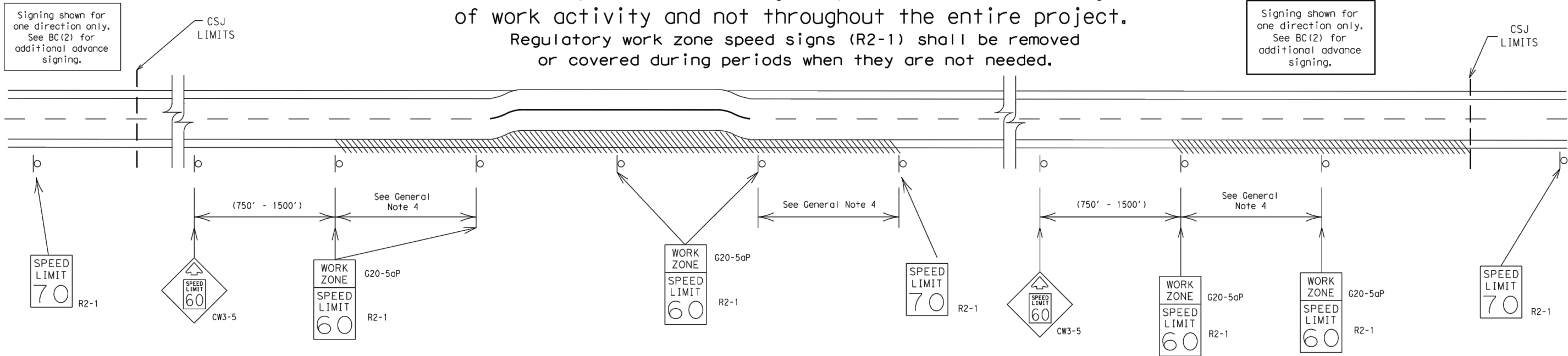
BC(2) - 14

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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

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. 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
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. 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.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. 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.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. 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

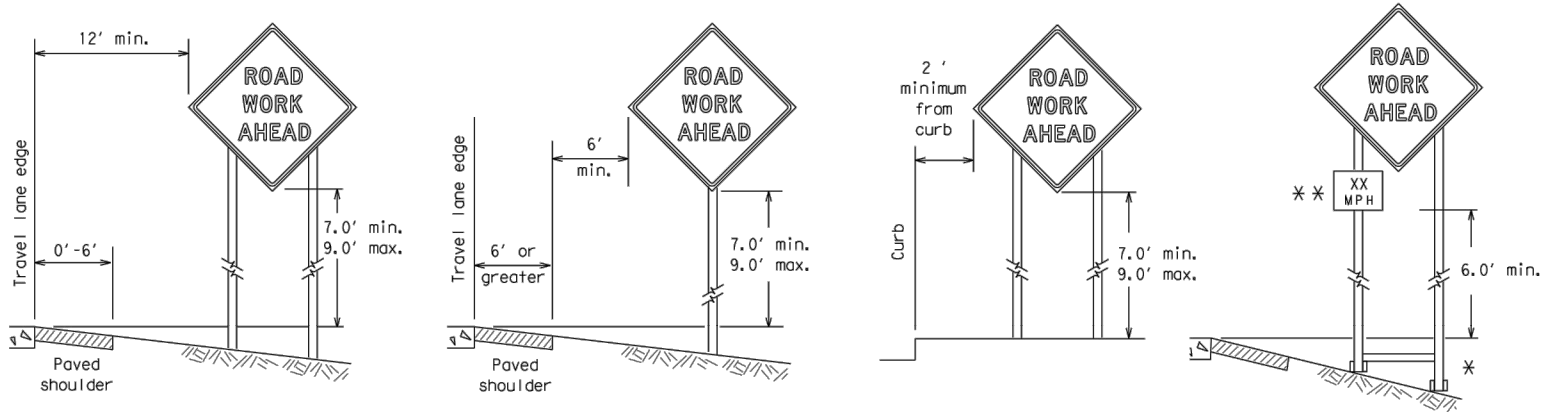
		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT			
C-509 19 of 30		BC (3) - 14	
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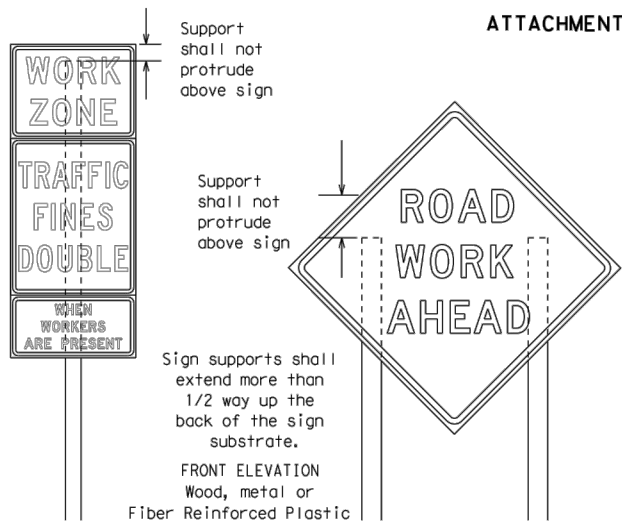
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



✱ 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.

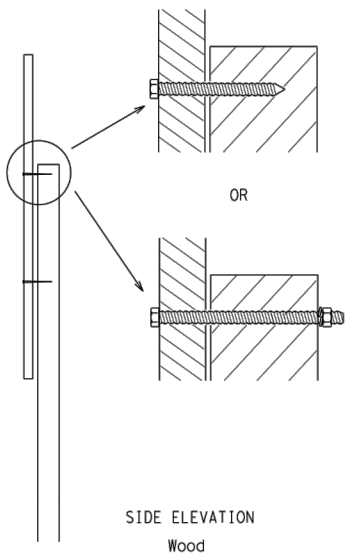
✱✱ When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



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.

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.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barriacades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

- When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
- 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.
- 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.
- 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.
- Burlap shall NOT be used to cover signs.
- Duct tape or other adhesive material shall NOT be affixed to a sign face.
- Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

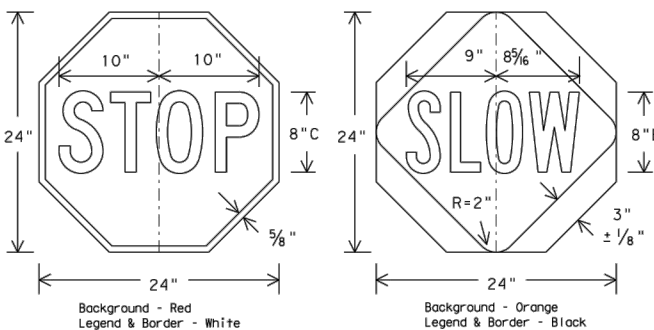
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

STOP/SLOW PADDLES

- 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.
- When used at night, the STOP/SLOW paddle shall be retroreflectorized.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

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Traffic Operations Division Standard

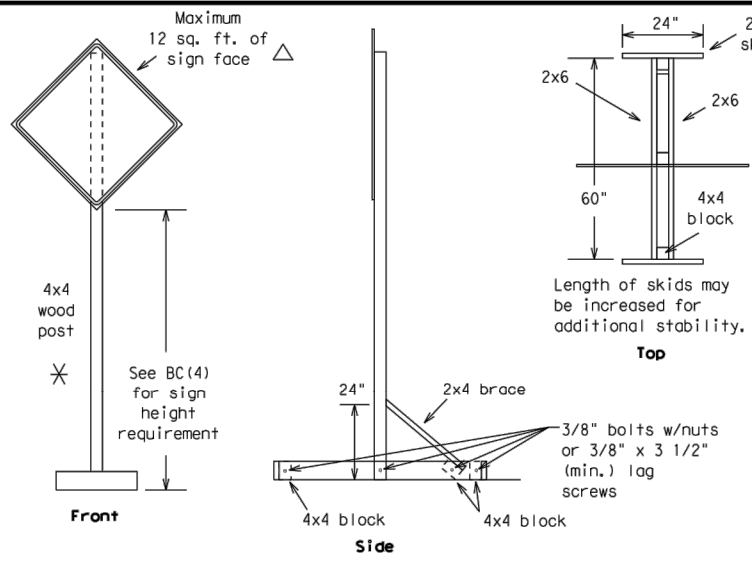
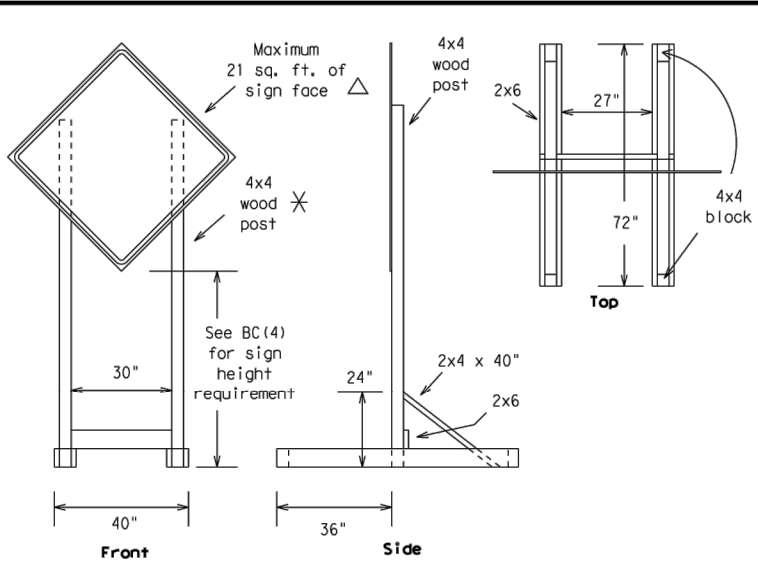
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

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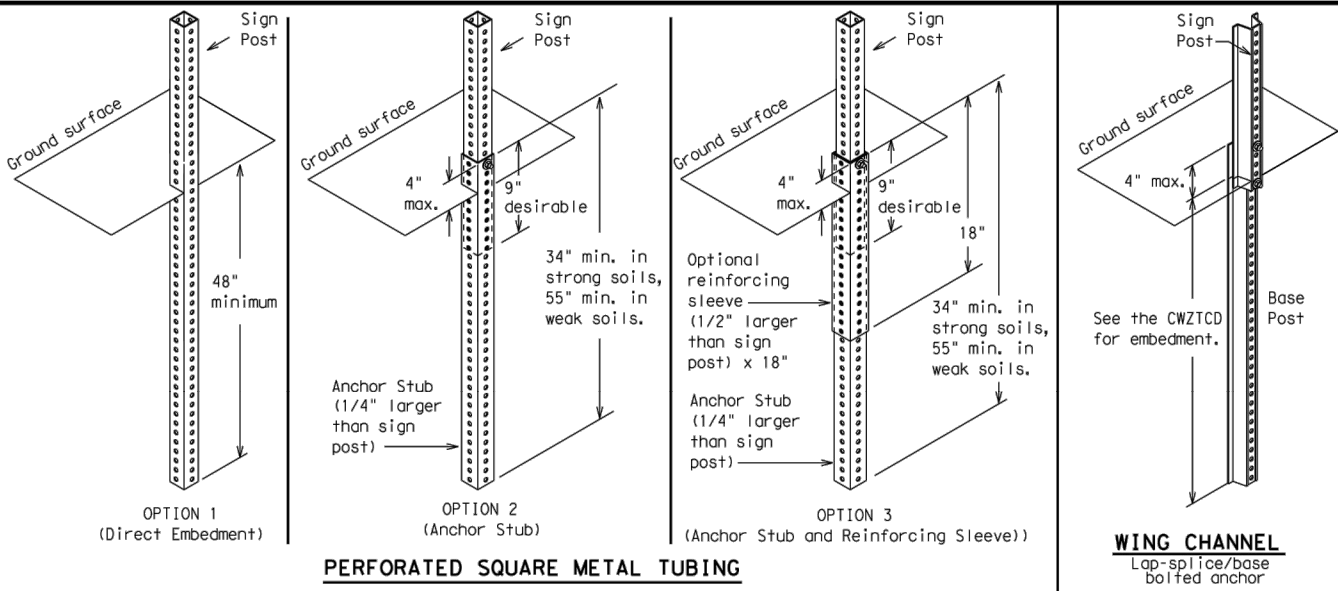
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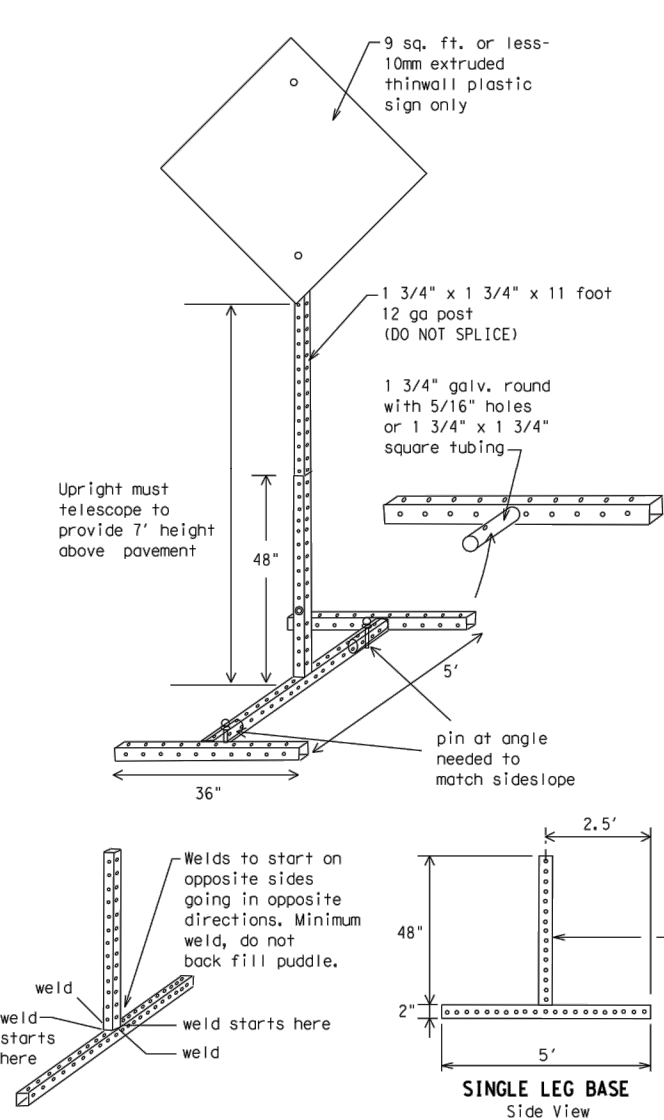
SKID MOUNTED WOOD SIGN SUPPORTS

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

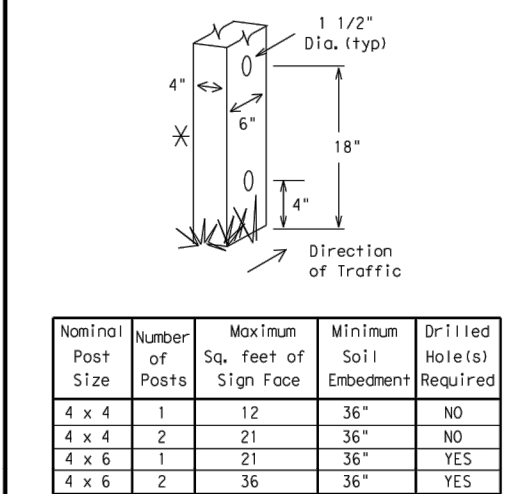
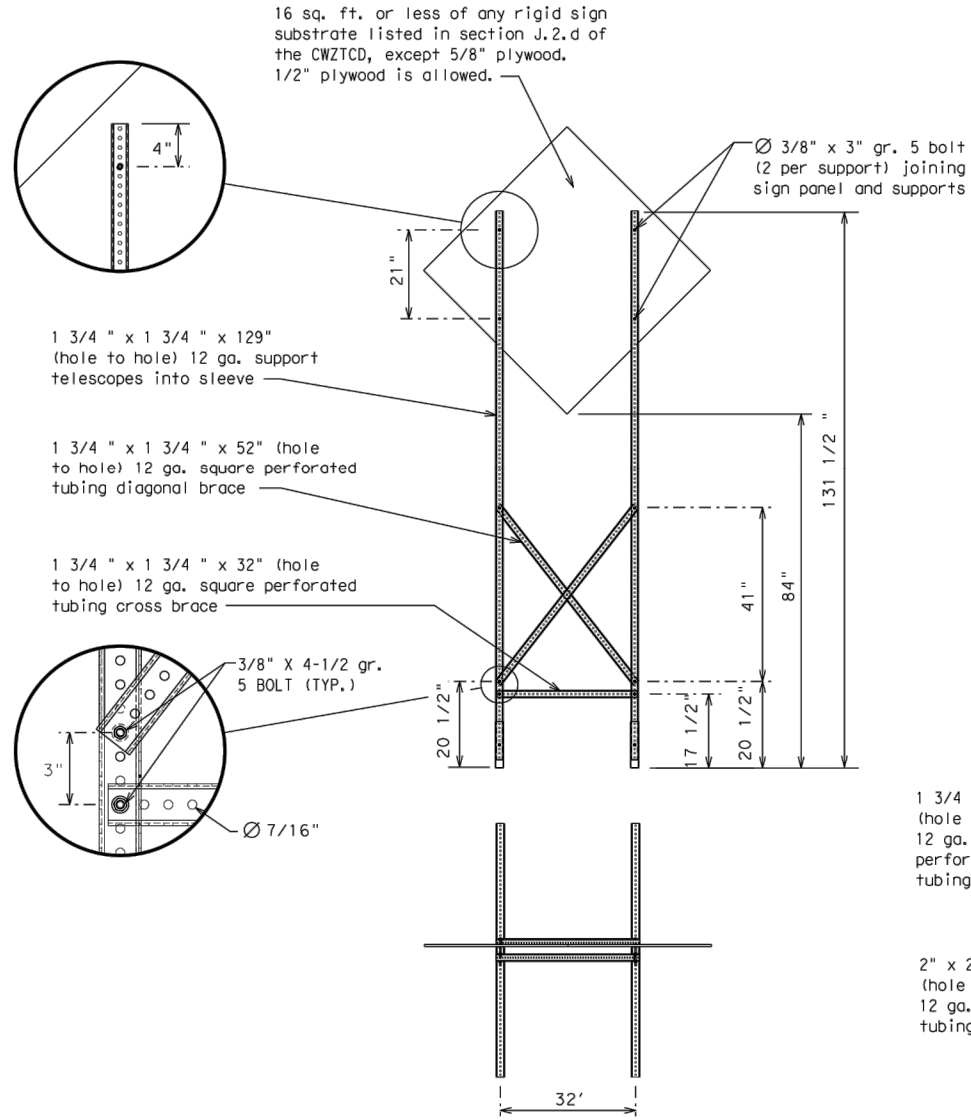


GROUND MOUNTED SIGN SUPPORTS

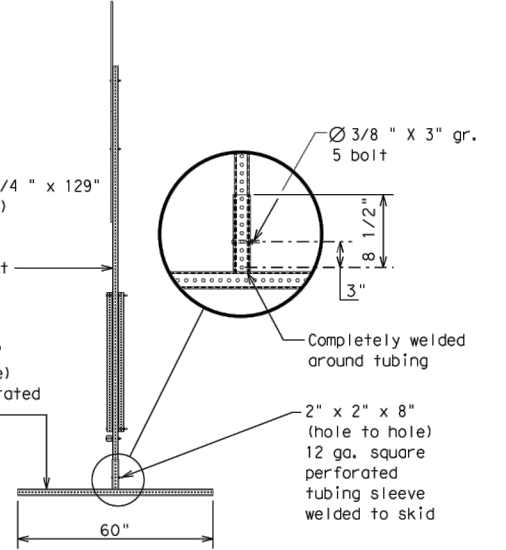
Refer to the CWZTCD and the manufacturer's installation procedure for each type sign support. The maximum sign square footage shall adhere to the manufacturer's recommendation. Two post installations can be used for larger signs.



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS



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

- 1. 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.
- 2. No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- 3. 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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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

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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

- 1. The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 2. 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.
- 3. 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.
- 4. Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- 5. Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- 6. When in use the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 7. 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.
- 8. 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.
- 9. Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 10. 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.
- 11. Do not use the word "Danger" in message.
- 12. Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- 13. Do not display messages that scroll horizontally or vertically across the face of the sign.
- 14. 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.
- 15. 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.
- 16. Each line of text should be centered on the message board rather than left or right justified.
- 17. 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	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Cannot	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLRS
High-Occupancy	HOV	Tuesday	TUES
Vehicle		Time Minutes	TIME MIN
Highway	HWY	Upper Level	UPR LEVEL
Hour(s)	HR, HRS	Vehicles (s)	VEH, VEHS
Information	INFO	Warning	WARN
It Is	ITS	Wednesday	WED
Junction	JCT	Weight Limit	WT LIMIT
Left	LFT	West	W
Left Lane	LFT LN	Westbound	(route) W
Lane Closed	LN CLOSED	Wet Pavement	WET PVMT
Lower Level	LWR LEVEL	Will Not	WONT
Maintenance	MAINT		

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES
(The Engineer may approve other messages not specifically covered here.)

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

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

- 1. Only 1 or 2 phases are to be used on a PCMS.
- 2. The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- 3. A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- 4. A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 5. 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.
- 6. 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.


FULL MATRIX PCMS SIGNS

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

WORDING ALTERNATIVES

- 1. The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- 2. Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- 3. EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- 4. Highway names and numbers replaced as appropriate.
- 5. ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- 6. AHEAD may be used instead of distances if necessary.
- 7. FT and MI, MILE and MILES interchanged as appropriate.
- 8. AT, BEFORE and PAST interchanged as needed.
- 9. 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)

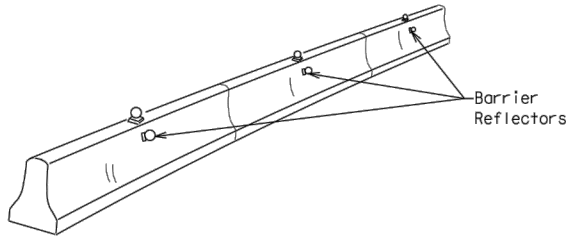
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BC (6) - 14

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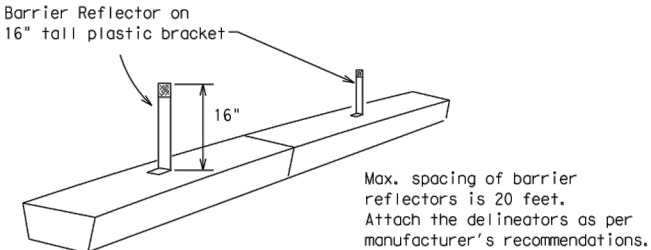
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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

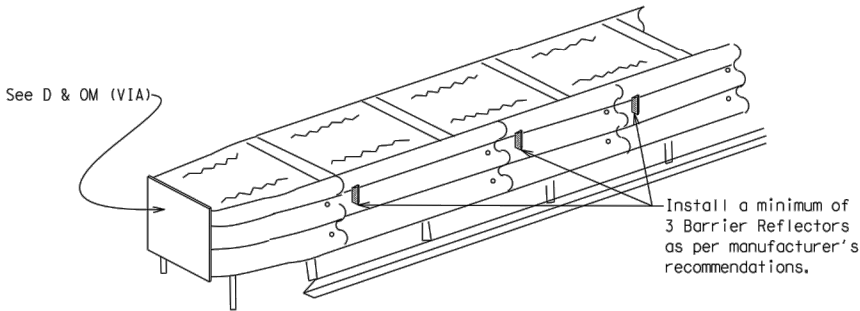


CONCRETE TRAFFIC BARRIER (CTB)

- 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

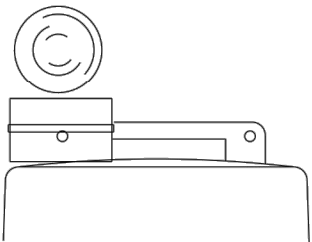
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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

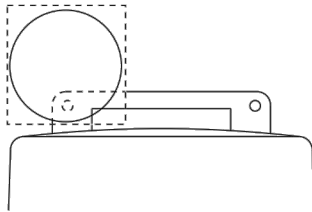
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.



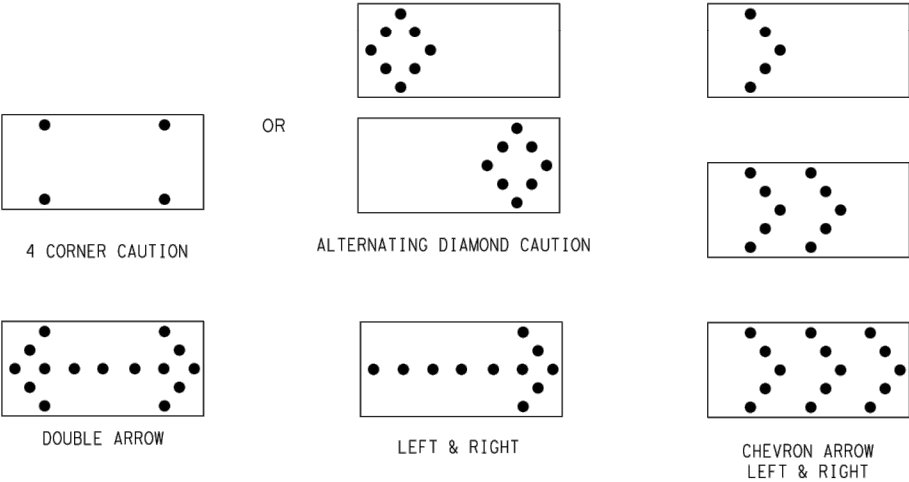
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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.



Traffic Operations Division Standard

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

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© TxDOT	November 2002	CONT	SECT	JOB			HIGHWAY		
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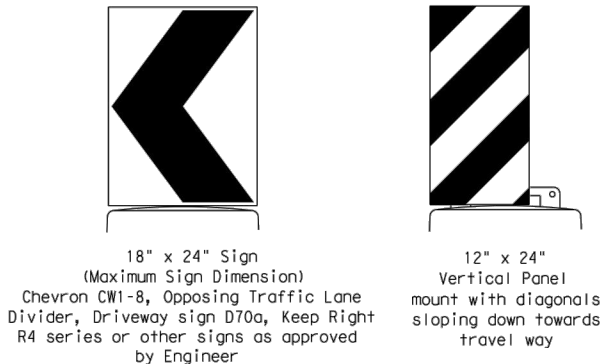
1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece 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.

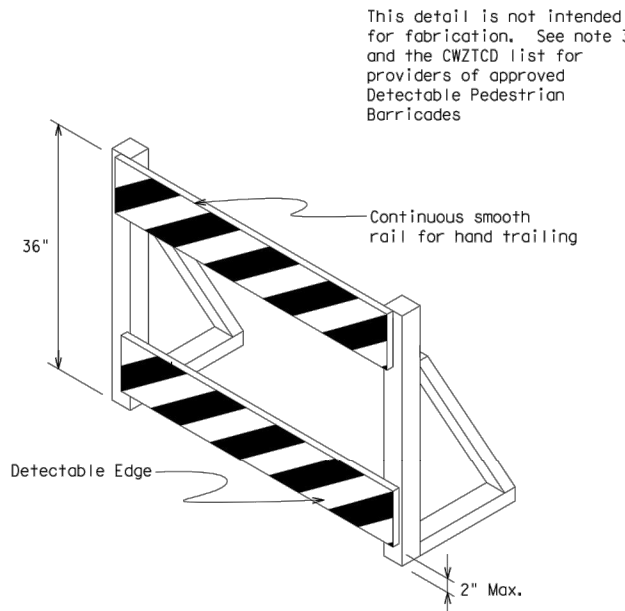
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable 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.



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.



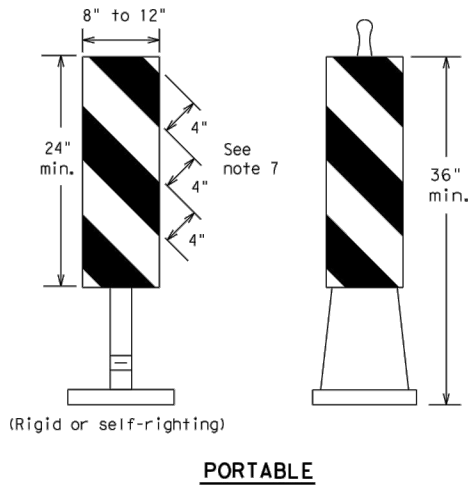
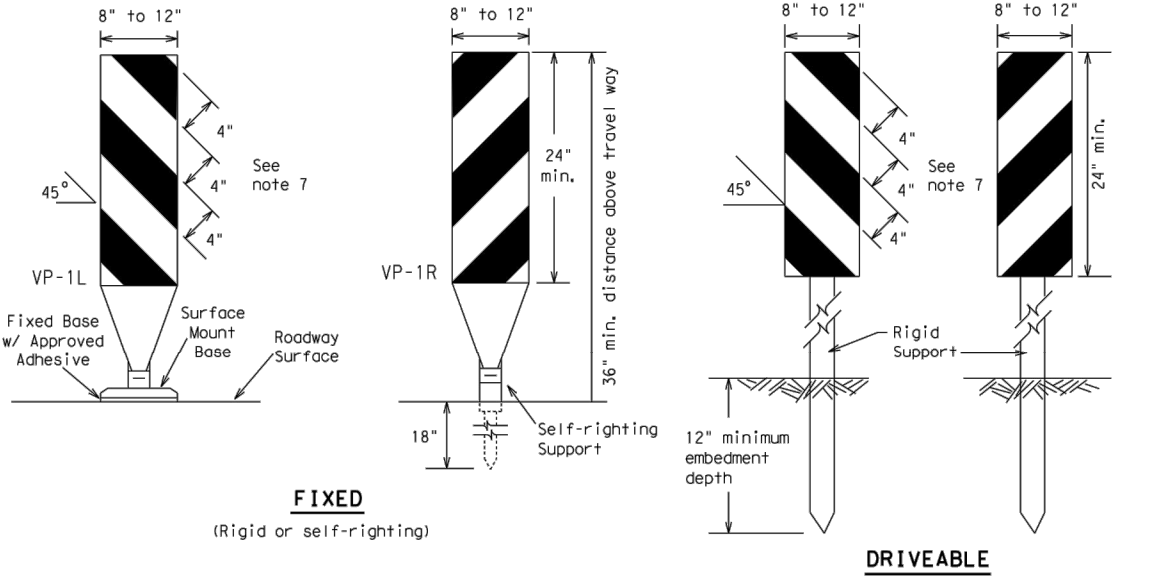
1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. 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 CWZTCD 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 should 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.

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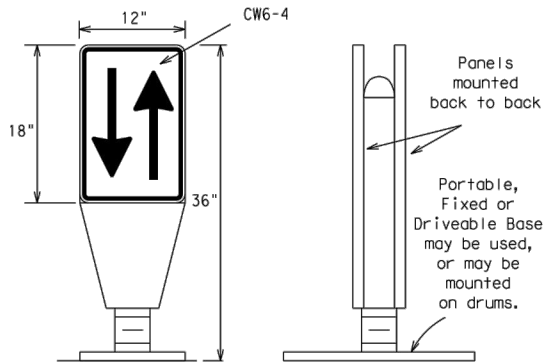
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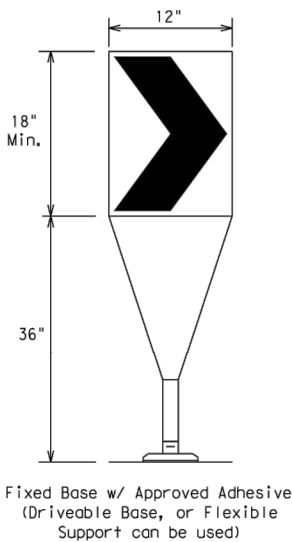
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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.
3. 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.
4. VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
5. Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
6. Sheeting for the VP's shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
7. Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.

VERTICAL PANELS (VPs)



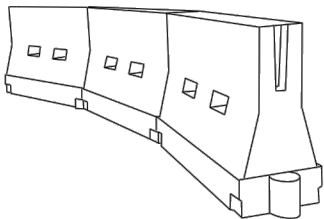
1. Opposing Traffic Lane Dividers (OTLD) are delineation devices designed to convert a normal one-way roadway section to two-way operation. OTLD's are used on temporary centerlines. The upward and downward arrows on the sign's face indicate the direction of traffic on either side of the divider. The base is secured to the pavement with an adhesive or rubber weight to minimize movement caused by a vehicle impact or wind gust.
2. The OTLD may be used in combination with 42" cones or VPs.
3. Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
4. 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.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. 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.
3. 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.
4. To be effective, the chevron should be visible for at least 500 feet.
5. 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.
6. 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)

1. 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.
2. LCDs may be used instead of a line of cones or drums.
3. LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
4. LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
5. LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
6. 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

1. 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.
2. 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.
3. 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.
4. 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.
5. 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 cones 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

1. 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).
2. 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.
3. 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).
4. 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.
5. Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
6. 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.
7. 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	$L = \frac{WS}{60}$	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

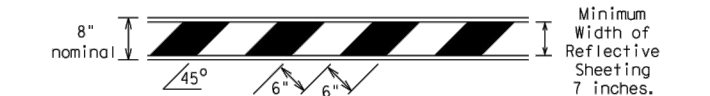
C-515 25 of 30		BC (9) - 14			
FILE:	bc-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS					
9-07	8-14	DIST	COUNTY		SHEET NO.
7-13					

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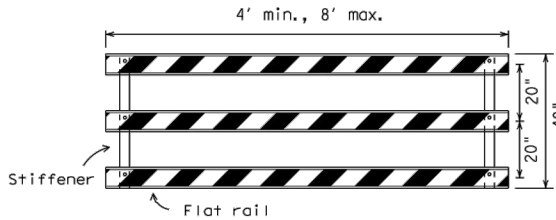
TYPE 3 BARRICADES

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.

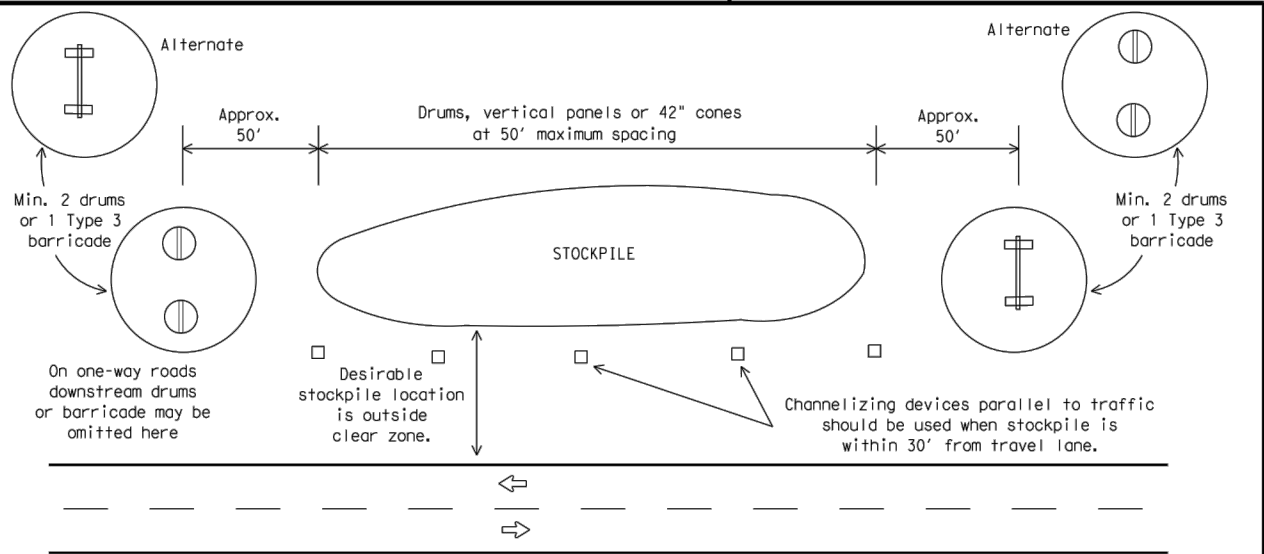


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



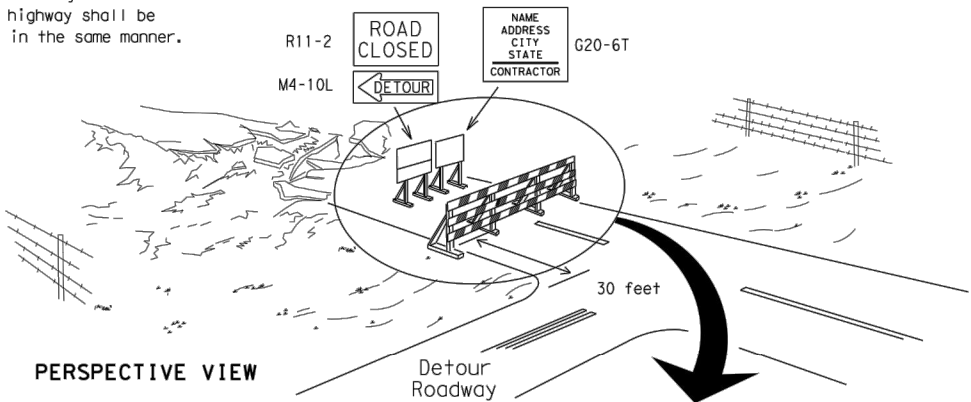
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

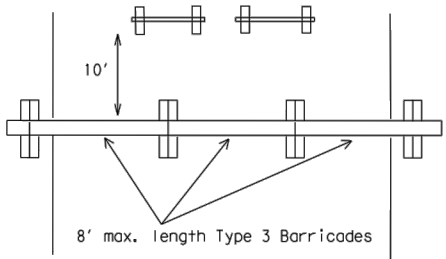
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

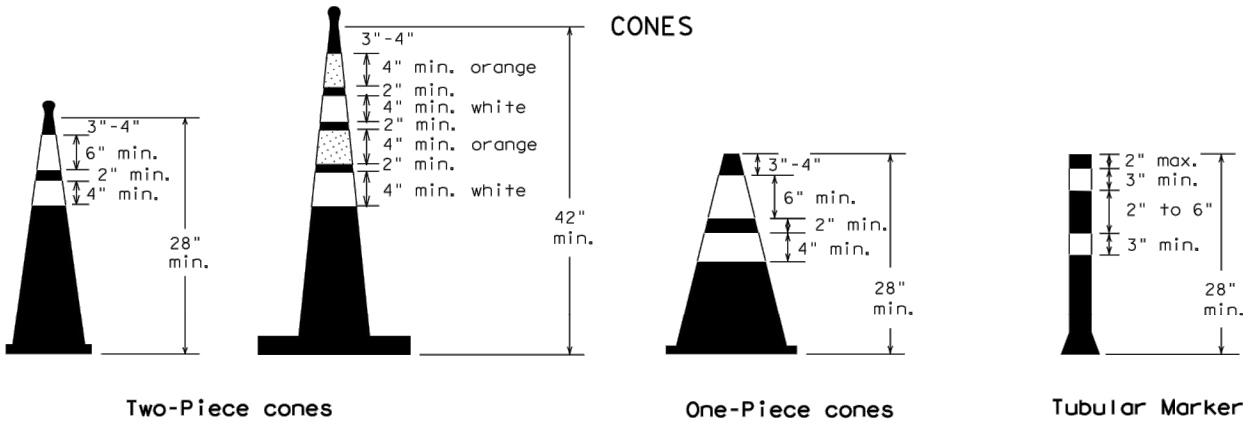
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.



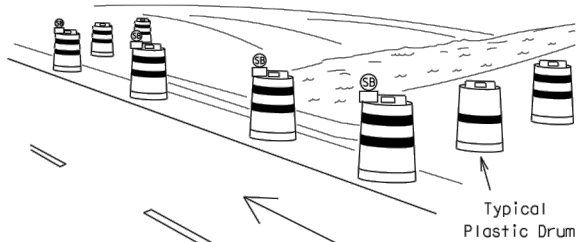
PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION

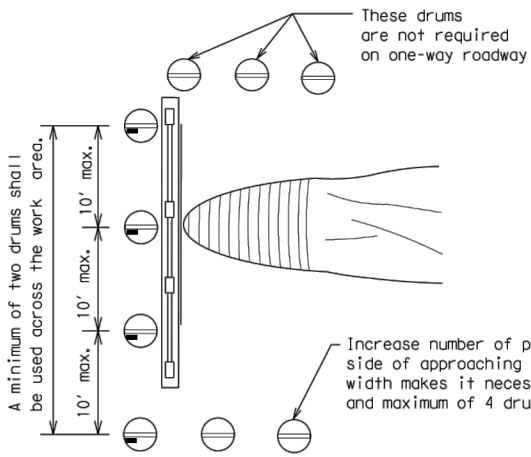


28" Cones shall have a minimum weight of 9 1/2 lbs.
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



PLAN VIEW

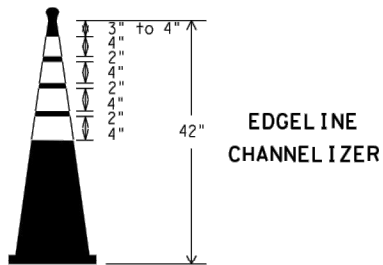
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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.



EDGE LINE 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.

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Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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DATE:
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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.

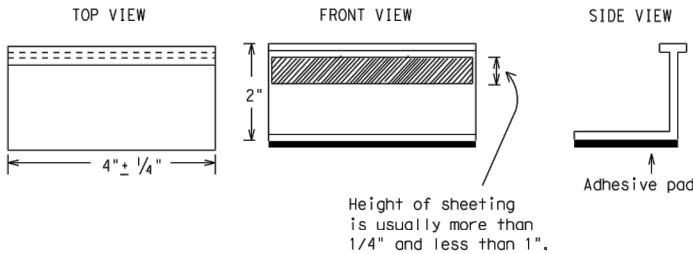
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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).

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Texas Department of Transportation

Traffic
Operations
Division
Standard

BARRICADE AND CONSTRUCTION
PAVEMENT MARKINGS

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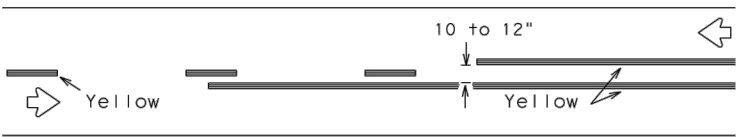
BC (11) - 14

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REVISIONS									
2-98	9-07	DIST		COUNTY	SHEET NO.				
1-02	7-13								
11-02	8-14								

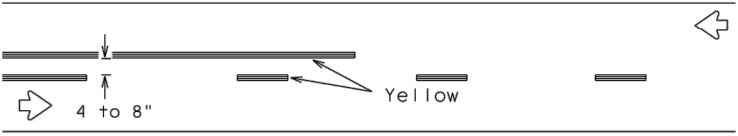
105

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PAVEMENT MARKING PATTERNS

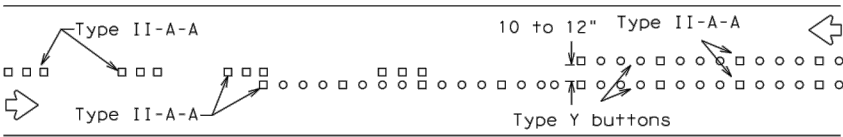


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

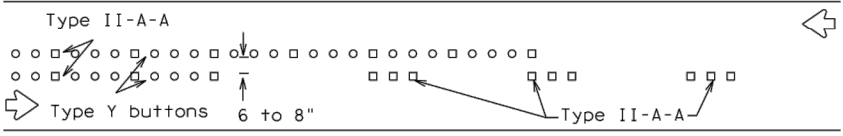


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.

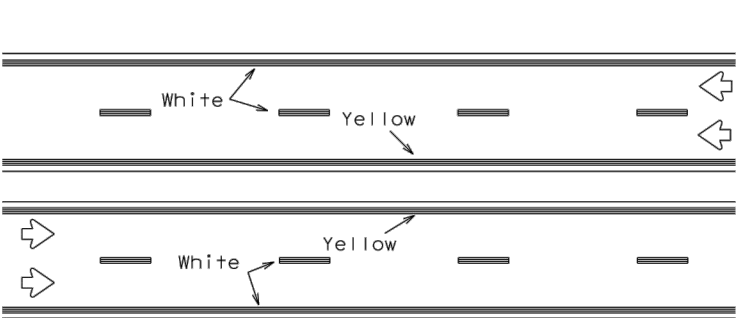


RAISED PAVEMENT MARKERS - PATTERN A



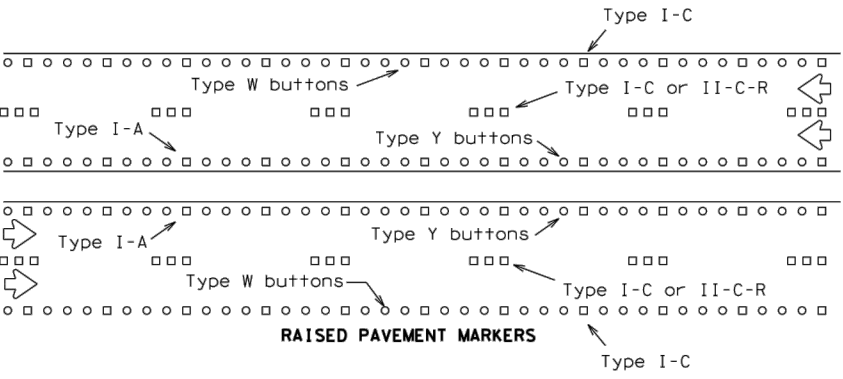
RAISED PAVEMENT MARKERS - PATTERN B

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



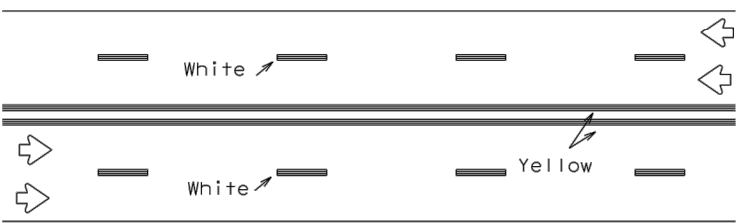
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



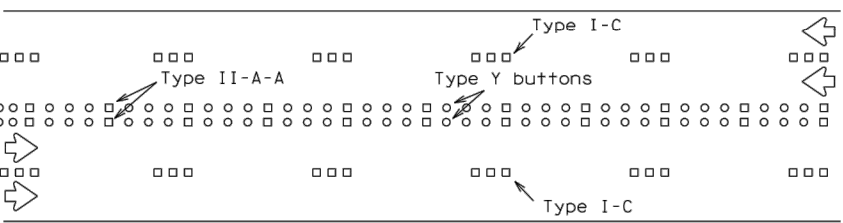
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



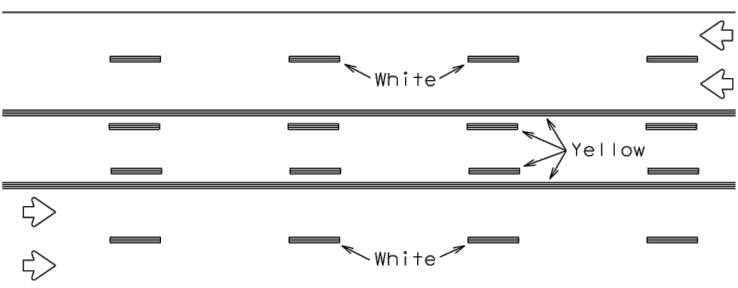
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



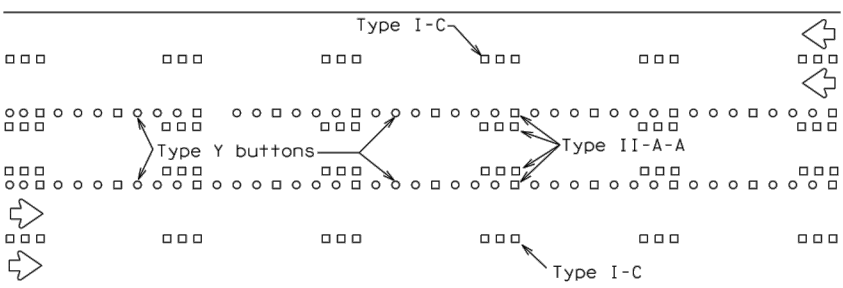
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

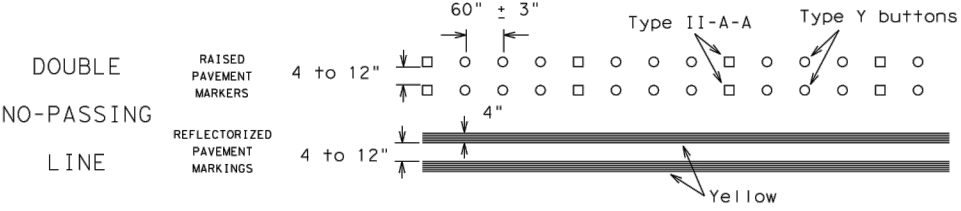
Prefabricated markings may be substituted for reflectORIZED pavement markings.



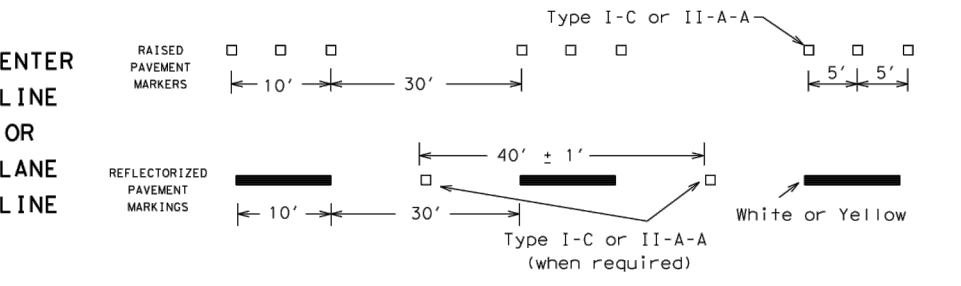
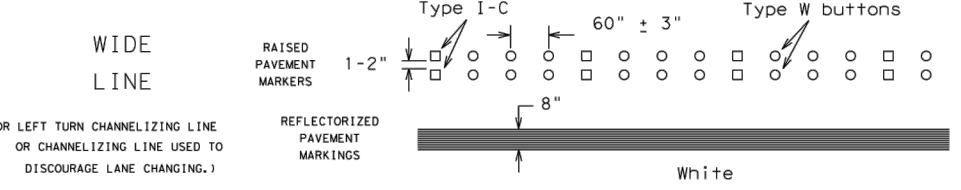
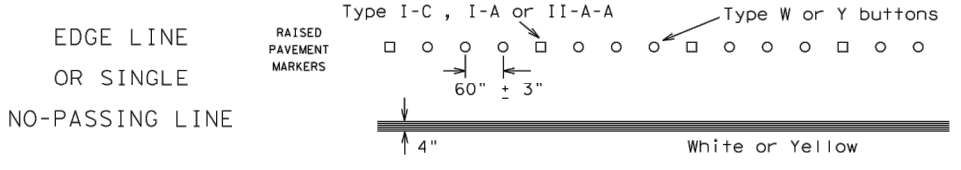
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

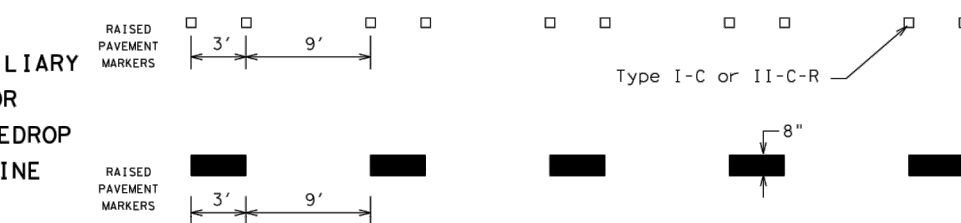
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

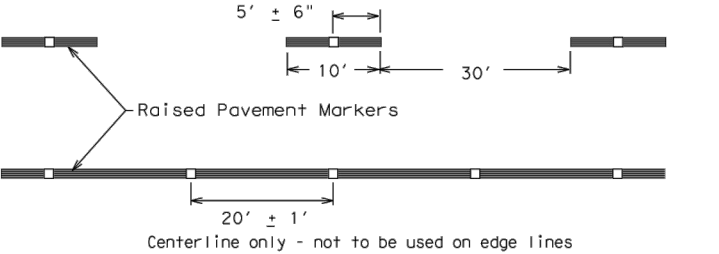


BROKEN LINES




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.



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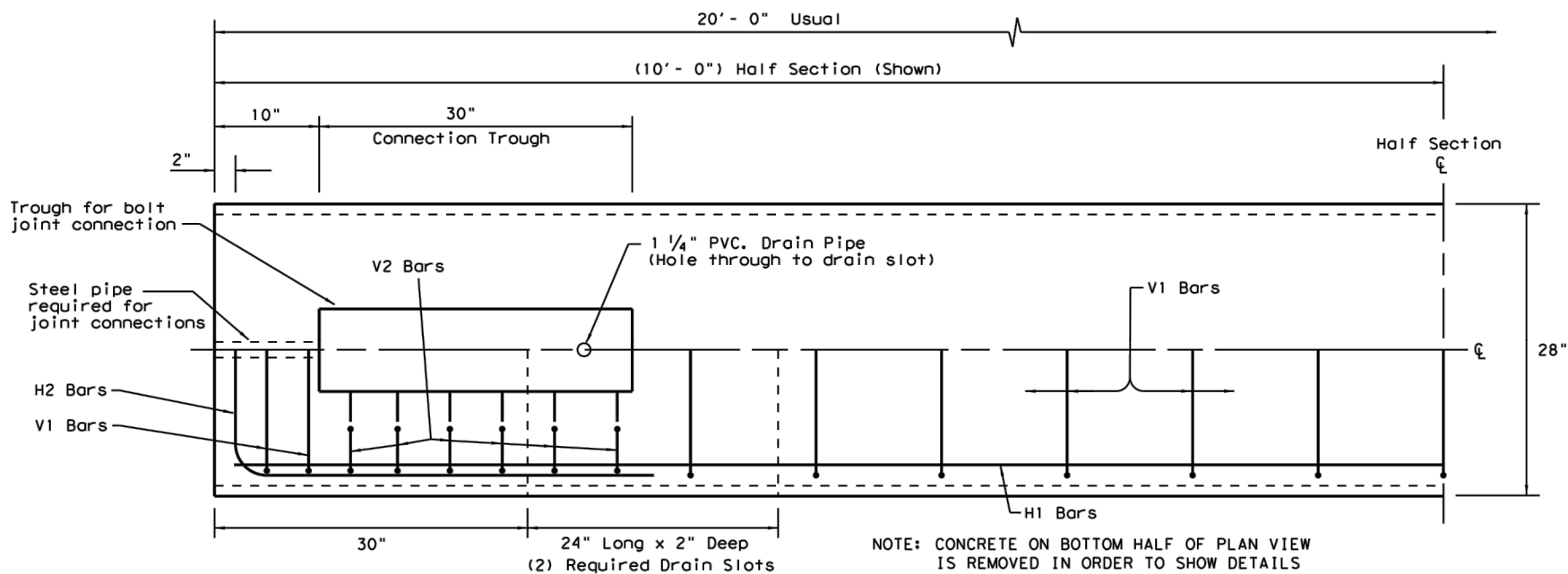
Texas Department of Transportation
Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS
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BC (12) - 14

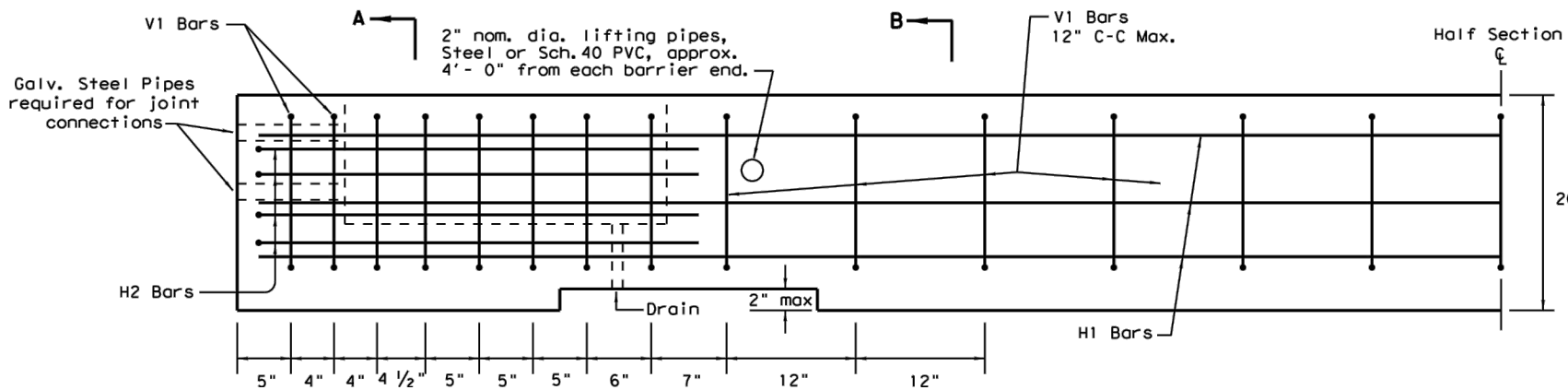
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REVISIONS				
1-97 9-07				
2-98 7-13				
11-02 8-14				
DIST		COUNTY	SHEET NO.	

Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

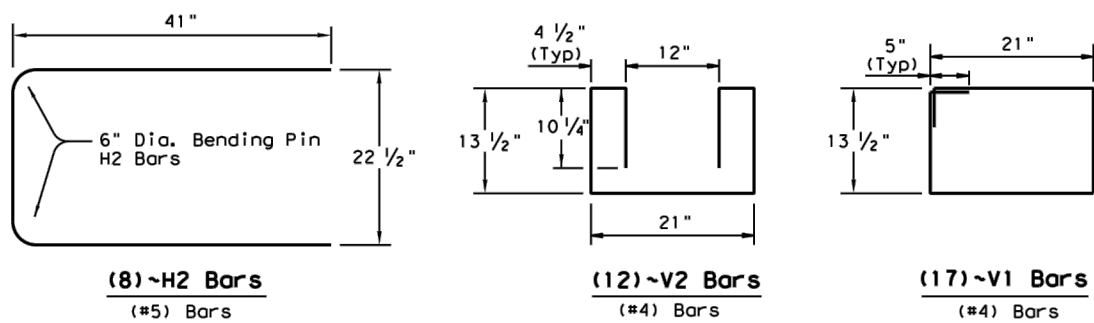
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PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)

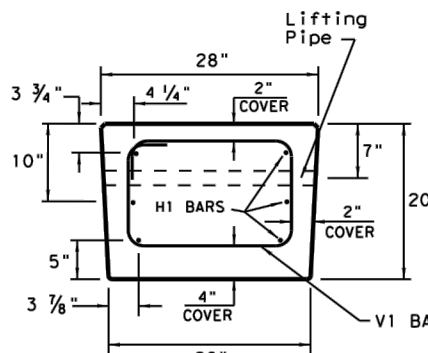
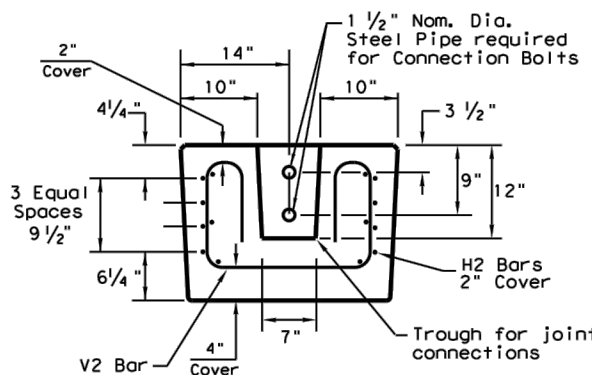


ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have 3/4" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts," and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

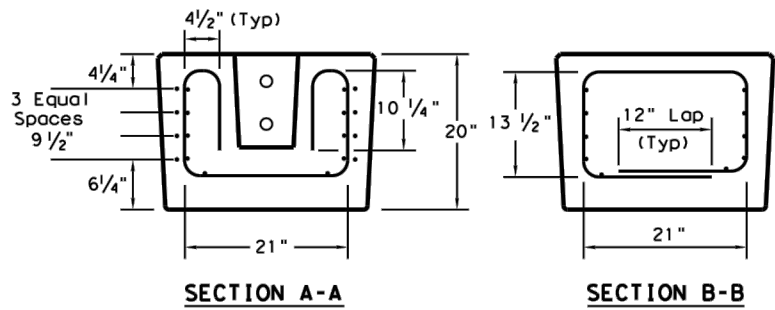
(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000

(WWR) GENERAL NOTES

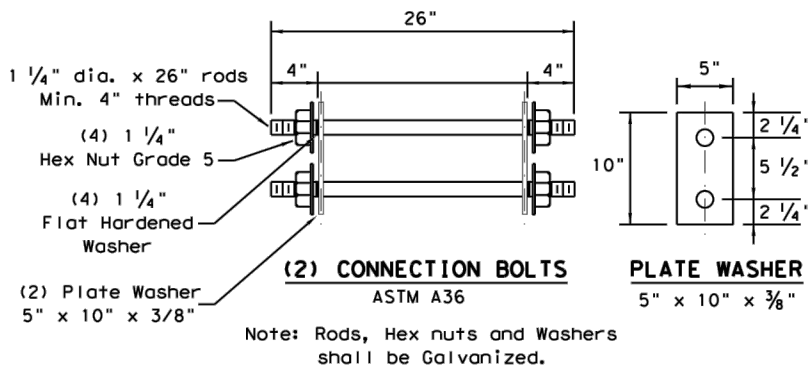
1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

- 8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)



WELDED WIRE REINFORCEMENT (WWR) - OPTIONAL REINFORCING



SHEET 1 OF 2

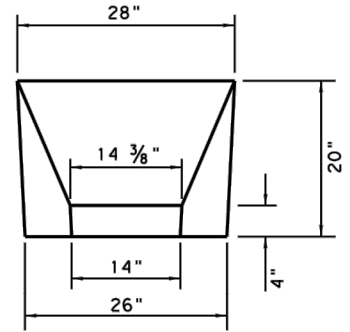
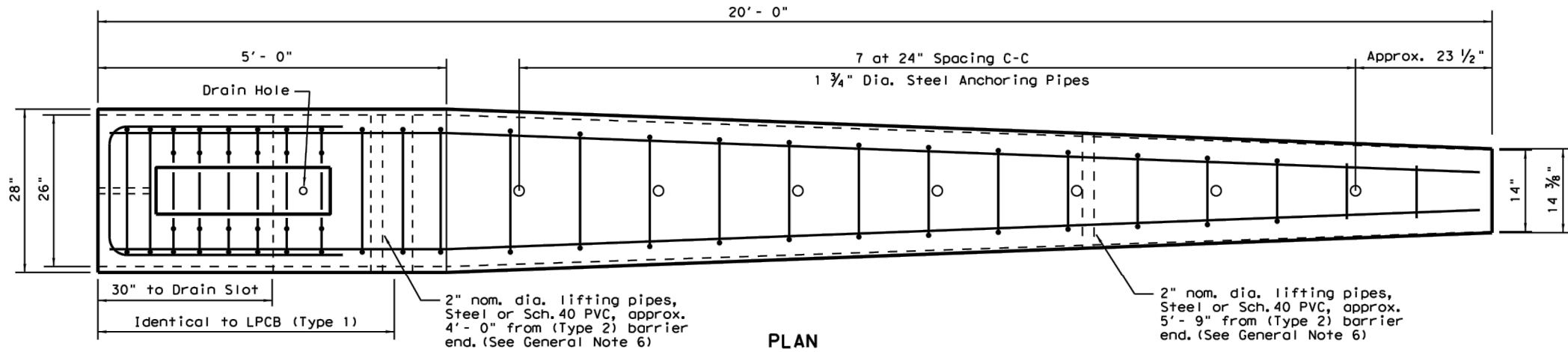
Design Division Standard

LOW PROFILE
CONCRETE BARRIER
PRECAST BARRIER
(TYPE 1)
LPCB-13

C-519
29 of 30

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	

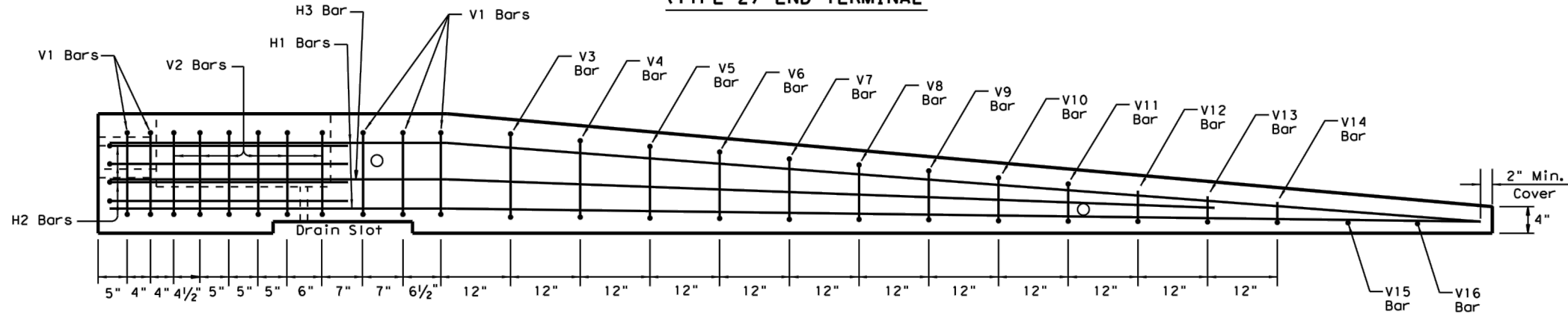
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



APPROACH VIEW

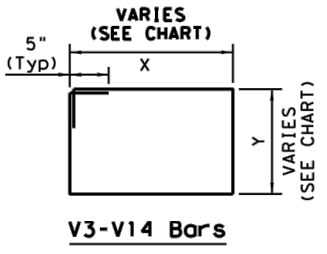
TYPE 2 - NOTES

1. Welded wire reinforcement (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

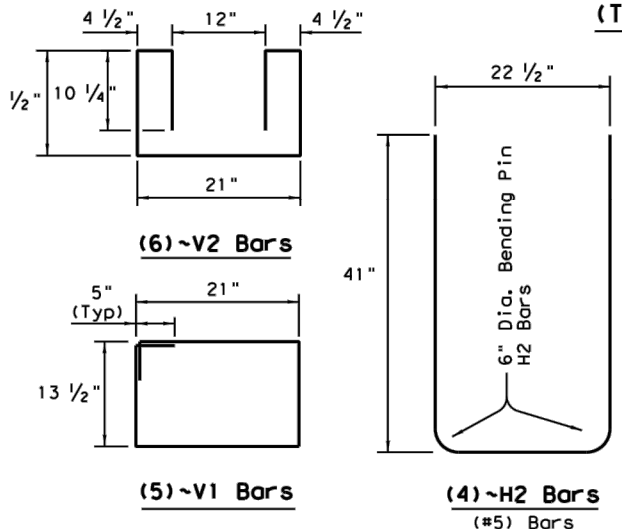


ELEVATION (TYPE 2) END TERMINAL

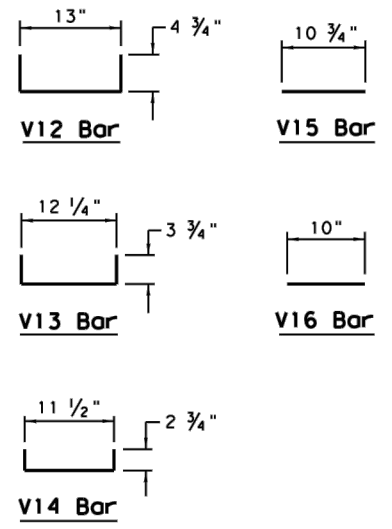
Note: Anchoring pipes not shown in Elevation View



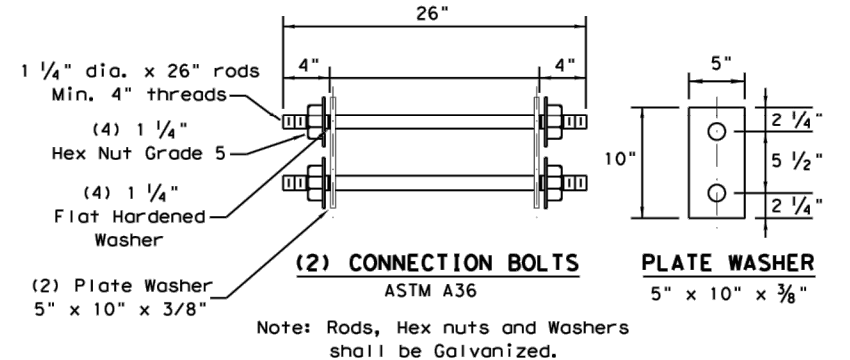
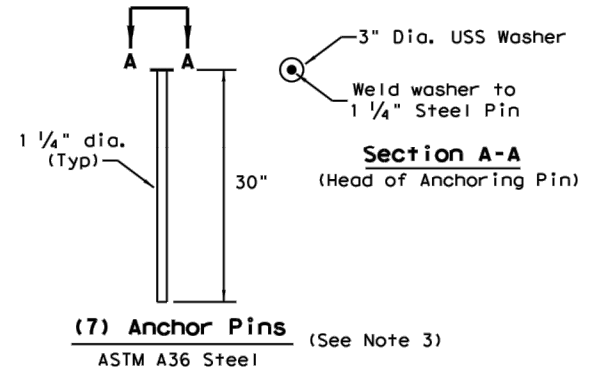
BAR (#4)	X (IN.)	Y (IN.)
V3 BAR	20 1/4	14 1/2
V4 BAR	19 1/2	13 1/2
V5 BAR	18 1/2	12 1/4
V6 BAR	17 1/2	11 1/4
V7 BAR	17	10 1/4
V8 BAR	16 1/4	9
V9 BAR	15 1/2	8
V10 BAR	14 1/2	7
V11 BAR	13 3/4	6



REINFORCING STEEL DETAILS TYPE 2 - END TERMINAL



Note: All V Bars are (#4)



FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

SHEET 2 OF 2

Design Division Standard

LOW PROFILE
CONCRETE BARRIER
PRECAST BARRIER
(TYPE 2)
C-520
30 of 30
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY	SHEET NO.	

BID FORM
WILLIAMSON COUNTY, TEXAS

PROJECT: 1708-187 Relocation of Williamson County Regional Raw Water Line (WCRRWL)
BIDDER: _____

Full compensation for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract will be considered as included in the unit prices for the work set forth below, and no separate payment will be made for compliance with each and every provision of the Request for Bids, the Bid, the Specifications, and the Contract, unless separate payment is expressly provided for therein.

BID ITEM	TECH SPEC ¹	DESCRIPTION	BID QUANTITY	UNIT MEASURE	UNIT COST	AMOUNT BID
1	100-6001	PREPARING RIGHT OF WAY	0.56	ACRE		\$ -
2	164-WC07	SEEDING FOR EROSION CONTROL (TEMP & PERM) (TY 7)	3730	SY		\$ -
3	402-6001	TRENCH EXCAVATION SAFETY PROTECTION	1215	EA		\$ -
4	500-6001	MOBILIZATION	1	LS		\$ -
5	502-6001	BARRICADES, SIGNS, AND TRAFFIC HANDLING	3	MO		\$ -
6	506-6022	CONSTRUCTION EXITS (INSTALL) (TY 3)	123	SY		\$ -
7	506-6024	CONSTRUCTION EXITS (REMOVE)	123	SY		\$ -
8	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	1119	LF		\$ -
9	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	1119	LF		\$ -
10	512-6009	PORT CTB (FRN & INSTL) (LOW PROF) (TY 1)	200	LF		\$ -
11	512-6010	PORT CTB (FRN & INSTL) (LOW PROF) (TY 2)	80	LF		\$ -
12	512-6057	PORT CTB (REMOVE) (LOW PROF) (TY 1)	200	LF		\$ -
13	512-6058	PORT CTB (REMOVE) (LOW PROF) (TY 2)	80	LF		\$ -
14	552-6003	WIRE FENCE (TY C)	40	LF		\$ -
15	552-6005	GATE (TY 1)	1	EA		\$ -
16	WCRRWL-1	DUCTILE IRON FITTINGS (C-110 WEIGHT SCHEDULE)	21.5	TON		\$ -
17	WCRRWL-2	48" DUCTILE IRON PIPE WITH RESTRAINED JOINTS, COMPLETE IN PLACE	1071	LF		\$ -
18	WCRRWL-3	VALVE, COMBINATION AIR/VACUUM RELIEF VALVE, 16 IN. DUAL BODY, INCLUDING TY 3 CORROSION TEST STATION	1	EA		\$ -
19	WCRRWL-4	ENCASEMENT PIPE, 66" DIA., STEEL	632	LF		\$ -

¹Refer to the Technical Specifications section for a description of the specific reference number.

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20	WCRRWL-5	REMOVE EXISTING 48" BWP PIPE	241	LF		\$ -
21	WCRRWL-6	48" CONNECTION TO EXISTING BWP, INCLUDING 48" AWWA C303 BWP CUSTOM TRANSITION COUPLING MANUFACTURED BY HANSON OR APPROVED EQUIVALENT, COMPLETE IN PLACE	4	EA		\$ -
22	WCRRWL-7	SPLIT ENCASEMENT PIPE, 66" DIA., STEEL	20	LF		\$ -
23	WCRRWL-8	JACKING OR BORING 66" PIPE, STEEL	97	LF		\$ -
24	WCRRWL-9	WATER FOR TESTING PURPOSES - INCLUDING LABOR, MATERIALS, SUPPLIES, STORAGE, OFF-SITE TRANSPORTATION, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK	100705	GAL		\$ -

NON-BID ITEMS TO BE INCLUDED IN BID AND CONTRACT AMOUNT. DO NOT MAKE CHANGES TO THIS SECTION.

25	999-WC01	FORCE ACCOUNT	50000	DOL	\$ 1.00	\$ 50,000.00
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TOTAL AMOUNT OF BID

_____ Dollars and _____ Cents

\$ 50,000.00

NOTE: THE COURT MAY EITHER REJECT ALL BIDS OR AWARD A CONTRACT TO THE LOWEST AND BEST BID.
¹Refer to the Technical Specifications section for a description of the specific reference number.

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ALT BID 1						
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NON-BID ITEMS TO BE INCLUDED IN BID AND CONTRACT AMOUNT. DO NOT MAKE CHANGES TO THIS SECTION.

#REF!	999-WC01	FORCE ACCOUNT	25000	DOL	\$ 1.00	\$ 25,000.00
#REF!	341-WC01	FORCE ACCOUNT - ESTIMATED PLACEMENT AND PRODUCTION BONUS/PENALTY (TY B)		DOL	\$ 1.00	\$ -
#REF!	341-WC02	FORCE ACCOUNT - ESTIMATED PLACEMENT AND PRODUCTION BONUS/PENALTY (TY C SURFACE)		DOL	\$ 1.00	\$ -
#REF!	585-WC01	FORCE ACCOUNT - ESTIMATED RIDE QUALITY BONUS/PENALTY		DOL	\$ 1.00	\$ -

TOTAL AMOUNT OF BID

_____ Dollars and _____ Cents \$ 25,000.00

TOTAL AMOUNT OF BID (INCL. ALT BID 1)

_____ Dollars and _____ Cents \$ 25,000.00

NOTE: THE COURT MAY EITHER REJECT ALL BIDS OR AWARD A CONTRACT TO THE LOWEST AND BEST BID.

¹Refer to the Technical Specifications section for a description of the specific reference number.

BID AFFIDAVIT

This form must be completed, signed, notarized and returned with Bid package

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 BIDSYSN ELECTRONICALLY.

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 #1708-187 - Relocation of Williamson County Regional Raw Water Line

Overall Bid Questions

There are no questions associated with this bid.