JEFFERSON COUNTY PURCHASING DEPARTMENT
Deborah L. Clark, Purchasing Agent

1149 Pearl Street, Beaumont, TX 77701 409-835-8593 Fax 409-835-8456

LEGAL NOTICE
Advertisement for Invitation for Bids
November 27, 2017

Notice is hereby given that sealed bids will be accepted by the Jefferson County Purchasing Department for IFB 17-043/JW, Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway for Jefferson County. **Specifications for this project may be obtained from the Jefferson County website, http://www.co.jefferson.tx.us/Purchasing/main.htm or by calling 409-835-8593.**

Bids are to be sealed and addressed to the Purchasing Agent with the bid number and name marked on the outside of the envelope or box. Bidders shall forward an original and three (3) copies of their bid to the address shown below. Jefferson County does not accept bids submitted electronically. Late bids will be rejected as non-responsive. Bids will be publicly opened and read aloud in the Jefferson County Commissioners' Courtroom at the time and date below. Bidders are invited to attend the sealed bid opening.

BID NAME:	**Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway for Jefferson County**
BID NO:	**IFB 17-043/JW**
DUE DATE/TIME:	**11:00 AM CDT, Tuesday, January 9, 2018**
MAIL OR DELIVER TO:	**Jefferson County Purchasing Department 1149 Pearl Street, 1st Floor Beaumont, Texas 77701**

There will be a **Mandatory Pre-bid Conference at 10:00 AM CDT on Thursday, December 14, 2017,** in the Jefferson County Engineering Conference Room located at 1149 Pearl Street, 5th Floor, Jefferson County (Historic) Courthouse.

The County shall require the bidder to furnish a bid security in the amount of five percent (5%) of the total contract cost. The bid bond must be executed with a surety company authorized to do business in the State of Texas. Within ten (10) days after the date of the signing of a contract, the bidder shall furnish a performance bond to the County for the full amount of the contract, if the contract exceeds one hundred thousand dollars ($100,000). If the contract is for one hundred thousand dollars ($100,000) or less, the County may provide that no money be paid to the contractor until completion and acceptance of the work or the fulfillment of the purchase obligation to the County.

Any questions relating to these requirements should be directed to Jamey West, Assistant Purchasing Agent, at 409-835-8593 or jwest@co.jefferson.tx.us. Bidders may submit technical questions to: Allen D. Sims (PE), Vice President with LJA Engineering, Inc. at 409-554-8969 or asims@ljaengineering.com.

Jefferson County encourages Disadvantaged Business Enterprises to participate in the bidding process. Jefferson County does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or the provisions of services. Individuals requiring special accommodations are requested to contact our office at 409-835-8593 to make arrangements no later than seven (7) calendar days prior to the submittal deadline. Jefferson County reserves the right to accept or reject any or all proposals, to waive technicalities and to take whatever action is in the best interest of Jefferson County.

All interested firms are invited to submit a bid in accordance with the terms and conditions stated in this bid.

RESPONDENTS ARE STRONGLY ENCOURAGED TO CAREFULLY READ THE ENTIRE INVITATION.

Deborah L. Clark, Purchasing Agent
Jefferson County, Texas
Publish:Beaumont Enterprise & Port Arthur News – November 29, 2017 & December 6, 2017

IFB 17-043/JW
Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway for Jefferson County

Bids due: 11:00 AM CDT, Tuesday, January 9, 2018

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Bid Submissions:

Bidder is responsible for submitting:

- One (1) *original* bid copy to include a completed copy of this specifications packet, in its entirety.
  Three (3) numbered bid *copies* to include at a minimum all pages requiring completion and/or marked with instructions to be returned with bid submission and any other documentation requested within these specifications.

Additionally, Bidder must monitor the Jefferson County Purchasing Department Website (below) to see if addenda or additional instructions have been posted. Failure to return all required forms could result in a response being declared as non-responsive.

http://www.co.jefferson.tx.us/purchasing/main.htm

Instructions to Bidders

1. Bid Submission

Bids must be submitted in complete original form by mail or messenger to the following address:

Jefferson County Purchasing Department
1149 Pearl Street, 1st Floor
Beaumont, TX 77701

Bids will be accepted at the above address until the time and date specified herein, and immediately after will be publicly opened and read aloud.

Bidder shall submit bid in a tightly sealed opaque envelope or box, plainly marked "SEALED BID." The outside of the envelope of box shall also include the Bid Number, Bid Name, Bid Due Date, and the Bidder's Name and Address; and shall be addressed to the Purchasing Agent.

Late bids will not be accepted and will be returned unopened to the bidder.

All bids submitted in response to this invitation shall become the property of Jefferson County and will be a matter of public record available for review.

2. Bid Submissions During Time of Inclement Weather, Disaster, or Emergency

In case of inclement weather or any other unforeseen event causing the County to close for business on the date of a bid/proposal/statement of qualifications submission deadline, the closing will automatically be postponed until the next business day that County offices are open to the public. Should inclement weather conditions or any other unforeseen event cause delays in courier service operations, the County may issue an addendum to all known vendors interested in the project to extend the deadline. It will be the responsibility of the vendor to notify the county of their interest in the project should these conditions impact their ability to submit a bid/proposal/statement of qualifications submission before the stated deadline. The County reserves the right to make the final judgement call to extend any deadline.

Should an emergency or unanticipated event interrupt normal County processes, and bid/proposal/statement of qualifications submissions cannot be received by the Jefferson County Purchasing Department's office by the exact time specified in the IFB and urgent County requirements preclude amendment to the IFB, the time specified for receipt of bids will be deemed to be extended to the same time of day specified in the solicitation on the first business day on which normal County processes resume.

3. Courthouse Security

Bidders are advised that all visitors to the Courthouse must pass through Security. **Bidders planning to hand deliver bids must allow time to get through Security, as a delay in entering the Courthouse will not be accepted as an excuse for late submittal.** Mondays and Tuesdays are particularly heavy days. Bidders are strongly urged to plan accordingly.

4. Preparation of Bids

The bid shall be legibly printed in ink or typed.

The County requests that bid submissions NOT be bound by staples or glued spines.

If a unit price or extension already entered is to be altered, it shall be crossed out and initialed in ink by the bidder.

The bid shall be legally signed and shall include the complete address of the bidder.

Jefferson County is exempt from Federal and State Sales Taxes, and such taxes shall not be included in bid prices.

5. Signatures

All bids, notifications, claims, and statements must be signed by an individual authorized to bind the bidder. The individual signing certifies, under penalty of perjury, that he or she has the legal authorization to bind the bidder.

6. County Holidays – 2017:

January 16	Monday	Martin Luther King, Jr. Day
February 20	Monday	President's Day
April 14	Friday	Good Friday
May 29	Monday	Memorial Day
July 4	Tuesday	Independence Day
September 4	Monday	Labor Day
November 10	Friday	Veteran's Day
November 23 & 24	Thursday & Friday	Thanksgiving
December 25 & 26	Monday & Tuesday	Christmas
January 1, 2018	Monday	New Year's

7. Rejection or Withdrawal

Submission of additional terms, conditions or agreements with the bid document are grounds for deeming a bid non-responsive and may result in bid rejection. Jefferson County reserves the right to reject any and all bids and to waive any informalities and minor irregularities or defects in bids. Bids may be withdrawn in person by a bidder or authorized representative, provided their identity is made known and a receipt is signed for the bid, but only if the withdrawal is made prior to the time set for receipt of bids. Bids are an irrevocable offer and may not be withdrawn within 90 days after opening date.

8. Emergency/Declared Disaster Requirements

In the event of an emergency or if Jefferson County is declared a disaster area, by the County, State, or Federal Government, this Acceptance of Offer may be subjected to unusual usage. Contractor shall service the county during such an emergency or declared disaster under the same terms and conditions that apply during non-emergency/disaster conditions. The pricing as specified in this Acceptance of Offer shall apply to serving the County's needs regardless of the circumstances. If Contractor is unable to supply the services under the terms of the Acceptance of Offer, then Contractor shall provide proof of such disruption and a copy of the invoice from Contractor's supplier(s). Additional profit margin as a result of supplying services during an emergency or declared disaster shall not be permitted. In the event that additional equipment, supplies, and materials are required during the declared disaster, additional shipping, handling and drayage fees may apply.

9. Award

The bid will be awarded to the responsible, responsive bidder(s) whose bid, conforming to the solicitation, will be most advantageous to Jefferson County – price and other factors considered. Unless otherwise specified in this IFB, Jefferson County reserves the right to accept a bid in whole or in part, and to award by item or by group, whichever is deemed to be in the best interest of Jefferson County. Any bidder who is in default to Jefferson County at the time of submittal of the bid shall have that bid rejected. Jefferson County reserves the right to clarify any contractual terms with the concurrence of the Contractor; however, any substantial nonconformity in the offer, as determined by Jefferson County, shall be deemed non-responsive and the offer rejected.

In evaluating bids, Jefferson County shall consider the qualifications of the bidders, and, where applicable, operating costs, delivery time, maintenance requirements, performance data, and guarantees of materials and equipment. In addition, Jefferson County may conduct such investigation as it deems necessary to assist in the evaluation of a bid and to establish the responsibility, qualifications, and financial ability of the bidders to fulfill the contract.

Jefferson County reserves the right to award this contract on the basis of **lowest and best bid** in accordance with the laws of the State of Texas, to waive any formality or irregularity, to make awards to more than one offeror, and/or to reject any or all bids. In the event the lowest dollar offeror meeting specifications is not a awarded a contract, Offeror may appear before the Commissioners' Court and present evidence concerning Offeror responsibility after officially notifying the Office of the Purchasing Agent of Offeror's intent to appear.

10. Contract

A response to an IFB is an offer to contract with Jefferson County based upon the terms, conditions, and specifications contained in the IFB. Bids do not become contracts unless and until they are executed by Jefferson County, eliminating a formal signing of a separate contract. For that reason, all of the terms and conditions of the contract are contained in the IFB, unless any of the terms and conditions is modified by an IFB Amendment, a Contract Amendment, or by mutually agreed terms and conditions in the contract documents.

11. Waiver of Subrogation

Bidder and bidder's insurance carrier waive any and all rights whatsoever with regard to subrogation against Jefferson County as an indirect party to any suit arising out of personal or property damages resulting from bidder's performance under this agreement.

12. Fiscal Funding

A multi-year contract (if requested by the specifications) continuing as a result of an extension option must include fiscal funding out. If, for any reason, funds are not appropriated to continue the contract, said contract shall become null and void.

13. Bid Results

Bid results are not provided in response to telephone inquiries. A preliminary tabulation of bids received will be posted on the Purchasing web page (http://co.jefferson.tx.us/ purchasing/main.htm) as soon as possible following bid opening. A final tabulation will be posted following bid award, and will also be available for review in the Purchasing Department.

14. Changes and Addenda to Bid Documents

Each change or addendum issued in relation to this IFB document will be on file in the Office of the Purchasing Agent, and will be posted on the Purchasing web site as soon as possible. It shall be the bidder's responsibility to make inquiry as to change or addenda issued, and to monitor the web site. All such changes or addenda shall become part of the contract and all bidders shall be bound by such addenda. Information on all changes or addenda issued will be available at the Office of the County Purchasing Agent.

15. Specifications

Unless otherwise stated by the bidder, the bid will be considered as being in accordance with Jefferson County's applicable standard specifications, and any special specifications outlined in the bid document. References to a particular trade name, manufacturer's catalogue, or model number are made for descriptive purposes to guide the bidder in interpreting the requirements of Jefferson County, and should not be construed as excluding bids on other types of materials, equipment, and supplies. However, the bidder, if awarded a contract, will be required to furnish the particular item referred to in the specifications or description unless departure or substitution is clearly noted and described in the bid. Jefferson County reserves the right to determine if equipment/ product being bid is an acceptable alternate. All goods shall be new unless otherwise so stated in the bid. Any unsolicited alternate bid, or any changes, insertions, or omissions to the terms and conditions, specifications, or any other requirements of the bid, may be considered non-responsive.

16. Delivery

Bids shall include all charges for delivery, packing, crating, containers, etc. Unless otherwise stated by the bidder (<u>in writing on the included Bid Form</u>), prices bid will be considered as being based on F.O.B. destination/delivered freight included.

17. Interpretation of Bid and/or Contract Documents

All inquiries shall be made within a reasonable time prior to the date and time fixed for the bid opening, in order that a written response in the form of an addendum, if required, can be processed before the bids are opened. Inquiries received that are not made in a timely fashion may or may not be considered.

18. Currency

Prices calculated by the bidder shall be stated in U.S. dollars.

19. Pricing

Prices shall be stated in units of quantity specified in the bid documents. In case of discrepancy in computing the amount of the bid, the unit price shall govern.

20. Notice to Proceed/Purchase Order

The successful bidder may not commence work under this contract until authorized to do so by the Purchasing Agent.

21. Certification

By signing the offer section of the Offer and Acceptance page, bidder certifies:

- The submission of the offer did not involve collusion or other anti-competitive practices.
- The bidder has not given, offered to give, nor intends to give at any time hereafter, any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to any public servant in connection with the submitted offer.
- The bidder hereby certifies that the individual signing the bid is an authorized agent for the bidder and has the authority to bind the bidder to the contract.

22. Definitions

"County" – Jefferson County, Texas.

"Contractor" – The bidder whose proposal is accepted by Jefferson County.

23. Minority-Women Business Enterprise Participation

It is the desire of Jefferson County to increase the participation of Minority (MBE) and women-owned (WBE) businesses in its contracting and procurement programs. While the County does not have any preference or set aside programs in place, it is committed to a policy of equitable participation for these firms.

General Conditions of Bidding and Terms of Contract

By execution of this document, the vendor accepts all general and special conditions of the contract as outlined below and in the specifications and plans.

1. Bidding

1.1 Bids. All bids must be submitted on the bid form furnished in this package.

1.2 Authorized Signatures. The bid must be executed personally by the vendor, duly authorized partner of the partnership, or duly authorized officer of the corporation. If executed by an agent, a power of attorney or other evidence of authority to act on behalf of the vendor shall accompany the bid to become a valid bid.

1.3 Late Bids. Bids must be in the office of the Jefferson County Purchasing Agent before or at the specified time and date bids are due. Bids received after the submission deadline shall be rejected as non-responsive and returned unopened.

1.4 Withdrawal of Bids Prior to Bid Opening. A bid may be withdrawn before the opening date by submitting a written request to the Purchasing Agent. If time allows, the bidder may submit a new bid. Bidder assumes full responsibility for submitting a new bid before or at the specified time and date bids are due. Jefferson County reserves the right to withdraw a request for bids before the opening date.

1.5 Withdrawal of Bids after Bid Opening. Bidder agrees that its offer may not be withdrawn or cancelled by the vendor for a period of ninety (90) days following the date and time designated for the receipt of bids unless otherwise stated in the bid and/or specifications.

1.6 Bid Amounts. Bids shall show net prices, extensions where applicable and net total. In case of conflict between unit price and extension, the unit price will govern. Any ambiguity in the bid as a result of omission, error, unintelligible or illegible wording shall be interpreted in the favor of Jefferson County.

1.7 Exceptions and/or Substitutions. All bids meeting the intent of the specifications and plans will be considered for award. Vendors taking exception to the specifications and plans, or offering substitutions, shall state these exceptions in the section provided. If bid is made on an article other than the one specified, which a bidder considers comparable, the name and grade of said article must be specified in the bid and sufficient specifications and descriptive data must accompany same to permit thorough evaluation. The absence of stated exceptions and/or substitutions shall indicate that the vendor has not taken any exceptions to the specifications and shall be responsible to perform in strict accordance with the specifications. As a matter of practice, Jefferson County rejects exception(s) and /or substitutions as non-responsive but reserves the right to accept any and/or all of the exception(s) and/or substitution(s) deemed to be in the best interest of Jefferson County.

1.8 Alternates. The Invitation for Bid and/or specifications may expressly allow bidder to submit an alternate bid. Presence of such an offer shall not be considered an indication of non-responsiveness.

1.9 Descriptions. Unless otherwise specified, any reference to make, manufacturer and/or model used in the bid specifications is merely descriptive and not restrictive, and is used only to indicate type, style, or quality of material desired.

1.10 Bid Alterations. Bids cannot be altered or amended after submission deadline. Any interlineations, alterations, or erasures made before opening time must be initialed by the signer of the bid, guaranteeing authenticity.

1.11 Tax Exempt Status. Jefferson County is exempt from federal excise tax and state sales tax. Unless the bid form or specifications specifically indicate otherwise, the bid price must be net, exclusive of above-mentioned taxes and will be so construed. Therefore, the bid price shall not include taxes.

1.12 Quantities. Quantities indicated are estimated quantities only and are not a commitment to buy. Approximate usage does not constitute an order, but only implies the probable quantity that will

be used. Commodities will be ordered on an as-needed basis. Bidder is responsible for accurate final counts.

1.13 Bid Award. Award of contract shall be made to the most responsible, responsive bidder, whose offer is determined to be the best value, taking into consideration the relative importance of price. Jefferson County reserves the right to be the sole judge as to whether items bid will serve the purpose intended. Jefferson County reserves the right to accept or reject in part or in whole any bid submitted, and to waive any technicalities or informalities for the best interest of the County. Jefferson County reserves the right to award based upon individual line items, sections or total bid.

1.14 Silence of Specifications for Complete Units. All materials, equipment and/or parts that will become a portion of the completed work, including items not specifically stated herein but, necessary to render the service(s) complete and operational per the specifications, are to be included in the bid price. Vendor may be required to furnish evidence that the service, as bid, will meet or exceed these requirements.

1.15 Addenda. Any interpretations, corrections or changes to the specifications and plans will be made by addenda no later than forty-eight (48) hours prior to the bid opening. Addenda will be posted on the Purchasing web site. Vendors are responsible for monitoring the web site in order to remain informed on addenda. Vendors shall acknowledge receipt of all addenda with submission of bid.

1.16 General Bid Bond/Surety Requirements. Failure to furnish bid bond/surety, if requested, will result in bid being declared non-responsive. Non-responsive bids will not be considered for award.

1.17 General Insurance Requirements. Failure to furnish Affidavit of Insurance, if required in these specifications, will result in bid being declared non-responsive. Non-responsive bids will not be considered for award.

1.18 Responsiveness. A responsive bid shall substantially conform to the requirements of this Invitation to Bid and/or specifications contained herein. Bidders who substitute any other terms, conditions, specifications and/or requirements or who qualify their bids in such a manner as to nullify or limit their liability to the contracting entity shall have their bids deemed non-responsive. Also, bids containing any clause that would limit contracting authority shall be considered non-responsive. Examples of non-responsive bids include but shall not be limited to: a) bids that fail to conform to required delivery schedules as set forth in the bid request; b) bids with prices qualified in such a manner that the bid price cannot be determined, such as with vague wording that may include “price in effect at the time of delivery,” and c) bids made contingent upon award of other bids currently under consideration.

1.19 Responsible Standing of Bidder. To be considered for award, bidder must at least: have the ability to obtain adequate financial resources, be able to comply with required or proposed delivery/completion schedule, have a satisfactory record of performance; have a satisfactory record of integrity and ethics, and be otherwise qualified and eligible to receive award.

1.20 Proprietary Data. Bidder may, by written request, indicate as confidential any portion(s) of a bid that contain proprietary information, including manufacturing and/or design processes exclusive to the vendor. Jefferson County will protect from public disclosure such portions of a bid, unless directed otherwise by legal authority, including existing Open Records Acts.

1.21 Public Bid Opening. Bidders are invited to be present at the opening of bids. After the official opening of bids, a period of not less than one week is necessary to evaluate bids. The amount of time necessary for bid evaluation may vary and is determined solely by the County. Following the bid evaluation, all bids submitted are available for public review.

2. Performance

2.1 Design, Strength, and Quality. Design, strength, and quality of materials and workmanship must conform to the highest standards of manufacturing and engineering practices. The apparent silence of specifications and/or plans as to any detailed description concerning any point shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of these specifications and/or plans shall be made on the basis of this statement.

2.2 Age and Manufacture. All tangible goods being bid must be new and unused, unless otherwise specified, in first-class condition, of current manufacture, and furnished ready to use. All items not specifically mentioned that are required for a complete unit shall be furnished.

2.3 Delivery Location. All deliveries will be made to the address(es) specified on the purchase order during normal working hours of 8:00 a.m. to 4:00 p.m., Monday through Friday, unless otherwise authorized by the Purchasing Agent or designee.

2.4 Delivery Schedule. Delivery time may be an important consideration in the evaluation of best value. The maximum number of days necessary for delivery ARO shall be stated in the space, if provided, on the bid form.

2.5 Delivery Charges. All delivery and freight charges, F.O.B. destination shown on Jefferson County purchase order, as necessary to perform contract are to be included in the bid price.

2.6 Installation Charges. All charges for assembly, installation and set-up shall be included in the bid price. Unless otherwise stated, assembly, installation and set-up will be required.

2.7 Operating Instructions and Training. Clear and concise operating instructions and descriptive literature will be provided in English, if requested. On-site detailed training in the safe and efficient use and general maintenance of item(s) purchased shall be provided as needed at the request of Jefferson County. Instructions and training shall be at no additional cost to the County.

2.8 Storage. Bidder agrees to provide storage of custom ordered materials, if requested, for up to thirty (30) calendar days.

2.9 Compliance with Federal, State, County, and Local Laws. Bids must comply with all federal, state, county and local laws, including, but not limited to, all applicable standard safety, emission, and noise control requirements. Any vehicles or equipment shall contain all standard safety, emission, and noise control requirements required for the types and sizes of equipment at the time of their manufacture. The contractor agrees, during the performance of work or service, to comply with all applicable codes and ordinances of Jefferson County or the State of Texas as they may apply, as these laws may now read, or as they may hereafter be changed or amended.

2.10 OSHA. The bidder will certify all equipment complies with all regulations and conditions stipulated under the Williams-Steiger Occupational Safety and Health Act of 1971, as amended. The successful bidder will further certify that all items furnished under this project will conform and comply with federal and State of Texas OSHA standards. The successful bidder will agree to indemnify and hold harmless Jefferson County for any and all damages that may be assessed against the County.

2.11 Patents and Copyrights. The successful vendor agrees to protect the County from claims involving infringements of patents and/or copyrights.

2.12 Samples, Demonstrations and Testing. At Jefferson County's request and direction, bidder shall provide product samples and/or testing of items bid to ensure compliance with specifications. Samples, demonstrations and/or testing may be requested at any point prior to or following bid award. Samples, demonstrations and/or testing may be requested upon delivery and/or any point during the term of resulting contract. All samples (including return thereof), demonstrations, and/or testing shall be at the expense of the bidder/vendor.

2.13 Acceptability. All articles enumerated in the bid shall be subject to inspection by an officer designated for that purpose by Jefferson County. If found inferior to the quality called for, or not equal in value to the specifications, deficient in workmanship or otherwise, this fact shall be certified to the Purchasing Agent, who shall have the right to reject the whole or any part of the same. Items and/or work determined to be contrary to specifications must be replaced at the vendor's expense. Inferior items not retrieved by the vendor within thirty (30) calendar days, or an otherwise agreed upon time, shall become the property of the County. If disposal of such items warrants an expense, an amount equal to the disposal expense will be deducted from amounts payable to the vendor.

2.14 Maintenance. Maintenance required for equipment bid should be available in Jefferson County by a manufacturer authorized maintenance facility. Cost for this service shall be shown on the bid sheet as requested or on a separate sheet, as required. If Jefferson County opts to include

maintenance, it shall be so stated in the purchase order and said cost will be included. Service will commence only upon expiration of applicable warranties and should be priced accordingly.

2.15 Material Safety Data Sheets. Under the "Hazardous Communications Act," common known as the "Texas Right to Know Act," a bidder must provide the user department, with each delivery, material safety data sheets which are applicable to hazardous substances defined in the Act. Failure of the bidder to furnish this documentation, will be cause to reject any bid applying thereto.

2.16 Evaluation. Evaluation shall be used as a determinant as to which services are the most efficient and/or most economical for the County. It shall be based on all factors having a bearing on price and performance of the items in the user environment. All bids are subject to tabulation by the Jefferson County Purchasing Department and recommendation to Jefferson County Commissioners' Court. Compliance with all bid requirements and needs of the using department are considered in evaluating bids. Pricing is not the only criteria for making a recommendation. The Jefferson County Purchasing Department reserves to right to contact any bidder, at any time, to clarify, verify or requirement information with regard to this bid.

3. Purchase Orders and Payment

3.1 Purchase Orders. A purchase order(s) shall be generated by the Jefferson County Purchasing Agent to the successful vendor. The purchase order number must appear on all itemized invoices and packing slips. The County will not be held responsible for any work orders placed and/or performed without a valid current purchase order number. Payment will be made for all services rendered and accepted by the contract administrator for which a valid invoice has been received.

3.2 Invoices. All invoices shall reference the Purchase Order number. Invoices shall reference the bid item number or a detailed description for each item invoiced. If an item purchased and itemized on the invoice does not correspond to an item in any of the categories awarded to the vendor, invoice shall reference the item as "N/C" to indicate that it is a non-contract item. This requirement is to assist the County in verifying contract pricing on all invoices. Payment will be made under terms of net thirty (30) days unless otherwise agreed upon by seller and the purchasing department.

3.3 Prompt Payment. In accordance with the State of Texas Prompt Payment Act, Article 601f V.T.C.S., payment will be made after receive and acceptance by the County of the merchandise ordered and of a valid invoice. Successful bidder(s) is required to pay subcontractors within ten (10) days after the successful bidder receives payment from the County.

3.4 Funding. Jefferson County is operated and funded on an October 1 to September 30 basis; accordingly, the County reserves the right to terminate, without liability to the County, any contract for which funding is not available.

4. Contract

4.1 Contract Definition. The General Conditions of Bidding and Terms of Contract, Specifications, Plans, Bidding Forms, Addenda, and any other documents made a part of this bid shall constitute the complete bid. This bid, when duly accepted by Jefferson County, shall constitute a contract equally binding between the successful bidder and Jefferson County.

4.2 Change Order. No different or additional terms will become part of this contract with the exception of a change order. No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing and at the discretion and approval of Jefferson County. No change order will be binding unless signed by an authorized representative of the County and the vendor.

4.3 Price Re-determination. A price re-determination may be requested at the time of annual renewal. All requests for price re-determination shall be in written form. Cause for such request, i.e., manufacturer's direct cost, postage rates, Railroad Commission rates, Federal/State minimum wage law, Federal/State unemployment taxes, F.I.C.A, Insurance Coverage Rates, etc., shall be substantiated in writing by the source of the cost increase. The bidder's past experience of honoring contracts at the bid price will be an important consideration in the evaluation of the lowest and best

bid. Jefferson County reserves the right to accept or reject any/all requests for price re-determination as it deems to be in the best interest of the County.

4.4 Termination. Jefferson County reserves the right to terminate the contract for default if the bidder breached any of the terms therein, including warranties of bidder or if the bidder becomes insolvent or commits acts of bankruptcy. Such right of termination is in addition to and not in lieu of any other remedies which Jefferson County may have in law or equity. Default may be construed as, but not limited to, failure to deliver the proper goods and/or service within the proper amount of time, and/or to properly perform any and all services required to Jefferson County's satisfaction and/or to meet all other obligations and requirements. Contracts may be terminated without cause upon thirty (30) days' written notice to either party unless otherwise specified. Jefferson County reserves the right to award canceled contract to the next lowest bidder. Bidder, in submitting this bid, agrees that Jefferson County shall not be liable to prosecution for damages in the event that the County declares the bidder in default.

4.5 Conflict of Interest. Employees of the County are not permitted to maintain financial interest in, or receive payment, directly or indirectly, borrow from, lend to, invest in, or engage in any substantial financial transaction with any individual, organization, supplier, or subcontractor who does business with the County without disclosure. When conflict of interest is discovered, it shall be grounds for termination of contract.

4.6 Injuries or Damages Resulting from Negligence. Successful vendor shall defend, indemnify and save harmless Jefferson County and all its officers, agents and employees from all suits, actions, or other claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person, persons, or property on account of any negligent act or fault of the successful vendor, or of any agent, employee, subcontractor or supplier in the execution of, or performance under, any contract which may result from bid award. Successful vendor shall pay any judgment with cost which may be obtained against Jefferson County growing out of such injury or damages.

4.7 Interest by Public Officials. No public official shall have interest in this contract, in accordance with Texas Local Government Code.

4.8 Warranty. The successful vendor shall warrant that all materials utilized in the performance of this contract shall conform to the proposed specifications and/or all warranties as stated in the Uniform Commercial Code and be free from all defects in material, workmanship and title.

4.9 Uniform Commercial Code. The successful vendor and Jefferson County agree that both parties have all rights, duties, and remedies available as stated in the Uniform Commercial Code.

4.10 Venue. This agreement will be governed and construed according to the laws of the State of Texas. This agreement is performable in the County of Jefferson, Texas.

4.11 Sale, Assignment, or Transfer of Contract. The successful vendor shall not sell, assign, transfer or convey this contract, in whole or in part, without the prior written consent of Jefferson County.

4.12 Silence of Specifications. The apparent silence of these specifications as to any detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

5. Federal Emergency Management Agency (FEMA) Mandated Contract Clauses

If applicable to the work and services being performed by CONTRACTOR under the parties' AGREEMENT, the following provisions are adopted and form part of this AGREEMENT:

(A) DAMAGES, 2 CFR §200.326 Appendix II to Part 200 (A)

(1) All work to be performed under this AGREEMENT shall be timely commenced. A breach of this AGREEMENT by Contractor would cause substantial delay in the completion of the required services affecting the safety and welfare of the public.

(2) In the event of Contractor's breach of its performance obligations, County shall have all rights and remedies against Contractor as provided by law.

(B) TERMINATION RIGHTS, 2 CFR §200.326 Appendix II to Part 200 (B)

Termination for Convenience: Whenever the interests of the County so require, County may terminate the parties' Agreement, in whole or in part, for the convenience of the County. County shall give Contractor thirty (30) days prior written notice of termination specifying the portions of the Agreement to be terminated and when such termination will become effective. If only portions of the parties' agreement are terminated, Contractor has the right to withdraw from the parties' Agreement, without adverse action or claims. In the event of a termination for convenience by County, Contractor shall be entitled to payment for all work and services performed by it up to the effective date of such termination.

Termination for Cause: The County may, by written notice of default to Contractor, terminate the parties' Agreement, in whole or in part, if the Contractor fails to satisfactorily perform any provisions of the parties' agreement after a period of ten (10) following Contractor's receipt of a Notice of Deficiency provided by County.

(C) EQUAL EMPLOYMENT OPPORTUNITY CLAUSE (2 CFR §200.326 Appendix II to Part 200 (C))

If applicable to the work and services performed by CONTRACTOR under the AGREEMENT, during the performance of the AGREEMENT, CONTRACTOR shall comply with the Equal Employment Opportunity Clause (41 CFR 60-1.4(b)):

(1) CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. CONTRACTOR 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; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. AGREEMENTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) CONTRACTOR will, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) CONTRACTOR will send to each labor union or representative of workers with which it has a collective bargaining agreement or other agreement or understanding, a notice to be provided advising the said labor union or workers' representatives of the CONTRACTOR'S commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) CONTRACTOR will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor for purpose of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the CONTRACTOR'S noncompliance with the nondiscrimination clauses of this AGREEMENT or with any of the said rules, regulations or orders, this AGREEMENT may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) CONTRACTOR will include the portion of the sentence immediately preceding paragraph (1) and the provisions of subparagraphs 1 through 7 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or contractor. CONTRACTOR will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: provided, however, that in the event CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or contractor as a result of such direction by the administering agency the CONTRACTOR may request the United States to enter into such litigation to protect the interest of the United States.

D. DAVIS-BACON ACT AND COPELAND "ANTI-KICKBACK" ACT, 2 CFR §200.326 Appen. II to Part 200 (D)

If applicable to the work and services performed by CONTRACTOR under the parties' AGREEMENT:

(1) Bacon-Davis Act: Applicable to construction or repair of public buildings or public works. see FEMA Public Assistance Program and Policy Guide, Ch.2(V)(G)(2), page 32 (FP 104-009-2/January 2016);

(2) Copeland "Anti-Kickback" Act: In contracts subject to the Davis-Bacon Act, CONTRACTOR shall comply with the Copeland "Anti-Kickback" Act (40 U.S.C. §3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that the contractor and subcontractor must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The GOVERNMENT must report all suspected or reported violations to the appropriate Federal agency.

If applicable to the work and services performed by CONTRACTOR under the parties' AGREEMENT:

(a) CONTRACTOR shall comply with 18 U.S.C. § 874, 40 U.S.C. § 3145, and the requirements of 29 C.F.R. pt. 3 as may be applicable, which are incorporated by reference into this AGREEMENT.

(b) CONTRACTOR or subcontractor shall insert in any subcontract the clause above and such other clauses as FEMA may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The CONTRACTOR shall be responsible for the compliance by any subcontractor or lower tier subcontract with all of these contract clauses.

(c) A breach of the AGREEMENT clause above may be grounds for termination of the AGREEMENT, and for debarment as a contractor and subcontractor as provided in 29 C.F.R. §5.12.

E. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT, 2 CFR §200.326 Appendix II to Part 200 (E) (40 U.S.C. 3701-3708)

Contracts in excess of $100,000 that involve the employment of mechanics or laborers shall comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, each contractor and its subcontractors shall compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-halftimes the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation: liability for unpaid wages: liquidated damages. In the event of any violation of the clause set forth in paragraph (I) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (I) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (I) of this section.

(3) Withholding for unpaid wages and liquidated damages. The GOVERNMENT shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) The contractor and subcontractor shall insert in any subcontract the clauses set forth in paragraphs (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts.

F. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT, 2 CFR §200.326 Appendix II to Part 200 (F)

If applicable to the work and services performed by CONTRACTOR under the parties' AGREEMENT and if the Federal award meets the definition of "funding agreement" under 37 CFR §401.2 (a) and the GOVERNMENT wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the GOVERNMENT must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business."

G. CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT, 2 CFR §200.326 Appendix II to Part 200 (G)

CONTRACTOR shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).

CONTRACTOR shall include the foregoing requirements in each subcontract exceeding $100,000.

H. ENERGY EFFICIENCY AND CONSERVATION, 2 CFR §200.326 Appendix II to Part 200 (H)

If applicable to the work and services performed by CONTRACTOR under the parties' AGREEMENT, CONTRACTOR shall comply with the mandatory standards and policies of the state regulation promulgated in accordance with the Energy Policy and Conservation Act (42 U.S.C. § 6201).

I. DEBARMENT AND SUSPENSION, 2 CFR §200.326 Appendix II to Part 200 (I)

(1) This AGREEMENT is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such, the CONTRACTOR is required to verify that none of the contractor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. § 180.935).

(2) The CONTRACTOR must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

(3) This certification is a material representation of fact relied upon by GOVERNMENT. If it is later determined that the CONTRACTOR did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to GOVERNMENT, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

(4) The CONTRACTOR agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C AGREEMENT is valid and throughout the period of performance. The CONTRACTOR further agrees to include a provision requiring such compliance in its lower tier covered transactions.

J. BYRD ANTI-LOBBYING AMENDMENT, 2 CFR §200.326 Appendix II to Part 200 (J)

CONTRACTOR must file with the GOVERNMENT the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier must also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the non-Federal award. If not provided with the bid response, CONTRACTOR must complete and submit the Certification Regarding Lobbying Form.

K. PROCUREMENT OF RECOVERED MATERIALS, 2 CFR §200.326 Appendix II to Part 200 (K) and 2 CFR §200.322)

(1) In the performance of this contract, the Contractor shall make maximum use of products containing recovered materials that are EPA-designated items unless the product cannot be acquired-

(a) Competitively within a timeframe providing for compliance with the contract performance schedule;
(b) Meeting contract performance requirements; or
(c) At a reasonable price.

(2) Information about this requirement is available at EPA's Comprehensive Procurement Guidelines web site, http://www.epa.gov/cpg/.
The list of EPA-designate items is available at http://www.epa.gov/cpg/products/htm.

L. AGREEMENTING WITH SMALL AND MINORITY BUSINESSES, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS (2 CFR §200.321)

Should the CONTRACTOR subcontract any of the work under this AGREEMENT, CONTRACTOR shall take the following affirmative steps: place qualified small and minority businesses and women's business enterprises on solicitation lists; assure that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources; divide total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises; establish delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises; and use the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

M. ACCESS TO RECORDS

(1) CONTRACTOR agrees to provide GOVERNMENT, the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives' access to any books, documents, papers, and records of the Contractor which are directly pertinent to this AGREEMENT for the purposes of making audits, examinations, excerpts, and transcriptions.

(2) CONTRACTOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

(3) CONTRACTOR agrees to provide the FEMA Administrator or his authorized representatives' access to construction or other work sites pertaining to the work being completed under the contract.

N. SEAL, LOGO AND FLAGS

CONTRACTOR shall not use the U.S. Department of Homeland Security's seal(s), logos, crests, or reproductions of flags or likenesses of the U.S. Department of Homeland Security's agency officials without specific FEMA preapproval.

O. COMPLIANCE WITH FEDERAL LAW, REGULATIONS AND EXECUTIVE ORDERS

This is an acknowledgement that FEMA financial assistance will be used to fund the AGREEMENT only. CONTRACTOR will comply will all federal law, regulations, executive orders, FEMA policies, procedures, and directives.

P. NO OBLIGATION BY FEDERAL GOVERNMENT

The Federal Government is not a party to this AGREEMENT and is not subject to any obligations or liabilities to GOVERNMENT, CONTRACTOR, or any other party pertaining to any matter resulting from the contract.

Q. PROGRAM FRAUD AND FALSE OR FRAUDULENT STATEMENTS OR RELATED ACTS

CONTRACTOR acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the CONTRACTOR'S actions pertaining to this contract.

Special Requirements/Instructions

The following requirements and instructions supersede General Requirements where applicable.

1. Bid Requirement

Each bidder shall ensure that required parts of the bid are completed with accuracy and submitted as per the requirements within this specifications packet, including any addenda.

Bidder is responsible for submitting one (1) *original* bid copy to include a completed copy of this specifications packet in its entirety; and three (3) numbered bid *copies* to include at a minimum all pages requiring completion and/or marked with instructions to be returned with bid submission and any other documentation requested within these specifications.

All bids shall be tightly sealed in an opaque envelope or box and plainly marked "SEALED BID." The outside of the envelope or box shall also include: Bid Number, Bid Name, Bid Due Date, Bidder's Name and Address; and shall be addressed to the Purchasing Agent.

Jefferson County shall not be responsible for any effort or cost expended in the preparation of a response to this IFB. All protests should be coordinated through the Purchasing Office prior to award recommendation to Commissioners' Court.

2. Vendor Registration: SAM (System for Award Management).

Vendors doing business with Jefferson County are **required** to be registered with The System for Award Management (SAM), with an "active" status. The System for Award Management (SAM) is the Official U.S. Government system that consolidated the capabilities of CCR/FedReg, ORCA, and EPLS. There is NO fee to register for this site. Entities may register at no cost directly from the SAM website at: https://www.sam.gov

Bid Respondents are strongly encouraged to review their firm's SAM (System for Award Management) status prior to Bid Submission.

3. Awarded Vendor(s): Submission of FORM 1295 (Texas Ethics Commission)

As of January 1, 2016, per House Bill 1295, the Texas Ethics Commission (TEC) requires **all awarded vendors** to complete a Certificate of Interested Parties (FORM 1295) at time of notification of award. **Awarded Vendors** must visit the TEC website link below, enter the required information on Form 1295, and print a copy of the completed form. The form will include a certification of filing that will contain a unique certification number.

At the time of award, the Jefferson County Purchasing Department will submit a request to the Awarded Vendor to both:

1. Submit FORM 1295 online via the Texas Ethics Commission website link below.

2. Submit a printed copy of FORM 1295, signed by an Authorized Agent of the Awarded Vendor and notarized to the Jefferson County Purchasing Department.

FORM 1295, Completion Instructions, and Login Instructions are available via the Texas Ethics Commission Website at: https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

4. Multiple Vendor Award

Jefferson County reserves the right to award this contract to more than one vendor at the County's discretion.

5. Delivery

If delivery is required, all items must be packaged so as to be protected from damage during shipping and handling. Any item(s) damaged in shipping must be replaced in kind, or repaired, by the contractor, at the discretion of, and at no additional charge to, Jefferson County.

6. Payment

Jefferson County will pay original invoices that clearly itemize the goods and/or services provided as to quantity, part number, description, price, applicable discount (if any), labor charges showing time differential, if applicable and if previously agreed to, and delivery, installation, and set-up costs, if applicable and if previously agreed to. Only charges as stated on the Bid Form(s) submitted as a part of the bid will be considered.

Invoices must indicate Jefferson County as applicable, the address to which the product(s) and/or service(s) were delivered, and the applicable purchase order number. Invoices will be matched to delivery tickets prior to payment; therefore, all delivery tickets should have an accurate description of the product(s) and/or service(s).

Invoices shall be submitted to: Jefferson County Auditing Department, Attention: Accounts Payable, 1149 Pearl Street, 7th floor, Beaumont, TX 77701.

7. Usage Reports

Jefferson County reserves the right to request, and receive at no additional cost, up to two (2) times during the contract period, a usage report detailing the products and/or services furnished to date under a contract resulting from this IFB. The reports must be furnished no later than five (5) working days after written request and itemize all purchases to date by Jefferson County department, description of each item purchased, including manufacturer, quantity of each item purchased, per unit and extended price of each item purchased, and total amount and price of all items purchased.

8. Insurance

The contractor (including any and all subcontractors as defined in Section 9.1.3 below) shall, at all times during the term of this contract, maintain insurance coverages with not less than the type and requirements shown below. Such insurance is to be provided at the sole cost of the contractor. These requirements do not establish limits of the contractor's liability.

All policies of insurance shall waive all rights of subrogation against the County, its officers, employees and agents; a copy of the policy wording or endorsement is required.

Contractor shall furnish Jefferson County with Certificate of Insurance naming Jefferson County as additional insured and will provide the actual policy wording or endorsement showing as such.

All insurance must be written by an insurer licensed to conduct business in the State of Texas.

Minimum Insurance Requirements

Public Liability, including Products & Completed Operations	$1,000,000
Excess Liability	$1,000,000

Property Insurance (policy below that is applicable to this project)**:**

Improvements & Betterments Policy: Improvements/Remodeling (for Lease Tenants)
Builder's Risk Policy: Structural Coverage for Construction Projects
Installation Floater Policy: Improvements/Alterations to Existing Structure

Workers' Compensation	Statutory Coverage (see attached)

9. Workers' Compensation Insurance

9.1 Definitions:

9.1.1 **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, DWC-81, DWC-82, DWC-83, or DWC-84 showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

9.1.2 **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.

9.1.3 **Persons providing services on the project ("subcontractor") in article 406.096** – Includes all persons or entities performing all or part of the services under 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, subcontractor, 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" includes, 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.

9.2 The Contractor shall provide coverage, based on proper reporting of classification code and payroll amounts and filing 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.

9.3 The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract – refer to Section 8 above.

9.4 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.

9.5 The Contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

9.5.1 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; and

9.5.2 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 ends during the duration of the project.

9.6 The Contractor shall retain all required certificates of coverage for the duration of the project and for one (1) year thereafter.

9.7 The Contractor shall notify the governmental entity 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.

9.8 The Contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Department of Workers' Compensation, 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.

9.9 The Contractor shall contractually require each person with whom it contracts to provide services on a project to:

9.9.1 Provide coverage, based on 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 its employees providing services on the project, for the duration of the project.

9.9.2 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.

9.9.3 Provide the Contractor, prior to the end of 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.

9.9.4 Obtain from each person with whom it contracts, and provide to the Contractor:

9.9.4.1 A certificate of coverage, prior to the other person beginning work on the project; and

9.9.4.2 the coverage period, if the coverage period shown on the current certificate of a new certificate of coverage showing extension of coverage, prior to the end of coverage ends during the duration of the project.

9.9.5 Retain all required certificates of coverage on file for the duration of the project and for one (1) year thereafter.

9.9.6 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

9.9.7 Contractually require each person with whom it contracts to perform as required by paragraphs 9.1. – 9.7., with the certificates of coverage to be provided to the person for whom they are providing services.

9.10 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 of 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.

9.11 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 the governmental entity.

Bidder Information Form

Instructions: Complete the form below. Please provide legible, accurate, and complete contact information. PLEASE PRINT.

Bid Number & Name: (IFB 17-043/JW), Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway for Jefferson County

Bidder's Company/Business Name: _____

Bidder's TAX ID Number: _____

Contact Person: _____ Title: _____

Phone Number (with area code): _____

Alternate Phone Number if available (with area code):_____

Fax Number (with area code):_____

Email Address: _____

Mailing Address (Please provide a physical address for bid bond return, if applicable):

_____
Address

_____
City, State, Zip Code

OFFER AND ACCEPTANCE FORM

OFFER TO CONTRACT

To Jefferson County:

We hereby offer and agree to furnish the materials or service in compliance with all terms, conditions, specifications, and amendments in the Invitation for Bid and any written exceptions in the offer. We understand that the items in this Invitation for Bid, including, but not limited to, all required certificates are fully incorporated herein as a material and necessary part of the contract.

The undersigned hereby states, under penalty of perjury, that all information provided is true, accurate, and complete, and states that he/she has the authority to submit this bid, which will result in a binding contract if accepted by Jefferson County.

We acknowledge receipt of the following amendment(s): _____, _____, _____, _____.

I certify, under penalty of perjury, that I have the legal authorization to bind the firm hereunder:

_____
Company Name

_____
Address

_____
City State Zip

_____
Signature of Person Authorized to Sign

_____
Printed Name

_____
Title

For clarification of this offer, contact:

_____
Name

_____
Phone Fax

_____
E-mail

Bidder Shall Return Completed Form with Offer.

Vendor References

Please list at least three (3) companies or governmental agencies (preferably a municipality) where the same or similar products and/or services as contained in this specification package were recently provided.

THIS FORM MUST BE RETURNED WITH YOUR BID.

REFERENCE ONE

Government/Company Name: _____

Address: _____

Contact Person and Title: _____

Phone: _____ Fax: _____

Email Address: _____ Contract Period: _____

Scope of Work: _____

REFERENCE TWO

Government/Company Name: _____

Address: _____

Contact Person and Title: _____

Phone: _____ Fax: _____

Email Address: _____ Contract Period: _____

Scope of Work: _____

REFERENCE THREE

Government/Company Name: _____

Address: _____

Contact Person and Title: _____

Phone: _____ Fax: _____

Email Address: _____ Contract Period: _____

Scope of Work: _____

Bidder Shall Return Completed Form with Offer.

Signature Page

As permitted under Article 4413 (32c) V.A.C.S., other governmental entities may wish to participate under the same terms and conditions contained in this contract (i.e., piggyback). In the event any other entity participates, all purchase orders will be issued directly from and shipped directly to the entity requiring supplies/services. Jefferson County shall not be held responsible for any orders placed, deliveries made or payment for supplies/services ordered by another entity. Each entity reserves the right to determine their participation in this contract.

Would bidder be willing to allow other governmental entities to piggyback off this contract, if awarded, under the same terms and conditions?..... **Yes** ☐ **No** ☐

This bid shall remain in effect for ninety (90) days from bid opening and shall be exclusive of federal excise and state and local sales tax (exempt).

The undersigned agrees, if this bid is accepted, to furnish any and all items upon which prices are offered, at the price and upon the terms and conditions contained in the Invitation for Bid, Conditions of Bidding, Terms of Contract, and Specifications and all other items made a part of the accepted contract.

The undersigned affirms that they are duly authorized to execute the contract, that this company, corporation, firm, partnership or individual has not prepared this bid in collusion with any other bidder, and that the contents of this bid as to prices, terms or conditions of said bid have not been communicated by the undersigned nor by any employee or agent to any other bidder or to any other person(s) engaged in this type of business prior to the official opening of this bid. And further, that neither the bidder nor their employees nor agents have been for the past six (6) months directly nor indirectly concerned in any pool or agreement or combination to control the price of goods or services on, nor to influence any person to bid or not to bid thereon.

Bidder (Entity Name)	Signature
Street & Mailing Address	Print Name
City, State & Zip	Date Signed
Telephone Number	Fax Number
E-mail Address	

<u>Bidder Shall Return Completed Form with Offer.</u>

Conflict of Interest Questionnaire

CONFLICT OF INTEREST QUESTIONNAIRE — FORM CIQ

For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session. This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a). By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. *See* Section 176.006(a-1), Local Government Code. A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.	**OFFICE USE ONLY** Date Received

1 **Name of vendor who has a business relationship with local governmental entity.**

2 ☐ **Check this box if you are filing an update to a previously filed questionnaire.**

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3 **Name of local government officer about whom the information in this section is being disclosed.**

_____
Name of Officer

This section (item 3 including subparts A, B, C, & D) must be completed for each officer with whom the vendor has an employment or other business relationship as defined by Section 176.001(1-a), Local Government Code. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income, other than investment income, from the vendor?

☐ Yes ☐ No

B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer named in this section AND the taxable income is not received from the local governmental entity?

☐ Yes ☐ No

C. Is the filer of this questionnaire employed by a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more?

☐ Yes ☐ No

D. Describe each employment or business and family relationship with the local government officer named in this section.

4

_____ _____
Signature of vendor doing business with the governmental entity — Date

Adopted 8/7/2015

Bidder Shall Return Completed Form with Offer.

Local Government Officer
Conflicts Disclosure Statement - OFFICE USE ONLY

LOCAL GOVERNMENT OFFICER CONFLICTS DISCLOSURE STATEMENT

FORM CIS

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This is the notice to the appropriate local governmental entity that the following local government officer has become aware of facts that require the officer to file this statement in accordance with Chapter 176, Local Government Code.

OFFICE USE ONLY

Date Received

1 **Name of Local Government Officer**

2 **Office Held**

3 **Name of vendor described by Sections 176.001(7) and 176.003(a), Local Government Code**

4 **Description of the nature and extent of employment or other business relationship with vendor named in item 3**

5 **List gifts accepted by the local government officer and any family member, if aggregate value of the gifts accepted from vendor named in item 3 exceeds $100 during the 12-month period described by Section 176.003(a)(2)(B).**

Date Gift Accepted _____ Description of Gift _____

Date Gift Accepted _____ Description of Gift _____

Date Gift Accepted _____ Description of Gift _____

(attach additional forms as necessary)

6 **AFFIDAVIT**

I swear under penalty of perjury that the above statement is true and correct. I acknowledge that the disclosure applies to each family member (as defined by Section 176.001(2), Local Government Code) of this local government officer. I also acknowledge that this statement covers the 12-month period described by Section 176.003(a)(2)(B), Local Government Code.

_____
Signature of Local Government Officer

AFFIX NOTARY STAMP / SEAL ABOVE

Sworn to and subscribed before me, by the said _____, this the _____ day of _____, 20 _____, to certify which, witness my hand and seal of office.

_____ _____ _____
Signature of officer administering oath | Printed name of officer administering oath | Title of officer administering oath

Adopted 8/7/2015

Good Faith Effort (GFE) Determination Checklist

This information must be submitted with your bid.

Bidder intends to utilize subcontractors/subconsultants in the fulfillment of this contract (if awarded).
☐ Yes ☐ No

Instructions: In order to determine if a "Good Faith Effort" was made in soliciting HUBs for subcontracting opportunities, the following checklist and supporting documentation shall be completed by the Prime Contractor/Consultant, and returned with the Prime Contractor/ Consultant's bid. This list contains the **minimum** efforts that should be put forth by the Prime Contractor/Consultant when attempting to achieve or exceed the goals of HUB Subcontractor participation. The Prime Contractor/Consultant may extend his/her efforts in soliciting HUB Subcontractor participation beyond what is listed below.

Did the Prime Contractor/Consultant . . .

☐ Yes ☐ No 1. To the extent practical, and consistent with standard and prudent industry standards, divide the contract work into the smallest feasible portions, to allow for maximum HUB Subcontractor participation?

☐ Yes ☐ No 2. **Notify** in writing a reasonable number of HUBs, allowing sufficient time for effective participation of the planned work to be subcontracted?

☐ Yes ☐ No 3. **Provide** HUBs that were genuinely interested in bidding on a subcontractor, adequate information regarding the project (i.e., plans, specifications, scope of work, bonding and insurance requirements, and a point of contract within the Prime Contractor/Consultant's organization)?

☐ Yes ☐ No 4. **Negotiate** in good faith with interested HUBs, and not reject bids from HUBs that qualify as lowest and responsive bidders?

☐ Yes ☐ No 5. **Document** reasons HUBs were rejected? Was a written rejection notice, including the reason for rejection, provided to the rejected HUBs?

☐ Yes ☐ No 6. If Prime Contractor/Consultant has zero (0) HUB participation, **please explain the reasons why.**

If "No" was selected, please explain and include any pertinent documentation with your bid.
If necessary, please use a separate sheet to answer the above questions.

Printed Name of Authorized Representative	Signature
Title	Date

Bidder Shall Return Completed Form with Offer.

Notice of Intent (NOI) to Subcontract with Historically Underutilized Business (HUB)

This information must be submitted with your bid.

Bidder intends to utilize subcontractors/subconsultants in the fulfillment of this contract (if awarded).
☐ Yes ☐ No

Instructions for Prime Contractor/Consultant: Bidder shall submit this form with the bid; however, the information below may be submitted after contract award, but prior to beginning performance on the contract. Please submit one form for each HUB Subcontractor/Subconsultant with proper signatures, per the terms and conditions of your contract.

Contractor Name: _____ HUB: p Yes p No

Address: _____
Street City State Zip

Phone (with area code): _____ Fax (with area code): _____

Project Title & No.: _____

Prime Contract Amount: $ _____

HUB Subcontractor Name: _____

HUB Status (Gender & Ethnicity): _____

Certifying Agency: ☐ Tx. Bldg & Procurement Comm. ☐ Jefferson County ☐ Tx Unified Certification Prog.

Address: _____
Street City State Zip

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

_____

Printed Name of Contractor Representative	Signature of Representative	Date
Printed Name of HUB	Signature of Representative	Date

NOTE: NOTHING ON THIS NOTICE OF INTENT FORM IS INTENDED TO CONFER ANY RIGHTS, EXPRESSED OR IMPLIED, TO ANY THIRD PARTIES.

Pre-Approval for Subcontractor Substitutions must be obtained from the Jefferson County Purchasing Agent's Representative. The "HUB Subcontractor/Subconsultant Change Form" must be completed and faxed to 409-835-8456.

Bidder Shall Return Completed Form with Offer.

Historically Underutilized Business (HUB)
Subcontracting Participation Declaration Form

This information must be submitted with your bid.

Bidder intends to utilize subcontractors/subconsultants in the fulfillment of this contract (if awarded).
☐ Yes ☐ No

Prime Contractor: _____ HUB: ☐ Yes ☐ No

HUB Status (Gender & Ethnicity): _____

Address: _____
Street City State Zip

Phone (with area code): _____ Fax (with area code): _____

Project Title & No.: _____ IFB/RFP No.: _____

Total Contract: $ _____ Total HUB Subcontract(s): $ _____

Construction HUB Goals: 12.8% MBE:: _____ % 12.6% WBE: _____ %

Sub-goals: 1.7 African-American, 9.7% Hispanic, 0.7% Native American, 0.8% Asian American.
Use these goals as a guide to diversify.

FOR HUB OFFICE USE ONLY:

Verification date HUB Program Office reviewed and verified HUB Sub information Date: _____ Initials: _____

PART I. HUB SUCONTRACTOR DISCLOSURE

HUB Subcontractor Name: _____

HUB Status (Gender & Ethnicity): _____

Certifying Agency: ☐ Texas Bldg & Procurement Comm. ☐ Texas Unified Certification Prog.

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

Bidder Shall Return Completed Form with Offer.

Historically Underutilized Business (HUB)
Subcontracting Participation Declaration Form

HUB SUBCONTRACTOR DISCLOSURE

PART I: Continuation Sheet **(Duplicate as Needed)**

HUB Subcontractor Name: _____

HUB Status (Gender & Ethnicity): _____

Certifying Agency: ☐ Tx. Bldg & Procurement Comm. ☐ Jefferson County ☐ Tx Unified Certification Prog.

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

_____

HUB Subcontractor Name: _____

HUB Status (Gender & Ethnicity): _____

Certifying Agency: ☐ Tx. Bldg & Procurement Comm. ☐ Jefferson County ☐ Tx Unified Certification Prog.

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

_____

All HUB Subcontractor Participation may be verified with the HUB Subcontractor(s) listed on Part I.

Bidder Shall Return Completed Form with Offer.

Historically Underutilized Business (HUB)
Subcontracting Participation Declaration Form

PART II: STATEMENT OF NON-COMPLIANCE FOR NOT MEETING HUB SUBCONTRACTING GOALS

Please complete Good Faith Effort (GFE) Checklist and attach any supporting documentation.

Our firm was unable to meet the HUB goals for this project for the following reasons:

- ☐ All subcontractors to be utilized are "Non-HUBs." *(Complete Part III)*
- ☐ HUBs were solicited but did not respond.
- ☐ HUBs solicited were not competitive.
- ☐ HUBs were unavailable for the following trade(s):
- ☐ Other: _____

Was the Jefferson County HUB Office contacted for assistance in locating HUBs? ☐ Yes ☐ No

PART III: DISCLOSURE OF OTHER "NON-HUB" SUBCONTRACTS

The bidder shall use this area to provide a listing of all "Non-HUB" Subcontractors, including suppliers, that will perform under this project. A list of those "Non-HUB" Subcontractors the bidder selects, after bid submission, shall be provided to the Purchasing Office not later than five (5) calendar days after being notified that bidder is the apparent low bidder. A list of those "Non-HUB" Subcontractors that are selected after contract award must be provided **immediately** after their selection.

Subcontractor Name: _____

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

Subcontractor Name: _____

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

Bidder Shall Return Completed Form with Offer.

Historically Underutilized Business (HUB)
Subcontracting Participation Declaration Form

Subcontractor Name: _____

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

_____

Subcontractor Name: _____

Address: _____
Street City State Zip

Contact person: _____ Title: _____

Phone (with area code): _____ Fax (with area code): _____

Proposed Subcontract Amount: $ _____ Percentage of Prime Contract: _____ %

Description of Subcontract Work to be Performed: _____

_____

I hereby certify that I have read the *HUB Program Instructions and Information*, truthfully completed all applicable parts of this form, and **attached any necessary support documentation as required**. I fully understand that intentionally falsifying information on this document may result in my not receiving a contract award or termination of any resulting contract.

Name (print or type): _____

Title: _____

Signature: _____

Date: _____

E-mail address: _____

Contact person that will be in charge of invoicing for this project:

Name (print or type): _____

Title: _____

Date: _____

E-mail address: _____

Bidder Shall Return Completed Form with Offer.

Residence Certification/Tax Form

Pursuant to Texas Government Code §2252.001 *et seq*., as amended, Jefferson County requests Resident Certification. §2252.001 *et seq*. of the Government Code provides some restrictions on the awarding of governmental contracts; pertinent provisions of §2252.001 are stated below:

(3) "Nonresident bidder" refers to a person who is not a resident.

(4) "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

☐ I certify that _____ [company name] is a Resident Bidder of Texas as defined in Government Code §2252.001.

☐ I certify that _____ [company name] is a Nonresident Bidder as defined in Government Code §2252.001 and our principal place of business is _____ _____ (city and state).

Taxpayer Identification Number (T.I.N.):	
Company Name submitting bid/proposal:	
Mailing address:	
If you are an individual, list the names and addresses of any partnership of which you are a general partner:	

Property: List all taxable property owned by you or above partnerships in Jefferson County.

Jefferson County Tax Acct. No.*	Property address or location**

* This is the property amount identification number assigned by the Jefferson County Appraisal District.

** For real property, specify the property address or legal description. For business property, specify the address where the property is located. For example, office equipment will normally be at your office, but inventory may be stored as a warehouse or other location.

Bidder Shall Return Completed Form with Offer.

Bid Affidavit

The undersigned certifies that the bid prices contained in this bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all commodities upon which prices are extended at the price offered, and upon the conditions contained in the specifications and the Notice to Bidders.

STATE OF_____ COUNTY OF_____

BEFORE ME, the undersigned authority, a Notary Public in and for the State of _____,

on this day personally appeared _____, who
(name)
after being by me duly sworn, did depose and say:

"I, _____ am a duly authorized officer of/agent
(name)
for _____ and have been duly authorized to execute the
(name of firm)
foregoing on behalf of the said_____.
(name of firm)

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 bid or not to bid thereon."

Name and address of bidder:_____

_____

Fax: _____ Telephone#_____

by: _____ Title:_____
(print name)

Signature:_____

SUBSCRIBED AND SWORN to before me by the above-named
_____ on

this the _____ day of_____, 201 .

_____
Notary Public in and for
the State of _____

Bidder Shall Return Completed Form with Offer.

PROJECT MANUAL

PROJECT MANUAL

Siphon Control Structures
At
Oilcut Ditch and Salt Bayou
At The
Gulf Intracoastal Waterway
For

Jefferson County
1149 Pearl St., 5th Floor
Beaumont, Texas

The following requirements and instructions provided within this Project Manual supersede General Requirements provided (Pages 1-33), where applicable.

GENERAL INFORMATION:

- Instructions to Bidders
- Notice of Requirements for Affirmative Action to Ensure Equal Employment Opportunity

CONTRACTOR'S BID SUBMITTALS:

- Bid
- Contractor's Bid
- Contractor's Qualifications

CONDITIONS OF THE CONTRACT:

- General Conditions (Including Supplementary Conditions)
- Agreement between Owner and Contractor
- Performance Bond
- Payment Bond
- Contractor's Progress Payment Affidavit
- Contractor's Final Payment Affidavit

TECHNICAL SPECIFICATIONS:

- General Notes
- Wage Rates
- Special Provisions
- Special Provision 000-001 Schedule of Liquidated Damages
- Special Provision 000-002 Nondiscrimination
- Special Provision 000-004 Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity
- Special Provision 000-005 Standard Federal Equal Employment Opportunity Construction Contract Specifications
- Special Provision 000-008 Special Labor Provisions for State Projects
- Technical Specifications
- Item 100 Preparing Right of Way
- Item 110 Excavation
- Item 132 Embankment
- Item 164 Seeding for Erosion Control
- Item 400 Excavation and Backfill for Structures
- Item 403 Temporary Special Shoring
- Item 618 Conduit
- Item 2000 Filter Fabric
- Item 8000 Dewatering
- Item 9000 Articulated Concrete Mats
- Item 9010 Vinyl Sheet Pile
- Item 9020 Siphon Structure (Installed)
- Item 9030 Breakwater

GENERAL INFORMATION

INSTRUCTIONS TO BIDDERS

1. BID PROCEDURE

Bids must be submitted in TRIPLICATE upon the prescribed forms, or copies thereof, in sealed envelopes plainly marked. Bids shall be prepared in compliance with the requirements of the NOTICE to BIDDERS, these instructions and the instructions printed on the prescribed forms. All blank places on the Proposal form must be filled in as noted, in ink, in both words and figures, with amounts extended and totaled, and no changes shall be made in the phraseology of the forms or of the items mentioned therein. In case of any discrepancy between the written amounts and the figures, the written amounts shall govern. Any bid may be deemed irregular which contains any omission, erasure, alteration, addition, irregularity of any kind or item not called for, or which does not contain prices set opposite to each of the several items in the Proposal form, or in which any of the prices are obviously unbalanced, or which shall in any manner fail to conform to the conditions of the published Notice to Bidders. The Bidder shall sign his Proposal in the blank area provided therefore. If the bid is made by a partnership or corporation, the name and address of the partnership or corporation shall be shown, together with the name and address of the partners or officers. If the bid is made by a partnership, it must be acknowledged by one of the partners; if made by a corporation, by one of the officers thereof accompanied by Corporate Seal. In order to ensure consideration, the Proposal must be enclosed in a sealed envelope plainly identified by the name of the project and addressed to the OWNER as prescribed in the Notice to Bidders.

Withdrawal or modifications to bids are effective only if written notice thereof is filed prior to time of bid opening and at the place specified in the Notice to Bidders. A notice of withdrawal or modifications to a bid must be signed by the CONTRACTOR or his designated representative. No withdrawal or modifications shall be accepted after the time for opening of proposals.

2. BID SECURITY

Bids shall be accompanied by a bid guarantee of not less than five percent (5%) Check or Cashier's Check payable without recourse to Jefferson County, or a bid bond with corporate surety authorized to conduct business in Texas. Said security shall be submitted with the understanding that it shall guarantee that the Bidder will not withdraw his bid within sixty (60) days after the date of the opening of the bids; that if a bid is accepted, the Bidder will enter into a formal Contract with the OWNER, furnish bonds and insurance as may be required and commence work at the specified time, and that in the event of the withdrawal of said bid within said period, or the failure to enter into said Contract, furnish said bonds and insurance and commence work within the time specified, the Bidder shall be liable to the OWNER for the difference between the amount specified in the bid amount for which the OWNER may otherwise procure the required work. Checks of all except the three lowest responsible Bidders will be returned when award is made; when the Contract is executed, the checks of the two remaining unsuccessful Bidders will be returned; that of the successful Bidder will be returned when formal Contract, bonds and insurance are approved, and work has commenced within the time specified.

The Bidder to whom the award is made shall execute and return the formal Contract with the OWNER and furnish Performance and Payment Bonds and required insurance Documents within ten (10) days after the prescribed forms are presented to him for signature. Said period will be extended only upon written presentation to the OWNER, within said period, of reasons which, in the sole discretion of the OWNER, justify an extension. If the Contract, bonds and insurance Documents

are not received by the OWNER within said period or if work has not been commenced within the time specified, the OWNER may proceed to have the work required by the Plans and Specifications performed by any means at its command, and the Bidder shall be liable to JEFFERSON COUNTY for any excess cost to the OWNER over his bid amount. Further, the bid guarantee shall be forfeited to JEFFERSON COUNTY as liquidated damages and Bidder shall be liable to JEFFERSON COUNTY for an additional amount of five percent (5%) of the bid amount as liquidated damages without limitation.

The OWNER, within ten (10) days of receipt of acceptable Performance and Payment Bonds, Insurance Documents and Contract signed by Bidder to whom Contract was awarded, shall sign and return executed duplicate of the Contract to said party. Should OWNER not execute the Contract within such period, the Bidder may, by written Notice to OWNER, withdraw his signed Agreement.

It is hereby understood and mutually agreed by and between the Contractor and Owner that the date of beginning and the time for completion as specified in the proposal are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed that the Work embraced in this Contract shall be commenced on a date to be specified in the "Notice to Proceed". The Contractor agrees that said Work shall be prosecuted regularly, diligently and uninterruptedly at such a rate of progress as will insure full completion, in an acceptable manner thereof, within the time specified.

The Contractor affirms that the time for completion of the Work described here is a reasonable time for completion of the Work and that he has sufficient plant, equipment and manpower to accomplish the Work within the specified time for completion. It is further agreed that TIME IS OF THE ESSENCE of each and every portion of this Contract and of the Specification where in a definite and certain length of time is fixed for the performance of any act whatsoever, and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall become the essence of this Contract.

3. PAYMENT & PERFORMANCE BONDS

If the Contract exceeds Twenty-five Thousand Dollars ($25,000.00), a Payment Bond shall be furnished, and if the contract exceeds One Hundred Thousand Dollars ($100,000) a performance bond also, shall be furnished on prescribed forms in the amount of one hundred percent (100%) corporate surety duly authorized to do business in the State of Texas. Attorneys-in-fact who sign Bonds must file with each Bond a certified and effective date copy of their Power of Attorney.

4. NOTICE TO PROCEED

Notice to Proceed shall be issued within ten (10) days of the execution of the Contract by OWNER. Should there by any reasons why Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between OWNER and CONTRACTOR. If Notice to Proceed has not been issued within the ten (10) day period or a period mutually agreed upon, CONTRACTOR may terminate the Contract without liability on the part of either party.

5. INSURANCE

All insurance must be written by an insurer licensed to conduct business in the State of Texas, unless otherwise permitted by OWNER. The CONTRACTOR shall, at his own expense, purchase, maintain and keep in force insurance that will protect against injury and/or damages which may arise out of or result from operations under this Contract, whether the operations be himself or by any Subcontractor or by anyone directly or indirectly employed by any of them. (No insurance policy or

certificate of insurance required by contract shall contain any aggregate policy year limit unless a specific dollar amount [or specific formula for determining a specific dollar amount] aggregate policy year limit is expressly provided in the contract which covers the particular insurance policy or certificate of insurance).

6. EQUAL OPPORTUNITY EMPLOYMENT & PREVAILING WAGES

Bidder is hereby advised that the work shall be subject to equal employment opportunity requirements, local prevailing wage rates, and Executive Order No.11246 as amended. In conformance with applicable statutes, the general prevailing wage rates in the locality in which the work is to be performed shall be minimum paid for labor employed upon this project.

Minimum paid wage rates as predetermined by the Secretary of Labor and State Statue have been included at the end of this section.

7. TAX EXEMPTIONS

The Owner is a sales tax exempt governmental entity. A sales tax exemption notice will be issued to the Contractor when the contract is awarded, in order that he does not have to pay sales taxes on labor and/or materials utilized in or consumed in connection with the Owner's project.

The Contractor performing this contract must issue to his suppliers an exemption certificate in lieu of the tax, said exemption certificate complying with all applicable State Comptroller's rulings, along with a copy of the sales tax exemption notice issued to him by the Owner.

END OF INSTRUCTIONS TO BIDDERS

Back

NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY (EXECUTIVE ORDER 11246 AND 41 CFR PART 60-4)

The following Notice shall be included in, and shall be a part of all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of $10,000.

The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for minority participation for each trade	Goals for female participation for each trade
What % to use?	22.6 %	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non federally involved construction.
The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is:

State of TEXAS

County of JEFFERSON

City of BEAUMONT

CONTRACTOR'S BID SUBMITTALS

Back

BID

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as _____ _____*.

To the_____ _____ (hereinafter called "OWNER").

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of _____ in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to his own organization, that this BID has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within _____ consecutive calendar days thereafter. BIDDER further agrees to pay as liquidated damages, the sum of $ 1,000.00 for each consecutive calendar day thereafter as provided in section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

_____

_____

*Insert "a corporation", "a partnership", or "an individual" as applicable.

CONTRACTOR'S BID

Jefferson County Engineering Department
1149 Pearl St., 5th Floor
Beaumont, Texas 77701

Having carefully examined the Bidding and Contract Documents for Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway in Jefferson County, Texas, as well as the premises and conditions affecting this work, and all other contract documents, the undersigned proposes to furnish all labor, equipment and materials necessary to complete the work for the following prices:

SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY								
Item No.	Spec No.	Alt	Description	Estimated Quantity	Unit	Unit Price	Unit Price (Written)	Total
100	001		PREPARING ROW (DITCH)	3.10	AC		and /100 Dollars	
110	001		EXCAVATION (DITCH)	14,048.00	CY		and /100 Dollars	
132	001		EMBANKMENT (TY D)	789.00	CY		and /100 Dollars	
164	001		SEEDING FOR EROSION CONTROL (DITCH)	6,304.00	SY		and /100 Dollars	
400	001		EXCAVATION FOR SIPHON STRUCTURE	157.00	CY		and /100 Dollars	
400	002		EXCAVATION FOR ARTICULATED CONCRETE MAT	2,508.00	CY		and /100 Dollars	
400	003		CEMENT STABILIZED BACKFILL	315.00	CY		and /100 Dollars	
403	001		TEMPORARY SPECIAL SHORING	4,136.00	SF		and /100 Dollars	
500	001		MOBILIZATION	1.00	LS		and /100 Dollars	
618	001		HIGH DENSITY POLYETHELENE PIPE (36" HDPE)	32.00	LF		and /100 Dollars	
618	002		HIGH DENSITY POLYETHELENE PIPE (36" HDPE)(HDD METHOD)	6,520.00	LF		and /100 Dollars	
2000	001		FILTER FABRIC	18,564.00	SF		and /100 Dollars	
8000	001		DEWATERING	1.00	LS		and /100 Dollars	
9000	001		ARTICULATED CONCRETE MATS (6")	2,046.00	SY		and /100 Dollars	
9010	001		VINYL SHEET PILE (SG-425)	2,220.00	SF		and /100 Dollars	
9010	002		VINYL SHEET PILE (SG-825) WITH WALE SYSTEM	3,500.00	SF		and /100 Dollars	
9020	001		SIPHON STRUCTURE (HEIGHT=9.0')/ W STUB-OUT	8.00	EA		and /100 Dollars	
9020	002		SIPHON STRUCTURE (HEIGHT=5.0')/ W STUB-OUT & FLAP GATE	8.00	EA		and /100 Dollars	
9020	003		SIPHON STRUCTURE (HEIGHT=6.0'))/W STUB-OUT & FLAP GATE	2.00	EA		and /100 Dollars	
9030	001		BREAKWATER (INSTALL)	408.00	CY		and /100 Dollars	
9030	002		BREAKWATER (REMOVE)	110.00	CY		and /100 Dollars	
							SUBTOTAL	
							GRAND TOTAL ALL ITEMS	

The undersigned shall include herewith security in the form of a bid bond, certified check, or cashier's check for an amount not less than five percent (5%) of the total amount of the bid to beawarded by Owner. To ensure adequate bid bond, Bidders should calculate bid bond based on the total amount of all Base Bids plus all Additive Bids (if any). The Bid Bond will be returned to or forfeited by the undersigned in accordance with the Bid Bond provision in the Instructions to Bidders. The undersigned further agrees that this Bid Bond is the appropriate measure of liquidated damages that the Owner will sustain by the failure of the undersigned to execute and deliver said contract and required documents.

The undersigned agrees that when written notice of bid acceptance is furnished by the Owner within 60 calendar days after the bid opening date, the undersigned will, within ten (10) calendar days from receipt of such notice, execute and deliver the contract and all required bonds and certificates of insurance to the Owner.

The undersigned agrees that this bid will not be withdrawn for a period of 60 calendar days from the date set for the bid opening, and the undersigned further agrees that the Bid Bond will be forfeited in the event this bid is withdrawn before expiration of said 60 calendar days.

By the signature hereon affixed, Bidder certifies that neither the Bidder, nor the firm, corporation, partnership, or institution represented by the Bidder, or anyone acting for such firm, corporation, or institution has violated the antitrust laws of this State, codified in Section 15.01 et seq., Texas Business and Commerce Code, or the Federal antitrust laws, nor communicated directly or indirectly the bid made to any competitor or any other person engaged in such line of business.

By the signature hereon affixed, Bidder certifies that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal or State department or agency.

By the signature hereon affixed, Bidder acknowledges that Bidder has not received compensation for participation in the preparation of the specifications for this project.

By the signature hereon affixed, Bidder certifies he is not currently delinquent in the payment to subcontractors or material suppliers of any franchise taxes owed the State of Texas under Chapter 171, Tax Code. Making a false statement as to corporate tax status is a material breach of contract.

By the signature hereon affixed, Bidder affirms that he has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with the submitted bid.

Signing this Bid with a false statement is a material breach of contract and shall void the submitted bid or any resulting contracts, and the Bidder shall be removed from all Owner Bid lists.

Bidder acknowledges receipt of the following addenda:

_____

By_____
Name of Contracting Firm

_____
Address

_____
City State Zip

_____
(Area Code) Phone Number

_____
Email Address

_____
Authorized Signature Date

_____
Printed Name

_____
Title

_____
(Area Code) Fax Number

_____
(Area Code) Cell Phone Number

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH BID

CONTRACTOR'S QUALIFICATIONS

Required as a statement of qualifications to Jefferson County prior to contract award for Siphon Control Structures at Oilcut Ditch and Salt Bayou at the Gulf Intracoastal Waterway.

CONTRACTOR:

Firm: _____

Address: _____

City: _____ State: _____ Zip Code _____ Tel. (_____) _____

____ Individual ____ Partnership ____ Corporation incorporated under the laws of the State of _____

With principal place of business in: City_____, State _____

OWNERSHIP

Bidder must provide in the spaces provided below, the name of and individual owner, a sole proprietor and all partners, shareholders, or owners with an ownership interest of at least twenty five percent (25%) of the business entity entering into this contract.

Name	%
Name	%
Name	%
Name	%

FIRM HISTORY:

List firm history including any other business names used.

From_____ to_____ Firm Name _____

Address _____ City_____ State _____

From_____ to_____ Firm Name _____

Address _____ City_____ State _____

From_____ to_____ Firm Name _____

Address _____ City_____ State _____

Has firm, under its current or former name(s), ever failed to complete a project, defaulted on a contract, or been engaged in litigation over a contract?

□ Yes □ No - If YES, state particulars of most recent occurrence on separate sheet(s) and attach to this form.

CONSTRUCTION CAPABILITIES:

List construction experience of principle individuals of your organization.

Name	Present Position or Office	Years Experience
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

FIRM'S WORK VOLUME: **Indicate average annual construction volume $_____**

Indicate percentage of this volume by construction categories:

Utility Plants ….	_____ %	Concrete ……	_____ %	Marine …….	_____ %
Utility Lines …..	_____ %	Site Work ….....	_____ %	Other ..…….	_____ %
Electrical…….....	_____ %	Highway / Roads	_____ %		
Plumbing.....	_____ %	Earthwork …….	_____ %		

BONDING REFERENCES:

Indicate agency through which bonding requirements will be obtained.

Agency _____ Address _____

City _____ State _____ Zip _____

Agent's Name _____ Tel. (____) _____

Agent(s) with Power of Attorney from Bonding Company (name(s) _____

_____. Expiration Date of Power of Attorney _____

BONDING COMPANY: _____ Address _____

City _____ State _____ Zip _____

Bonding Company representative to contact for verification:

Name _____ Tel. (____)_____

CONSTRUCTION PERFORMANCE RECORD:

List three projects that are at least 30% complete or have been completed within the last two years

1. Project Title or Description _____

   Project Location _____

   Project Number _____ Contract Amount $ _____

   Project Owner (Firm or Agency) _____

   Address _____ City _____ State _____

   Owner / Owner's representative familiar with details of the project (name) _____

   Telephone (____) _____ Project percent complete ____% if completed, date completed _____

2. Project Title or Description _____

   Project Location _____

   Project Number _____ Contract Amount $ _____

   Project Owner (Firm or Agency) _____

   Address _____ City _____ State _____

   Owner / Owner's representative familiar with details of the project (name) _____

   Telephone (____) _____ Project percent complete ____% if completed, date completed _____

3. Project Title or Description _____

   Project Location _____

   Project Number _____ Contract Amount $ _____

   Project Owner (Firm or Agency) _____

   Address _____ City _____ State _____

   Owner / Owner's representative familiar with details of the project (name) _____

   Telephone (____) _____ Project percent complete ____% if completed, date completed _____

I hereby certify that all the information provided above and attached is true and correct.

Name of Firm	Signature of Owner or Officer
Title of Person Signing	Date

CONDITIONS OF THE CONTRACT

JEFFERSON COUNTY

GENERAL CONDITIONS,
Including SUPPPLEMENTARY CONDITIONS
For

SIPHON CONTROL STRUCTURES
AT
OILCUT DITCH AND SALT BAYOU
AT THE
GULF INTRACOASTAL WATERWAY

GENERAL CONDITIONS, Including SUPPPLEMENTARY CONDITIONS

TABLE OF CONTENTS

ARTICLE I. CONTRACT DEFINITIONS

Whenever the following terms are used in these General Conditions or in the other Contract Documents the intent and meaning shall be interpreted as follows:

1.1 CONTRACT DOCUMENTS: The Contract Documents consist of the Owner-Contractor Agreement, The Conditions of the Contract (General, Supplementary General and Special Conditions), the Advertisement to Bid, Instructions to Bidders, Drawings, Specifications, and all addenda issued prior to bidding and any Change Orders issued after execution of the Contract. The Contract Documents do not include Bidding documents such as sample forms, unless specifically enumerated in the Owner-Contractor Agreement or the Supplementary General Conditions.

1.1.1 The Contract Documents form the CONTRACT, which represents the entire and integrated agreement between the Owner and the Contractor and supersedes all prior negotiations, representations or agreements, either written or oral. The Contract Documents are complementary, and what is required by any one document shall be as binding as if required by all.

.1 (Suppl) The intention of the documents is to include, except as specifically excluded, all labor, plant, materials, facilities and services necessary for the proper execution and completion of the work.

1.1.2 Supplementary General Conditions are the standard procedures and contract administration requirements of the Owner and alter or expand upon matters covered in the Uniform General Conditions.

.1 (Suppl) Supplementary General Conditions for Jefferson County project are included in this printing within the body of the Uniform General Conditions, in bold font with a (Suppl) notation preceding the text.

1.1.3 Special Conditions relate to a specific project and are peculiar to it.

.1 (Suppl) "Special Conditions" where used herein refers to all sections in Division I – General Requirements of the Specifications.

1.2 OWNER: The Owner is Jefferson County. Hereinafter, the term "Owner" refers to the Agency responsible for the execution of this contract.

1.3 ENGINEER: A person registered as a licensed professional engineer pursuant to Article 327a, T.C.S., or firm employed to provide professional engineering services and having overall responsibility for the design or production of documents for a project or a significant portion thereof.

1.3.1 (Suppl) Project Manager: The person designated as the Owner's Representative who is responsible for the general administration of the Contract.

1.3.2 (Suppl) Project Inspector: The person designated as the Owner's Representative who is responsible for ascertaining the correctness of the work and conformity with the Contract Documents.

1.3.3 (Suppl) Project Engineer: The person or company designated as the Owner's Representative responsible for the engineering design of the work provided for the Contract.

1.4 CONTRACTOR: The individual, corporation, company, partnership, firm or other organization that has contracted to perform the work under the contract with the Owner.

1.5 SUBCONTRACTOR: A person or organization who contracts under, or for the performance of part or all of, the contract between the Owner and the Contractor. The Subcontract may be direct with the Contractor or with another Subcontractor.

1.6 PROJECT: The term “Project” shall comprise the Work defined by the Contract Documents.

1.7 WORK: All labor, plant, materials, facilities, and all other things that are required by the Contract Documents.

1.8 DAY: Wherever the word “Day” is used in the Contract Documents, it shall be interpreted to mean a calendar day, unless otherwise specifically stipulated.

1.9 CONTRACT SUM: Is the total compensation payable to the Contractor for performing the Work as originally contracted for or as subsequently adjusted by Change Order.

1.10 CONTRACT DATE: Contract Date is the same as the date of the Contract Award Notice issued by the Owner.

1.11 NOTICE TO PROCEED: Notice to Proceed is the written notice provided to the Contractor by the Owner which establishes the date for commencement of contract work and the date for completion of the contracted project or work

ARTICLE II. LAWS GOVERNING CONSTRUCTION

2.1 COMPLIANCE WITH LAWS: In the execution of the contract, the Contractor must comply with all applicable State and Federal laws, including but not limited to laws concerned with labor, environment, equal employment opportunity, safety and minimum wages. The Contractor shall make himself familiar with and at all times shall observe and comply with all Federal, State and Local laws, ordinances and regulations which in any manner affect the conduct of the work, and shall indemnify and save harmless Jefferson County and its official and/or contractual representatives against any claim arising from violation of any such law, ordinance or regulations by himself or by his Subcontractors, or suppliers at any tier, or his or their employees.

2.1.1 (Suppl) The Contractor shall cooperate with applicable city or other government officials at all times where their jurisdiction applies. The Contractor shall make application for any permits and permanent utilities that are required for the execution of the contract.

2.1.2 (Suppl) Disclosure of Information: If any good or services are purchased under this contract with federal grant funds, the Owner, the Federal grantor agency, the Comptroller General of the United States, or any of their duly authorized representatives shall have access to any books, documents, papers and records of the Contractor which are directly pertinent to this specific grant program for the purpose of making audit, examination, excerpts, and transcriptions. All pertinent records will be maintained for at least six (6) years after final payment is made and all other pending matters closed.

2.1.3 (Suppl) Security Information: Jefferson County may be in possession of confidential information and material which require protection under applicable laws, rules and regulations, as well as policies and procedures of Jefferson County. Confidential information and material obtained within or from Jefferson County shall not be discussed, communicated, copied, extracted, or used in any manner by the Contractor or the Contractor's personnel. Magnetic media, program source code, program and system documentation or copies thereof shall not be permitted to be removed from the Owner's possession unless specifically authorized in writing by Jefferson County. If so released, the Contractor and Contractor's personnel shall comply with any stated terms of release and return of materials.

The Contractor shall ensure information about Jefferson County's clients will be kept confidential.

2.1.4 (Suppl) Applicability of the Texas Open Records Act: Jefferson County is a governmental agency under the Texas Open Records Act, TEX. Govt. Code Chapter 552.

.1 (Suppl) Information submitted by Contractor is subject to release by Jefferson County as public information unless the information or specific parts thereof can be shown to fall within one or more of the exceptions listed in the Act. If Contractor believes parts of their information are exempt from disclosure under the Open Records Act, they shall specify those parts and exceptions that they believe apply, with specific detailed reasons. Vague and general claims to confidentiality are not acceptable. Jefferson County shall have sufficient information to give to the Attorney General if his opinion is requested. The Attorney General has previously ruled that the exception pertaining to advantage to competitors of Contractors generally does not apply after the contract has been awarded.

.2 (Suppl) Once a Contract has been awarded, information will automatically be considered public information unless a detailed explanation giving basis for a claim for exemption from disclosure is presented by Contractor.

2.1.5 (Suppl) Civil Rights: By this reference, the Contractor agrees to comply with Title VII of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990, and all amendments to each, and all requirements by the regulations issued pursuant to these Acts. In addition, the contractor agrees to comply with Title 40, Chapter 73, of the Texas Administrative Code. These provide in part that no persons in the United States shall, on the grounds of race, color, national origin, sex, age, disability, political beliefs or religion be excluded

from participation in or denied, any aid, care, service or other benefits provided by federal or state funding, or otherwise be subjected to any unlawful discrimination.

2.1.6 (Suppl) Immigration Reform: By this reference, all requirements to comply with the immigration Reform and Control Act of 1986 regarding employment verification and retention of verification forms for any individuals hired on or after November 06, 1986, who will perform any labor or services under this contract are incorporated.

2.1.7 (Suppl) Texas Business and Commerce Code: All sections of the Texas Business and Commerce Code which protect the Owner are hereby incorporated by reference.

2.1.8 (Suppl) Governing Law: Any contract resulting from the information submitted shall be construed in accordance with the laws of the State of Texas without reference to any choice of law principles that would result in the application of the law of any state other than the state of Texas.

2.2 WAGE RATES: The Contractor is required to pay not less than the wage scale of the various classes of labor as shown on the "Prevailing Wage Rates Section" provided by Owner. The specified wage rates are minimum rates only, the Owner will not consider any claims for additional compensation made by any Contractor because of payment by the Contractor of any wage rates in excess of the applicable minimum rate contained in the Contract.

2.2.1 Contractor shall forfeit as a penalty to the Owner sixty dollars ($60.00) for each laborer, workman or mechanic employed, for each calendar day, or portion thereof, such laborer, workman or mechanic is paid less than the said stipulated minimum rates for any work done under said contract, by him, or by any Subcontractor under him. The Contractor and each Subcontractor shall keep, or cause to be kept, an accurate record showing the names and occupations of all laborers, workmen and mechanics employed in connection with the work, and showing also the actual per diem wages paid to such workers, which record shall be open at all reasonable hours for the inspection by the Owner.

.1 (Suppl) Payroll records shall be maintained and available for inspection by Owner's Representatives at the job site.

2.3 STATE SALES AND USE TAXES: The Owner qualifies for exemption from State and Local Sales and Use Taxes pursuant to the provisions of the Texas Tax Code (Title 2, Chapter 151, Subsection 151.309).

The Contractor shall comply with applicable provisions of Chapter 34, Rules 3.291 and 3.357 of the Texas Administrative Code, or other procedures as may be prescribed by the State Comptroller of Public Accounts regarding tax exemptions.

2.4 ANTITRUST CLAIMS: The contractor shall assign to the Owner any and all claims for overcharges associated with this contract which arise under the antitrust laws of the United States, 15 U.S.C.A. Secs. 1 et. seq.

2.4.1 (Suppl) The Contractor shall assign to the Owner any and all claims for overcharges associated with this contract which arise under the antitrust laws of the State of Texas, TEX.BUS. & COMM. Code Ann. Sec. 15.01, et. seq. (1967).

2.5 VENUE OF SUITS: The exclusive venue of any suit brought for breach of contract for this project shall be in any state court of competent jurisdiction in Jefferson County, Texas.

2.5.1 (Suppl) The exclusive venue of any suit brought against Contractor's bonds shall be in the county in which the project is located.

ARTICLE III. CONTRACT DOCUMENTS AND BONDS

3.1 COPIES FURNISHED – DRAWINGS AND SPECIFICATIONS: The Contractor will be furnished free of charge the number of complete sets of Contract Drawings and Specifications as provided in the Supplementary General Conditions. Additional complete sets of Drawings and Specifications, if requested, will be furnished at reproduction cost to the one requesting such additional sets.

3.1.1 (Suppl) Unless otherwise called for in the Special Conditions, up to two (2) sets of drawings and specifications will be furnished to the Contractor free of charge.

3.2 OWNERSHIP OF DRAWINGS AND SPECIFICATIONS: All Drawings, Specifications and copies thereof furnished by the Owner or the Architect/Engineer are and shall remain property of the Owner. They are not to be used by Contractor on any other project, and with the exception of one (1) contract set for each party to the contract, are to be returned to the Owner upon request following completion of the work.

3.3 DRAWINGS AND SPECIFICATIONS AT THE SITE: The Contractor shall maintain at the site one (1) copy of all Drawings, Specifications, Addenda, approved Shop Drawings and Contract Modifications, in good order and marked to record all changes made during construction.

3.3.1 (Suppl) The Contractor shall also record the exact locations of buried utilities, concealed work, and all facilities designated by Contract Documents to be located in the field by Owner.

3.3.2 (Suppl) Recorded changes shall be made with the same accuracy of dimension and/or scale as shown originally by the Contract Documents.

3.3.3 (Suppl) All records prescribed herein shall be made available for reference and examination by the Owner's Representatives. The Contractor shall update the "Record Drawings" a minimum of once monthly prior to submission of periodic partial pay estimates.

3.3.4 (Suppl) Upon completion of all the Work and prior to final acceptance and final payment by the Owner, the Contractor shall furnish a complete set of "Record Drawings" to the Owner.

3.4 PERFORMANCE AND PAYMENT BONDS: Payment or Performance Bonds are not required on contracts of $25,000.00 or less unless otherwise stipulated in Supplementary General Conditions. If the total contract price exceeds $25,000.00, but is less than $100,000.00, the contractor shall execute in accordance with the provisions of Article 5160, Texas Civil Statutes, a Payment Bond in the amount of the total contract price, solely for the protection of those supplying labor, materials and/or equipment in the prosecution of the contract. If the total contract price exceeds $100,000.00 the Contractor shall execute a Payment Bond and a Performance Bond in the amount of the total contract price conditioned upon the faithful performance of the contract. The Performance Bond shall be solely for the protection of the Owner.

3.4.1 (Suppl) A "Payment Bond" herein refers to a deposit, pledge, or contract of guaranty supplied by the successful Contractor to protect the Owner against loss due to the contractor's failure to pay material suppliers, laborers and subcontractors.

3.4.2 (Suppl) A "Performance Bond" herein refers to a deposit, pledge, or contract of guaranty supplied by the successful Contractor to protect the Owner against loss due to the Contractor's inability or failure to complete the Contract as agreed.

3.4.3 (Suppl) Acceptable forms of Payment Bonds and Performance Bonds are: cashier's check or irrevocable letter of credit issued by a financial institution subject to the laws of Texas; a surety or blanket bond from a company chartered or authorized to do surety business in Texas; United States Treasury bond, or insured certificate of deposit.

3.4.4 (Suppl) Each bond shall be executed by a corporate surety or corporate sureties duly authorized to do business in the State of Texas, and those acceptable to the Owner, and on forms approved by the

Attorney for the Owner. If any surety upon any bond furnished in connection with the Contract becomes insolvent, or otherwise not authorized to do business in the State, the Contractor shall promptly furnish equivalent security to protect the interests of the Owner.

3.4.5 (Suppl) 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 he is empowered to issue a single bond.

3.4.6 (Suppl) The Owner will consider Performance and Payment Bonds from Surety Firms qualified to do business in Texas which have approval listings in the current United States Department of Treasury Circular 570, "Companies holding Certificates of Authority as acceptable Sureties of Federal Bonds and Acceptable Reinsuring Companies", Sections 9304 through 9308 of Title 31 of the United States Code.

.1 (Suppl) The Owner will accept only, sureties licensed to do surety business in the State of Texas, in lieu of Article 3.4.3.

3.4.7 (Suppl) Contractor's obligation to furnish the required bonds is one of the initial requirements of the contract that must be accomplished before a Notice to Proceed will be issued. If the bonds are not provided within ten (10) calendar days after Contractor's receipt of Notice of Award, then, at Owner's option, the Contract will be terminated and Contractor's bid bond forfeited.

3.5 INTERRELATION OF DOCUMENTS: The interrelation of the Specifications, the Drawings and the Schedules is as follows: the Specifications determine the quality of the several materials: the Drawings establish the quantities, dimensions and details; and the Schedules give the locations. Anything mentioned in the Specifications and not shown on the Drawings or Schedules, or shown on the Drawings or Schedules and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.

3.5.1 Should the Drawings disagree one with another, or with Specification, the better quality or greater quantity of work or materials shall be performed or furnished. Figures given on Drawings govern over small scale drawings, and large scale drawings govern over small scale drawings.

.1 (Suppl) Figures given on drawings shall govern over scaled measurements from drawings.

3.5.2 The "Scope of the Work", placed in the front part of each Section of the Specifications, is intended to designate the scope and locations of all items of the work included therein, either generally or specifically. It is not intended to limit the Scope of Work should plans, schedules or notes indicate an increased scope. Inadvertent omission of an item from its proper section of the specifications and its inclusion in another section shall not relieve the Contractor of responsibilities for the item specified.

ARTICLE IV. CONTRACT ADMINISTRATION

4.1 GENERAL ADMINISTRATION: Unless otherwise provided for in the Contract Documents, the Architect/Engineer will provide general administration of the contract and will be the Owner's representative during construction and until final payment. The Owner assumes no responsibility for any understanding given or representation made orally by its agents prior to the execution of this Contract, unless such understanding(s) or representations(s) are expressly stated in the Contract. The Owner assumes no responsibility for any conclusions or interpretations made by the Contractor. Any failure by the Contractor to become acquainted with available information will not relieve it from responsibility for properly estimating the difficulty or cost of successfully performing the work or mutually agreed changes thereto.

4.1.1 The Engineer has the authority to act on behalf of the Owner to the extent provided for in the Contract Documents, unless otherwise modified by written instrument that will be shown to the Contractor. The Engineer will advise and consult with the Owner, and the Owner's instructions to the Contractor will generally be issued through the Engineer, except that the Owner reserves the right on appropriate occasions to issue instructions directly to the Contractor through other designated representatives.

4.1.2 All instructions affecting Contract Sum, Contract Time or Contract Interpretation, shall be confirmed expeditiously in writing with copies furnished to the Engineer, the Owner's designated representatives, and the Contractor by the party issuing the instruction. No instruction affecting the Engineer's professional design liability shall be issued without his prior written consent.

.1 (Suppl) The Engineer will be the interpreter of the requirements of the Contract Documents necessary for the proper execution and progress of the Work. All interpretations and decisions of the Engineer shall be consistent with the intent of and reasonably inferable from the Contract Documents.

4.1.3 The Engineer shall have the authority to reject work performed by the Contractor which, in the opinion of the Engineer, does not meet the requirements of the Contract, and to order such work removed and replaced in accordance with paragraph 5.11.

4.2 ACCESS TO AND INSPECTION OF THE WORK: The Contractor shall provide sufficient, safe and proper facilities at all reasonable times for the observation and/or inspection of the Work by the authorized representatives of the Owner. The Engineer and the Owner will make periodic visits to the site to familiarize themselves with the progress and quality of the Work and to determine if the Work is proceeding generally in accordance with the Contract Documents.

4.2.1 (Suppl) INSPECTIONS: Inspection by Owner's Representative in no way relieves the Contractor from his obligation to supervise and direct the Work, to follow the plans and specifications implicitly, and to provide the designated quality and quantity of materials and workmanship for all job stages. The Inspector will be present on the site as frequently as the Owner deems necessary to explain project requirements and to judge whether the quality and quantity of the work complies with the Contract Documents. The Owner, acting through either the Project Inspector or the Project Manager, has the authority but not the duty to stop the Contractor from beginning or completing any portion of the work that in any way fails to conform to the drawings and specifications.

4.3 SEPARATE CONTRACTS: The Owner reserves the right to award other contracts in connection with other portions of the project under these or similar conditions of the contract.

4.3.1 When separate contracts are awarded for different portions of the project, "the Contractor" in the Contract Documents in each case shall be the Contractor who signs each separate contract. This Contractor shall properly connect and coordinate his work with the work of other Contractors. If any part of this Contractor's work depends for proper execution or proper results on the work of any other separate Contractor, this Contractor shall inspect and promptly report in writing to the Engineer any discrepancies or defects he may find in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute and acceptance of the other Contractor's

work as fit and proper to receive his work, except as to defects which may develop in the other separate Contractor's work after the execution of this Contractor's work.

4.3.2 Should this Contractor cause damage to the work or property of any separate Contractor on the project, this Contractor shall, upon due notice, endeavor to settle with such other Contractor by agreement. If such separate Contractor sues the Owner on account of any damage alleged to have been so sustained, the Owner shall notify this Contractor who shall defend such proceedings and pay all costs in connection therewith, and if any judgment against the Owner arises there from, this Contractor shall pay or satisfy it.

4.3.3 This Contractor shall afford the Owner and/or other Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate his work with theirs.

4.4 CONTRACT TERMINATION:

4.4.1 Termination by Contractor: If the work is stopped for a period of thirty (30) calendar days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the work under a contract with the Contractor, then the Contractor may, upon ten (10) additional days written notice to the Owner and the Engineer, terminate the contract and recover from the Owner payment for all work executed and for any loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and overhead associated with such work or losses and reasonable expenses resulting from such termination. If the cause of the work stoppage is removed prior to the end of the ten (10) day notice period, the Contractor may not terminate the contract under the provisions of this section 4.4.1.

4.4.2 Termination by Owner: If the Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, pay his Subcontractors or Suppliers, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, or fails to so prosecute the work as to insure its completion, within the time, or any extension thereof, specified in this Contract, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, ten (10) days written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor. Should the surety fail to respond within fifteen (15) days following such notice and fail to pursue completion of the work with diligence acceptable to the Owner, the Owner may arrange for completion of the work and deduct the cost thereof from the unpaid contract sum remaining, including the cost of additional Engineer services made necessary by such default or neglect, in which event no further payment shall then be made by the Owner until all costs of completing the work shall have been paid. If the unpaid balance of the contract sum exceeds the costs of finishing the work, including compensation for the Engineer's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor or his surety shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Contract.

4.4.3 Termination for Convenience of Owner: Prior to, or during the performance of the work, the Owner reserves the right to terminate the contract for unforeseen causes not limited to court orders, loss of funding, acts of the federal government to discontinue the work, etc., that may occur. Upon such an occurrence, the following procedures will be adhered to:

.1 The Owner will immediately notify the Engineer and the Contractor in writing, specifying the effective termination date of the Contract.

.2 After receipt of the Notice of Termination, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due at that point in the Contract.

a. Stop all work.

b. Place no further subcontracts or orders for materials or services.
c. Terminate all subcontracts.
d. Cancel all material and equipment orders as applicable.
e. Take action that is necessary to protect and preserve all property related to this Contract which is in the possession of the Contractor.

.3 Within sixty (60) days of the date of the Notice of Termination, the Contractor shall submit a final termination settlement proposal to the Owner based upon costs up to the date of termination, reasonable profit on work done only, and reasonable demobilization costs. If the Contractor fails to submit the proposal within the time allowed, the Owner may determine the amount due to the Contractor because of the termination and shall pay the determined amount to the Contractor.

.4 If the Contractor and the Owner fail to agree on the settlement amount, the matter will be handled as a dispute through administrative procedures as established in the Supplementary General Conditions.

4.5 WRITTEN NOTICE: Written notice shall be considered to have been duly given if delivered in person to the individual or member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail to the last business address known to one who gives the notice.

4.6 DISPUTED MATTERS: Disputed matters, and protests, shall be handled through administrative procedures as established in Supplementary General Conditions. Such matters shall be referred to the Owner's established administrative review process prior to resort by either party to judicial redress through courts of law.

4.6.1 (Suppl) Any dispute concerning a question of fact arising under this contract, not disposed of by agreement between the Engineer and Contractor, shall be appealed by the Contractor to the Owner. Such decision shall be final and conclusive unless, within thirty (30) calendar days, from the date of receipt thereof, the Contractor mails or otherwise furnishes to the Owner a written appeal. The Contractor shall be afforded an opportunity to be heard and to offer evidence in support of this appeal. The decision of the Owner will be final and conclusive. Pending final decision of the dispute hereunder, the Contractor shall proceed with the performance of the contract in accordance with the Owner's decision.

.1 (Suppl) This disputes provision does not preclude consideration of questions of law in connection with decisions provided for in this Article. Nothing in this contract, however, shall be construed as making final the decision of any Jefferson County administrative official or representative on a question of law.

4.6.2 (Suppl) The dispute resolution process provided for in Chapter 2260 of the Texas Government Code must be used by the Owner and Contractor to attempt to resolve all disputes arising under this contract.

ARTICLE V. CONTRACT RESPONSIBLITIES

5.1 OWNER'S RESPONSIBILITIES: The Owner shall furnish all surveys, describing the physical characteristics, legal description and limitations, site utility locations and other information necessary to the Contractor which is under the Owner's control. Communication with the Contractor shall be in accordance with paragraph 4.1.1. Necessary actions of the Owner, including processing of payments to the Contractor, shall be accomplished with reasonable promptness.

5.2 OWNER – CONTRACTOR OBLIGATIONS: The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner.

5.3 CONTRACTOR'S RESPONSIBILITIES: The Contractor shall supervise and direct the work using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, safety, sequences and procedures, and for coordinating all portions of the work under his contract.

5.3.1 (Suppl) Correcting Deficient Work: In the event the Owner issues a Deficient Work Order, the Contractor has the duty to rework as necessary and complete that portion in a manner that conforms to the drawings and specifications and has no right to assert a claim for damages attendant to such order.

5.4 CONTRACTOR'S SUPERINTENDENT: The Contractor shall employ a competent Superintendent who shall be in attendance at the project site during the progress of the work. The Superintendent shall be satisfactory to the Owner, and shall not be changed except with the written approval of the Owner unless he leaves the employment of the Contractor. The Superintendent shall represent the Contractor and shall have full authority to act on his behalf. All communication given to the Superintendent shall be as binding as if given to the Contractor. All oral communication affecting Contract Time, Contract Cost and Contract Interpretation will be confirmed in writing.

5.4.1 (Suppl) The Contractor shall, as soon as practicable after receipt of Notice of Award and before commencement of the work, submit to the Owner the name of the person designated as Project Superintendent.

5.4.2 (Suppl) Subcontracts: As soon as practicable after receipt of Notice of Award and before commencement of the work, the Contractor shall submit to the Owner for approval, a list of all Subcontractors he and his major Subcontractors propose to use in the construction of the project. The Contractor shall not employ any Subcontractor to whom the Owner has a reasonable objection. After the execution of the Contract, a substitution for an approved Subcontractor or addition of a new Subcontractor shall be made only with the written consent of the Owner.

5.5 ACTS AND OMISSIONS: The Contractor shall be responsible for acts and omissions of his employees and his Subcontractors, their agents and employees.

5.5.1 (Suppl) The Contractor agrees to bind every Subcontractor to the terms of the Uniform General Conditions, Supplementary General Conditions, the Special Conditions, and the Drawings and Specifications of the Contract. The Contractor shall inform his Subcontractors, prior to executing an agreement with them, that they will be required to perform their work in conformance with related documents and to submit cost estimates and Change Order proposals in sufficient detail when so requested. The Contractor shall indemnify the Owner for any Subcontractor's claim that may result from the Contractor's failure to incorporate the provisions of this contract in agreements with any of his Subcontractors.

5.5.2 (Suppl) Removal of Employees: The Owner will, in writing, require the Contractor to remove from the Work any employee of the Contractor or a Subcontractor who the Owner finds careless, incompetent, or otherwise objectionable. Owner has no duty to make any such objection, and failure to do so shall not relieve Contractor from any obligation under the Contract.

5.6 CONDITIONS AT SITE OR BUILDING

5.6.1 The Contractor is responsible for having visited the site and having ascertained pertinent local conditions such as location, accessibility, and general character of the site or building, the character and extent of existing work within and adjacent to the site, and any other work being performed thereon at the time of the submission of his bid. Any failure to do so will not relieve him from responsibility for successfully performing the work without additional expense to the Owner.

5.6.2 If, in the performance of the Contract, subsurface, latent or concealed conditions at the site are found to be materially different from the information included in the bid documents, or if unknown conditions of an unusual nature are disclosed differing materially from the conditions usually inherent in work of the character shown and specified, the Engineer shall be notified in writing of such conditions before they are disturbed. Upon such notice, or upon his own observation of such conditions, the Engineer, with the approval of the Owner, will promptly make such changes in the Drawings and Specifications as he deems necessary to conform to the different conditions, and any increase or decrease in the cost of the work, or in the time within which the work is to be completed, resulting from such changes will be adjusted by Change Order, subject to the prior approval of the Owner.

5.6.3 (Suppl) Existing Improvements: The Contractor will protect from damage improvements, vegetation, and utilities at or near the site of the work.

.1 The approximate location of existing underground improvements and utilities is shown on the Drawings according to the best information available to the Owner; in addition, the Contractor will make every effort to establish the exact location of such underground improvement or utility by contacting Owners of same and by prospecting in advance of all trenching and subsurface excavations.

.2 The Contractor will preserve and protect all existing vegetation such as trees, shrubs and grass on or adjacent to the site of work which is not to be removed and which does not unreasonably interfere with the construction work. Any limbs or branches of trees broken during construction shall be trimmed with a clean cut and painted with an approved tree pruning compound as directed by the Owner. Care will be taken in removing trees authorized for removal to avoid damage to vegetation to remain in place.

.3 If the Contractor damages any existing improvements, utility, or vegetation, the Contractor shall repair such damage without delay and without cost to the Owner. If the Contractor fails or refuses to repair such damage promptly, the Owner will have the necessary repairs performed and deduct the cost thereof from money due or to become due the Contractor.

5.7 INSURANCE:

5.7.1 The Contractor shall not commence work under this contract until he has obtained all the insurance required hereunder and certificates of such insurance have been filed with and accepted by the Owner. Insurance coverage shall provide for a thirty (30) day notice of cancellation or material change to the policy coverage and or limits. Acceptance of the insurance certificates by the Owner shall not relieve or decrease the liability of the Contractor.

.1 (Suppl) Contractor shall furnish Certificates of Insurance to the Owner within ten (10) days after receipt of Notice of Award and prior to Owner's issuance of Notice to Proceed. If Contractor fails to provide Certificate of Insurance within such time, the Owner will terminate the contract, and in the event of such termination, Contractor's bid bond will be forfeited.

.2 (Suppl) Contractor shall furnish to the Owner a copy of Owner's Protection Liability Insurance Policy naming the Owner, its employees, and the Engineer as insured, and Contractor shall furnish a copy of endorsement to Builder's Risk Insurance Policy, if required, naming his Subcontractors and the Owner as additional insured.

5.7.2 Unless otherwise provided for in Supplementary Conditions, the Contractor shall provide and maintain, until the Work included in this Contract is completed and accepted by the Owner, the minimum insurance coverages that follow, provided that the limits of liability may be met in part by the use of umbrella or excess policies, and further provided that the limits of liability stated below are reduced by fifty percent (50%) if the contract sum is $25,000 or less:

.1 (Suppl) Minimum insurance coverages for this project shall be as follows:

Type of Coverage	**Limits of Liability**
.1 Worker's Compensation …….. Statutory	
.2 Employer's Liability	
Bodily Injury by Accident …….	**$1,000,000 each Accident**
Bodily Injury by Disease ……	**$1,000,000 each Employee**
Bodily Injury by Disease ……	**$1,000,000 Policy Limit**
.3 Comprehensive General Liability.....	**$3,000,000 Aggregate**
Combined Bodily Injury …….	**$3,000,000 Products – Completed Operations**
Property Damage ……	**$3,000,000 Personal & Advertising Liability**
.4 Comprehensive Auto Liability ……	**$1,000,000 Combined Single Limit**

.5 Owner's Protective Liability Insurance Policy: The Contractor shall obtain at his expense an Owner's Protective Liability Insurance Policy naming Jefferson County and its employees as named insured, and the Engineer named as Additional Insured with the following limits:

.1 Bodily Injury	**$3,000,000 each Occurrence**
	$3,000,000 Aggregate

.6 Builder's All Risk Insurance: The Contractor shall obtain at his expense on an all risk of physical lost basis, Builder's Risk Insurance coverage including workmanship acceptable to the Owner, n the amount of insurance equal at all times to 100% of the insurable value of materials delivered and labor performed. The policy shall have endorsements as follows:

"This insurance shall be specific as to coverage and not considered as contributing insurance with any permanent insurance maintained on the present premises."

.7 Flood Insurance when specified in Supplementary General Conditions.

.1 (Suppl) Flood insurance will be maintained at same level of coverage as Builder's All Risk Insurance.

5.8 SAFETY PRECAUTIONS AND PROGRAMS:

5.8.1 It shall be the duty and responsibility of the Contractor and all of its Subcontractors to be familiar and comply will all requirements of Public Law 91-596, 29 U.S.C. Secs. 651 et. seq., the Occupational Safety and Health Act of 1970, (OSHA) and all amendments thereto, and to enforce and comply with all of the provisions of this Act. In addition, on projects in which trench excavation will exceed a depth of five (5) feet, the Contractor and all of its Subcontractors shall comply with all requirements of 29 CFR 1926, Subpart P, "Excavations", OSHA Safety and Health Regulation for Construction, which are more fully described in the Special Conditions and shall require a pay item classification, pursuant to paragraph 7.1, for the particular safety system to be utilized by the Contractor.

.1 (Suppl) Before commencing any trench excavation which will exceed a depth of five (5) feet, Contractor will provide Owner with detailed plans and specifications regarding the safety systems to be utilized. Said plans and specifications shall include a certification from a registered professional engineer indicating full compliance with OSHA provisions, 29 CFR 1926, Subpart P, excavations. Additional provisions, if required, are addressed in Article 7.1.1 and will be stated in the Special Conditions.

5.8.2 In any emergency affecting the safety of persons and property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor resulting from emergency work shall be considered in accordance with Article VI for Contract Changes.

5.9 MATERIALS AND WORKMANSHIP: All work shall be executed in accordance with the Contract Documents, complete in all parts and in accordance with approved practices and customs, and of acceptable finish and workmanship. Unless otherwise specified, all materials and equipment incorporated in the work under the contract shall be new.

5.9.1 (Suppl) Materials shall be unused and of current production.

5.10 TESTS: If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any work to be inspected, tested or approved, the Contractor shall give the Owner and the Engineer timely notice of its readiness and of the date arranged so the Engineer may observe such inspection, testing or approval. In addition, the Owner or the Engineer may require special inspection, testing or approval of material or work for compliance with the requirements of the Contract Documents. Upon direction of the Owner and Engineer, the Contractor shall promptly arrange for such special testing, inspection or approval procedure. Should material or work fail to comply with the requirements of the Contract Documents, the Contractor shall bear all costs of the testing, inspection or approval, as well as the cost of replacement of unsatisfactory material or work as provided by paragraph 5.11; otherwise, the Owner shall bear such costs and an appropriate Change Order shall be issued. The costs of routine testing shall be borne by the Owner, but the Contractor shall be responsible for the cost of material tested. When directed by the Owner, material compliance with the Specifications shall be made by one of the following:

a. Manufacture's Certificate of Compliance
b. Mill Certificate
c. Testing Laboratory Certification
d. Report of Actual Laboratory Test from the Owner's laboratory or from a laboratory satisfactory to the Owner. Samples tested shall be selected by or in the presence of the Owner and the method of testing shall comply with the professional society's standard specifications.

5.10.1 (Suppl) The Contractor shall notify the Owner's Representative, sufficiently in advance of other work so as to prevent delays, when work is ready for testing. Unless otherwise stated in Special Conditions, the Contractor shall bear all costs for testing which is implemented in the absence of the Owner's Representative.

5.10.2 (Suppl) All tests shall be scheduled to start and terminate during normal work hours on normal workdays. No testing will be scheduled on holidays or weekends unless approved by the Owner's Representative.

5.10.3 (Suppl) The Contractor has the right to have tests performed on any material at any time for his own information and job control and at his own cost. The Owner does not assume responsibility for costs of such tests or for giving them consideration when apprising quality of materials.

5.11 REMOVAL OF DEFECTIVE WORK: If any materials furnished under this contract are condemned by the Owner and/or Engineer, the Contractor shall, after having received notice from the Owner and/or Engineer to that effect, proceed to remove from the grounds or buildings all condemned materials, whether worked or unworked, and to take down all portions of the work which the Owner and/or Engineer shall be by written notice condemn as unsound or improper or as in any way failing to conform to the Drawings and Specifications, and shall make good all work damaged or destroyed thereby.

5.12 ROYALTIES AND PATENTS: The Contractor shall pay all royalties and license fees, and defend all suits or claims for infringement of any patent rights and shall save the Owner and his representatives harmless from loss on account thereof, except that the Owner shall be responsible for all such royalties and license fees and loss when a particular design or process, or the product of a particular manufacturer or manufacturers is specified; provided, however, if the Contractor has reason to believe the design, process or product specified constitutes an infringement of a patent, he shall be responsible for such royalties, license fees and loss unless he promptly gives such information to the Owner and the Engineer.

5.12.1 (Suppl) Patent or Copyright Infringement: The contractor will defend at its own expense any action brought against Jefferson County to the extent that it is based on a claim that the items supplied by Contractor infringes a United States patent, copyright or other legal claim, and the Contractor will pay those damages finally awarded against Jefferson County in any such claim, but such defense and payments are conditioned on the following:

.1 (Suppl) That the Contractor shall be notified promptly in writing by Jefferson County of any notice of such claims.

.2 (Suppl) The Contractor shall indemnify, defend and hold harmless Jefferson County, its officers, agents and employees from any and all claims and losses occurring or resulting to any and all consultants, subcontractors, suppliers, laborers and any other person, firm or corporation furnishing or supplying work, services, materials or supplies in connection with the performance of the Contract, and from any and all claims and losses occurring or resulting to any person, firm or corporation who may be injured or damaged by the Contractor in the performance of the Contract and against liability, including costs and expenses, for violation of proprietary rights, copyrights, or rights of privacy, arising out of publication, translation, reproduction, delivery, performance, use or disposition of any data furnished under the Contract or based on any libelous or other unlawful matter considered in such information. The Contractor is not an employee of Jefferson County. Any employees or agents utilized shall be agents or employees of the Contractor. Jefferson County does not have any control, direction of dominion over the Contractor or its agents and/or employees. The Contractor shall solely be responsible for providing and certifies that it can provide the necessary expertise and qualification to perform the services needed hereunder and that the services shall be conducted in strict accordance with currently approved practices.

5.13 EQUAL MATERIALS: It is not the intent of the Specifications to limit materials to the product of any particular manufacturer. Where definite materials, equipment and/or fixtures have been specified by name, manufacturer or catalog number, it has been done so as to set a definite standard and a reference for comparison as to quality, application, physical conformity, and other characteristics. It is not the intention to discriminate against or prevent any dealer, jobber or manufacturer from furnishing materials, equipment, and/or fixtures that meet or exceed the characteristics of the specified items. Substitution of materials shall not be made without prior written approval from the Owner and the Engineer.

5.13.1 The Contractor shall be responsible for any additional costs or delays resulting from having furnished materials, equipment or fixtures other than those specified, and shall reimburse the Owner for any increased design costs resulting from unauthorized substitutions.

5.14 SHOP DRAWINGS AND SAMPLES:

5.14.1 Shop Drawings are drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are prepared by the Contractor or any Subcontractor, manufacturer, supplier or distributor, and which illustrates some portion of the work.

5.14.2 Samples are physical examples furnished by the Contractor to illustrate materials, equipment or workmanship, and to assist in the establishment of standards by which the work will be judged.

5.14.3 The Contractor shall submit, with reasonable promptness and in orderly sequence, all Shop Drawings and Samples required by the Contract Documents, or subsequently required by the Engineer as covered by contract modifications. The Contractor shall review and approve them for compliance with Contract Documents and shall certify that he has done so by stamp, or otherwise, affixed to each copy thereof. Submittal data presented without such certification will be returned without review or other comment, and any delay resulting there from will be the Contractor's responsibility.

5.14.4 Shop Drawings and Samples shall be properly identified, as specified or as the Owner and/or the Engineer may require. At the time of submission, the Contractor shall inform the Owner and the Engineer in writing of any deviation in the Shop Drawings or Samples from the requirements of the Contract Document.

.1 (Suppl) Each sample shall be marked with Contractor's name and address and requisition number.

.2 (Suppl) If not destroyed in examination, samples will be returned to the Contractor, on request, at Contractor's expense

5.14.5 By submitting Shop Drawings and Samples, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog number and similar data, or will do so, and that he has checked and coordinated each Shop Drawing and Sample with the requirements of the Work and of the Contract Documents and he shall so certify as required by Paragraph 5.14.3.

5.14.6 The Engineer, or the Owner if required by Supplementary General Conditions, will review and approve the Shop Drawings and Samples with reasonable promptness, but only for conformance with the design concept of the project and with the information given in the Contract Documents. The approval of a separate item shall not indicate approval of an assembly in which the item functions. The approval of the Shop Drawings or Samples shall not relieve the Contractor of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has informed the Owner and the Engineer in writing of such deviation at the time of submission and the Owner or the Engineer has not objected to the specific deviation. The approval shall not relieve the Contractor from responsibility for error or omissions in the Shop Drawings or Samples.

.1 (Suppl) All submittals will be subject to review and approval by the Owner. Review procedures shall be stated in the Special Conditions.

5.14.7 The Contractor shall make any corrections required and shall resubmit the required number of corrected copies of the Shop Drawings or new Samples of materials until approved. The Contractor shall direct specific attention in writing to any new revisions other than the corrections requested on previous submissions.

5.14.8 No work requiring a Shop Drawing or Sample submission shall be commenced until the submission has been approved. All such work shall be in accordance with approved Shop Drawings and Samples.

5.15 CLEANING:

5.15.1 The Contractor shall at all times keep the premises clean and free from accumulation of waste materials or rubbish caused by the Work under his Contract.

5.15.2 Upon completion of the project, and prior to the final inspection, the Contractor shall have the premises in a neat and clean condition.

ARTICLE VI. CONTRACT CHANGES

6.1 CHANGE ORDERS (PURCHASE ORDER CHANGE NOTICE): A Change Order is a written order to the Contractor signed by the Owner and the Engineer, issued after execution of the contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including any adjustment in the Contract Sum or the Contract Time.

6.1.1 The Owner, without invalidating the Contract, may order changes in the work within the general scope of the Contract consisting of additions, deletions or other revisions, and the Contract Sum and the Contract Time will be adjusted accordingly. All such changes in the work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents. If such changes cause an increase or decrease in the Contractor's cost of, or time required for, performance of the contract, an equitable adjustment shall be made and confirmed in writing in a Change Order.

6.1.2 It is recognized by the parties hereto and agreed by them that the Specifications and Drawings may or may not be complete or free from errors, omissions and imperfections or require changes or additions in order for the Work to be completed to the satisfaction of the Owner and that accordingly, it is the express intention of the parties, notwithstanding any other provisions in this Contract, that any errors, omissions or imperfections in such Specifications and Drawings, or any changes in or additions to same or to the work ordered by Owner and any resulting delays in the work or increases in Contractor's costs and expenses, shall not constitute or give rise to any claim, demand or cause or action of any nature whatsoever in favor of Contractor, whether for breach of contract, quantum meruit, or otherwise; provided however, that Owner shall be liable to Contractor for the sum stated to be due Contractor in any Change Order approved and signed by both parties, it being agreed hereby that such sum, together with any extension of time contained in said Change Order, shall constitute full compensation to Contractor for all costs, expenses and damages to Contractor, whether direct, consequential or otherwise in any wise incident to, arising out of, or resulting directly or indirectly from the work performed by Contractor under such Change Order.

6.1.3 Procedures for administration of Change Orders shall be established by the Owner and stated in Supplementary General Conditions.

.1 (Suppl) Change in the Construction Contract shall be formally initiated by a Change Order Request detailing requirements of the proposed change for pricing by the Contractor. Except for emergency conditions defined in Article 5.8.2, written acceptance by the Owner will be required for authorization to proceed with the work being changed. The Owner will not be responsible for the cost of such changed work performed by the Contractor without prior written approval, and the Contractor shall be required to remove work so installed if not subsequently approved by Owner.

.2 (Suppl) Contractor's proposal for Change Order Work must be supported by itemized accounting of material, equipment and labor prices in sufficient detail to permit analysis by the Engineer and Owner. Photocopies of Subcontractor and significant Contractor proposals shall be furnished when requested by the Owner.

.3 (Suppl) The Change Order cost shall be determined by (a) price of materials, equipment and labor necessary for performance of the changed work, and (b) overhead and profit on material, equipment and labor cost.

Overhead and Profit shall include bonds, insurance, field and office supervisors and assistants, use of small tools, incidental job burdens, and general home office expenses; and no separate allowance will be made therefore. Maximum allowable percentage for Overhead and Profit shall be as follows:

a. For work performed by the General Contractor's own forces, fifteen percent (15%) of the first $10,000.00 of material, equipment and labor price of the changed work,; ten percent (10%) of the next $10,000.00; and seven and one-half percent (7 ½ %) of the balance over $20,000.00.

b. For Subcontracted work, the Subcontractor shall figure his price and overhead and profit as described for General Contractor's work, and to that total price the General Contractor will be allowed to add a maximum of ten percent (10%) of the first $10,000.00 for materials, equipment and labor price of the changed work; seven and on-half percent (7 ½ %) of the next $10,000.00; and five percent (5%) of the balance over $20,000.00

c. For a change resulting in a deduction from the Contract Amount, the credit to be given by the Contractor may be net, and the Contractor may retain his Profit and Overhead calculated at the percentages stated in paragraphs (a) and (b) above.

d. On changes involving both additions and deletions, Profit and Overhead will be allowed only on net additions.

.4 (Suppl) <u>Unilateral Change Order</u>: A Unilateral Change Order is one issued by the Owner without the full or timely agreement of the Contractor. A Unilateral Change Order shall be issued when the Owner requires a change in the Work within the scope of the Contract and it is impractical for any reason to obtain a price proposal from the Contractor within a reasonable time.

.1 A Unilateral Change Order will state Owner's estimate of the Change Order cost. Upon completion of the change-ordered work, the Contractor shall submit to Owner documented records of the costs incurred by Contractor in Performance of the work, and the final Change Order cost shall be determined by the Owner from such records in accordance with Article 6.1.3.3.

.2 When a Unilateral Change Order has been issued it will have the full force and effect of a contract modification.

.3 If the Contractor objects to a Unilateral Change Order, he shall state in writing his specific objections or points of disagreement within ten (10) calendar days of receipt of such order.

.4 The issuance of a Unilateral Change Order will not prejudice any of the Contractor's rights to make claims or to appeal disputed matters under other applicable provisions of this Contract.

6.1.4 If a Contractor intends to assert a claim for an adjustment of cost or time over and above any adjustment already being granted in a Change Order, he must within fifteen (15) calendar days after receipt of a written Change Order, or oral or written order to proceed with a proposed change under paragraph 6.1, or the furnishing of a written notice under paragraph 6.3.1 submit to the Owner a written statement setting forth in detail the nature and monetary extent of such claim. The fifteen (15) day period of time for the submission of such claim, maybe extended only a by written agreement signed by the Owner. Except for claims based on defects in Specifications furnished by the Owner, no claim for any change under 6.3.1, shall be allowed for any costs incurred more than twenty (20) days before the Contractor gives written notice as therein required; provided that, in the case of defects in Specifications furnished by the Owner, the adjustment in cost shall include only those increased direct costs reasonably and necessarily incurred by the Contractor as a result of such defective Specifications and shall not include Profit or Overhead.

6.1.5 Except as provided above, no order, oral statement, or direction of the Owner or his duly Appointed Representative shall be treated as a change under this article or entitle the Contractor to an adjustment there under.

6.1.6 The Contractor agrees that the Owner or any of its duly Authorized Representatives shall have access and the right to examine any directly pertinent books, documents, papers, and records of the Contractor. Further, the Contractor agrees to include in all its subcontracts a provision to the effect that the Subcontractor agrees that the Owner or any of its duly Authorized Representatives shall have access to and the right to examine any directly pertinent books, documents, papers and records of such Contractor relating to any claim arising from this contract, whether or not the Subcontractor is a part to the claim. The

period of access and examination described herein which relates to appeals under the "Disputes" article of this Contract, litigation, or the settlement of claims arising out of the performance of this Contract shall continue until final disposition of such claims, appeals or litigation.

6.2 UNIT PRICES: If unit prices are stated in the Contract Documents or subsequently agreed upon, and if the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted as provided in the Supplementary General Conditions.

6.2.1 (Suppl) Each unit price bid by the Contractor shall include all costs applicable to the work, including but not limited to mobilization, labor, material, equipment, plant, supervision, overhead and profit.

6.2.2 (Suppl) Equitable adjustment shall be made upon demand of either party and shall be based upon an increase or decrease in cost due solely to the variation above one hundred fifteen percent (115%) of below eighty five percent (85%)- of the originally specified quantity.

.1 Contractor shall make claim for additional time in accordance with Article VIII.

6.3 CLAIMS FOR ADDITIONAL COSTS:

6.3.1 If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner and the Engineer written notice thereof within fifteen (15) days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with paragraph 5.8.2. No such claim shall be valid unless so made. If the Owner and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined by administrative procedures as provided by Supplementary General Conditions. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

6.3.2 If the Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation of the Contract Documents, (2) any order by the Owner to stop the work pursuant to paragraph 4.4.2, where the Contractor is not at fault, (3) any written order for a minor change in the work issued pursuant to paragraph 6.5, the Contractor shall make such claim as provided in paragraph 6.3.1.

6.3.3 Review of Contract Document and Project Conditions: The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner pursuant to Article 1.1 and shall at once report to the Engineer errors, inconsistencies or omissions discovered.

.1 Should the contractor or his Subcontractor fail to report to the Engineer known errors, inconsistencies or omissions, and proceeds to perform construction incorporating known error, inconsistency or omission, the Contractor shall assume appropriate responsibility and shall bear appropriate attributable cost for the performance of such construction.

.2 The Owner may assume an intent to circumvent competitive bidding for necessary corrective project work where the Contractor proceeds to perform the Contract and fails to report to the Engineer known errors, inconsistencies, and omissions. In such case, the Owner may choose to award a separate contract for the corrective work.

.3 Claims for time extensions or for extra cost resulting from delayed notice and/or reports of Contract Document errors, inconsistencies or omissions will not be considered by the Owner.

6.4 CLAIMS FOR ADDITIONAL TIME: The Contractor shall make claims for additional time in accordance with Article VIII.

6.5 MINOR CHANGES: The Engineer, with concurrence of the Owner, will have authority to order minor changes in the work not involving an adjustment in the Contract Sum or an extension of the Contract Time. Such changes shall be effected by written order that the Contractor shall carry out promptly.

ARTICLE VII. CONTRACT PAYMENTS

7.1 CONTRACT PRICE BREAKDOWN: Upon execution of the contract by the Owner and the Contractor, the Contractor shall submit to the Owner and the Engineer for approval a breakdown of the Contract Price, itemizing the various classification of the work. The breakdown will be used as the basis for the progress payments of the Contract.

7.1.1 (Suppl) Pursuant to Paragraph 5.8.1, a separate pay item shall be included in the job cost breakdown when a trench safety system is to be utilized by the Contractor.

7.2 PROGRESS PAYMENTS: Payment will be made to the Contractor upon monthly certificates as provided hereinafter for the work performed, and materials in place or on the site, suitably stored and protected or on other sites agreed to by the Owner and the Contractor.

7.2.1 Once each calendar month, the Owner shall make a progress payment to the Contractor on the basis of the certified estimate, approved by the Engineer, of the work performed during the preceding calendar month under this Contract, including an affidavit that all payrolls, bills for labor, materials, equipment, or other indebtedness connected with such work have been paid or will be paid within thirty (30) days after receipt of the progress payment, or within the period of time required by Article 601f, Texas Civil Statutes; but to insure the proper performance of this Contract, the Owner shall retain not less than ten percent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this contract. After Substantial Completion of the work, the Owner shall, upon application by the Contractor approved by the Engineer, and without terminating the Contract, make payment of the balance due for that portion of the work fully completed and accepted. If the remaining balance of work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Article III, such payment shall be made under the terms and conditions governing final payment, and shall not constitute a waiver of claims. Final payment shall be made after completion of the work by the Contractor in accordance with the Contract Documents.

.1 (Suppl) The provisions of Article 601f of Texas Civil Statutes apply to payment under this Contract.

.2 (Suppl) The Contractor shall, in accordance with Article 601f, Texas Civil Statutes, provide a properly signed Contractor's Progress Payment Affidavit with each requested progress payment.

.3 (Suppl) The Contractor shall reference the Purchase Order number, as supplied by the Owner, on each Progress Payment request.

7.2.2 In preparing estimates all material delivered and labor performed shall be included in the progress upon which payment is based.

.1 (Suppl) If requested, the Contractor shall provide documents sufficient for Owner to determine quantities of materials for which payment is requested.

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

.1 Defective work not remedied.
.2 Damage to work of another Contractor.
.3 Failure to maintain scheduled progress.
.4 Receipt of written notice by the Owner of unpaid bills, as stipulated in Sec. 53.232, Property Code, T.C.S., if the Contractor has not provided a payment bond and if the contract sum does not exceed $25,000.00. Any funds so withheld shall be released to the Contractor if he furnishes a bond for release of lien as provided in Section 53.236, Property Code, T.C.S.
.5 Failure to maintain a current record set of "As-build" documents on site.
.6 Failure to maintain or to allow Owner's inspection of payroll records at the job site.

When the above grounds are removed, payment will be made for amounts withheld because of them.

7.2.4 All material and work covered by partial payments made shall thereupon become the sole property of the Owner, but this provision shall not be construed as relieving the Contractor from the sole responsibility for the care and protection of materials and work upon which payments have been made or the restoration of any damaged work, or as a waiver of the right of the Owner to require the fulfillment of all the terms of the Contract.

7.2.5 Payments to the Contractor shall not be construed to release the Contractor or his surety from any obligations under this contract.

ARTICLE VIII. CONTRACT COMPLETION TIME

8.1 NOTICE TO PROCEED: The contract time will begin on the date designated in the Notice to Proceed issued by the Owner and the Contractor is required to complete the work in the time that is stated in the Contract.

8.2 WORK PROGRESS SCHEDULE: Within three (3) weeks after receipt of a Notice to Proceed, if requested by the Owner, the Contractor shall submit in duplicate to the Owner and the Engineer for review an estimated progress schedule for the work in relation to the entire project. This schedule shall indicate the dates for the starting and completing the various classifications of construction.

8.3 DELAYS AND EXTENSION OF TIME:

8.3.1 The Contractor may be granted an extension of time because of changes ordered in the contract.

.1 (Suppl) Normal inclement weather for this project location shall be considered to be zero days per year for contract time extension purposes.

8.3.2 Claims for extensions of time must be made in writing within fifteen (15) calendar days after the occurrence of the delay. All time extension claims shall be supported by sufficient written evidence to justify the claim. In the case of a continuing cause of delay, only one claim is necessary. Claims for extensions of time shall be stated in numbers of whole or half calendar days.

8.4 FAILURE TO COMPLETE WORK ON TIME / LIQUIDATED DAMAGES: The time set forth in the Contract for the completion of work is an essential element of the contract. Contractor's failure to complete the work within such time will cause damage to the Owner.

8.4.1 (SUPPL) THE WORK IS CRITICAL TO THE OWNER'S SECURITY AND SAFETY REQUIREMENTS, AND DELAY DAMAGES ARE INCAPABLE OF BEING EXACTLY DETERMINED. THE PARTIES AGREE THAT THE SUM OF $1,000.00 PER CALENDAR DAY THAT THE WORK IS NOT COMPLETED BY THE CONTRACT TIME IS A FAIR, REASONABLE AND NON-PUNITIVE AMOUNT TO BE CREDITED TO OWNER AS LIQUIDATED DAMAGES FOR SUCH DELAY.

ARTICLE IX. CONTRACT TIME

9.1 **The Contractor shall be allowed 120 calendar days to complete the project.**

9.2 CERTIFICATION: Should the Owner wish to use or occupy a structure, or part thereof, prior to final completion, and the Owner determines that the work, or a designated portion thereof acceptable to the Owner, is Substantially Complete, the Contractor shall prepare for submission to the Engineer a list of items to be completed or corrected. The failure to include any item on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. When the Engineer on the basis of an inspection determines that the work is Substantially Complete, he will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion; shall state the responsibilities of the Owner and the Contractor for maintenance, heat, utilities, operation of permanent equipment, and insurance; and shall fix the time within which the Contractor shall complete the items listed therein. The Certificate the Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to each of them in such Certificate.

9.3 ADDITIONAL INSPECTION COSTS: Contractor shall be charged with any cost for re-inspection resulting from substantial differences between the Contractor's list of items to be completed or corrected and the list of items resulting from the Engineer inspection.

ARTICLE X. CONTRACT FINAL ACCEPTANCE AND PAYMENT

10.1 NOTIFICATION: When the work is completed, the Contractor shall notify the Engineer in writing that the work will be ready for final inspection on a definite date. Upon verification by the Engineer that the work is ready for final inspection and acceptance, the Owner will within ten (10) calendar days make a final inspection and, when the work is found acceptable under the Contract Documents and the Contract is fully performed, make a final payment to the Contractor within thirty (30) calendar days after Section 10.2 is complied with by Contractor.

10.2 FINAL PAYMENT DOCUMENTATION: Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Engineer for transmittal to the Owner:

1. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the Owner or his property might in any way be responsible, have been paid or will be paid or otherwise satisfied within thirty (30) days after receipt of final payment from the Owner, or within the period of time required by Article 601f, Texas Civil Statutes, (T.C.S.); and

2. If required by Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any such claim.

10.3 FINAL PAYMENT: The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

1. Faulty or defective work appearing or discovered after Substantial Completion;
2. Failure of the Work to comply with the requirements of the Contract Documents; or
3. Terms of any warranties required by the Contract Documents.

Acceptance of Final Payment shall constitute a waiver of all claims by the Contractor against the Owner except those specifically enumerated in writing at the time of final payment.

ARTICLE XI. CONTRACT WARRANTY AND GUARANTEE

11.1 ONE YEAR WARRANTY: Except as otherwise specified, the Contractor warrants and guarantees all work against defect in materials, equipment or workmanship for one (1) year from the date of Final Acceptance by Owner.

11.2 CORRECTION OF DEFECTS: Upon receipt of written notice from the Owner of the discovery of any defects, the Contractor shall remedy the defects and replace any property damaged there from occurring within the Warranty and Guarantee Period. If the Contractor, after notice, fails to proceed promptly and remedy within fifteen (15) calendar days or within another period of time which has been agreed to in writing by Owner in compliance with the terms of the Warranty and Guarantee, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred.

AGREEMENT BETWEEN OWNER & CONTRACTOR

STATE OF TEXAS

COUNTY OF JEFFERSON

THIS AGREEMENT, made this _____day of _____, 2018 by and between **Jefferson County**, hereinafter called the OWNER, and _____ _____ , hereinafter called the CONTRACTOR.

WITNESSETH: That for and in consideration of the payments and agreements hereinafter described, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete certain project described as

SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY

for the use and benefit of the OWNER as described in the Bidding and Contract Documents prepared by LJA Engineering, Inc. which together with the Contract Documents are made part of the Contract.

The consideration to be paid by the OWNER to the CONTRACTOR for furnishing all the materials, supplies, machinery, equipment, tools, labor, superintendence, insurance, and other accessories and services necessary to complete the said project in accordance with the Contract Documents is the sum of _____ _____ Dollars ($ _____)

The exclusive venue of any suit brought for any breach of this contract is hereby fixed in and state court of competent jurisdiction in Jefferson County, Texas. All payments under this contract shall be due and payable solely in Jefferson County, Texas.

The said parties for themselves, their heirs, successors, executors, administrators, and assigns, do hereby agree to full performance of the covenants herein contained.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in two (2) counterparts, each of which shall be deemed an original, in the day and year first above written.

CONTRACTOR:	**OWNER:**
_____	**JEFFERSON COUNTY**
By: _____	By: _____
_____	_____
Title	Title

PERFORMANCE BOND

STATE OF TEXAS

COUNTY OF JEFFERSON

KNOW ALL MEN BY THESE PERSENTS:

That we, _____ as **PRINCIPAL**, and _____ as **SURETY(S)**, are hereby held and firmly bound unto the State of Texas in the penal sum of

_____ Dollars ($_____) for the payment, whereof, the said **PRINCIPAL** and **SURETY(S)** bind themselves, their heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The conditions of this obligation are such that whereas the **PRINCIPAL** entered into a certain contract dated _____ _____, 2018, hereto attached, and made a part hereof, with Jefferson County, to commence and complete certain public works described as **SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY.**

NOW THEREFORE, the conditions of this obligation are such that, if the **PRINCIPAL** shall faithfully perform the contract in accordance with the plans, specifications, and contract documents, and shall fully indemnify and save harmless Jefferson County from all cost and damage which Jefferson County may suffer by reason of the **PRINCIPAL'S** default or failure to do so and shall fully reimburse and repay Jefferson County all outlay and expense which Jefferson County may incur in making good any such default, then obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further, that if any legal action be filed upon this bond, venue shall lie exclusively in the county in which the project or work, or any part thereof, is situated, and that the said surety(s) for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed there under, or the Specifications accompanying the same, shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alternation or addition, to the items of the contract or to the work or to the Specifications.

In the event **PRINCIPAL** is in default under the contract as defined herein, **SURETY(S)** shall within fifteen (15) calendar days of determination of such default take over and assume completion of said contract and become entitled to the payment of the balance of the contract price.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this _____ day of _____, 2018. The name and corporation seal of each corporate party being hereto affixed and these present duly signed by its undersigned representative pursuant to authority of its governing body.

PRINCIPAL	**SURETY**
By: _____	By: _____

PAYMENT BOND

STATE OF TEXAS

COUNTY OF JEFFERSON

KNOW ALL MEN BY THESE PERSENTS:

That we, _____ as **PRINCIPAL**, and _____ as **SURETY(S)**, are hereby held and firmly bound unto the State of Texas in the penal sum of

_____ Dollars ($_____) for the payment, whereof, the said **PRINCIPAL** and **SURETY(S)** bind themselves, their heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

The conditions of this obligation are such that whereas the **PRINCIPAL** entered into a certain contract dated _____ _____, 2018, hereto attached, and made a part hereof, with Jefferson County, to commence and complete certain public works described as **SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY.**

NOW THEREFORE, the conditions of this obligation are such that, if the **PRINCIPAL** shall promptly make payment to all claimants as defined in ARTICLE 5160 REVISED CIVIL STATUTES OF TEXAS, 1925, as amended, supplying labor and materials in the prosecution of the work provided for in said contract and any and all duly authorized changes to said contract that may hereafter be made, notice of such changes to the SURETY(S) being hereby waived, then, this obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further, that if any legal action be filed upon this bond, venue shall lie exclusively in the county in which the project or work, or any part thereof, is situated, and that the said surety(s) for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract, or to the work to be performed there under, or the Specifications accompanying the same, shall in anywise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alternation or addition, to the items of the contract or to the work or to the Specifications.

This bond is made and entered into solely for the protection of all claimants supplying labor and materials in the prosecution of the work provided for in said contract, and all such claimants shall have a direct right to action under the bond as provided in ARTICLE 5160 REVISED CIVIL STATUTES, 1925, as amended.

In the event **PRINCIPAL** is in default under the contract as defined herein, **SURETY(S)** shall within fifteen (15) calendar days of determination of such default take over and assume completion of said contract and become entitled to the payment of the balance of the contract price.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals this _____ day of _____, 2018. The name and corporation seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative pursuant to authority of its governing body.

PRINCIPAL **SURETY**

By: _____ By: _____

CONTRACTOR'S PROGRESS PAYMENT AFFIDAVIT

STATE OF TEXAS

COUNTY OF JEFFERSON

BEFORE ME THE UNDERSIGNED AUTHORITY, on this day personally appeared _____ who being duly sworn, on oath, says that he/she is a duly authorized representative of _____ CONTRACTOR, and all terms of the contract for the completion of certain public works described as **SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY** have been satisfactorily completed to the extent indicated on the attached voucher and that ALL sums of money due for payrolls, bills for material and equipment, and other indebtedness connected with the work for which OWNER or its property might in any way be responsible, to the best of his/her knowledge and belief have been paid or will be paid or otherwise satisfied within ten (10) days after receipt of the requested payment from the OWNER, or within the period of time required by V.T.C.A., GOV. CODE, Section 2251.023.

Affiant agrees to indemnify and hold OWNER harmless from any liens, debts or obligations that arise as a result of labor or materials provided by or through Affiant to the project. Affiant further agrees to indemnify and hold harmless all real property on which the improvements were constructed and all interests in such property, including leasehold interests, from any liens, debts, or obligations arising from any labor or materials provided by or through Affiant to the project.

_____
Signature

_____
Title

Sworn and subscribed before me this _____ day of _____, 2018

Notary Public in and for
_____ County, Texas

(SEAL)

Instructions:

Affidavit must be signed by an individual owner, a partner in a partnership, or by a person authorized by bylaws or Board of Directors to sign for a corporation. If CONTRACTOR is a joint venture or partnership of individuals, either may sign, but if a joint venture in which a corporation is a party, separate affidavits must be executed by each corporation and by each individual owner or partnership.

CONTRACTOR'S FINAL PAYMENT AFFIDAVIT

STATE OF TEXAS

COUNTY OF JEFFERSON

BEFORE ME THE UNDERSIGNED AUTHORITY, on this day personally appeared who being duly sworn, on oath, says that he/she is a duly authorized representative of Contractor, and that all terms of the contract for the completion of certain public works described as: **SIPHON CONTROL STRUCTURES AT OILCUT DITCH AND SALT BAYOU AT THE GULF INTRACOASTAL WATERWAY** have been satisfactorily completed and that ALL sums of money for payrolls, bills for material and equipment, and other indebtedness connected with the work for which OWNER or its property might in any way be responsible, to the best of his/her knowledge and belief, have been paid or will be paid or otherwise satisfied within ten (10) days after receipt of final payment from the OWNER, or within the period of time required by V.T.C.A., GOV. CODE, Section 2251.023. Payments not made in full at the date of this affidavit are listed below.

Affiant hereby waives all claims against the OWNER. (List any exceptions, if "NONE" so state)

Affiant agrees to indemnify and hold OWNER harmless from any liens, debts or obligations that arise as a result of labor or materials provided by or through Affiant to the project. Affiant further agrees to indemnify and hold harmless all real property on which the improvements were constructed and all interests in such property, including leasehold interests, from any liens, debts, or obligations arising from any labor or materials provided by or through Affiant to the project.

_____
Signature

_____
Title

Sworn and subscribed before me this _____ day of _____, 2018

Notary Public in and for
_____ County, Texas

(SEAL)

Final payments pending as of the date hereof are: □ none pending; □ as listed below:

Individual or Company Name	Mailing Address	Amount Owed

Instructions: Affidavit must be signed by an individual owner, a partner in a partnership, or by a person authorized by bylaws or Board of Directors to sign for a corporation. If CONTRACTOR is a joint venture or partnership of individuals, either may sign, but if a joint venture in which a corporation is a party, separate affidavits must be executed by each corporation and by each individual owner or partnership. In the event subcontractors, laborers, or material-men have not been paid in full, CONTRACTOR shall list hereon the amount owed and the name and address of each subcontractor, laborer, or material-man to whom such payment is owed. Add additional pages if required.

TECHNICAL SPECIFICATIONS

General Notes

General Notes

The Contractor shall have full responsibility for testing all materials incorporated in the project at his sole expense.

Contractor shall assume ownership for all designated construction waste material and dispose of it at a place off of Jefferson County property, as approved by the Engineer.

Contractor shall procure all the necessary city and/or county permits and licenses.

The responsibility for the construction surveying on this contract will be the Contractor's responsibility. No additional compensation will be paid the Contractor for surveying on this project.

Working days will be charged Sunday through Saturday, including Holidays, regardless of weather conditions, material availability, or other conditions not under the control of the Contractor.

All items not specifically covered in these General Notes and Specifications shall be governed by the TxDOT Standard Specifications Manual, 2014 Edition.

Item 100 Preparing Right of Way

Prepare the right of way and designated easements for construction operations by removing and disposing of all vegetation and organic material or anything that would hinder the construction of this Project. All materials removed shall not be reused in the embankment or any part of the construction of this project.

Item 110 Excavation

Excavate areas as shown on plans or as directed by the Engineer to the lines, grades, and typical sections on the plans. All excavation, except grass and other organic matter to be disposed of shall be used as fill on this project.

Item 132 Embankment

Compaction shall be "Ordinary" compaction and maximum lift thickness shall be 8" loose.

Item 164 Seeding for Erosion Control

Provide and install a mixture of 2500 pounds per acre of cellulose fiber mulch, 3 pounds of pure live Bermuda grass seed per acre, fertilizer at a rate of 100 pounds of Nitrogen per acre and enough water to make the mixture sprayable to the areas to be seeded. Fertilizer shall be subsidiary to this Item.

Item 400 Excavation and Backfill for Structures

Cement stabilized backfill shall be cohesionless sand with 3 sacks of cement / C.Y. based on dry weight of sand.

Item 403 Temporary Special Shoring

Furnish and place temporary shoring for excavations deeper than 5 foot. Provide vertical or sloped cuts, benches, shields, support systems, that provide the necessary protection in accordance with OSHA Standards and Interpretations, 29 CFR 1926, Subpart P, "Excavations".

Item 618 Conduit

Conduit pipe shall be high density polyethylene (HDPE) and have a minimum pressure rating of 100 psi.

HDPE installed by the Horizontal Directional Drilling (HDD) method shall have a 12° entry and exit angle and 720' radius on curve.

Item 2000 Filter Fabric

Furnish and install filter fabric in areas shown on the plans and according to the manufacturer's recommendations. Filter fabric shall conform to DMS-6200, "Filter Fabric", Type 2.

Item 8000 Dewatering

Contractor shall submit a dewatering plan to the Engineer prior to the beginning of construction.

Item 9000 Articulated Concrete Mats

Articulated concrete mats shall consist of open-cell blocks. Weight of blocks shall be 40 to 50 pounds per square foot with a nominal thickness of 6 inches. Articulated concrete mat shall be ArmorFlex Class 50-S or an approved equivalent. Articulated mats shall be butted up against the ends of the structures leaving no gap for erosion to occur.

Item 9010 Vinyl Sheet Pile

Vinyl Sheet Pile constructed with 9 foot structures shall have an allowable moment capacity greater than 7,000 foot pounds per foot. Sheet pile shall be ShoreGuard SG-825 or an approved equivalent.

Wale System shall be installed on Vinyl Sheet Pile SG-825. 4"x6" timber wales shall be constructed where indicated on plans. Installation and materials needed for installation, including timber wales, tie back rods, hardware and anchor blocks, shall be subsidiary to Item 9010 with no extra compensation.

Vinyl Sheet Pile constructed with 5 foot structures shall have an allowable moment capacity greater than 2,700 foot pounds per foot. Sheet pile shall be ShoreGuard SG-425 or an approved equivalent.

All Sheet Pile layout and orientation shall be submitted to Engineer for approval prior to construction.

Wale System shall be installed on Vinyl Sheet Pile SG-825. 4" x 6" timber wales shall be constructed where indicated on the plans. Installation and materials needed for installation, including timber wales, tie back rods, hardware and anchor blocks, shall be subsidiary to Item 9010 with no extra compensation.

Item 9020 Siphon Structure (Installed)

Siphon Structures shall be built and installed according to plan details. Any variation from the plan drawings must have prior approval from the Engineer. Siphon Structures have front side tabs that the vinyl sheet pile shall be attached to with ¾" stainless steel bolts, UV resistant polymer washers (both sides) and nuts at a spacing of 1 (one) foot apart. The rear side tabs shall be attached to 6" x 6" treated timbers that are driven a minimum of 4 feet into the ground at each tab location. The rear tabs shall have the same size bolts and bolting pattern as the vinyl sheet piling. Bolt configuration shall be submitted to the Engineer prior to drilling of holes. Note that bolt configuration will vary depending on sheet pile size and location of sheet pile relative to Siphon Structure.

Rolled aluminum stub out pipes and flanges, bottoms of Aluminum Outfall structures, and any metallic portion of the complete drainage structure that contacts cement stabilized backfill shall be bitumen coated on the outside for greater corrosion resistance. The Bitumen coating, UV resistant polymer washers as well as all

timbers and hardware to install them shall be subsidiary to the Item 9020 Siphon Structure and no additional compensation will be due the Contractor for the cost of these items.

Siphon Structures have a 6 foot long rolled aluminum plate stub-out in the rear with 36" flange. The 36" plate shall be aluminum and be welded, if necessary, to be placed at full length and avoid joints or connections. This rolled plate and flange shall be considered part of the overall siphon structure and will be subsidiary to Item 9020 with no extra compensation.

Aluminum alloy anodes (N-1A) shall be attached to the aluminum structures with stainless steel bolts and UV resistant polymer washers, (each side) as per Engineer's directions to act as sacrificial anodes for the structures. These anodes shall also be subsidiary to Item 9020 Siphon Structure and no additional compensation will be due the Contractor for the cost or installation of these items.

Minimum weight of aluminum alloy anodes on each box structure shall be 6 lbs. Minimum weight on each flap gate shall be 3.5 lbs.

Material Properties of Structures shall be:

- Aluminum Plate = 5086 Alloy
- Aluminum Angle = 6061-T6 Alloy
- Grating shall be 1" x 3/16" Aluminum Serrated Bar Grating

The Contractor shall verify all dimensions before fabrication.

Item 9030 Breakwater

Breakwaters shall have a side slope of 2.5:1. The crown shall have the width of 3 feet. Rock will be 18" graded rock placed to ensure no large outcroppings occur. The top elevation of the breakwater shall be +4.0 NAVD.

Gradation shall be	Weight, #	% Lighter
	400-160	100
	160-80	50
	80-30	15

Breakwater removal shall be complete and no rocks left at the removal location. The breakwater material removed is to be relocated and reused as part of the proposed breakwater quantity.

Wage Rates

The wage rates listed are those predetermined by the Secretary of Labor and State Statue to be the minimum wages paid. To determine the applicable wage rate zone, a list entitled "TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES" is provided in the contract. Any wage rate that is not listed must be submitted to the Engineer for approval. IMPORTANT NOTICE FOR STATE PROJECTS; only the controlling wage rate zone applies to the contract. Effective 1-2-2015

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX07 1/2/15	ZONE TX08 1/2/15	ZONE TX11 1/2/15	ZONE TX12 1/2/15	ZONE TX14 1/2/15	ZONE TX16 1/2/15	ZONE TX18 1/2/15	ZONE TX34 1/2/15	ZONE TX35 1/2/15	ZONE TX37 1/2/15	ZONE TX38 1/2/15	ZONE TX40 1/2/15	ZONE TX41 1/2/15	ZONE TX54 1/2/15	ZONE TX56 1/2/15	ZONE TX63 1/2/15
1428	Agricultural Tractor Operator						$12.69					$12.35			$11.75		
1300	Asphalt Distributor Operator	$14.87	$13.48	$13.88			$15.55	$15.72	$13.28	$15.32	$15.62	$14.36	$14.25	$14.03	$13.75	$14.06	$14.40
1303	Asphalt Paving Machine Operator	$13.40	$12.25	$12.35	$13.87		$14.36	$14.20	$13.26	$13.99	$14.68	$12.92	$13.44	$12.53	$14.00	$14.32	$12.99
1106	Asphalt Raker	$12.28	$10.61	$12.02	$14.21		$12.12	$11.64	$11.44	$12.69	$12.05	$11.34	$11.67	$11.40	$12.59	$12.36	
1112	Batching Plant Operator, Asphalt																
1115	Batching Plant Operator, Concrete																
1214	Blaster																
1615	Boom Truck Operator						$18.36										
1444	Boring Machine Operator																
1305	Broom or Sweeper Operator	$11.21	$10.33	$10.10			$11.04	$11.62		$11.74	$11.41	$10.30		$10.23	$10.60	$12.68	$11.05
1144	Communications Cable Installer																
1124	Concrete Finisher, Paving and Structures	$13.55	$12.46	$13.16	$12.85		$12.56	$12.77	$12.44	$14.12	$13.04	$13.38		$12.80	$12.79	$12.98	$13.32
1318	Concrete Pavement Finishing Machine Operator						$15.48			$16.05		$19.31				$13.07	
1315	Concrete Paving, Curing, Float, Texturing Machine Operator											$16.34				$11.71	
1333	Concrete Saw Operator									$14.48	$17.33					$13.99	
1399	Concrete/Gunite Pump Operator																
1344	Crane Operator, Hydraulic 80 tons or less						$18.36			$18.12	$18.04	$20.21			$18.63	$13.86	
1345	Crane Operator, Hydraulic Over 80 Tons																
1342	Crane Operator, Lattice Boom 80 Tons or Less	$16.82	$14.39	$13.85			$15.87			$17.27		$14.67			$16.42	$14.97	
1343	Crane Operator, Lattice Boom Over 80 Tons						$19.38			$20.52		$17.49			$25.13	$15.80	
1306	Crawler Tractor Operator	$13.96	$16.63	$13.62			$15.67			$14.07	$13.15	$13.38			$14.60	$13.68	$13.50
1351	Crusher or Screen Plant Operator																
1446	Directional Drilling Locator						$11.67										
1445	Directional Drilling Operator						$17.24										
1139	Electrician	$20.96		$19.87			$26.35		$20.27	$19.80		$20.92				$27.11	
1347	Excavator Operator, 50,000 pounds or less	$13.46	$12.56	$13.67			$12.88	$14.38	$13.49	$17.19		$13.88			$14.09	$12.71	$14.42
1348	Excavator Operator, Over 50,000 pounds		$15.23	$13.52			$17.71			$16.99	$18.80	$16.22				$14.53	
1150	Flagger	$10.10	$10.10	$10.10		$10.10	$10.10	$10.10		$10.10	$10.10	$10.10		$10.10	$10.10	$10.33	$10.10
1151	Form Builder/Setter, Structures	$13.52	$12.30	$13.38	$12.91	$12.71	$12.87	$12.38	$12.26	$13.84	$12.98	$13.07	$13.61	$12.82	$14.73	$12.23	$12.25
1160	Form Setter, Paving & Curb	$12.36	$12.16	$13.93	$11.83	$10.71	$12.94			$13.16	$12.54	$11.33	$10.69		$13.33	$12.34	
1360	Foundation Drill Operator, Crawler Mounted									$17.99						$17.43	
1363	Foundation Drill Operator, Truck Mounted		$16.86	$22.05			$16.93			$21.07	$20.20	$20.76		$17.54	$21.39	$15.89	
1369	Front End Loader Operator, 3 CY or Less	$12.28	$13.49	$13.40			$13.04	$13.15	$13.29	$13.69	$12.64	$12.89			$13.51	$13.32	$12.17
1372	Front End Loader Operator, Over 3 CY	$12.77	$13.69	$12.33			$13.21	$12.86	$13.57	$14.72	$13.75	$12.32			$13.19	$13.17	
1329	Joint Sealer																
1172	Laborer, Common	$10.30	$10.10	$10.10	$10.51	$10.71	$10.50	$10.24	$10.58	$10.72	$10.45	$10.30	$10.25	$10.10	$10.54	$11.02	$10.15
1175	Laborer, Utility	$11.80	$11.53	$12.70	$12.17	$11.81	$12.27	$12.11	$11.33	$12.32	$11.80	$11.53	$11.23	$11.50	$11.95	$11.73	$12.37
1346	Loader/Backhoe Operator	$14.18	$12.77	$12.97	$15.68		$14.12			$15.18	$13.58	$12.87		$13.21	$14.13	$14.29	

Texas Department of Transportation

CLASS. #	CLASSIFICATION DESCRIPTION	ZONE TX07 1/2/15	ZONE TX08 1/2/15	ZONE TX11 1/2/15	ZONE TX12 1/2/15	ZONE TX14 1/2/15	ZONE TX16 1/2/15	ZONE TX18 1/2/15	ZONE TX34 1/2/15	ZONE TX35 1/2/15	ZONE TX37 1/2/15	ZONE TX38 1/2/15	ZONE TX40 1/2/15	ZONE TX41 1/2/15	ZONE TX54 1/2/15	ZONE TX56 1/2/15	ZONE TX63 1/2/15
1187	Mechanic	$20.14	$15.47	$17.47			$17.10			$17.68	$18.94	$18.58		$16.61	$18.46	$16.96	
1380	Milling Machine Operator	$15.54	$14.64	$12.22			$14.18			$14.32	$14.35	$12.86			$14.75	$13.53	
1390	Motor Grader Operator, Fine Grade	$17.49	$16.52	$16.88			$18.51	$16.69	$16.13	$17.19	$18.35	$17.07	$17.74	$17.47	$17.08	$15.69	$20.01
1393	Motor Grader Operator, Rough	$16.15	$14.62	$15.83		$17.07	$14.63	$18.50		$16.02	$16.44	$15.12		$14.47	$17.39	$14.23	$15.53
1413	Off Road Hauler			$10.10			$11.88			$12.25		$12.23			$13.00	$14.60	
1196	Painter, Structures						$18.34						$21.29			$18.62	
1396	Pavement Marking Machine Operator	$16.42		$13.10			$19.17	$12.01		$13.63	$14.60	$13.17		$16.65	$10.54	$11.18	
1443	Percussion or Rotary Drill Operator																
1202	Piledriver															$14.95	
1205	Pipelayer		$11.87	$14.64			$12.79		$11.37	$13.24	$12.66	$13.24	$11.17	$11.67		$12.12	
1384	Reclaimer/Pulverizer Operator	$12.85					$12.88			$11.01		$10.46					
1500	Reinforcing Steel Worker	$13.50	$14.07	$17.53			$14.00			$16.18	$12.74	$15.83		$17.10		$15.15	
1402	Roller Operator, Asphalt	$10.95		$11.96			$12.78	$11.61		$13.08	$12.36	$11.68			$11.71	$11.95	$11.50
1405	Roller Operator, Other	$10.36		$10.44			$10.50	$11.64		$11.51	$10.59	$10.30		$12.04	$12.85	$11.57	
1411	Scraper Operator	$10.61	$11.07	$10.85			$12.27		$11.12	$12.96	$11.88	$12.43		$11.22	$13.95	$13.47	
1417	Self-Propelled Hammer Operator																
1194	Servicer	$13.98	$12.34	$14.11			$14.51	$15.56	$13.44	$14.58	$14.31	$13.83		$12.43	$13.72	$13.97	
1513	Sign Erector																
1708	Slurry Seal or Micro-Surfacing Machine Operator																
1341	Small Slipform Machine Operator									$15.96							
1515	Spreader Box Operator	$12.60		$13.12			$14.04			$14.73	$13.84	$13.68		$13.45	$11.83	$13.58	
1705	Structural Steel Welder															$12.85	
1509	Structural Steel Worker						$19.29									$14.39	
1339	Subgrade Trimmer																
1143	Telecommunication Technician																
1145	Traffic Signal/Light Pole Worker						$16.00										
1440	Trenching Machine Operator, Heavy						$18.48										
1437	Trenching Machine Operator, Light																
1609	Truck Driver Lowboy-Float	$14.46	$13.63	$13.41	$15.00	$15.93	$15.66			$16.24	$16.39	$14.30	$16.62	$15.63	$14.28	$16.03	
1612	Truck Driver Transit-Mix									$14.14							
1600	Truck Driver, Single Axle	$12.74	$10.82	$10.75			$11.79	$13.53	$13.16	$12.31	$13.40	$10.30	$11.61		$11.97	$11.46	
1606	Truck Driver, Single or Tandem Axle Dump Truck	$11.33	$14.53	$11.95			$11.68		$14.06	$12.62	$11.45	$12.28		$13.08	$11.68	$11.48	$11.10
1607	Truck Driver, Tandem Axle Tractor with Semi Trailer	$12.49	$12.12	$12.50			$12.81	$13.16		$12.86	$16.22	$12.50			$13.80	$12.27	
1441	Tunneling Machine Operator, Heavy																
1442	Tunneling Machine Operator, Light																
1706	Welder		$14.02				$15.97		$13.74	$14.84					$13.78		
1520	Work Zone Barricade Servicer	$10.30	$12.88	$11.46	$11.70		$11.85	$10.77		$11.68	$12.20	$11.22	$11.51	$12.96	$10.54	$11.67	

Notes:

Any worker employed on this project shall be paid at the rate of one and one half (1-1/2) times the regular rate for every hour worked in excess of forty (40) hours per week.

The titles and descriptions for the classifications listed here are further detailed in the AGC of Texas' *Standard Job Classifications and Descriptions for Highway, Heavy, Utilities, and Industrial Construction in Texas* . AGC will make it available on its Web site for any contractor.

TEXAS COUNTIES IDENTIFIED BY WAGE RATE ZONES: 7, 8, 11, 12, 14, 16, 18, 34, 35, 37, 38, 40, 41, 54, 56, 63

County Name	Zone	County Name	Zone	County Name	Zone	County Name	Zone
Anderson	38	Donley	54	Karnes	37	Reagan	54
Andrews	54	Duval	41	Kaufman	35	Real	54
Angelina	38	Eastland	54	Kendall	16	Red River	38
Aransas	40	Ector	7	Kenedy	41	Reeves	18
Archer	35	Edwards	18	Kent	54	Refugio	37
Armstrong	7	El Paso	34	Kerr	37	Roberts	54
Atascosa	16	Ellis	35	Kimble	54	Robertson	16
Austin	56	Erath	38	King	54	Rockwall	35
Bailey	54	Falls	38	Kinney	18	Runnels	54
Bandera	16	Fannin	38	Kleberg	37	Rusk	11
Bastrop	16	Fayette	37	Knox	54	Sabine	38
Baylor	54	Fisher	54	Lamar	38	San Augustine	38
Bee	37	Floyd	54	Lamb	54	San Jacinto	56
Bell	16	Foard	54	Lampasas	16	San Patricio	40
Bexar	16	Fort Bend	56	LaSalle	41	San Saba	54
Blanco	37	Franklin	38	Lavaca	37	Schleicher	54
Borden	54	Freestone	38	Lee	37	Scurry	54
Bosque	38	Frio	37	Leon	38	Shackelford	54
Bowie	11	Gaines	54	Liberty	56	Shelby	38
Brazoria	56	Galveston	56	Limestone	38	Sherman	54
Brazos	16	Garza	54	Lipscomb	54	Smith	11
Brewster	18	Gillespie	37	Live Oak	37	Somervell	38
Briscoe	54	Glasscock	54	Llano	37	Starr	41
Brooks	41	Goliad	40	Loving	54	Stephens	54
Brown	54	Gonzales	37	Lubbock	7	Sterling	54
Burleson	16	Gray	54	Lynn	54	Stonewall	54
Burnet	37	Grayson	35	Madison	38	Sutton	18
Caldwell	16	Gregg	11	Marion	38	Swisher	54
Calhoun	40	Grimes	38	Martin	54	Tarrant	35
Callahan	35	Guadalupe	16	Mason	37	Taylor	7
Cameron	8	Hale	54	Matagorda	37	Terrell	18
Camp	38	Hall	54	Maverick	41	Terry	54
Carson	7	Hamilton	38	McCulloch	54	Throckmorton	54
Cass	38	Hansford	54	McLennan	16	Titus	38
Castro	54	Hardeman	54	McMullen	41	Tom Green	7
Chambers	56	Hardin	56	Medina	16	Travis	16
Cherokee	38	Harris	56	Menard	54	Trinity	38
Childress	54	Harrison	63	Midland	7	Tyler	38
Clay	35	Hartley	54	Milam	38	Upshur	11
Cochran	54	Haskell	54	Mills	54	Upton	54
Coke	54	Hays	16	Mitchell	54	Uvalde	41
Coleman	54	Hemphill	54	Montague	54	Val Verde	18
Collin	35	Henderson	38	Montgomery	56	Van Zandt	38
Collingsworth	54	Hidalgo	8	Moore	54	Victoria	14
Colorado	37	Hill	38	Morris	38	Walker	38
Comal	16	Hockley	54	Motley	54	Waller	56
Comanche	54	Hood	38	Nacogdoches	38	Ward	54
Concho	54	Hopkins	38	Navarro	38	Washington	38
Cooke	54	Houston	38	Newton	38	Webb	8
Coryell	16	Howard	54	Nolan	54	Wharton	37
Cottle	54	Hudspeth	18	Nueces	40	Wheeler	54
Crane	54	Hunt	35	Ochiltree	54	Wichita	12
Crockett	18	Hutchinson	54	Oldham	54	Wilbarger	54
Crosby	7	Irion	7	Orange	56	Willacy	41
Culberson	18	Jack	38	Palo Pinto	38	Williamson	16
Dallam	54	Jackson	37	Panola	38	Wilson	16
Dallas	35	Jasper	38	Parker	35	Winkler	54
Dawson	54	Jeff Davis	18	Parmer	54	Wise	35
Deaf Smith	54	Jefferson	56	Pecos	18	Wood	38
Delta	35	Jim Hogg	41	Polk	38	Yoakum	54
Denton	35	Jim Wells	37	Potter	7	Young	54
DeWitt	37	Johnson	35	Presidio	18	Zapata	41
Dickens	54	Jones	35	Rains	38	Zavala	41
Dimmit	41			Randall	7		

Revised 1-2-15

Special Provisions

Special Provision to Item 000
Nondiscrimination

1. DESCRIPTION

All recipients of federal financial assistance are required to comply with various nondiscrimination laws including Title VI of the Civil Rights Act of 1964, as amended, (Title VI). Title VI forbids discrimination against anyone in the United States on the grounds of race, color, or national origin by any agency receiving federal funds.

Texas Department of Transportation, as a recipient of Federal financial assistance, and under Title VI and related statutes, ensures that no person shall on the grounds of race, religion (where the primary objective of the financial assistance is to provide employment per 42 U.S.C. § 2000d-3), color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any Department programs or activities.

2. DEFINITION OF TERMS

Where the term “Contractor” appears in the following six nondiscrimination clauses, the term “Contractor” is understood to include all parties to Contracts or agreements with the Texas Department of Transportation.

3. NONDISCRIMINATION PROVISIONS

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

3.1. **Compliance with Regulations**. The Contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract.

3.2. **Nondiscrimination**. The Contractor, with regard to the work performed by it during the Contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3.3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this Contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.

3.4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Recipient or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

3.5. **Sanctions for Noncompliance**. In the event of a Contractor's noncompliance with the Nondiscrimination provisions of this Contract, the Recipient will impose such Contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

- withholding payments to the Contractor under the Contract until the Contractor complies, and/or
- cancelling, terminating, or suspending a Contract, in whole or in part.

3.6. **Incorporation of Provisions**. The Contractor will include the provisions of paragraphs (3.1) through (3.6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

4. PERTINENT NONDISCRIMINATION AUTHORITIES:

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

4.1. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.

4.2. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

4.3. Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);

4.4. Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;

4.5. The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

4.6. Airport and Airway Improvement Act of 1982, (49 U.S.C. § 4 71, Section 4 7123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

4.7. The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, subrecipients and Contractors, whether such programs or activities are Federally funded or not);

4.8. Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

4.9. The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

4.10. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

4.11. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

4.12. Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U .S.C. 1681 et seq).

Special Provision to Item 000

Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity (Executive Order 11246)

1. GENERAL

In addition to the affirmative action requirements of the Special Provision titled "Standard Federal Equal Employment Opportunity Construction Contract Specifications" as set forth elsewhere in this proposal, the Bidder's attention is directed to the specific requirements for utilization of minorities and females as set forth below.

2. GOALS

2.1. Goals for minority and female participation are hereby established in accordance with 41 CFR 60-4.

2.2. The goals for minority and female participation expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area are as follows:

Goals for minority participation in each trade, %	Goals for female participation in each trade, %
See Table 1	6.9

2.3. These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it will apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction. The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 will be based on its implementation of the Standard Federal Equal Employment Opportunity Construction Contract Specifications Special Provision and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the Contract, and in each trade, and the Contractor must make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority and female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals will be a violation of the Contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

2.4. A Contractor or subcontractor will be considered in compliance with these provisions by participation in the Texas Highway-Heavy Branch, AGC, Statewide Training and Affirmative Action Plan. Provided that each Contractor or subcontractor participating in this plan must individually comply with the equal opportunity clause set forth in 41 CFR 60-1.4 and must make a good faith effort to achieve the goals set forth for each participating trade in the plan in which it has employees. The overall good performance of other Contractors and subcontractors toward a goal in an approved plan does not excuse any covered Contractor's or subcontractor's failure to make good faith efforts to achieve the goals contained in these provisions. Contractors or subcontractors participating in the plan must be able to demonstrate their participation and document their compliance with the provisions of this Plan.

3. SUBCONTRACTING

The Contractor must provide written notification to the Department within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the Contract resulting from this solicitation pending concurrence of the Department in the award. The notification will list the names,

address and telephone number of the subcontractor; employer identification number; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the Contract is to be performed.

4. COVERED AREA

As used in this special provision, and in the Contract resulting from this solicitation, the geographical area covered by these goals for female participation is the State of Texas. The geographical area covered by these goals for other minorities are the counties in the State of Texas as indicated in Table 1.

5. REPORTS

The Contractor is hereby notified that he may be subject to the Office of Federal Contract Compliance Programs (OFCCP) reporting and record keeping requirements as provided for under Executive Order 11246 as amended. OFCCP will provide direct notice to the Contractor as to the specific reporting requirements that he will be expected to fulfill.

Table 1
Goals for Minority Participation

County	Participation, %	County	Participation, %
Anderson	22.5	Chambers	27.4
Andrews	18.9	Cherokee	22.5
Angelina	22.5	Childress	11.0
Aransas	44.2	Clay	12.4
Archer	11.0	Cochran	19.5
Armstrong	11.0	Coke	20.0
Atascosa	49.4	Coleman	10.9
Austin	27.4	Collin	18.2
Bailey	19.5	Collingsworth	11.0
Bandera	49.4	Colorado	27.4
Bastrop	24.2	Comal	47.8
Baylor	11.0	Comanche	10.9
Bee	44.2	Concho	20.0
Bell	16.4	Cooke	17.2
Bexar	47.8	Coryell	16.4
Blanco	24.2	Cottle	11.0
Borden	19.5	Crane	18.9
Bosque	18.6	Crockett	20.0
Bowie	19.7	Crosby	19.5
Brazoria	27.3	Culberson	49.0
Brazos	23.7	Dallam	11.0
Brewster	49.0	Dallas	18.2
Briscoe	11.0	Dawson	19.5
Brooks	44.2	Deaf Smith	11.0
Brown	10.9	Delta	17.2
Burleson	27.4	Denton	18.2
Burnet	24.2	DeWitt	27.4
Caldwell	24.2	Dickens	19.5
Calhoun	27.4	Dimmit	49.4
Callahan	11.6	Donley	11.0
Cameron	71.0	Duval	44.2
Camp	20.2	Eastland	10.9
Carson	11.0	Ector	15.1
Cass	20.2	Edwards	49.4
Castro	11.0	Ellis	18.2

County	Participation, %	County	Participation, %
El Paso	57.8	Kenedy	44.2
Erath	17.2	Kent	10.9
Falls	18.6	Kerr	49.4
Fannin	17.2	Kimble	20.0
Fayette	27.4	King	19.5
Fisher	10.9	Kinney	49.4
Floyd	19.5	Kleberg	44.2
Foard	11.0	Knox	10.9
Fort Bend	27.3	Lamar	20.2
Franklin	17.2	Lamb	19.5
Freestone	18.6	Lampasas	18.6
Frio	49.4	LaSalle	49.4
Gaines	19.5	Lavaca	27.4
Galveston	28.9	Lee	24.2
Garza	19.5	Leon	27.4
Gillespie	49.4	Liberty	27.3
Glasscock	18.9	Limestone	18.6
Goliad	27.4	Lipscomb	11.0
Gonzales	49.4	Live Oak	44.2
Gray	11.0	Llano	24.2
Grayson	9.4	Loving	18.9
Gregg	22.8	Lubbock	19.6
Grimes	27.4	Lynn	19.5
Guadalupe	47.8	Madison	27.4
Hale	19.5	Marion	22.5
Hall	11.0	Martin	18.9
Hamilton	18.6	Mason	20.0
Hansford	11.0	Matagorda	27.4
Hardeman	11.0	Maverick	49.4
Hardin	22.6	McCulloch	20.0
Harris	27.3	McLennan	20.7
Harrison	22.8	McMullen	49.4
Hartley	11.0	Medina	49.4
Haskell	10.9	Menard	20.0
Hays	24.1	Midland	19.1
Hemphill	11.0	Milam	18.6
Henderson	22.5	Mills	18.6
Hidalgo	72.8	Mitchell	10.9
Hill	18.6	Montague	17.2
Hockley	19.5	Montgomery	27.3
Hood	18.2	Moore	11.0
Hopkins	17.2	Morris	20.2
Houston	22.5	Motley	19.5
Howard	18.9	Nacogdoches	22.5
Hudspeth	49.0	Navarro	17.2
Hunt	17.2	Newton	22.6
Hutchinson	11.0	Nolan	10.9
Irion	20.0	Nueces	41.7
Jack	17.2	Ochiltree	11.0
Jackson	27.4	Oldham	11.0
Jasper	22.6	Orange	22.6
Jeff Davis	49.0	Palo Pinto	17.2
Jefferson	22.6	Panola	22.5
Jim Hogg	49.4	Parker	18.2
Jim Wells	44.2	Parmer	11.0
Johnson	18.2	Pecos	18.9
Jones	11.6	Polk	27.4
Karnes	49.4	Potter	9.3
Kaufman	18.2	Presidio	49.0
Kendall	49.4	Randall	9.3

County	Participation, %	County	Participation, %
Rains	17.2	Reagan	20.0
Real	49.4	Throckmorton	10.9
Red River	20.2	Titus	20.2
Reeves	18.9	Tom Green	19.2
Refugio	44.2	Travis	24.1
Roberts	11.0	Trinity	27.4
Robertson	27.4	Tyler	22.6
Rockwall	18.2	Upshur	22.5
Runnels	20.0	Upton	18.9
Rusk	22.5	Uvalde	49.4
Sabine	22.6	Val Verde	49.4
San Augustine	22.5	Van Zandt	17.2
San Jacinto	27.4	Victoria	27.4
San Patricio	41.7	Walker	27.4
San Saba	20.0	Waller	27.3
Schleicher	20.0	Ward	18.9
Scurry	10.9	Washington	27.4
Shackelford	10.9	Webb	87.3
Shelby	22.5	Wharton	27.4
Sherman	11.0	Wheeler	11.0
Smith	23.5	Wichita	12.4
Somervell	17.2	Wilbarger	11.0
Starr	72.9	Willacy	72.9
Stephens	10.9	Williamson	24.1
Sterling	20.0	Wilson	49.4
Stonewall	10.9	Winkler	18.9
Sutton	20.0	Wise	18.2
Swisher	11.0	Wood	22.5
Tarrant	18.2	Yoakum	19.5
Taylor	11.6	Young	11.0
Terrell	20.0	Zapata	49.4
Terry	19.5	Zavala	49.4

Special Provision to Item 000

Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)

1. GENERAL

1.1. As used in these specifications:

- "Covered area" means the geographical area described in the solicitation from which this Contract resulted;
- "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
- "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
- "Minority" includes:
  - Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
  - Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
  - Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
  - American Indian or Alaskan Native (all persons having origins in any of the original peoples of North American and maintaining identifiable tribal affiliations through membership and participation or community identification).

1.2. Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it will physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this Contract resulted.

1.3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U. S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) will be in accordance with that plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the equal employment opportunity (EEO) clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

1.4. The Contractor will implement the specific affirmative action standards provided in Section 1.7.1. through Section 1.7.16. of these specifications. The goals set forth in the solicitation from which this Contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction Contractors performing Contracts in geographical areas where they do not have a Federal or federally assisted construction Contract will apply the minority and female goals established for the geographical area where the Contract is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or any Federal procurement contracting officer. The

Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

1.5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women will excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

1.6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U. S. Department of Labor.

1.7. The Contractor will take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications will be based upon its effort to achieve maximum results from its actions. The Contractor will document these efforts fully, and will implement affirmative action steps at least as extensive as the following:

1.7.1. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor will specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

1.7.2. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

1.7.3. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this will be documented in the file with the reason therefor, along with whatever additional actions the Contractor may have taken.

1.7.4. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral Process has impeded the Contractor's efforts to meet its obligations.

1.7.5. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor will provide notice of these programs to the sources compiled under 7b above.

1.7.6. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and Collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

1.7.7. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other

employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., before the initiation of construction work at any job site. A written record must be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

1.7.8. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

1.7.9. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month before the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor will send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

1.7.10. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

1.7.11. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

1.7.12. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

1.7.13. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment-related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

1.7.14. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities will be provided to assure privacy between the sexes.

1.7.15. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.

1.7.16. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

1.8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (Section 7.1. through Section 7.16.). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under Section 7.1. through Section 7.16. of these Specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation will not be a defense for the Contractor's noncompliance.

1.9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor

Special Provision to Item 000
Special Labor Provisions for State Projects

1. GENERAL

This is a "Public Works" Project, as provided under Government Code Title 10, Chapter 2258, "Prevailing Wage Rates," and is subject to the provisions of the Statute. No provisions in the Contract are intended to be in conflict with the provisions of the Statute.

The Texas Transportation Commission has ascertained and indicated in the special provisions the regular rate of per diem wages prevailing in each locality for each craft or type of worker. Apply the wage rates contained in the specifications as minimum wage rates for the Contract.

2. MINIMUM WAGES, HOURS AND CONDITIONS OF EMPLOYMENT

All workers necessary for the satisfactory completion of the work are within the purview of the Contract.

Whenever and wherever practical, give local citizens preference in the selection of labor.

Do not require any worker to lodge, board or trade at a particular place, or with a particular person as a condition of employment.

Do not charge or accept a fee of any from any person who obtains work on the project. Do not require any person who obtains work on the project to pay any fee to any other person or agency obtaining employment for the person on the project.

Do not charge for tools or equipment used in connection with the duties performed, except for loss or damage of property. Do not charge for necessary camp water.

Do not charge for any transportation furnished to any person employed on the project.

The provisions apply where work is performed by piece work, station work, etc. The minimum wage paid will be exclusive of equipment rental on any shipment which the worker or subcontractor may furnish in connection with his work.

Take responsibility for carrying out the requirements of this specification and ensure that each subcontractor working on the project complies with its provisions.

Any form of subterfuge, coercion or deduction designated to evade, reduce or discount the established minimum wage scales will be considered a violation of the Contract.

The Fair Labor Standards Acts (FLSA) established one and one-half (1-1/2) pay for overtime in excess of 40 hours worked in 1 week. Do not consider time consumed by the worker in going to and returning from the place of work as part of the hours of work. Do not require or permit any worker to work in excess of 40 hours in 1 week, unless the worker receives compensation at a rate not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek.

The general rates of per diem wages prevailing in this locality for each class and type of workers whose services are considered necessary to fulfill the Contract are indicated in the special provisions, and these rates govern as minimum wage rates on this Contract. A penalty of $60.00 per calendar day or portion of a calendar day for each worker that is paid less than the stipulated general rates of per diem wages for any work done under the Contract will be deducted. The Department, upon receipt of a complaint by a worker,

will determine within 30 days whether good cause exists to believe that the Contractor or a subcontractor has violated wage rate requirements and notify the parties involved of the findings. Make every effort to resolve the alleged violation within 14 days after notification. The next alternative is submittal to binding arbitration in accordance with the provisions of the Texas General Arbitration Act (Art. 224 et seq., Revised Statutes).

Notwithstanding any other provision of the Contract, covenant and agree that the Contractor and its subcontractors will pay each of their employees and contract labor engaged in any way in work under the Contract, a wage not less than what is generally known as the “federal minimum wage” as set out in 29 U.S.C. 206 as that Statute may be amended from time to time.

Pay any worker employed whose position is not listed in the Contract, a wage not less than the per diem wage rate established in the Contract for a worker whose duties are most nearly comparable.

3. RECORD AND INSPECTIONS

Keep copies of weekly payrolls for review. Require subcontractors to keep copies of weekly payrolls for review. Show the name, occupation, number of hours worked each day and per diem wage paid each worker together with a complete record of all deductions made from such wages. Keep records for a period of 3 years from the date of completion of the Contract.

Where the piece-work method is used, indicate on the payroll for each person involved:

- Quantity of piece work performed.
- Price paid per piece-work unit.
- Total hours employed.

The Engineer may require the Contractor to file an affidavit for each payroll certifying that payroll is a true and accurate report of the full wages due and paid to each person employed.

Post or make available to employees the prevailing wage rates from the Contract. Require subcontractors to post or make available to employees the prevailing wage rates from the Contract.

may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

1.10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

1.11. The Contractor will not enter into any Subcontract with any person or firm debarred from Government Contracts pursuant to Executive Order 11246.

1.12. The Contractor will carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties will be in violation of these specifications and Executive Order 11246, as amended.

1.13. The Contractor, in fulfilling its obligations under these specifications, will implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director will proceed in accordance with 41 CFR 60-4.8.

1.14. The Contractor will designate a responsible official to monitor all employment-related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records must at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records must be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, Contractors shall not be required to maintain separate records.

1.15. Nothing herein provided will be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

1.16. In addition to the reporting requirements set forth elsewhere in this Contract, the Contractor and the subcontractors holding subcontracts, not including material suppliers, of $10,000 or more, will submit for every month of July during which work is performed, employment data as contained under Form PR 1391 (Appendix C to 23 CFR, Part 230), and in accordance with the included instructions.

TECHNICAL SPECIFICATIONS

Item 100
Preparing Right of Way

1. DESCRIPTION

Prepare the right of way and designated easements for construction operations by removing and disposing of all obstructions when removal of such obstructions is not specifically shown on the plans to be paid by other Items.

2. CONSTRUCTION

Protect designated features on the right of way and prune trees and shrubs as directed. Do not park equipment, service equipment, store materials, or disturb the root area under the branches of trees designated for preservation. Treat cuts on trees with an approved tree wound dressing within 20 min. of making a pruning cut or otherwise causing damage to the tree when shown on the plans. Follow all local and state regulations when burning. Pile and burn brush at approved locations as directed. Coordinate work with state and federal authorities when working in state or national forests or parks. Test, remove, and dispose of hazardous materials in accordance with Article 6.10., "Hazardous Materials."

Clear areas shown on the plans of all obstructions, except those landscape features that are to be preserved. Such obstructions include remains of houses and other structures, foundations, floor slabs, concrete, brick, lumber, plaster, septic tank drain fields, basements, abandoned utility pipes or conduits, equipment, fences, retaining walls, and other items as specified on the plans. Remove vegetation and other landscape features not designated for preservation, curb and gutter, driveways, paved parking areas, miscellaneous stone, sidewalks, drainage structures, manholes, inlets, abandoned railroad tracks, scrap iron, and debris, whether above or below ground. Removal of live utility facilities is not included in this Item. Remove culverts, storm sewers, manholes, and inlets in proper sequence to maintain traffic and drainage.

Notify the Engineer in writing when items not shown on the plans and not reasonably detectable (buried with no obvious indication of presence) are encountered and required to be removed. These items will be handled in accordance with Article 4.5., "Differing Site Conditions."

Remove obstructions not designated for preservation to 2 ft. below natural ground in areas receiving embankment. Remove obstructions to 2 ft. below the excavation level in areas to be excavated. Remove obstructions to 1 ft. below natural ground in all other areas. Cut trees and stumps off to ground level when allowed by the plans or directed. Plug the remaining ends of abandoned underground structures over 3 in. in diameter with concrete to form a tight closure. Backfill, compact, and restore areas where obstructions have been removed unless otherwise directed. Use approved material for backfilling. Dispose of wells in accordance with Item 103, "Disposal of Wells."

Accept ownership, unless otherwise directed, and dispose of removed materials and debris at locations off the right of way in accordance with local, state, and federal requirements.

3. MEASUREMENT

This Item will be measured by the acre; by the 100-ft. station, regardless of the width of the right of way; or by each tree removed.

4. PAYMENT

For "acre" and "station" measurement, the work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Preparing Right of Way." For "each"

Item 110
Excavation

1. DESCRIPTION

Excavate areas as shown on the plans or as directed. Remove materials encountered to the lines, grades, and typical sections shown on the plans and cross-sections.

2. CONSTRUCTION

Accept ownership of unsuitable or excess material and dispose of material in accordance with local, state, and federal regulations at locations outside the right of way.

Maintain drainage in the excavated area to avoid damage to the roadway section. Correct any damage to the subgrade caused by weather at no additional cost to the Department.

Shape slopes to avoid loosening material below or outside the proposed grades. Remove and dispose of slides as directed.

2.1. Rock Cuts. Excavate to finish subgrade. Manipulate and compact subgrade in accordance with Section 132.3.4., "Compaction Methods," unless excavation is to clean homogenous rock at finish subgrade elevation. Use approved embankment material compacted in accordance with Section 132.3.4., "Compaction Methods," to replace undercut material at no additional cost if excavation extends below finish subgrade.

2.2. Earth Cuts. Excavate to finish subgrade. Scarify subgrade to a uniform depth at least 6 in. below finish subgrade elevation in areas where base or pavement structure will be placed on subgrade. Manipulate and compact subgrade in accordance with Section 132.3.4., "Compaction Methods."

Take corrective measures as directed if unsuitable material is encountered below subgrade elevations.

2.3. Subgrade Tolerances. Excavate to within 1/2 in. in cross-section and 1/2 in. in 16 ft. measured longitudinally for turnkey construction. Excavate to within 0.1 ft. in cross-section and 0.1 ft. in 16 ft. measured longitudinally for staged construction.

3. MEASUREMENT

This Item will be measured by the cubic yard in its original position as computed by the method of average end areas.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Limits of measurement for excavation in retaining wall areas will be as shown on the plans.

Shrinkage or swelling factors will not be considered in determining the calculated quantities.

4. PAYMENT

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 (Roadway)," "Excavation (Channel),"

"Excavation (Special)," or "Excavation (Roadway and Channel)." This price is full compensation for authorized excavation; drying; undercutting subgrade and reworking or replacing the undercut material in rock cuts; hauling; disposal of material not used elsewhere on the project; scarification and compaction; and equipment, labor, materials, tools, and incidentals.

Drying required deeper than 6 in. below subgrade elevation will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Excavation and replacement of unsuitable material below subgrade elevations will be performed and paid for in accordance with the applicable bid items. However, if Item 132, "Embankment," is not included in the Contract, payment for replacement of unsuitable material will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

When a slide not due to the Contractor's negligence or operation occurs, payments for removal and disposal of the slide material will be in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Excavation in backfill areas of retaining walls will not be measured or paid for directly but will be subsidiary to pertinent Items.

Item 132
Embankment

1. DESCRIPTION

Furnish, place, and compact materials for construction of roadways, embankments, levees, dikes, or any designated section of the roadway where additional material is required.

2. MATERIALS

Furnish approved material capable of forming a stable embankment from required excavation in the areas shown on the plans or from sources outside the right of way. Provide one or more of the following types as shown on the plans:

- Type A. Granular material that is free from vegetation or other objectionable material and meets the requirements of Table 1.

Table 1
Testing Requirements

Property	Test Method	Specification Limit
Liquid limit	Tex-104-E	≤ 45
Plasticity index (PI)	Tex-106-E	≤ 15
Bar linear shrinkage	Tex-107-E	≥ 2

Perform the Linear Shrinkage test only as indicated in Tex-104-E.

- Type B. Materials such as rock, loam, clay, or other approved materials.
- Type C. Material meeting the specification requirements shown on the plans. Type C may be further designated as Type C1, C2, etc.
- Type D. Material from required excavation areas shown on the plans.

Meet the requirements of the pertinent retaining wall Items for retaining wall backfill material.

3. CONSTRUCTION

Meet the requirements of Item 7, "Legal Relations and Responsibilities," when off right of way sources are used. Notify the Engineer before opening a material source to allow for required testing. Complete preparation of the right of way in accordance with Item 100, "Preparing Right of Way," for areas to receive embankment.

Backfill tree-stump holes or other minor excavations with approved material and tamp. Restore the ground surface, including any material disked loose or washed out, to its original slope. Compact the ground surface by sprinkling in accordance with Item 204, "Sprinkling," and by rolling using equipment complying with Item 210, "Rolling," when directed.

Scarify and loosen the unpaved surface areas, except rock, to a depth of at least 6 in. unless otherwise shown on the plans. Bench slopes before placing material. Begin placement of material at the toe of slopes. Do not place trees, stumps, roots, vegetation, or other objectionable material in the embankment. Simultaneously recompact scarified material with the placed embankment material. Do not exceed the layer depth specified in Section 132.3.4., "Compaction Methods."

Construct embankments to the grade and sections shown on the plans. Construct the embankment in layers approximately parallel to the finished grade for the full width of the individual roadway cross-sections unless

otherwise shown on the plans. Ensure that each section of the embankment conforms to the detailed sections or slopes. Maintain the finished section, density, and grade until the project is accepted.

3.1. Earth Embankments. Earth embankment is mainly composed of material other than rock. Construct embankments in successive layers, evenly distributing materials in lengths suited for sprinkling and rolling.

Treat material in accordance with Item 260, "Lime Treatment (Road-Mixed)" or Item 275, "Cement Treatment (Road-Mixed)" when required. Obtain approval to incorporate rock and broken concrete produced by the construction project in the lower layers of the embankment. Place the rock and concrete outside the limits of the completed roadbed when the size of approved rock or broken concrete exceeds the layer thickness requirements in Section 132.3.4., "Compaction Methods." Cut and remove all exposed reinforcing steel from the broken concrete.

Move the material dumped in piles or windrows by blading or by similar methods and incorporate it into uniform layers. Featheredge or mix abutting layers of dissimilar material for at least 100 ft. to ensure there are no abrupt changes in the material. Break down clods or lumps of material and mix embankment until a uniform material is attained.

Apply water free of industrial wastes and other objectionable matter to achieve the uniform moisture content specified for compaction.

Roll and sprinkle each embankment layer in accordance with Section 132.3.4.1., "Ordinary Compaction," when ordinary compaction is specified. Compact the layer to the required density in accordance with Section 132.3.4.2., "Density Control," when density control is specified.

3.2. Rock Embankments. Rock embankment is mainly composed of rock. Construct rock embankments in successive layers for the full width of the roadway cross-section with a depth of 18 in. or less. Increase the layer depth for large rock sizes as approved. Do not exceed a depth of 2-1/2 ft. in any case. Fill voids created by the large stone matrix with smaller stones during the placement and filling operations.

Ensure the depth of the embankment layer is greater than the maximum dimension of any rock. Do not place rock greater than 2 ft. in its maximum dimension, unless otherwise approved. Construct the final layer with graded material so that the density and uniformity is in accordance with Section 132.3.4., "Compaction Methods." Break up exposed oversized material as approved.

Roll and sprinkle each embankment layer in accordance with Section 132.3.4.1., "Ordinary Compaction," when ordinary compaction is specified. Compact each layer to the required density in accordance with Section 132.3.4.2., "Density Control," when density control is specified. Proof-roll each rock layer as directed, where density testing is not possible, in accordance with Item 216, "Proof Rolling," to ensure proper compaction.

3.3. Embankments Adjacent to Culverts and Bridges. Compact embankments adjacent to culverts and bridges in accordance with Item 400, "Excavation and Backfill for Structures."

3.4. Compaction Methods. Begin rolling longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least 1/2 the width of the roller. Begin rolling at the lower side and progress toward the high side on super elevated curves. Alternate roller trips to attain slightly different lengths. Compact embankments in accordance with Section 132.4.1., "Ordinary Compaction," or Section 132.3.4.2., "Density Control," as shown on the plans.

3.4.1. Ordinary Compaction. Use approved rolling equipment complying with Item 210, "Rolling," to compact each layer. Use specific equipment when required by the plans or the Engineer. Do not allow the loose depth of any layer to exceed 8 in., unless otherwise approved. Bring each layer to the moisture content directed before and during rolling operations. Compact each layer until there is no evidence of further consolidation. Maintain a level layer to ensure uniform compaction. Recompact and refinish the subgrade at no additional expense to the Department if the required stability or finish is lost for any reason.

3.4.2. **Density Control**. Compact each layer to the required density using equipment complying with Item 210, "Rolling." Determine the maximum lift thickness based on the ability of the compacting operation and equipment to meet the required density. Do not exceed layer thickness of 16 in. loose or 12 in. compacted material unless otherwise approved. Maintain a level layer to ensure uniform compaction.

The Engineer will use Tex-114-E to determine the maximum dry density (D_a) and optimum moisture content (W_{opt}). Meet the requirements for field density and moisture content in Table 2 unless otherwise shown on the plans.

Table 2
Field Density Control Requirements

Description	Density	Moisture Content
	Tex-115-E	
PI ≤ 15	≥ 98% D_a	
15 < PI ≤ 35	≥ 98% D_a and ≤ 102% D_a	≥ $W_{opt.}$
PI > 35	≥ 95% D_a and ≤ 100% D_a	≥ $W_{opt.}$

Each layer is subject to testing by the Engineer for density and moisture content. During compaction, the moisture content of the soil should not exceed the value shown on the moisture-density curve, above optimum, required to achieve:

- 98% dry density for soils with a PI greater than 15 but less than or equal to 35 or
- 95% dry density for soils with PI greater than 35.

Remove small areas of the layer to allow for density tests as required. Replace the removed material and recompact at no additional expense to the Department. Proof-roll in accordance with Item 216, "Proof Rolling," when shown on the plans or as directed. Correct soft spots as directed.

3.5. **Maintenance of Moisture and Reworking**. Maintain the density and moisture content once all requirements in Table 2 are met. Maintain the moisture content no lower than 4% below optimum for soils with a PI greater than 15. Rework the material to obtain the specified compaction when the material loses the required stability, density, moisture, or finish. Alter the compaction methods and procedures on subsequent work to obtain specified density as directed.

3.6. **Acceptance Criteria**.

3.6.1. **Grade Tolerances**.

3.6.1.1. **Staged Construction**. Grade to within 0.1 ft. in the cross-section and 0.1 ft. in 16 ft. measured longitudinally.

3.6.1.2. **Turnkey Construction**. Grade to within 1/2 in. in the cross-section and 1/2 in. in 16 ft. measured longitudinally.

3.6.2. **Gradation Tolerances**. Ensure no more than 1 of the 5 most recent gradation tests is outside the specified limits on any individual sieve by more than 5% when gradation requirements are shown on the plans.

3.6.3. **Density Tolerances**. Ensure no more than 1 of the 5 most recent density tests for compaction work is outside the specified density limits, and no test is outside the limits by more than 3 pcf.

3.6.4. **Plasticity Tolerances**. Ensure no more than 1 of the 5 most recent PI tests for material is outside the specified limit by more than 2 points.

4. MEASUREMENT

Embankment will be measured by the cubic yard. Measurement will be further defined for payment as follows:

4.1. Final. The cubic yard will be measured in its final position using the average end area method. The volume is computed between the original ground surface or the surface upon which the embankment is to be constructed and the lines, grades, and slopes of the embankment. In areas of salvaged topsoil, payment for embankment will be made in accordance with Item 160, "Topsoil." Shrinkage or swell factors will not be considered in determining the calculated quantities.

4.2. Original. The cubic yard will be measured in its original and natural position using the average end area method.

4.3. Vehicle. The cubic yard will be measured in vehicles at the point of delivery.

When measured by the cubic yard in its final position, this is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

Shrinkage or swell factors are the Contractor's responsibility. When shown on the plans, factors are for informational purposes only.

Measurement of retaining wall backfill in embankment areas is paid for as embankment unless otherwise shown on the plans. Limits of measurement for embankment in retaining wall areas are shown on the plans.

5. PAYMENT

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 "Embankment (Final)," "Embankment (Original)," or "Embankment (Vehicle)" of the compaction method and type specified. This price is full compensation for furnishing embankment; hauling; placing, compacting, finishing, and reworking; disposal of waste material; and equipment, labor, tools, and incidentals.

When proof rolling is directed, it will be paid for in accordance with Item 216, "Proof Rolling."

All sprinkling and rolling, except proof rolling, will not be paid for directly but will be considered subsidiary to this Item, unless otherwise shown on the plans.

Where subgrade is constructed under this Contract, correction of soft spots in the subgrade will be at the Contractor's expense. Where subgrade is not constructed under this Contract, correction of soft spots in the subgrade will be paid in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

Item 164
Seeding for Erosion Control

1. DESCRIPTION

Provide and install temporary or permanent seeding for erosion control as shown on the plans or as directed.

2. MATERIALS

2.1. Seed. Provide seed from the previous season's crop meeting the requirements of the Texas Seed Law, including the testing and labeling for pure live seed (PLS = Purity × Germination). Furnish seed of the designated species, in labeled unopened bags or containers to the Engineer before planting. Use within 12 mo. from the date of the analysis. When Buffalograss is specified, use seed that is treated with KNO_3 (potassium nitrate) to overcome dormancy.

Use Tables 1–4 to determine the appropriate seed mix and rates as specified on the plans. If a plant species is not available by the producers, the other plant species in the recommended seed mixture will be increased proportionally by the PLS/acre of the missing plant species.

Table 1
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
1 (Paris) Feb. 1–May 15	Green Sprangletop Sideoats Grama (Haskell) Bermudagrass Little Bluestem (Native) Illinois Bundleflower	0.3 3.2 1.8 1.7 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sand Lovegrass Weeping Lovegrass (Ermelo) Partridge Pea	0.3 1.5 6.0 0.6 0.8 1.0
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Purple Prairie Clover (Cuero) Engelmann Daisy (Eldorado) Illinois Bundleflower Awnless Bushsunflower (Plateau)	1.0 1.0 1.0 0.4 0.2 0.8 0.6 0.75 1.3 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Slender Grama (Dilley) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover	1.0 0.2 0.2 0.4 1.0 0.2 0.2 0.6 0.8 0.75 0.3
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Blue Grama (Hachita) Western Wheatgrass (Barton) Galleta Grass (Viva) Engelmann Daisy (Eldorado) Awnless Bushsunflower (Plateau)	0.6 1.0 1.0 0.4 0.2 0.8 0.4 1.2 0.6 0.75 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover (Cuero)	1.0 0.2 0.2 0.4 0.2 0.2 0.6 0.8 0.75 0.3
4 (Amarillo) Feb. 15–May 15	Green Sprangletop Sideoats Grama (Haskell) Blue Grama (Hachita) Buffalograss (Texoka) Illinois Bundleflower	0.3 3.6 1.2 1.6 1.0	Green Sprangletop Weeping Lovegrass (Ermelo) Blue Grama (Hachita) Sand Dropseed (Borden Co.) Sand Bluestem Purple Prairie Clover	0.3 0.8 1.0 0.3 1.8 0.5

Table 1 (continued)

Permanent Rural Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
5 (Lubbock) Feb. 15–May 15	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Buffalograss (Texoka) Illinois Bundleflower	0.3 3.6 1.2 1.6 1.0	Green Sprangletop Weeping Lovegrass (Ermelo) Blue Grama (Hachita) Sand Dropseed (Borden Co.) Sand Bluestem Purple Prairie Clover	0.3 0.8 1.0 0.3 1.8 0.5
6 (Odessa) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Blue Grama (Hachita) Galleta Grass (Viva) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Alkali Sacaton (Saltalk) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Whiplash Pappusgrass (Webb) Arizona Cottontop (La Salle)	1.0 1.0 0.4 0.6 0.2 0.6 0.2 0.2 0.1 0.6 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Blue Grama (Hachita) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Indian Ricegrass (Rim Rock) Sand Bluestem (Cottle County) Little Bluestem (Pastura) Purple Prairie Clover (Cuero)	1.0 0.2 0.4 0.4 0.2 0.2 1.6 1.2 0.8 0.3
7 (San Angelo) Feb. 1–May 1	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Blue Grama (Hachita) Western Wheatgrass (Barton) Galleta Grass (Viva) Engelmann Daisy (Eldorado) Illinois Bundleflower (Sabine)	1.0 1.0 1.0 0.4 0.2 0.4 0.4 1.2 0.6 0.75 1.0	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Sand Bluestem (Cottle County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover (Cuero)	1.0 0.2 0.2 0.4 0.2 0.2 1.2 0.6 0.8 0.75 0.3
8 (Abilene) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Blue Grama (Hachita) Western Wheatgrass (Barton) Galleta Grass (Viva) Engelmann Daisy (Eldorado) Illinois Bundleflower (Sabine)	1.0 1.0 1.0 0.4 0.2 0.4 0.4 1.2 0.6 0.75 1.0	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Sand Bluestem (Cottle County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover (Cuero)	1.0 0.2 0.2 0.4 0.2 0.2 1.2 0.6 0.8 0.75 0.3
9 (Waco) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Purple Prairie Clover (Cuero) Engelmann Daisy (Eldorado) Illinois Bundleflower Awnless Bushsunflower (Plateau)	1.0 1.0 1.0 0.4 0.2 0.8 0.6 0.75 1.3 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Slender Grama (Dilley) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover	1.0 0.2 0.2 0.4 1.0 0.2 0.2 0.6 0.8 0.75 0.3
10 (Tyler) Feb. 1–May 15	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sideoats Grama (Haskell) Illinois Bundleflower	0.3 1.8 9.0 2.7 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Weeping Lovegrass (Ermelo) Sand Lovegrass Lance-Leaf Coreopsis	0.3 1.8 9.0 0.5 0.5 1.0
11 (Lufkin) Feb. 1–May 15	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sideoats Grama (Haskell) Illinois Bundleflower	0.3 1.8 9.0 2.7 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sand Lovegrass Lance-Leaf Coreopsis	0.3 2.1 9.0 0.5 1.0

Permanent Rural Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
12 (Houston) Jan. 15–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell) Little Bluestem (Native) Illinois Bundleflower	0.3 2.1 3.2 1.4 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Weeping Lovegrass (Ermelo) Lance-Leaf Coreopsis	0.3 2.4 10.5 1.0 1.0
13 (Yoakum) Jan. 15–May 15	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Slender Grama (Dilley) Shortspike Windmillgrass (Welder) Halls Panicum (Oso) Plains Bristlegrass (Catarina Blend) Canada Wildrye (Lavaca) Illinois Bundleflower (Sabine) Purple Prairie Clover (Cuero)	1.0 1.0 1.5 1.0 0.3 0.2 0.2 2.0 1.3 0.6	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Slender Grama (Dilley) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Purple Prairie Clover (Cuero) Partridge Pea (Comanche) Englemann Daisy (Eldorado)	1.0 0.4 1.0 0.8 0.2 0.6 0.6 1.0
14 (Austin) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Purple Prairie Clover (Cuero) Engelmann Daisy (Eldorado) Illinois Bundleflower (Sabine) Awnless Bushsunflower (Plateau)	1.0 1.0 1.0 0.4 0.2 0.8 0.6 0.75 1.3 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Slender Grama (Dilley) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover	1.0 0.2 0.2 0.4 1.0 0.2 0.2 0.6 0.8 0.75 0.3
15 (San Antonio) Feb. 1–May 1	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Slender Grama (Dilley) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Halls Panicum (Oso) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Hooded Windmillgrass (Mariah) Arizona Cottontop (La Salle)	1.0 1.0 1.0 1.0 0.2 0.6 0.2 0.2 0.1 0.2 0.2	Green Sprangletop (Van Horn) Slender Grama (Dilley) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Plains Bristlegrass (Catarina Blend) Hooded Windmillgrass (Mariah) Multi-flowered False Rhoades Grass (Hidalgo) Arizona Cottontop (La Salle)	1.0 2.0 0.6 0.4 0.6 0.2 0.3 0.1 0.2
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Slender Grama (Dilley) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Halls Panicum (Oso) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Hooded Windmillgrass (Mariah) Arizona Cottontop (La Salle)	1.0 1.0 1.0 1.0 0.2 0.6 0.2 0.2 0.1 0.2 0.2	Green Sprangletop (Van Horn) Slender Grama (Dilley) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Plains Bristlegrass (Catarina Blend) Hooded Windmillgrass (Mariah) Multi-flowered False Rhodes Grass (Hidalgo) Arizona Cottontop (La Salle)	1.0 2.0 0.6 0.4 0.6 0.2 0.3 0.1 0.2
17 (Bryan) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell) Little Bluestem (Native) Illinois Bundleflower	0.3 1.5 3.6 1.7 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Weeping Lovegrass (Ermelo) Sand Lovegrass Lance-Leaf Coreopsis	0.3 1.5 7.5 0.6 0.6 1.0

Table 1 (continued)

Permanent Rural Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
18 (Dallas) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Purple Prairie Clover (Cuero) Engelmann Daisy (Eldorado) Illinois Bundleflower Awnless Bushsunflower (Plateau)	1.0 1.0 1.0 0.4 0.2 0.8 0.6 0.75 1.3 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Slender Grama (Dilley) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover	1.0 0.2 0.2 0.4 1.0 0.2 0.2 0.6 0.8 0.75 0.3
19 (Atlanta) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell) Illinois Bundleflower	0.3 2.4 4.5 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sand Lovegrass Lance-Leaf Coreopsis	0.3 2.1 7.5 0.6 1.0
20 (Beaumont) Jan. 15–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell) Illinois Bundleflower	0.3 2.7 4.1 1.0	Green Sprangletop Bermudagrass Bahiagrass (Pensacola) Sand Lovegrass Lance-Leaf Coreopsis	0.3 2.1 7.5 0.6 1.0
21 (Pharr) Jan. 15–May 15	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Slender Grama (Dilley) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Halls Panicum (Oso) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Hooded Windmillgrass (Mariah) Arizona Cottontop (La Salle)	1.0 1.0 1.0 1.0 0.2 0.6 0.2 0.2 0.1 0.2 0.2	Green Sprangletop (Van Horn) Slender Grama (Dilley) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Plains Bristlegrass (Catarina Blend) Hooded Windmillgrass (Mariah) Multi-flowered False Rhoades Grass (Hidalgo) Arizona Cottontop (La Salle)	1.0 2.0 0.6 0.4 0.6 0.2 0.3 0.1 0.2
22 (Laredo) Jan. 15–May 1	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Texas Grama (Atascosa) Slender Grama (Dilley) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Halls Panicum (Oso) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Hooded Windmillgrass (Mariah) Arizona Cottontop (La Salle)	1.0 1.0 1.0 1.0 0.2 0.6 0.2 0.2 0.1 0.2 0.2	Green Sprangletop (Van Horn) Slender Grama (Dilley) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Plains Bristlegrass (Catarina Blend) Hooded Windmillgrass (Mariah) Multi-flowered False Rhoades Grass (Hidalgo) Arizona Cottontop (La Salle)	1.0 2.0 0.6 0.4 0.6 0.2 0.3 0.1 0.2
23 (Brownwood) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (Haskell) Texas Grama (Atascosa) Hairy Grama (Chaparral) Shortspike Windmillgrass (Welder) Little Bluestem (OK Select) Blue Grama (Hachita) Western Wheatgrass (Barton) Galleta Grass (Viva) Engelmann Daisy (Eldorado) Awnless Bushsunflower (Plateau)	0.6 1.0 1.0 0.4 0.2 0.8 0.4 1.2 0.6 0.75 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Shortspike Windmillgrass (Welder) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Partridge Pea (Comanche) Little Bluestem (OK Select) Englemann Daisy (Eldorado) Purple Prairie Clover (Cuero)	1.0 0.2 0.2 0.4 0.2 0.2 0.6 0.8 0.75 0.3

Table 1 (continued)
Permanent Rural Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
24 (El Paso) Feb. 1–May 15	Green Sprangletop (Van Horn) Sideoats Grama (South Texas) Blue Grama (Hachita) Galleta Grass (Viva) Shortspike Windmillgrass (Welder) Pink Pappusgrass (Maverick) Alkali Sacaton (Saltalk) Plains Bristlegrass (Catarina Blend) False Rhodes Grass (Kinney) Whiplash Pappusgrass (Webb) Arizona Cottontop (La Salle)	1.0 1.0 0.4 0.6 0.2 0.6 0.2 0.2 0.1 0.6 0.2	Green Sprangletop (Van Horn) Hooded Windmillgrass (Mariah) Blue Grama (Hachita) Hairy Grama (Chaparral) Sand Lovegrass (Mason) Sand Dropseed (Borden County) Indian Ricegrass (Rim Rock) Sand Bluestem (Cottle County) Little Bluestem (Pastura) Purple Prairie Clover (Cuero)	1.0 0.2 0.4 0.4 0.2 0.2 1.6 1.2 0.8 0.3
25 (Childress) Feb. 1–May 15	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Western Wheatgrass Galleta Illinois Bundleflower	0.3 2.7 0.9 2.1 1.6 1.0	Green Sprangletop Weeping Lovegrass (Ermelo) Sand Dropseed (Borden Co.) Sand Lovegrass Purple Prairie Clover	0.3 1.2 0.5 0.8 0.5

Table 2
Permanent Urban Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
1 (Paris) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
2 (Ft. Worth) Feb. 1–May 15	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Buffalograss (Texoka)	0.3 3.6 2.4 1.6	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Sand Dropseed (Borden Co.)	0.3 3.6 2.1 0.3
3 (Wichita Falls) Feb. 1–May 15	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Buffalograss (Texoka)	0.3 4.5 1.8 1.6	Green Sprangletop Sideoats Grama (El Reno) Bermudagrass Sand Dropseed (Borden Co.)	0.3 3.6 1.8 0.4
4 (Amarillo) Feb. 15–May 15	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Sand Dropseed (Borden Co.) Buffalograss (Texoka)	0.3 2.7 0.9 0.4 1.6
5 (Lubbock) Feb. 15–May 15	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Sand Dropseed (Borden Co.) Buffalograss (Texoka)	0.3 2.7 0.9 0.4 1.6
6 (Odessa) Feb. 1–May 15	Green Sprangletop Sideoats Grama (Haskell) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Sideoats Grama (Haskell) Sand Dropseed (Borden Co.) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 2.7 0.4 0.9 1.6
7 (San Angelo) Feb. 1–May 1	Green Sprangletop Sideoats Grama (Haskell) Buffalograss (Texoka)	0.3 7.2 1.6	Green Sprangletop Sideoats Grama (Haskell) Sand Dropseed (Borden Co.) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.2 0.3 0.9 1.6
8 (Abilene) Feb. 1–May 15	Green Sprangletop Sideoats Grama (Haskell) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Sand Dropseed (Borden Co.) Sideoats Grama (Haskell) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 0.3 3.6 0.8 1.6

Table 2 (continued)

Permanent Urban Seed Mix

District and Planting Dates	Clay Soils Species and Rates (lb. PLS/acre)		Sandy Soils Species and Rates (lb. PLS/acre)	
9 (Waco) Feb. 1–May 15	Green Sprangletop Bermudagrass Buffalograss (Texoka) Sideoats Grama (Haskell)	0.3 1.8 1.6 4.5	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed (Borden Co.)	0.3 1.6 3.6 0.4
10 (Tyler) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
11 (Lufkin) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
12 (Houston) Jan. 15–May 15	Green Sprangletop Sideoats Grama (Haskell) Bermudagrass	0.3 4.5 2.4	Green Sprangletop Bermudagrass	0.3 5.4
13 (Yoakum) Jan. 15–May 15	Green Sprangletop Sideoats Grama (South Texas) Bermudagrass	0.3 4.5 2.4	Green Sprangletop Bermudagrass	0.3 5.4
14 (Austin) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (South Texas) Buffalograss (Texoka)	0.3 2.4 3.6 1.6	Green Sprangletop Bermudagrass Buffalograss (Texoka)	0.3 4.8 1.6
15 (San Antonio) Feb. 1–May 1	Green Sprangletop Sideoats Grama (South Texas) Bermudagrass Buffalograss (Texoka)	0.3 3.6 2.4 1.6	Green Sprangletop Bermudagrass Buffalograss (Texoka)	0.3 4.8 1.6
16 (Corpus Christi) Jan. 1–May 1	Green Sprangletop Sideoats Grama (South Texas) Bermudagrass Buffalograss (Texoka)	0.3 3.6 2.4 1.6	Green Sprangletop Bermudagrass Buffalograss (Texoka)	0.3 4.8 1.6
17 (Bryan) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
18 (Dallas) Feb. 1–May 15	Green Sprangletop Sideoats Grama (El Reno) Buffalograss (Texoka) Bermudagrass	0.3 3.6 1.6 2.4	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed (Borden Co.)	0.3 1.6 3.6 0.4
19 (Atlanta) Feb. 1–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
20 (Beaumont) Jan. 15–May 15	Green Sprangletop Bermudagrass Sideoats Grama (Haskell)	0.3 2.4 4.5	Green Sprangletop Bermudagrass	0.3 5.4
21 (Pharr) Jan. 15–May 15	Green Sprangletop Sideoats Grama (South Texas) Buffalograss (Texoka) Bermudagrass	0.3 3.6 1.6 2.4	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed (Borden Co.)	0.3 1.6 3.6 0.4
22 (Laredo) Jan. 15–May 1	Green Sprangletop Sideoats Grama (South Texas) Buffalograss (Texoka) Bermudagrass	0.3 4.5 1.6 1.8	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed	0.3 1.6 3.6 0.4
23 (Brownwood) Feb. 1–May 15	Green Sprangletop Sideoats Grama (Haskell) Bermudagrass Blue Grama (Hachita)	0.3 3.6 1.2 0.9	Green Sprangletop Buffalograss (Texoka) Bermudagrass Sand Dropseed (Borden Co.)	0.3 1.6 3.6 0.4
24 (El Paso) Feb. 1–May 15	Green Sprangletop Sideoats Grama (South Texas) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Buffalograss (Texoka) Sand Dropseed (Borden Co.) Blue Grama (Hachita)	0.3 1.6 0.4 1.8
25 (Childress) Feb. 1–May 15	Green Sprangletop Sideoats Grama (El Reno) Blue Grama (Hachita) Buffalograss (Texoka)	0.3 3.6 1.2 1.6	Green Sprangletop Sand Dropseed (Borden Co.) Buffalograss (Texoka) Bermudagrass	0.3 0.4 1.6 1.8

Table 3
Temporary Cool Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)	
Paris (1), Amarillo (4), Lubbock (5), Dallas (18)	September 1–November 30	Tall Fescue Western Wheatgrass Wheat (Red, Winter)	4.5 5.6 34
Odessa (6), San Angelo (7), El Paso (24)	September 1–November 30	Western Wheatgrass Wheat (Red, Winter)	8.4 50
Waco (9), Tyler (10), Lufkin (11), Austin (14), San Antonio (15), Bryan (17), Atlanta (19)	September 1–November 30	Tall Fescue Oats Wheat	4.5 24 34
Houston (12), Yoakum (13), Corpus Christi (16), Beaumont (20), Pharr (21), Laredo (22)	September 1–November 30	Oats	72
Ft. Worth (2), Wichita Falls (3), Abilene (8), Brownwood (23), Childress (25)	September 1–November 30	Tall Fescue Western Wheatgrass Cereal Rye	4.5 5.6 34

Table 4
Temporary Warm Season Seeding

Districts	Dates	Seed Mix and Rates (lb. PLS/acre)	
All	May 1–August 31	Foxtail Millet	34

2.2. Fertilizer. Use fertilizer in conformance with Article 166.2., "Materials."

2.3. Vegetative Watering. Use water that is clean and free of industrial wastes and other substances harmful to the growth of vegetation.

2.4. Mulch.

2.4.1. Straw or Hay Mulch. Use straw or hay mulch in conformance with Section 162.2.5., "Mulch."

2.4.2. Cellulose Fiber Mulch. Use only cellulose fiber mulches that are on the Approved Products List, *Erosion Control Approved Products*. (http://www.txdot.gov/business/resources/erosion-control.html) Submit one full set of manufacturer's literature for the selected material. Keep mulch dry until applied. Do not use molded or rotted material.

2.5. Tacking Methods. Use a tacking agent applied in accordance with the manufacturer's recommendations or a crimping method on all straw or hay mulch operations. Use tacking agents as approved or as specified on the plans.

3. CONSTRUCTION

Cultivate the area to a depth of 4 in. before placing the seed unless otherwise directed. Use approved equipment to vertically track the seedbed as shown on the plans or as directed. Cultivate the seedbed to a depth of 4 in. or mow the area before placement of the permanent seed when performing permanent seeding after an established temporary seeding. Plant the seed specified and mulch, if required, after the area has been completed to lines and grades as shown on the plans.

3.1. Broadcast Seeding. Distribute the seed or seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution or hydro-seeding on top of the soil unless otherwise directed. Apply the mixture to the area to be seeded within 30 min. of placement of components in the equipment when seed and water are to be distributed as a slurry during hydro-seeding. Roll the planted area with a light roller or other suitable equipment. Roll sloped areas along the contour of the slopes.

3.2. Straw or Hay Mulch Seeding. Plant seed according to Section 164.3.1., "Broadcast Seeding." Apply straw or hay mulch uniformly over the seeded area immediately after planting the seed or seed mixture. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

3.3. Cellulose Fiber Mulch Seeding. Plant seed in accordance with Section 164.3.1., "Broadcast Seeding." Apply cellulose fiber mulch uniformly over the seeded area immediately after planting the seed or seed mixture at the following rates.

- Sandy soils with slopes of 3:1 or less—2,500 lb. per acre.
- Sandy soils with slopes greater than 3:1—3,000 lb. per acre.
- Clay soils with slopes of 3:1 or less—2,000 lb. per acre.
- Clay soils with slopes greater than 3:1—2,300 lb. per acre.

Cellulose fiber mulch rates are based on dry weight of mulch per acre. Mix cellulose fiber mulch and water to make a slurry and apply uniformly over the seeded area using suitable equipment.

3.4. Drill Seeding. Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 in. using a pasture or rangeland type drill unless otherwise directed. Plant seed along the contour of the slopes.

3.5. Straw or Hay Mulching. Apply straw or hay mulch uniformly over the area as shown on the plans. Apply straw mulch at 2 to 2.5 tons per acre. Apply hay mulch at 1.5 to 2 tons per acre. Use a tacking method over the mulched area.

Apply fertilizer in conformance with Article 166.3., "Construction." Seed and fertilizer may be distributed simultaneously during "Broadcast Seeding" operations, provided each component is applied at the specified rate. Apply half of the required fertilizer during the temporary seeding operation and the other half during the permanent seeding operation when temporary and permanent seeding are both specified for the same area.

Water the seeded areas at the rates and frequencies as shown on the plans or as directed.

4. MEASUREMENT

This Item will be measured by the square yard or by the acre.

5. PAYMENT

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Broadcast Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Broadcast Seeding (Temp)" of warm or cool season specified, "Straw or Hay Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Straw or Hay Mulch Seeding (Temp)" of warm or cool season specified, "Cellulose Fiber Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Cellulose Fiber Mulch Seeding (Temp)" of warm or cool season specified, "Drill Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Drill Seeding (Temp)" of warm or cool season specified, and "Straw or Hay Mulching." This price is full compensation for furnishing materials, including water for hydro-seeding and hydro-mulching operations, mowing, labor, equipment, tools, supplies, and incidentals. Fertilizer will not be paid for directly but will be subsidiary to this Item. Water for irrigating the seeded area, when specified, will be paid for under Item 168, "Vegetative Watering."

Item 400
Excavation and Backfill for Structures

1. DESCRIPTION

Excavate for placement and construction of structures and backfill structures. Cut and restore pavement.

2. MATERIALS

Use materials that meet the requirements of the following Items.

- Item 401, "Flowable Backfill,"
- Item 421, "Hydraulic Cement Concrete," and
- DMS-4600, "Hydraulic Cement."

3. CONSTRUCTION

3.1. Excavation.

3.1.1. General. Excavate to the lines and grades shown on the plans or as directed. Provide slopes, benching, sheeting, bracing, pumping, and bailing as necessary to maintain the stability and safety of excavations up to 5 ft. deep. Excavation protection for excavations deeper than 5 ft. are governed by Item 402, "Trench Excavation Protection," and Item 403, "Temporary Special Shoring." Use satisfactory excavated material as backfill or as embankment fill in accordance with Item 132, "Embankment." Dispose of material not incorporated into the final project off the right of way in accordance with federal, state, and local regulations.

Keep any topsoil that has been removed separate, and replace it, as nearly as feasible, in its original position when excavating for installation of structures across private property or beyond the limits of the embankment. Restore the area to an acceptable condition.

Excavate drilled shafts in accordance with Item 416, "Drilled Shaft Foundations."

3.1.1.1. Obstructions. Remove obstructions to the proposed construction, including trees and other vegetation, debris, and structures, over the width of the excavation to a depth of 1 ft. below the bottom of excavation. Remove as required to clear the new structure and plug in an approved manner if abandoned storm drains, sewers, or other drainage systems are encountered. Restore the bottom of the excavation to grade by backfilling after removing obstructions in accordance with this Item. Dispose of surplus materials in accordance with federal, state, and local regulations.

3.1.1.2. Excavation in Streets. Cut pavement and base to neat lines when structures are installed in streets, highways, or other paved areas. Restore pavement structure after completion of excavation and backfilling.

Maintain and control traffic in accordance with the approved traffic control plan and the TMUTCD.

3.1.1.3. Utilities. Comply with the requirements of Article 7.15., "Responsibility for Damage Claims." Conduct work with minimum disturbance of existing utilities, and coordinate work in or near utilities with the utility owners. Inform utility owners before work begins, allowing them enough time to identify, locate, reroute, or make other adjustments to utility lines.

Avoid cutting or damaging underground utility lines that are to remain in place. Promptly notify the utility company if damage occurs. Provide temporary flumes across the excavation while open if an active sanitary

sewer line is damaged during excavation, and restore the lines when backfilling has progressed to the original bedding lines of the cut sewer.

3.1.1.4. De-Watering. Construct or place structures in the presence of water only if approved. Place precast members, pipe, and concrete only on a dry, firm surface. Remove water by bailing, pumping, well-point installation, deep wells, underdrains, or other approved method.

Remove standing water in a manner that does not allow water movement through or alongside concrete being placed if structures are approved for placement in the presence of water. Pump or bail only from a suitable sump separated from the concrete work while placing structural concrete or for a period of at least 36 hr. thereafter. Pump or bail during placement of seal concrete only to the extent necessary to maintain a static head of water within the cofferdam. Pump or bail to de-water inside a sealed cofferdam only after the seal has aged at least 36 hr.

Place a stabilizing material in the bottom of the excavation if the bottom of an excavation cannot be de-watered to the point the subgrade is free of mud or it is difficult to keep reinforcing steel clean. Use flexible base, cement-stabilized base or backfill, lean concrete, or other approved stabilizing material. Provide concrete with at least 275 lb. of cement per cubic yard, if lean concrete is used, and place to a minimum depth of 3 in. Stabilizing material placed for the convenience of the Contractor will be at the Contractor's expense.

3.1.2. Bridge Foundations and Retaining Walls. Do not disturb material below the bottom of footing grade. Do not backfill to compensate for excavation that has extended below grade. Fill the area with concrete at the time the footing is placed if excavation occurs below the proposed footing grade. Additional concrete placed will be at the Contractor's expense.

Take core samples to determine the character of the supporting materials if requested. Provide an intact sample adequate to judge the character of the founding material. Take these cores when the excavation is close to completion. Cores should be approximately 5 ft. deeper than the proposed founding grade.

Remove loose material if the founding stratum is rock or another hard material, and clean and cut it to a firm surface that is level, stepped, or serrated, as directed. Clean out soft seams, and fill with concrete at the time the footing is placed.

Place the foundation once the Engineer has inspected the excavation and authorized changes have been made to provide a uniform bearing condition if the material at the footing grade of a retaining wall, bridge bent, or pier is a mixture of compressible and incompressible material.

3.1.3. Cofferdams. The term "cofferdam" designates any temporary or removable structure constructed to hold surrounding earth, water, or both out of the excavation whether the structure is formed of soil, timber, steel, concrete, or a combination of these. Use pumping wells or well points for de-watering cofferdams if required.

Submit details and design calculations for sheet-pile or other types of cofferdams requiring structural members bearing the seal of a licensed professional engineer for review before constructing the cofferdam. The Department reserves the right to reject designs. Design structural systems to comply with the AASHTO *Standard Specifications for Highway Bridges* or AASHTO LRFD *Bridge Design Specifications*. Interior dimensions of cofferdams must provide enough clearance for the construction, inspection, and removal of required forms and, if necessary, enough room to allow pumping outside the forms. Extend sheet-pile cofferdams well below the bottom of the footings, and make concrete seals as well braced and watertight as practicable.

Use Class E concrete for foundation seals unless otherwise specified. Place concrete foundation seals in accordance with Item 420, "Concrete Substructures." Seals placed for the convenience of the Contractor will be at the Contractor's expense.

Make the excavation deep enough to allow for swelling of the material at the base of the excavation during pile-driving operations when the Engineer judges it to be impractical to de-water inside a cofferdam and a

concrete seal is to be placed around piling driven within the cofferdam. Remove swelling material to the bottom of the seal grade after driving the piling. Remove the foundation material to exact footing grades where it is possible to de-water inside the cofferdam without placing a seal after driving piling. Do not backfill a foundation to compensate for excavation that has been extended below grade; fill such areas below grade with concrete at the time the seals or footings are placed.

Remove cofferdams after completing the substructure without disturbing or damaging the structure unless otherwise provided.

3.1.4. Culverts and Storm Drains. When the design requires special bedding conditions for culverts or storm drains, an excavation diagram will be shown on the plans. Do not exceed these limits of excavation.

Construct pipe structures in an open cut with vertical sides extending to a point 1 ft. above the pipe unless otherwise shown on the plans. When site conditions or the plans do not prohibit sloping the cut, the excavation may be stepped or laid back to a stable slope beginning 1 ft. above the pipe. Maintain the stability of the excavation throughout the construction period.

Construct the embankment for pipe to be installed in fill above natural ground to an elevation at least 1 ft. above the top of the pipe, and then excavate for the pipe.

3.1.4.1. Unstable Material. Remove the material to a depth of no more than 2 ft. below the grade of the structure when unstable soil is encountered at established footing grade, unless the Engineer authorizes additional depth. Replace soil removed with stable material in uniform layers no greater than 8 in. deep (loose measurement). Each layer must have enough moisture to be compacted by rolling or tamping as required to provide a stable foundation for the structure.

Use special materials such as flexible base, cement-stabilized base, cement-stabilized backfill, or other approved material when it is not feasible to construct a stable foundation as outlined above.

3.1.4.2. Incompressible Material. Remove the incompressible material to 6 in. below the footing grade, backfill with an approved compressible material, and compact in accordance with Section 400.3.3., “Backfill,” if rock, part rock, or other incompressible material is encountered at established footing grade while placing prefabricated elements.

3.2. Shaping and Bedding. Place at least 2 in. of fine granular material for precast box sections on the base of the excavation before placing the box sections. Use bedding as shown in Figure 1 for pipe installations. Use Class C bedding unless otherwise shown on the plans. The Engineer may require the use of a template to secure reasonably accurate shaping of the foundation material. Undercut the excavation at least 4 in. where cement-stabilized backfill is indicated on the plans and backfill with stabilized material to support the pipe or box at the required grade.

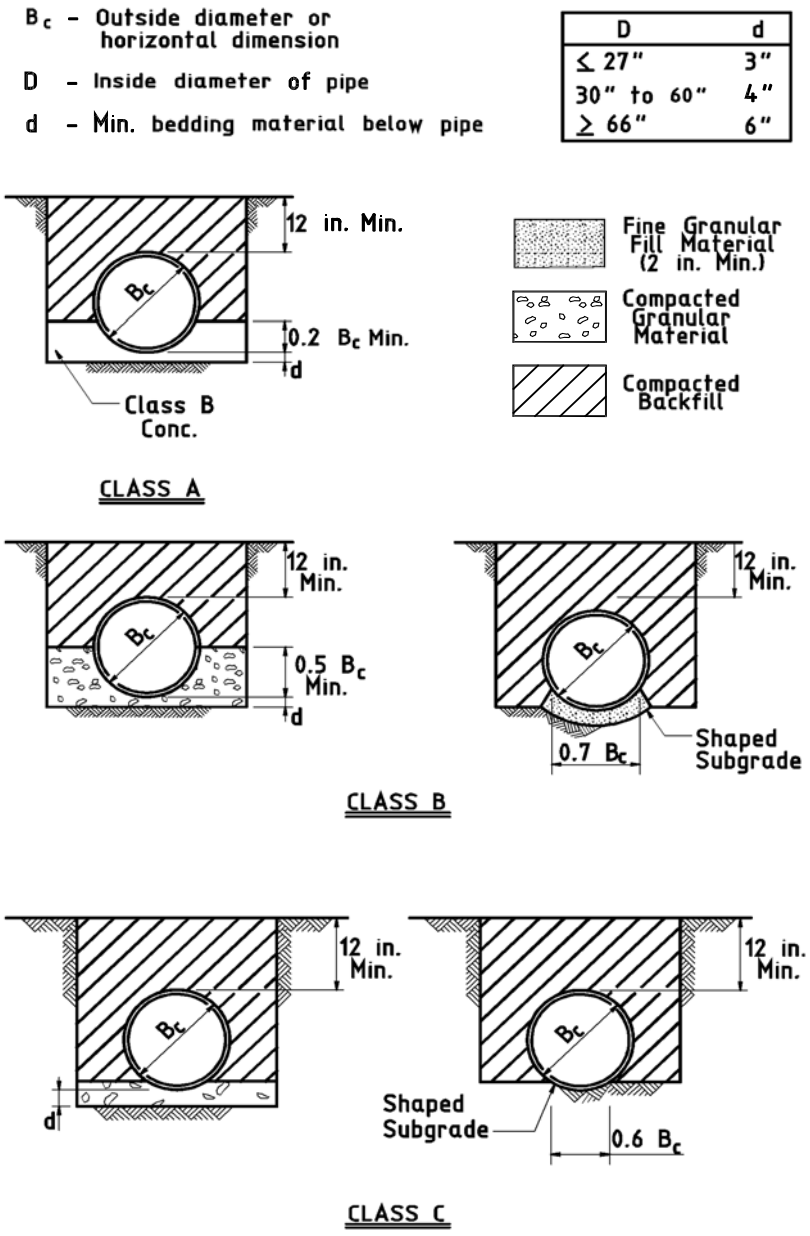

Figure 1
Bedding Diagrams

3.3. Backfill.

3.3.1. General. Backfill the excavation after placement of the permanent structure as soon as practical. Use backfill free from stones large enough to interfere with compaction; large or frozen lumps that will not break down readily under compaction; and wood or other extraneous material. Obtain backfill material from excavation or from other sources.

Place backfill in layers no greater than 10 in. deep (loose measurement) in areas not supporting a completed roadbed, retaining wall, or embankment. Place backfill in uniform layers no greater than 8 in. deep (loose measurement) in areas supporting a portion of a roadbed, retaining wall, or embankment. Compact each layer to meet the density requirements of the roadbed, retaining wall, embankment material, or as shown on the plans.

Bring each layer of backfill material to the moisture content needed to obtain the required density. Use mechanical tamps or rammers to compact the backfill. Rollers may be used to compact backfill if feasible.

Cohesionless materials may be used for backfilling. Use cohesionless materials that conform to the requirements of Table 1.

Table 1
Cohesionless Material Gradation Limits

Sieve Size	Percent Retained
3"	0
#10	See Note[1]
#200	90–100

1. No. 10 sieve requirements are 0 to 30% retained when used as aggregate for cement-stabilized backfill.

Compact cohesionless materials using vibratory equipment, water-ponding, or a combination of both.

3.3.2. Bridge Foundations, Retaining Walls, Manholes/Inlets, and Box Culverts. Place backfill against the structure only after the concrete has reached the design strength required in Item 421, "Hydraulic Cement Concrete."

Backfill retaining walls with material meeting the requirements of Item 423, "Retaining Walls." Backfill around bridge foundations, manholes/inlets and culverts using material with particles no more than 4 in. in greatest dimension and a gradation that permits thorough compaction. Use rock or gravel mixed with soil if the percentage of fines is enough to fill all voids and ensure a uniform and thoroughly compacted mass of proper density.

Use mechanical tamps and rammers to avoid damage to the structure where backfill material is being placed too close to the structure to permit compaction with blading and rolling equipment.

Avoid wedging action of backfill against structures. Step or serrate slopes bounding the excavation to prevent such action. Place backfill uniformly around bridge foundations. Place backfill equally and in uniform layers along both sides of manholes/inlets and culverts.

The Engineer may require backfilling of structures excavated into hard, erosion-resistant material, and subject to erosive forces, with stone or lean concrete.

Box culverts may be opened to traffic as soon as enough backfill and embankment has been placed over the top to protect culverts against damage from heavy construction equipment. Repair damage to culvert caused by construction traffic at no additional expense to the Department.

3.3.3. Pipe. Bring backfill material to the proper moisture condition after installing bedding and pipe as required and place it equally along both sides of the pipe in uniform layers no greater than 8 in. deep (loose measurement). Compact each lift mechanically. Thoroughly compact materials placed under the haunches of the pipe to prevent damage or displacement of the pipe. Place backfill in this manner to the top-of-pipe elevation. Place and compact backfill above the top of the pipe in accordance with Section 400.3.3.1., "General."

The Engineer may reject backfill material containing more than 20% by weight of material retained on a 3 in. sieve with large lumps not easily broken down or that cannot be spread in loose layers. Material excavated by a trenching machine will generally meet the requirements of this Section as long as large stones are not present.

Place and compact additional material where pipe extends beyond the toe of slope of the embankment and the depth of cover provided by backfill to the original ground level is less than the minimum required by the specifications for the type of pipe involved until the minimum cover has been provided.

3.3.4. **Cement-Stabilized Backfill**. Backfill the excavation to the elevations shown with cement-stabilized backfill when shown on the plans. Use cement-stabilized backfill that contains aggregate conforming to the gradation limits shown in Table 1, water, and a minimum of 7% hydraulic cement based on the dry weight of the aggregate, in accordance with Tex-120-E.

Place cement-stabilized backfill equally along the sides of structures to prevent strain on or displacement of the structure. Fill voids when placing cement-stabilized backfill. Use hand-operated tampers if necessary to fill voids.

3.3.5. **Flowable Backfill**. Backfill the excavation with flowable backfill to the elevations indicated when shown on the plans. Prevent the structure from being displaced during the placement of the flowable fill, and prevent flowable fill from entering manholes/inlets and culverts, and drainage structures.

4. MEASUREMENT

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

4.1. **Structural Excavation**. Unless shown on the plans as a pay item, structural excavation quantities shown are for information purposes only.

When structural excavation is specified as a pay item, structural excavation for pipe headwalls, inlets, manholes, culvert or storm drain extensions less than 15 ft. long, bridge abutments, retaining walls, and side road and private entrance pipe culverts will not be measured. No allowance will be made for variance from plans quantity incurred by an alternate bid.

When specified as a pay item, structural excavation will be measured by the cubic yard as computed by the average end areas method. Excavation diagrams on the plans take precedence over the provisions of this Article.

4.1.1. **Boundaries of Measurement**.

4.1.1.1. **Pipe**.

4.1.1.1.1. **Pipe up to 42 Inches**. For pipe up to 42 in. nominal or equivalent diameter, no material outside of vertical planes 1 ft. beyond and parallel to the horizontal projection of the outside surfaces of the pipe will be included.

4.1.1.1.2. **Pipe Larger than 42 Inches**. For pipes larger than 42 in. nominal or equivalent diameter, no material outside of vertical planes located 2 ft. beyond and parallel to the horizontal projection of the outside surfaces of the pipe will be included.

Quantities for excavation in fill above natural ground include 1 ft. above the top of the pipe regardless of the height of completed fill. Excavation for pipe will be measured between the extreme ends of the completed structure including end appurtenances as shown on the plans and from centerline to centerline of inlets, manholes, etc.

4.1.1.2. **Structural Plate Structures**. No material outside of vertical planes 3 ft. beyond and parallel to the horizontal projection of the outside surfaces of the structure will be included. When the quality of the existing soil or embankment is less than that of the proposed backfill material, the limits of measurement will be extended to vertical planes located 1/2 of the span beyond the horizontal projection of the outside surfaces of the structure.

4.1.1.3. **Footings, Walls, Boxes, and Other Excavation**. No material outside of vertical planes 1 ft. beyond and parallel to the edges of the footings or outside walls will be included whether or not a cofferdam or shoring is

used. When plans provide the option of cast-in-place or precast boxes, measurement will be based on the cast-in-place option.

Where excavation in addition to that allowed for the footings is required for other portions of the structure, measurement for the additional excavation will be limited laterally by vertical planes 1 ft. beyond the face of the member and parallel to it, and vertically to a depth of 1 ft. below the bottom of the member.

4.1.1.4. Excavation near Roadways and Channels. At structure sites other than culverts and pipe excavations, the measurement of structural excavation will include only material below or outside the limits of the completed road or channel excavation. Roadway and channel excavation will be paid under Item 110, "Excavation." For culverts except side road and private entrance culverts, excavation within the limits of the structure and below or outside the limits of the completed roadway excavation will be measured as structural excavation.

4.1.2. Falsework. No measurement will be made for excavation necessary for placing forms or falsework that exceeds the limits given in Section 400.4.1.1., "Boundaries of Measurement."

4.1.3. Swelling. Measurement will not include materials removed below footing grades to compensate for anticipated swelling due to pile-driving, nor will it include material required to be removed due to swelling beyond the specified limits during pile-driving operations.

4.1.4. Cave-Ins. Measurement will not include additional volume caused by slips, slides, cave-ins, silting, or fill material resulting from the action of the elements or the Contractor's operation.

4.1.5. Undercut. Where rock or other incompressible or unstable material is undercut to provide a suitable foundation for pipe or box sections, such material below grade directed to be removed will be measured for payment.

4.1.6. Grade Change. Additional measurement will be made of the volume of excavation involved in the lowering or raising of the elevation of a footing, foundation, or structure unit, when such grade change is authorized.

4.2. Cement-Stabilized Backfill. Cement-stabilized backfill will be measured by the cubic yard as shown on the plans.

4.3. Cutting and Restoring Pavement. Cutting and restoring pavement will be measured by the square yard as shown on the plans. Excavation below pavement or base will be measured as structural excavation of the pertinent type.

5. PAYMENT

5.1. Structural Excavation. Unless specified as a pay item, structural excavation and backfill performed, and material furnished in accordance with this Item will not be paid for directly but are subsidiary to pertinent Items.

When structural excavation is specified as a pay item, the excavation and backfill work performed, and materials furnished will be paid for at the unit price bid for "Structural Excavation," "Structural Excavation (Box)," "Structural Excavation (Pipe)," and "Structural Excavation (Bridge)." This price includes concrete to compensate for excavation that has extended below grade for bridge foundations and retaining walls, and backfilling and compacting areas that were removed as part of structural excavation.

Cofferdams or other measures necessary for supporting excavations less than 5 ft. deep will not be measured or paid for directly but will be subsidiary to the Contract.

Foundation seal concrete for cofferdams, when required, will be paid for as provided in the pertinent Items. If no direct method of payment is provided in the Contract, the work will be measured and paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method." Seal placed for the convenience of the Contractor will not be paid for.

Unless otherwise provided, stone or lean concrete backfill around structures as provided for in Section 400.3.3.2., "Bridge Foundations, Retaining Walls, Manholes/Inlets, and Box Culverts," will be measured and paid for as extra work in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

When structural excavation is specified as a pay item, a partial payment of 50% of the bid price will be made for structural excavation completed to the satisfaction of the Engineer but not backfilled. The remaining amount will be paid upon completion of backfilling. When the Contractor elects to excavate beyond plan requirements, no measurement will be made of the additional volume.

5.2. Removal and Replacement of Unsuitable or Incompressible Material. Removal and replacement of material will be paid for if directed. Removal and replacement of material or placement of special material made necessary by the softening of founding material due to the Contractor's sequence of work or operation, will be at the Contractor's expense. Special material used or additional excavation made for the Contractor's convenience will not be paid for.

5.2.1. Structural Excavation as a Pay Item. Where special materials are not required or specified, payment for the removal and replacement of unstable or incompressible material will be made at a price equal to 200% of the unit price bid per cubic yard for Structural Excavation. When the Contractor elects to remove and replace material deeper than directed, no measurement will be made on that portion below the directed elevation. This price is full compensation for removing the unstable or incompressible material; furnishing, hauling, placing, and compacting suitable replacement material; and equipment, labor, tools, and incidentals.

When the plans specify or when directed, the use of special materials such as flexible base, cement-stabilized base, cement-stabilized backfill, or other special material, payment for excavation below footing grades will be made at the unit price bid for Structural Excavation. Payment for furnishing, hauling, placing, and compacting the flexible base, cement-stabilized base, cement-stabilized backfill, or other special materials will be made at the unit price bid for these items in the Contract, or, if the required material is not a bid item, in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

5.2.2. Structural Excavation Not a Pay Item. Where special materials for backfill are not required or specified, payment for the authorized removal and replacement of unstable or incompressible material will be measured and paid for at $15 per cubic yard of material removed. This price is full compensation for removing the unstable or incompressible material; furnishing, hauling, placing, and compacting suitable replacement material; and equipment, labor, tools, and incidentals.

When the plans specify or when directed, the use of special materials such as flexible base, cement-stabilized base, cement-stabilized backfill, or other special material, excavation below the footing grades will be paid for at $10 per cubic yard. Payment for furnishing, hauling, placing, and compacting the flexible base, cement-stabilized base, cement-stabilized backfill, or other special materials will be made at the unit price bid for these items, or, if the required material is not a bid item, in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

5.3. Lowering of a Structure Foundation. If the Engineer requires a structure foundation to be lowered to an elevation below the grade shown on the plans, overexcavation will be paid in accordance with Table 2.

Table 2
Payment for Required Overexcavation

Variance of Revised Footing Grade from Plan Grade	Payment Terms	Variance of Revised Footing Grade from Plan Grade
	"Structural Excavation" is a Bid Item	"Structural Excavation" is not a Bid Item
Up to and including 5 ft.	Unit price equal to 115% of unit price bid for "Structural Excavation"	$10 per cubic yard
Over 5 ft. up to 10 ft.	Unit price equal to 125% of unit price bid for "Structural Excavation"	$12 per cubic yard
Over 10 ft.	In accordance with Article 9.7., "Payment for Extra Work and Force Account Method."	

5.4. **Cement-Stabilized Backfill**. Cement-stabilized backfill will be paid for at the unit price bid for "Cement-Stabilized Backfill."

5.5. **Cutting and Restoring Pavement**. Cutting and restoring pavement will be paid for at the unit price bid for "Cutting and Restoring Pavement" of the type specified.

Work done to repair damage to base or pavement incurred outside the limits shown on the plans, or the limits authorized, will not be measured for payment.

The unit prices bid are full compensation for excavation including removing obstructions and plugging drainage systems; bedding and backfilling including placing, sprinkling and compaction of material; soundings; cleaning and filling seams; constructing and removing cofferdams; de-watering, sheeting, or bracing excavations up to and including 5 ft. deep; pumps; drills; explosives; disposition of surplus material; cutting pavement and base to neat lines; and materials, hauling, equipment, labor, tools, and incidentals.

Flowable backfill will be paid for as provided in Item 401, "Flowable Backfill." Protection methods for open excavations deeper than 5 ft. will be measured and paid for as required under Item 402, "Trench Excavation Protection," or Item 403, "Temporary Special Shoring."

Item 403
Temporary Special Shoring

1. DESCRIPTION

Furnish and install temporary shoring to hold the surrounding earth, water, or both out of the work area.

2. MATERIALS

Furnish new or used materials. Furnish materials that meet the requirements of Item 423, "Retaining Walls," when using temporary Mechanically Stabilized Earth (MSE) walls. Furnish materials that meet the requirements of Item 410, "Soil Nail Anchors," or Item 411, "Rock Nail Anchors," when using temporary nailed walls (rock or soil).

3. CONSTRUCTION

The Contractor is responsible for the temporary special shoring design unless complete details are included on the plans. Submit details and design calculations bearing the seal of a licensed professional engineer before constructing the shoring. The Department reserves the right to reject designs. Design the shoring to comply with OSHA Standards and Interpretations, 29 CFR Part 1926, Subpart P, "Excavations." Design structural systems to comply with AASHTO *Standard Specifications for Highway Bridges* or AASHTO LRFD *Bridge Design Specifications*. Design shoring subject to railroad loading to comply with the AREMA *Manual for Railway Engineering* and any additional requirements of the railway being supported.

Provide vertical or sloped cuts, benches, shields, support systems, or other systems to provide the necessary protection in accordance with the approved design. Construct temporary MSE walls, when used, in accordance with Item 423, "Retaining Walls." Construct temporary nailed walls (rock or soil), when used, in accordance with Item 410, "Soil Nail Anchors," or Item 411, "Rock Nail Anchors."

4. MEASUREMENT

This Item will be measured by the square foot of surface area of a vertical plane at the face of the shoring between the top of the ground being supported and the minimum protection grade line shown on the plans. If no minimum protection grade is shown on the plans, the lowest required excavated elevation will be used. Shoring projecting above the level of the ground being supported will not be measured. When excavation techniques (e.g., sloped cuts or benching) are used to provide the necessary protection, the surface area for payment will be calculated based on the area described by a vertical plane adjacent to the structure.

5. PAYMENT

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 Special Shoring." This price is full compensation for excavation and backfill; furnishing, placing and removing shoring, sheeting, or bracing; de-watering or diversion of water; jacking and jack removal; and equipment, labor, materials, tools, and incidentals.

No payment will be made for special shoring made necessary by the selection of an optional design or sequence of work that creates the need for shoring.

Item 500
Mobilization

1. DESCRIPTION

Establish and remove offices, plants, and facilities. Move personnel, equipment, and supplies to and from the project or the vicinity of the project site to begin work or complete work on Contract Items. Bonds and insurance are required for performing mobilization.

For Contracts with emergency mobilization, provide a person and method of contact available 24 hrs. a day, 7 days a week unless otherwise shown on the plans. The time of notice will be the transmission time of the written notice or notice provided orally by the Department's representative.

2. MEASUREMENT

This Item will be measured by the lump sum or each as the work progresses. Mobilization is calculated on the base bid only and will not be paid for separately on any additive alternate items added to the Contract.

3. PAYMENT

For this Item, the adjusted Contract amount will be calculated as the total Contract amount less the lump sum for mobilization. Except for Contracts with callout or emergency work, mobilization will be paid in partial payments as follows:

- Payment will be made upon presentation of a paid invoice for the payment or performance bonds and required insurance,
- Payment will be made upon verification of documented expenditures for plant and facility setup. The combined amount for all these facilities will be no more than 10% of the mobilization lump sum or 1% of the total Contract amount, whichever is less,
- When 1% of the adjusted Contract amount for construction Items is earned, 50% of the mobilization lump sum bid or 5% of the total Contract amount, whichever is less, will be paid. Previous payments under this Item will be deducted from this amount,
- When 5% of the adjusted Contract amount for construction Items is earned, 75% of the mobilization lump sum bid or 10% of the total Contract amount, whichever is less, will be paid. Previous payments under the Item will be deducted from this amount,
- When 10% of the adjusted Contract amount for construction Items is earned, 90% of the mobilization lump sum bid or 10% of the total Contract amount, whichever is less, will be paid. Previous payments under this Item will be deducted from this amount,
- Upon final acceptance, 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 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.

For projects with extended maintenance or performance periods, payment for the remainder of the lump sum bid for "Mobilization" will be made 6 months after final acceptance.

For Contracts with callout or emergency work, “Mobilization,” will be paid as follows:

- Payment will be made upon presentation of a paid invoice for the payment of performance bonds and required insurance,
- Mobilization for callout work will be paid for each callout work request, and
- Mobilization for emergency work will be paid for each emergency work request.

Item 618
Conduit

1. DESCRIPTION

Furnish and install conduit.

2. MATERIALS

Provide new materials that comply with the details shown on the plans, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 400, "Excavation and Backfill for Structures"
- Item 476, "Jacking, Boring, or Tunneling Pipe or Box"

When specified on the plans, provide:

- rigid metal conduit (RMC);
- intermediate metal conduit (IMC);
- electrical metallic tubing (EMT);
- polyvinyl chloride (PVC) conduit;
- high density polyethylene (HDPE) conduit;
- liquidtight flexible metal conduit (LFMC); or
- liquidtight flexible nonmetallic conduit (LFNC).

Furnish conduit from new materials in accordance with DMS-11030, "Conduit."

Provide prequalified conduit from the Department's MPL. When required by the Engineer, notify the Department in writing of selected materials from the MPL intended for use on each project.

Provide other types of conduit not on the MPL that comply with the details shown on the plans and the NEC. Fabricate fittings such as junction boxes and expansion joints from a material similar to the connecting conduit, unless otherwise shown on the plans. Use watertight fittings. Do not use set screw and pressure-cast fittings. Steel compression fittings are permissible. When using HDPE conduit, provide fittings that are UL-listed as electrical conduit connectors or thermally fused using an electrically heated wound wire resistance welding method.

Use red 3-in. 4-mil polyethylene underground warning tape that continuously states "Caution Buried Electrical Line Below."

3. CONSTRUCTION

Perform work in accordance with the details shown on the plans and the requirements of this Item.

Use established industry and utility safety practices when installing conduit located near underground utilities. Consult with the appropriate utility company before beginning work.

Install conduit a minimum of 18 in. deep below finished grade unless otherwise shown on the plans. Meet the requirements of the NEC when installing conduit. Secure and support conduit placed for concrete encasement in such a manner that the alignment will not be disturbed during placement of the concrete. Cap ends of conduit and close box openings before concrete is placed.

Ream conduit to remove burrs and sharp edges. Use a standard conduit cutting die with a 3/4-in. taper per foot when conduit is threaded in the field. Fasten conduit placed on structures with conduit straps or hangers as shown on the plans or as directed. Fasten conduit within 3 ft. of each box or fitting and at other locations shown on the plans or as directed. Use metal conduit clamps that are galvanized malleable or stainless steel unless otherwise shown on the plans. Use 2-hole type clamps for 2-in. diameter or larger conduit.

Fit PVC and HDPE conduit terminations with bushings or bell ends. Fit metal conduit terminations with a grounding type bushing, except conduit used for duct cable casing that does not terminate in a ground box and is not exposed at any point. Conduit terminating in threaded bossed fittings does not need a bushing. Before installation of conductors or final acceptance, pull a properly sized mandrel or piston through the conduit to ensure that it is free from obstruction. Cap or plug empty conduit placed for future use.

Perform trench excavation and backfilling as shown on the plans or as directed, and in accordance with Item 400, “Excavation and Backfill for Structures.” Excavation and backfilling will be subsidiary to the installation of the conduit.

Jack and bore as shown on the plans or as directed, and in accordance with Item 476, “Jacking, Boring, or Tunneling Pipe or Box.”

Place warning tape approximately 10 in. above trenched conduit. Where existing surfacing is removed for placing conduit, repair by backfilling with material equal in composition and density to the surrounding areas and by replacing any removed surfacing, such as asphalt pavement or concrete riprap, with like material to equivalent condition. Mark conduit locations as directed.

4. MEASUREMENT

This Item will be measured by the foot of conduit.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., “Plans Quantity Measurement.” Additional measurements or calculations will be made if adjustments of quantities are required.

5. PAYMENT

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 “Conduit” of the type and size specified and the installation method specified as applicable. This price is full compensation for furnishing and installing conduit; hanging, strapping, jacking, boring, tunneling, trenching, and furnishing and placing backfill; encasing in steel or concrete; replacing pavement structure, sod, riprap, curbs, or other surface; marking location of conduit (when required); furnishing and installing fittings, junction boxes, and expansion joints; and materials, equipment, labor, tools, and incidentals.

Flexible conduit will not be paid for directly but will be subsidiary to pertinent Items. Unless otherwise shown on the plans, no payment will be allowed under this Item for conduit used on electrical services or in foundations.

1. Item 1000

1. Horizontal Directional Drilling

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1. Description. This Item shall govern for the installation of a new conduit by the directional drilling method. Horizontal directional drilling (HDD) rig is a mechanical drilling device used to create a horizontal borehole trough which a pipe or conduit is installed. Directional drilling is the installation of a pipe by drilling a pilot bore from the entry pit to a pre-determined exit location. The drilling head is then replaced with a reamer and the drilling string is pulled back to the entry hole, enlarging the hole while simultaneously pulling the conduit into place.

2. Equipment. The Contractor shall be responsible for the directional drilling method and equipment. The Contractor shall confirm that the drilling rig and mud mixing system have the capacity required to successfully complete the installation knowing the length of the crossing and product type and diameter, and shall consider ground and groundwater conditions that can be reasonably foreseen.

   (1) Operating range and degree of accuracy of proposed tracking system shall be adequate to meet project conditions. Tracking/steering equipment shall allow for continuous monitoring of the drilling head along the entire proposed alignment. If a poor contact with the transmitter is expected to occur at any section, this shall be communicated to the Engineer prior to commencement of construction.

   (2) The drilling unit shall be equipped with an electrical strike safety package unless underground electrical utilities are confirmed not in the area. The package shall include warning sound alarm, grounding mats and protective gear.

   (3) Only trained operators shall be permitted to operate the drilling equipment, and manufacture's operating instructions and safety practices shall always be followed.

3. Work Methods.

   (1) Submittals and Requirements.

      (a) Contractor shall submit complete methodology specific to each crossing, including equipment specifications and capabilities, size of pilot hole, number and size of pre-reams, use of rollers, baskets and side booms to suspend and direct pipe during pull back, type and capabilities of tracking system, and number of sections in which the conduit is to be installed.

      (b) The Contractor must determine and document the proposed drill path including its horizontal and vertical alignments and the location of buried utilities and substructures along the path.

      (c) Contractor shall submit for approval a drilling fluid management plan detailing proposed methods to control, collect, transport, and dispose of drilling fluids and spoils. Return and spoils are the drilling mud and cuttings collected in the entry and exit pits as well as any fluid, which escapes from the borehole to the surface. The plan shall contain a method of dealing with inadvertent returns or surface seepage of drilling fluids and spoils and a contingency plan in case of spills (i.e., drilling fluids, hydraulic fluids, etc.) including measures to contain and clean the affected area.

      (d) The Contractor shall also be responsible for developing and maintaining emergency procedures for inadvertently boring into existing utilities including a live power line, natural gas line, water line, sewer line, or fiber-optic cables..

      (e) If a drilled hole beneath a man-made surface must be abandoned, the hole shall be filled with grout to prevent future subsidence. The Engineer shall be notified before the borehole is abandoned and the abandoned borehole shall be identified on the as-built plans.

   (2) Drilling and Back-Reaming.

      (a) Contractor shall prevent drilling fluids from entering the manholes, sanitary and storm sewers, other drainage systems, and any Waters of the United States including creeks and streams.

(b) A strict minimum bending radius guideline is imposed so as to avoid an excessively sharp bending radius and consequently, possible damages to the conduit. The entrance angle of the drill string shall be between 8 and 20 degrees to the horizontal, with 12 degrees considered optimal. The exit angle of the drill string shall be within the range of 5 to 10 degrees.

(c) Drilling mud shall be used during drilling and back-reaming operations. Drilling mud pressure in the borehole should not exceed that which can be supported by the overburden to prevent heaving or hydraulic fracturing of the soil ("Frac-out").

(d) The pilot hole shall be back-reamed to accommodate and permit free sliding of the product inside the borehole. The Contractor shall be responsible for selecting the appropriate reamer size.

(e) A sufficient number of pre-reams shall be utilized as to avoid heaving while enlarging the hole to the desired diameter.

(f) Pipe rollers, skates or other protective devices should be used in the installation of conduits (6 in.) in outside diameter or larger.

(g) Pipe installation shall be performed in a manner that minimizes the over-stressing and straining of the pipe.

(h) During pull-back operations, the conduit shall be sealed with a cap or plug to prevent water, drilling fluids and other foreign materials from entering the pipe as it is being pulled back.

(i) Breakaway swivels shall be used with pulling head to limit the amount of force used during pull-back operation.

(3) Pipe Joining.

(a) High Density Polyethylene. Sections of pipe should be assembled and joined on the job site above ground. Joining should be accomplished by the butt-fusion method in strict conformance with the manufacturer's printed instructions.
The butt-fusion method for pipe joining shall be carried out in the field by qualified fusion technicians following the pipe and fitting manufacturer's specifications. The joints shall have a smooth, uniform, double rolled back bead made while supplying the proper melt, pressure and alignment. It shall be the sole responsibility of the Contractor to provide an acceptable butt-fusion joint. The Contractor shall perform a leak test prior to pull back.
All joints shall be made available for inspection by the Engineer before insertion.

(b) Contractor shall use a form of coating that provides a corrosion barrier as well as an abrasion barrier. To avoid difficulties during the pull-back operation, the coating should be well bonded and have a hard, smooth surface to resist soil stresses and reduce friction. The Contractor shall perform a leak test prior to pull back.

(c) PVC Conduit - Sections of pipe should be assembled and joined on the job site above ground. Joining should be accomplished by the butt-fusion method in strict conformance with the manufacturer's printed instructions.

(4) Tie-Ins and Connections. Trenching may be used to join sections at tie-ins of conduits installed by the directional boring method.

(a) An additional pipe length, sufficient for joining to the next segment, shall be pulled into the entrance pit. This length of the pipe shall not be damaged or interfere with the subsequent drilling of the next leg. The Contractor shall leave a minimum of 3 feet of conduit above the ground on both sides of the borehole.

(b) Polyethylene pipe, tie-ins and connections shall only be made after a suitable time period in order to allow the pipe to recover. Recovery period shall be equal to at least twice the pull-back time.

(5) Drilling fluids –Collection and Disposal Practices. Excess drilling mud slurry shall be contained in a lined pit or containment pound at exit and entry points until recycled or removed from the site. Entrance and exit pits shall be of sufficient size to contain the expected return of drilling mud and spoils.
Precautions shall be taken to keep drilling fluids out of the streets, manholes, sanitary and storm sewers, and other drainage systems including streams and rivers.
The Contractor shall make all diligent efforts to minimize the amount of drilling fluids and cuttings spilled during the drilling operation, and shall provide complete clean-up of all drilling mud overflows or spills.

(6) Acceptance. The Contractor shall provide a set of as-built drawings including both alignment and profile. Drawing should be constructed from actual field reading. Raw data shall be submitted at any time upon Engineer's request.

Conduit shall be installed within the pre-specified alignment and grade tolerances as appear on the drawings and/or project specifications.

All surfaces affected by the work shall be restored to their pre-construction condition. This includes backfilling, replacement of topsoil, seeding and fertilizer.

4. Measurement. This Item will be measured as the distance in feet along the ground of the centerline of the proposed pipeline and not actual drilled distance from entrance pit to exit pit. Trenches for joining sections at tie-ins of conduits shall be considered incidental to the installation.

This is a plans quantity measurement Item and the quantity to be paid for will be that quantity shown in the proposal and on the "Estimate and Quantity" sheet of the contract plans, except as may be modified by Article 9.8. If no adjustment of quantities is required, additional measurements or calculations will not be required.

5. Payment. 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 "Horizontal Directional Drilling" of the type of pipe specified and of the size of pipe specified and "Trenches". This price shall be full compensation for drilling, drill mud, pipe, exterior coating (if required), butt-fusion welding, hot glueing, flushing, pressure testing, water, all engineering services, plant, labor, material, and services for preparation of the site including removal of vegetation, location of all existing utilities along the proposed path, excavation of entry, exit, and slurry containment pits, full location map, surface restoration to existing conditions, replacement and/or reinstatement of existing utilities, backfill, compaction, and for all other materials, equipment, labor, tools and incidentals necessary to complete the work.

Item 2000
Filter Fabric

6. Description. Furnish and install filter fabric.

7. Materials. Furnish filter fabric conforming to DMS-6200, "Filter Fabric."

8. Construction. Place when general weather conditions are suitable, in the opinion of the Engineer.

Install to the lines, grades, and dimensions shown on the plans. Overlaps of filter fabric shall be 18 in. minimum. Use securing pins when necessary to insure proper anchoring of the fabric.

Leave filter fabric in its protective wrapping until ready for use. Fabric removed from wrapping for longer than 72 hours without being covered shall be deemed unsatisfactory and be replaced.

Repair torn or punctured fabric by placing a patch over the damaged area. Patch shall consist of an additional layer of fabric large enough to provide a minimum overlap of 3 ft. in all directions.

9. Measurement. Filter fabric will be measured by the square foot, complete in place, with no allowance for overlapping at transverse or longitudinal joints.

10. Payment. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" are paid for at the unit price bid for "Filter Fabric." This price is full compensation for furnishing and placing filter fabric including manipulation, labor, tools, equipment, and incidentals.

Item 8000
Dewatering

1. Description. This Item shall govern work for temporary dewatering systems.

2. System Description.

   A. Remove water which accumulates in excavations during the progress of work so that all can be done in the dry, unless otherwise approved by the Engineer. Keep excavated areas free from water while underground utilities or structures are constructed, while concrete is setting and until backfill or elements of the structure have been placed to a sufficient height to anchor the work against possible leakage or buoyant uplift forces. A height to anchor the work against buoyant uplift forces shall be considered sufficient when the dead load weight of the backfill or elements of the structure exceeds the uplift forces by a minimum factor-of-safety of 1.5.

   B. In addition to the other requirements specified herein, design the dewatering systems to perform as follows:
      1. Prevent damage to adjacent properties, buildings, structures, utilities, and other work as a result of settlement or other groundwater-related effects.
      2. At all times, maintain groundwater levels over the entire excavation a minimum of 3 feet below the excavation grade.

   C. At all times, have on the work site sufficient pumping equipment for immediate use, including standby pumps for use in case other pumps become inoperable. Dispose of water in accordance with the detailed requirements specified herein and so as to cause no injury to personnel or the public, damage to public or private property, nor menace to the public health.

   D. Design dewatering system to prevent pumping fines from below grade or disturbing materials exposed at the excavation bottom. Wells shall be cased, and filter(s) shall be provided to prevent such pumping of fines.

   E. Provide a sufficient number of monitoring wells to confirm the following:
      1. The dewatering system is performing as intended and is achieving the specified reduction in groundwater levels.
      2. Construction site groundwater levels inside and outside dewatered excavations to determine the acceptability of removing the dewatering system from operation.

   F. Furnish container for construction dewatering complete with baffles for the purpose of filtering silt prior to discharge of water. Size container or containers to suit dewatering and storage demands.

   G. If the approved methods include displacing groundwater as concrete or other work is placed in excavations, the dewatering system shall capture groundwater as it is displaced and follow the procedures herein for its containment, analysis, and discharge.

   H. Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering.

3. Dewatering Plan.

   A. Submit dewatering plan to the Engineer, including shop drawings and design data including the following elements:

      1. The proposed type of dewatering system.
      2. Arrangement, location, and depths of system components.
      3. Complete description of equipment and instrumentation to be used, with installation, operation and maintenance procedures.
      4. Types and sizes of filters.
      5. Design calculations demonstrating adequacy of the proposed system and equipment.
      6. Methods of disposal of pumped water.
      7. Method of water quality monitoring.
      8. Type of filtration and chemical treatment of contaminated water, as applicable.
      9. Well point system design, if proposed: Submit design complete with calculations and shop drawings.
      10. Method for establishing and monitoring construction site groundwater levels.
      11. Criteria for determining the acceptability of removing the dewatering system from operation.

   B. Prior to removing the dewatering system from operation, submit documentation and calculations verifying that the approved criteria for determining the acceptability of removing the system from operation have been met.

4. Deliverables. Submit copies of permits required for work of this Section.

5. Dewatering Execution.

   A. Except as otherwise indicated in the Contract Documents, perform dewatering to accomplish a lowering of measured static ground water level to an elevation which is suitable for the construction of structures below grade.

   B. When pumping is required to reduce groundwater levels, accomplish pumping in a manner that will not disrupt the surrounding environment.

   C. The Contractor may, during the daylight hours of 8:30 AM to 4:30 PM, use power plants to operate the dewatering pumps. During all other hours, power to run the pumps shall be electric and obtained from the electric power utility, unless otherwise authorized by the Engineer and jurisdictional authorities.

   D. If any dewatering well pumps fines, terminate pumping and construct new well at a different location with a revised design which eliminates the pumping of fines.

   E. Do not turn off the dewatering system in a manner that the upsurge in water weakens the subgrade for completed excavation and structure foundation work.

   F. Remove storage containers, including those cleaned, and other dewatering facilities from the site at the completion of dewatering operations.

6. Containment, Analysis, and Discharge of Groundwater Extracted.

A. Containment: Upon extraction, store groundwater extracted in the process of construction dewatering in containers prior to discharge or disposal of water, as applicable. Keep containers locked to prevent accidental or purposeful discharge of the water. Contain and store the water on-site and in such a manner that it will not interfere with the Contractor's existing or continued construction operations.

B. Analysis: Collect and analyze water samples taken directly from each storage container to verify that the extracted groundwater meets applicable discharge requirements. Number of samples taken per container shall be at the sole discretion of the Engineer.

C. Discharge Requirements: Discharge no water which exceeds regulatory requirements or the jurisdictional authority's discharge requirements.

D. Discharge: Obtain jurisdictional authority's specific discharge requirements prior to commencement of dewatering. Subject to the discharge restrictions specified herein and upon written authorization from the jurisdictional authority, discharge effluent from dewatering directly into existing sanitary manholes, where said sewer system is in operating condition. Provide conduits to carry said effluent to nearest sanitary sewer manhole and drainage to the nearest storm drainage. Confirm that manholes to be utilized are in operating condition. Release water in a manner that will not impact the Contractor's operations.

E. Use: Extracted groundwater of sufficient quality as shown by test data may be used on site with Engineer's written approval for those purposes approved by the Engineer.

7. Measurement. Dewatering for this project will be measured by the lump sum.

8. Payment. 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 "Dewatering". This price shall be full compensation for dewatering operations and disposal of water removed; for monitoring points; for locating the water table; for restoring dewatering conveyance system routes to original condition; and for all labor, tools, equipment and incidentals necessary to complete the work.

ITEM 9000
ARTICULATED CONCRETE MATS

ARTICULATING CONCRETE BLOCK (ACB)
REVETMENT SYSTEM SPECIFICATIONS - ARMORFLEX®

PART 1: GENERAL

A. Scope of Work

The contractor shall furnish all labor, materials, equipment, and incidentals required and perform all operations in connection with the installation of cellular concrete erosion control blocks in accordance with the lines, grades, design and dimensions shown on the Contract Drawings and as specified herein.

B. Submittal

The Contractor shall submit to the Engineer all manufacturers' hydraulic testing and calculations in support of the proposed cellular concrete mat system and geotextile.

The Contractor shall furnish the manufacturer's certificates of compliance for cellular concrete blocks/mats, revetment cable, and any revetment cable fittings and connectors. The Contractor shall also furnish the manufacturer's specifications, literature, shop drawings for the layout of the mats, and any recommendations, if applicable, that are specifically related to the project.

Alternative materials may be considered. Such materials must be pre-approved in writing by the Engineer prior to bid date. Alternative material packages must be submitted to the Engineer a minimum of fifteen (15) days prior to bid date. Submittal packages must include, as a minimum, the following:

1. Full-scale laboratory testing performed by the submitting manufacturer and associated engineered calculations quantifying the hydraulic capacity of the proposed cellular concrete mat system in similar conditions to the specific project.

2. A list of 5 comparable projects, in terms of size and applications, in the United States, where the results of the specific alternate revetment system use can be verified after a minimum of five (5) year of service life.

PART 2: PRODUCT

A. General

All cellular concrete mats shall be prefabricated as an assembly of concrete blocks, with specific hydraulic capacities, laced with revetment cables. Cellular concrete mats may be assembled on-site by hand-placing the individual units either with or without subsequent insertion of cables.

Individual units in the system shall be staggered and interlocked for enhanced stability. The mats shall be constructed of open and/or closed cell units as shown on the contract drawings. The open cell units have two (2) vertical openings of rectangular cross section with sufficient wall thickness to resist cracking during shipping and installation. Parallel strands of cable shall extend through two (2) cable ducts in each block allowing for longitudinal binding of the units within a mat. Each row of units shall be laterally offset by one-half of a block width from the adjacent row so that any given block is cabled to four other blocks (two in the row above and two in the row below).

Each block shall incorporate interlocking surfaces that minimize lateral displacement of the blocks within the mats when they are lifted by the longitudinal revetment cables. The interlocking surfaces must not protrude beyond the perimeter of the blocks to such an extent that they reduce the flexibility or articulation capability of the cellular mats or

become damaged or broken when the mats are lifted during shipment or placement. Once the mats are in place, the interlocking surfaces shall minimize the lateral displacement of the blocks even if the cables should become damaged or removed. The mats must be able to flex a minimum of 18° between any given row or column of blocks in the uplift direction and a minimum of 45° in the downward direction.

The cables inserted into the mats shall form lifting loops at one end of the mat with the corresponding cable ends spliced together to form a lifting loop at the other end of the mat. The Engineer shall approve appropriate sleeves for use in order to splice the lifting loop. The cables shall be inserted after sufficient time has been allowed for the concrete to complete the curing process.

The cellular concrete mats shall be placed on a filter fabric as specified herein. Under no circumstances shall the filter fabric be affixed (i.e. chemically bonded to the blocks) to the mattress in a manner in which would jeopardize the functionality of the filter fabric. Specifically, the filter fabric shall be independent of the block system.

Certification (Open-Channel Flow): Cellular concrete mats will only be accepted when accompanied by documented hydraulic performance characteristics that are derived from tests under controlled flow conditions. Testing guidelines should conform to U.S. Federal Highway Administration and U.S. Bureau of Reclamation Testing Protocol as documented in "Minimizing Embankment Damage During Overtopping Flow", Report No. FHWA-RD-88-181 and all hydraulic performance testing shall be performed in a 2H:1V flume.

Performance (Open-Channel Flow): The design of the cellular concrete mats shall be in accordance with the Factor-of-Safety design methodology as described in "Erosion and Sedimentation" by Pierre Julien, Cambridge University Press, 1995. The minimum designed safety factor shall be 1.5 by utilizing the following equation.

$$SF = ((\gamma_2 / \gamma_1)\ \gamma_0) / ((1 - \gamma_2^2)^{0.5} \cos\ \theta + \mu\ (\gamma_2 / \gamma_1) + (\gamma_3\ F_d' \cos\ \theta + \gamma_4\ F_l') / \gamma_1 W_s) = 1.5$$

The analysis shall be performed based upon the stability of the mat due to gravity forces alone, neglecting conservative forces added by cabling, mechanical anchorage, contact with adjacent blocks, or other restraints not attributable to gravity based forces. The analysis must account for a 0.5-inch block projection.

In order to analyze the performance of the unit, the hydraulic information listed below is required:

TABLE 1. ACB HYDRAULIC INFORMATION

Velocity (ft/sec)	?
Shear Stress (lb/ft^2)	?
Friction or Bed Slope (ft/ft)	?.
Side Slope (_H:1V)	?
Allowable Unit Protrusion (in)	0.5 for Uniform Units &
	0.0 for 0.5 inch Tapered Units

B. Cellular Concrete Blocks

1. Scope

1.1 This specification covers erosion control mats used in revetments for soil stabilization.

Note 1 - Concrete units covered by this specification are made from lightweight or normal weight aggregates, or both.

Note 2 - The values stated in U.S. customary units are to be regarded as the standard.

2. Materials

2.1 Cementitious Materials - Materials shall conform to the following applicable ASTM specifications:

2.1.1 Portland Cements - Specification C 150, for Portland Cement.

2.1.2 Blended Cements - Specification C 595, for Blended Hydraulic Cements.

2.1.3 Hydrated Lime Types - Specification C 207, for Hydrated Lime Types.

2.1.4 Pozzolans - Specification C 618, for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.

2.2 Aggregates shall conform to the following ASTM specifications, except that grading requirements shall not necessarily apply:

2.2.1 Normal Weight - Specification C 33, for Concrete Aggregates.

3. Casting

3.1 The concrete units shall be produced by a dry cast method. The dry cast units obtain strength in a shorter duration as well as an increase in the durability and overall quality of product.

4. Physical Requirements

4.1 At the time of delivery to the work site, the units shall conform to the physical requirements prescribed in Table 2 listed below.

2. *TABLE 2. PHYSICAL REQUIREMENTS*

Compressive Strength Net Area Min. p.s.i (mPa)		Water Absorption Max. lb/ft^3 (kg/m^3)	
Avg. of 3 units	Individual Unit	Avg. of 3 units	Individual Unit
4,000 (27.6)	3,500 (24.1)	9.1 (160)	11.7 (192)

4.2 Units will be sampled and tested in accordance with *ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.*

4.3 Units shall be sampled and tested in accordance with ASTM D 6684-04, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.

5. Visual Inspection

5.1 All units shall be sound and free of defects that would interfere with either the proper placement of the unit or impair the performance of the system. Surface cracks incidental to the usual methods of manufacture, or surface chipping resulting from customary methods of handling in shipment and delivery, shall not be deemed grounds for rejection.

5.2 Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth shall be deemed grounds for rejection.

5.3 Chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit shall be deemed grounds for rejection.

5.4 Blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural grout or replaced at the expense of the contractor.

6. Sampling and Testing

6.1 The purchaser or their authorized representative shall be accorded proper access to facilities to inspect and sample the units at the place of manufacture from lots ready for delivery.

6.2 Field installation procedures shall comply with the procedures utilized during the hydraulic testing procedures of the recommended system. All system restraints and ancillary components (such as synthetic drainage mediums) shall be employed as they were during testing. For example, if the hydraulic testing installations utilize a drainage layer then the field installation must utilize a drainage layer; an installation without the drainage layer would not be permitted.

6.3 The theoretical force-balance equation used for performance extrapolation tends for conservative performance values of thicker concrete units based on actual hydraulic testing of thinner units. When establishing performance values of thinner units based on actual hydraulic testing of thicker units, there is a tendency to overestimate the hydraulic performance values of the thinner units. Therefore, all performance extrapolation must be based on actual hydraulic testing of a thinner unit then relating the values to the thicker units in the same "family" of blocks.

6.4 Additional testing, other than that provided by the manufacturer, shall be borne by the purchaser.

Manufacturer

Cellular concrete blocks shall be ARMORFLEX® as manufactured and sold by:

ARMORTEC, A Contech Company
9025 Centre Pointe Dr., Suite 400
West Chester, OH 45269
Phone: 1-800-645-7000 Fax: 1-513-645-7993

The ARMORFLEX® cellular concrete blocks shall have the following nominal characteristics:

TABLE 2. STANDARD SIZES OF ARMORFLEX® BLOCKS

CLASS	TYPE	BLOCK WEIGHT		BLOCK SIZE			OPEN AREA %
		Lbs	Lbs./Sq.ft.	Length inches	Width inches	Height inches	
30S	Open	31-36	32-37	13.0	11.6	4.75	20
50S	Open	45-52	45-53	13.0	11.6	6.0	20
45S	Closed	39-45	40-45	13.0	11.6	4.75	10
55S	Closed	51-61	54-62	13.0	11.6	6.0	10
40	Open	59-64	33-36	17.4	15.5	4.75	20
50	Open	76-82	43-46	17.4	15.5	6.0	20
70	Open	115-124	65-71	17.4	15.5	8.5	20
45	Closed	72-78	41-44	17.4	15.5	4.75	10
55	Closed	91-100	53-57	17.4	15.5	6.0	10
75	Closed	112-121	63-68	17.4	15.5	7.5	10
85	Closed	136-147	76-84	17.4	15.5	8.5	10
40L	Open	97-118	42-46	17.4	23.6	4.75	20
70L	Open	174-189	67-74	17.4	23.6	8.5	20
45L	Closed	108-118	42-46	17.4	23.6	4.75	10
85L	Closed	208-225	80-87	17.4	23.6	8.5	10

*Block height may vary based on local manufacture's capabilities.
**Block weight may vary based upon the specific gravity of local available aggregate material

C. Revetment Cable and Fittings

Option 1. Polyester Revetment Cable and Fittings. Revetment cable shall be constructed of high tenacity, low elongating, and continuous filament polyester fibers. Cable shall consist of a core construction comprised of parallel fibers contained within an outer jacket or cover. The weight of the parallel core shall be between 65% to 70% of the total weight of the cable. The revetment cable shall have the following physical properties:

Polyester Cable				
Nominal Cable Dia.	Approx. Ave. Strength		Weight per Length	
(in.)	(Lbs)	(kN)	(Lbs)/100ft	(kg/m)
1/4	3,000	13.3	2.2	0.03
5/16	7,000	31.1	4.4	0.07
3/8	10,000	44.5	5.5	0.08
1/2	15,000	66.7	9.7	0.14

Elongation requirements specified below are based upon stabilized new, dry cable. Stabilization refers to a process in which the cable is cycled fifty (50) times between a load corresponding to $200D^2$ and a load equal to 10%, 20% or 30% of the cable's approximate average breaking strength. Relevant elongation values are as shown in the table below. The tolerance on these values is $\pm$ 5%.

ELASTIC ELONGATION		
at Percentage of Break Strength		
10%	20%	30%
0.6	1.4	2.2

The revetment cable shall exhibit resistance to most concentrated acids, alkalis and solvents. Cable shall be impervious to rot, mildew and degradation associated with marine organisms. The materials used in the construction of the cable shall not be affected by continuous immersion in fresh or salt water.

Selection of cable and fittings shall be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 60% of the minimum rated cable strength. Fittings such as sleeves and stops shall be aluminum and washers shall be galvanized steel unless otherwise shown on the Contract Drawings.

Option 2. Galvanized Steel Revetment Cable and Fittings. Revetment cable shall be constructed of preformed galvanized aircraft cable. The cables shall be made from individual wires and strands that have been formed during the manufacture into the shape they have in finished cable.

Cable shall consist of a core construction comprised of seven (7) wires wrapped within seven (7) or nineteen (19) wire strands. The revetment cable shall have the following physical properties:

Galvanized Cable					
Nominal Cable Dia.	Type	Approx. Ave. Strength		Weight per Length	
(in.)		(Lbs)	(kN)	(Lbs)/100ft	(kg/m)
1/8	7x7	1,700	7.5	2.8	0.04

3/16	7x7	3,700	16.4	6.2	0.09
1/4	7x7	6,100	27.1	10.6	0.16
5/16	7x19	9,800	43.6	17.3	0.26
3/8	7x19	14,400	64.1	24.3	0.36

The revetment cable shall exhibit resistance to mild concentrations of acids, alkalis, and solvents. Fittings such as sleeves and stops shall be aluminum, and the washers shall be galvanized steel. Furthermore, depending on material availability, the cable type (7x7 or 7x19) can be interchanged while always ensuring the required factor of safety for the cable.

Selection of cable and fittings shall be made in a manner that insures a safe design factor for mats being lifted from both ends, thereby forming a catenary. Consideration shall be taken for the bending of the cables around hooks or pins during lifting. Revetment cable splicing fittings shall be selected so that the resultant splice shall provide a minimum of 75% of the minimum rated cable strength.

D. Anchors

Where permanent anchoring is required, e.g. hanging mats on steep slopes without toe construction, the cables (polyester or steel) shall be attached to the anchoring system as indicated on the Contract Drawings. The design and layout of the anchored system shall be design by a separate entity other than Armortec.

E. Filter Fabric

The geotextile filter shall meet the minimum physical requirements listed in Table No. 3 of these Specifications. Consultation with the manufacturer is recommended.

The geotextile must be permitted to function properly by allowing relief of hydrostatic pressure; therefore fine soil particles shall not be allowed to clog the filter fabric.

The geotextile fiber shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of propylene, ethylene, ester, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic, if necessary, to make the filaments resistant to deterioration due to ultraviolet and heat exposure. The edges of the geotextile shall be finished to prevent the outer fiber from pulling away from the geotextile.

The Contractor shall furnish the Engineer, in duplicate, manufacturer's certified test results showing actual test values obtained when the physical properties are tested for compliance with the specifications.

During all periods of shipment and storage, the filter fabric shall be protected from direct sunlight, ultraviolet rays and temperatures greater than 140 degrees Fahrenheit. To the extent possible, the fabric shall be maintained wrapped in its protective covering. The geotextile shall not be exposed to sunlight, ultraviolet rays until the installation process begins.

3.

4. TABLE 3. PHYSICAL REQUIREMENTS

Physical Property	Test Procedure	Minimum Value
Grab Tensile Strength (Unaged Geotextile)	ASTM D4632	200 Lbs. (in any principal direction)
Breaking Elongation (Unaged Geotextile)	ASTM D4632	50% max. (in any principal direction)
Burst Strength	ASTM D3786	400 p.s.i
Puncture Strength	ASTM D4833	115 lbs.
A.O.S., U.S. Std. Sieve	ASTM D4751	see Design Manual

% Open Area	CWO-22125-86	See Design Manual
Permittivity	ASTM D4491	See Design Manual

Final acceptance of the filtration geotextile by the Engineer based on project specific soil information. Soil characteristics such as grain size distribution and plasticity shall be determined for every 200,000 square feet of geotextile installed or for each source of borrow material used during construction. Significant differences in soil characteristics shall require further performance sieve and possible hydrometer testing by either the at the discretion of the Engineer. The locations for which the material to be tested is extracted shall be approved by the Engineer. The Contractor shall provide the site-specific soil and modified proctor curves for the site-soil, at his own expense, to the manufacturer. Also, the contractor shall be responsible for the performance of the test by a certified independent laboratory experienced in performing such test. The test shall be performed under the actual field soil conditions or as otherwise required by the Engineer.

At the time of installation, the filter fabric shall be rejected if it has been removed from its protective cover for over 72 hours or has defects, tears, punctures, flow deterioration, or damage incurred during manufacture, transportation or storage. With the acceptance of the Engineer, placing a filter fabric patch over the damaged area prior to placing the mats shall repair a torn or punctured section of fabric. The patch shall be large enough to overlap a minimum of three (3) feet in all directions.

F. Size of Cellular Concrete Mats

General. The cellular concrete blocks, cables and fittings shall be fabricated at the manufacturer or another approved location into mats with a width of up to eight (8) feet and a length up to forty (40) feet, which is approved by the Engineer.
Mat Length: The cellular concrete mats shall have the ability for fabrication in various lengths, widths, and in combinations of length and/or widths. Special mats are a combination of two opposing dimensions either in the longitudinal or transverse direction of the mats. The special mats are available in various dimensions that allow for a custom fit to a site-specific project.

PART 3: FOUNDATION PREPARATION, GEOTEXTILE AND MAT PLACEMENT

General. All subgrade preparation should be performed in accordance with *ASTM D6884-03, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

Grading. The slope shall be graded to a smooth plane surface to ensure that intimate contact is achieved between the slope face and the geotextile (filter fabric), and between the geotextile and the entire bottom surface of the cellular concrete blocks. All slope deformities, roots, grade stakes, and stones which project normal to the local slope face must be re-graded or removed. No holes, "pockmarks", slope board teeth marks, footprints, or other voids greater than 0.5 inch in depth normal to the local slope face shall be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 1.0 foot in any direction shall be permitted. Where such areas are evident, they shall be brought to grade by placing compacted homogeneous material. The slope and slope face shall be uniformly compacted, and the depth of layers, homogeneity of soil, and amount of compaction shall be as required by the Engineer.
Excavation and preparation for anchor trenches, flanking trenches, and toe trenches or aprons shall be done in accordance to the lines, grades and dimensions shown in the Contract Drawings. The anchor trench hinge-point at the top of the slope shall be uniformly graded so that no dips or bumps greater than 0.5 inches over or under the local grade occur. The width of the anchor trench hinge-point shall also be graded uniformly to assure intimate contact between all cellular concrete blocks and the underlying grade at the hinge-point.

Inspection. Immediately prior to placing the filter fabric and cellular concrete blocks, the prepared subgrade shall be inspected by the Engineer as well as the owner's representative. No fabric or blocks shall be placed thereon until that area has been approved by each of these parties.

B. Placement of Geotextile Filter Fabric

General.
All placement and preparation should be performed in accordance with *ASTM D6884-03, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

Filter Fabric, or filtration geotextile, as specified elsewhere, will be placed within the limits of ACBs shown on the Contract Drawings.

Placement. The filtration geotextile will be placed directly on the prepared area, in intimate contact with the subgrade, and free of folds or wrinkles. The geotextile will not be walked on or disturbed when the result is a loss of intimate contact between the cellular concrete block and the geotextile or between the geotextile and the subgrade. The geotextile filter fabric will be placed so that the upstream strip of fabric overlaps the downstream strip. The longitudinal and transverse joints will be overlapped at least two (2) feet. The geotextile will extend at least one (1) foot beyond the top and bottom revetment termination points, or as required by the Engineer. If cellular concrete blocks are assembled and placed as large mattresses, the top lap edge of the geotextile should not occur in the same location as a space between cellular concrete mats unless the space is concrete filled.

C. Placement of Cellular Concrete Blocks/Mats

General.
ACB placement and preparation should be perform` with *ASTM D6884-03, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems*.

Cellular concrete block/mats, as specified in Part 2:A of these Specifications, will be constructed within the specified lines and grades shown on the Contract Drawings.

Placement. The cellular concrete blocks will be prepared subgrade in such a manner as to produce a smooth plane surface in intimate contact. No individual block within the plane of placed cellular concrete blocks will protrude more than one-half inch or as otherwise specified by the Engineer. Cellular concrete blocks should be flush and develop intimate contact with the subgrade section, as approved by the Engineer.

Proposed hand placing only is to be used in limited areas, specifically identified by the Engineer.

If assembled and placed as large mattresses, the cellular concrete mats will be attached to a spreader bar or other approved device to aid in the lifting and placing of the mats in their proper position by the use of a crane or other approved equipment. The equipment used should have adequate capacity to place the mats without bumping, dragging, tearing or otherwise damaging the underlying fabric. The mats will be placed side-by-side and/or end-to-end, so that the mats abut each other. Mat seams or openings between mats greater than two (2) inches will be backfilled with 4000 p.s.i. non-shrink grout, concrete or other material approved by the Engineer. Whether placed by hand or in large mattresses, distinct changes in grade that results in a discontinuous revetment surface in the direction of flow will require backfill at the grade change location so as to produce a continuous surface.

Termination trenches and side trenches will be backfilled and compacted flush with the top of the blocks. The integrity of the trench backfill must be maintained so as to ensure a surface that is flush with the top surface of the cellular concrete blocks for its entire service life. Toe trenches will be backfilled as shown on the Contract Drawings. Backfilling and compaction of trenches will be completed in a timely fashion. No more than 500 linear feet of placed cellular concrete blocks with non-completed anchor and/or toe trenches will be permitted at any time.

Finishing. The cells or openings in the cellular concrete blocks will be backfilled and compacted with suitable material, as specified by the Engineer. Backfilling and compaction will be completed in a timely manner so that no more than 500 feet of exposed mats exist at any time.

Finishing requirements is explicitly at the discretion of the Engineer of Record.

Consultation. The manufacturer of the cellular concrete blocks/mats will provide design and construction advice during the design and initial installation phases of the project as necessary, by the discretion of the Engineer.

Item 9010
Vinyl Sheet Pile

1. DESCRIPTION

Furnish and place vinyl sheet piling.

2. MATERIALS

All vinyl sheet piling shall be ShoreGuard vinyl sheet piling or an approved equal meeting the following requirements as indicated on the General Notes. The length of sheet piling furnished shall be as indicated on the plans or as authorized by the Engineer.

3. MEASUREMENT

This Item will be measured by the square foot of acceptable piling in place. Piling driven below the elevation required by the plans or the elevation authorized by the Engineer will not be measured for payment.

4. PAYMENT

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 "Vinyl Sheet Pile". No direct payment will be made for excavation and backfill work. The price bid is full compensation for furnishing and placing all vinyl sheet piling materials including timber piling, timber wales, the anchors, tie rods and fasteners, and tools, equipment, labor, and incidentals.

Item 9020
Siphon Structure

1. DESCRIPTION

Furnish and install siphon structure and materials for construction of structure.

2. CONSTRUCTION

The siphon structure is generally lifted and set in place by some kind of cherry picker or crane. The structure is then fastened to sheet piling or some other form of retaining wall to stop any lift of buoyancy the structure may have.

3. MEASUREMENT

This Item will be measured by each structure placed in its final position and accepted by the Engineer.

4. PAYMENT

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 "Siphon Structure." This price is full compensation for fabrication and installation of structure; and equipment, labor, materials, tools, and incidentals.

INSTALLATION GUIDE

CONTECH®
ENGINEERED SOLUTIONS

ArmorFlex® Installation Guide

ARMORTEC
Erosion Control Solutions

ArmorFlex® Installation Guide

The purpose of the ArmorFlex Installation Guide is to provide recommendations for the proper installation of Articulating Concrete Block (ACB) revetment systems. While this guide offers a set of instructions for performing those operations that are critical for the proper functioning of ACB revetment systems, final preparation and installation is the responsibility of the end user. Additional information is contained in ASTM D6884 Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems.

The proper installation of ACB revetment systems is important to achieving the intended hydraulic performance and maintaining stability against the erosive forces of flowing water. An ACB revetment system consists of a suitably prepared and compacted subgrade, a suitable site-specific filter fabric and properly sized ACB block mattresses placed in "intimate contact" with the filter fabric and subgrade. Each individual site will vary so it is important to follow the engineering project drawings as designed and sealed by a registered Professional Engineer; particularly as they relate to standard termination details. All illustrations and photographs used in this guide are examples of typical situations.

It is the Contractor's responsibility to maintain safe work practices consistent with OSHA (Occupational Safety and Health Administration) regulations and other prevailing safe work practices. This guide is intended to be used in conjunction with all applicable safety regulations and safe work practices and is in no way a replacement thereof.

Site Planning & Preparation

Foundation Preparation

Areas on which filter fabric and ACB units are to be placed shall be constructed to the lines and grades shown on the contract drawings to the tolerances specified in the contract documents and approved by the engineer. All areas to receive the ACB shall be compacted and graded smooth to facilitate the installation of the articulated concrete block system and ensure that intimate contact (between the slope face, the filter fabric and the entire bottom surface of the ACB units) is maintained throughout the system.

Unsatisfactory soils (soils having excessive in-place moisture content, soils containing clods, roots, or other organic material that impair the local slope face) must be removed, replaced with approved material and compacted to a minimum 90% of Standard Proctor density (Test Method D698).

Holes, "pockmarks", slope board teeth marks, footprints or other voids greater than 1 inch in depth normal to the local slope face shall not be permitted. No grooves or depressions greater than 0.5 inches in depth normal to the local slope face with a dimension exceeding 1 foot in any direction shall be permitted. Where such areas are evident, they shall be brought to grade by placing compacted homogeneous material. The slope and slope face shall be uniformly compacted, and the Engineer shall determine the depth of layers, homogeneity of soil, and amount of compaction required. If differing block heights are used — the slope is to be prepared so that the tops of the blocks are flush.

Care shall be exercised so as not to excavate below the grades shown on the Engineer's Contract Drawings, unless directed by the Engineer to remove unsatisfactory materials. Excavation of subgrade shall not be more than 2 inches (50 mm) below specified grade. In such areas, placing and compacting approved material, in order to get up to specified grade, in layers not exceeding 6 inches (150 mm) is required. In such areas where subgrade is above specified grade, they shall be brought to grade by removing material or reworking existing material and compacting.

Proper excavation, grading and compaction is critical to the performance of the ACB system.

Fabric shall have the proper overlap and be free of any holes or tears.

When working in an underwater application, it is the contractor's responsibility to assess the jobsite conditions and the means of achieving proper subgrade preparation, per the Engineer's Contract drawings, specifications, and tolerances.

Placement of Filter Fabric

The subgrade shall be inspected immediately prior to filter fabric and ACB placement for proper preparation. The filter fabric shall be placed directly on the prepared subgrade, in intimate contact with the subgrade and free of folds, wrinkles or excess tension. The filter fabric shall not be walked on or disturbed in a manner resulting in the loss of intimate contact between the filter frabric, the ArmorFlex block and subgrade soils.

The filter fabric shall be placed so that upstream sections overlap downstream sections and so that upslope sections overlap downslope sections ("shingle effect"). Overlaps shall be in the direction of flow wherever possible. The longitudinal and transverse joints shall be overlapped at least 3 feet (91 cm) for below-water installations and at least 2 feet (60 cm) for dry installations. The filter fabric shall extend at least 1 foot beyond the top, bottom, and flanking revetment termination points.

Product Delivery and Handling

Deliveries are typically scheduled to accommodate the overall installation sequence requested though the stacking of mats on an individual load is limited to larger mats towards the bottom and smaller mats toward the top of the trailer.

Deliveries are typically made on 48' flat beds with over-the-road tractors, so adequate truck access and turnaround room at the jobsite must be provided by the Contractor. The trucks and drivers are typically contract carriers (not CONTECH trucks).

The drivers are not expected to have any special certifications, jobsite training or equipment. In the case special requirements are needed, the terms and conditions will need to be negotiated and established at the time of the order. Drivers will untie their loads but are not qualified to help with any rigging, unloading or installation.

CONTECH requires at least a full 4 day notice to schedule trucks (Example: notification on Monday for Friday delivery).

For staging mats (offloading for installation later) allow approximately 30-45 minutes to offload each truck. Staging of mats on-site is highly recommended, especially if your company has never installed ArmorFlex in the past.

Timing is everything. Be prepared to unload the mats when the trucks arrive. If applicable, the first load will have the Spreader Bar and filter fabric, along with the first sequence of mats. For installation off the truck, allow 45-60 minutes for direct installation off the truck. Additional time between loads should be considered for inexperienced crews.

CONTECH loads typically allow 2 hours for unloading time. Detention may apply after this 2 hour period and will be charged to the contractor. Loads are typically pre-loaded the day before in order to arrive first thing in the morning.

Each load will have a Bill of Lading (BOL) that has the load number with unloading dates and times.

All mats will be marked on the side of each mat with one of the following descriptions:

1. Rectangle mats will be marked with the size (Example: 8' W x 20' L).
2. Angle/Pie shape mats will be marked with the mat number per the Mat Layout Spreadsheet.

CONTECH requires notification of any changes or cancellation of scheduled deliveries during normal business hours the day prior to loading in order to avoid any cancellation charges.

The use of a crane is optimal for fast and safe unloading and installation of the mats.

Spreader Bar Overview

This instruction content is for informational purposes and should not be considered to be used in lieu of consultation with a professional rigger. Distribute this guide as a procedure for rigging and handling CONTECH supplied Spreader Bars (See Detail A). Notwithstanding the instructions contained in this guide, it is the responsibility of the customer or customer's agent to handle CONTECH products in a safe and efficient manner. For additional information, refer to safety standard ASME B30.20, *Below-the-Hook Lifting Devices*.

Inspection

The operator or other designated personnel should visually inspect the unit before every lift, as well as during operation in the event that damage occurs during a lift. Connector Links, Eye Hooks with Snap Lock and Screw Pin Shackles should engage properly and be free of damage (see Detail B).

The unit shall be free of structural deformation, cracks or excessive wear of any part of the Main Lifting Beam and the Hook Tube Assemblies. The operator should check for loose or missing fasteners, including Connector Links (12), Eye Hooks with Snap Lock (12) and Screw Pin Shackles (2). Welds should also be inspected for signs of obvious cracking.

Maintenance

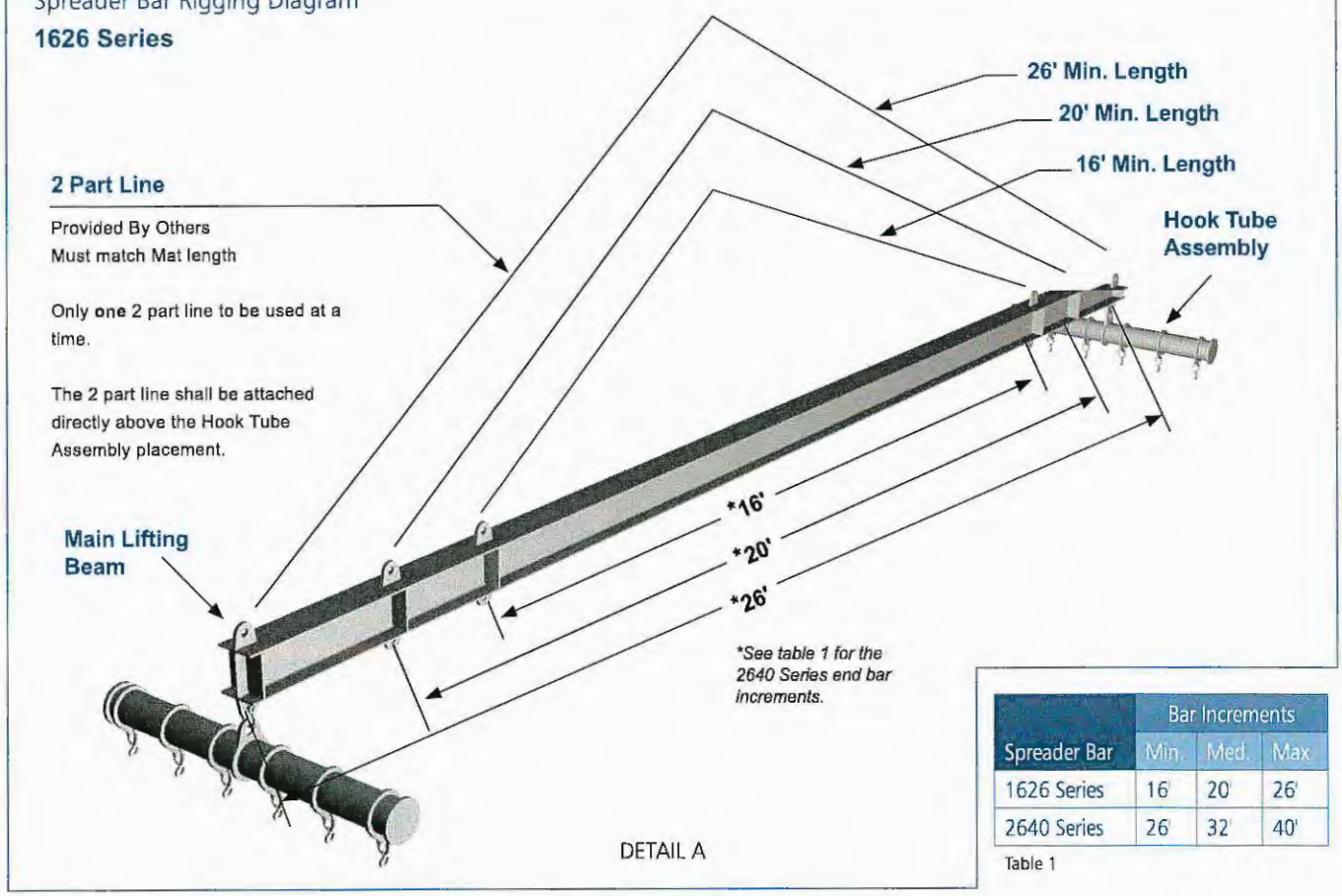
Any observed damage to the Connector Links, Eye Hooks with Snap Lock and Screw Pin Shackles or hazardous conditions found during an inspection shall be corrected before the Spreader Bar is put back into service. Adjustments and repairs shall only be done by a qualified person, and the following process shall be followed by the contractor or their designee:

1. Contact a CONTECH Project Manager before any repair work is performed.
2. The Spreader Bar shall be tagged "OUT OF SERVICE."
3. Replacement parts shall be equal and/or exceed the original manufacturer's specifications (see "Spreader Bar Parts List").
4. Personnel working on the device must be qualified to make the given repair.

When structural damage of the unit is noted or repairs are needed (except for Connector Link, Eye Hooks with Snap Lock, Screw Pin Shackle), the contractor shall halt use of the Spreader Bar, tag the bar "OUT OF SERVICE" and contact the CONTECH Project Manager for further instruction. No welding whatsoever shall be performed on the Spreader Bar unit.

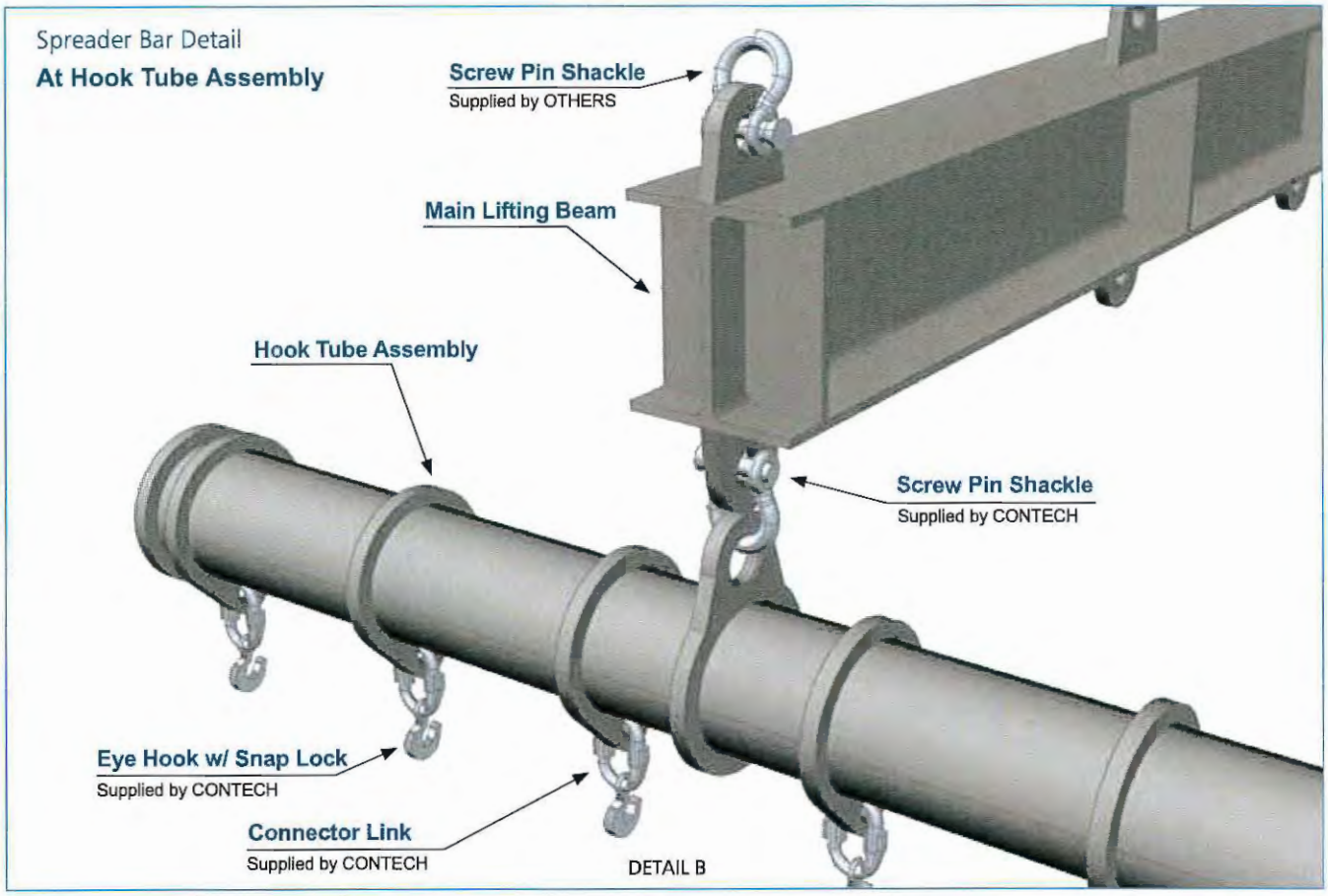
Spreader Bar Rigging Diagram

1626 Series



Spreader Bar	Bar Increments		
	Min.	Med.	Max.
1626 Series	16'	20'	26'
2640 Series	26'	32'	40'

Table 1



SPREADER BAR PARTS LIST	
Qty.	Description
1	Main Lifting Beam
2	Hook Tube Assembly
12	Connector Link, Lok-A-Loy 6-5/8", 16,500 lb Crosby #1014459
12	Eye Hook w/ Snap Lock - 2 ton S-320C Crosby #1022233
2	1" Screw Pin Shcackle 20,000 lb Columbus McKinnon #600-02515
	Replacement Latch Kit - Crosby #1096468

Equipment Needs

Prior to delivery, review the heaviest lift and highest pick in order to properly size the equipment used for the offload and the installation of the mats.

Total pick weight will include the weight of each mat AND Spreader Bar. Estimated Spreader Bar weight is 2,600 lbs for 26' bars and 3,500 lbs for 40' bars.

Total vertical lift height typically ranges between 30' - 65' and is determined by the following variables:

Setting Mats with a Crane or Excavator

1. "Walking" mats with an excavator or using more than one piece of equipment to pick is not recommended and can result in unsafe working conditions and/or damage to the ACB mattresses.
2. Proper lifting with the Spreader Bar ensures the 5:1 working load factor of the cable is preserved.
3. Single end picks (picking up the mat from one end) are not allowed.
4. Identify and avoid obstructions that may hinder reach height (Example: Power lines).

EQUIPMENT	*PICK HEIGHT IMPACT*
Flatbed Trailer	5'
Sag of Mat	5'-20'
2-Part Line	15'-35'
Height of Spreader Bar	4'
Total Vertical Lift Range	30'-65'

Is the reach of your crane or excavator sufficient to set the mats?

CAUTION: Consult the load chart for the machine to verify its load rating is not exceeded.

WARNING NOTES & SAFETY INSTRUCTIONS

Only trained and authorized equipment operators are to be permitted to use CONTECH supplied Spreader Bars. Failure to follow these instructions can result in serious injury or death and/or damage to the product.

DO NOT: Exceed the rated load or lift loads not specified in this guide.

DO NOT: Operate a damaged or malfunctioning unit or a unit with missing parts.

DO NOT: Lift people.

DO NOT: Leave suspended loads unattended.

DO NOT: Remove or obscure warning labels.

DO NOT: Operate without having read and understood the operating guide.

DO NOT: Stand under or near suspended load.

DO NOT: Lift loads higher than necessary.

DO NOT: Make alterations or modifications to a Spreader Bar.

Installation Instructions

Placement of ArmorFlex Units

Care shall be taken while installing the system in order to avoid damage to the filter fabric or the underlying subgrade. The ArmorFlex units shall be placed on the filter fabric in such a manner as to produce a smooth plane surface in intimate contact with the filter fabric.

The preferred method is to start installation of the ACB system at the downstream end and proceed upstream, taking care to protect the leading edge against erosive forces. These erosive forces could potentially undermine the system if proper installation procedures are not followed.

No individual unit within the plane of the system shall exceed a 0.5 inch protrusion or greater protrusion than is specified in the contract drawings. The units shall be placed side by side so that the blocks abut. Termination trenches typically consist of a 2-block toe-in, including the top of slope, the toe of slope and flanks unless otherwise directed by the EOR. This design is typical of an ACB system to protect all sides from erosive factors.

Subgrade preparation, placement of filter fabric, placement of the ArmorFlex concrete units and the final completed project shall be inspected and approved by the Contractor and EOR.

To assist in aligning the unit being placed, use of a pry bar may be necessary.

Earth Anchors (if required):

1. Anchors shall be installed per the manufacturer's instructions.
2. Anchor penetrations through the filter fabric shall be grouted with approved material to prevent migration of subsoil through the penetration point.

FINISHING

Grouting

4,000 psi non-shrinking grout or 4,000 psi concrete shall be placed where the loop ends of the mats meet, or wherever there is greater than a 2-inch gap between adjacent mats or structures. Grout to the top of the block or slightly lower (not above). Grouting of seams is meant to provide a hydraulic connection, not necessarily a structural connection between mats.

Backfill

Backfill of the block shall be specified by the Engineer of Record (EOR). Typical backfill is either suitable soil for revegatation or .375 to .750 inch (10 to 20 mm) diameter crushed stone. Backfilling should occur as early as possible to protect the filter fabric from UV damage. The exposed edges shall be backfilled until flush, ensuring the integrity of a soil backfill is maintained.

Termination trenches shall be backfilled as shown on the approved contract drawings. This backfill material shall be approved by the EOR. It is the recommendation by Armortec® that this non-erodible backfill be 4,000 psi non-shrinking grout or concrete.

Repair of Damaged Units

In the event that a damaged concrete unit exists prior to the placement or after the mat has been installed, the concrete unit can be repaired in one of the following acceptable manners; unit to be completely removed and then backfilled with 4,000 psi grout/concrete or, replaced with a new block unit.

Depending on the size of the crack or chip, the perimeter and void areas of the block can be filled with grout up to or just below the top grade of the block.

Chipping resulting in a weight loss exceeding 10% of the average weight of a concrete unit shall be repaired. Surface chipping (i.e. weight loss of less than 10%) resulting from customary handling methods generally do not require repair.

Grout to the top of the block or slightly lower — not above.

Backfilling should occur as early as possible to protect the filter fabric from UV damage.

Tool and Material Checklist	
Two-part line for attachment to the Spreader Bar's Main Lifting Beam. Each leg of the two-part line needs to be equal to or greater than the longest mat to be picked to achieve an angle no less than 60 degrees between the bar and line. (See Detail A).	**Supplied by others**
Chokers or Straps for ease of Spreader Bar adjustment, recommend: 6 chokers each 2', 5', 8' or 1-2 nylon straps each 2', 5', 8'.	**Supplied by others**
Swivel Clevis for picking point of equipment	**Supplied by others**
Three heavy duty rock bar or pry bars (5 feet length is optimal).	**Supplied by others**
Upside down marking paint (for alignment markings on the mats or ground during installation).	**Supplied by others**
100' measuring tape.	**Supplied by others**
Amortec's Mat Layout Plan Drawings and Mat Layout Spreadsheet with mat numbers and sizes. Have these documents on-site at ALL times for reference.	**Supplied by CONTECH**

Notes:

Support

If you need guidance please, call your local sales representative or our corporate headquarters at 1.800.338.1122 and ask for a representative.

- Drawings and specifications are available at www.ContechES.com.
- Site-specific design support is available from Contech representatives.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products.

Nothing in this catalog should be construed as an expressed warranty or an implied warranty of merchantability or fitness for any particular purpose. See the Contech standard quotation or acknowledgement for applicable warranties and other terms and conditions of sale.

For information on other Contech offerings,
visit www.ContechES.com or call 800.338.1122

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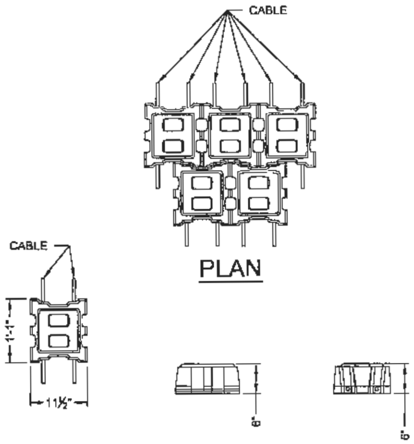
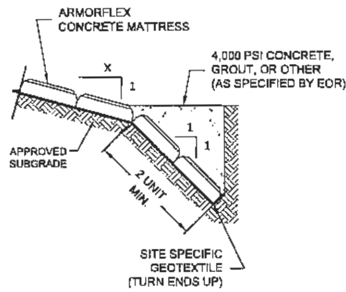
ENGINEERED SOLUTIONS

ARMORTEC®
Erosion Control Solutions

armorflex_install PDF 1/15



TYP. 50S BLOCK (1)
NOT TO SCALE



SECTION (B)
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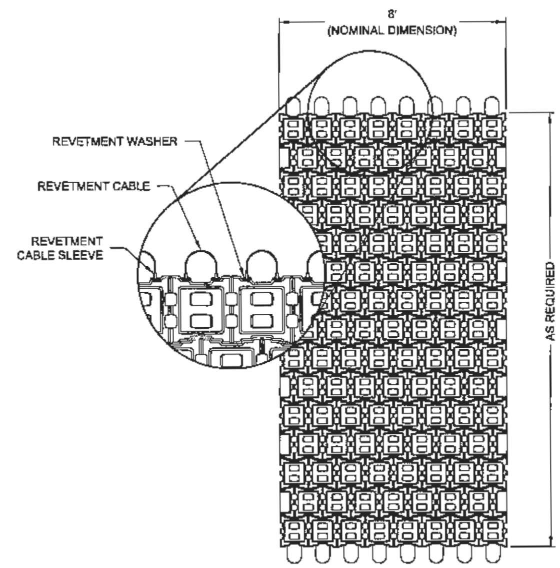
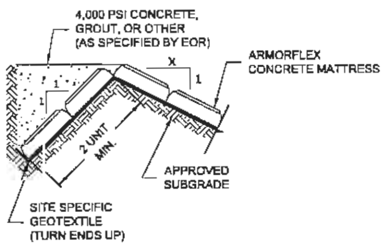


TYP. 50S MAT (2)
NOT TO SCALE



SECTION (A)
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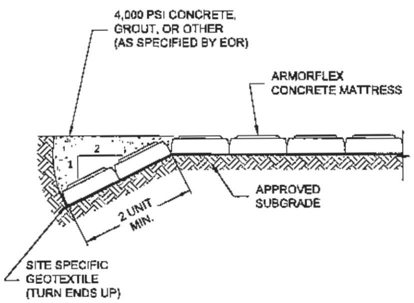


SECTION (C)
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

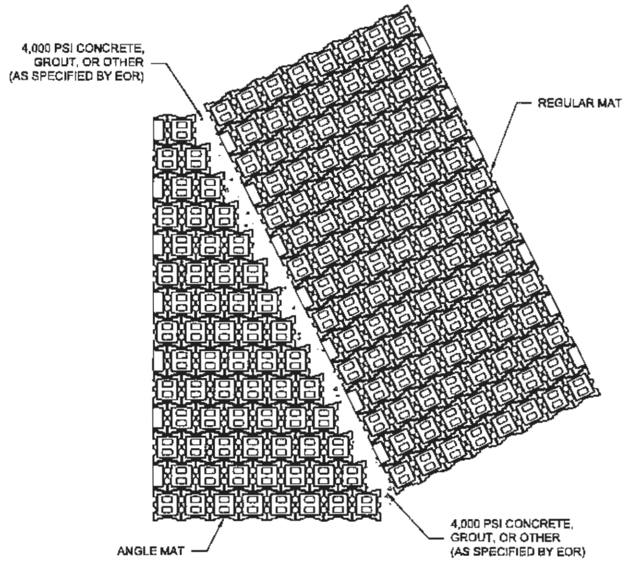
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

ARMORTEC Erosion Control Solutions
CONTECH PROPOSAL DRAWING

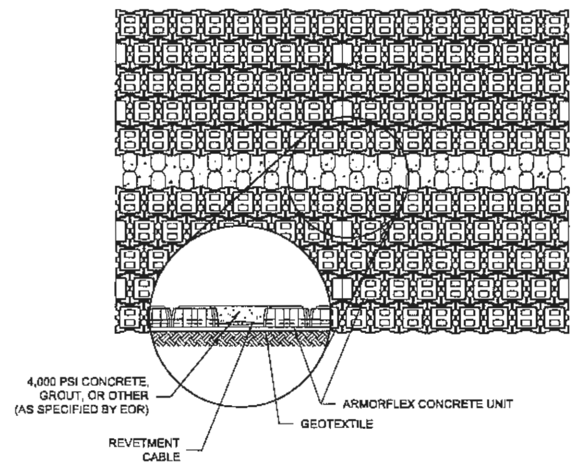
ARMORFLEX CLASS 50 SMALL STANDARD TERMINATION DETAILS

PROJECT No.	SEQ. No.	DATE
—	—	10/28/2013
DESIGNED: —		DRAWN: —
CHECKED: —		APPROVED: —
SHEET NO.: CT1 OF CT2		



NOTE:
ANGLE MATS WILL BE CONSTRUCTED BY OMITTING THE REQUIRED UNITS SO THE REQUIRED MAT DIMENSIONS CAN BE OBTAINED.

TYP. ANGLE MAT (3)
NOT TO SCALE



TYP. MAT TO MAT (4)
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

MARK	DATE	REVISION DESCRIPTION	BY

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www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

ARMORTEC Erosion Control Solutions
CONTECH PROPOSAL DRAWING

ARMORFLEX CLASS 50 SMALL
STANDARD TERMINATION DETAILS

PROJECT No.	SEQ. No.	DATE
—	—	10/28/2013
DESIGNED —		DRAWN —
CHECKED —		APPROVED —
SHEET NO. CT2 OF CT2		

Item 9010
Vinyl Sheet Pile

1. DESCRIPTION

Furnish and place vinyl sheet piling.

2. MATERIALS

All vinyl sheet piling shall be ShoreGuard vinyl sheet piling or an approved equal meeting the following requirements as indicated on the General Notes. The length of sheet piling furnished shall be as indicated on the plans or as authorized by the Engineer.

3. MEASUREMENT

This Item will be measured by the square foot of acceptable piling in place. Piling driven below the elevation required by the plans or the elevation authorized by the Engineer will not be measured for payment.

4. PAYMENT

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 "Vinyl Sheet Pile". No direct payment will be made for excavation and backfill work. The price bid is full compensation for furnishing and placing all vinyl sheet piling materials including timber piling, timber wales, the anchors, tie rods and fasteners, and tools, equipment, labor, and incidentals.

UltraCOMPOSITE™
SHEET PILING AND PILES

SHOREGUARD®
Synthetic Sheet Piling

Installation Guide

Crane Materials International
www.cmilc.com
770-933-8596
info@cmilc.com

CRANE MATERIALS INTERNATIONAL

WARNING

No two walls are the same. The numerous job site variables make it impossible to provide specific construction designs without careful analysis of each variable and the effect it will have on the structure. This analysis should be left up to an architect, professional contractor, or engineer. This manual lists typical installation techniques for demonstration purposes only, and in no way represents any recommendations on how to approach your particular project. Please rely on your engineer for specific design recommendations. Because of the complexity of geotechnical loading calculations and the susceptibility to extreme change of soil loads with minor changes in local site conditions such as soil parameters, water levels, surcharge loads, etc., we strongly recommend the use of design professionals who are familiar with local wall construction to determine the required wall parameters, design techniques, and applicable installation methods and procedures.

WARNING

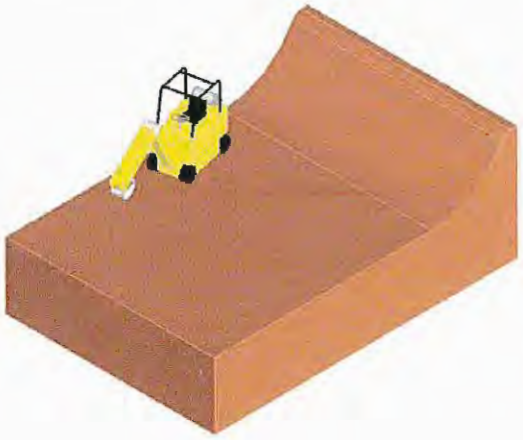
This manual does not address any safety or regulatory issues associated with its use nor the installation of CMI products. It is the user's responsibility to establish and ensure that all regulated and appropriate safety and health practices are followed. It is also the user's responsibility to ensure that any and all applicable permits and permissions have been secured before installation of any CMI product.

TABLE OF CONTENTS

Before You Begin

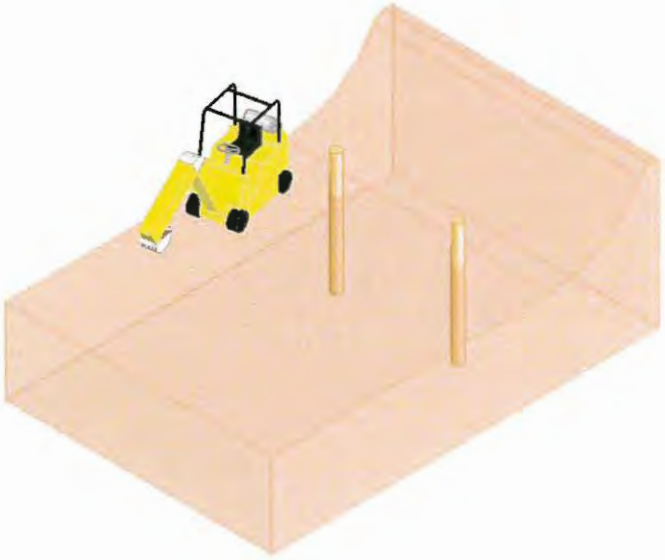
Prepping the Site

There are many types of sheet piling structures that serve many different purposes. We cannot hope to cover every situation here but rather, show some fundamental ideas. Most scenarios are going to involve some preparatory work before you begin the construction of your structure. Many situations require excavation. Whether it is to have more mobility in construction, for burying anchors, or ultimately changing the landscape, preparatory work will need to be done first. This might be a good time to more closely investigate the soil and its properties to ensure that your wall has been properly designed. A simple, anchored, earth retaining wall situation is shown here for illustration purposes.

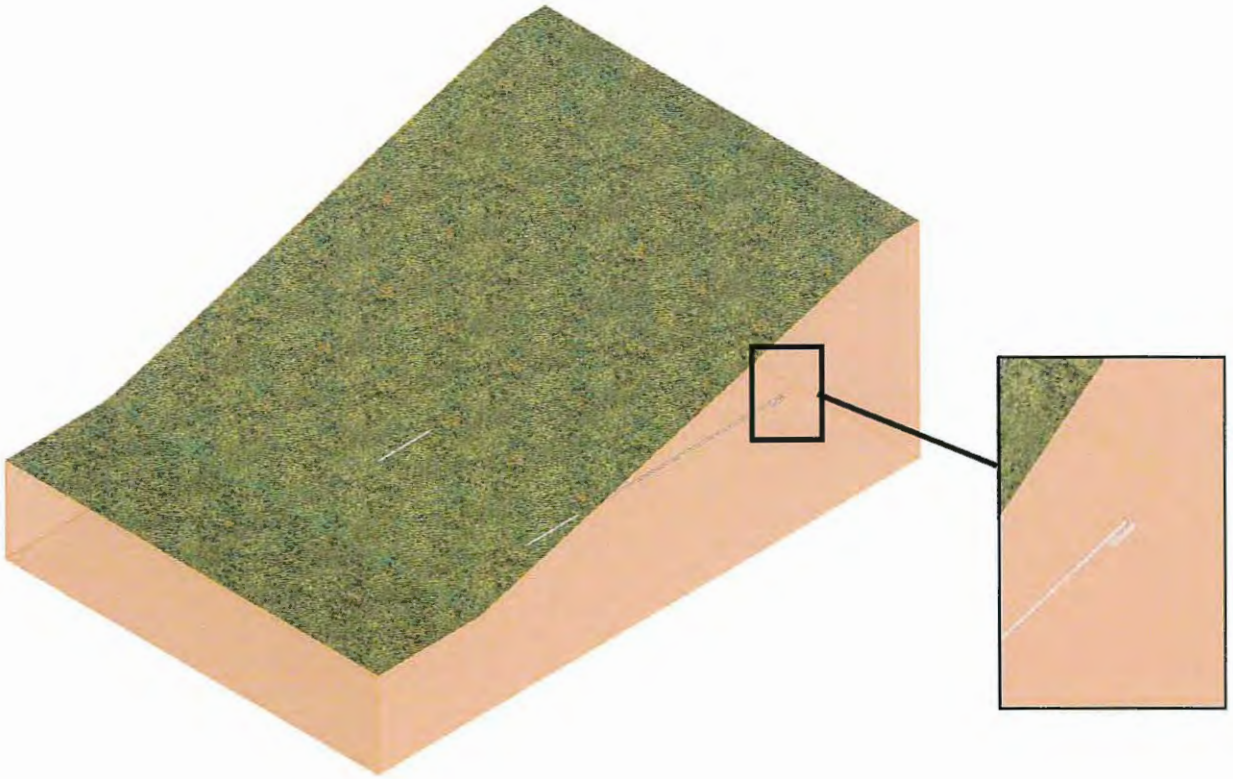


Anchoring

If you will be anchoring your wall, there are many types of anchors to choose from. The most popular anchoring method involves driving or burying large bodies in the ground with which to secure your wall. This method involves excavation which may not be possible or feasible in every situation. Different people use different materials and different layouts to achieve their preferred anchoring system. Shown here are TimberGuard poles used as anchor piles. It is important that, whatever anchor system you use, the anchor be buried outside of the slip plane or active wedge of the soil. This is the angle that the dirt settles to, naturally, if left unsupported. It is this falling of the dirt that you are trying to counteract with a retaining wall. The wall designer should designate the distance and depth that your anchors should be, in relation to the wall. Make sure to plan so that you have access to the anchor for attachment to your wall when nearing completion.

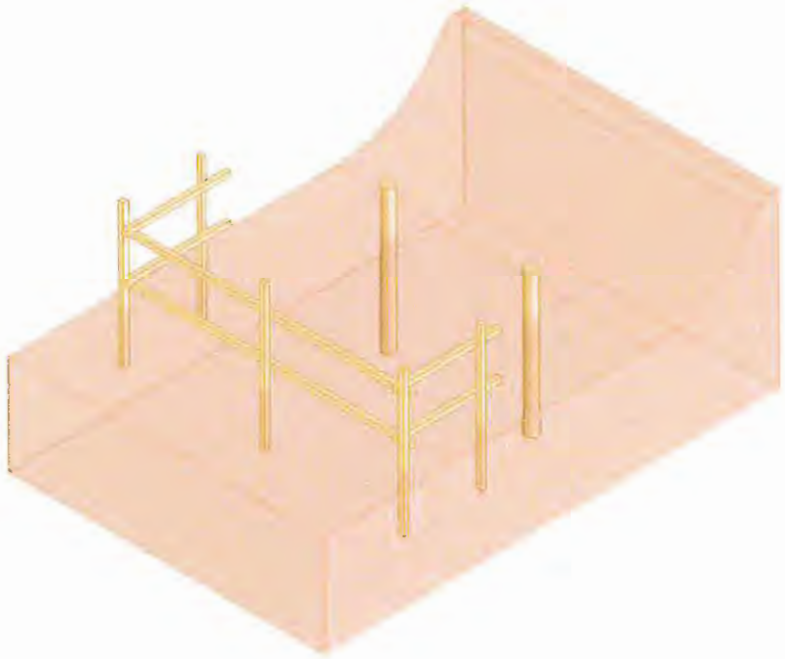


In cases where excavation is undesirable, there are other types of anchors that can be driven or screwed into the ground, leaving the exposed topside virtually undisturbed. The type pictured below has a mechanism that extends when sufficient pressure is applied to the rod, securely holding itself in place. These types of anchors can also have load checking devices, to ensure that they are installed with a firm footing.



Building a Driving Guide

A temporary driving guide is highly recommended for building a straight wall. By assembling a driving guide before you begin installation, you establish an accurate wall position and provide a surface to drive against that keeps the sheet piling plumb. Construction should be fast and simple. There are many methods and techniques out there. For example: If you are re-facing a wall, then you may be able to use the structure you are replacing as your guide. You will need to find the method that best suits you and your situation. You may incorporate your wales and poles, if they are in your design, into your driving guide. This can save you a great deal of time and effort. If you decide to do this, you should construct your wale system as you would for final installation (see Wales). This will be the backbone of your finished wall. ShoreGuard, Gator Aluminum, UltraComposite and TimberGuard wales may be clamped or temporarily lagged to your posts. Use your wales as the horizontal members and poles as the vertical posts for your temporary driving guide. Ensure that an adequate number of posts are used so the guide does not move when you begin driving your sheets. Also, two points of contact for your sheet piling (as shown below) provide for more accurate driving than one alone. If you choose not to incorporate wales or poles into your driving guide, then the guide will need to be removed after the sheet piling is installed. However, if you construct your guide on the back side of your wall, you may be able to simply bury it after completion.

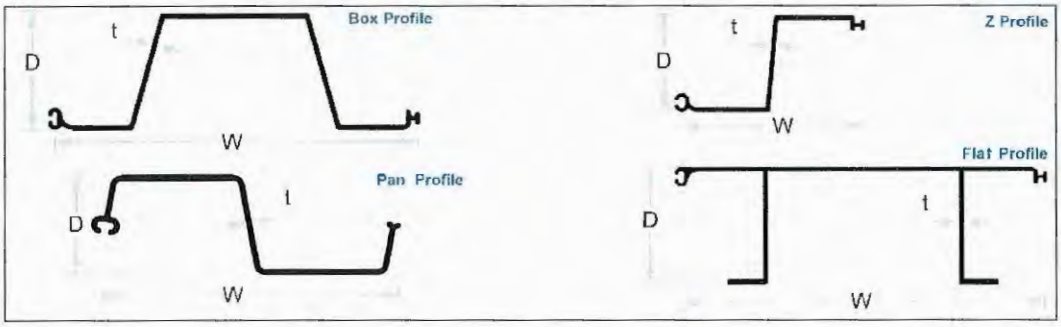


Now you are ready to begin installing your sheet piling.

Sheet Piling

Materials

We offer many different profiles of sheet piling in three different materials; vinyl, aluminum, and FRP Composite (fiber reinforced polymer composite). The many profiles offered fall into four basic categories; "Box", "Z", "Flat", and "Pan" profiles. These four basic shapes are shown here respectively.



Your application may also require corners. They are available for turning 90 degree angles with all products and 45 with most.

Equipping for the Job

Synthetic sheet piling does not require specialized driving equipment. It can be installed with conventional driving practices and equipment. Commonly used equipment for driving includes water jets, excavation equipment, drop hammers, vibratory hammers, and vibratory plate compactors. The equipment you use will need to be appropriate for the soil, site conditions, and the sheet piling that you will be using.

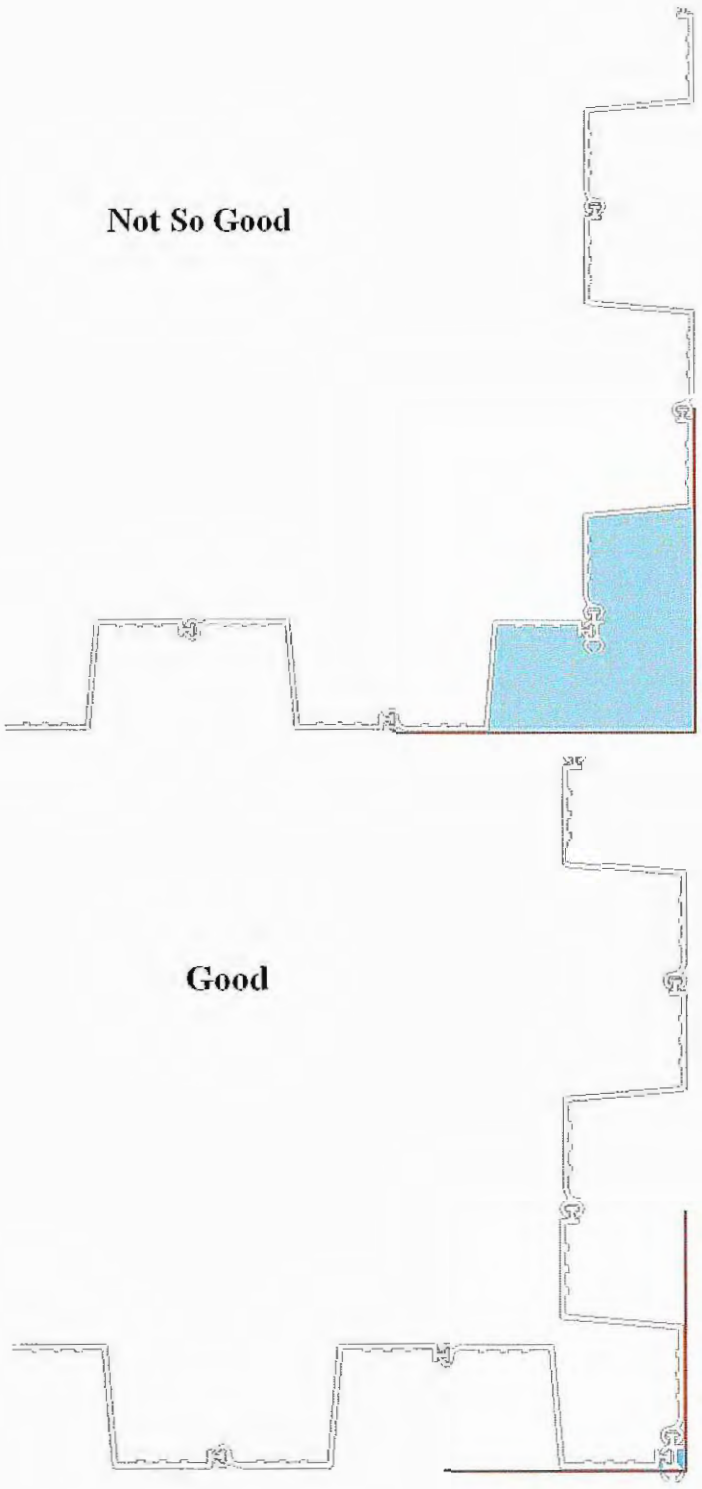
Installation

Sheet piling has been around for many years. There is no one correct installation method. Everyone has their own technique that works best for them. Here, we will cover the basic elements and tips for a successful installation.

In order to achieve the full performance of your structure, your sheet piling must be driven to the depth specified by the wall designer. You may want to mark your desired driving depth on your sheet to ensure that it is sufficiently driven.

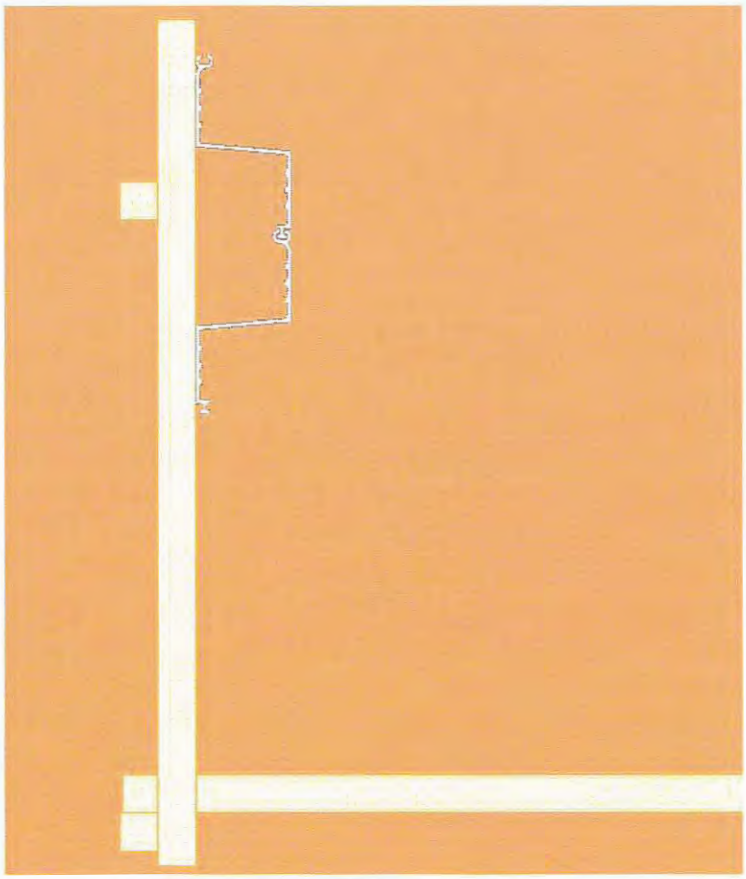
Some forethought needs to be given to the sheet orientation before you begin. First, the most popular way to drive is with the male lock leading; the rationale being that the female lock has a tendency to fill up with soil and hinder driving if used as the leading edge.

It is also a good idea to orient your sheets so that any outside corners are configured as shown in the drawing below whenever possible. Orienting your sheet piling in this way maximizes the strength of your wall in the corners, by eliminating as much of a void as possible between the sheet piling and the cap and/or wale, and reduces the induced stress on the corner joint. If you look closely at the corner, you will see that there is sometimes an attachment point in the corner piece for possible future additions to the wall. Additions will be possible with most series of synthetic sheet piling.

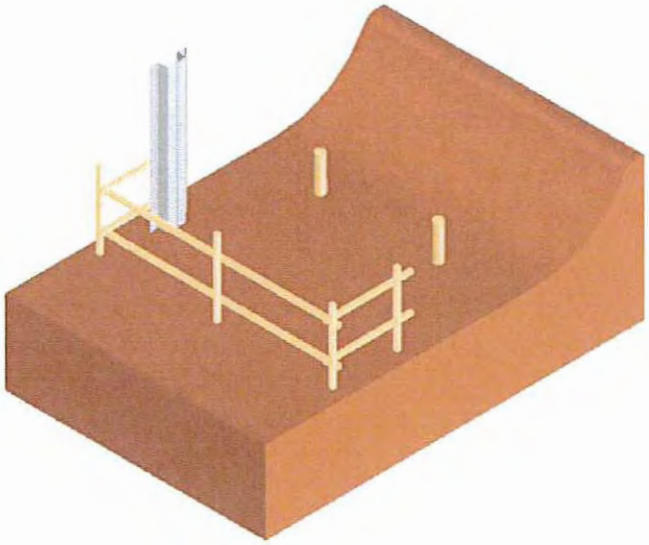


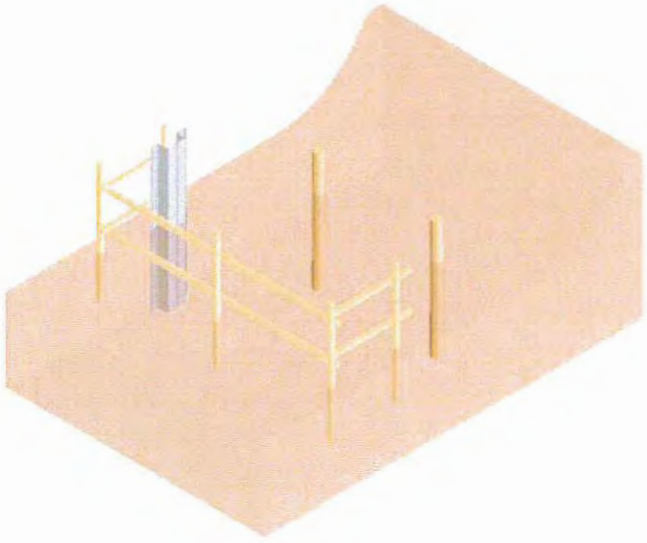
After you are satisfied that your sheet orientation is correct, you are ready to begin driving. You will want to drive your sheets as full box sections. If you have purchased a box section sheet, then you are ready to go. If you have Z section sheets, then you will want to pair them before driving.

Place your first sheet or pair of sheets on your driving guide and make sure they are in the proper location and orientation for driving. Again, sheet piling installation varies from person to person. The starting location is up to you. It is important, however, to drive your first section plumb, because it will act as a vertical guide for the following sheets.

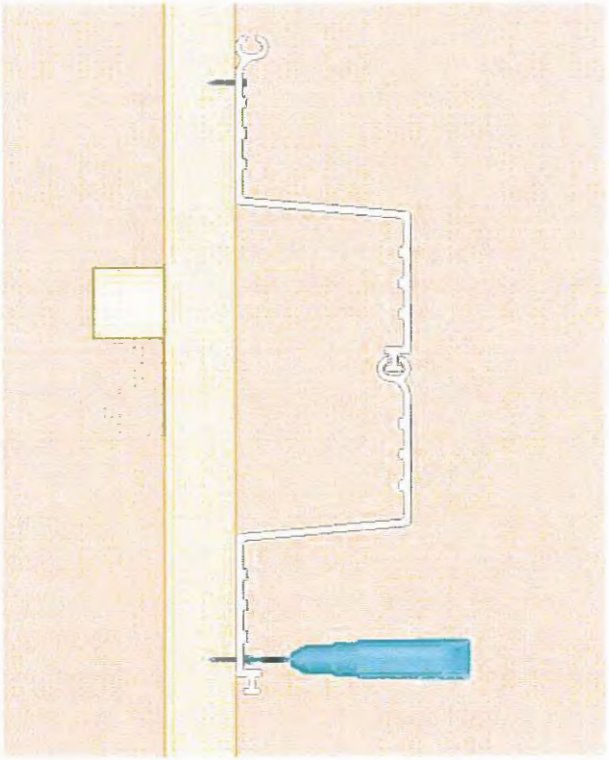


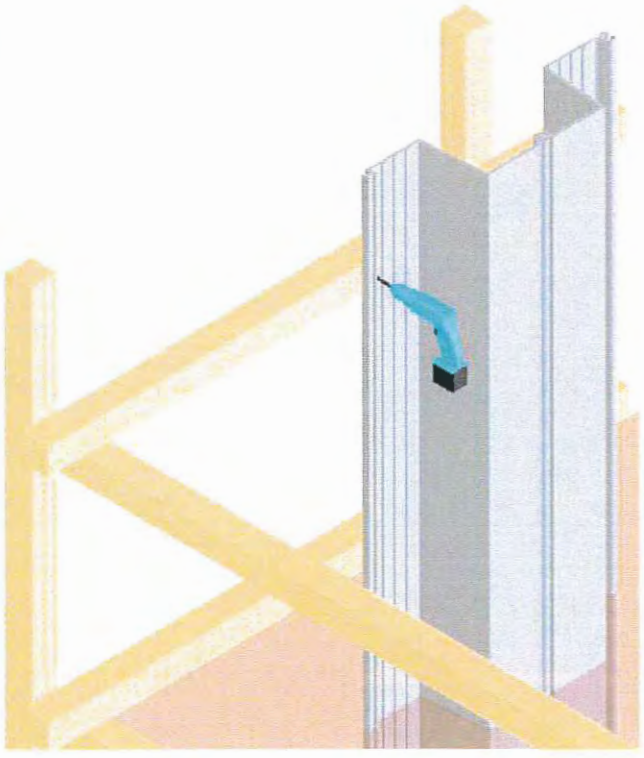
Drive your sheet to the specified depth.



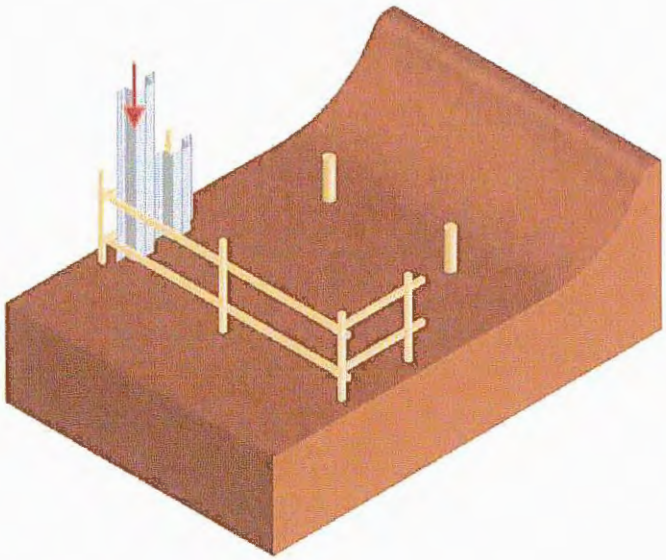


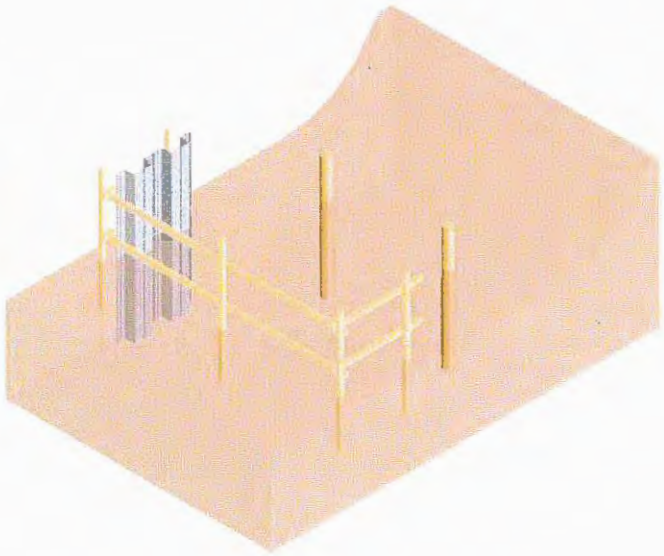
Whether or not your guide includes wales, it is a good idea to lag each sheet to the driving guide after you are satisfied with its position. Lagging your sheets as you go will ensure that your driven sheets will remain plumb as you continue to drive, as well as prevent them from being overdriven as you drive subsequent sheets. If your situation has allowed you to incorporate wales into your guide, then you will be lagging the sheet piling to the wale, eliminating a future step.





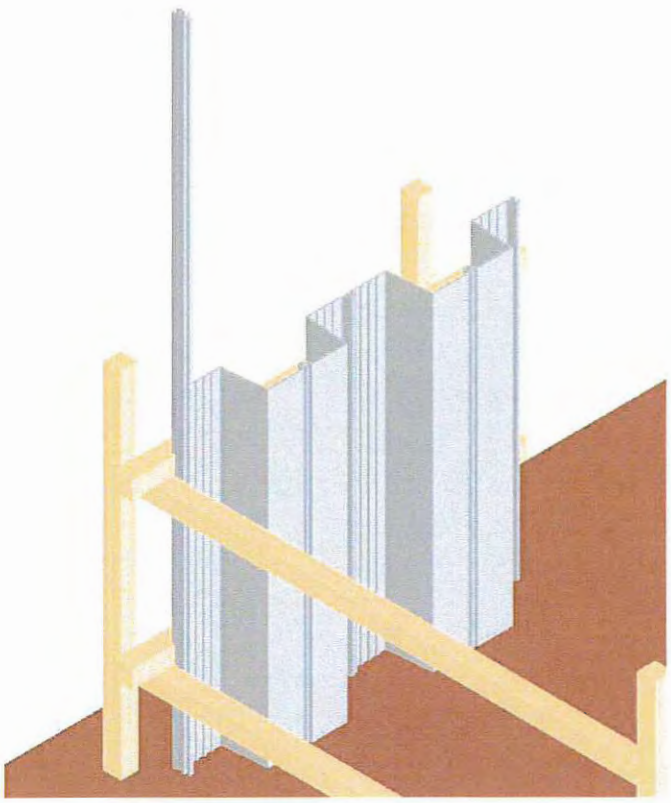
Continue this process for the first straight run of your wall. There should be enough play in the locks and flexibility in the sheets to ensure that each sheet can install in the proper position.

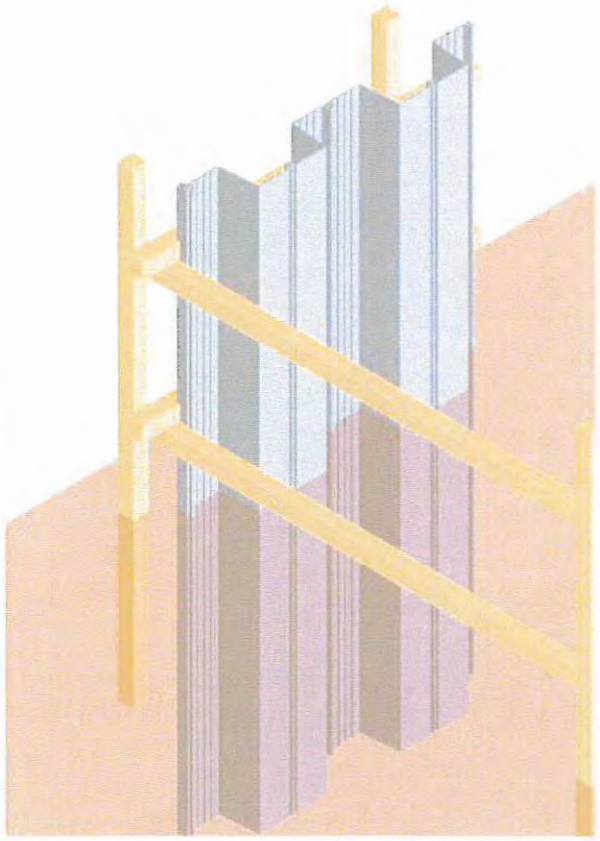




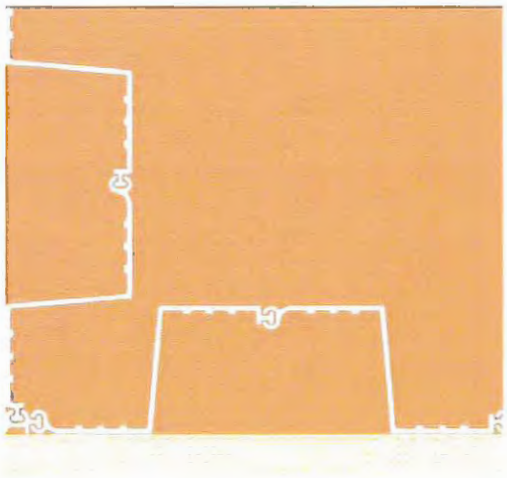
Turning a Standard Corner

Corner pieces are available for any sheet piling that you might purchase. These pieces come in 90 degree angles, and in most cases, include 45 degree bends as well. Drive these just as you would sheet piling. Alternatively you can thread your corner piece on the leading lock of the last sheet to be driven and drive the sheet and the corner piece together.

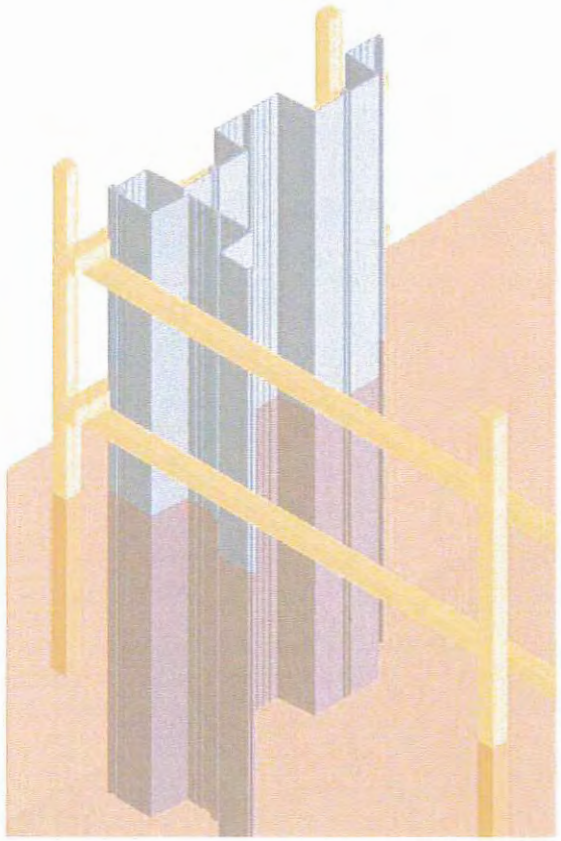




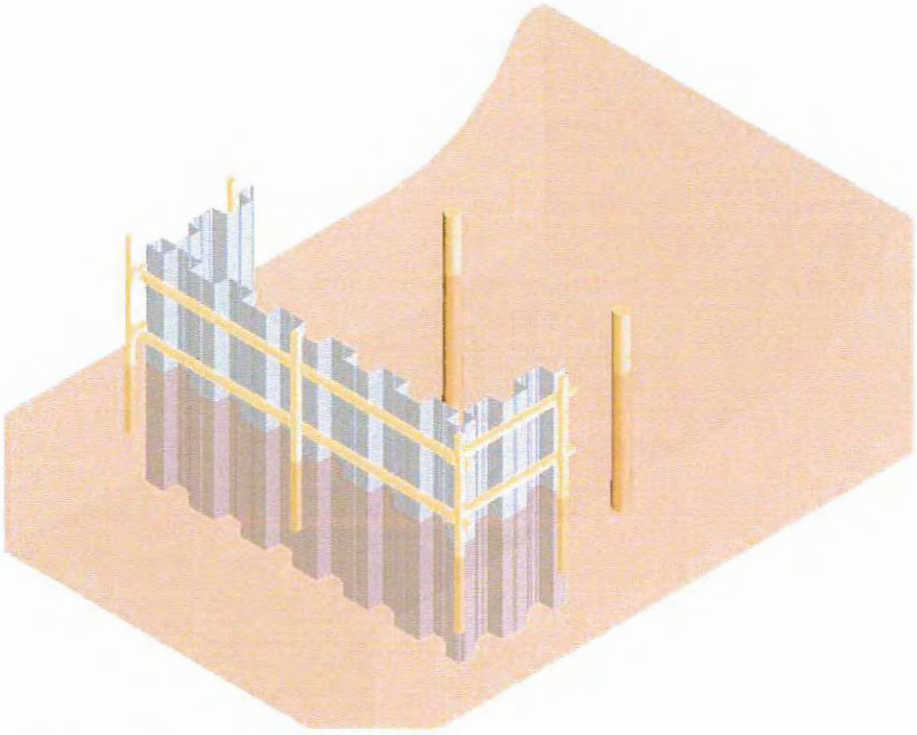
After you are satisfied that your corner is in position, drive your next box section, lining it up, using the corner's male lock and your driving guide.



After you are satisfied that this sheet is properly positioned, secure the sheet to your guide.

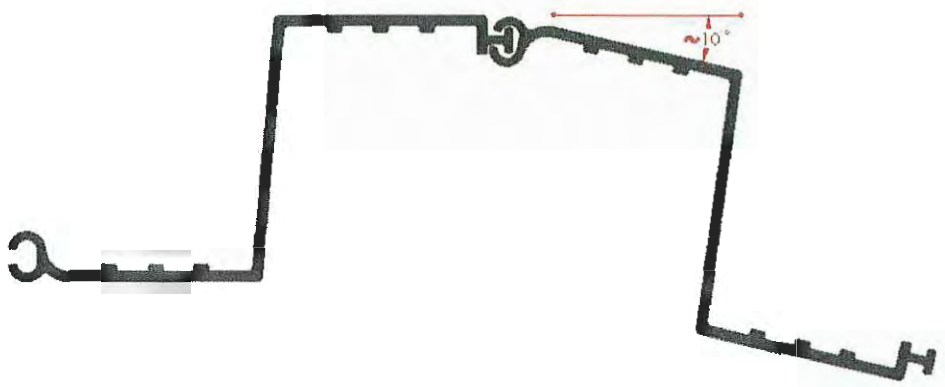


Repeat the steps learned in this section to complete your wall.

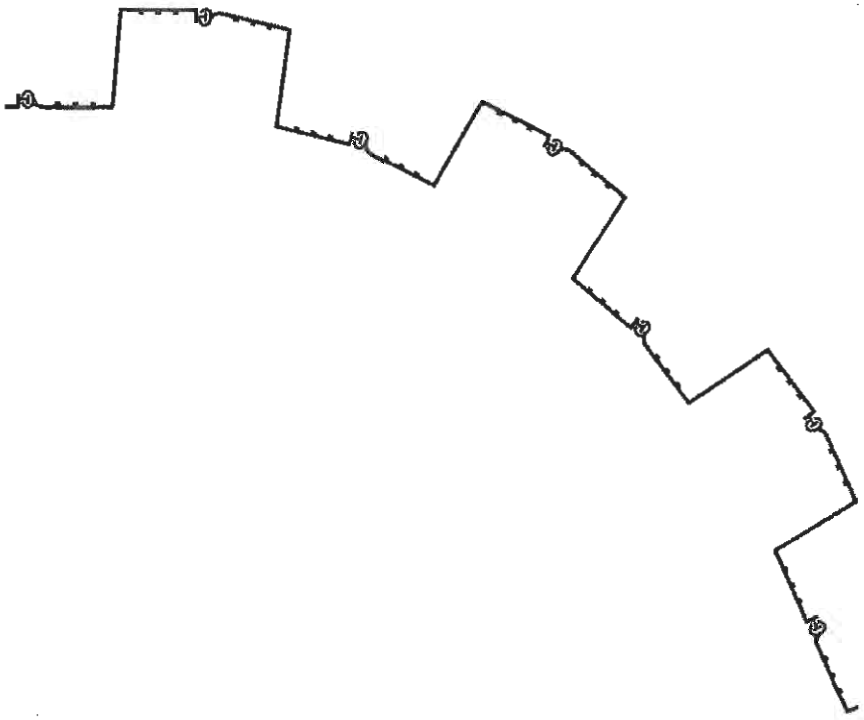


Making a Non-Standard Turn

If you need to make a gradual curve or turn an angle that your particular corner piece does not allow, you can do so by curving the sheets. The tolerance in the locks allows for turns of up to approximately 10º per interlock. (This angle may be greater or smaller, depending on the particular sheet used.)

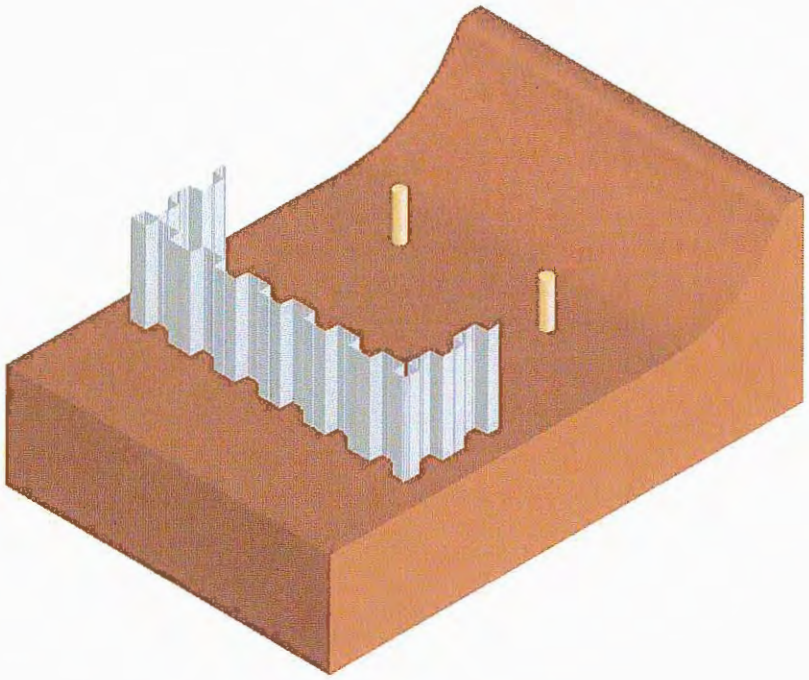


This will allow you to customize your curves and angles when constructing your wall.



Preparing for the Next Step

Depending on your situation, you will probably need to dismantle your driving guide to some degree. If you incorporated your wales into the guide, then you will only need to remove the posts. If you constructed it with wales and poles, or if it is on the back side and will be buried, then you are already prepared to move on to the next step.



TimberGuard Poles

Materials

TimberGuard poles are very popular because they install similar to wood but have a plastic barrier to provide added protection from the elements and the harsh marine environment. The plastic sleeve does not bond to the wood; it is extruded and vacuum molded around the wood in a patented process. This process allows for expansion and contraction of the wood independent of the plastic sleeve.

It will be up to you to decide what fasteners and peripherals you will need to secure your TimberGuard pole to your structure. It is notable that stainless steel fasteners last longer in most pressure treated wood than other, more corrosive steels.

You may want wrap and/or sealant for covering holes in the plastic sleeve due to fasteners, cuts or any accidental damage. Wrap, and sealant are available for purchase and come in standard TimberGuard colors.

Applications

Like wooden poles, there are many applications for TimberGuard Poles. You can use them in the same situations as you would regular wooden poles. Some popular applications are included here.

Docks:

Navy Style Seawalls & Fender Piles:

Anchors:

Installation

You will not have to re-equip to use TimberGuard. TimberGuard can be driven and installed using conventional construction methods and equipment. Shown here is a very typical installation, using a drop hammer. TimberGuard's polymer skin is very robust and can stand up to harsh environments and even harsher driving conditions. However, it is a good idea to take some measure to shield it from extremely high impact scenarios as well as impact with sharp objects like the teeth on a backhoe or forklift. Again, drop hammers are very common, but other types of equipment, such as vibratory plate compactors, are often used. If possible, water jetting can greatly increase the ease of driving. It is also very common for poles to be incorporated into driving guides for sheet piling.

Oxygen and light are two of the primary factors that contribute to marine borer survival and rot. Therefore, when accidental or intentional breech of the TimberGuard's polymer skin occurs, you may utilize a roll of TimberGuard wrap or TimberGuard sealant. The wrap is very useful for wrapping splices or large cuts. Wrap the desired area and secure it with fasteners such as screws. Sealant may be used for small holes and to seal up any fasteners that have been installed. Apply it as you would standard caulk. A putty knife is useful for smoothing the sealant out to create a more seamless look. Shown

below (left) is a TimberGuard Pole that has had the top cut off and been treated with TimberGuard Sealant. Shown below (right) was a damaged TimberGuard Pole that has also been treated with TimberGuard Sealant.

For the aesthetics and the peace of mind that comes with knowing that your TimberGuard pole is more completely covered it is a good idea to use wrap or sealant. However, breaches in the polymer do not necessarily compromise your product. Even with some minor holes in the polymer protection, the vast majority of the pole is still covered and the amount of oxygen and light allowed to penetrate the wood is very limited.

Wales

ShoreGuard & UltraComposite

Materials

After deciding that you will use either ShoreGuard or UltraComposite wales, you will need to decide if your application requires STR or standard aluminum inserts. The standard option comes with a 16" splice kit. This kit includes a 16" piece of aluminum insert for every 20' wale piece, for the purpose of splicing adjacent wale sections. If your application requires a stronger and more rigid beam, then you can upgrade to the STR option, which includes a 20' aluminum insert for every 20' wale section to run the entire length of your wale. If you will be turning corners, you should consider buying prefabricated corner inserts. These inserts are roughly 16" in length (from each direction of the angle) and come in 45 and 90 degree angles. These options save fabrication time and provide better stability at the corners, where you need it most. Mounting hardware is included, so you will only need to provide the appropriate tools for wale installation. In order to show clarifying details, non-standard wale lengths are used in the figures for this manual.

Recommended Tools:

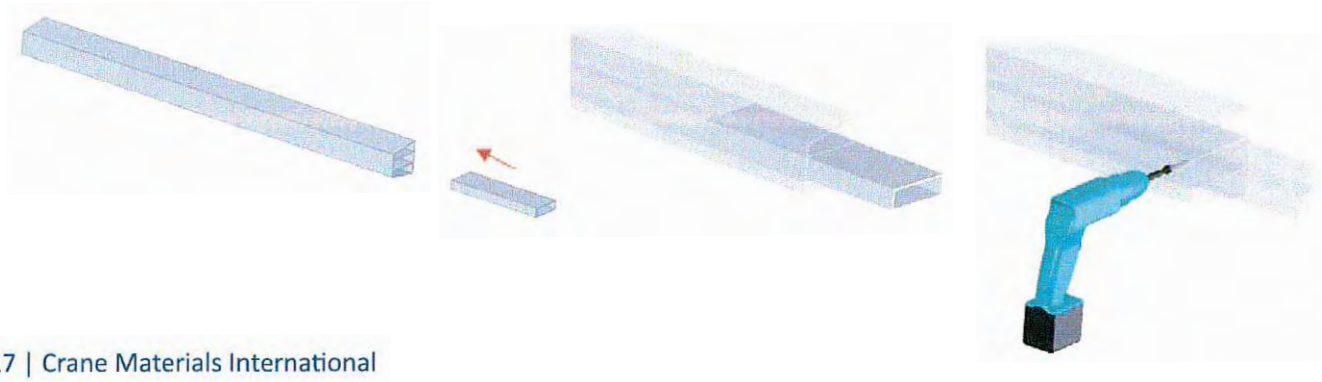
- Drill with a 3/8" hex head socket for hanging the wale with included lag screws
- Chop saw or any mitering saw that can accommodate the dimensions of the wale
- Blades appropriate for the material selected (For ShoreGuard a blade suitable for cutting the aluminum wale and inserts is required. For UltraComposite a masonry blade or diamond blade is recommended. Because FRP is abrasive, you will need to be prepared to have backups if a standard masonry blade is used.)
- Measuring and leveling devices for proper wale placement
- Aluminum Welder, if you will be making non-standard turns or custom inserts

Installation

Hanging your ShoreGuard/UltraCompositeWale

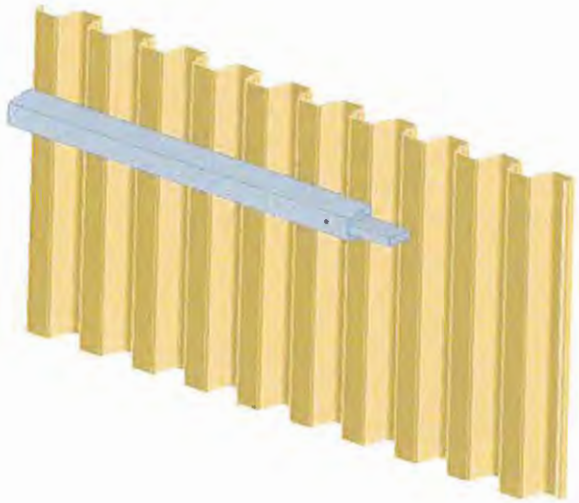
Step 1 – Prepare your wale for hanging

Before you start attaching your wale to your sheet piling, it is a good idea to position your wale insert half in, half out of the wale section as shown, and secure the insert using one of the provided self-tapping screws. We will refer to this as a wale assembly.

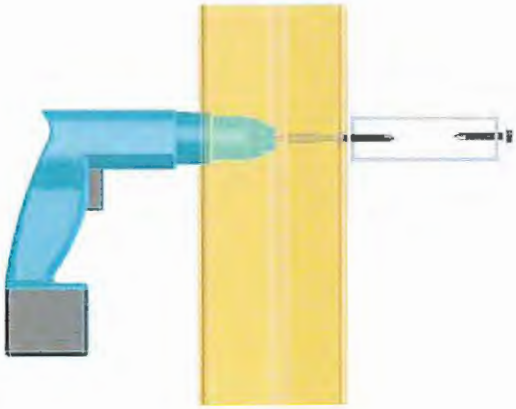


Step 2 – Hanging your first wale section

Place this wale assembly on your sheet piling in the desired position for attachment, ensuring that it is level and that the larger parallel face (we will call this the back) contacts the wall. You will probably want to start at one end of your wall and work to the other end. The wale assembly is oriented such that the insert is on the leading end. We will work from left to right for this example.



Secure your wale assembly to the sheet piling from the back with the remaining self-tapping screws.

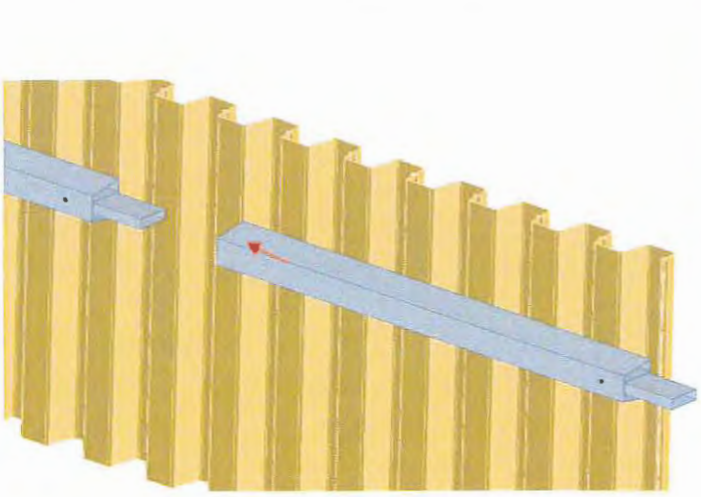


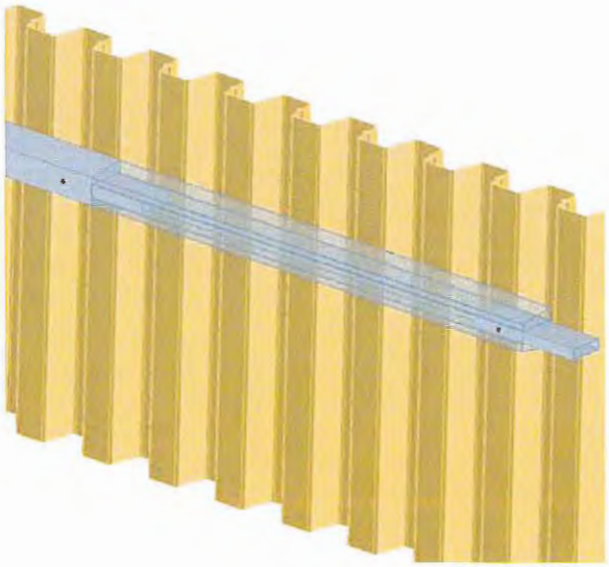
Evenly space the remaining 9 screws over the length of the wale section that does not house any insert (3 shown here). These screws will not be load bearing. They primarily act as a placeholder for your wale until the anchor system is connected.

Step 3 – Hanging intermediate wale sections

Repeat Step 1 for each intermediate section, creating a wale assembly.

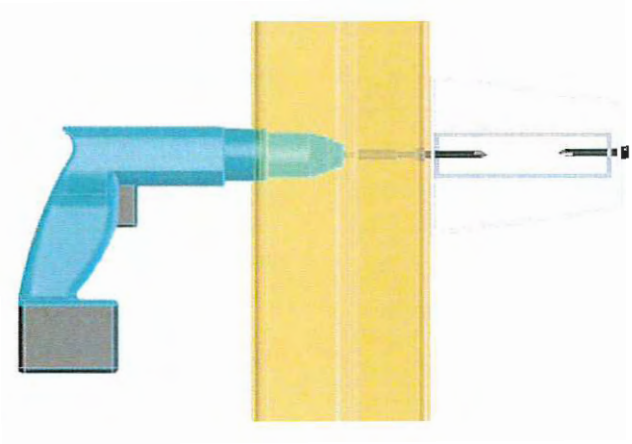
Slide your newly-created wale assembly over the exposed insert section of the previously-hung wale assembly. You will use each hung wale assembly as a guide for the following wale assembly. You will still want to ensure that each is correctly positioned and level before attaching to your wall.



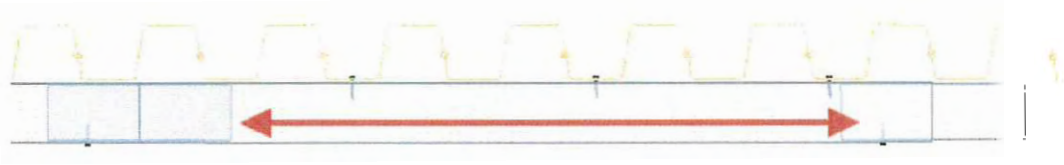


As in the previous step, secure your newly-positioned wale assembly to the sheet piling from the back with the remaining

screws.



Evenly space the screws over the length of the wale that does not house any insert.

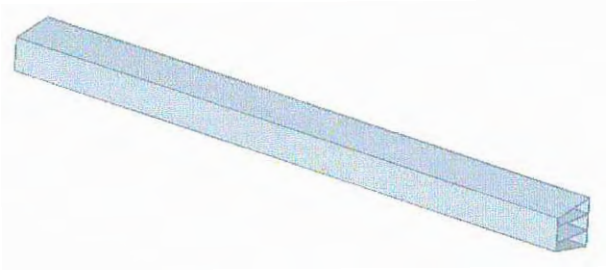


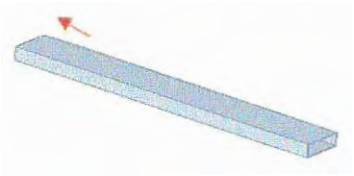
Now repeat this process for all the straight runs of your structure.

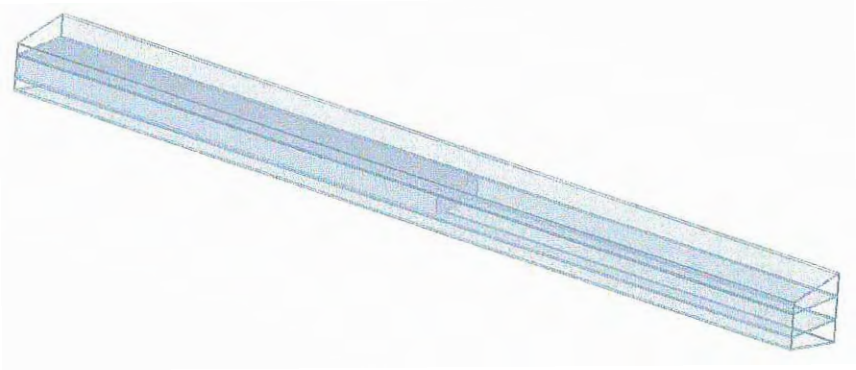
Step 4 – Modifying your installation for ShoreGuard /UltraComposite Wale STR

Choosing to use the STR package will allow your wale system to more closely approximate a continuous beam than the standard package. The only difference between the two is that the STR package includes a 20' insert in place of the 16" standard insert. This results is the insert running the whole length of your wall, adding strength and rigidity. The STR package is also slightly easier to install than the standard one.

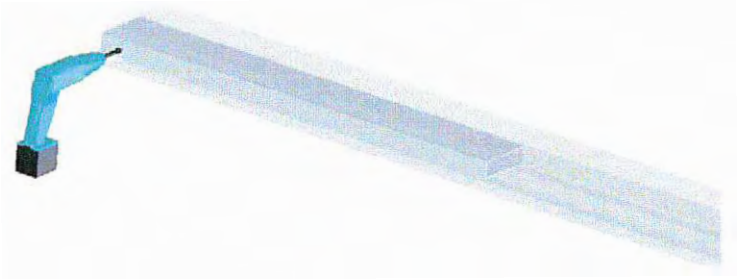
It is recommended that you cut your first 20' structural insert into two 10' lengths for easy installation. Insert one of the 10' lengths into your first wale section so that it is flush with your outside end. You will save the other piece for the final section.



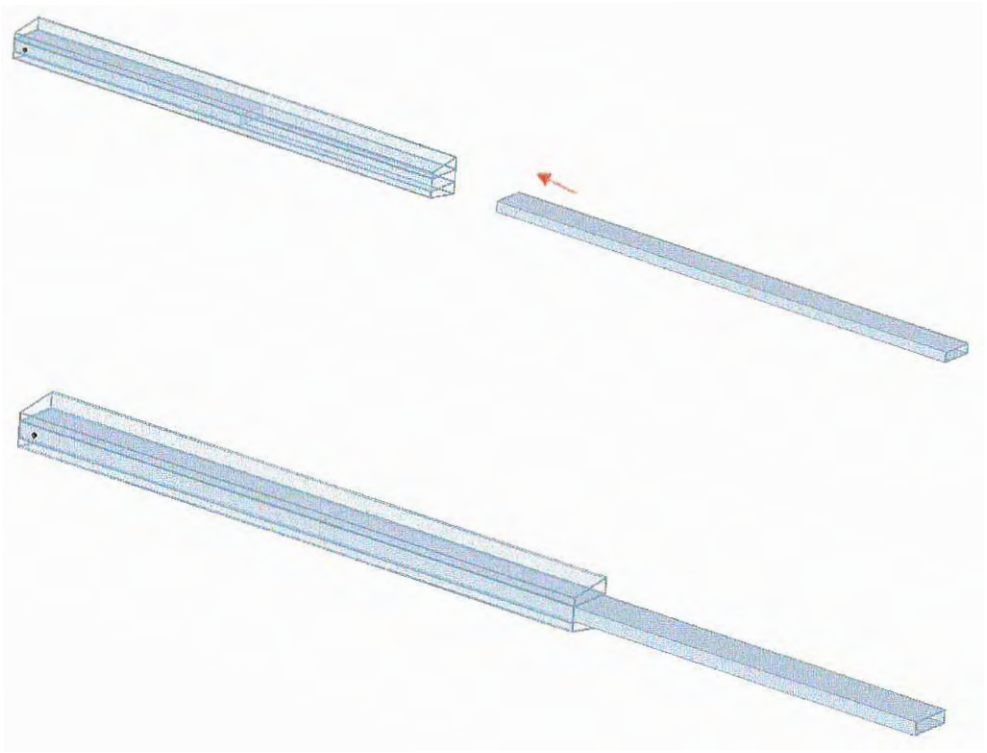




Secure this piece through the front with a self-tapping screw. This is just to keep the insert from moving inside the wale section.

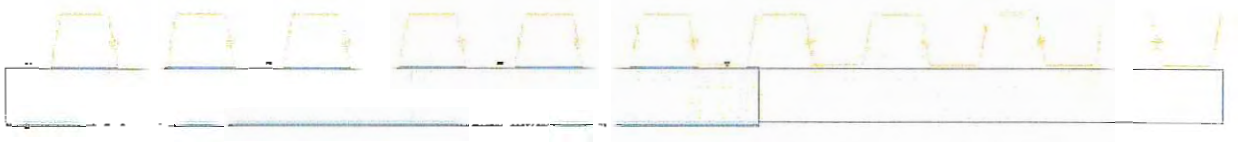


Slide an uncut 20' insert into your wale. Because you have made this 10' piece, every other insert will be half-in, half-out.

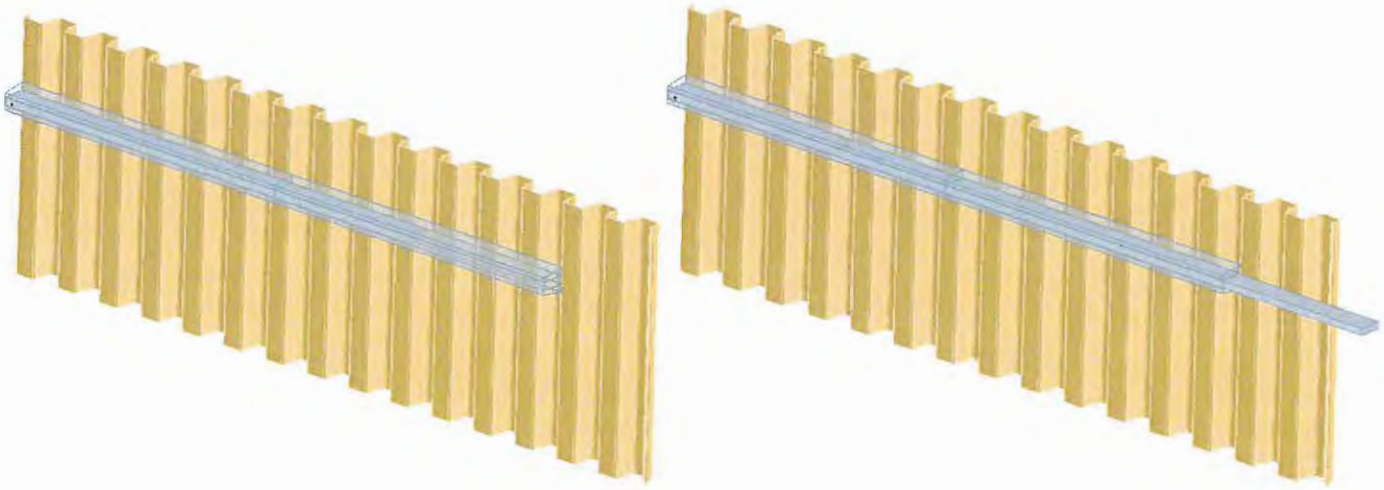


As in Step 2, place this assembly on your sheet piling in the desired position for attachment, and ensure that it is level. You will want to start at one end of your wall and work to the other end.

Secure your newly-positioned assembly to the sheet piling from the back with the remaining 9 screws. Be sure not to screw through the exposed insert, or the next wale section cannot slide over.



Slide a new wale section over the exposed insert section; then, slide in another 20' insert section.



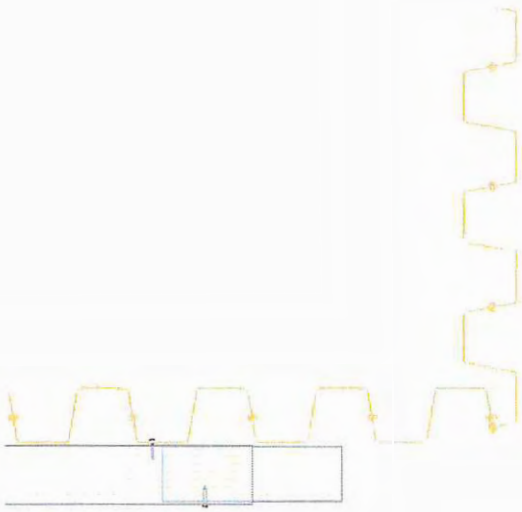
At this point you will secure your unattached wale and insert to the sheet piling. From the back, fasten your unattached wale and insert by evenly spacing all 10 of your self-tapping screws. While you can penetrate the inserts, do not attach the exposed section of the insert, so the next wale piece can slide over the insert.

Repeat this process for all the straight runs of your structure.

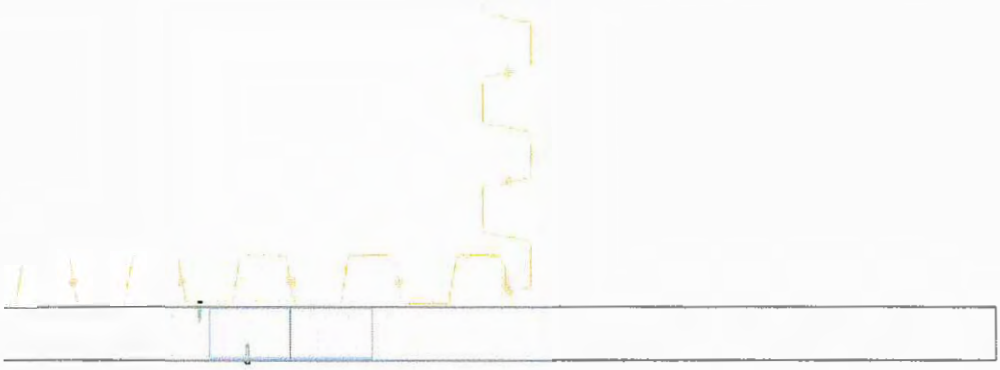
Turning a corner with your ShoreGuard/UltraCompositeWale

Step 1 – Preparing to turn a corner

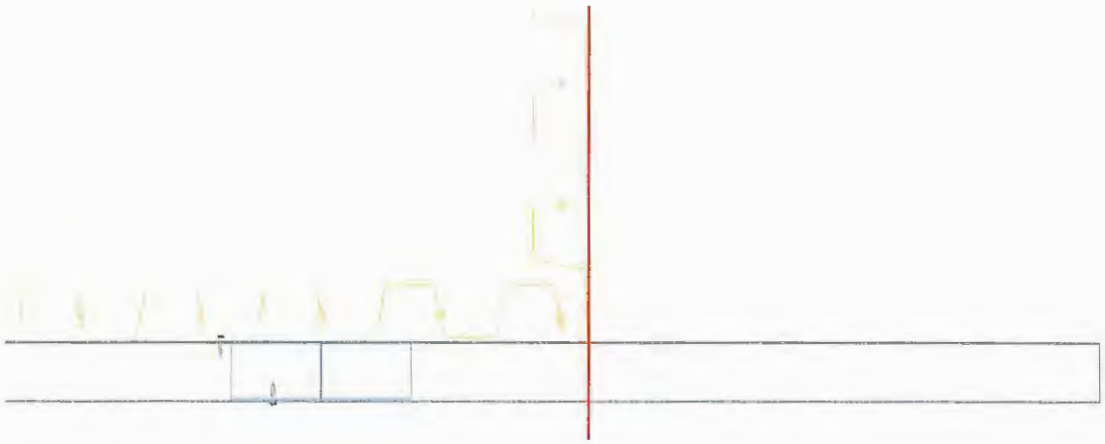
For this example we will show the standard ShoreGuard/UltraComposite Wale package turning a 90 degree corner. This process will use a 90 degree corner insert. CMI also offers 45 degree corner inserts, but the process for turning a 45 or a 90 degree corner is fundamentally the same. When you reach a corner, you will want to stop so that your last wale assembly fits within the straight section of the wall. You should plan so this does not happen too close to the corner.



You will want to slide the next wale section on, in order to identify and mark where your miter cut needs to be made.

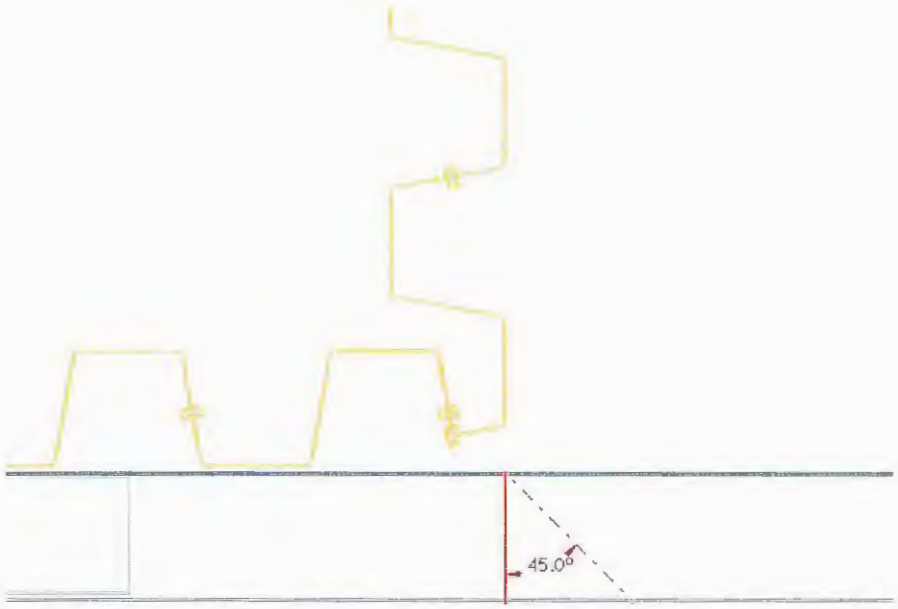


Extend a line from the angled face and transfer a construction line to the wale section using a marking device.



Step 2 – Making your cuts

Since this will be a mitered cut, your cut angle will be ½ of your actual turned angle. For this example of a 90 degree turn, we will cut at a 45 degree angle from our construction line. For a 45 degree turn, the cut would be made at 22.5 degrees and so on. For accurate cutting, you should use a chop saw, miter box, or have them professionally mitered. It is important to note that the wale is angled, and can be very hard to make an accurate miter cut. This should not be attempted without using appropriate mitering equipment.



Slide off your marked wale section and cut your angle. You might want to go ahead and cut your other miter corner piece as well, since you are already cutting. You should make your second corner piece from a new 20' section so that the next splice occurs as far from the corner as possible. For this cut you will make the matching miter cut 22.5 or 45 degrees from perpendicular, respectively, for a 45 or 90 degree turn.

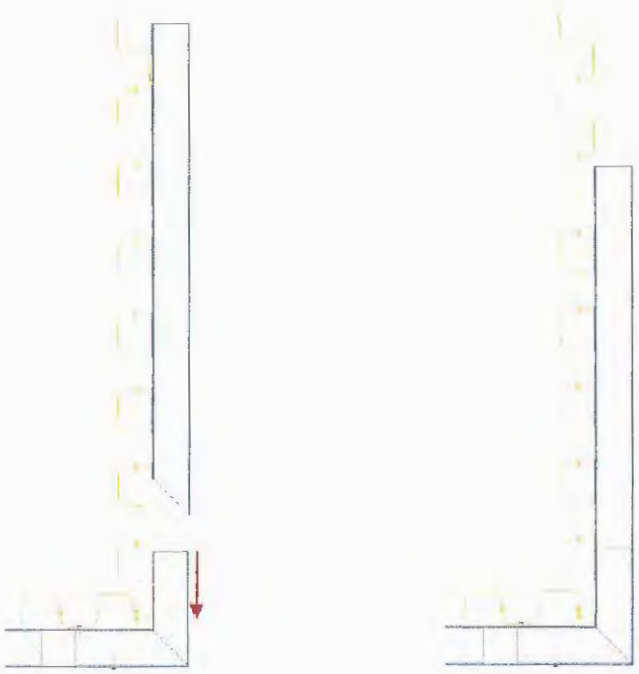
Step 3 – Installing your corner

After you have made your cuts, you are ready to assemble your corner. Slide your first cut wale section onto the exposed insert.

Insert the appropriate corner insert, in this case a 90 degree corner insert, into the wale section.

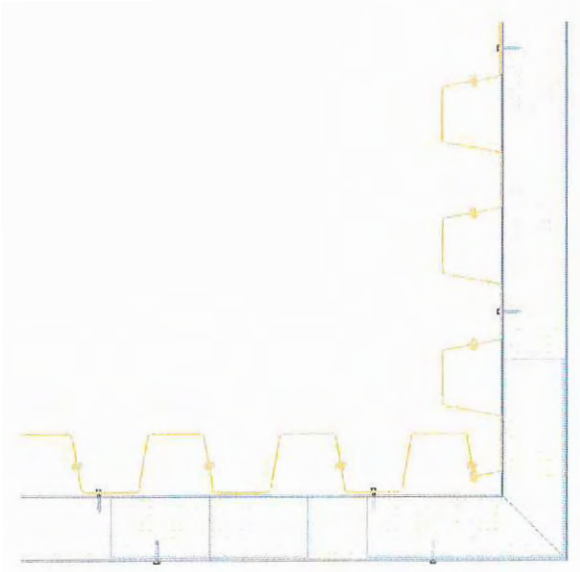
You will use the same attachment principals learned in the Hanging your ShoreGuard/UltraComposite Wale section. You will secure the insert to the previous wale and use it as a guide for the next. It is a good idea to temporarily slide your second cut wale section on to mock up your corner before you attach it. Secure the first cut wale section and corner insert with the provided self-tapping screws. You are provided 10 screws for every 20' of wale, so you should gain some extra screws in the corners.

Slide your second cut wale section onto the exposed corner insert.



If you are going to continue wale placement on this wall face, you might want to create a wale assembly (Step 1, Hanging your ShoreGuard/UltraComposite Wale) with this wale section for easier future installation.

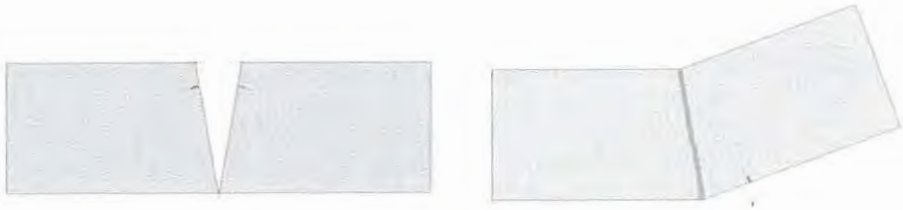
Attach this wale section or wale assembly to the wall as you would have in the Hanging your ShoreGuard/UltraComposite Wale section.



It is important to note that this installation scenario requires that the load on the corners not be excessive. Excessive load on the corners can be avoided by placing your anchor tie rods as closely as possible to the corner. Otherwise, all of the load at the corner would transfer to the screws, as it tries to spread. These screws are not made for carrying load. If you anticipate a significant load concentration in the corner, other support options need to be considered, such as a braced corner as described later.

Step 4 – Modifying your installation for non-standard turns

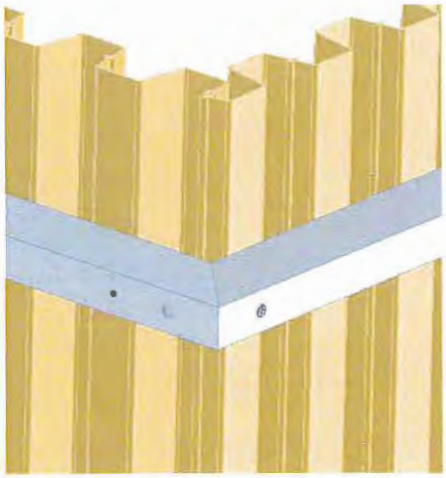
If you will be making a turn other than 45 or 90 degrees, the process is identical, only you will need to fabricate your own corner inserts. You can use a provided splicing insert for this. Miter cut the insert using the same process and at the same angle as you would cut your wale sections. Weld the two mitered aluminum insert pieces together to create your own custom corner insert. Now you have your non-standard corner insert, and the corner turning process is the same as above.



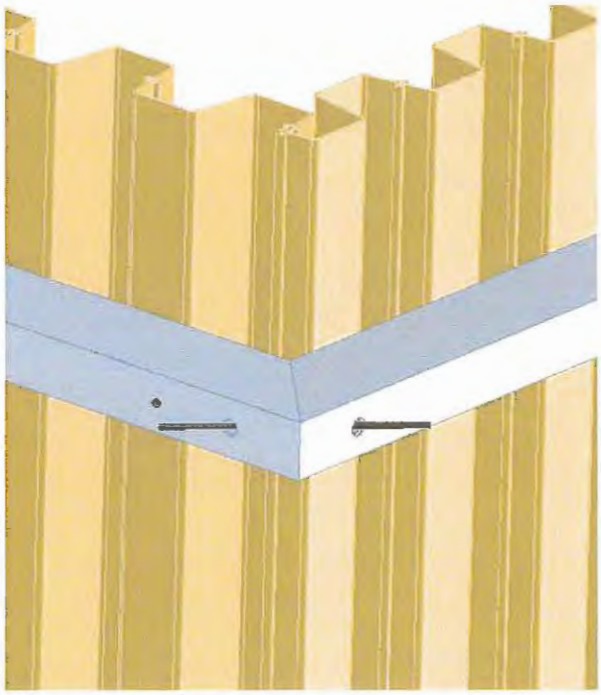
Step 5 – Modifying your installation for a Braced Corner

If you anticipate a need for more stability on your 90 degree corners, then you will want to consider the use of a 90 degree corner Bracing Kit. This kit helps hold your corner together under load.

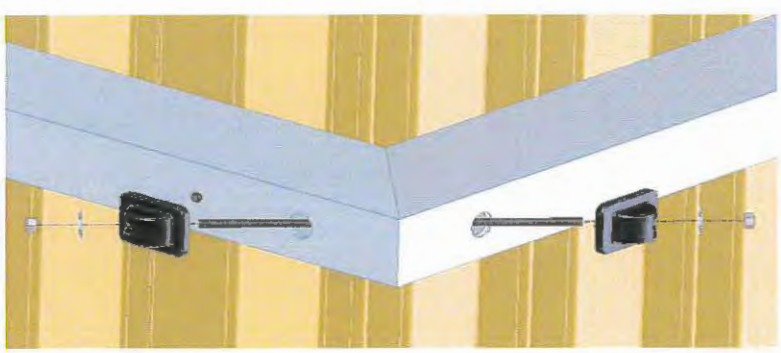
Drill two vertically centered 1 ½" holes, one on each side of the corner joint and straight into the face. Place the holes approximately 6" from the joint or just line them up with the inside corner of the wale. These holes only need to penetrate the outer face of the wale section and the corner insert piece inside. A couple inches will do it.



Insert the 16" threaded rod through both holes.



Attach included washers and nuts, oriented as shown. Tighten the nuts.



Touch Up and Maintenance of Your ShoreGuard Wale

Although ShoreGuard Wales and inserts are made from high quality marine grade aluminum, as is the case with all metallic material, there is a possibility of corrosion in some cases. It is always a good idea to carefully inspect your structure for any area that may be susceptible to corrosion.

Wherever the anodized coating on the cap has been damaged it is necessary to buff the area and apply a fresh layer of touch-up paint. It is also important to grind down and buff any jagged edges and apply a fresh coat of touch-up paint.

Periodically through the life of the structure it is advisable to closely inspect all the components of your structure. If there is any evidence of damage to the wale coating or the onset of corrosion, you can dramatically increase the life of your structure by buffing the area, removing any corrosion and applying a fresh coat of touch-up paint.

TimberGuard

Materials

TimberGuard wales are very popular because they install similar to wood but have a plastic barrier to provide added protection from the elements and the harsh marine environment.. The plastic coating does not bond to the wood; it is extruded and vacuum molded around the wood in a patented process. This process allows for expansion and contraction of the wood independent of the plastic sleeve.

For the most part you can treat TimberGuard generally as you would wood for installation purposes. It will be up to you to decide what fasteners and peripherals you will need to use for lagging the TimberGuard Wales to the sheet and splicing them together. It is notable that stainless steel fasteners last longer in most pressure treated wood than other, more corrosive steels.

You may also need end caps, which are plastic caps used to cover any exposed ends that you may create. You may want wrap and/or sealant for covering holes in the plastic sleeve due to fasteners, cuts or any accidental damage. Caps, wrap, and sealant are available for purchase and come in standard TimberGuard colors. TimberGuard dimensional lumber is available in the sizes listed below.

Recommended Tools/Hardware

- Tools and fasteners needed to lag wale to the sheet
- Saw for cutting wale joints
- Measuring and leveling devices for proper wale placement
- Drill with standard bit for drilling through wood/vinyl
- Through bolts with nuts and washers for connecting wale joints
- Appropriate fasteners for securing corners

Installation

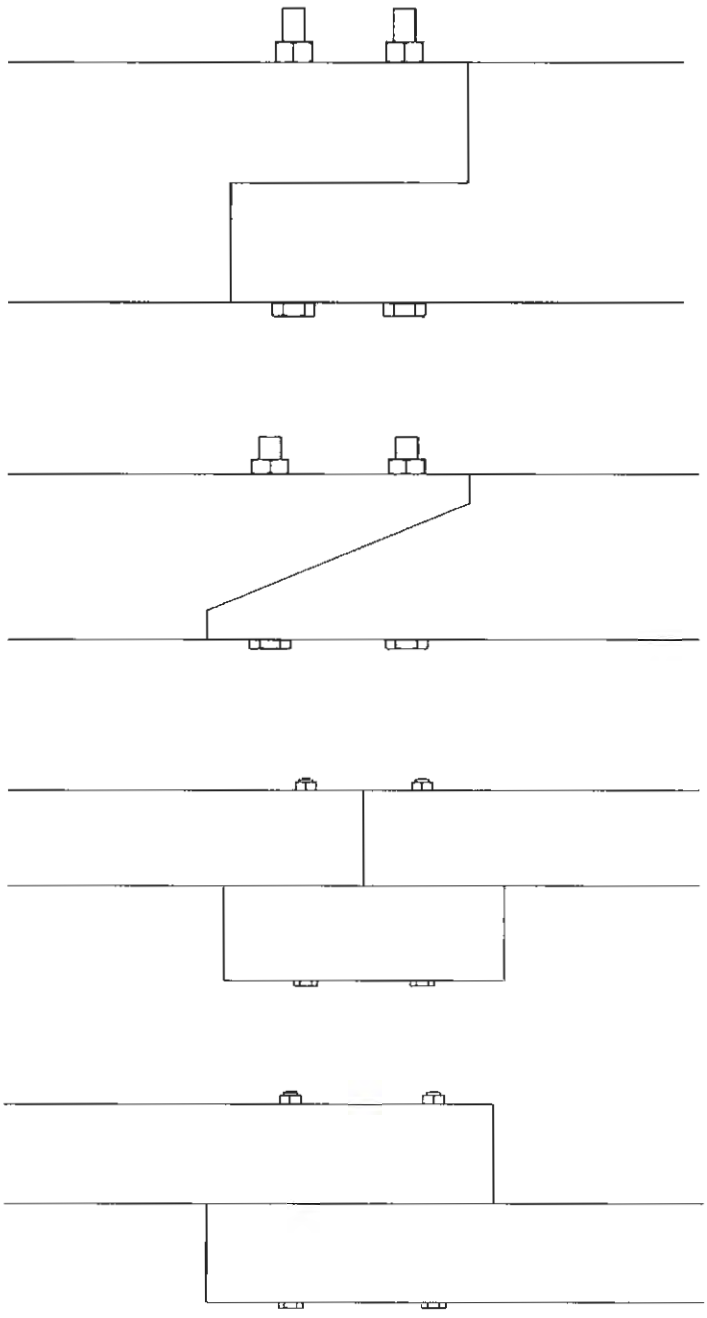
Hanging your TimberGuard Wale

Step 1 – Prepare your wale for hanging

There are many different ways to approach wooden wale installation. For example, many people incorporate their wales into their false work, so that they can also be used as a driving guide. Our guide follows a generic example. For more details on wale installation, see the section titled ShoreGuard/UltraCompositeWales.

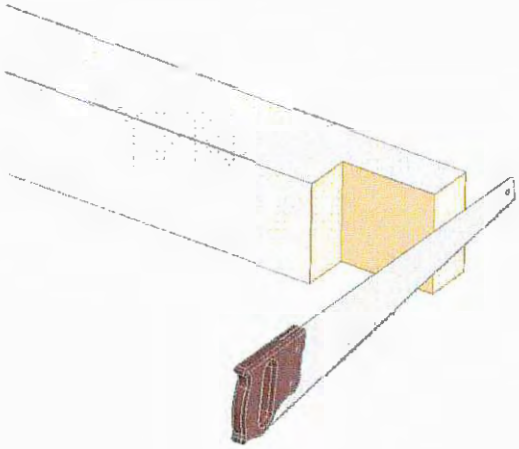
Step 2 – Prepare your joints

There are also many types of joints in woodworking. Several are shown here. Finding a balance between aesthetics, structural requirements, and ease of installation for your application will dictate what type of joint you will use.



Due to the vacuum molding process, the plastic coating is tightly stretched around the wooden core. Because of this, when TimberGuard is cut, the plastic tends to relax and pull back slightly from the newly cut face. One effective method to ensure that you have a clean looking joint is to allow the plastic coating to relax before your joint is cut. Precut your TimberGuard wale to allow the plastic coating to find its natural resting place.

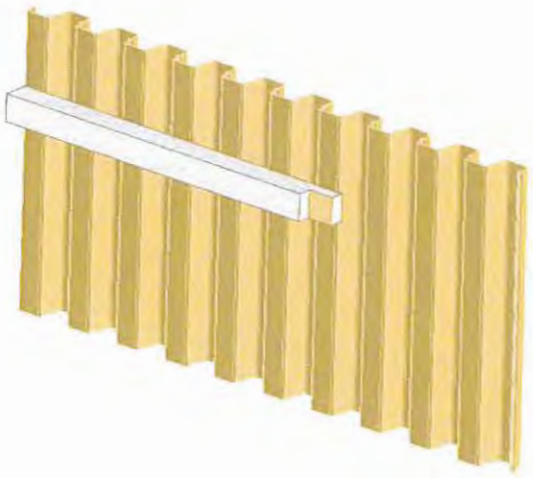
Now cut your joint, and the plastic will be flush with the newly cut wooden face. You can plan ahead and precut all your TimberGuard or cut each joint as you go.



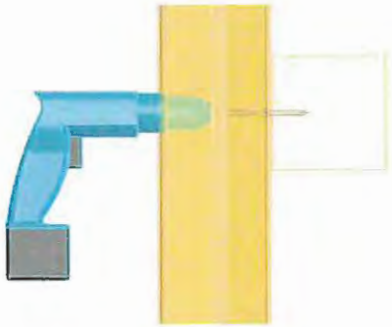
Step 3 – Hanging your first wale section

Place your TimberGuard wale on your sheet piling in the desired position for attachment, ensuring that it is level. The orientation of the joint depends on the situation but primarily on personal preference. We will use the first joint shown above, a standard shiplap, for our example. This joint is very universal. The same joint shape can be used to turn 90 degree corners as well.

You will probably want to start at one end of your wall and work to the other end.



After aligning and leveling your first section, secure your TimberGuard wale to the sheet piling from the back with evenly-spaced lag screws. You do not want to penetrate your joint with screws because you will be securing it with bolts in a later step.

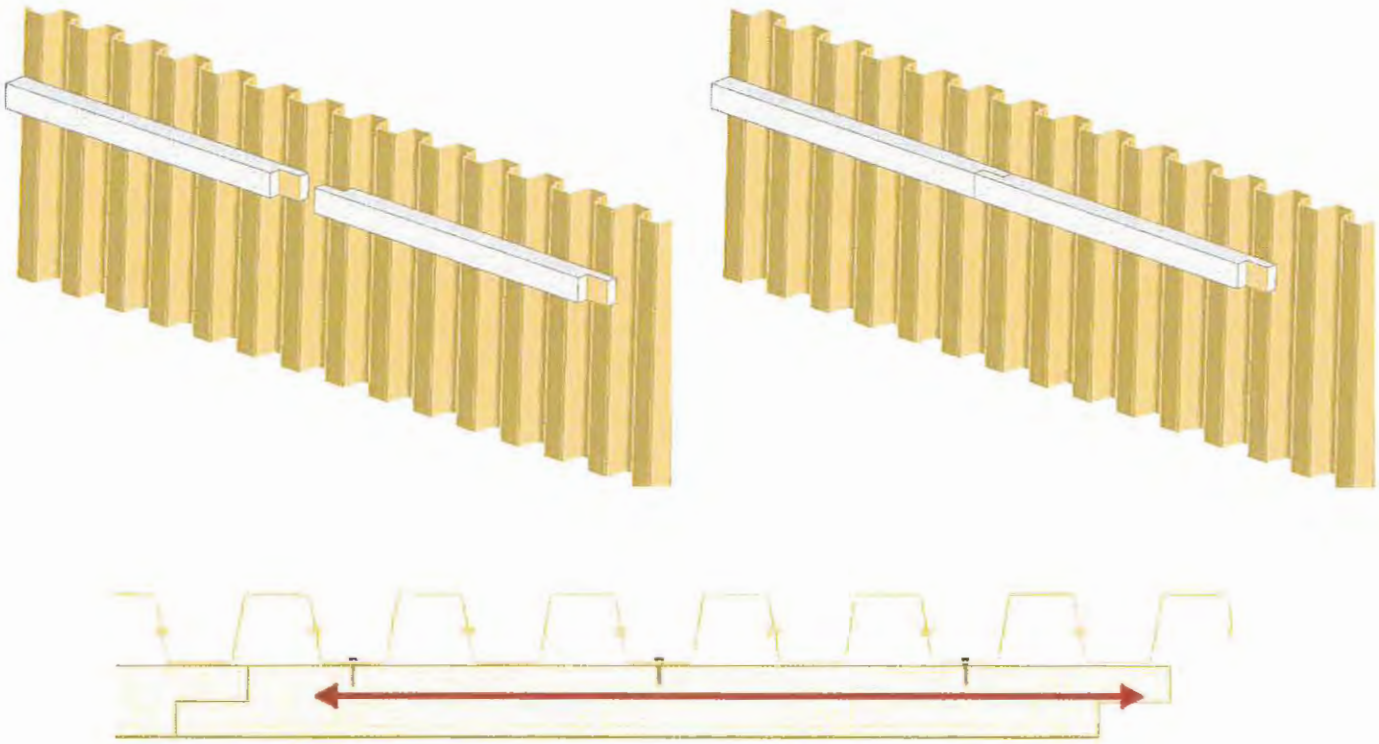


These screws will not be load bearing. They primarily act as a placeholder for your wale until the anchor system is connected.

Step 4 – Hanging intermediate wale sections

You will need to cut two joints for each internal wale piece, one on each end to match your previously-hung wale section and your next wale section to be hung. Properly position this wale section on your wall and lag screw it through the back

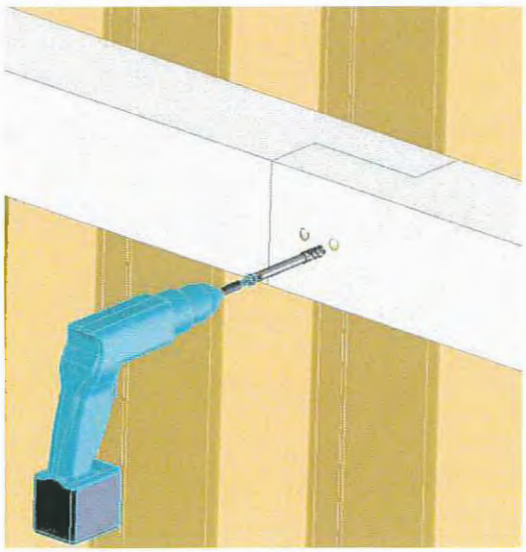
as you did in Step 3. Again, it is a better idea not to lag through joint sections.

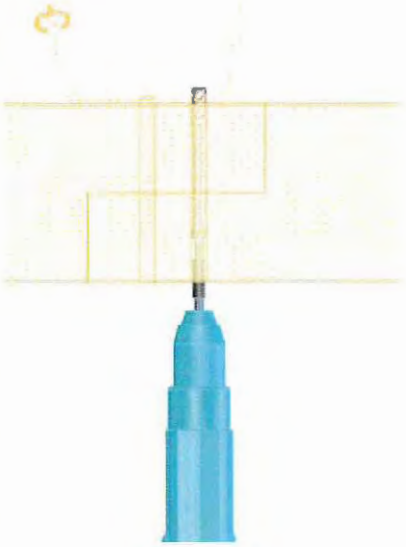


Step 5 – Securing your joint

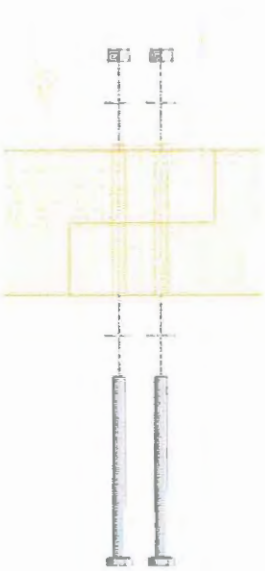
At this point, your joints are the weakest part of the wale. You want to eliminate these weak spots by securely binding them together. The wall type, joint type, and personal preference will dictate how you accomplish this. One of the easiest ways to lock them together is with bolts, nuts, and washers. Since these bolts will be load bearing, you will need to make sure that the fasteners you select are capable of withstanding all of the forces that will be applied to it. The joints are easier to secure when they fall on either a flat face or a gap within the sheet piling corrugation. If at all possible, try to keep them from landing on web sections for simpler bolt installation.

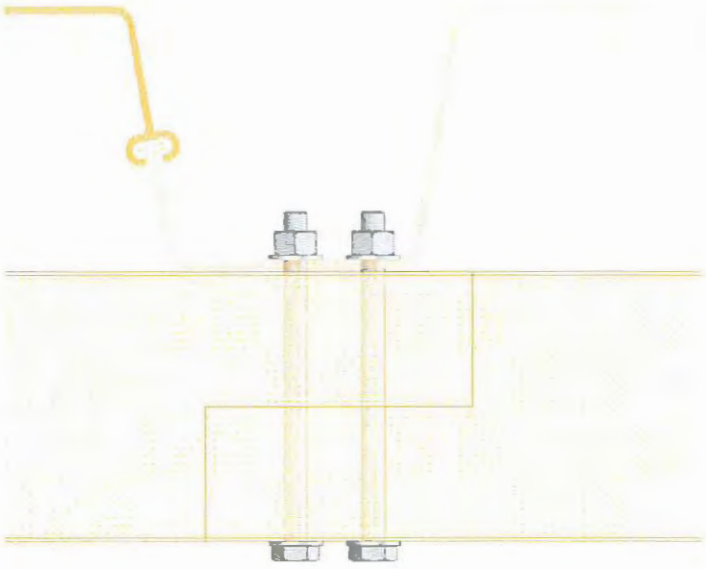
When the joint falls on a flat face, you will want to drill the bolt holes all the way through the TimberGuard and your sheet piling.



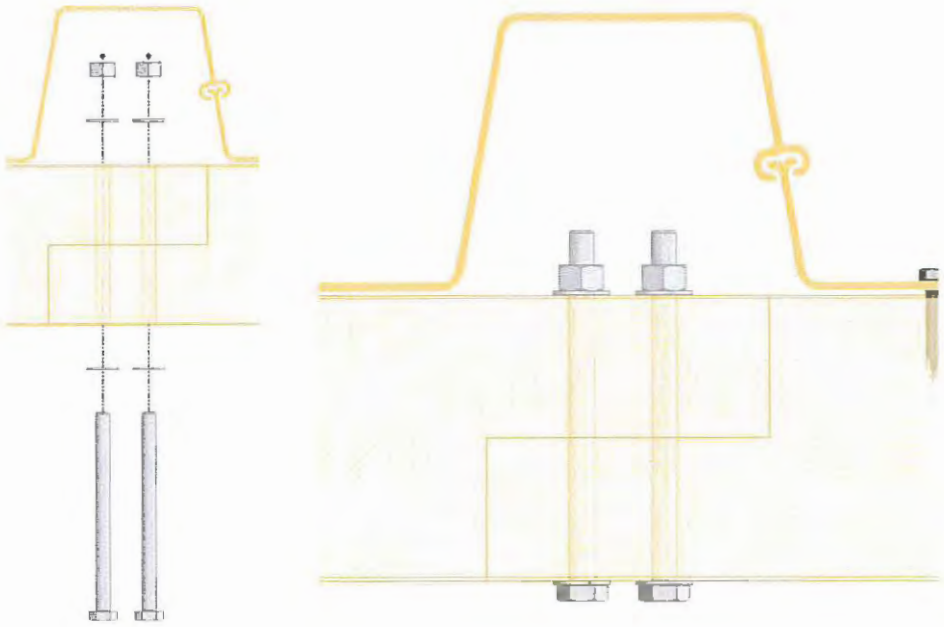


Assemble your fasteners and tighten the nuts.





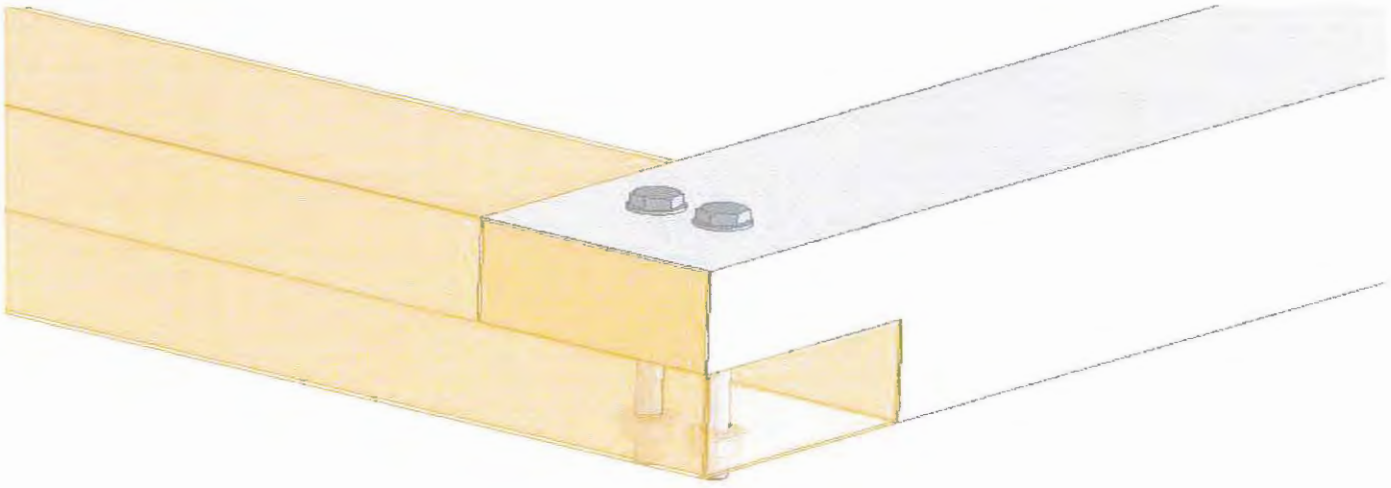
The process is the same if your joint lands on a gap. However, you will only bolt through the TimberGuard, not the sheet piling.



Turning a corner with your TimberGuard Wale

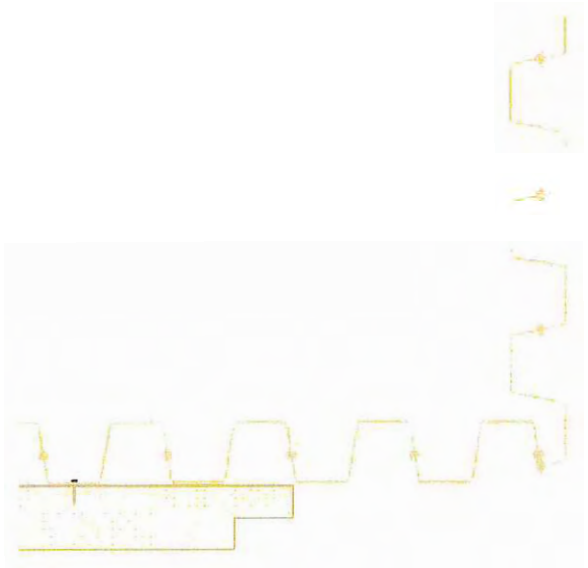
Step 1 – Preparing to turn a corner

There are many ways to turn a corner with TimberGuard, as many as there are for wood. For a common 90 degree turn, one of the easiest corners can be made using the same standard shiplap joint as was used in the previous section, only with a different orientation.

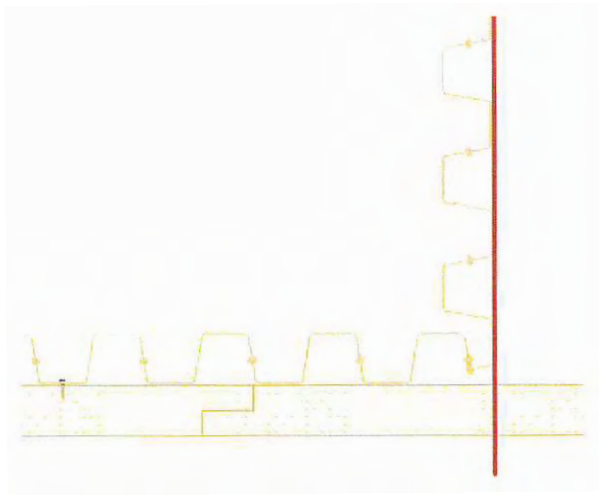


Another aesthetically-pleasing option is a mitered corner. For this example, we will show the steps to create a mitered corner for a 90 degree turn, although you can use this method to create any angled turn by adjusting your cut angle. When you reach a corner, you will want to stop so that your last wale section fits within the straight section of the wall. Make

your face joints as far from the corner as possible.

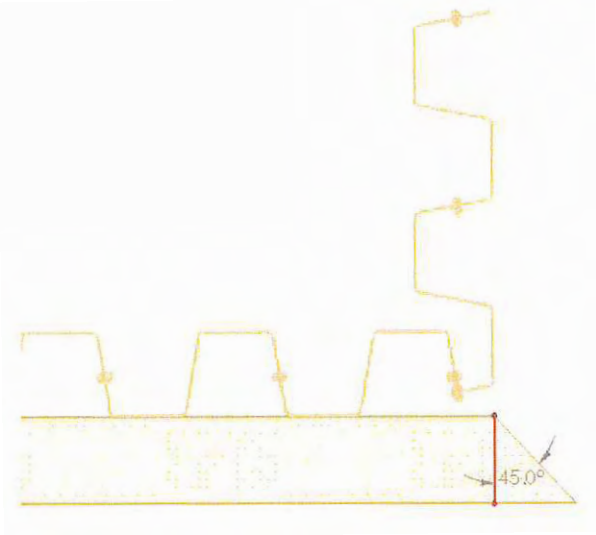


If you haven't already done so, you will want to take your measurements for cutting your first corner wale piece. An easy way to do this is to use a section on which the joint cut has already been made. Place it on the wall as if you were going to connect it to the previously hung wale section. Extend the line from the angled face, and transfer a construction line to the wale section using a marking device.



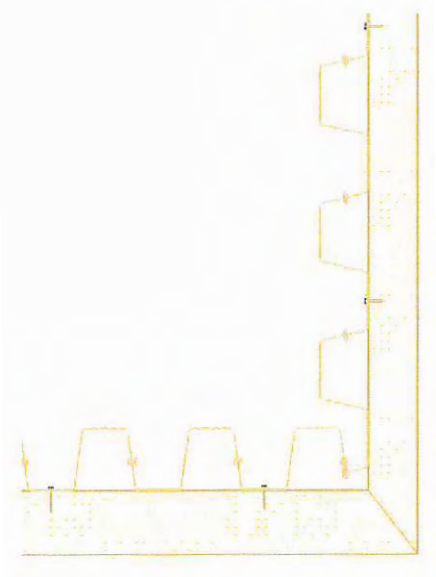
Step 2 – Making your cuts

Since this will be a mitered cut, your cut angle will be ½ of your actual turned angle. For this example of a 90 degree turn, we will cut at a 45 degree angle from our perpendicular construction line. For a 45 degree turn, the cut would be made at 22.5 degrees and so on. For accurate cutting, you should use a chop/miter saw, miter box, or have them professionally cut. If you have a small enough wale and skilled woodworkers, you could use a circular saw and a protractor.



You might want to go ahead and cut your other mitered corner piece as well, since you are already cutting. You should have enough material to cut from a new section so that your face joints are as far from the corner as possible. For this cut you will make the matching miter cut 22.5 or 45 degrees from perpendicular, respectively, for a 45 or 90 degree turn.

Ensure that the pieces are level and properly positioned on the wall. Secure the two corner pieces to your wall as you have done before with lag screws.

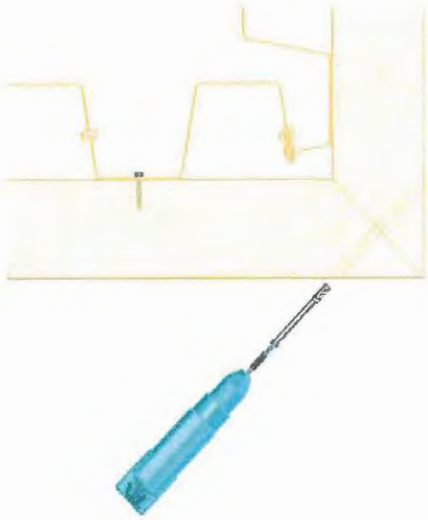


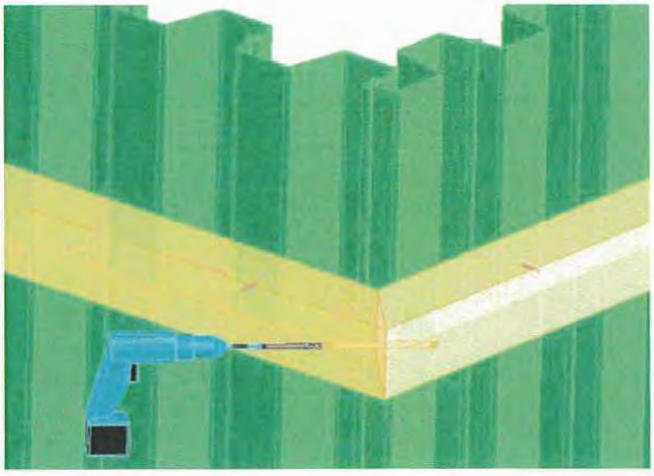
You will need to join your corner to keep it from separating after backfill. There are many ways to achieve this. One example is as follows:

Step 3 – Securing your corner

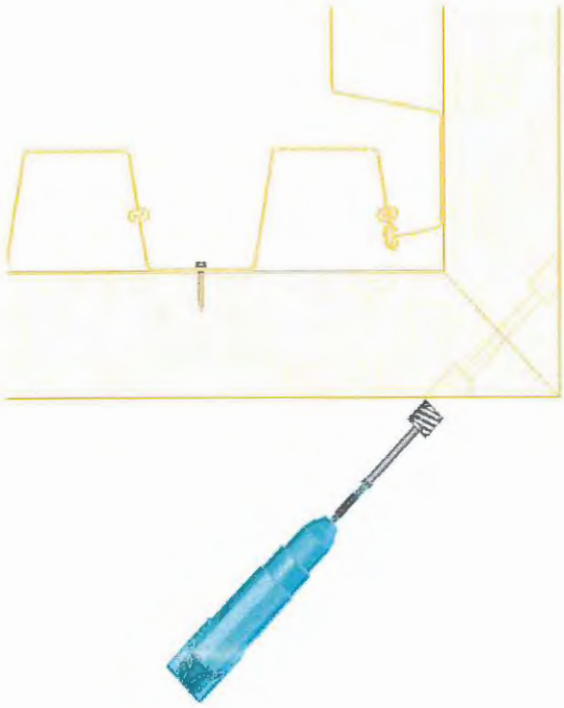
Again, there are many ways to join your corner. The following is one method that is aesthetically pleasing and common. For this particular corner, you will need a threaded rod with two matching nuts as well as two washers. After your corner is

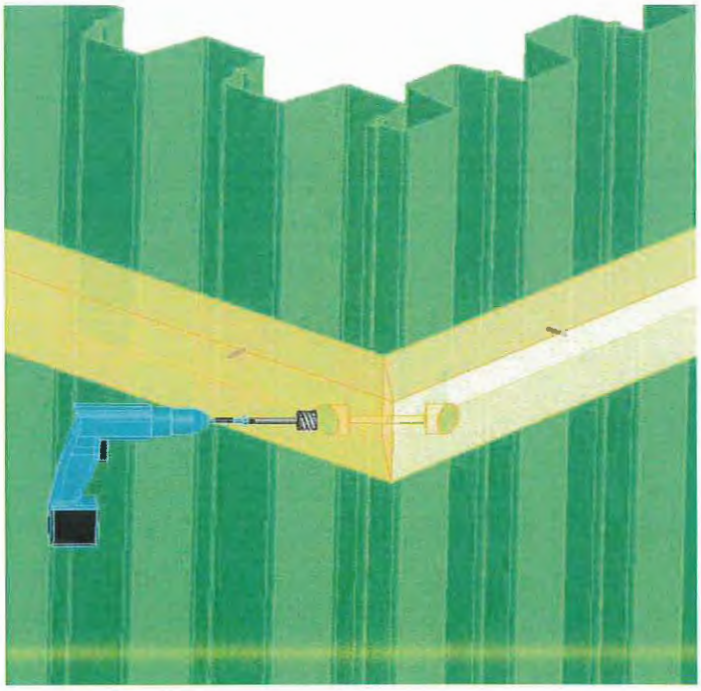
held in place with lag screws, drill a through hole perpendicular to the miter cut and all the way through your corner. This hole should be centered vertically and placed so that the hole intersects the miter cut faces as closely as possible to their center. This hole is made for your threaded rod, so its diameter should be chosen accordingly.



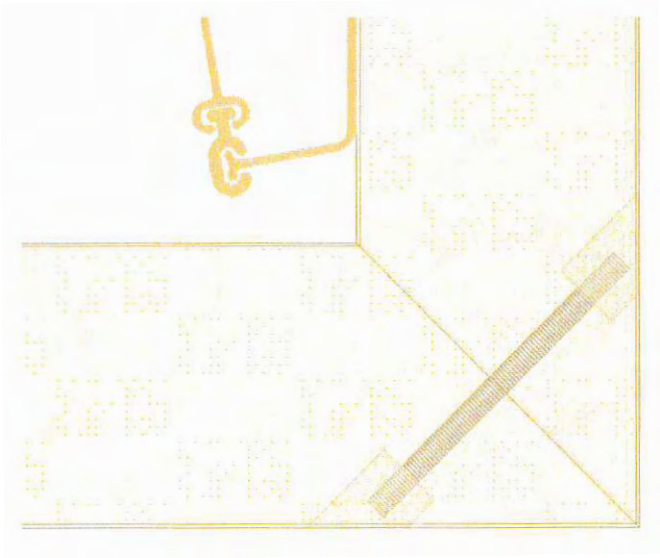


Make a countersunk hole concentric with the hole that you just drilled, and deep enough to house the nuts and washers. It should be wide enough to accommodate the washers you have chosen.

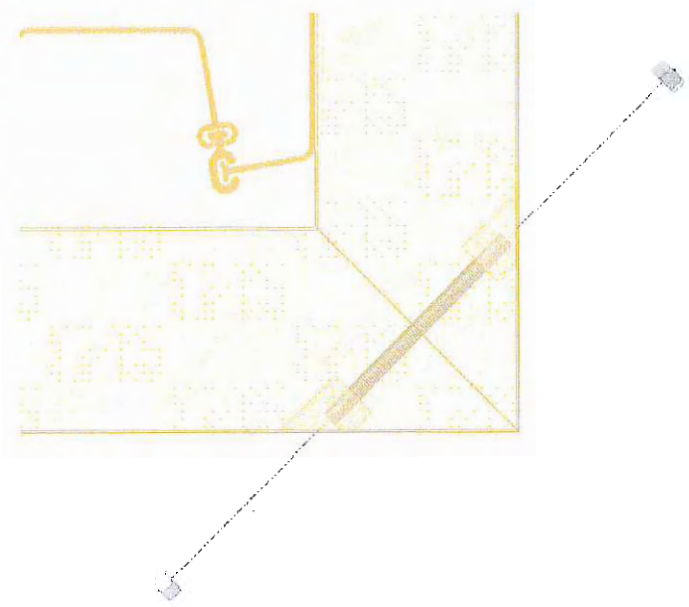


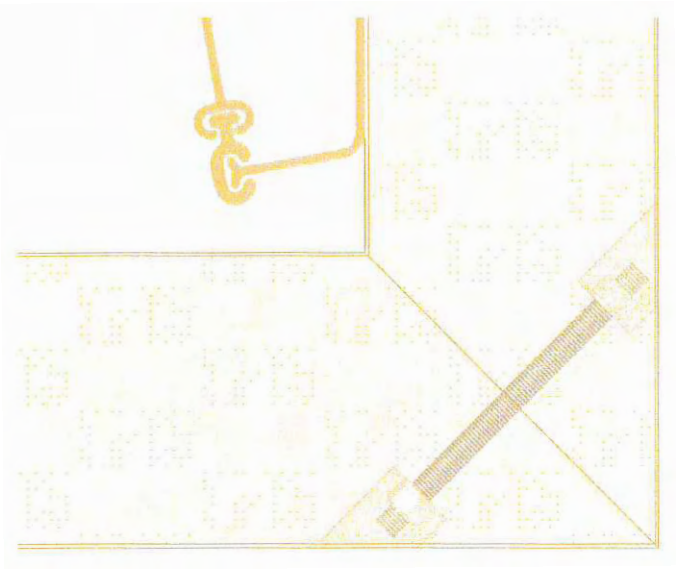


Insert the threaded rod into the drilled hole. It is a good idea to make sure the ends of the rod do not extend outside your wale. You may want to consider cutting them off if they do. Removing this extrusion will help protect the rod from the elements, as well as improve the aesthetics of your wale.



Attach washers and nuts, oriented as shown.





Oxygen and light are two of the primary factors that contribute to marine borer survival and rot. Therefore, when accidental or intentional breech of the TimberGuard's polymer skin occurs, you may utilize a roll of TimberGuard wrap or TimberGuard sealant. The wrap is very useful for wrapping splices or large cuts. Wrap the desired area and secure it with fasteners such as screws. Sealant may be used for small holes and to seal up any fasteners that have been installed. Apply it as you would standard caulk. A putty knife is useful for smoothing the sealant out to create a more seamless look. You may want to save this finishing step for the very end. Shown below is a TimberGuard wale that has been installed with an angled shiplap joint using the pre-cutting process described earlier and TimberGuard Sealant.

For the aesthetics and the peace of mind that comes with knowing that your TimberGuard pole is more completely covered it is a good idea to use wrap or sealant. However, breaches in the polymer do not necessarily compromise your product. Even with some minor holes in the polymer protection, the vast majority of the wale is still covered and the amount

of oxygen and light allowed to penetrate the wood is very limited.

Tie Rods

ShoreGuard Rods

Materials

Tie rod selection is an important decision. A large portion of the load acting on a tied back wall is carried by the tie rods to the anchors. Rod specs as well as spacing need to be given careful design consideration. Since tie rods play such an important role in the life of your wall, you want to make sure that they can handle the job that you need them to do. Many walls fail because the tie rods or anchors fail. Most of the tie rod is covered in soil, therefore protecting it from harsh and corrosive environments. The first few feet, however, can be exposed to air and water which can accelerate corrosion of the rods. ShoreGuard tie rod head sections are coated in plastic to protect them from the harsh environment in these critical first few feet.

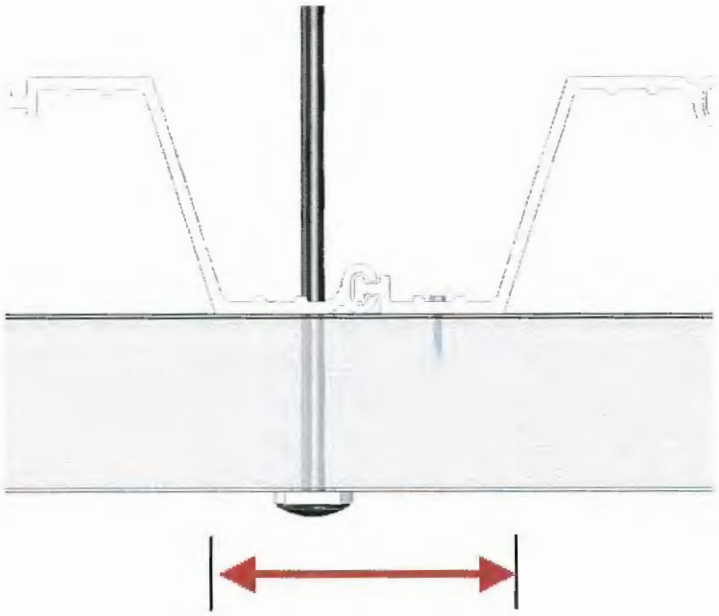
All of the most common hardware for tying back your wall comes with the ShoreGuard Tie Rod package. Use the table below to select the package that is right for you. There are several available accessories that should be considered. If you are going to angle your rods, which is normally the case, we carry ShoreGuard beveled washers. It is recommended, for UltraComposite and ShoreGuard wales and caps in particular, that you use beveled washers when assembling your tie rods. Because of the angle, the rod head would not lie flush with the wale face if beveled washers are not used, and point loading can be a potential problem for this scenario. Using a beveled washer will distribute the load on the angled rod head evenly to the wale face. ShoreGuard beveled washers come in a 5 degree angle, and two can be stacked together to achieve a 10 degree angle. It is highly recommended that you use a ShoreGuard plate washer when tying back through a UltraComposite wale. Due to the particularly high rigidity of FRP material, you want to distribute the load from the tie rods as much as possible to minimize point loading. This large, thick nylon washer will do just that.

Recommended Tools:

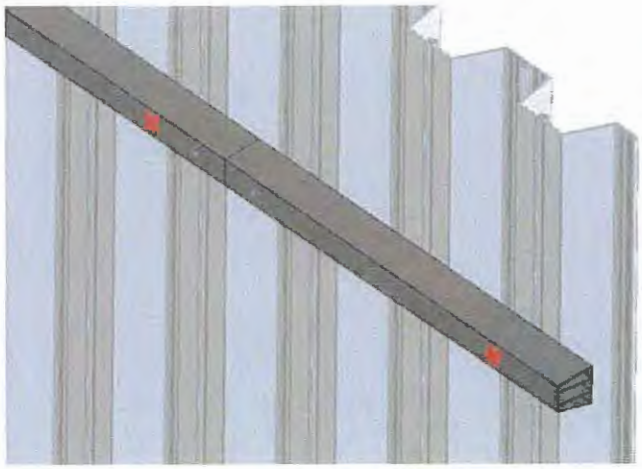
- Appropriate drill for drilling holes through your wale, wall & anchor depending on anchor type
- Drill bits appropriate for the material and tie rod diameter selected. Bits will need to be slightly oversized in order for the holes to be large enough to accommodate the plastic coating.
- Measuring and marking devices for proper tie rod placement
- Heavy wrench or device for tensioning your tie rod with the turnbuckle

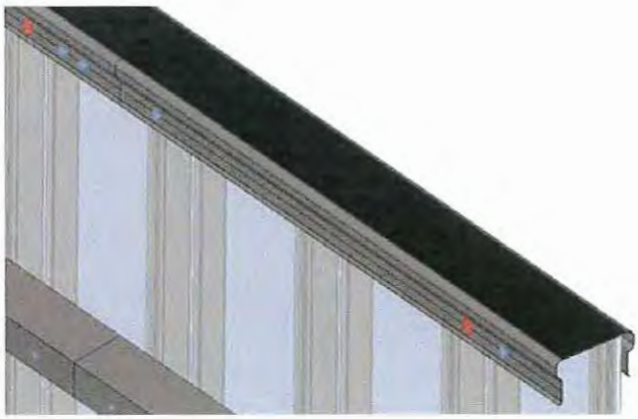
Installation

The rod spacing should already have been determined by the wall designer. It is a good idea to lay out where your rods will be placed by marking hole locations on your wale or cap. As much as possible, you should have your tie rods fall on the flats of outer wall faces.



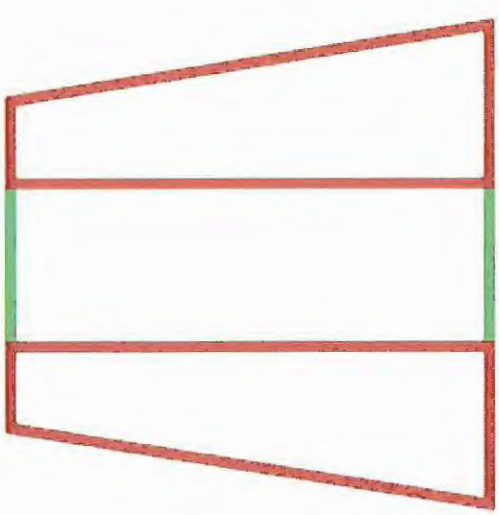
Temporarily mark your hole locations so that the rods can be positioned in the most effective manner before you begin drilling. After you are satisfied with your rod layout, you are ready to drill your holes. If tying back through wales, your holes should be centered on the outer vertical face as shown. If you are tying back through ShoreGuard caps, you should also center your holes on the front, flat, vertical face as shown, and the same face where your cap bolts are located. It is important to note that if you are planning on tying back through your caps, you must use the ShoreGuard Cap STR package.

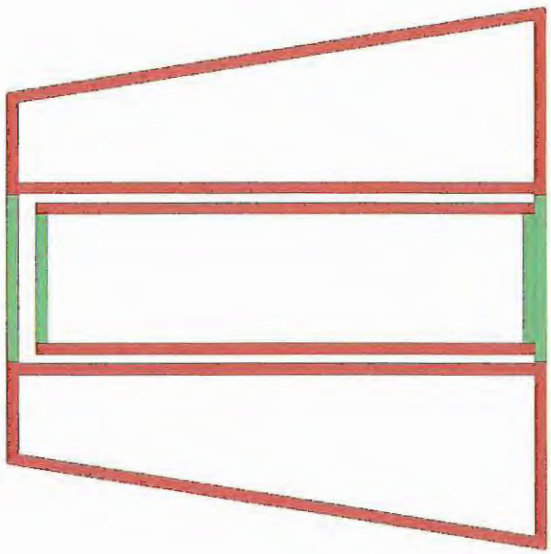




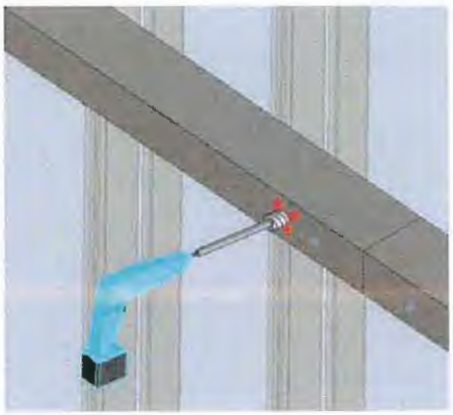
You will have to drill through different materials in this process with as many as three material transitions. This can be very harsh on the drill operator if done in the field. For instance, when drilling through rigid aluminum wales, as soon as the relatively soft plastic is penetrated, it tends to grab the bit, transferring all the torque to the operator. With careful planning, the hole locations can be determined prior to construction, and the drilling process can be done in a safer and more efficient way. If the hole locations are determined ahead of time, at least one component of the wall, can be drilled separately, predrilling the wale with a drill press for example. This way there are no material transitions, making the process quicker, less abrasive, and making it easier to use the appropriate bit for each material. You will want to drill all the way from the outer face of the wale or cap through the back of your wall and whatever lies in between.

It is important that you not drill through the inner web sections of an ShoreGuard or UltraComposite wale or their inserts. Limit all drilling to vertical faces only. If you drill through any horizontal sections, the strength of the beam is weakened. It is a good idea to penetrate green areas only, and leave the red areas completely intact. Profiles are shown for the standard ShoreGuard wale and the STR package. Your drillable area is slightly less in the STR package due to the insert.

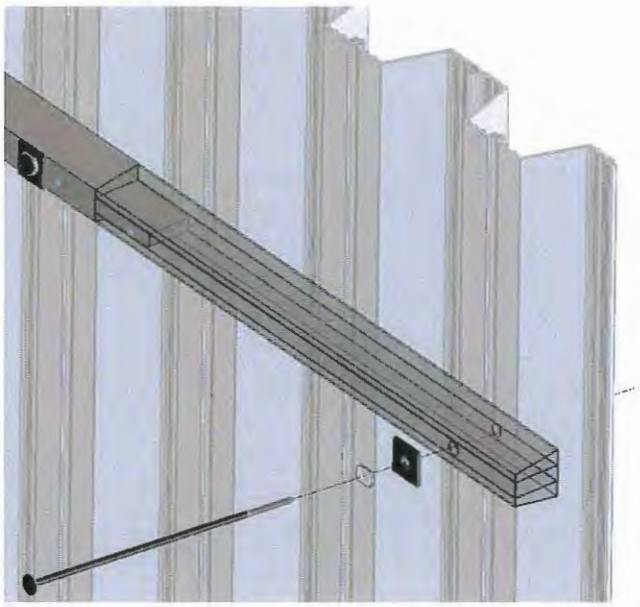


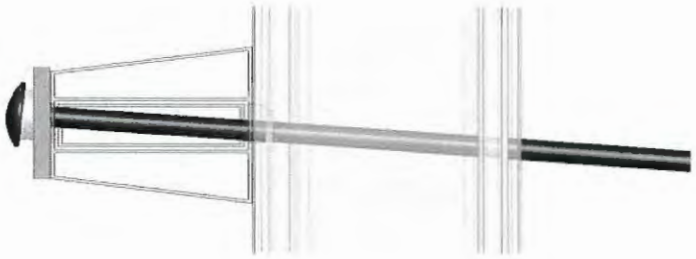


Most designs will call for you to angle your tie rod with a slight downward slope through the wale or cap, which will allow for a deep anchor. Because TimberGuard, like wood, is relatively soft and has a pretty homogeneous cross section, there is little worry about point loading and structural damage with the drilling of such a hole. There are virtually no more constraints with TimberGuard on maximum angle and hole location than with typical lumber, though you will generally want to keep the holes centered. ShoreGuard and UltraComposite wales, however, are more restricting. Because of the limited drillable area, there is a maximum possible angle of between 5 and 10 degrees, depending on your wale setup and rod diameter. To achieve your desired angle, you will either need to drill your hole at the desired angle or straight in. If you choose to drill straight in, then you need to make the hole larger than the diameter of the rod to allow room to adjust to the desired angle.



Insert your ShoreGuard coated rod through whatever washer assembly you will be using and into the holes that you have drilled. Shown is a ¾" diameter ShoreGuard Rod, tied back through the wale, with one ShoreGuard beveled washer and one ShoreGuard plate washer.

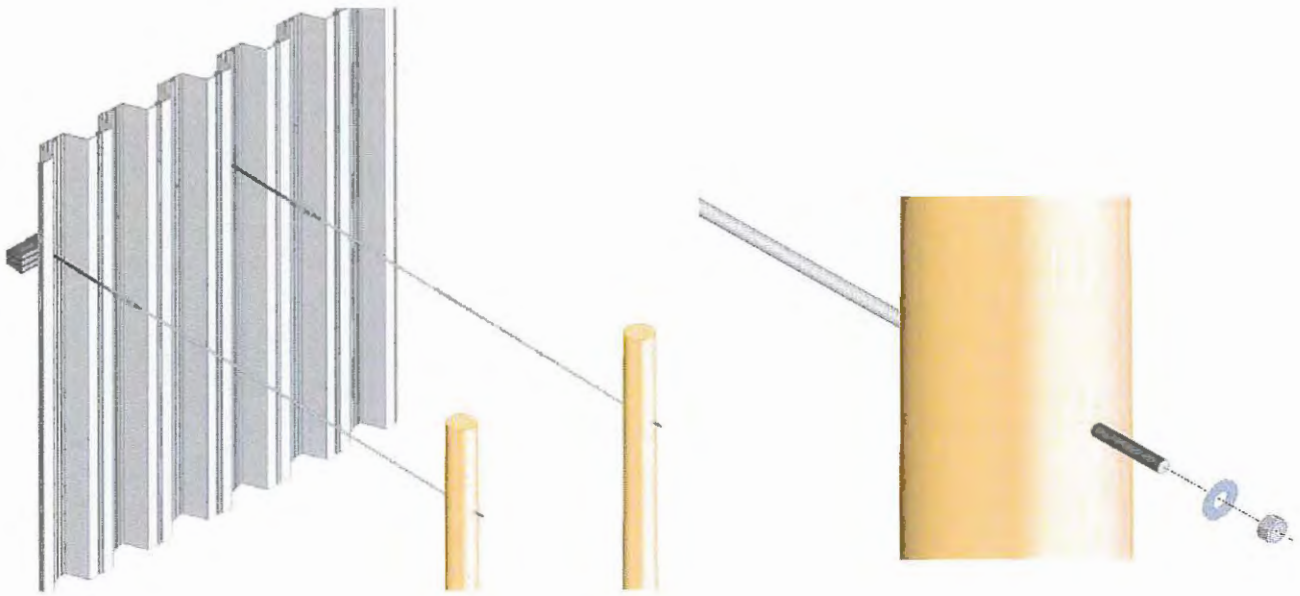




Screw the appropriately threaded end of the included turnbuckle onto the threads of the coated ShoreGuard rod. The coated rod section is reverse-threaded to allow your tie rod system to be tightened with the turnbuckle after assembly.

Next, screw the long uncoated rod into the opposite end of the turnbuckle. This will be regular right-hand thread. It is important to maximize thread contact area here as the rods and turnbuckles will be carrying a large portion of the load on the structure. Be sure that the rod head and tie rods are screwed all the way through the threads of the turnbuckle.

Secure your ShoreGuard tie rods to your anchors with the included nuts and washers. One very common anchor system is shown here, using TimberGuard piles.



After all of your tie rod components are assembled, use the turnbuckle and a wrench to tighten to the desired tension.

Caps

ShoreGuard

Materials

After deciding that you will use ShoreGuard caps, you will need to decide whether or not your application requires aluminum STR inserts. The standard option comes with a splice kit. This kit includes a 16" piece of aluminum insert for every 20' cap piece, for the purpose of splicing your cap. If you are planning on tying back through your cap, then your application will probably require a stronger and more rigid beam, and you should upgrade to the STR option, which includes a 20' aluminum insert for every 20' cap section to run the entire length of your cap. If you will be turning corners, you should consider buying prefabricated corner inserts. These inserts are roughly 16" in length and come in 45 and 90 degree angles. These options save fabrication time and provide some reinforcement at the corners, where you need it most. Touch up paint is available in most ShoreGuard colors. Though our aluminum alloy is designed for resisting corrosion, using this paint to touch up or seal off damaged or exposed areas will cut down on unprotected surfaces available and extend the life of your wall. Mounting hardware is included, so you will only need to provide the appropriate tools for wale installation. Use the table below to select the cap package that is right for you.

Recommended Tools:

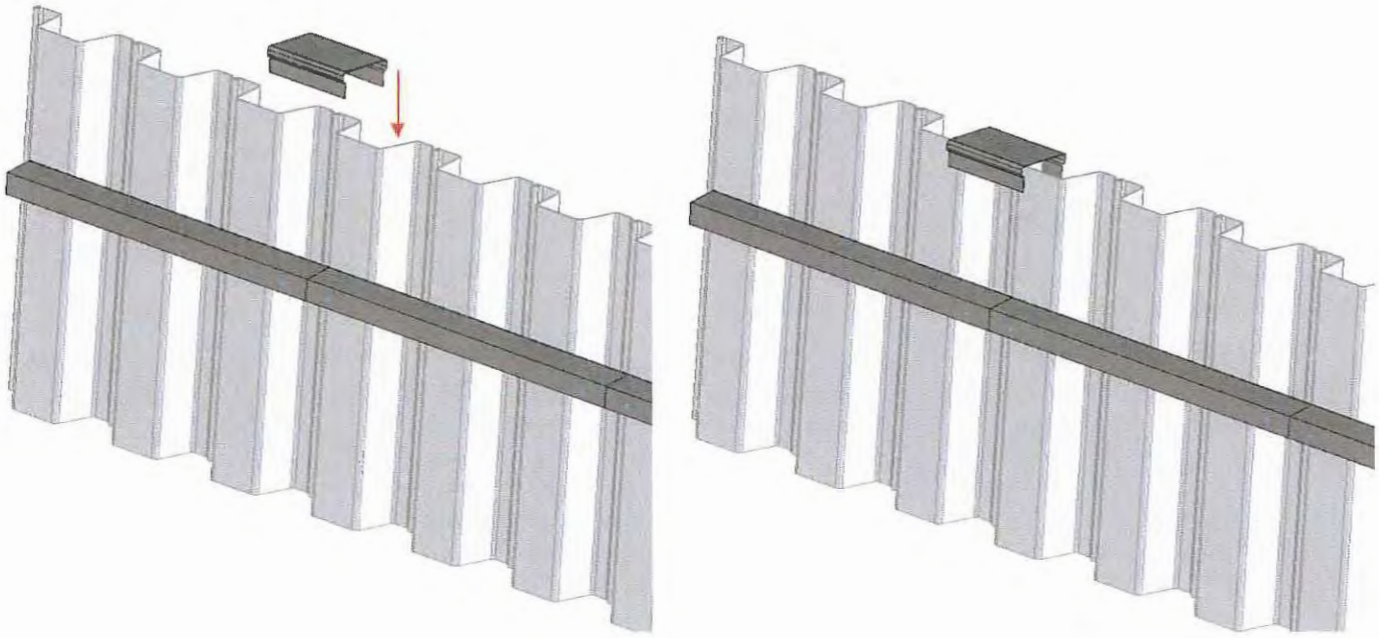
- Drill with a 3/8" bit for drilling bolt holes through aluminum and wall material
- 9/16" socket and/or wrench for tightening nuts and bolts
- Chop saw or any mitering saw that can accommodate the dimensions of the cap
- Blades appropriate for cutting the aluminum cap and inserts are required
- Measuring and leveling devices for proper cap positioning
- Aluminum Welder, if you will be making non-standard turns

Installation

Attaching your ShoreGuard Cap

Step 1 – Positioning your first ShoreGuard Cap section

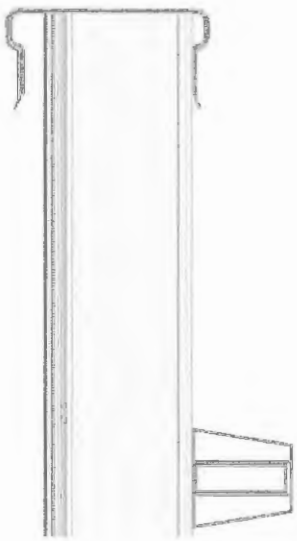
First, place your 16" insert on top of the wall approximately 20' from the beginning of your wall. You will probably want to start at one end of your wall and work to the other end. We will work from left to right for this example.



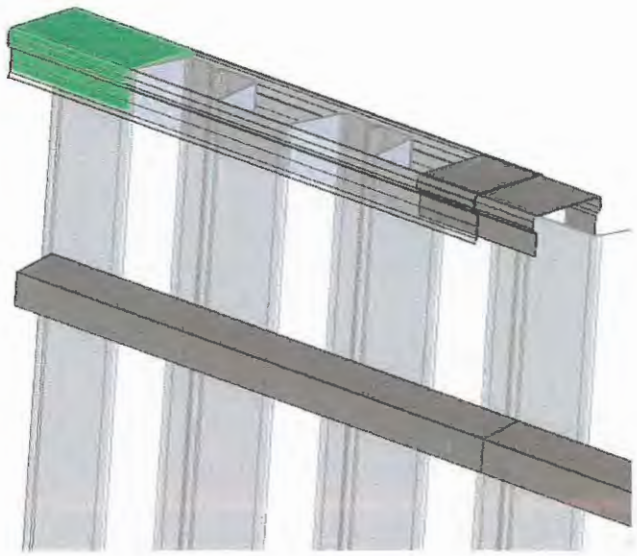
Next, slide a ShoreGuard Cap section onto the insert. The cap acts like a roof on your wall, so you want to make sure that no wall is left exposed underneath the outside end of your cap.

The cap is designed to be wider than the sheet piling wall that it houses. This allows for easy installation and overhanging material for increased protection. Throughout this entire capping process, you will probably want your cap's contact with the sheet piling to be on the front face (exposed side). This is a must if you are planning on tying back through the cap, and this is the way it will be shown throughout the manual. There will also be some instances were there is no gap between

the sheet piling and the cap. This will result in a very tight fit. The fit of the cap will be dependant on several variables such as the straightness of your structure. It is common to have to use some force to install the cap.



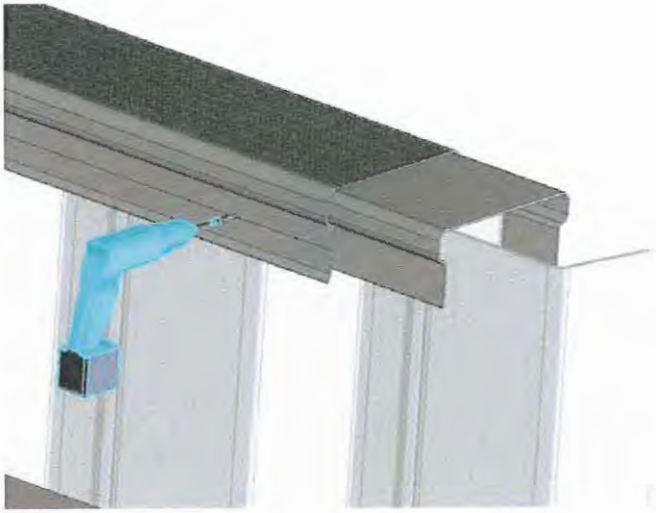
After you have made sure that your cap section is flush with the outermost end of your wall, you want to position your insert for attachment. Like the wale inserts, you want the cap insert to be half in, half out of the cap section. This will leave 9" of cap insert exposed. Before taking steps to secure the cap insert to the cap, you need to make sure that everything is properly positioned and level. Since your 20' cap section is only sitting on the 9" of cap insert, leveling the cap can be awkward. A tip to easily overcome this is to temporarily slide another cap insert on the outside edge of the cap section to give it a level base.

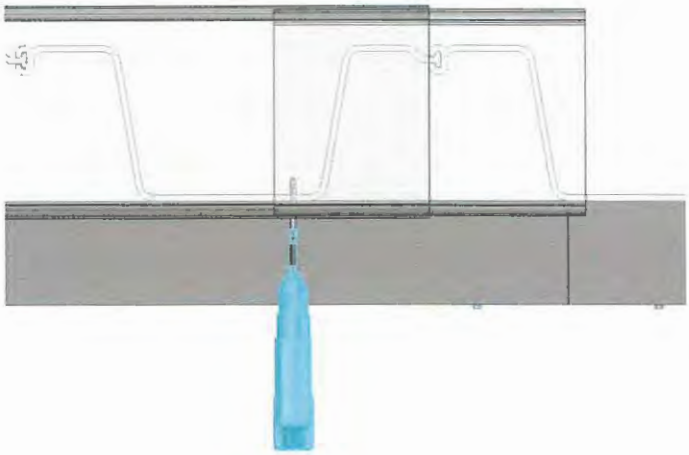


After you have secured the cap to the wall in a level position, you will need to remove the temporary leveling insert as you will be installing it at a later time.

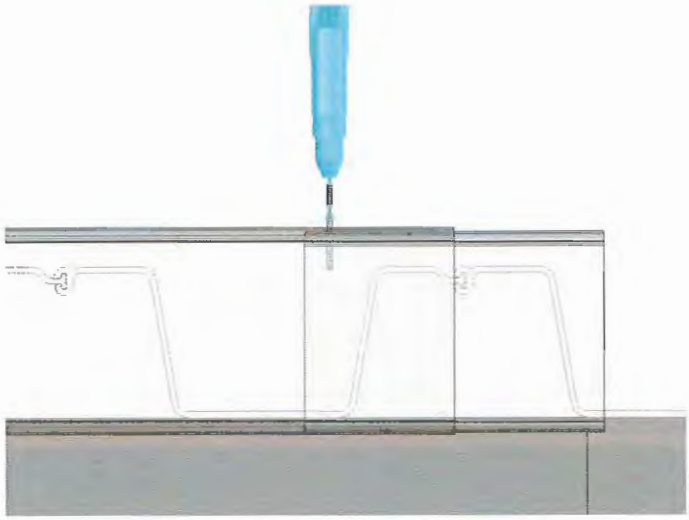
Step 2 – Attaching your Insert to the ShoreGuard Cap section

After you are satisfied that the cap and insert are correctly positioned, you are ready to secure the insert to the cap section. Drill one hole for a 3/8" bolt through the front side of the cap and insert. This hole should be located in the center of the lower flat face of the cap. To add a little more sturdiness to your assembly, you can also drill through the wall (as shown). This can only be done if part of the insert falls on an outside flat face as it does in this scenario. This will be the case more often than not, depending on the type of sheet that you use. The main objective of this step is to secure the ShoreGuard Cap section to the insert, not to secure the cap to the wall. If this does not conveniently fall on a flat face, only drill and secure through the cap and insert.



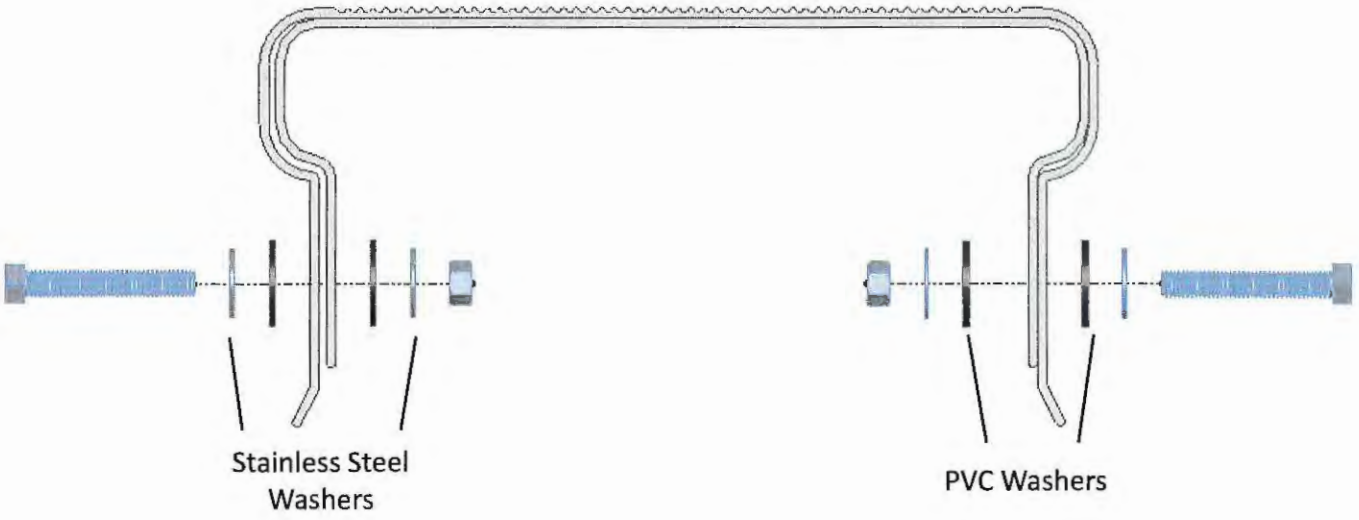


Repeat this process for the rear of the wall. In this case, however, you want to make sure that you do not drill through the wall, only the cap and insert so that they can be securely fastened, and the cap will remain flush with the front wall face.



After both holes have been drilled, secure them with the cap bolts and washers, in the order shown. The PVC washers are

included to provide a galvanic corrosion barrier between the stainless steel washers and the aluminum cap.

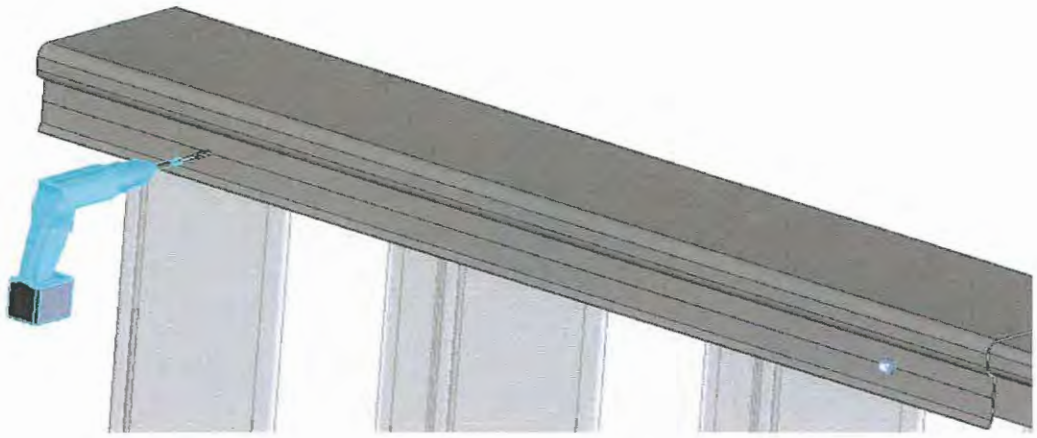


Hand-tighten the front side first to ensure good solid contact, followed by hand tightening the rear side, and then fully tightening both. In this scenario, we have chosen to sandwich the front face of the wall in as well.

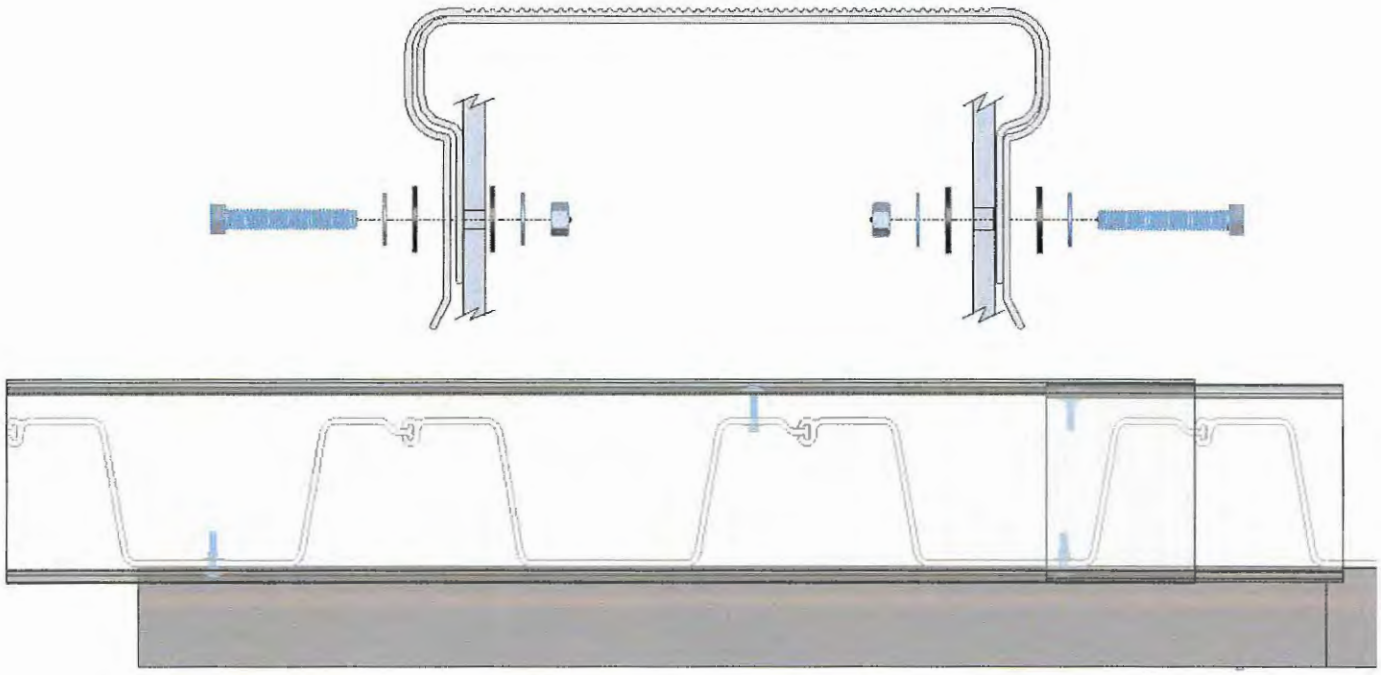
Step 3 – Attaching your first ShoreGuard Cap section to the wall

After you have secured the insert to the cap section, you will attach your cap to the wall using the remaining bolts. As

before, you want to drill your holes in the center of the lower flat face of the cap. Position your holes so that they fall near the center on the flat outer faces of the wall. Drill through the cap and the wall face.

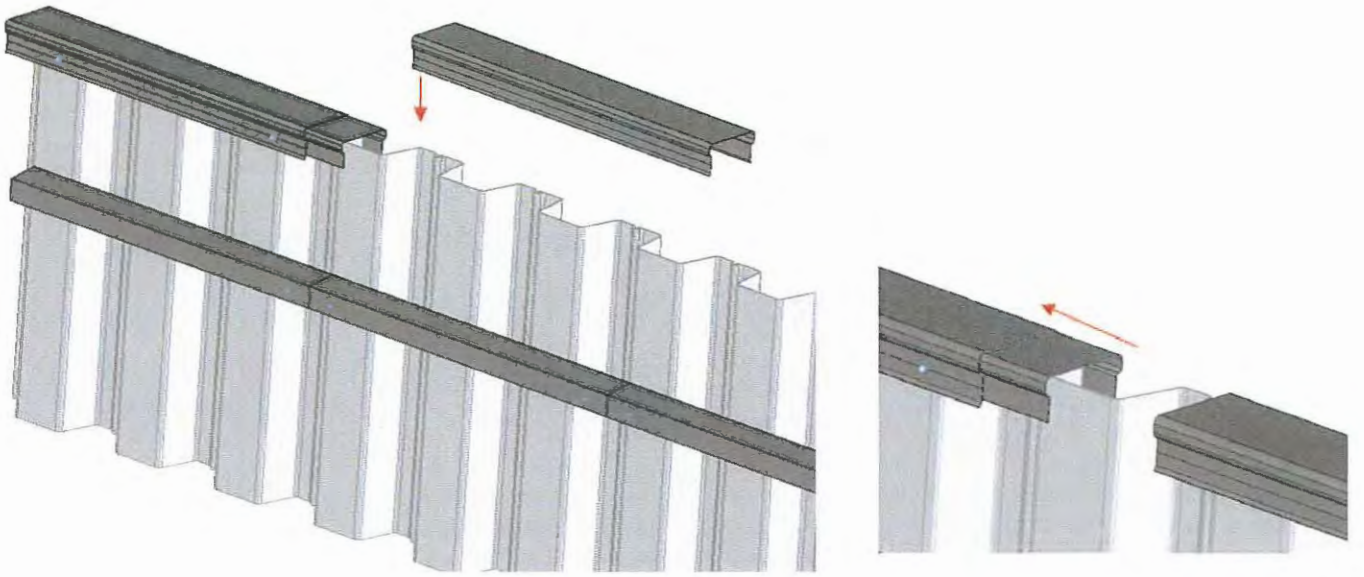


Evenly space your bolts and washers along the length of the cap, half on each side of the wall. Attach them as you did before, with the cap and wall between the washers on both sides. Hand-tighten the complete front side first to make sure that the cap is in direct contact with the front face, and then fully tighten all nuts. In cases were there is a significant gap between the cap and the back surface of the sheet piling, it may be advisable to fill the gap with some kind of blocking material such as left over sheet piling material or wood.

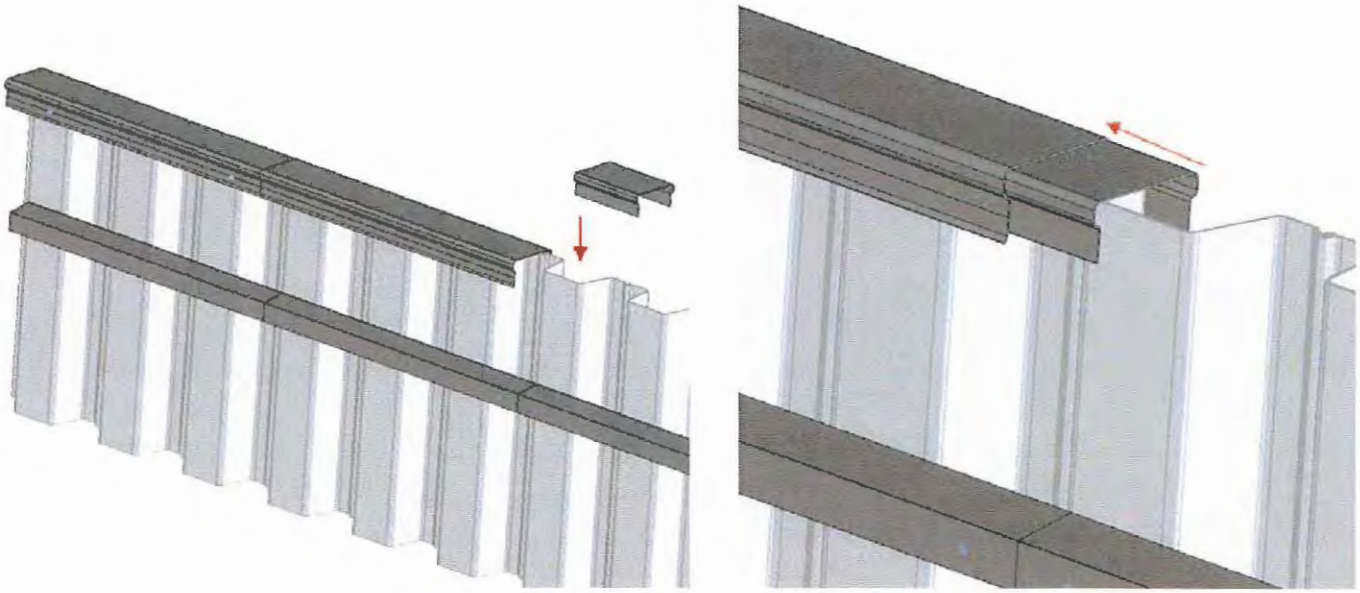


Step 4 – Installing intermediate cap sections

Slide your next cap section onto the attached, exposed insert. You will use each attached cap section and insert as a guide for its following cap section.

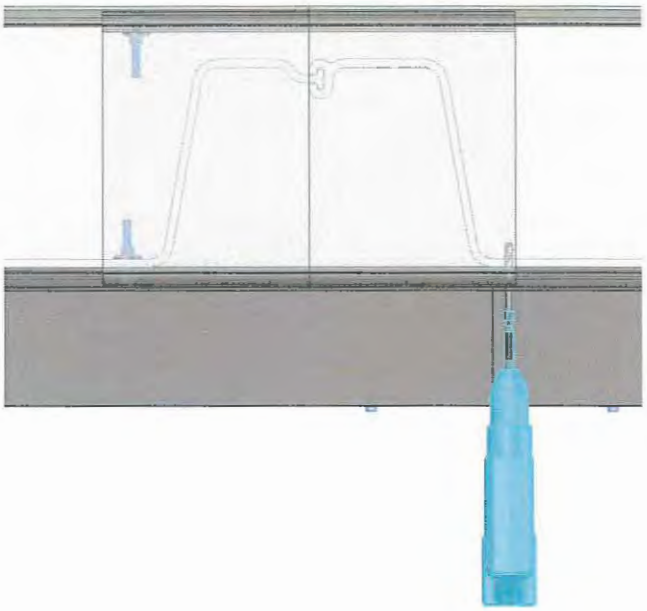


Slide your next cap insert into this cap section, half-in, half-out. This will level the cap section and leave you in a position similar to that in Step 2.

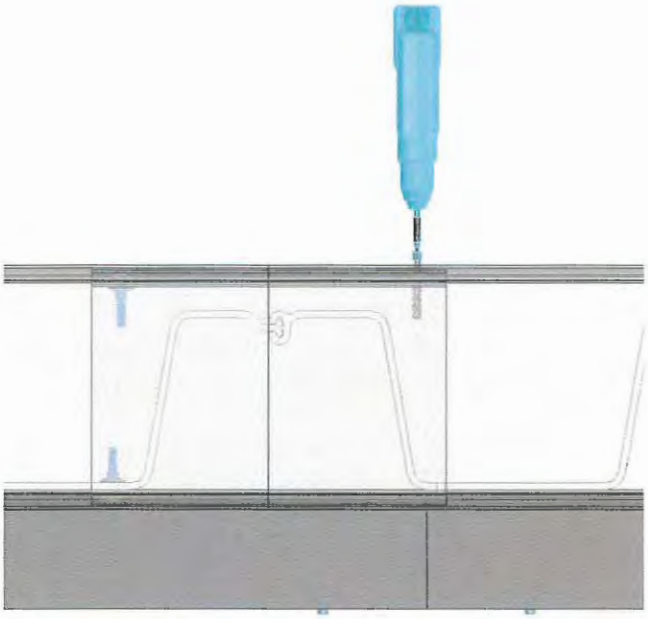


You will need to secure the insert on both sides of the cap section rather than just the leading end. You will begin attachment by securing the trailing end of the unattached cap section to its corresponding (partially installed) insert. You will use the same installation principals and methods as you learned in Step 2. Drill one hole for a 3/8" bolt through the front side of the cap and insert. This hole should be located in the center of the lower flat face of the cap. As in Step 2, to add a little

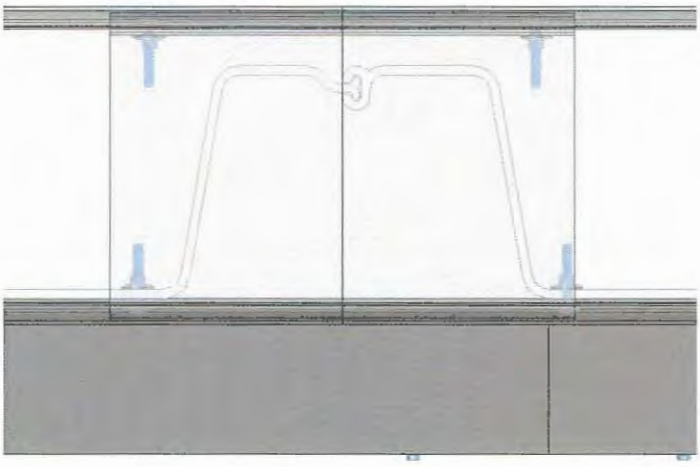
more sturdiness to your assembly, you can also drill through the wall (as shown). Remember from before, this can only be done if part of the insert falls on an outside flat face as it does in this scenario. This will be the case more often than not, depending on the type of sheet that you use. The main objective of this step is to secure the ShoreGuard Cap section to the insert, not to secure the cap to the wall. If this does not conveniently fall on a flat face, only drill and secure through the cap and insert.



Repeat this process for the rear of the wall. Again, in this case, you want to make sure that you do not drill through the wall, only the cap and insert, so that they can be securely fastened, and the cap will remain in direct contact with the front wall face.



Hand-tighten the front side first to ensure good solid contact, followed by hand tightening the rear side, and then fully tighten both. Remember, in this scenario, we have chosen to sandwich the front face of the wall in as well.



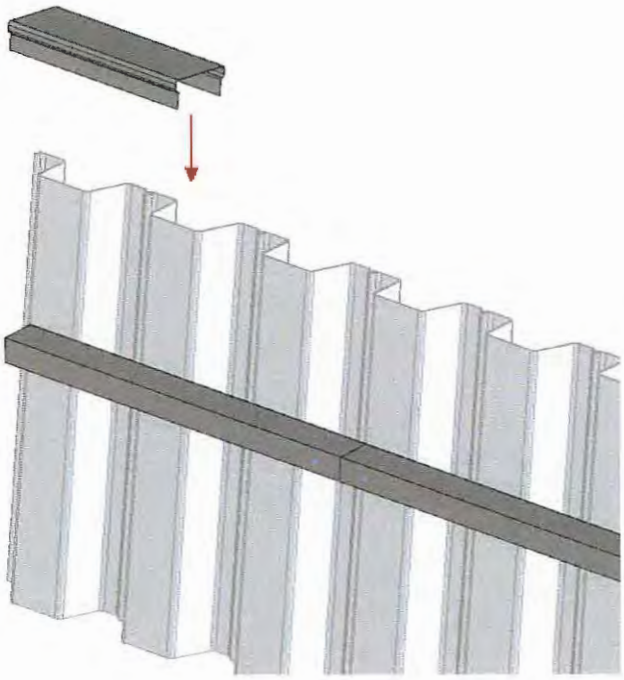
Follow Steps 2 and 3 to finish securing your cap and insert to each other and then to the wall.

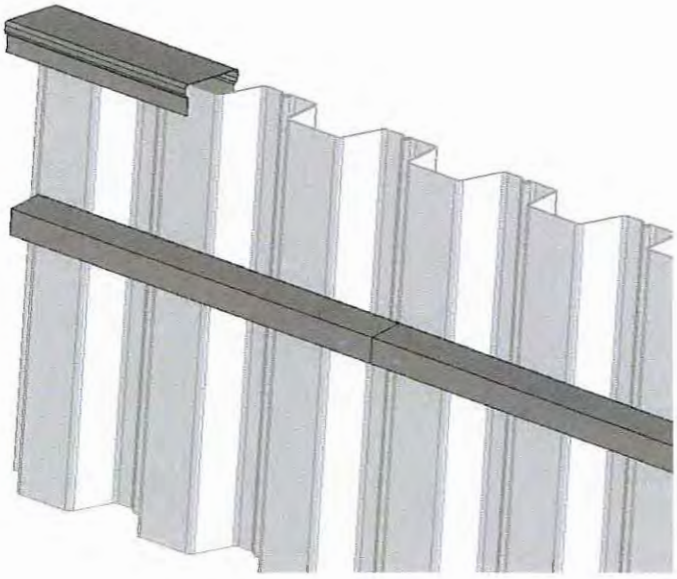
Repeat this process for all the straight runs of your wall.

Step 5 – Modifying your installation for ShoreGuard Cap STR

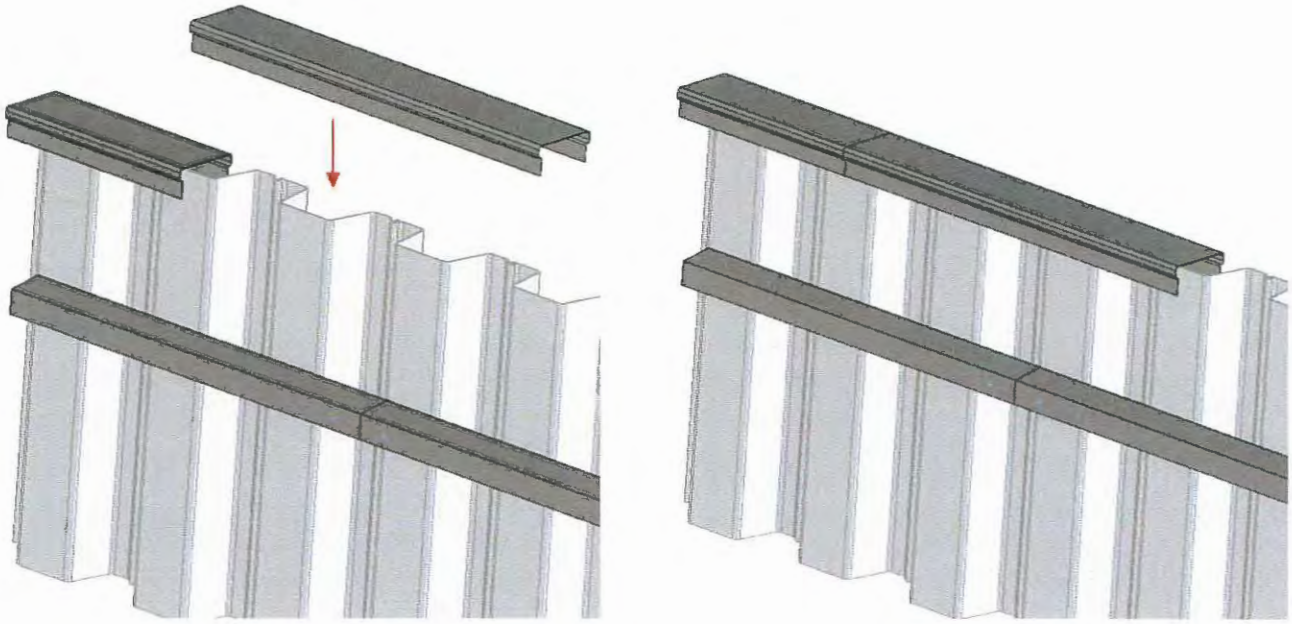
Choosing to use the STR package will allow your cap system to more closely approximate a continuous beam than the standard package. The only difference between the two is that the STR package includes a 20' insert in place of the 16" standard insert. This results in the insert running the whole length of your wall, adding strength and rigidity. The STR package is also slightly easier to install than the standard one.

It is recommended that you cut one of your 20' structural inserts into two 10' lengths for easy installation. Place one of the 10' lengths onto your wall so that no wall is left exposed underneath the outside end of your insert. You will save the other piece for the final step of your installation.

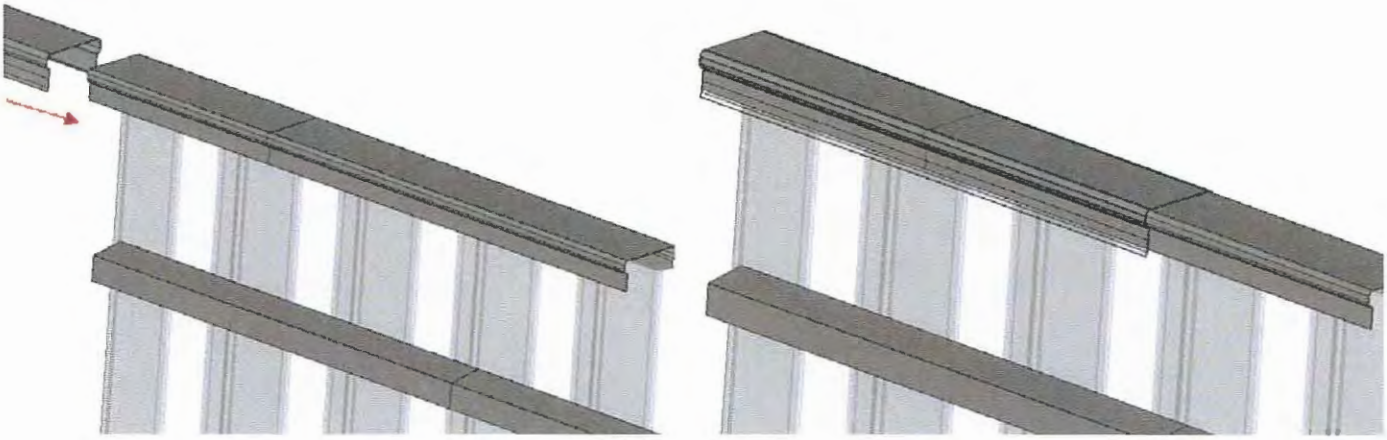




Place a 20' insert onto the wall so that it touches your already positioned 10' insert.

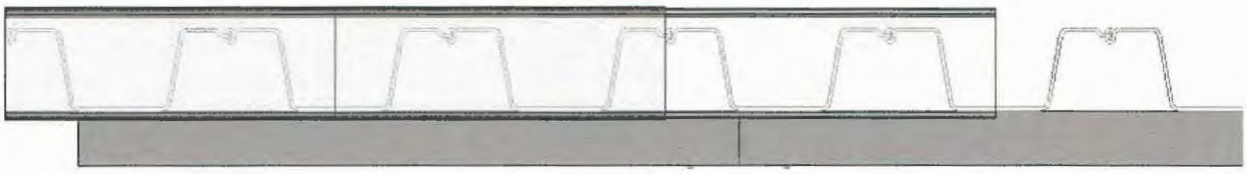


Slide a 20' cap section onto the cap inserts. Because your cap system acts like a roof, be sure that the outside end of your wall is completely covered by the cap section. Because you have made this 10' insert piece, every other insert will automatically be half-in, half-out of the cap for optimal placement.



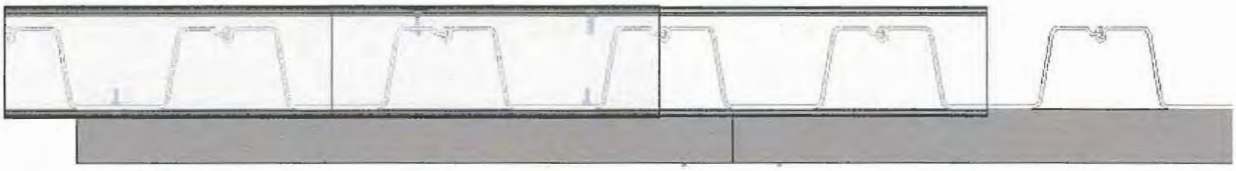
After this helpful setup, the rest of the install process is the same as with the standard package. Follow Steps 2-4 from above to complete the installation for the faces of your wall.

To summarize:



Secure the 1st cap section to the insert.

Secure the cap and insert to the wall.

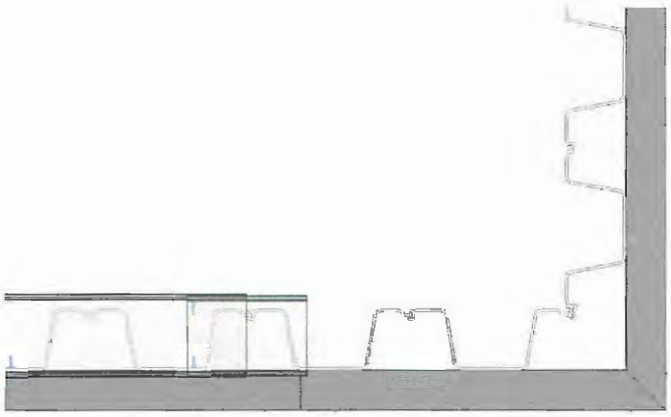


Secure the next cap section to inserts at both ends, followed by securing the cap and insert to the wall.

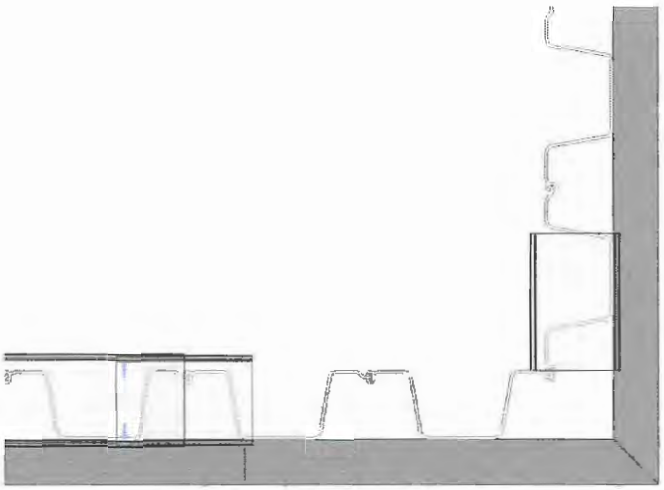
Turning a corner with your ShoreGuard Cap

Step 1 – Preparing to turn a corner

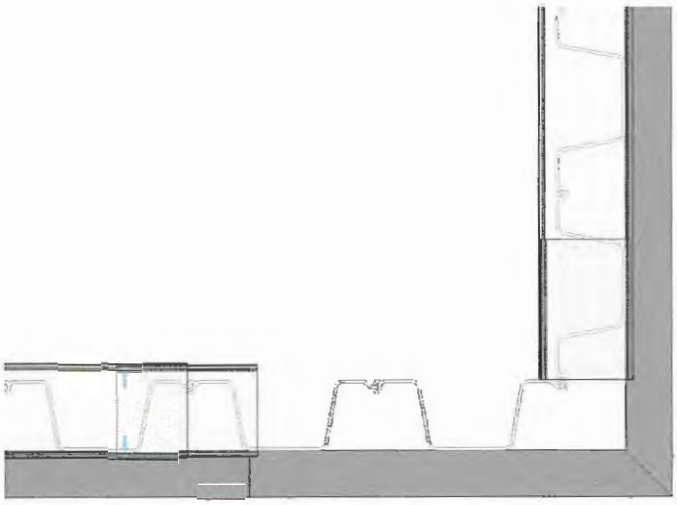
For this example we will show the standard ShoreGuard Cap package turning a 90 degree corner. This process will use a 90 degree corner insert. We also offer 45 degree corner inserts, but the process for turning a 45 or 90 degree corner is fundamentally the same. When you reach a corner, you will want to stop so that your last cap insert is still within a straight section of the wall. You should plan so this does not happen near the corner.



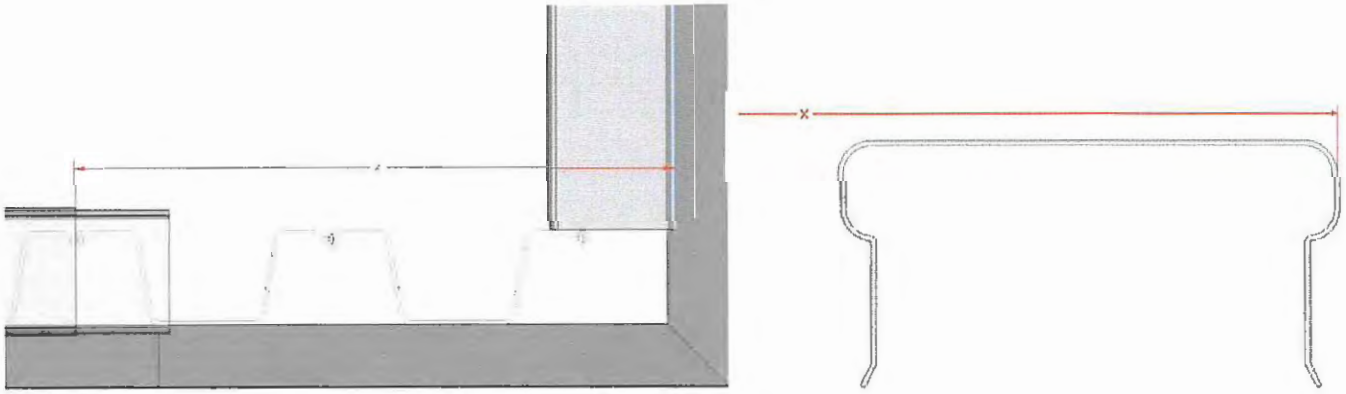
Identifying the proper location for your miter cut is very important for a quick, simple, and attractive wall. There are many ways to accomplish this, but one of the simpler ways is as follows: Place a cap insert onto the turned wall section and slide it as far into the corner as possible.



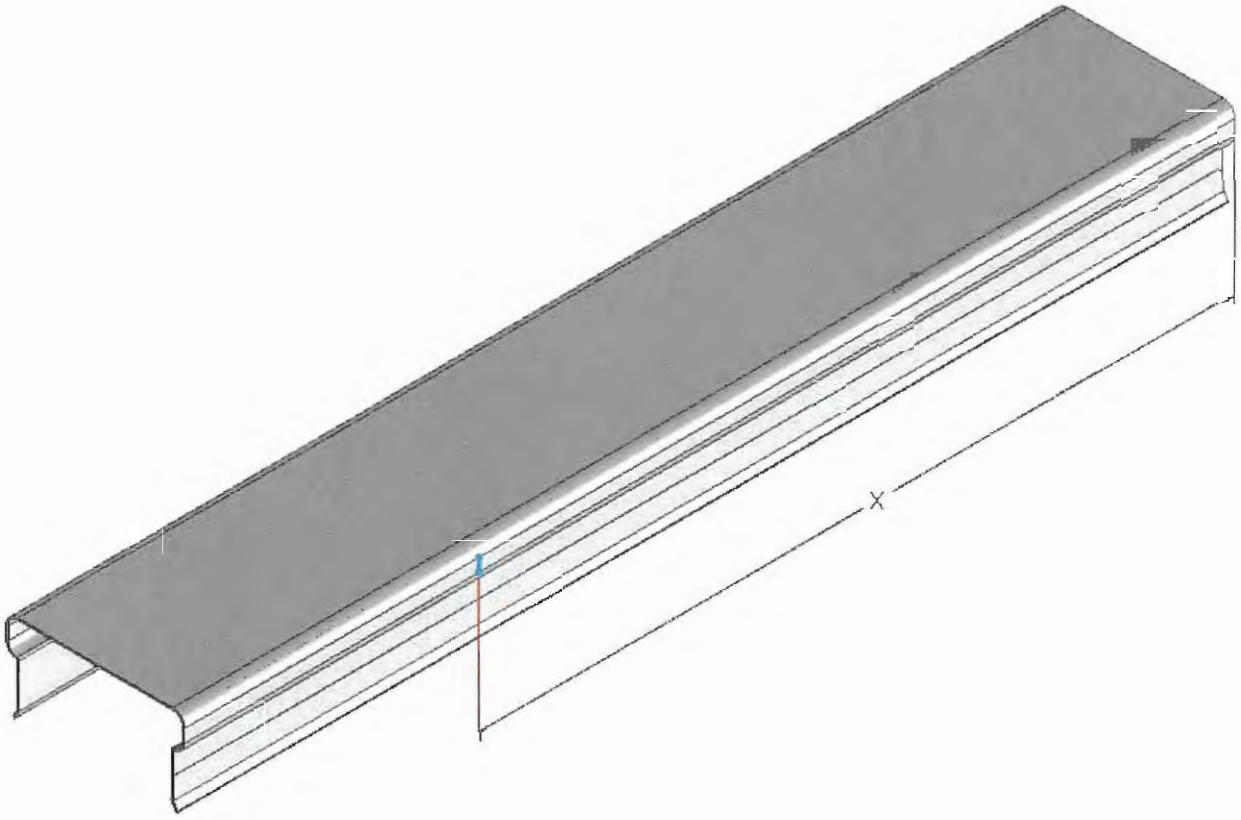
Slide a cap section onto the insert and up to the corner as well. Position these just as you would for final installation. This ensures, in this particular situation, that the cap and wall tightly sandwich the insert on the front side and are hanging over the back just as before.



Measure the distance from the farthest point on the cap that you just positioned (this will be the upper flat section) to the last cap section on the flat of your wall.



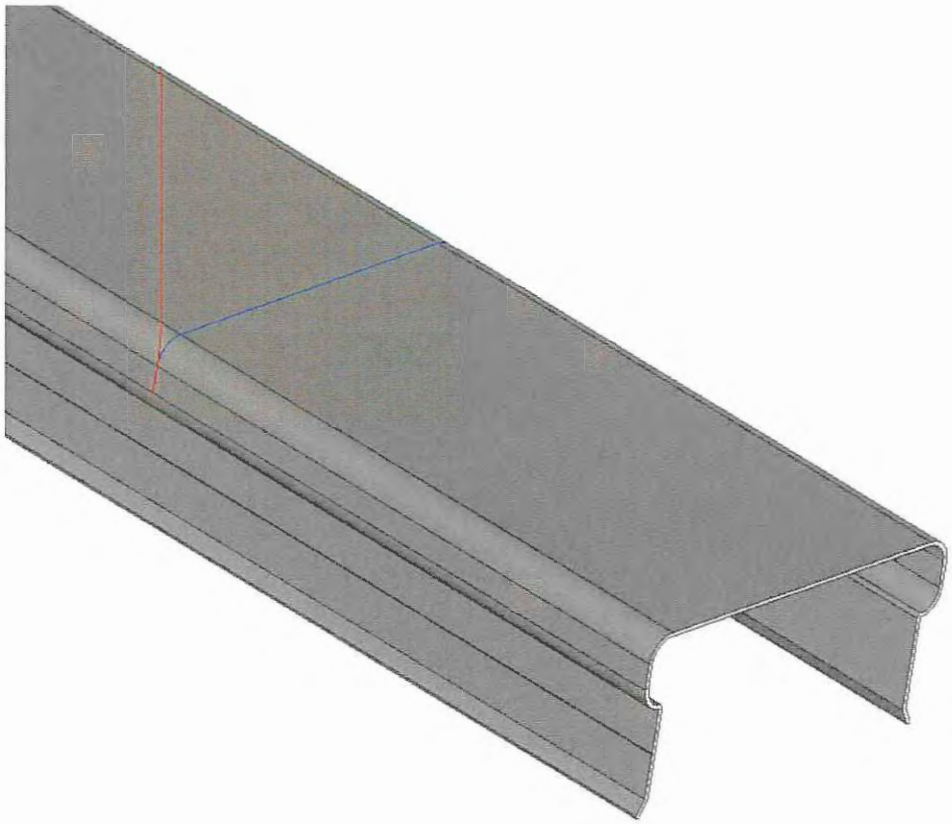
Mark this distance out on a new cap section (shown in blue).



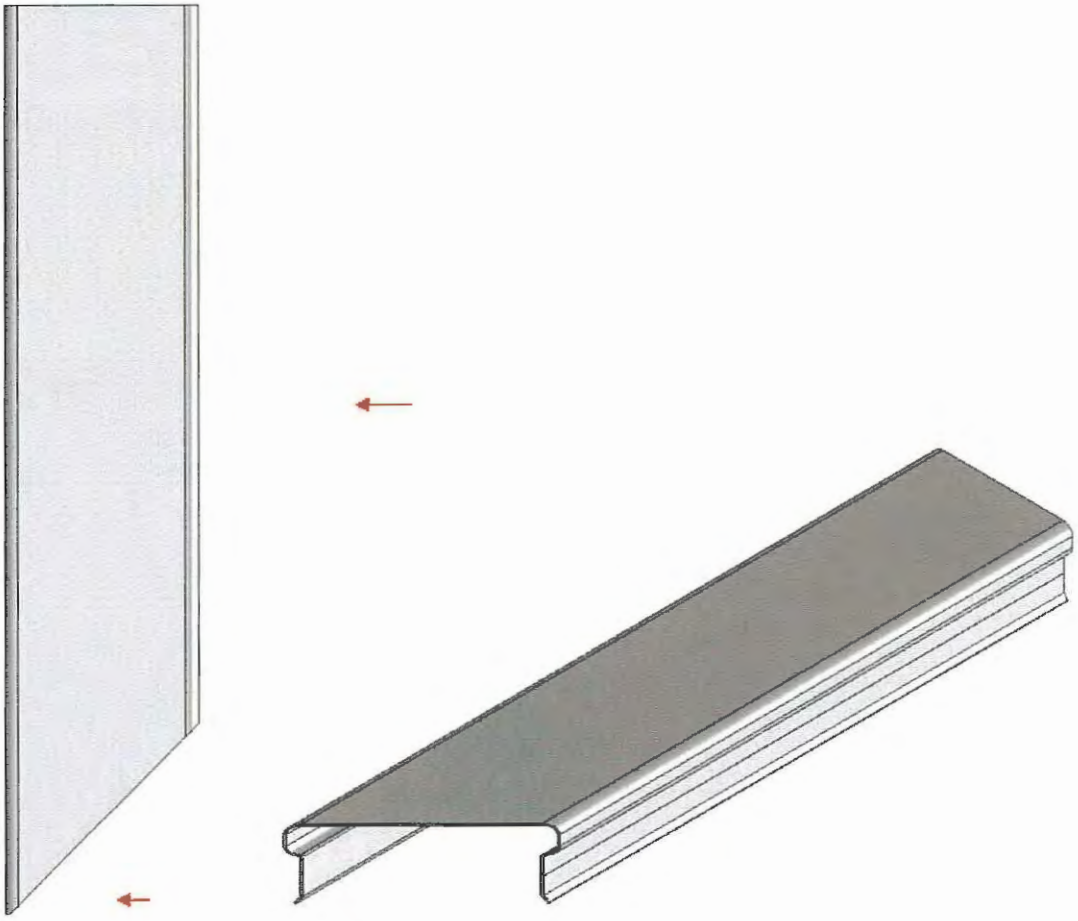
Extend this point across and around to the opposite side of your cap to get a baseline for your cut (shown in blue).

Step 2 – Making your cuts

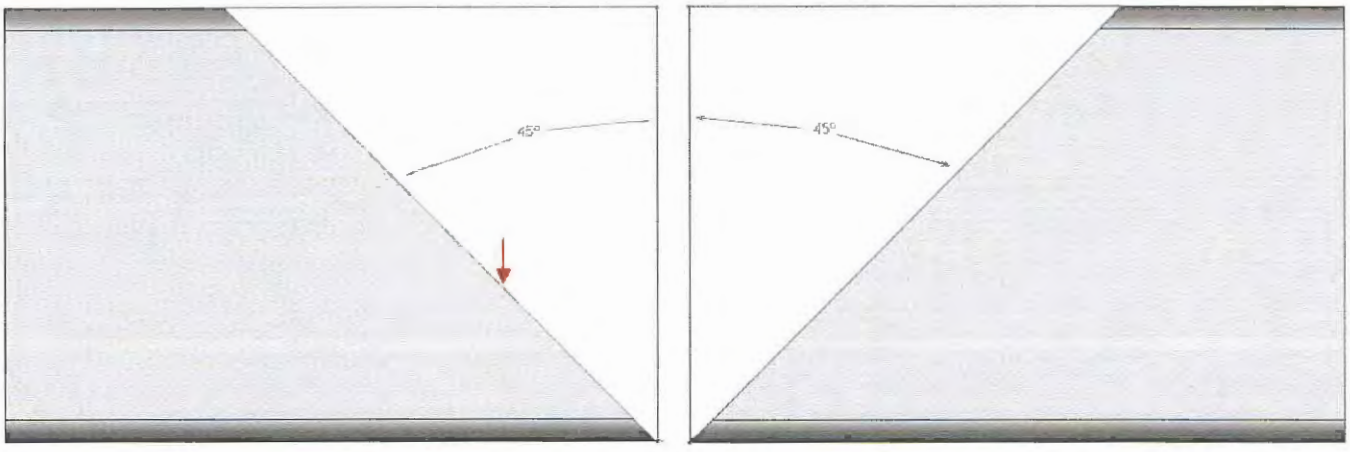
Since this will be a mitered cut, your cut angle will be ½ of your actual turned angle. For this example of a 90 degree turn, we will cut at a 45 degree angle from base line. For a 45 degree turn, the cut would be made at 22.5 degrees and so on. For accurate cutting, you should use a chop saw, miter box, or have your cap sections professionally mitered. The corner will be a focal point for your wall, and you will probably want to take care to make sure that you have accurate angles and clean cuts. Make your angled cut line (shown in red) from the baseline (blue) in the appropriate orientation. The baseline represents the outer corner of your finished wale, so your cut line will always be pointed away from the end that you intend to use as the corner. Remember that this is a projected line, over the curved sections of the cap, so a string might help keep the line.



Make your cut by following the red line with your saw.

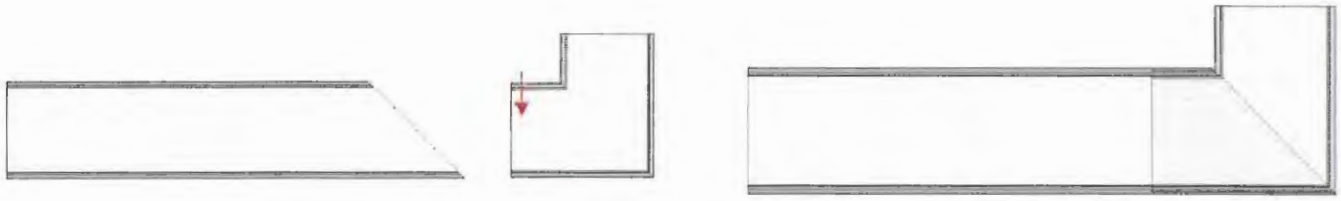


You might want to go ahead and cut your other miter corner piece as well, while you are already cutting. You should make your second corner piece from a new 20' section so that the next splice occurs as far from the corner as possible. For this cut, you will make the matching miter cut 22.5 or 45 degrees from perpendicular, respectively, for a 45 or 90 degree turn. This cut can be made from the end so that no measurement is necessary.

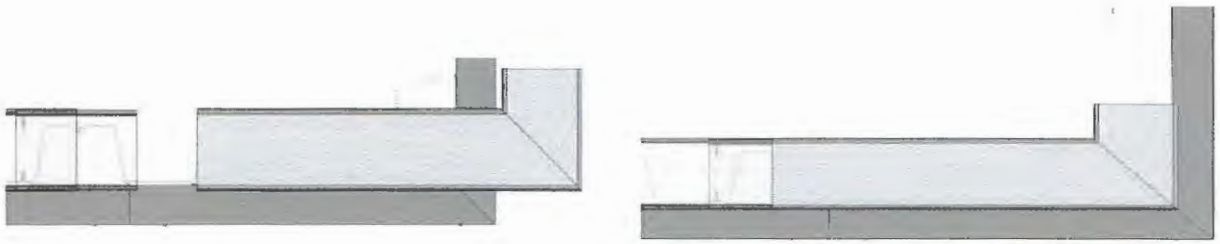


Step 3 – Installing your corner

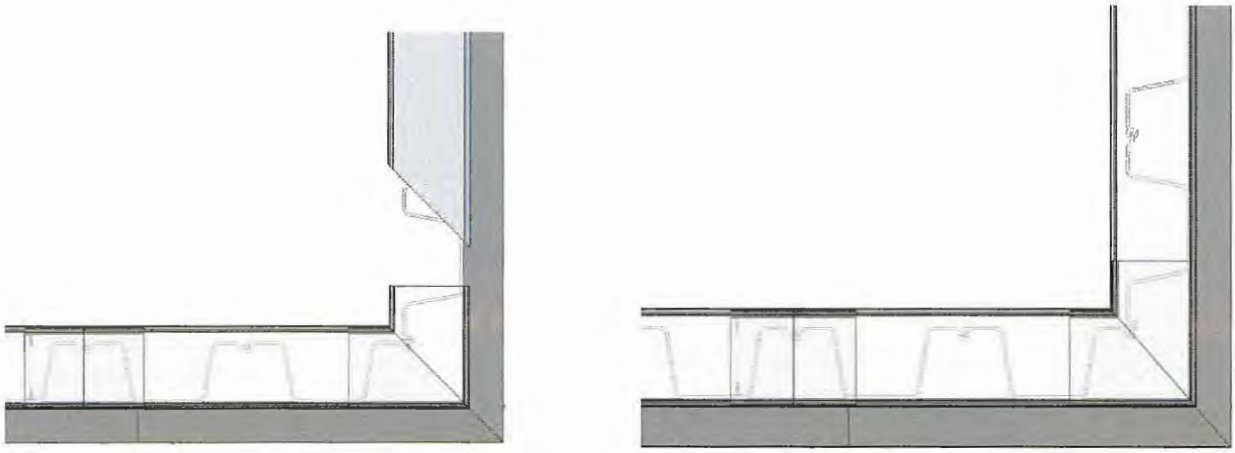
After you have made your cuts, you are ready to assemble your corner. Since there are some precision cuts used here, it might be a good idea to "mock up" your corner to ensure that everything fits together to your satisfaction before fastening. Slide your appropriate corner insert, in this case a 90 degree corner insert, into the first cap section (the one with the measured cut).



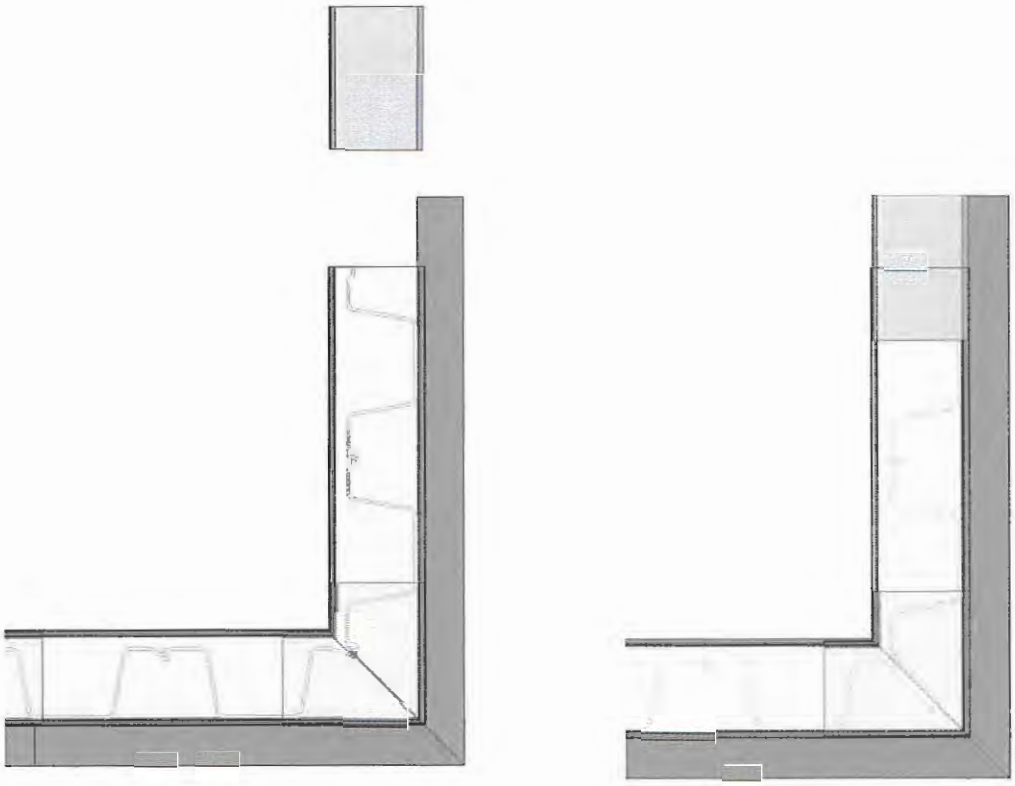
You will now need to slide this onto your last insert on the wall face while at the same time positioning the corner insert piece on the corner of the wall. You will be doing two things at once here, so depending on your situation, some force may be required.



After your cap section and corner insert are in place, slide your matching miter cut cap section (the one from a new 20' section) onto the exposed insert.



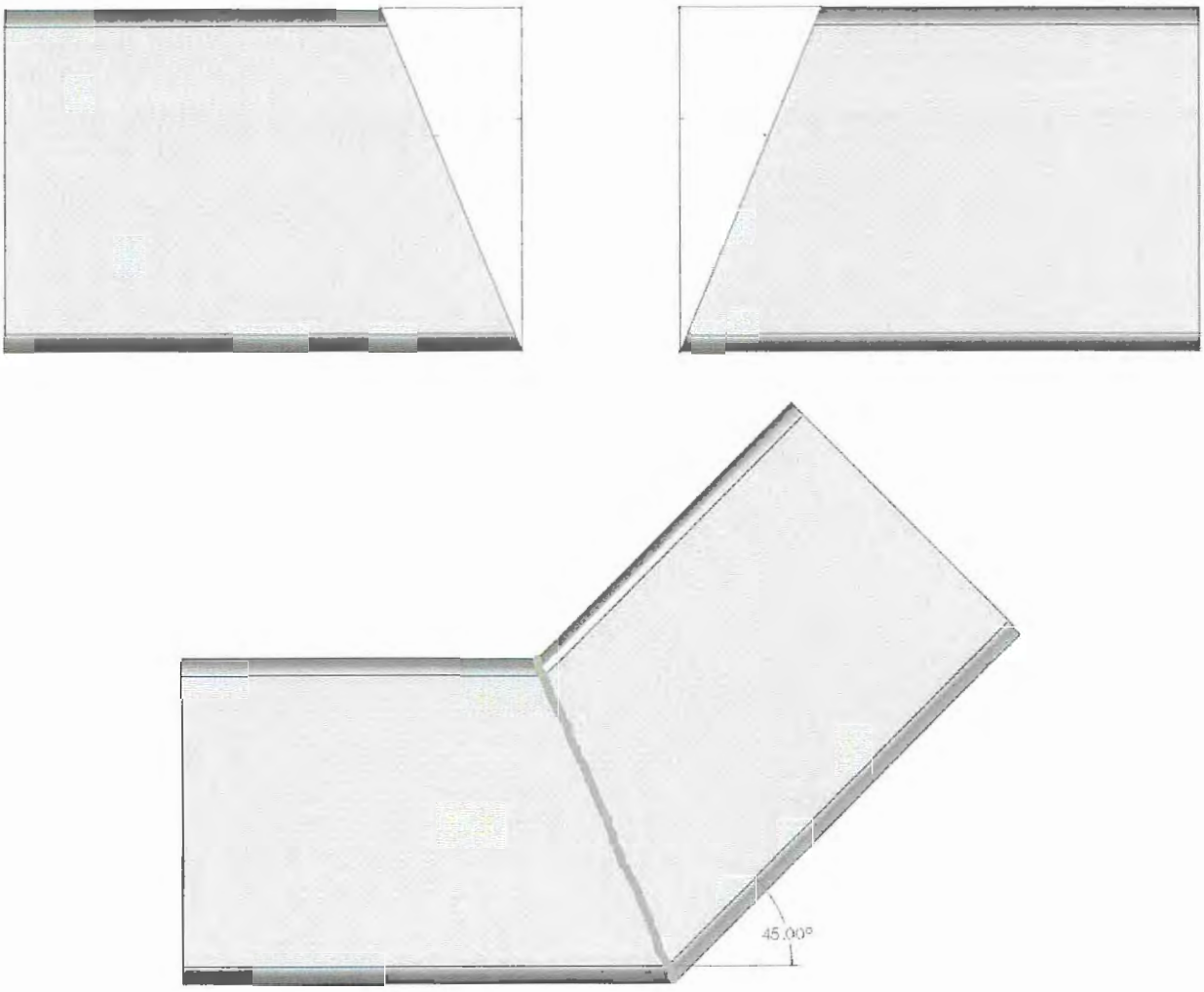
Slide in an 16" insert half-in, half-out of the last cap section. If you will be continuing your wall, this will be used to connect your next cap section. If your wall stops here, then this insert will aid in leveling your cap.



You should make sure that everything fits together properly and no more finishing is required before fastening. When you are satisfied that the cap is level and everything is in contact on the front face, you are ready to fasten the components. You will use the same attachment principals that you have learned throughout this section.

Step 4 – Modifying your installation for non-standard turns

If you will be making a custom turn, the process is identical, only you will need to fabricate your own corner inserts. You can use two of the provided inserts for this. Miter cut the inserts at the same angle as you would cut your cap sections. Weld the two mitered insert pieces together to create your own custom corner insert (45 shown here). Now you have your non-standard corner insert, and the corner turning process is the same as above.



Touch Up and Maintenance of Your ShoreGuard Cap

Although ShoreGuard Caps and inserts are made from high quality marine grade aluminum, as is the case with all metallic material, there is a possibility of corrosion in some cases. It is always a good idea to carefully inspect your structure for any area that may be susceptible to corrosion.

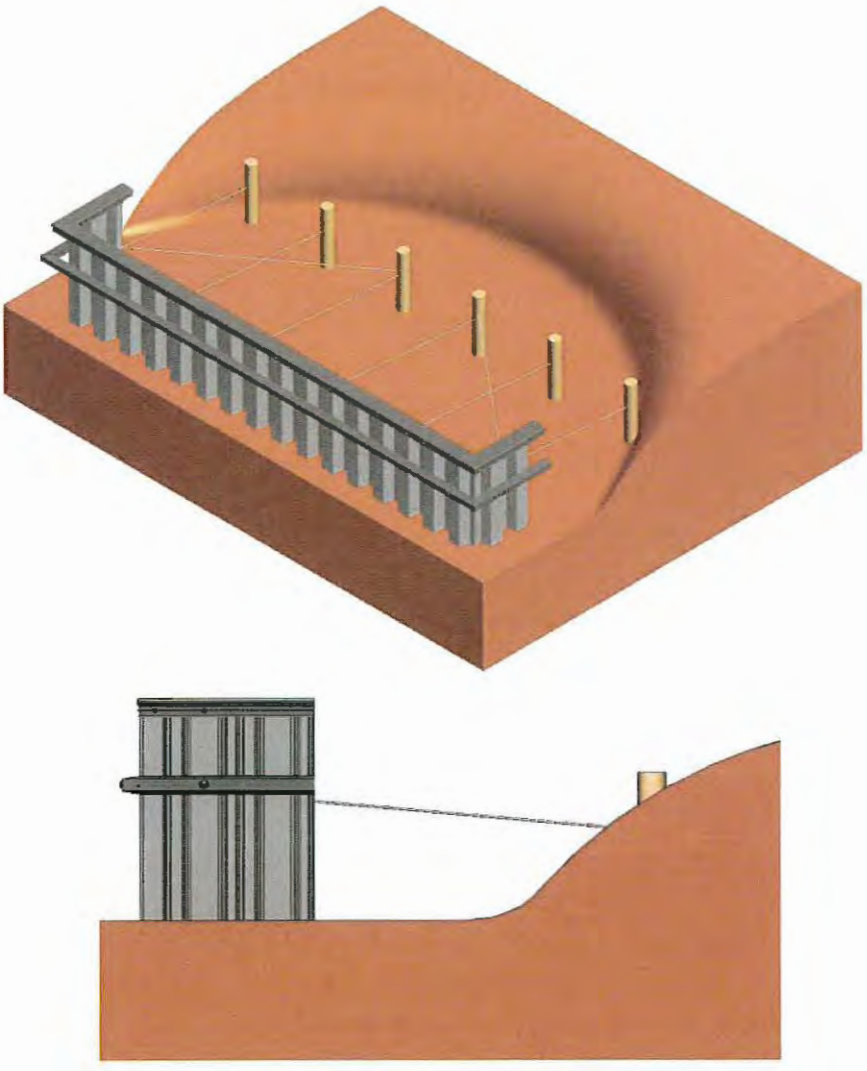
Wherever the painted or anodized coating on the cap has been damaged it is necessary to buff the area and apply a fresh layer of touch-up paint. It is also important to grind down and buff any jagged edges and apply a fresh coat of touch-up paint.

Periodically through the life of the structure it is advisable to closely inspect all the components of your structure. If there is any evidence of damage to the cap coating or the onset of corrosion, you can dramatically increase the life of your structure by buffing the area, removing any corrosion and applying a fresh coat of touch-up paint.

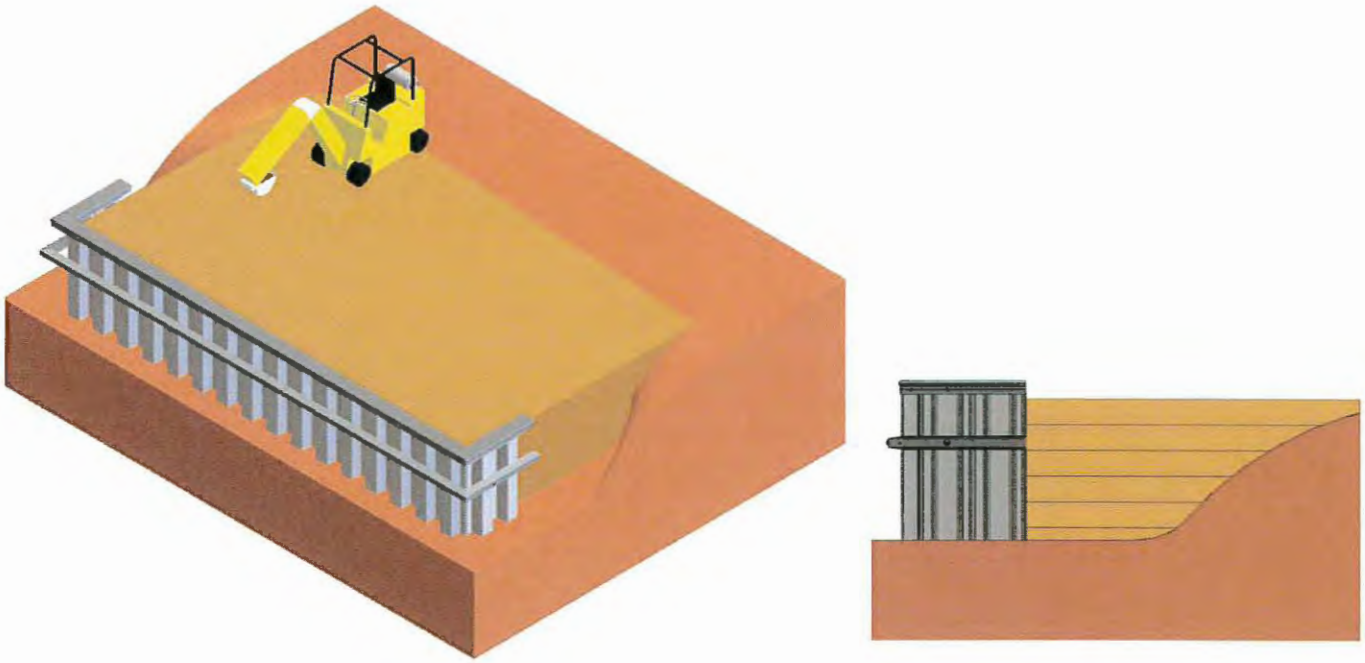
Finishing Up

Backfilling

The type of backfill you use is a very important decision that is often overlooked. Your choice in backfill influences your wall structure more than any other single factor. Hydrostatic pressure behind a wall causes more failures than any other factor. You should use granular, free draining backfill. If site conditions permit, the use of drainage or weep holes is also recommended. Often times the designer for your structure will specify in detail what type of backfill and drainage is required.

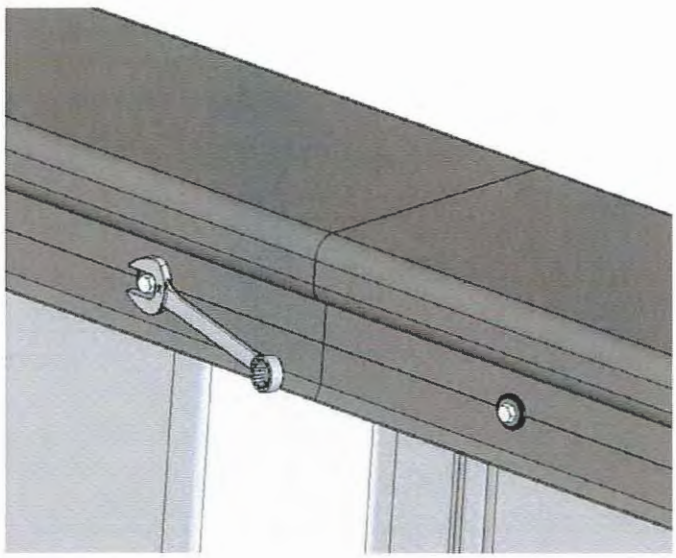


It is a good idea to backfill in lifts or layers of 1-2 ft., compacting the soil at each layer. It is very important to make sure that there are no voids in the backfill and that it has good contact with the entire surface of your wall. This is particularly important in the corners, where it may take some extra effort to ensure good backfilling and compaction.



Final Wall Tuning

After all of your components are installed and you have backfilled, you will now want to tighten all nuts and bolts on your structure.



If you have used TimberGuard components and would like to wrap or seal any openings to give it a finished look, you can do this now. We have suggested that you save this step for last because it is primarily a polishing step to touch up the aesthetics of your wall. You may, however, do this at any point that you wish in the construction process. Shown below is a TimberGuard wale using TimberGuard wrap to conceal the joint.

Finally, after your retaining structure is complete, it is a good practice to periodically check back to make sure that everything is aging as expected and no maintenance is required. Though the metals used are designed for marine environments, all metals corrode eventually. You should make sure that no premature corrosion is taking place, and if found, the corroded material should be removed and sealed to prevent damage to the integrity of the structure.

With the fundamentals learned in this manual you should be well on your way to constructing synthetic sheet piling structures to protect your investments for years to come.

Item 9020
Siphon Structure

1. DESCRIPTION

Furnish and install siphon structure and materials for construction of structure.

2. CONSTRUCTION

The siphon structure is generally lifted and set in place by some kind of cherry picker or crane. The structure is then fastened to sheet piling or some other form of retaining wall to stop any lift of buoyancy the structure may have.

3. MEASUREMENT

This Item will be measured by each structure placed in its final position and accepted by the Engineer.

4. PAYMENT

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 "Siphon Structure." This price is full compensation for fabrication and installation of structure; and equipment, labor, materials, tools, and incidentals.

Item 9030
Breakwater

1. DESCRIPTION

This item shall govern for the furnishing and placing of breakwater as indicated on plans.

2. CONSTRUCTION

The finished breakwater shall be free from objectable pockets of small rocks and clusters of larger rocks. Placing the rocks by dumping into chutes or by similar methods likely to cause segregation of the various sizes will not be permitted. Weighing, as required, to meet particle size specification compliance, shall be performed by the Contractor under the direct supervision of the Engineer.

3. MEASUREMENT

This Item will be measured by the cubic yard.

4. PAYMENT

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 "Breakwater." This price is full compensation for furnishing all materials and for all labor, tools, equipment and incidentals necessary to complete the work.

GUIDE TO SAMPLING AND TESTING

GUIDE SCHEDULE OF SAMPLING & TESTING

MARCH 2015

Texas Department of Transportation

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 ≤ 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. Sample in accordance with Tex-100-E.
	Plasticity Index **(A)**	Tex-106-E		Materials with PI > 15: 5,000 CY	
	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. 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.
				Cut: each 6,000 LF	
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.
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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.
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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 in the current Material Producer List for Lime. Only materials listed in 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 in 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 in the current Material Producer List for Fly Ash. Only materials from CSTM&P approved sources listed in 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 a 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.

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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, 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.

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 – 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.
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: • 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 in 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 CSTM&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 CSTM&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: • 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 in 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 in 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 in 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.

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
	Micro Deval	Tex-461-A	Stockpile	1 per project or as necessary for control	Compare result to published value listed in the current Material Producer List for BRSQC. Submit sample to CSTM&P for Soundness and LA 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 CSTM&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 CSTM&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 CSTM&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: • 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 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 in the current Material Producer list for CRSQC, meets the project specifications. If not, sample and submit to CSTM&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 in 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 in the current CRSQC, meets the project specifications. If not, sample and submit to CSTM&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 in the Material Producer Lists. If not, sample and submit to CSTM&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 in 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 CSTM&P. See remarks.	When requested by CST	Only products listed in 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 in 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 CSTM&P approved sources listed in the Material Producer List 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 CSTM&P	3 couplers per lot (500 couplers) for each type, model, bar size and grade	Only materials from CSTM&P approved sources listed in 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 CSTM&P.	1 per batch or shipment	Verify the source is listed in 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)

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
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. Two cylinders shall be tested at 7 days and if the average value is below the design strength as defined in Item 421 Table 8, the remaining 2 cylinders shall be tested 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 two remaining cylinders are not required to be tested.
CONCRETE	Slump	Tex-415-A		See Remarks	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. • 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		1 test for every 10 contractor job control tests	
	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: • 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. Tests for slump, air, and temperature should be done often 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.

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 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 in the Material Producer Lists. If not, sample and submit to CSTM&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: • 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 in the current CRSQC, meets the project specifications. If not, sample and submit to CSTM&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 in the current CRSQC, meets the project specifications. If not, sample and submit to CSTM&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 in the Material Producer List. If not, sample and submit to CSTM&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 CSTM&P; tested by CSTM&P. See remarks.	1 per batch or shipment	Sample in accordance with Tex-500-C. Sampling may be waived when the source is listed in the Material Producer List for Joint Sealers. **(C)**
CURING COMPOUND	Compliance with DMS-4650		Sampled at jobsite; tested by CSTM&P. See remarks.	When requested by CST	Only products listed in 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 in 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 CSTM&P approved sources listed in 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 CSTM&P; tested by CSTM&P. See remarks.	Refer to Tex-711-I for sampling rates	Only materials from CSTM&P approved sources listed in 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 CSTM&P. See remarks.	1 batch per shipment	Verify the source is listed in 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 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	Sampling shall be in accordance with Tex-407-A. 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. Split sample verification testing used when contractor performs job control testing. When job control testing by the contractor is waived by the plans, the frequency of sampling shall be one test (2 specimens) for each 3,000 SY of concrete or fraction thereof or per day and split sample verification testing shall be waived. Contractor's required testing will be in accordance with specification requirements for the appropriate specification Item #.
	Slump	Tex-415-A	At time and location strength specimens are made	See Remarks	Slump is not required for slip-formed pavement. 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. • Sample in accordance with Tex-407-A. • Perform slump and temperature tests on the same load from which the strength specimens are made. • Perform entrained air test only when entrained air concrete is specified in the plans. 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		1 test for every 10 contractor job control tests.	
	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		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 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, the analysis shall be documented 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.

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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 in the current Material Producer list for BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&P for testing prior to use in accordance with Tex-499-A. **(C)**
	Magnesium Sulfate Soundness **(A)**	Tex-411-A			
	Surface Aggregate Classification **(A)**	Tex-499-A		1 per project, per source	
	Micro Deval	Tex-461-A		1 per project, per aggregate source	Not required when the Rated Source Soundness Magnesium loss is 15 or less as listed in the current published BRSQC. If testing is required, sample in accordance with Tex-221-F.
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 CSTM&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.

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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.

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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 CSTM&P		Sampling must be in accordance with Tex-735-I. Verify the source is listed in 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 in the current Material Producer list for BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 in the current Material Producer list for BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 CSTM&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 CSTM&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 in the current Material Producer list for BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 in the current Material Producer list for BRSQC, meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 CSTM&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 CSTM&P		Sample in accordance with Tex-735-I. Verify the source is listed in the current Material Producer List for Silt Fence, Filter Fabric and Fabric Underseals. If not sample and submit to CSTM&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 in the current Material Producer list for BRSQC meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 in the current BRSQC, meets the project specifications. If not, sample and submit to CSTM&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 in the current Material Producer list for BRSQC meets the project specifications. If not, sample in accordance with Tex-221-F and submit to CSTM&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 CSTM&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 in the current Material Producer List for Cement. If not, sample and submit to CSTM&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.

JEFFERSON COUNTY, TEXAS

CONSTRUCTION PLANS
FOR
SIPHON CONTROL STRUCTURES
AT
OILCUT DITCH & SALT BAYOU
GULF INTRACOASTAL WATERWAY

INDEX OF SHEETS

PROJECT LOCATION
GIWW SIPHON
CITY: BEAUMONT | COUNTY: JEFFERSON | STATE: TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN: 079 | PN: 1012 | DRAWING | SHEET: 01

LJA Engineering, Inc.
Public Infrastructure
905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1862
Fax 409.813.1916
FRN - F-1386

CLIENT
JEFFERSON COUNTY

TITLE SHEET

08/17/16
DATE

Wallace R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

OILCUT DITCH

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	QUANTITY
100	001	PREPARING ROW (DITCH)	AC	3.00
110	001	EXCAVATION (DITCH)	CY	13,573.00
164	001	SEEDING FOR EROSION CONTROL (DITCH)	SY	6,221.00
400	001	EXCAVATION FOR SIPHON STRUCTURE	CY	81.00
400	002	EXCAVATION FOR ARTICULATED CONCRETE MAT	CY	1,211.00
400	003	CEMENT STABILIZED BACKFILL	CY	77.00
403	001	TEMPORARY SPECIAL SHORING	SF	2,016.00
500	001	MOBILIZATION	LS	1.00
618	002	HIGH DENSITY POLYETHELENE PIPE (36" HDPE)(HDD METHOD)	LF	3,200.00
2000	001	FILTER FABRIC	SF	6,016.00
8000	001	DEWATERING	LS	1.00
9000	001	ARTICULATED CONCRETE MATS (6")	SY	668.00
9010	001	VINYL SHEET PILE (SG-425)	SF	900.00
9010	002	VINYL SHEET PILE (SG-825) WITH WALE SYSTEM	SF	1,750.00
9020	001	SIPHON STRUCTURE (HEIGHT=9.0')/W STUB-OUT	EA	4.00
9020	002	SIPHON STRUCTURE (HEIGHT=5.0')/W STUB-OUT & FLAP GATE	EA	4.00

SALT BAYOU

ITEM NO.	DESC CODE	DESCRIPTION	UNIT	QUANTITY
100	001	PREPARING ROW (DITCH)	AC	0.10
110	001	EXCAVATION (DITCH)	CY	475.00
132	001	EMBANKMENT (TY D)	CY	789.00
164	001	SEEDING FOR EROSION CONTROL (DITCH)	SY	83.00
400	001	EXCAVATION FOR SIPHON STRUCTURE	CY	76.00
400	002	EXCAVATION FOR ARTICULATED CONCRETE MAT	CY	1,297.00
400	003	CEMENT STABILIZED BACKFILL	CY	238.00
403	001	TEMPORARY SPECIAL SHORING	SF	2,120.00
500	001	MOBILIZATION	LS	1.00
618	001	HIGH DENSITY POLYETHELENE PIPE (36" HDPE)	LF	32.00
618	002	HIGH DENSITY POLYETHELENE PIPE (36" HDPE)(HDD METHOD)	LF	3,320.00
2000	001	FILTER FABRIC	SF	12,404.00
8000	001	DEWATERING	LS	1.00
9000	001	ARTICULATED CONCRETE MATS (6")	SY	1,378.00
9010	001	VINYL SHEET PILE (SG-425)	SF	1,320.00
9010	002	VINYL SHEET PILE (SG-825) WITH WALE SYSTEM	SF	1,750.00
9020	001	SIPHON STRUCTURE (HEIGHT=9.0')/ W STUB-OUT	EA	4.00
9020	002	SIPHON STRUCTURE (HEIGHT=5.0')/ W STUB-OUT & FLAP GATE	EA	4.00
9020	003	SIPHON STRUCTURE (HEIGHT=6.0'))/W STUB-OUT & FLAP GATE	EA	2.00
9030	001	BREAKWATER (INSTALL)	CY	408.00
9030	002	BREAKWATER (REMOVE)	CY	110.00

PROJECT LOCATION
GIWW SIPHON | COUNTY | STATE
CITY | BEAUMONT | JEFFERSON | TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN 079 | PN 1012 | DRAWING | SHEET 02

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CLIENT JEFFERSON COUNTY

SUMMARY SHEET

08/17/16 DATE

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS · WALLACE R. WILSON · 84857 · PROFESSIONAL ENGINEER

NO. | DATE | REVISION | APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

General Notes

The Contractor shall have full responsibility for testing all materials incorporated in the project at his sole expense.

Contractor shall assume ownership for all designated construction waste material and dispose of it at a place off of Jefferson County property, as approved by the Engineer.

Contractor shall procure all the necessary city and/or county permits and licenses.

The responsibility for the construction surveying on this contract will be the Contractor's responsibility. No additional compensation will be paid the Contractor for surveying on this project.

Working days will be charged Sunday through Saturday, including Holidays, regardless of weather conditions, material availability, or other conditions not under the control of the Contractor.

All items not specifically covered in these General Notes and Specifications shall be governed by the TxDOT Standard Specifications Manual, 2014 Edition.

Item 100 Preparing Right of Way

Prepare the right of way and designated easements for construction operations by removing and disposing of all vegetation and organic material or anything that would hinder the construction of this Project. All materials removed shall not be reused in the embankment or any part of the construction of this project.

Item 110 Excavation

Excavate areas as shown on plans or as directed by the Engineer to the lines, grades, and typical sections on the plans. All excavation, except grass and other organic matter to be disposed of shall be used as fill on this project.

Item 132 Embankment

Compaction shall be "Ordinary" compaction and maximum lift thickness shall be 8" loose.

Item 164 Seeding for Erosion Control

Provide and install a mixture of 2500 pounds per acre of cellulose fiber mulch, 3 pounds of pure live Bermuda grass seed per acre, fertilizer at a rate of 100 pounds of Nitrogen per acre and enough water to make the mixture sprayable to the areas to be seeded. Fertilizer shall be subsidiary to this Item.

Item 400 Excavation and Backfill for Structures

Cement stabilized backfill shall be cohesionless sand with 3 sacks of cement / C.Y. based on dry weight of sand.

Item 403 Temporary Special Shoring

Furnish and place temporary shoring for excavations deeper than 5 foot. Provide vertical or sloped cuts, benches, shields, support systems, that provide the necessary protection in accordance with OSHA Standards and Interpretations, 29 CFR 1926, Subpart P, "Excavations".

Item 618 Conduit

Conduit pipe shall be high density polyethylene (HDPE) and have a minimum pressure rating of 100 psi.

HDPE installed by the Horizontal Directional Drilling (HDD) method shall have a 12° entry and exit angle and 720' radius on curve.

Item 2000 Filter Fabric

Furnish and install filter fabric in areas shown on the plans and according to the manufacturer's recommendations. Filter fabric shall conform to DMS-6200, "Filter Fabric", Type 2.

Item 8000 Dewatering

Contractor shall submit a dewatering plan to the Engineer prior to the beginning of construction.

Item 9000 Articulated Concrete Mats

Articulated concrete mats shall consist of open-cell blocks. Weight of blocks shall be 40 to 50 pounds per square foot with a nominal thickness of 6 inches. Articulated concrete mat shall be ArmorFlex Class 50-S or an approved equivalent. Articulated mats shall be butted up against the ends of the structures leaving no gap for erosion to occur.

Item 9010 Vinyl Sheet Pile

Vinyl Sheet Pile constructed with 9 foot structures shall have an allowable moment capacity greater than 7,000 foot pounds per foot. Sheet pile shall be ShoreGuard SG-825 or an approved equivalent.

Wale System shall be installed on Vinyl Sheet Pile SG-825. 4"x6" timber wales shall be constructed where indicated on plans. Installation and materials needed for installation, including timber wales, tie back rods, hardware and anchor blocks, shall be subsidiary to Item 9010 with no extra compensation.

Vinyl Sheet Pile constructed with 5 foot structures shall have an allowable moment capacity greater than 2,700 foot pounds per foot. Sheet pile shall be ShoreGuard SG-425 or an approved equivalent.

All Sheet Pile layout and orientation shall be submitted to Engineer for approval prior to construction.

Wale System shall be installed on Vinyl Sheet Pile SG-825. 4" x 6" timber wales shall be constructed where indicated on the plans. Installation and materials needed for installation, including timber wales, tie back rods, hardware and anchor blocks, shall be subsidiary to Item 9010 with no extra compensation.

Item 9020 Siphon Structure (Installed)

Siphon Structures shall be built and installed according to plan details. Any variation from the plan drawings must have prior approval from the Engineer. Siphon Structures have front side tabs that the vinyl sheet pile shall be attached to with ¾" stainless steel bolts, UV resistant polymer washers (both sides) and nuts at a spacing of 1 (one) foot apart. The rear side tabs shall be attached to 6" x 6" treated timbers that are driven a minimum of 4 feet into the ground at each tab location. The rear tabs shall have the same size bolts and bolting pattern as the vinyl sheet piling. Bolt configuration shall be submitted to the Engineer prior to drilling of holes. Note that bolt configuration will vary depending on sheet pile size and location of sheet pile relative to Siphon Structure.

Rolled aluminum stub out pipes and flanges, bottoms of Aluminum Outfall structures, and any metallic portion of the complete drainage structure that contacts cement stabilized backfill shall be bitumen coated on the outside for greater corrosion resistance. The Bitumen coating, UV resistant polymer washers as well as all timbers and hardware to install them shall be subsidiary to the Item 9020 Siphon Structure and no additional compensation will be due the Contractor for the cost of these items.

Siphon Structures have a 6 foot long rolled aluminum plate stub-out in the rear with 36" flange. The 36" plate shall be aluminum and be welded, if necessary, to be placed at full length and avoid joints or connections. This rolled plate and flange shall be considered part of the overall siphon structure and will be subsidiary to Item 9020 with no extra compensation.

Aluminum alloy anodes (N-1A) shall be attached to the aluminum structures with stainless steel bolts and UV resistant polymer washers, (each side) as per Engineer's directions to act as sacrificial anodes for the structures. These anodes shall also be subsidiary to Item 9020 Siphon Structure and no additional compensation will be due the Contractor for the cost or installation of these items.

Minimum weight of aluminum alloy anodes on each box structure shall be 6 lbs. Minimum weight on each flap gate shall be 3.5 lbs.

Material Properties of Structures shall be:

- Aluminum Plate = 5086 Alloy
- Aluminum Angle = 6061-T6 Alloy
- Grating shall be 1" x 3/16" Aluminum Serrated Bar Grating

The Contractor shall verify all dimensions before fabrication.

Item 9030 Breakwater

Breakwaters shall have a side slope of 2.5:1. The crown shall have the width of 3 feet. Rock will be 18" graded rock placed to ensure no large outcroppings occur. The top elevation of the breakwater shall be +4.0 NAVD.

Gradation shall be	Weight, #	% Lighter
	400-160	100
	160-80	50
	80-30	15

Breakwater removal shall be complete and no rocks left at the removal location. The breakwater material removed is to be relocated and reused as part of the proposed breakwater quantity.

PROJECT LOCATION
GIWW SIPHON
CITY BEAUMONT | COUNTY JEFFERSON | STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN 079 | PN 1012 | DRAWING | SHEET 03

LJA Engineering, Inc.
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FRN - F-1386

CLIENT JEFFERSON COUNTY

GENERAL NOTES

08/17/16 DATE

Walter R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

NO. | DATE | REVISION | APPROV.
TEXAS REGISTERED ENGINEERING FIRM F-1386

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TEXAS REGISTERED ENGINEERING FIRM F-1386			

STATE OF TEXAS
WALLACE R. WILSON
84857
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PROJECT LAYOUT

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

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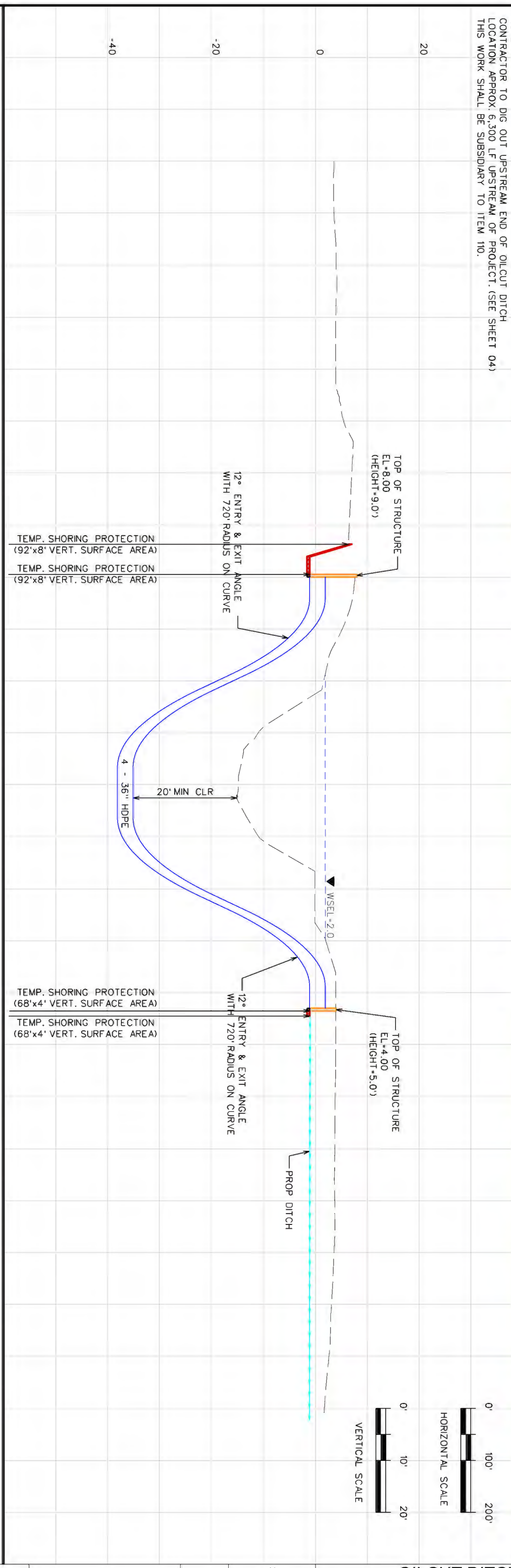
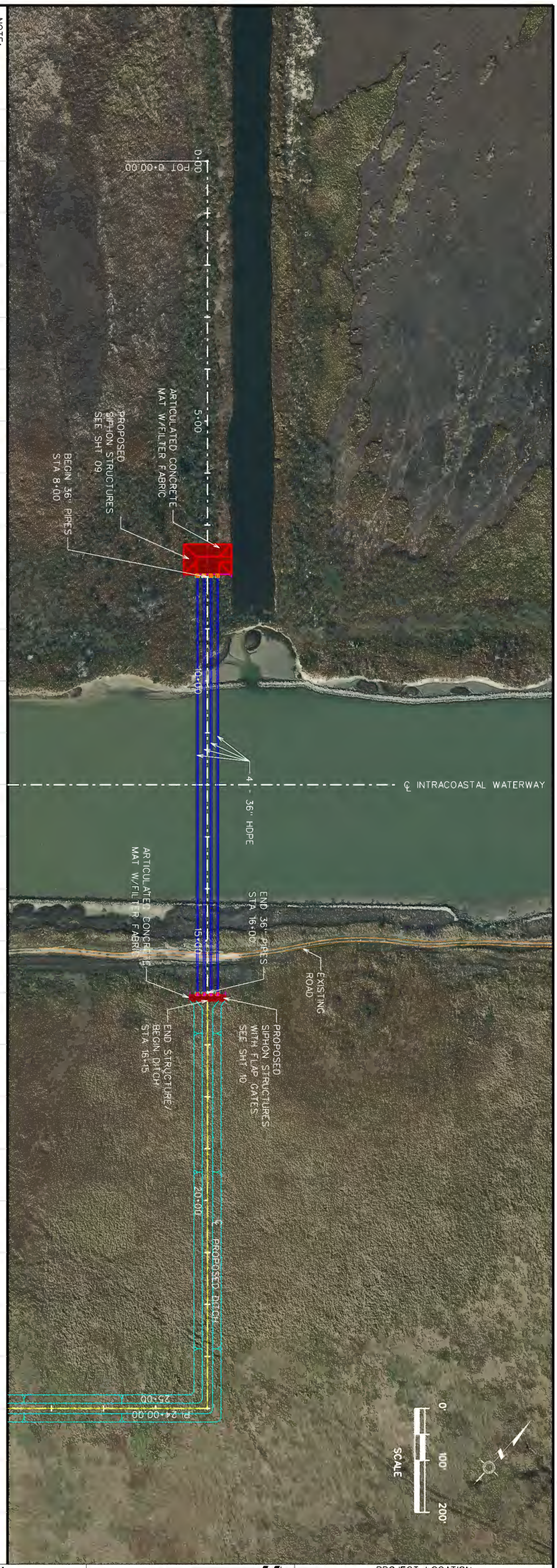
CLIENT
JEFFERSON COUNTY

PROJECT LOCATION			
GIWW SIPHON			
CITY	COUNTY		STATE
BEAUMONT	JEFFERSON		TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			
CN	PN	DRAWING	SHEET
079	1012		04

NOTE:
CONTRACTOR TO DIG OUT UPSTREAM END OF OILCUT DITCH LOCATION APPROX. 6,300 LF UPSTREAM OF PROJECT. (SEE SHEET 04) THIS WORK SHALL BE SUBSIDIARY TO ITEM 110.





NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

STATE OF TEXAS · WALLACE R. WILSON · 84857 · LICENSED PROFESSIONAL ENGINEER

OILCUT DITCH PLAN & PROFILE

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

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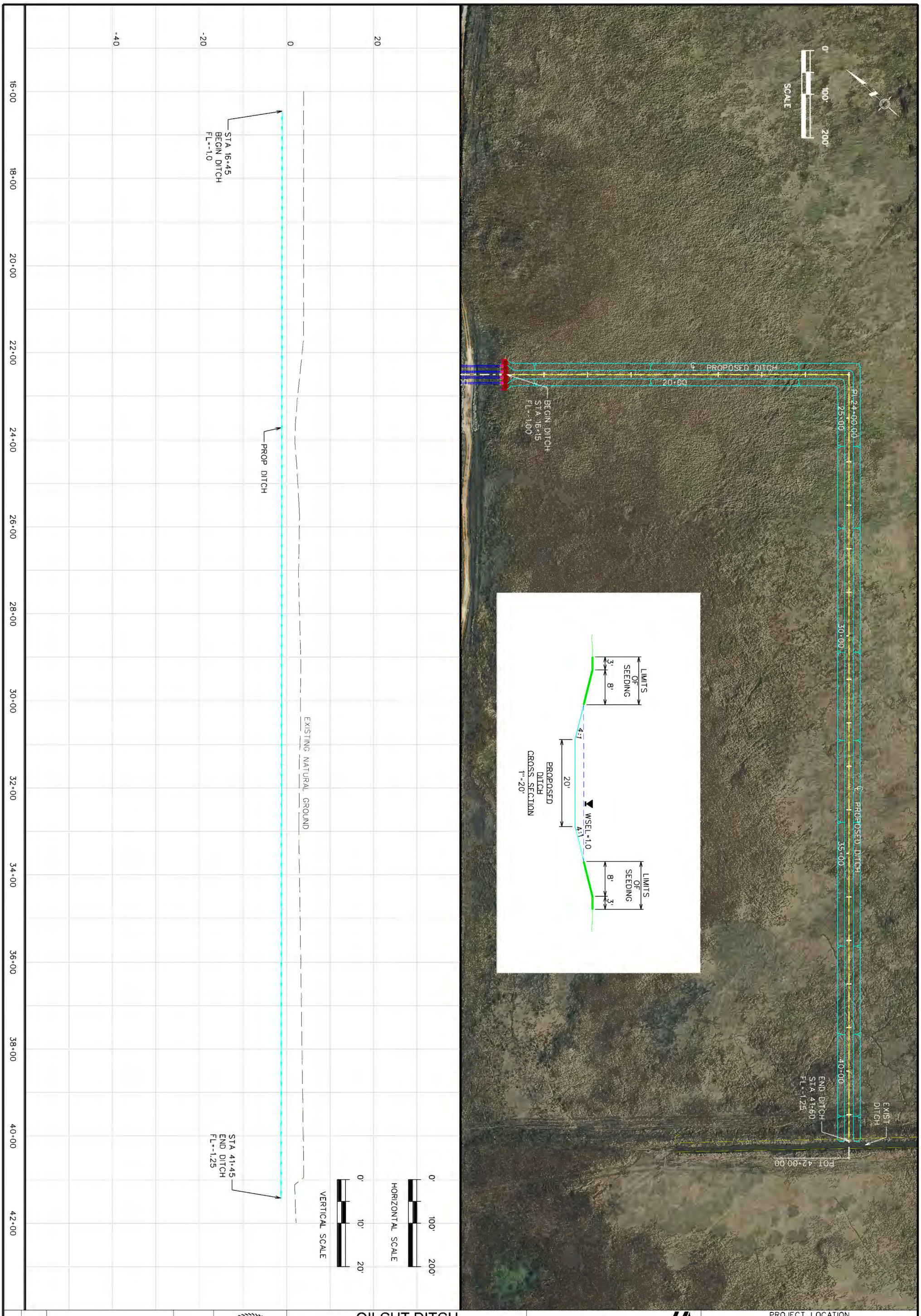
FRN - F-1386

CLIENT
JEFFERSON COUNTY

PROJECT LOCATION			
GIWW SIPHON			
CITY	COUNTY		STATE
BEAUMONT	JEFFERSON		TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			
CN	PN	DRAWING	SHEET
079	1012		05



NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

STATE OF TEXAS · WALLACE R. WILSON · 84857 · LICENSED PROFESSIONAL ENGINEER

OILCUT DITCH PLAN & PROFILE

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

LJA Engineering, Inc.
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905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1862
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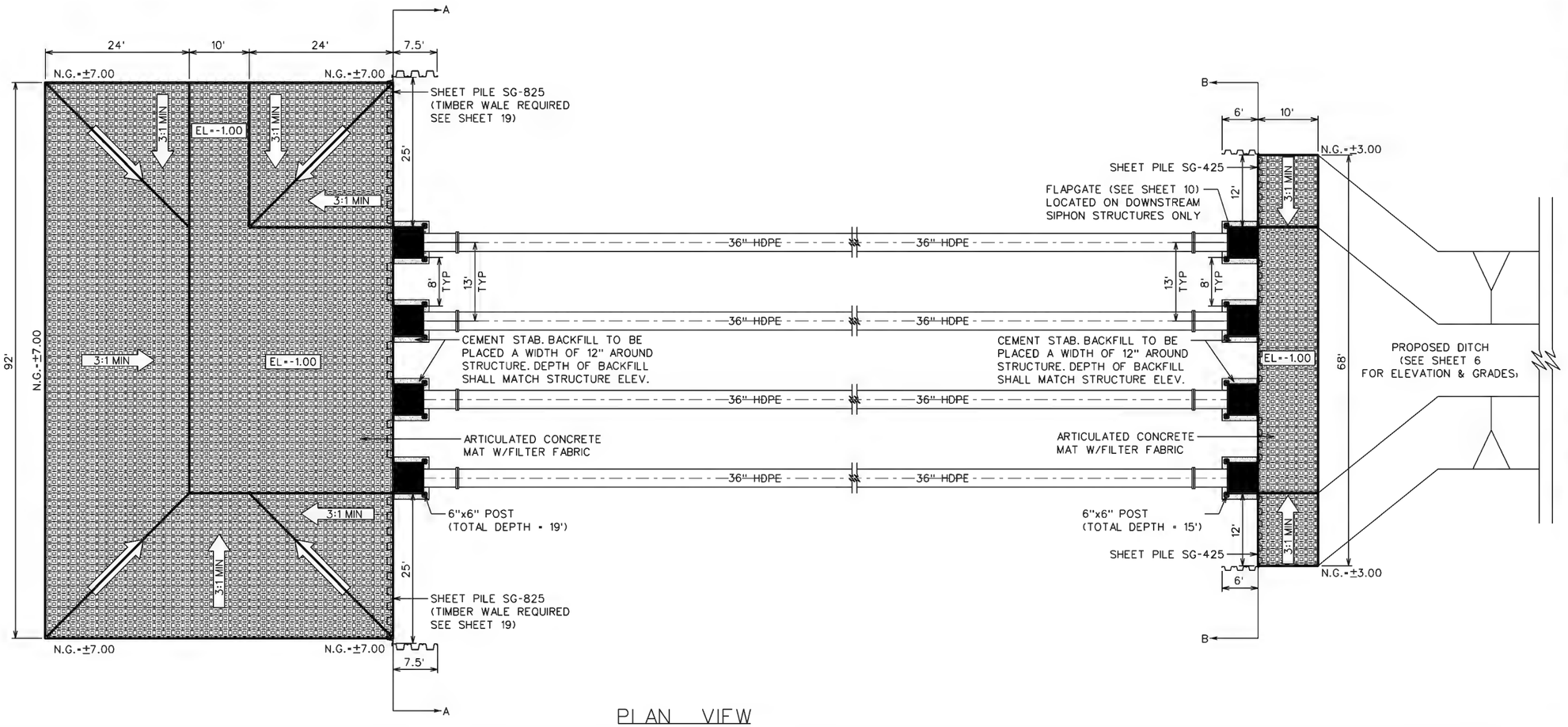
FRN - F-1386

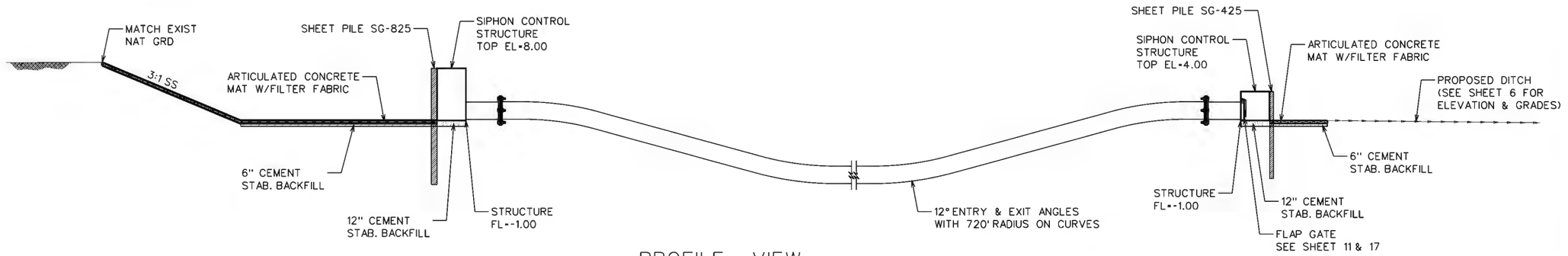
CLIENT
JEFFERSON COUNTY

PROJECT LOCATION			
GIWW SIPHON			
CITY	COUNTY		STATE
BEAUMONT	JEFFERSON		TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			
CN	PN	DRAWING	SHEET
079	1012		06



PLAN VIEW

SCALE: 1"=20'



PROFILE VIEW

NOTE:
PROFILE NOT TO SCALE
SEE SHEET 5 FOR DETAILS ON PIPE ANGLES AND BENDS

HORIZ SCALE: 1"=20'
VERT SCALE: NTS

OILCUT DITCH
SIPHON DETAIL 1

Walter R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

DATE	08/17/16

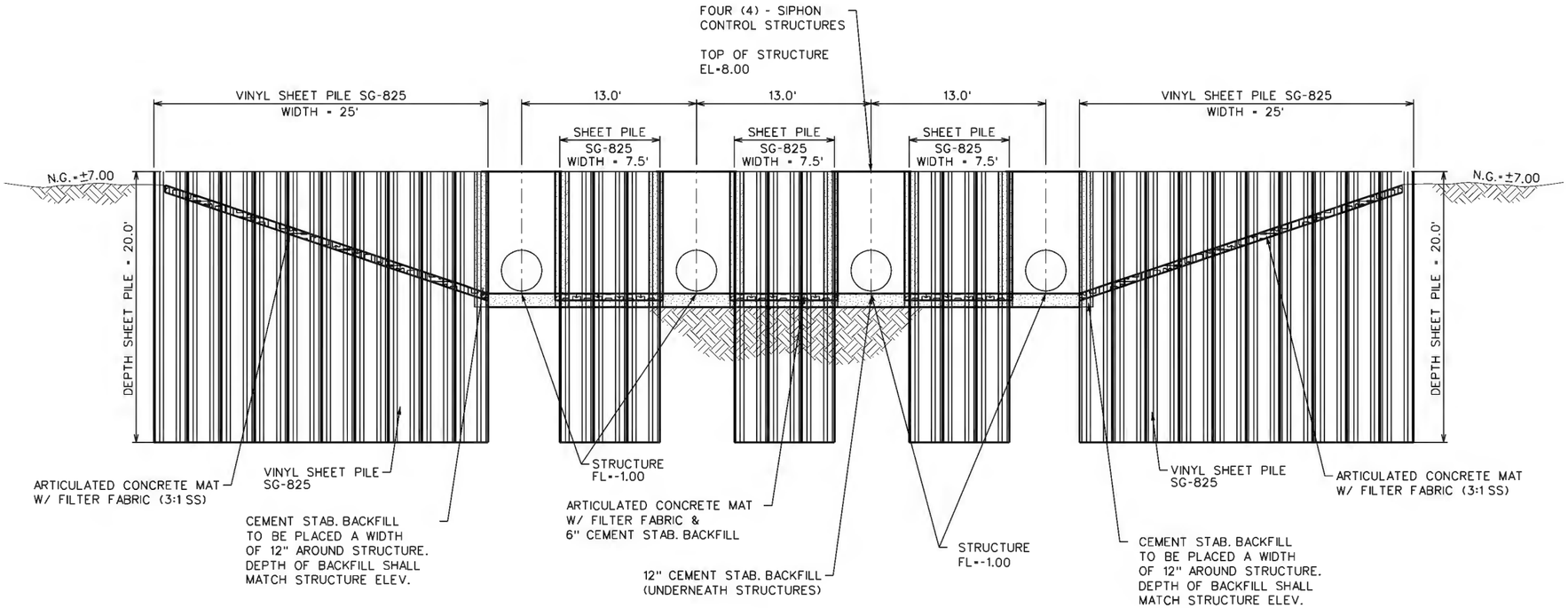
PROJECT LOCATION

GIWW	SIPHON	STATE
CITY	COUNTY	TEXAS
BEAUMONT	JEFFERSON	

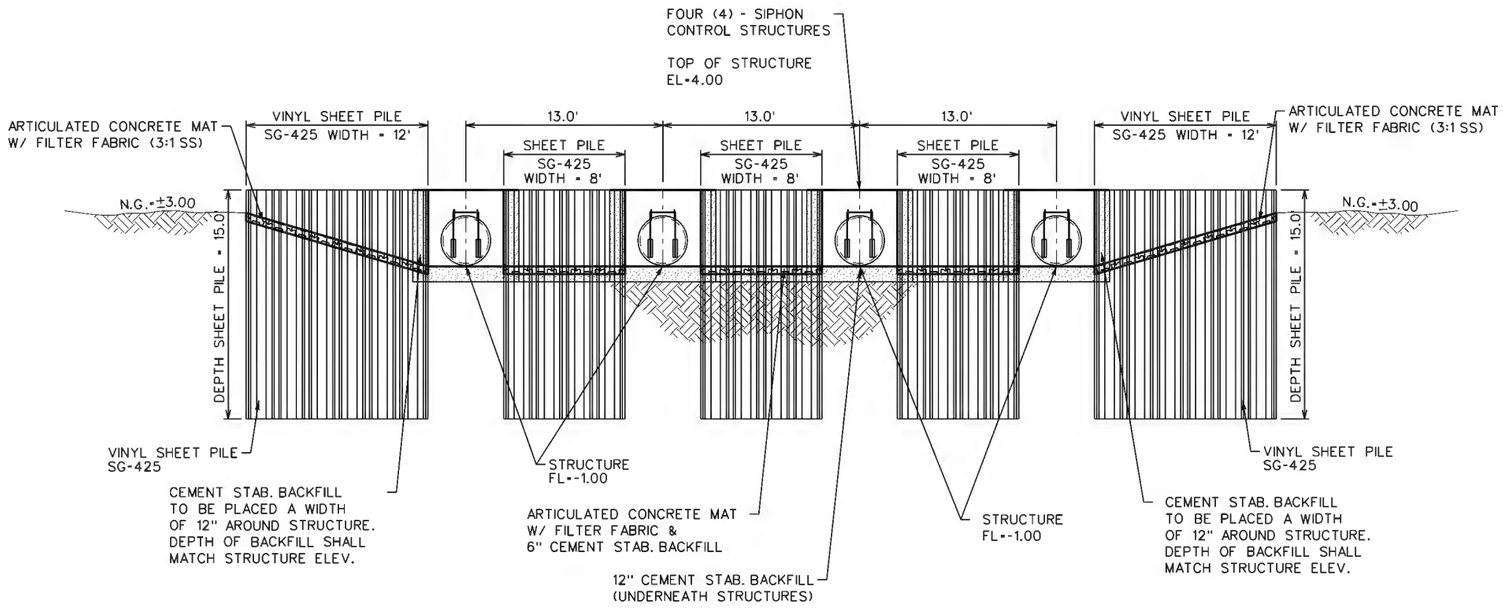
SITE ADDRESS:	INTRACOASTAL WATERWAY	
CN	PN	DRAWING	SHEET
079	1012		07

LJA Engineering, Inc.
Public Infrastructure
905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1662
Fax 409.813.1916
FRN-F-1386

CLIENT
JEFFERSON COUNTY



SECTION A-A



SECTION B-B

SCALE: 1"=10'

PROJECT LOCATION
GIWW SIPHON | CITY BEAUMONT | COUNTY JEFFERSON | STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY | CN 079 | PN 1012 | DRAWING | SHEET 08

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CLIENT
JEFFERSON COUNTY

OILCUT DITCH
SIPHON DETAIL 2

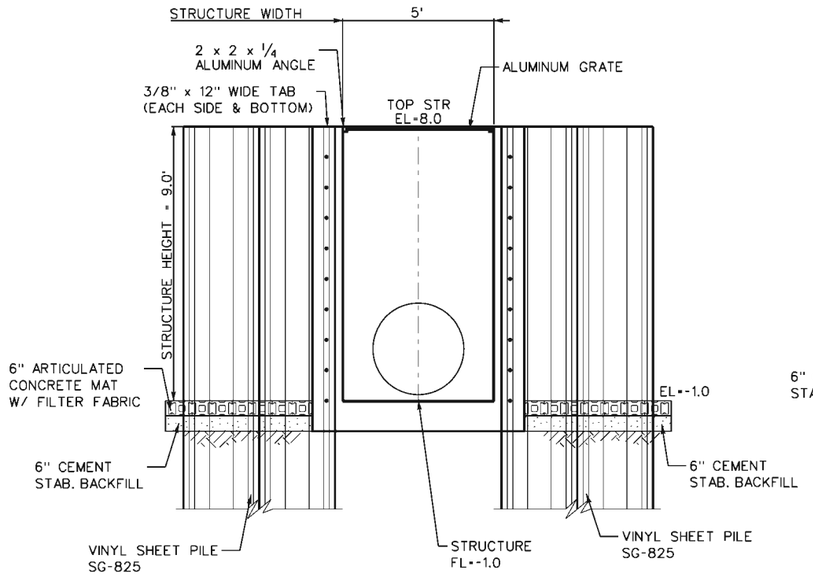
Walter R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

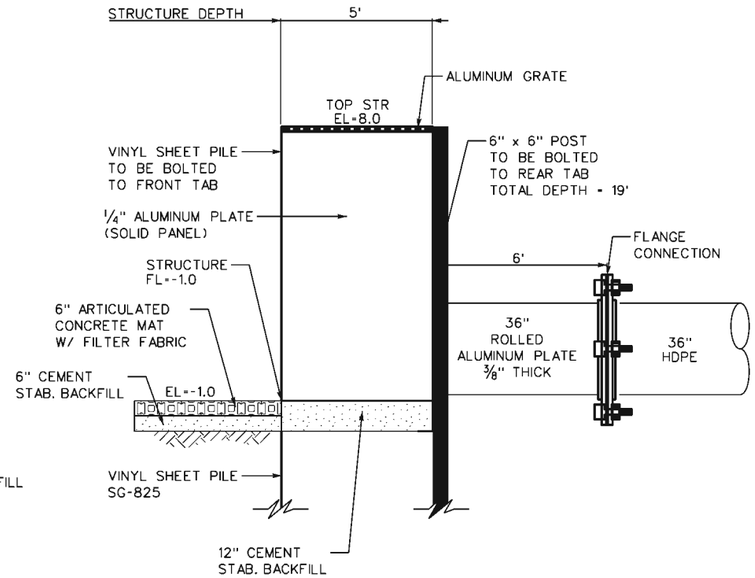
STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

NO. | DATE | REVISION | APPROV.

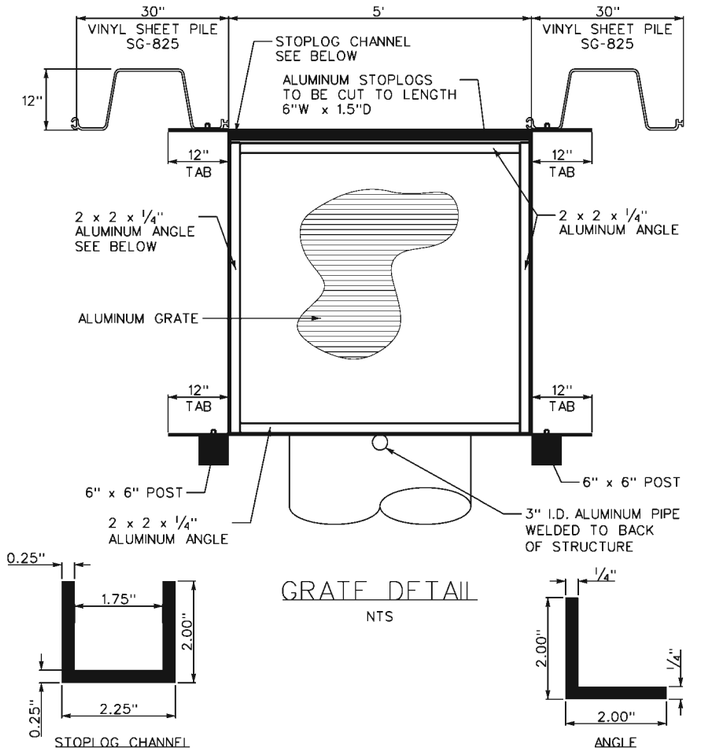
TEXAS REGISTERED ENGINEERING FIRM F-1386



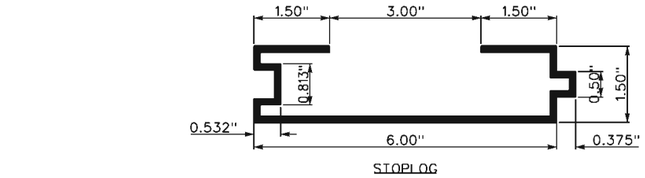
SIPHON CONTROL STRUCTURE
FRONT VIEW



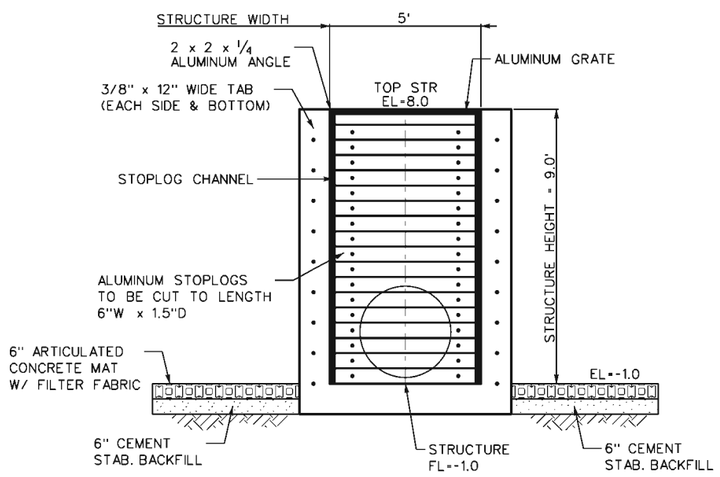
SIPHON CONTROL STRUCTURE
SIDE VIEW



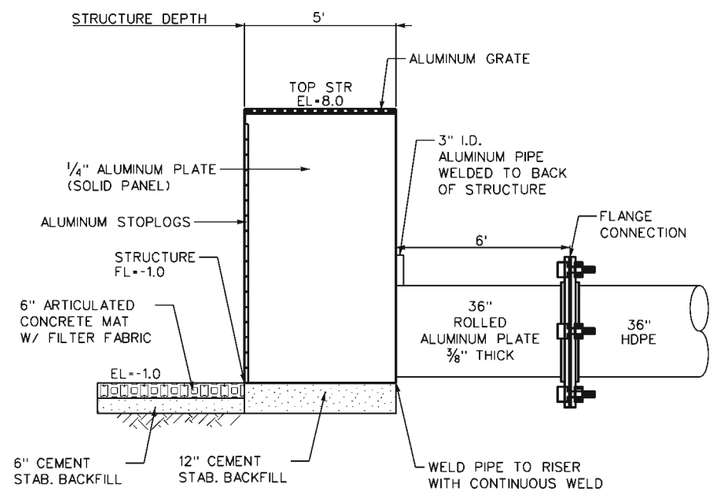
GRATE DETAIL
NTS



STOPLOG



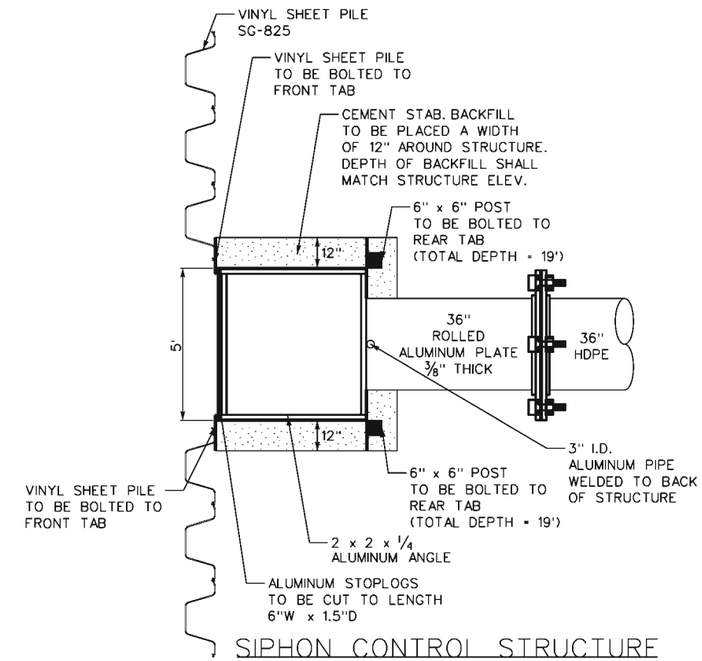
SIPHON CONTROL STRUCTURE
FRONT VIEW
(WITH STOPLOGS)



SIPHON CONTROL STRUCTURE
SIDE VIEW
(WITH STOPLOGS)

STRUCTURE HEIGHT= 9.0'

USE VINYL SHEET PILE SG-825



SIPHON CONTROL STRUCTURE
TOP VIEW

SCALE: 1"=5'

PROJECT LOCATION
GIWW SIPHON
CITY BEAUMONT COUNTY JEFFERSON STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN 079 PN 1012 DRAWING 09 SHEET

LJA Engineering, Inc.
Public Infrastructure
925 Orleans Street
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FRN-F-1386

CLIENT JEFFERSON COUNTY

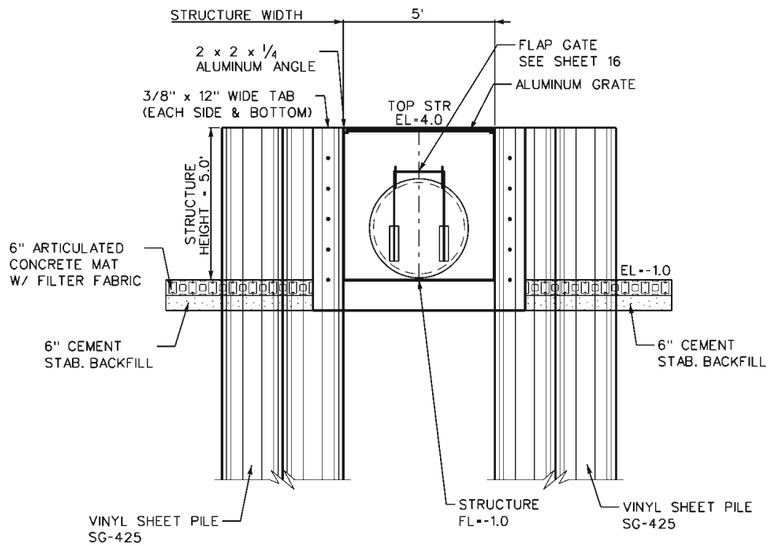
OILCUT DITCH
SIPHON DETAIL 3

08/17/16 DATE

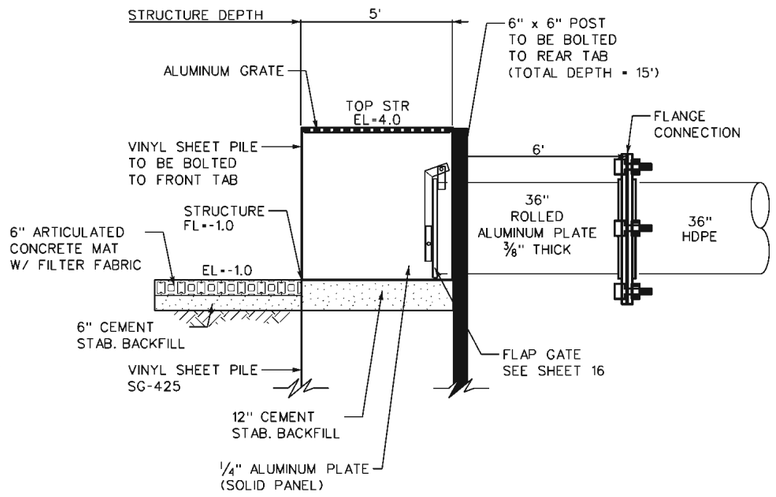
Walter R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS WALLACE R. WILSON 84857 LICENSED PROFESSIONAL ENGINEER

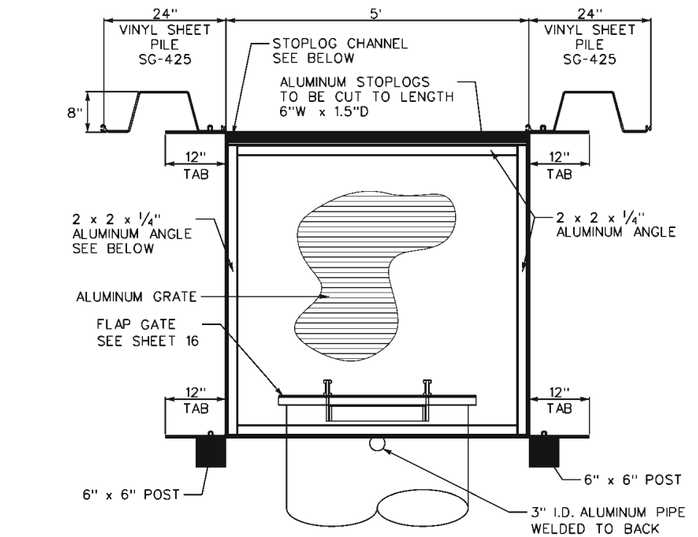
NO. DATE REVISION APPROV.
TEXAS REGISTERED ENGINEERING FIRM F-1386



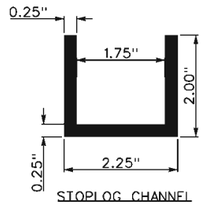
SIPHON CONTROL STRUCTURE
FRONT VIEW



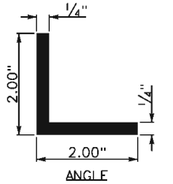
SIPHON CONTROL STRUCTURE
SIDE VIEW



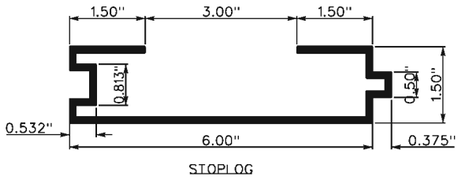
GRATE DETAIL
NTS



STOPLOG CHANNEL



ANGLE



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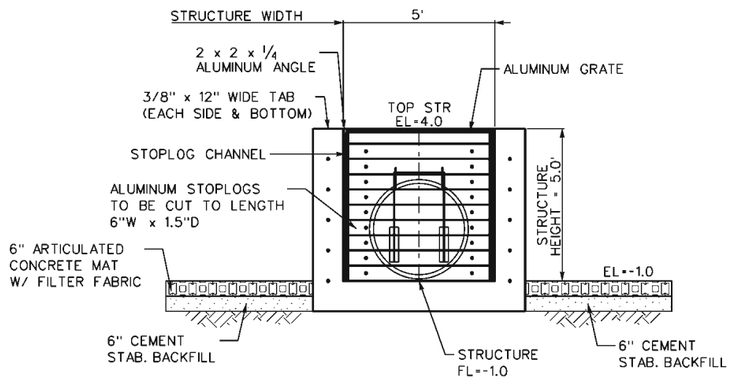
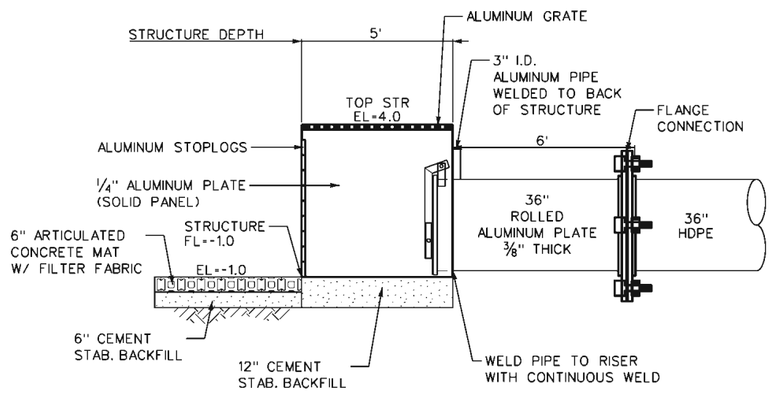


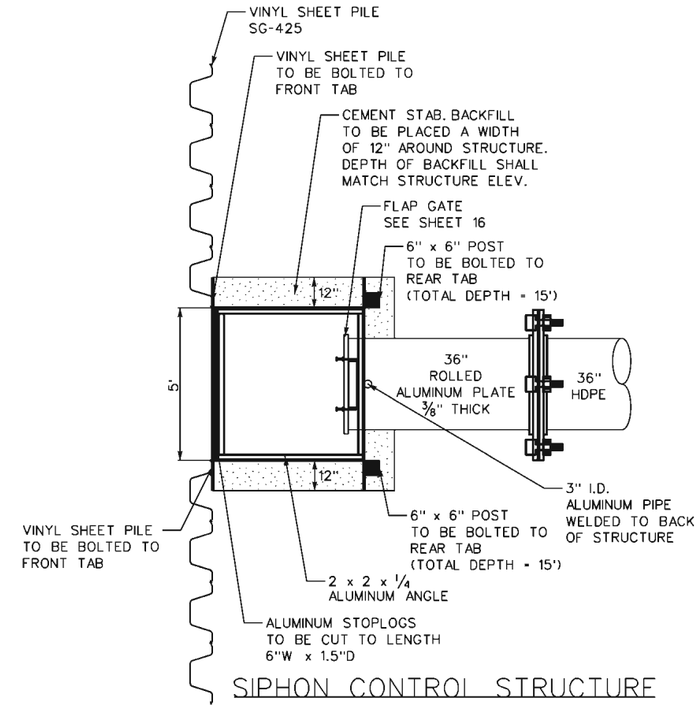
SIPHON CONTROL STRUCTURE
FRONT VIEW
(WITH STOPLOGS)



SIPHON CONTROL STRUCTURE
SIDE VIEW
(WITH STOPLOGS)

STRUCTURE HEIGHT= 5.0'

USE VINYL SHEET PILE SG-425



SIPHON CONTROL STRUCTURE
TOP VIEW

SCALE: 1"=5'

OILCUT DITCH
SIPHON DETAIL 4

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

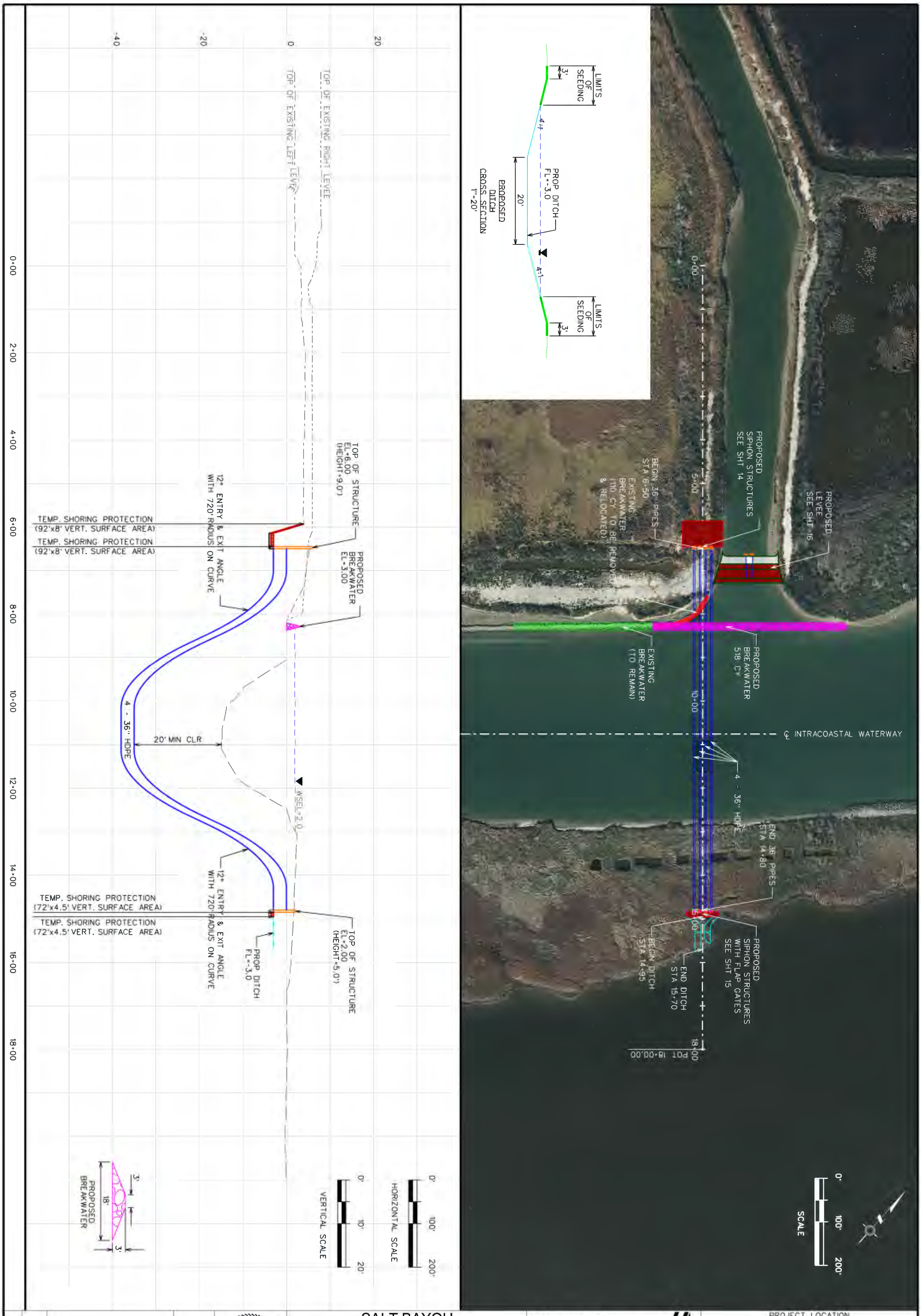
LJA Engineering, Inc.
Public Infrastructure
905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1882
Fax 409.813.1916
FRN-F-1386

CLIENT JEFFERSON COUNTY

PROJECT LOCATION			
GIWW SIPHON	CITY	COUNTY	STATE
	BEAUMONT	JEFFERSON	TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			

CN	PN	DRAWING	SHEET
079	1012		10

08/17/16
DATE



NO.	DATE	REVISION	APPROV.
TEXAS REGISTERED ENGINEERING FIRM F-1386			

STATE OF TEXAS · WALLACE R. WILSON · 84857 · LICENSED PROFESSIONAL ENGINEER

SALT BAYOU
PLAN & PROFILE

Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

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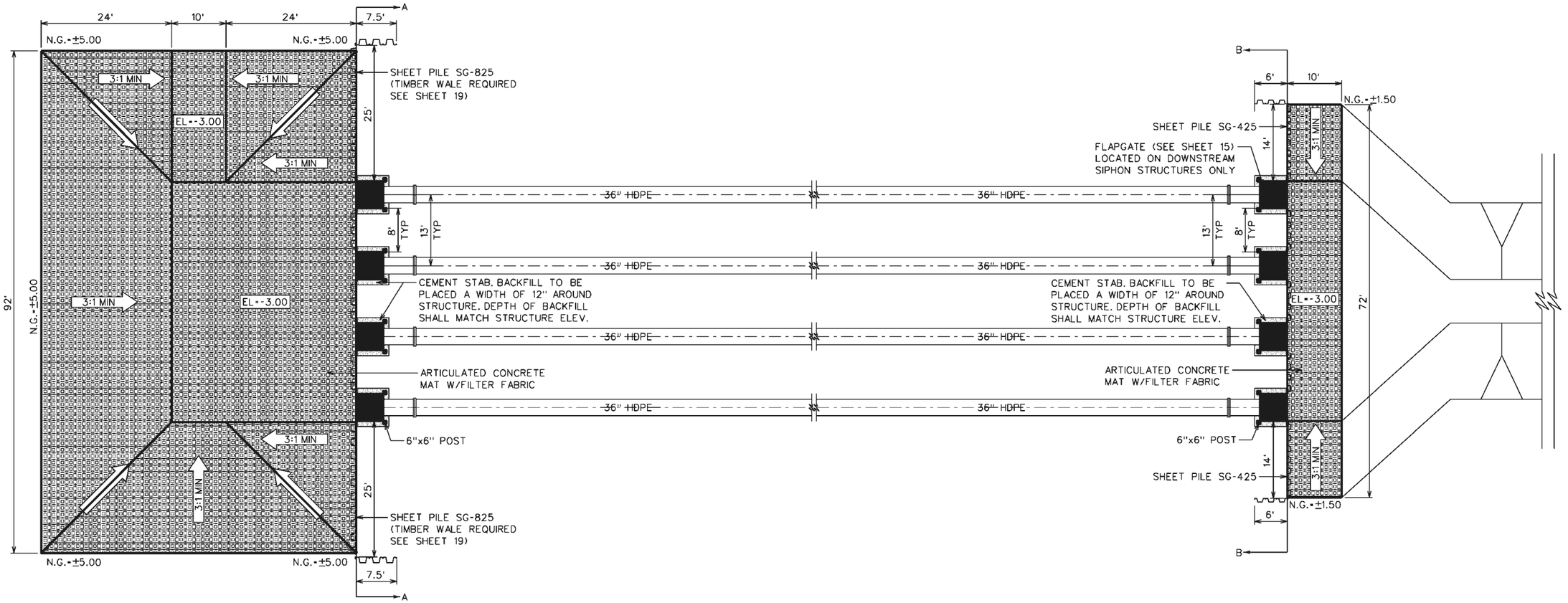
Phone 409.813.1862
Fax 409.813.1916
FRN - F-1386

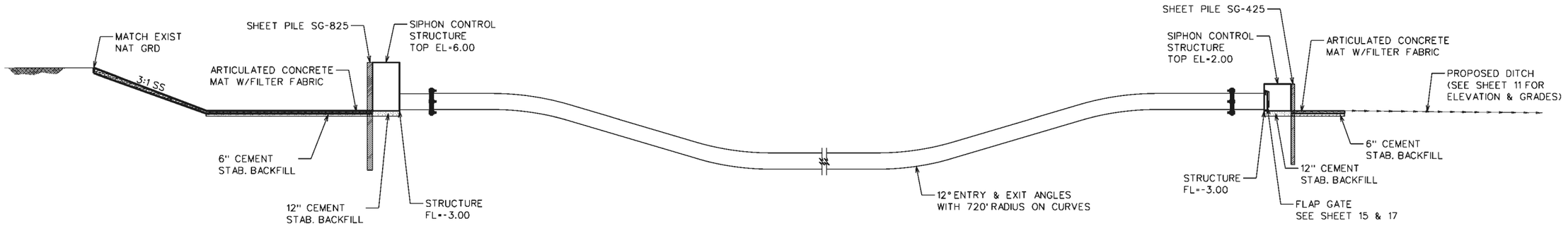
CLIENT
JEFFERSON COUNTY

PROJECT LOCATION			
GIWW SIPHON			
	COUNTY		STATE
BEAUMONT	JEFFERSON		TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			
CN	PN	DRAWING	SHEET
079	1012		11



PLAN VIEW

SCALE: 1"=20'



PROFILE VIEW

NOTE:
SEE SHEET 7 FOR DETAILS ON PIPE ANGLES AND BENDS

HORIZ SCALE: 1"=20'
VERT SCALE: NTS

PROJECT LOCATION

GIWW SIPHON			
CITY	COUNTY		STATE
BEAUMONT	JEFFERSON		TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY			
CN	PN	DRAWING	SHEET
079	1012		12

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FRN-F-1386

CLIENT JEFFERSON COUNTY

08/17/16
DATE

SALT BAYOU SIPHON DETAIL 1

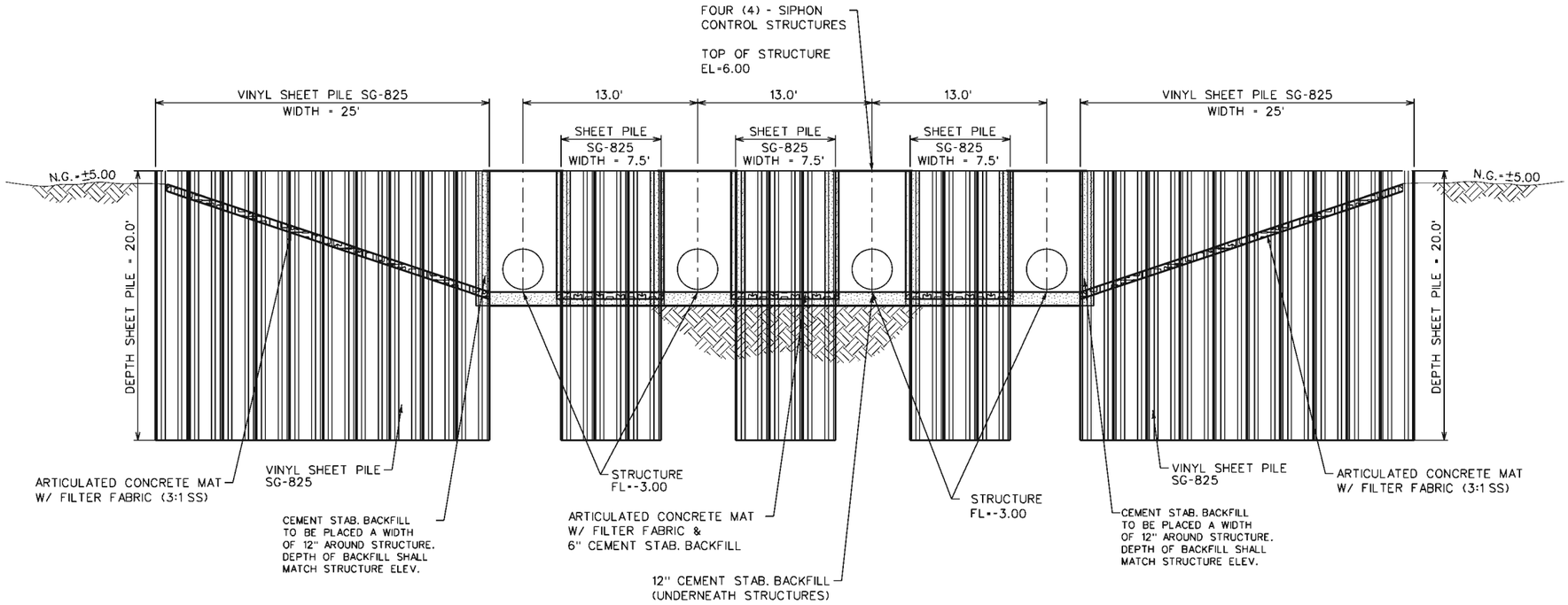
Walter R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

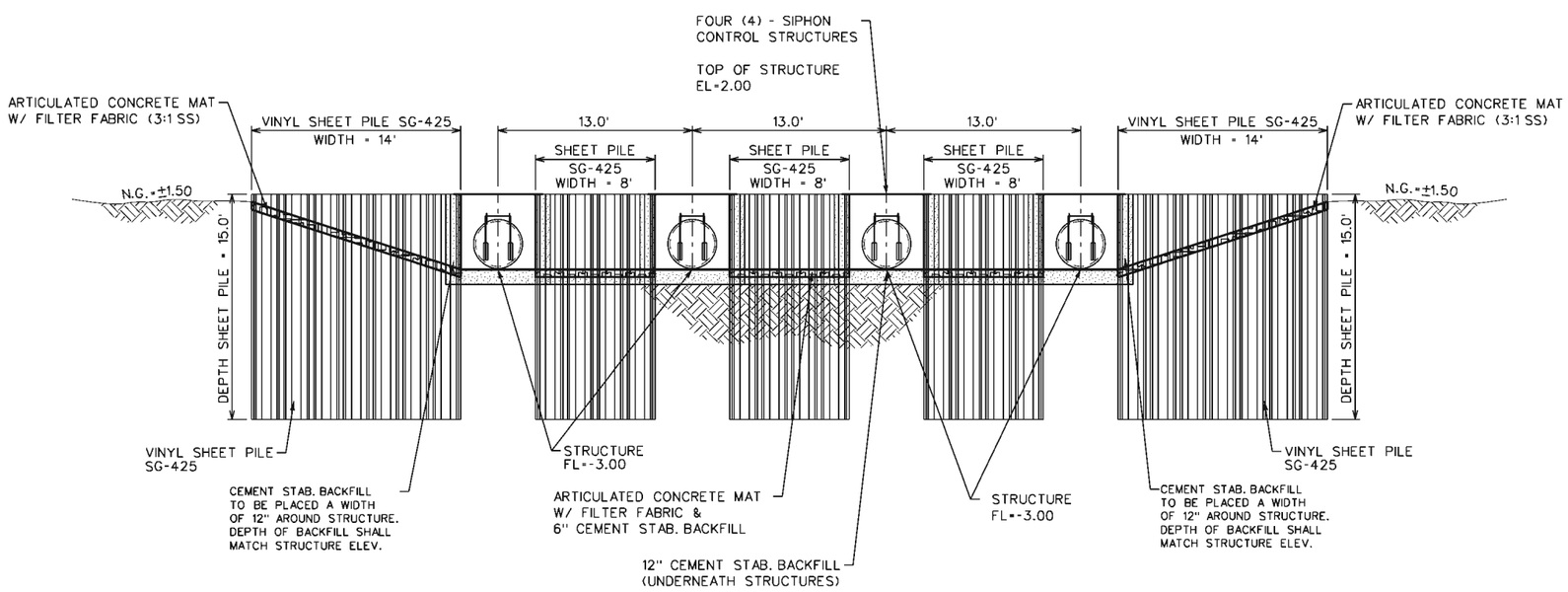
STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386



SECTION A-A



SECTION B-B

SCALE: 1"=10'

PROJECT LOCATION
GIWW SIPHON | CITY BEAUMONT | COUNTY JEFFERSON | STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY | CN 079 | PN 1012 | DRAWING | SHEET 13

LJA Engineering, Inc.
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FRN-F-1386

CLIENT JEFFERSON COUNTY

SALT BAYOU SIPHON DETAIL 2

08/17/16 DATE

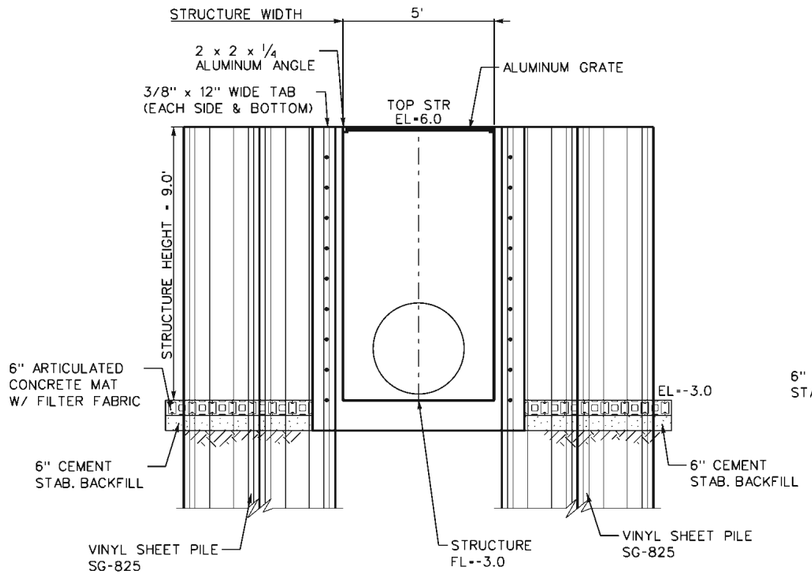
Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

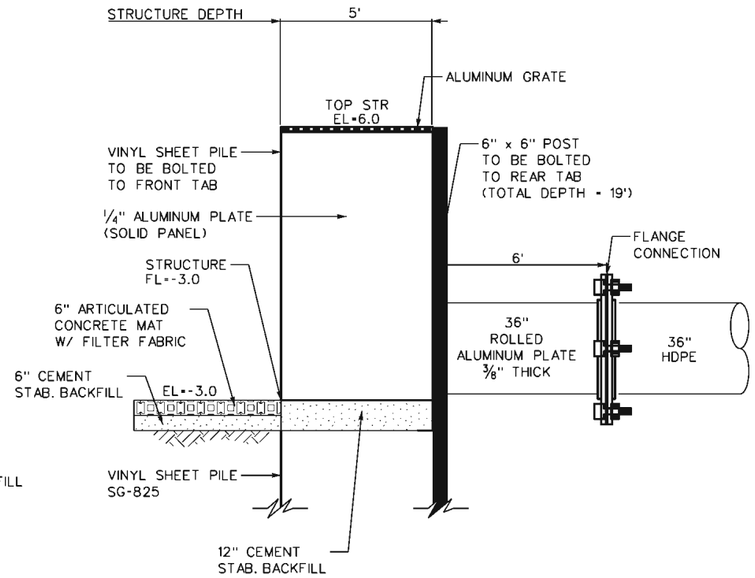
STATE OF TEXAS WALLACE R. WILSON 84857 LICENSED PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

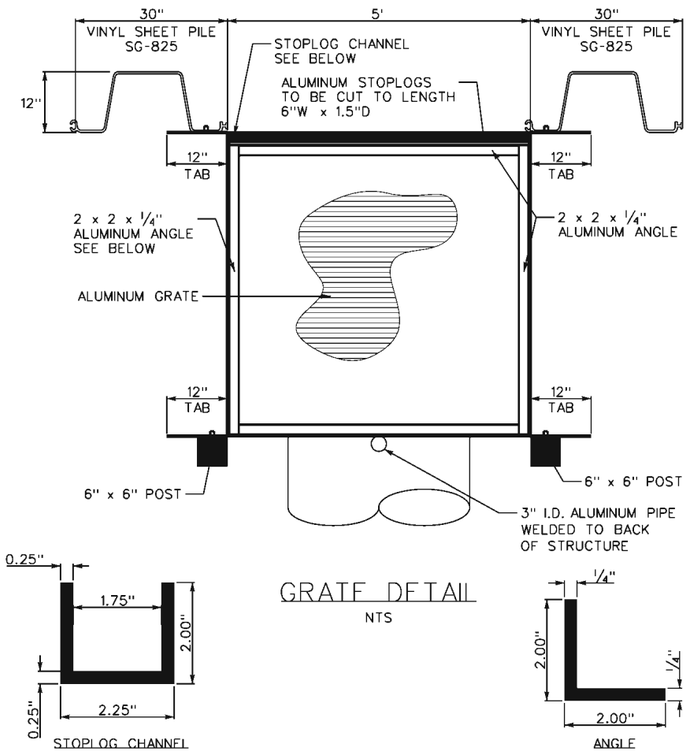
TEXAS REGISTERED ENGINEERING FIRM F-1386



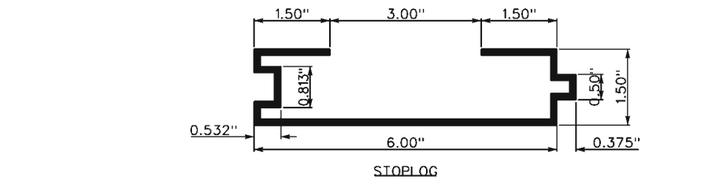
SIPHON CONTROL STRUCTURE
FRONT VIEW



SIPHON CONTROL STRUCTURE
SIDE VIEW



GRATE DETAIL
NTS



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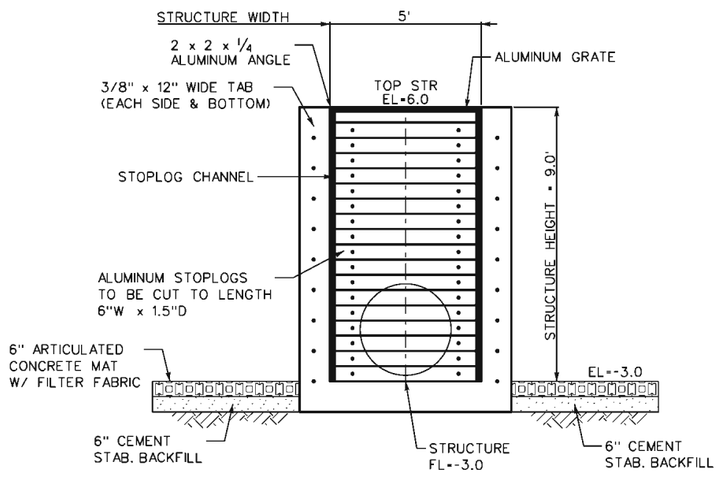
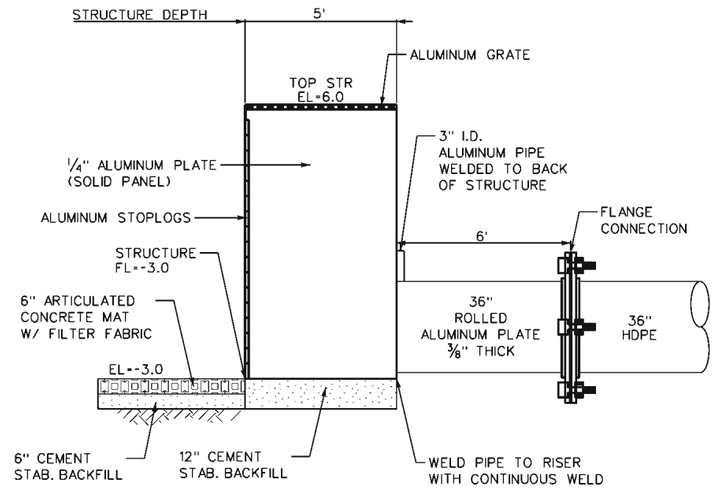
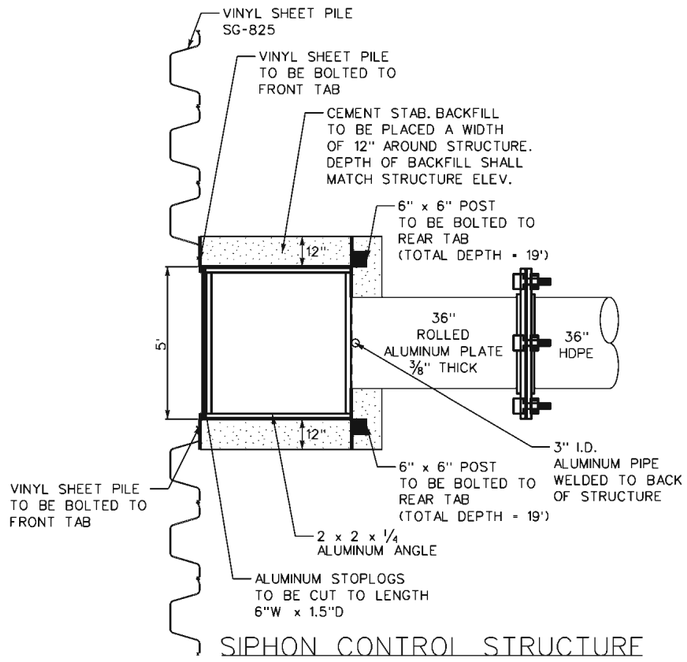


SIPHON CONTROL STRUCTURE
FRONT VIEW
(WITH STOPLOGS)



SIPHON CONTROL STRUCTURE
SIDE VIEW
(WITH STOPLOGS)

STRUCTURE HEIGHT= 9.0'
USE VINYL SHEET PILE SG-825



SIPHON CONTROL STRUCTURE
TOP VIEW

SCALE: 1"=5'

PROJECT LOCATION
GIWW SIPHON | CITY BEAUMONT | COUNTY JEFFERSON | STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY | CN 079 | PN 1012 | DRAWING | SHEET 14

LJA Engineering, Inc.
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FRN-F-1386

CLIENT JEFFERSON COUNTY

SALT BAYOU
SIPHON DETAIL 3

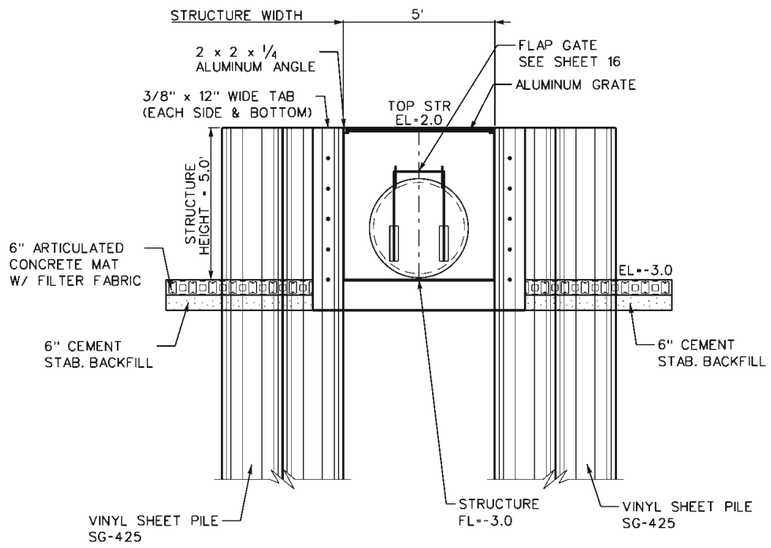
Walter R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS WALLACE R. WILSON 84857 LICENSED PROFESSIONAL ENGINEER

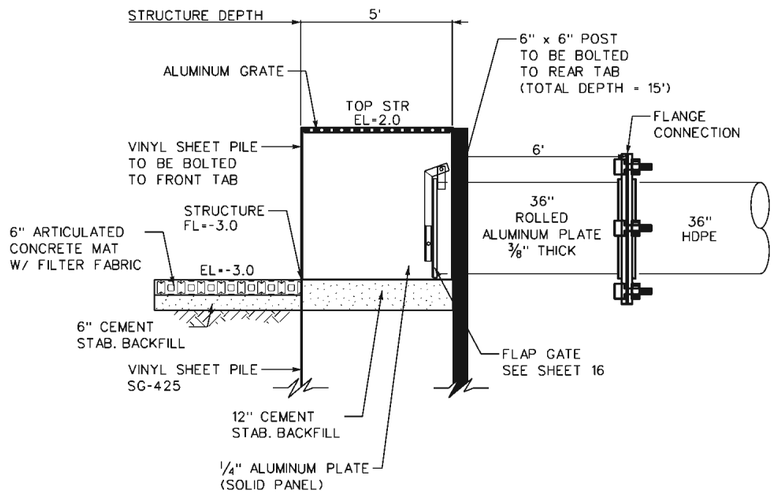
NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

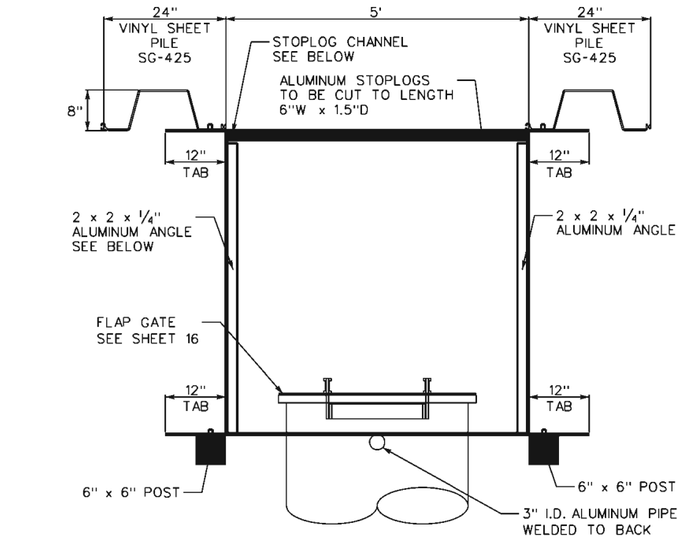
08/17/16
DATE



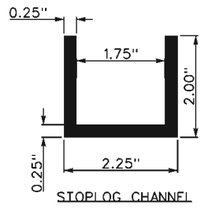
SIPHON CONTROL STRUCTURE
FRONT VIEW



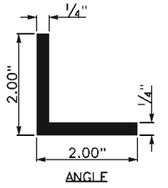
SIPHON CONTROL STRUCTURE
SIDE VIEW



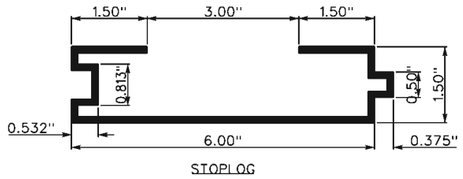
GRATE DETAIL
NTS



STOPLOG CHANNEL



ANGLE



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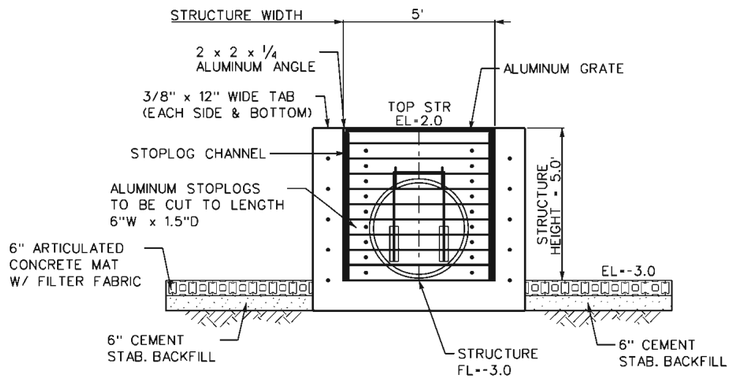
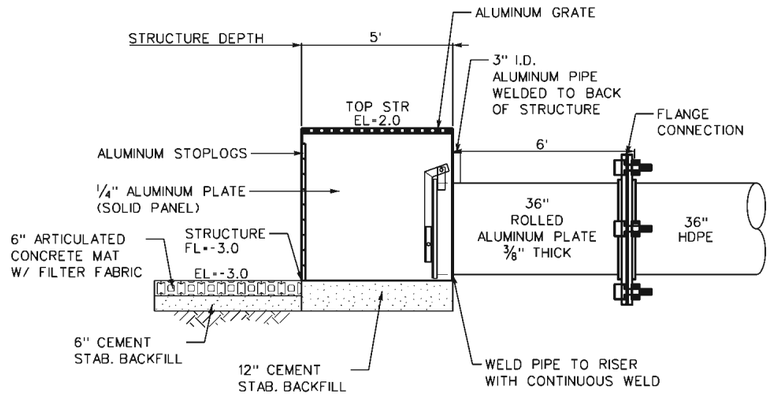
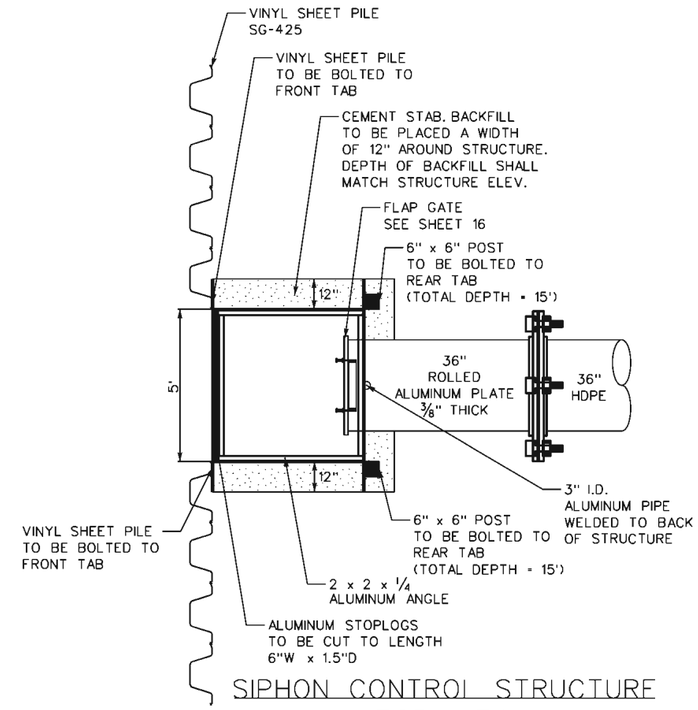


SIPHON CONTROL STRUCTURE
FRONT VIEW
(WITH STOPLOGS)



SIPHON CONTROL STRUCTURE
SIDE VIEW
(WITH STOPLOGS)

STRUCTURE HEIGHT= 5.0'
USE VINYL SHEET PILE SG-425



SIPHON CONTROL STRUCTURE
TOP VIEW

SCALE: 1"=5'

PROJECT LOCATION
CITY: BEAUMONT
COUNTY: JEFFERSON
STATE: TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN: 079
PN: 1012
DRAWING: 15
SHEET

LJA Engineering, Inc.
Public Infrastructure
905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1882
Fax 409.813.1916
FRN-F-1386

CLIENT: JEFFERSON COUNTY

SALT BAYOU
SIPHON DETAIL 4

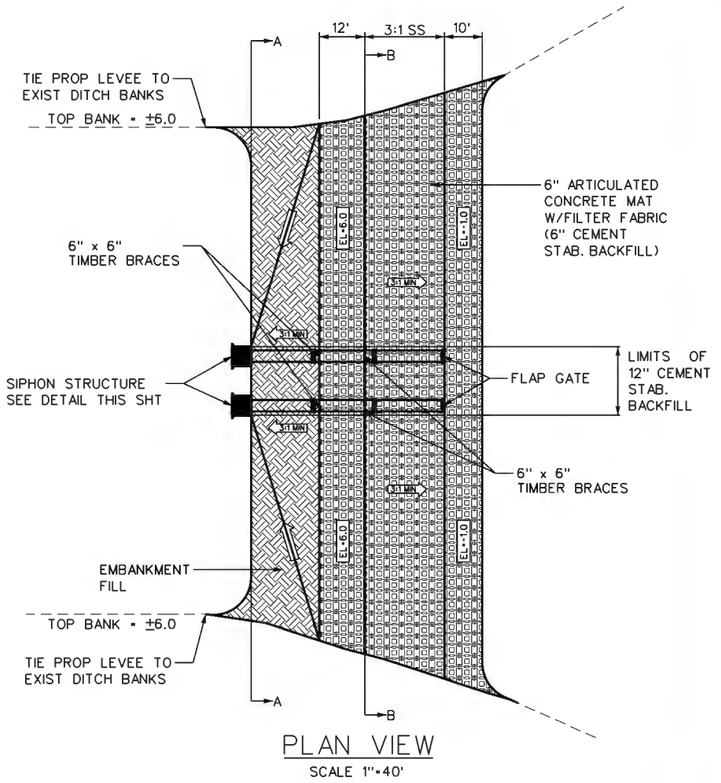
08/17/16
DATE

Wallace R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

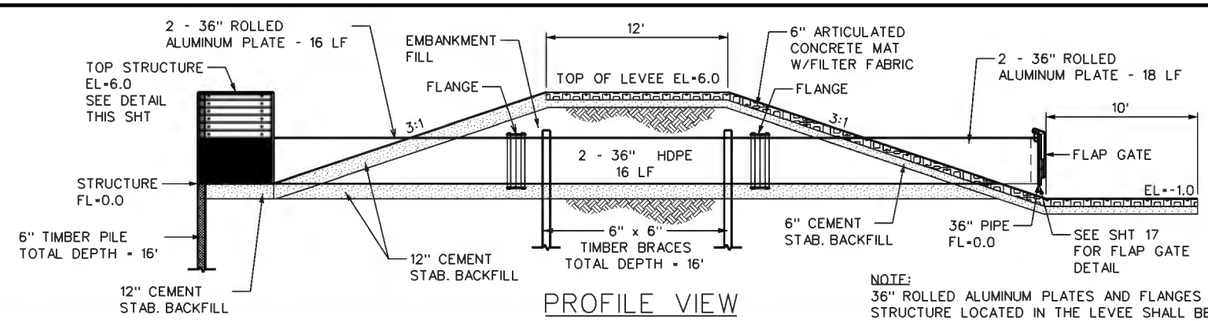
NO. | DATE | REVISION | APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386



PLAN VIEW

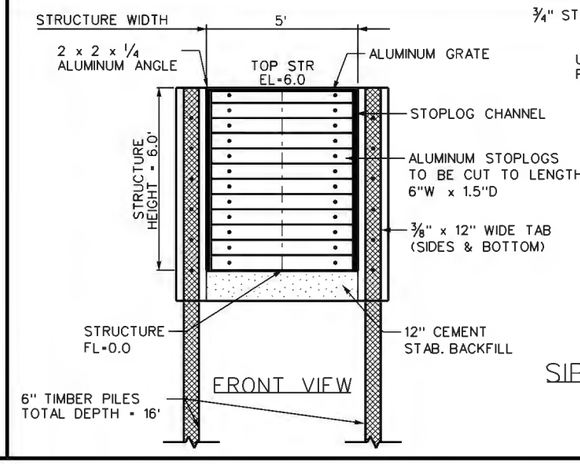
SCALE 1"=40'



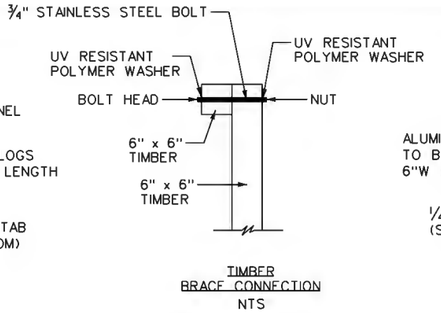
PROFILE VIEW

SCALE 1"=10'

NOTE:
36" ROLLED ALUMINUM PLATES AND FLANGES ON 6' SIPHON STRUCTURE LOCATED IN THE LEVEE SHALL BE SUBSIDIARY TO ITEM 9020 003 WITH NO EXTRA COMPENSATION.



FRONT VIEW

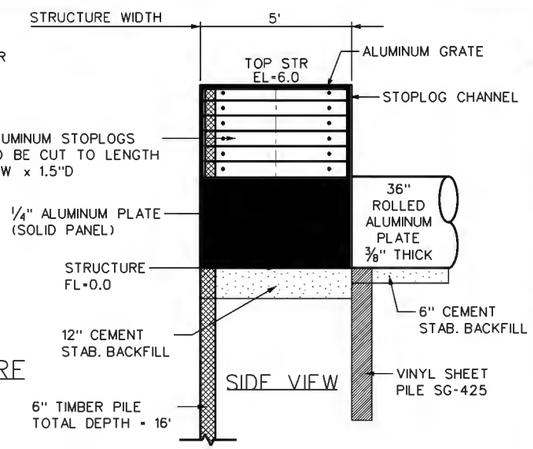


TIMBER BRACE CONNECTION

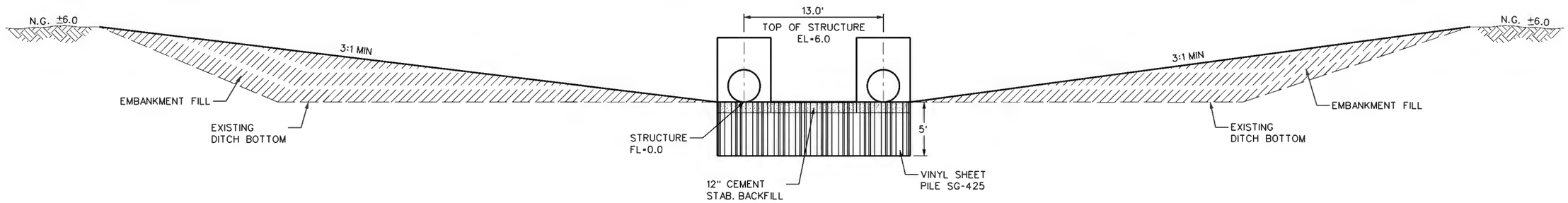
NTS

SIPHON CONTROL STRUCTURE HEIGHT = 6.0'

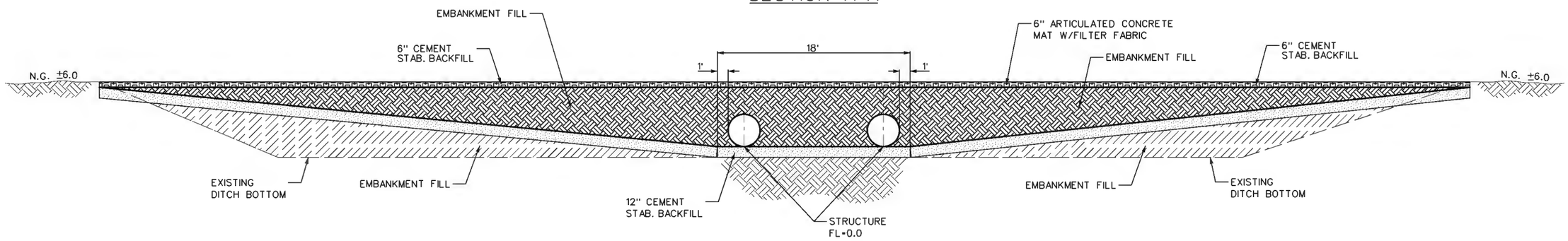
SCALE 1"=5'



SIDE VIEW



SECTION A-A



SECTION B-B

SCALE 1"=10'

NOTE:
STABLE MATERIAL OBTAINED FROM EXCAVATION MAY BE UTILIZED AS EMBANKMENT FILL

PROJECT LOCATION
GIWW SIPHON
CITY BEAUMONT COUNTY JEFFERSON STATE TEXAS
SITE ADDRESS: INTRACOASTAL WATERWAY
CN 079 PN 1012 DRAWING 16 SHEET

LJA Engineering, Inc.
Public Infrastructure
905 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1662
Fax 409.813.1916
FRN-F-1386

CLIENT JEFFERSON COUNTY

DATE 08/17/16

SALT BAYOU LEVEE DETAIL

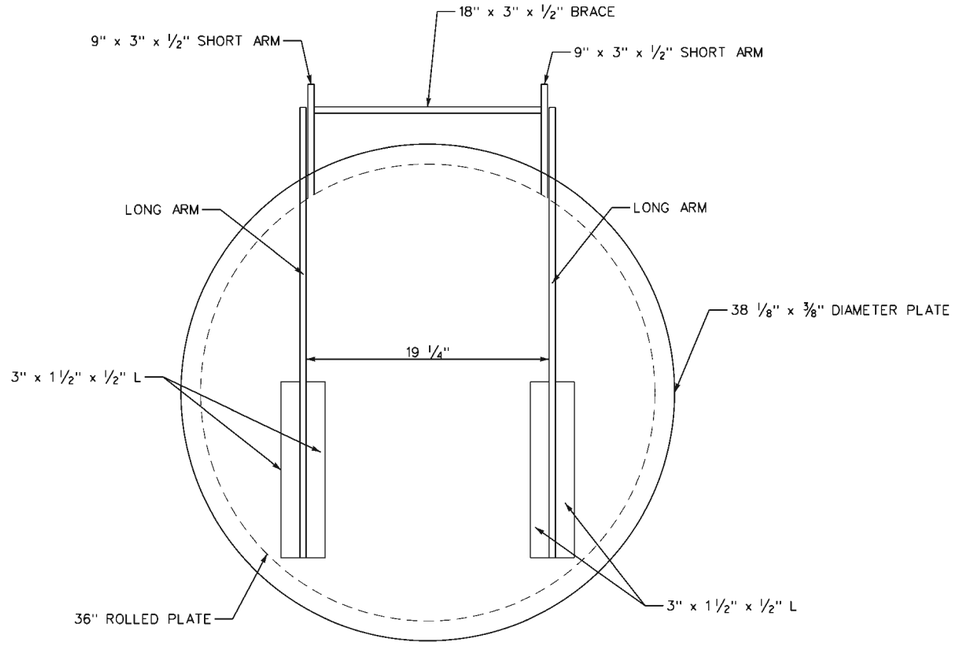
Wallace R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

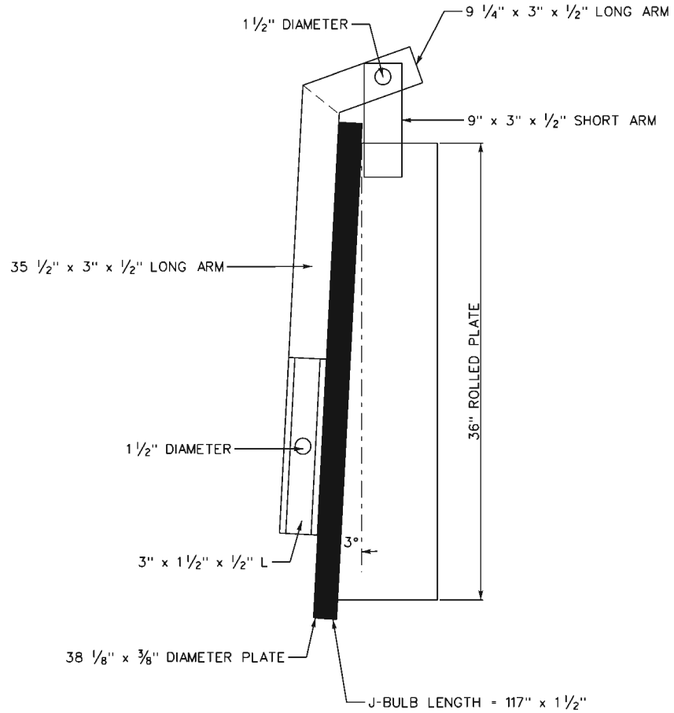
STATE OF TEXAS WALLACE R. WILSON 84857 LICENSED PROFESSIONAL ENGINEER

NO. DATE REVISION APPROV.

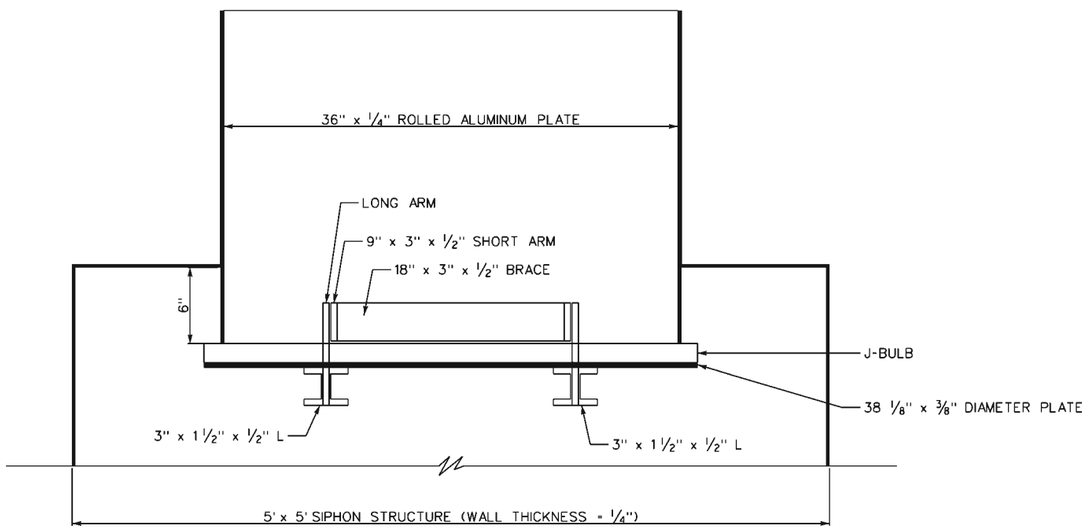
TEXAS REGISTERED ENGINEERING FIRM F-1386



FRONT VIEW



SIDE VIEW



TOP VIEW

NOTES:

1. FLAP GATE SHALL BE CONSTRUCTED OF ALUMINUM.
2. ALUMINUM THICKNESS SHALL BE ½".
3. FLAP GATE TO BE CONSTRUCTED ON DOWNSTREAM SIPHON STRUCTURES.
4. CONTRACTOR TO SUPPLY SHOP DRAWINGS OF FLAP GATE TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.

SCALE: 1"=1'

FLAP GATE DETAIL FOR STRUCTURE HEIGHT = 5.0'

Walter R. Wilson P.E.

WALLACE R. WILSON, P.E. #84857

08/17/16
DATE

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386

LJA Engineering, Inc.
Public Infrastructure
925 Orleans Street
Beaumont, Texas 77701
Phone 409.813.1862
Fax 409.813.1916
FRN - F-1386

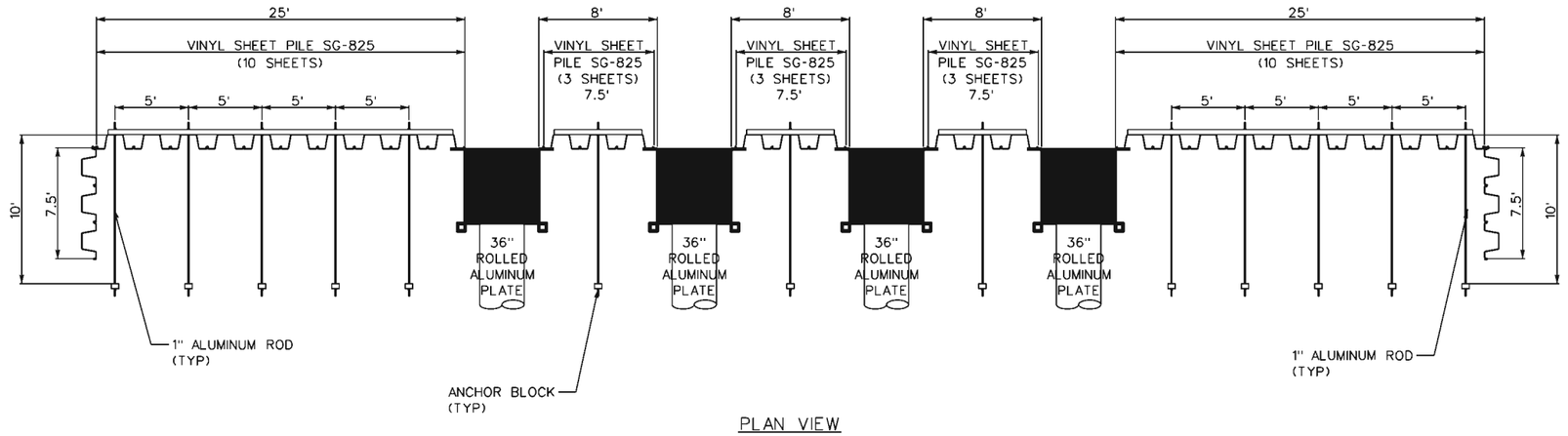
CLIENT
JEFFERSON COUNTY

PROJECT LOCATION

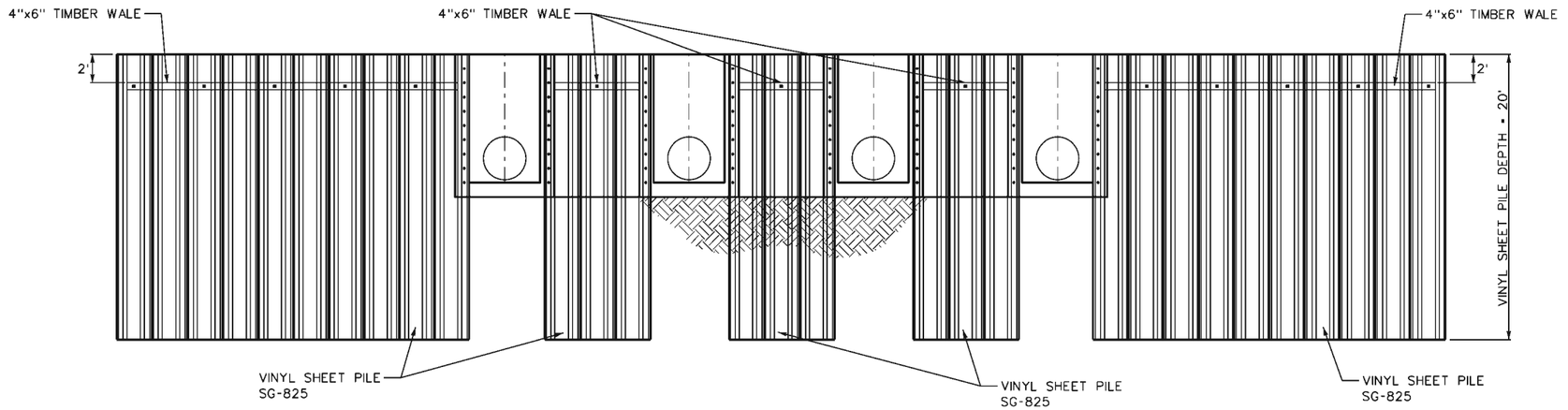
GIWW SIPHON		
CITY	COUNTY	STATE
BEAUMONT	JEFFERSON	TEXAS

SITE ADDRESS: INTRACOASTAL WATERWAY

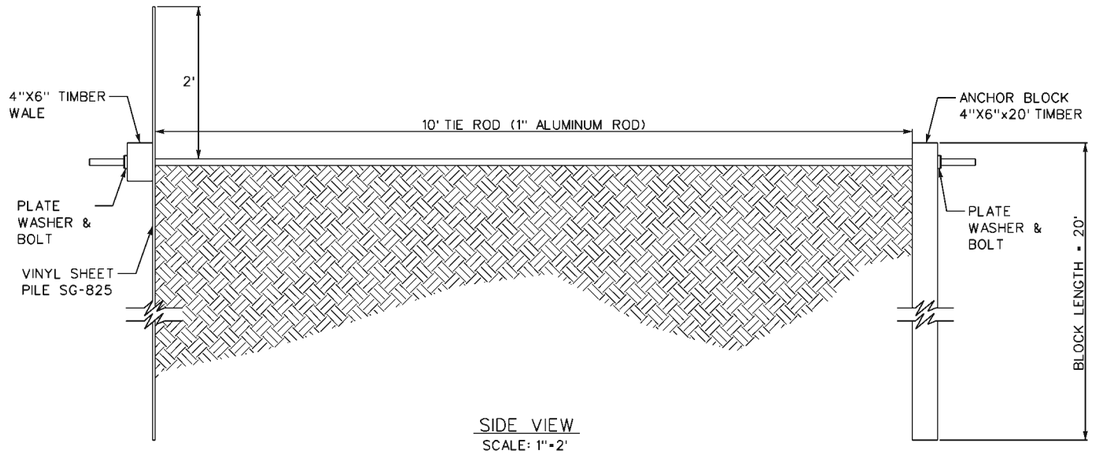
CN	PN	DRAWING	SHEET
079	1012		17



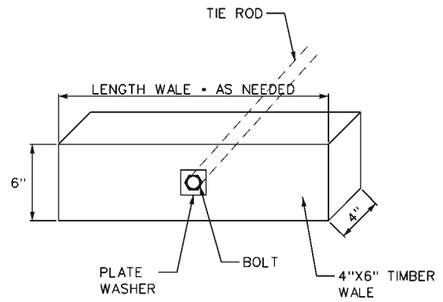
PLAN VIEW



END VIEW



SIDE VIEW
SCALE: 1"=2'



CONNECTION DETAIL
SCALE: 1"=1'

WALE DETAIL FOR VINYL SHEET PILE SG-825

SCALE: 1"=10'

PROJECT LOCATION

GIWW	SIPHON	STATE
CITY	COUNTY	TEXAS
BEAUMONT	JEFFERSON	

SITE ADDRESS: INTRACOASTAL WATERWAY

CN	PN	DRAWING	SHEET
079	1012		18

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CLIENT
JEFFERSON COUNTY

08/17/16
DATE

WALE DETAIL

Wallace R. Wilson P.E.
WALLACE R. WILSON, P.E. #84857

STATE OF TEXAS
WALLACE R. WILSON
84857
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION	APPROV.

TEXAS REGISTERED ENGINEERING FIRM F-1386