CONTRACT DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

FOR

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT
CBBEP No. 2123

FOR

1305 N. SHORELINE BLVD.
CORPUS CHRISTI, TEXAS 78401

PREPARED BY:

LJA ENGINEERING
TBPE F-1386/TBPLS 10104001
5350 S. STAPLES STREET, SUITE 425
CORPUS CHRISTI, TEXAS 78411
PHONE: 361.991.8550
WWW.LJA.COM

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
7.9.2024

JULY 2024

CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS
COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT, CBBEP No. 2123

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I.
INVITATION TO BIDDERS

Sealed proposals, addressed to the Coastal Bend Bays & Estuaries Program, Inc. (Owner) for the **MISSION RIVER DELTA CIRCULATION ENHANCEMENT, CBBEP NO. 2123.** The work consists of removing three existing concrete pipe crossings & damaged structures and installing three new crossings at the same location. Crossing #1 consists of a single 14" rise x 23" span elliptical pipe (18" RCP equivalent); Crossing #2 consists of three 18" RCP pipes and Crossing #3 consists of a double 6' span x 2' rise box culverts. Minor excavation to install new crossings, bulk rock for soil stabilization and erosion protection; and Type A, Grade 1-2 base material for trail surface on top of the new pipe crossings. The construction staging placement area will be located upland. Board mats may be placed to protect any vegetated area along the trail while moving material to the site. All excavated material should be removed from the site. This project is located at the end of Ermis Road, Mission River Delta marsh as part of the restoration program to enhance the tidal river circulation for the Coastal Bend Bays & Estuaries Program, Inc. All work shall be completed in accordance with the construction plans, specifications, and contract documents.

Bids will be received at the CBBEP Office, 1305 N. Shoreline Blvd. #205, Corpus Christi, Texas 78411until **2:00 pm** on **Thursday, August 15, 2024**, and then publicly opened and read. Any bid received after closing time will be returned unopened.

A **Pre-Bid Meeting** is scheduled for **10:00 am** on **Thursday, August 1, 2024.** The Pre-Bid Meeting will be conducted by the Engineer and the CBBEP representative. We will meet at the project site located at the end of Ermis Road, approximately ¼ mile east of 125 Ermis Road, Bayside Texas 78340. No additional or separate visitations will be conducted by the CBBEP.

A bid bond in the amount of 5% of the highest amount bid must accompany each proposal. Failure to provide the bid bond will constitute a non-responsive proposal which will not be considered. Failure to provide required performance and payment bonds for contracts over $25,000.00 will result in forfeiture of the 5% bid bond to the CBBEP as liquidated damages. Plans, proposal forms, specifications and contract documents may be procured from the Engineer, LJA Engineering, Inc. (LJA), 5350 S. Staples, Suite 425, Corpus Christi, Texas 78411, upon receipt of a **non-refundable payment** of Fifty Dollars **($50.00)**. Documents can be obtained by mail upon receipt of an additional non-refundable postage/handling charge of Ten Dollars **($10.00)**. Plans and Specifications will be available at no charge to download through Sharefile. In order to obtain instructions to download please contact our office at 361.991.8550 or via email LJASouthcc@lja.com. Include all company contact information when utilizing the Sharefile option.

The CBBEP reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the CBBEP's opinion, seems most advantageous to the CBBEP and in the best interest of the Public.

Coastal Bend Bays & Estuaries Program, Inc.
/s/ Jake Herring
Director of Land Conservation

II.
INSTRUCTIONS TO BIDDERS

II.
INSTRUCTIONS TO BIDDERS

1. SPECIAL AND GENERAL PROVISIONS OF THE AGREEMENT: Bidders shall thoroughly familiarize themselves with Sections VII. and VIII. especially as they relate to bid preparation, bond submittal, withdrawal, opening and all other aspects related to the Proposal. These Instructions to Bidders are meant as a supplement to these Sections. In the event of a discrepancy, Sections VII. and VIII. shall prevail.

2. PREPARATION OF BIDS: Bidders will be furnished PROPOSAL forms which will state the description of the proposed work to be performed and a schedule of items for which lump sum bids or unit price bids are asked. All blank places on the PROPOSAL form must be filled in as noted, in ink, with amount extended and totaled and no changes shall be made in the phraseology of the forms or of the items mentioned herein. If the Bidder does not bid on optional items (if shown on the PROPOSAL form) "No Bid" shall be entered in the blank spaces, therefore. PROPOSALS may be rejected if they show any alteration of words or figures, additions not called for, conditional or uncalled for alternate bids, incomplete bids, erasures irregularities of any kind. The PROPOSAL shall be signed in ink by the person or persons authorized to make the bid. If the PROPOSAL is made by an individual, the post office address shall be given. If made by a firm or partnership, the name and post office address of each member of the firm or partnership shall be given. If made by a corporation, its post office address and title of the person signing the PROPOSAL shall be given.

3. EXAMINATION OF PLANS, SPECIFICATIONS AND SITE OF WORK: Before filing a bid, the Bidder shall carefully examine the PROPOSAL, PLANS and SPECIFICATIONS, and form of the CONTRACT to be entered into for the work contemplated. He shall examine the site of work and satisfy himself as to be as to the conditions which will be encountered relating to the character, quality, and quantity of the work to be performed and materials to be furnished. He shall satisfy himself as to all subsurface obstacles to be encountered. The filing of a bid by a Bidder shall be presumptive evidence that he has complied with these requirements. Bidders desiring further information or further interpretation of the CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS and PLANS must make request for such information in writing to the Engineer, prior to 48 hours before the bid opening. Answers to all such requests will be given in writing to all Bidders, in addendum form, and all addenda will be bound and made a part of the Contract. No other explanation or interpretation will be considered official or binding. Should a Bidder find discrepancies in, or omissions from the Contract Documents, TECHNICAL SPECIFICATIONS and PLANS, or should he be in doubt as to their meaning, he should at once notify the Engineer in order that a written addendum may be sent to all Bidders. It is the responsibility of the Bidders to know if they have received all such addenda, the complete file of which will be maintained in the office of the Engineer.

4. ADDITIONAL INSURED: As delineated in **Paragraph A-20 of the Special Provisions** the successful bidder shall be required to list the **CBBEP and LJA Engineering, Inc. (LJA)** and each of their officers, agents, and employees as additional insured on all required and specified in the Contract Documents.

5. INTERPRETATION OF CONTRACT DOCUMENTS AND TECHNICAL SPECIFICATIONS, AND PLANS: Bidder desiring further information, or for further interpretation of the Contract Documents and TECHNICAL SPECIFICATIONS and PLANS must make request for such information in writing to the Engineer at LJA 5350 S. Staples Street, Suite 425, Corpus Christi, Texas 78411, prior to (5) working days before the bid opening.

   Answers to all such requests will be given in writing to all bidders, in addendum form, and all addendums will be bound and made a part of the Contract. No other explanation or interpretation will be considered official or binding.

Should a bidder find discrepancies in, or omissions from the Contract Documents, TECHNICAL SPECIFICATIONS, or PLANS, or should he be in doubt as to their meaning, he should at once notify the Engineer at 5350 S. Staples Street, Suite 425, Corpus Christi, Texas and in order that a written addendum may be sent to all bidders. It is the responsibility of the Bidder to know if they have received all such addenda, complete files of which will be maintained in the office of LJA at 5350 S. Staples Street, Suite 425, Corpus Christi, Texas and in the office designated to receive the PROPOSAL.

6. CONDITIONS OF WORK: Each Bidder is expected to inform himself fully of the construction and labor conditions under which the work will be performed and will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Documents, TECHNICAL SPECIFICATIONS, and PLANS. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of the Contract and to complete the contemplated work for the considerations set forth in his PROPOSAL.

7. PRE-BID CONFERENCE: A **Pre-Bid Meeting** is scheduled for **10:00 am** on **Thursday, August 1, 2024.** The Pre-Bid Meeting will be conducted by the Engineer and the CBBEP representative. We will meet at the project site located at the end of Ermis Road, approximately ¼ mile east of 125 Ermis Road, Bayside Texas 78340. No additional or separate visitations will be conducted by the CBBEP.

8. INSURANCE REQUIRMENTS: Bidders shall note Sections VII-A Notice to Contractors “A” Insurance Requirements and VII-B Notice to Contractors “B” Workers Compensation Insurance Requirements.

9. CONTRACTORS QUALIFICATIONS: The Contractor must have at least five (5) projects minimum experience in street reconstruction work of similar size (or larger) and complexity to this project. Contractors shall submit with bid a list indicating the five (5) projects, each to include: Owner, Project Name, Amount of Project, Owner Contact and Project Engineer Contact Information (phone, fax, email, etc.). **The Contractor shall also note to submit with bid all information requested in Item A-21 and Item A-22 of Section VIII. Special Provisions of the Agreement.**

III.
PROPOSAL

III.
PROPOSAL

PROJECT NAME	MISSION RIVER DELTA CIRCULATION ENHANCEMENT, CBBEP No. 2123
PROJECT NUMBER	C285-22106
OWNER	COASTAL BEND BAYS & ESTUARIES PROGRAM
BIDDER	
DESIGNER	LJA ENGINEERING, INC.

THE UNDERSIGNED, AS BIDDER, DECLARES THAT THE ONLY PERSON OR PARTIES INTERESTED IN THIS PROPOSAL AS PRINCIPALS ARE THOSE NAMED HEREIN; THAT THIS PROPOSAL IS MADE WITHOUT COLLUSION WITH ANY OTHER PERSON, FIRM, CORPORATION; THAT HE HAS CAREFULLY EXAMINED THE PLANS THEREIN REFERRED TO, AND HAS CAREFULLY EXAMINED THE LOCATIONS, CONDITIONS, AND CLASSES OF MATERIALS OF THE PROPOSED WORK, AND AGREES THAT HE WILL PROVIDE ALL THE NECESSARY MACHINERY, TOOLS, APPARATUS, AND OTHER MEANS OF CONSTRUCTION AND WILL DO ALL THE WORK AND FURNISH ALL THE MATERIALS CALLED FOR IN THE CONTRACT AND SPECIFICATIONS IN THE MANNER PRESCRIBED THEREIN AND ACCORDING TO THE REQUIREMENTS OF THE ENGINEER AS THEREIN SET FORTH. BIDDER FURTHER DECLARES THAT HE HAS EXAMINED THE SITE OF THE WORK AND THAT HE WILL PROVIDE, IF HE IS THE SUCCESSFUL BIDDER, THOSE ITEMS LISTED IN SECTIONS A-21, A-22, AND A-23 OF SECTION VII. SPECIAL PROVISIONS OF THE AGREEMENT. **SEE ITEM NO. 9 CONTRACTOR'S QUALIFICATION'S, SECTION II. INSTRUCTIONS TO BIDDERS.**

BASE BID

GENERAL

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
1	MOBILIZATION AND DEMOBILIZATION	LS	1	$----------	$ -
2	STORMWATER POLLUTION PREVENTION PLAN	LS	1	$----------	$ -
3	ALLOWANCE FOR UNANTICIPATED ADJUSTMENTS	LS	1	$----------	$ -
				SUBTOTAL GENERAL (ITEMS 1-3)	**$ -**

DRAINAGE IMPROVEMENTS

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
4	REMOVE AND DIPOSE OF EXISTING PIPES, HEADWALLS, BRICKS AND ALL ITEMS TOPERFORMED PROPOSED IMPROVEMENTS	LS	1	$ -	$ -
5	EXCAVATION	CY	150	$ -	$ -
6	8" COMPACTED SUBGRADE	SY	80	$ -	$ -
7	6' SPAN X 2' RISE BOX CULVERT (12 LFx2 CULVERTS)	LF	24	$ -	$ -
8	14"RISE X 23" SPAN (18"EQ) ELLIPTICAL RCP	LF	8	$ -	$ -
9	18" RCP (12 LF X 3 PIPES)	LF	36	$ -	$ -
10	3X5 BULLROCK (24" DEPTH)	CY	80	$ -	$ -
11	CRUSHED LIMESTONE BASE (TYPE A, GRADE 1-2) (3"-6")	CY	30	$ -	$ -
12	FILTER FABRIC FOR WRAP ROCK RIP RAP	SY	80	$ -	$ -
13	FLOWABLE BACKFILL	CY	10	$ -	$ -
14	TRENCH SAFETY FOR PIPE/BOX (8'-10')	LF	80	$ -	$ -
15	CEMENT STABILIZED SAND	CY	50	$ -	$ -
16	HEADWALL/WINGWALL (HW = 5')FOR MULTIPLE BOX CULVERT	LF	50	$ -	$ -
17	HEADWALL/WINGWALL (HW = 4')FOR TRIPLE 18" RCP'S	LF	60	$ -	$ -
18	END TREATMENT FOR ELLIPTICAL PIPE (18" EQ)	EA	2	$ -	$ -
19	RESHAPE/REGRADE DITCH (0-4')	LF	50	$ -	$ -
20	SOIL RETENTION BLANKET	SY	50	$ -	$ -
21	WOODEN BOLLARDS WITH DELINEATOR	EA	12	$ -	$ -
22	DEWATERING	LS	1	$ -	$ -
				SUBTOTAL DRAINAGE IMPROVEMENTS (ITEMS 4-22)	$ -

The undersigned hereby declares that he has visited the site and has carefully examined the plans, specifications and contract documents relating to the work covered by his bid or bids, that he agrees to do the work, and that no representations made by the City are in any sense a warranty but are mere estimates for the guidance of the Contractor.

III.
PROPOSAL

BID SUMMARY TOTAL

GENERAL ITEMS SUBTOTAL $ _____

DRAINAGE IMPROVEMENTS SUBTOTAL $ _____

BASE BID TOTAL **$** _____

The undersigned agrees to complete the work for MISSION RIVER DELTA CIRCULATION ENHANCEMENTwithin 90 **Calendar Days**, from the date designated by the Notice to Proceed.

Receipt of the following addenda is acknowledged:

ADDENDUM _____ DATE _____

ADDENDUM _____ DATE _____

ADDENDUM _____ DATE _____

Enclosed with the PROPOSAL is a Cashier's Check or Bidder's Bond in the amount of $_____ (at least 5 percent of the largest BASE BID shown in this PROPOSAL). Undersigned agrees that this amount is the measure of liquidated damages which Owner will sustain by the failure of the undersigned to execute and deliver the above named Contract and bonds, and further agrees that this check or Bidder's Bond shall be collected and retained by Owner as liquidated damages in the event this PROPOSAL is accepted by Owner within 60 days after the date of the opening of bids and the undersigned fails to execute the Contract and the required bonds with Owner with the conditions thereof, within ten (10) days after the date Contract Documents are received by the undersigned, otherwise said check or bond shall be returned to the undersigned in accordance with the provisions of the INVITATION TO BIDDERS.

VERY TRULY YOURS,

BY: _____

TITLE: _____

ADDRESS: _____

_____

(SEAL - IF BID IS BY A COPORATION)

ATTEST: _____ DATE: _____

IV.
AGREEMENT

IV.
AGREEMENT

THE STATE OF TEXAS §

COUNTY OF REFUGIO §

THIS AGREEMENT is entered into this the ____ day of _____, **2024**, by and between the **COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. (CBBEP),** County of Refugio, State of Texas, acting through its duly authorized Executive Director, termed in the Contract Documents as **"CBBEP"**, and _____, City of _____, County of _____, State of Texas, termed in the Contract Documents as **"CONTRACTOR"**, upon these terms, performable in Refugio County, Texas.

IN CONSIDERATION of the payment of **$**_____ by the CBBEP and other obligations of the CBBEP as set out herein, the CONTRACTOR will construct, and complete certain improvements described as follows:

MISSION RIVER DELTA CIRCUALTION ENHANCEMENT
CBBEP No. 2123

ACCORDING TO the attached Plans and Specifications in a good and workmanlike manner for the prices and conditions set out in their attached bid proposal supplying at their expense such materials, services, labor and insurance as required by the attached Contract Documents, including overseeing the entire job. The Contract Documents include this Agreement, the bid proposal and instructions, plans and specifications, including all maps, plats, blueprints, and other drawings, the Performance and Payment bonds, addenda, and related documents all of which constitute the contract for this project and are made a part hereof.

The CONTRACTOR will commence work within ten (10) calendar days from date they receive written work order and will substantially complete same within the working time for completion of **MISSION RIVER DELTA CIRCUALTION ENHANCEMENT** will be **90 Calendar Days**. Should CONTRACTOR default, CONTRACTOR may be liable for liquidated damages as set forth in the Contract Documents.

CBBEP WILL pay CONTRACTOR in current funds for performance of the contract in accordance with the Contract Documents as the work progresses. Signed in four (4) parts in Nueces County, Texas on the date shown above.

COASTAL BEND BAYS & ESTAURIES PROGRAM, INC.

By:_____
Kiersten Stanzel, Executive Director

CONTRACTOR

By:_____

Title: _____

_____
(Address)

_____
(City) (State) (Zip)

V.
PERFORMANCE BOND

V.
PERFORMANCE BOND

STATE OF TEXAS **§**

COUNTY OF REFUGIO **§**

KNOW ALL BY THESE PRESENTS:

That _____, City of _____, County of _____, State of _____, hereinafter called "PRINCIPAL", and _____ _____ a solvent company duly authorized under the laws of the State of Texas to act as surety on bonds for principals, hereinafter called "SURETY", are held and firmly bound unto the **COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. (CBBEP),** a non-profit organization of Nueces, Texas, hereinafter called "CBBEP", and unto all Subcontractors, workers, laborers, mechanics and suppliers as their interests may appear, all of whom shall have a right to sue upon this bond in the penal sum of _____ _____ **DOLLARS** *(amount in words)* **($_____)** *(amount in figures)* to be paid in Refugio County, Texas, for the payment of which sum well and truly to be made, We, said PRINCIPAL and SURETY, bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

Conditions of this bond are such that, whereas, PRINCIPAL has entered into a certain written contract with the **CBBEP**, dated this the _____ of _____, **2024** which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein, for the construction of:

MISSION RIVER DELTA CIRCUALTION ENHANCEMENT
CBBEP NO. 2123

Now therefore, the condition of this obligation is such, that if said PRINCIPAL shall faithfully perform said Agreement in accordance with the plans, specifications and contract documents, including any changes, extensions, or guarantees, and including all and singular covenants, conditions, and agreements in and by said contract agreed and covenanted by PRINCIPAL to be observed and performed, and according to the true intent and meaning of said Agreement hereto annexed, and if the PRINCIPAL shall repair and/or replace all defects due to faulty materials and/or workmanship that appear within a period of one (1) year from the date of completion and acceptance of improvements by the CBBEP, then this obligation shall be void; otherwise to remain in full force and effect.

SURETY, for value received, stipulates and agrees that no change to the contract time or contract amount, and no alteration or addition to the terms of the contract, or to the work performed thereunder, or to the plans, specifications, drawings, etc., 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, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

Provided further, that this bond is executed pursuant to Chapter 2253, Texas Government Code, as amended.

Provided further, that if any legal action be filed on this bond, venue shall lie in Refugio County, Texas.

The undersigned agent is hereby designated by the SURETY as the Resident Agent in Refugio County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Sections 3503.001 to 3503.005, Texas Insurance Code, as amended.

In witness whereof, said PRINCIPAL and SURETY have signed and sealed this instrument in four (4) copies, each one of which shall be deemed an original, this the ___ day of _____, **2024**.

ATTEST

By:_____
Secretary

CONTRACTOR

By:_____

SURETY

By: _____
Attorney-in-fact

Name and address of Resident Agent of Surety in Refugio County, Texas, for delivery of notice and service of process:

Name: _____

Address: _____
(Physical Street Address)

_____
(City) (State) (Zip)

Telephone: _____

Note: Bond shall be issued by a solvent Surety company authorized to do business in Texas and shall meet any other requirements established by law or by (City) OWNER under applicable law.

Note: Surety Agent's Original Power of Attorney must be attached hereto.

Note: Date of Performance Bond must not be prior to date of contract.

VI.
PAYMENT BOND

VI.
PAYMENT BOND

STATE OF TEXAS §

COUNTY OF REFUGIO §

KNOW ALL BY THESE PRESENTS:

That _____, City of _____, County of _____, State of _____, hereinafter called "PRINCIPAL", and _____ _____ a solvent company duly authorized under the laws of the State of Texas to act as surety on bonds for principals, hereinafter called "SURETY", are held and firmly bound unto the **COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. (CBBEP),** a non-profit organization of Nueces County, Texas, hereinafter called "CBBEP", and unto all Subcontractors, workers, laborers, mechanics and suppliers as their interests may appear, all of whom shall have a right to sue upon this bond in the penal sum of _____**DOLLARS** *(amount in words)* **($_____)** *(amount in figures)* to be paid in Refugio County, Texas, for the payment of which sum well and truly to be made, We, said PRINCIPAL and SURETY, bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents:

Conditions of this bond are such that, whereas, PRINCIPAL has entered into a certain written contract with the **CBBEP**, dated this the ___ day of _____, **2024** which Agreement is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein, for the construction of:

MISSION RIVER DELTA CIRCUALTION ENHANCEMENT
CBBEP No. 2123

Now, therefore, the condition of this obligation is such, that if said PRINCIPAL shall well and truly pay all Subcontractors, workers, laborers, mechanics and suppliers, all monies to them owing by said Principals for subcontracts, work, labor, equipment, supplies and materials done and furnished for the construction of improvements of said Agreement, then this obligation shall be and become null and void; otherwise, to remain in full force and effect.

Surety, for value received, stipulates and agrees that no change to the contract time or contract amount, and no alteration or addition to the terms of the contract, or to the work performed thereunder, or to the plans, specifications, drawings, etc., 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, alteration or addition to the terms of the contract, or to the work to be performed thereunder.

Provided further, that this bond is executed pursuant to Chapter 2253, Texas Government Code, as amended.

Provided further, that if any legal action be filed on this bond, venue shall lie in Refugio County, Texas.

The undersigned agent is hereby designated by the SURETY as the Resident Agent in Refugio County to whom any requisite notices may be delivered and on whom service of process may be had in matters arising out of such suretyship, as provided by Sections 3503.001 to 3503.005, Texas Insurance Code, as amended.

In witness whereof, said PRINCIPAL and SURETY have signed and sealed this instrument in four (4) copies, each one of which shall be deemed an original, this the _____ day of _____, **2024**.

ATTEST

_____
Secretary

CONTRACTOR

By: _____

SURETY

By: _____
Attorney-in-fact

Name and address of Resident Agent of Surety in Refugio County, Texas, for delivery of notice and service of process:

Name: _____

Address: _____
(Physical Street Address)

_____
(City) (State) (Zip)

Telephone: _____

Note: Bond shall be issued by a solvent Surety company authorized to do business in Texas and shall meet any other requirements established by law or by OWNER under applicable law.
Note: Surety Agent's Original Power of Attorney must be attached hereto.
Note: Date of Payment Bond must not be prior to date of contract.

VII.
SPECIAL PROVISIONS OF THE AGREEMENT

VII.
SPECIAL PROVISIONS OF THE AGREEMENT

A-1 Time and Place of Receiving Proposals/Pre-Bid Meeting

Sealed proposals will be received in conformity with the official advertisement inviting bids for the project. Proposals will be received at the CBBEP Office, 1305 N. Shoreline Blvd., Suite #205, Corpus Christi, Texas 78401, until **2:00 pm** on **Thursday, August 15, 2024**. Proposals mailed should be addressed in the following manner:

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. (CBBEP)
1305 N. SHORELINE BLVD. #205
CORPUS CHRISTI, TEXAS 78401

ATTENTION BID PROPOSAL: MISSION RIVER DELTA CIRCULATION ENHANCEMENT

A **Pre-Bid Meeting** is scheduled for **10:00 am** on **Thursday, August 1, 2024.** The Pre-Bid Meeting will be conducted by the Engineer and the CBBEP representative. We will meet at the project site located at the end of Ermis Road, approximately ¼ mile east of 125 Ermis Road, Bayside Texas 78340. No additional or separate visitations will be conducted by the CBBEP.

A-2 Definitions and Abbreviations

Section B-1 of the General Provisions will govern.

A-3 Description of Project

Sealed proposals, addressed to the Coastal Bend Bays & Estuaries Program, Inc. (Owner) for the **MISSION RIVER DELTA CIRCULATION ENHANCEMENT, CBBEP NO. 2123.** The work consists of removing three existing concrete pipe crossings & damaged structures and installing three new crossings at the same location. Crossing #1 consists of a single 14” rise x 23” span elliptical pipe (18" RCP equivalent); Crossing #2 consists of three 18" RCP pipes and Crossing #3 consists of a double 6' span x 2' rise box culverts. Minor excavation to install new crossings, bull rock for soil stabilization and erosion protection; and Type A, Grade 1-2 base material for trail surface on top of the new pipe crossings. The construction staging placement area will be located upland. Board mats will be placed to protect any vegetated area along the trail while moving material to the site. All excavated material should be removed from the site. This project is located at the end of Ermis Road, Mission River Delta marsh as part of the restoration program to enhance the river circulation for the Coastal Bend Bays & Estuaries Program, Inc. All work shall be completed in accordance with the construction plans, specifications, and contract documents.

A-4 Method of Award

The bids will be evaluated based on the following priorities subject to the availability of funds.

1. Total Base Bid

The award of the Contract will be to the lowest, responsible Bidder that submits a responsive Bid that demonstrates that the Bidder meets all of the requirements of the Bidding Documents, including the minimum specific project experience requirements. The CBBEP reserves the right to reject any or all bids, to waive irregularities and to accept the bid which, in the CBBEP's opinion, is most advantageous to the CBBEP and in the best interest of the public.

A-5 Explanation of Proposal and Items to be Submitted with Proposal

The following items **ARE REQUIRED** to be submitted with the Proposal:

1. **5% Bid Bond (must reference Project Name): MISSION RIVER DELTA CIRCULATION ENHANCEMENT as identified in the Proposal. (A cashier’s check, certified check, money order or bank draft from any State or National Bank will also be acceptable).**

2. **A list of successfully completed projects similar to the project proposed by these plans and specifications. The list shall include the project description, construction cost, and Owner and Engineer reference contact information.**

3. **Information requested in Items A-21 and A-22 of the Special Provisions.**

A-6 Time of Completion/Liquidated Damages

The working time for completion of **MISSION RIVER DELTA CIRCULATION ENHANCEMENT** will be **90 Calendar Days.**

For each calendar day that any work remains incomplete after the time specified in the Contract for completion of the work or after such time-period as extended pursuant to other provisions of **MISSION RIVER DELTA CIRCULATION ENHANCEMENT $300.00 (three hundred dollars)** per calendar day will be assessed against the Contractor as liquidated damages.

Said liquidated damages are not imposed as a penalty but as an estimate of the damages that the CBBEP will sustain from delay in completion of the work, which damages by their nature are not capable of precise proof. The Executive Director may withhold and deduct from the monies otherwise due to the Contractor in the amount of the liquidated damages that are due to the CBBEP.

A-7 Workers Compensation Insurance Coverage

If the Contractor's workers' compensation insurance coverage for its employees working on the Project is terminated or canceled for any reason, and replacement workers' compensation insurance coverage meeting the requirements of this Contract is not in effect on the effective date of cancellation of the workers' compensation insurance coverage to be replaced, then any Contractor employee not covered by the required workers' compensation insurance coverage must not perform any work on the Project.

Furthermore, for each calendar day including and after the effective date of termination or cancellation of the Contractor's workers' compensation insurance coverage for its employees working on the Project until the date replacement workers' compensation insurance coverage, meeting the requirements of this Contract, is in effect for those Contractor employees, liquidated damages will be assessed against and paid by the Contractor at the highest daily rate elsewhere specified in this Contract. Such liquidated damages will accumulate without notice from the Engineer to the Contractor and will be assessed and paid even if the permitted time to complete the Project has not expired. In accordance with other requirements of this Contract, the Contractor shall not permit subcontractors or others to work on the Project unless all such individuals working on the Project are covered by workers' compensation insurance and unless the required documentation of such coverage has been provided to the Contractor and the Engineer.

A-8 Faxed Proposals

Proposals faxed directly to the CBBEP will be considered non-responsive. Proposals must contain original signatures and guaranty and be submitted in accordance with Section B-2 of the General Provisions.

A-9 Acknowledgment of Addenda

The Contractor shall acknowledge receipt of all addenda received in the appropriate space provided in the proposal. Failure to do so will be interpreted as non-receipt. Since addenda can have significant impact on the proposal, failure to acknowledge receipt, and a subsequent interpretation of non-receipt, could have an adverse effect when determining the lowest responsible bidder.

A-10 Cooperation with Public Agencies

The Contractor shall cooperate with all public and private agencies with facilities operating within the limits of the Project. The Contractor shall provide a forty-eight (48) hour notice to any applicable agency when work is anticipated to proceed in the vicinity of any facility by using DIGTESS at 1.800.344.8377, the Lone Star Notification Company at 1.800.669.8344, Texas 811 and the Verizon Dig Alert at 1.800.483.6279.

For the Contractor's convenience, the following telephone numbers are listed.

A/E Project Manager / Engineer	Yesenia Singleton, PE LJA Engineering, Inc. 5350 S. Staples, Suite 425 Corpus Christi, TX 78411 Phone: 361.991.8550 Email: ysingleton@lja.com
Pipeline Technician III	Cory Daniels Enbridge, Inc. Phone: 631.269.7100 Cell: 361.412.8451
Director of Land Conservation	Jake Herring Coastal Bend Bays and Estuaries Program, Inc. Phone: 361.336.0309 Cell: 361.244.0258

A-11 Maintenance of Services

The Contractor shall take all precautions to protect existing utilities, both above and below ground. The Drawings show as much information as can be reasonably obtained from existing as-built drawings, base maps, utility records, etc. and from as much field work as normally deemed necessary for the construction of this type of project with regard to the location and nature of underground utilities, etc. However, the accuracy and completeness of such information is not guaranteed.

It is the Contractor's sole and complete responsibility to locate such underground features sufficiently in advance of his operations to preclude damaging the existing facilities. If the Contractor encounters utility services along the line of this work, it is his responsibility to maintain the services in continuous operation at his own expense. In the event of damage to underground utilities, whether shown in the drawings, the Contractor shall make the necessary repairs to place the utilities back in service to construct the work as intended at no increase in the Contract price. All such repairs must conform to the requirements of the company or agency that owns the utilities.

A-12 Area Access

All weather access must be provided at all times during construction. The Contractor must provide temporary matts, driveways and/or roads of approved material during wet weather. The Contractor must maintain a stockpile on the Project site to meet the demands of inclement weather.

The Contractor will be required to schedule his operations so as to cause minimum adverse impact of adjoining properties and wetlands.

A-13 Construction Equipment Spillage and Tracking

The Contractor shall keep the adjoining area free of tracked and/or spilled materials going to or from the construction area. Hand labor and/or mechanical equipment must be used where necessary to keep these roadways clear of job-related materials. Such work must be completed without any increase in the Contract price.

Site must be cleaned at the end of the workday or more frequently, if necessary, to prevent material from washing into the body of water. No visible material that could be washed into the river is allowed to remain on the Project site or adjoining streets.

A-14 Excavation and Removals

All existing concrete and debris within the limits of the Project must be removed unless otherwise noted. All necessary removals including but not limited to pipe, etc., are to be considered subsidiary to the bid item for "Street Excavation"; therefore, no direct payment will be made to the Contractor.

A-15 Disposal/Salvage of Materials

Excess material and other unwanted material will become the property of the Contractor and must be removed from the site by the Contractor. The cost of all hauling is considered subsidiary; therefore, no direct payment will be made to Contractor.

A-16 Schedule and Sequence of Construction

The Contractor shall submit to the Engineer a work plan based only on working days. This plan must detail the schedule of work and must be submitted to the Engineer at least three (3) working days prior to the pre-construction meeting. The plan must indicate the schedule of the following work items:

1. Initial Schedule: Submit to the Engineer three (3) days prior to the Pre-Construction Meeting an initial Construction Progress Schedule for review.
2. Items to Include: Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Identify the first workday of each week.
3. Submittal Dates: Indicate submittal dates required for all submittals.
4. Re-Submission: Revise and resubmit as required by the Engineer.
5. Periodic Update: Submit Updated Construction Progress Schedule to show actual progress of each stage by percentage against initial Schedule.

A-17 Construction Staking

The drawings depict lines, slopes, grades, sections, measurements, benchmarks, baselines, etc. that are normally required to construct a project of this nature. The Engineer shall furnish all control staking. Contractor shall furnish all construction staking.

A-18 Testing and Certification

The CBBEP shall provide material testing. All materials to be used in project construction shall be subject to testing. The preponderance of testing to be performed in this project is directly related to **MISSION RIVER DELTA CIRCUALTION ENHANCEMENT** a series of laboratory tests normally associated with this type of construction will be required, said tests being performed by an independent testing laboratory using qualified personnel. If TxDOT Specifications are referenced for material, Contractor shall perform testing required by that specification as part of submittals. The Contractor shall notify the Engineer at least one week prior to the contractor beginning construction. It is assumed that the preponderance of testing required in this project is testing related directly to paving, concrete, and utility construction. The following ratio of testing is established.

DENSITIES

Raw Subgrade ..... 1 per 200 LF of each lane/lift or 1 per 300 SY on paved areas
Curb/Gutter Subgrade ..... 1 per 200 LF curb and gutter
Base Material ..... 1 per 200 LF of each lane/lift or 1 per 300 SY on paved areas

BACKFILL DENSITY CONTROL

Utility Trench ..... 1 per 200 LF/Lift (1 per lift min)
Behind Curb and Gutter ..... 1 per 200 LF curb and gutter
Trench Under Roadways ..... 1 per 200 LF/Lift (1 per lift min)

PROCTORS

Raw Subgrade ..... 1 per each type material
Fill Material ..... 1 per 3,000 CY of material
Base Material ..... 1 per 3,000 CY
Bank Sand Backfill ..... 1 per each type of material source
Trench Backfill (Natural Material) ..... 1 per each type of material

BASE QUALIFICATION TESTS

Atterberg Limits and Gradation……..1 per 3,000 CY
Wet Ball Test ……1

CONCRETE (COMPRESSIVE STRENGTH TEST)

Curb/Gutter……1 set (3) per 500 LF
Sidewalks, Drives, Concrete Pavement……1 set (3) per 4,000 SF (1 set min)
Inlets……1 set (3) per 6 Inlets
Poured–In–Place Concrete Culvert (Ea) ……2 sets per each
Foundations……..2 sets per each

HOT MIX ASPHALTIC CONCRETE (HMAC)

Extraction, Sieve Analysis……per 500 tons or day
Lab Density & Stability……per 500 tons or day
Theoretical Density (Rice Method)……per 500 tons or day
Temperature – During Lay-Down ……continuous as needed
Thickness – In Place (Core) ……per 1000 LF street
% Air Voids – In Place (Core) …….. per 1000 LF street
% Theoretical Density – In Place (Core) ……per 1000 LF street

BANK SAND BACKFILL……Atterberg Limits & 1-minus #200 sieve analysis from source prior to delivery to site. Two Atterberg Limits & minus #200 sieve from onsite stockpiles when directed by project representative.

BANK SAND BEDDING & INITIAL BACKFILL…… Classification Tests, Sieve Analysis minus #200 sieve prior to delivery to site. Two additional of same from stockpile.

The above schedule is a minimum schedule for testing. Failures are not included. In the event of failures, additional tests will be required. If excessive rain occurs on a previously tested section, the Engineer shall order re-tests as necessary. Retests shall be at Contractors expense.

A-19 Surety Bonds

Paragraph two (2) of Section B-3-4 of the General Provisions is changed to read as follows: "No surety will be accepted by the CBBEP from any Surety Company who is now in default or delinquent on any bonds or who has an interest in any litigation against the CBBEP. All bonds must be issued by an approved Surety Company authorized to do business in the State of Texas.

If performance and payment bonds are in an amount in excess of ten percent (10%) of the Surety Company's capital and surplus, the Surety Company shall provide certification satisfactory to the CBBEP Attorney that the Surety Company has reinsured the portion of the bond amount that exceeds ten percent (10%) of the Surety Company's capital and surplus with reinsurer(s) authorized to do business in the State of Texas. The amount of the bond reinsured by any reinsurer may not exceed ten percent (10%) of the reinsurer's capital and surplus. For purposes of this section, the amount of allowed capital and surplus will be verified through the State Board of Insurance as of the date of the last annual statutory financial statement of the Surety Company or reinsurer authorized and admitted to do business in the State of Texas.

The Surety shall designate an agent who is a resident of Refugio County, Texas. Each bond must be executed by the Contractor and the Surety. For contracts in excess of $100,000 the bond must be executed by a Surety company that is certified by the United States Secretary of the Treasury or must obtain reinsurance for any liability in excess of $100,000 from a reinsurer that is certified by the United States Secretary of the Treasury and that meets all the above requirements. The insurer or reinsurer must be listed in the Federal Register as holding certificates of authority on the date the bond was issued."

A-20 Supplemental Insurance Requirements

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating: In the event of cancellation or material change that reduces or restricts the insurance afforded by this coverage part, each insurer covenants to mail prior written notice of cancellation or material change to:

1. Name: CBBEP
2. Address: 1305 n. Shoreline Blvd
   Corpus Christi, Texas 78401
3. Number of Days Advance Notice: 30

The Contractor shall provide to the Engineer the signed endorsements, or copies thereof certified by the insurer, within thirty (30) calendar days after the date the Engineer requests that the Contractor sign the Contract documents.

Within thirty (30) calendar days after the date the Engineer requests that the Contractor sign the Contract documents, the Contractor shall provide the Engineer with a certificate of insurance certifying that the Contractor provides worker's compensation insurance coverage for all employees of the Contractor employed on the Project described in the Contract.

For each insurance coverage provided in accordance with Section B-6-11 of the Contract, the Contractor shall obtain an endorsement to the applicable insurance policy, signed by the insurer, stating that the CBBEP and LJA Engineering, Inc. are an additional insured under the insurance policy. The CBBEP need not be named as additional insured on Worker's Compensation coverage.

For contractual liability insurance coverage obtained in accordance with Section B-6-11 (a) of the Contract, the Contractor shall obtain an endorsement to this coverage stating: Contractor agrees to indemnify, save harmless and defend the CBBEP, its agents, servants, and employees, and each of them against and hold it and them harmless from any and all lawsuits, claims, demands, liabilities, losses and expenses, including court costs and attorneys' fees, for or on account of any injury to any person, or any death at any time resulting from such injury, or any damage to any property, which may arise or which may be alleged to have arisen out of or in connection with the work covered by this Contract.

The foregoing indemnity shall apply except if such injury, death, or damage is caused directly by the negligence or other fault of the CBBEP, its agents, servants, or employees or any person indemnified hereunder.

A-21 Considerations for Contract Award and Execution

To allow the CBBEP to determine that the bidder is able to perform its obligations under the proposed contract, then prior to award, the CBBEP may require a bidder to provide documentation concerning:

1. Whether any liens have been filed against bidder for either failure to pay for services or materials supplied against any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the party holding the lien, the amount of the lien, the basis for the lien claim, and the date of the release of the lien. If any such lien has not been released, the bidder shall state why the claim has not been paid; and whether there are any outstanding unpaid claims against bidder for services or materials supplied which relate to any of its projects begun within the preceding two (2) years. The bidder shall specify the name and address of the claimant, the amount of the claim, the basis for the claim, and an explanation why the claim has not been paid.
2. A bidder may also be required to supply construction references and a financial statement, prepared no later than ninety (90) days prior to the CBBEP's request, signed and dated by the bidder's owner, president, or other authorized party, specifying all current assets and liabilities.

A-22 Contractor's Field Administration Staff

The Contractor shall employ for this Project, as its field administration staff, superintendents and foremen who are careful and competent and acceptable to the CBBEP. The criteria upon which the CBBEP makes this determination may include the following:

1. The superintendent must have at least **five (5) years** experience in the day-to-day field management and oversight of projects of a similar size and complexity to this Project. This experience must include, but is not limited to, scheduling of manpower and materials, safety, coordination of subcontractors, and familiarity with the submittal process and contract close-out procedures.
2. The foreman must have at least **five (5) years** experience in oversight and management of the work of various subcontractors and crafts. If the scope of the Project is such that a foreman is not required, the Contractor's superintendent shall assume the responsibilities of a foreman.

Documentation concerning these matters will be reviewed by the CBBEP. The Contractor's field administration staff, and any subsequent substitutions or replacements thereto, must be approved by the CBBEP in writing prior to such superintendent or foreman assuming responsibilities on the Project. Such written approval of field administration staff is a prerequisite to the CBBEP's obligation to execute a contract for this Project. If such approval is not obtained, the award may be rescinded. Further, such written approval is also necessary prior to a change in field administration staff during the term of this Contract. If the Contractor fails to obtain prior written approval of the CBBEP concerning any substitutions or replacements in its field administration staff for this Project during the term of the Contract, such a failure constitutes a basis to annul the Contract pursuant to section B-7-13.

A-23 Amended "Consideration of Contract" Requirements

Under "General Provisions and Requirements for Municipal Construction Contracts" Section B-3-1 Consideration of Contract add the following text: Within five (5) working days following the public opening and reading of the proposals, the three (3) apparent lowest bidders (based on the Base Bid only) must submit to the Engineer the following information:

1. A list of the major components of the work,
2. A list of the products to be incorporated into the Project,
3. A schedule of values which specifies estimates of the cost for each major component of the work,
4. A schedule of anticipated monthly payments for the Project duration. A list of subcontractors that will be working on the Project. This list may contain more than one subcontractor for major components of the work if the Contractor has not completed his evaluation of which subcontractor will perform the work. The Engineer retains the right to approve all subcontractors that will perform work on the Project. The Contractor shall obtain written approval by the Engineer of all of its subcontractors prior to beginning work on the Project. If the Engineer does not approve all proposed subcontractors, it may rescind the Contract award. In the event that a subcontractor previously listed and approved is sought to be substituted for or replaced during the term of the Contract, then the Engineer retains the right to approve any substitute or replacement subcontractor prior to its participation in the Project. Such approval will not be given if the replacement of the subcontractor will result in an increase in the Contract price. Failure of the Contractor to comply with this provision constitutes a basis upon which to annul the Contract pursuant to Section B-7-13,
5. A preliminary progress schedule indicating relationships between the major components of the work. The final progress schedule must be submitted to the CBBEP at the pre-construction conference,
6. Documentation required pursuant to the Special Provisions A-21 and A-22 concerning Considerations for Contract Award and Execution and the Contractor's Field Administration Staff.
7. Within five (5) days following bid opening, submit in letter form, information identifying type of entity and state, i.e., Texas (or other state) Corporation or Partnership, and name(s) and Title(s) of individual(s) authorized to execute contracts on behalf of said entity.

A-24 Amended Policy on Extra Work and Change Orders

Under "General Provisions and Requirements for Municipal Construction Contracts" B-8-5 Policy on Extra Work and Change Orders the present text is deleted and replaced with the following: Contractor acknowledges that the CBBEP has no obligation to pay for any extra work for which a change order has not been signed by the Executive Director or his designee.

The Contractor also acknowledges that the CBBEP Executive Director may authorize change orders, which do not exceed $25,000.00. The Contractor acknowledges that any change orders in an amount in excess of $25,000.00 must also be approved by the CBBEP.

A-25 Conditions of Work

Each bidder must familiarize himself fully with the conditions relating to the completion of the Project. Failure to do so will not excuse a bidder of his obligation to carry out the provisions of this Contract. Contractor is reminded to attend the **Pre-Bid Meeting referred to in Special Provision A-1**.

A-26 Precedence of Contract Documents

In case of conflict in the Contract documents, first precedence will be given to addenda issued during the bidding phase of the Project, second precedence will be given to the Special Provisions, third precedence will be given to the construction plans, fourth precedence will be given to the Standard Specifications and the General Provisions will be given last precedence. In the event of a conflict between any of the Standard Specifications with any other referenced specifications, such as the Texas Department of Public Transportation Standard Specifications for Highways, Streets and Bridges, ASTM specifications, etc., the precedence will be given to TxDOT Standard Specifications addenda, Special Provisions and Supplemental Special Provisions (if applicable), construction plans, referenced specifications, Standard Specifications, and General Provisions, in that order.

A-27 Other Submittals

See Specification Item 013010 “Contractor Submittals”.

1. Shop Drawing Submittal: The Contractor shall follow the procedure outlined below when processing Shop Drawing submittals:
    a. Quantity: Contractor shall submit number required by the CBBEP to the Engineer or his designated representative.
    b. Submittal Transmittal Forms: Contractor shall use the Submittal Transmittal Form attached at the end of this Section; and sequentially number each transmittal form. Resubmittals must have the original submittal number with an alphabetic suffix. Contractor must identify the Contractor, the Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate, on each submittal form.
    c. Contractor's Stamp: Contractor must apply Contractor's stamp, appropriately signed or initialed, which certifies that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information, is all in accordance with the requirements of the Project and Contract documents.
    d. Scheduling: Contractor must schedule the submittals to expedite the Project, and deliver to the Engineer for approval, and coordinate the submission of related items.
    e. Marking: Contractor must mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
    f. Variations: Contractor must identify any proposed variations from the Contract documents and any Product or system limitations which may be detrimental to successful performance of the completed work.
    g. Space Requirements: Contractor must provide adequate space for Contractor and Engineer review stamps on all submittal forms.
    h. Re-submittals: Contractor must revise and resubmit submittals as required by Engineer and clearly identify all changes made since previous submittal.
    i. Distribution: Contractor must distribute copies of reviewed submittals to subcontractors and suppliers and instruct subcontractors and suppliers to promptly report, through Contractor, any inability to comply with provisions.
2. Samples: The Contractor must submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Engineer's selection.
3. Test and Repair Report: When specified in the Technical Specifications Section, Contractor must submit three (3) copies of all shop test data, and repair report, and all on-site test data within the specified time to the Engineer for approval. Otherwise, the related equipment will not be approved for use on the project.

A-28 OSHA Rules & Regulations

It is the responsibility of the Contractor(s) to adhere to all applicable OSHA rules and regulations while performing any, and all CBBEP-related projects and or jobs.

A-29 Amended Indemnification & Hold Harmless

Under "General Provisions and Requirements for Construction Contracts" B-6-21 Indemnification & Hold Harmless, text is deleted in its entirety and the following is substituted in lieu thereof: The Contractor shall hold the CBBEP, its officials, employees, attorneys, and agents harmless and shall indemnify the CBBEP, its officials, employees, attorneys, and agents from any and all damages, injury or liability whatsoever from an act or omission of the contractor, or any subcontractor, supplier, material man, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the contractor, or any subcontractor, supplier, material man, or their officials, employees, agents, or consultants.

The contractor shall hold the CBBEP, its officials, employees, attorneys, and agents harmless and shall indemnify the CBBEP, its officials, employees, attorneys, and agents from any, and all damages, injury, or liability whatsoever from a negligent act or omission of the CBBEP, its officials, employees, attorneys, and agents that directly or indirectly causes injury to an employee of the contractor, or any subcontractor, supplier, or material man.

A-30 Change Orders

Should a change order(s) be required by the Engineer, Contractor shall furnish the Engineer a complete breakdown as to all prices charged for work of the change order (unit prices, hourly rates, sub-contractor's costs and breakdowns, cost of materials and equipment, wage rates, etc.). This breakdown information shall be submitted by contractor as a basis for the price of the change order.

A-31 As-Built Dimensions and Drawings

1. Contractor shall make appropriate daily measurements of facilities constructed and keep accurate records of location (horizontal and vertical) of all facilities.
2. Upon completion of each facility, the Contractor shall furnish Owner with one set of direct prints, marked with red pencil, to show as-built dimensions and locations of all work constructed. As a minimum, the final drawings shall include the following:
   a. Horizontal and vertical dimensions due to substitutions/field changes.
   b. Changes in equipment and dimensions due to substitutions.
   c. "Nameplate" data on all installed equipment.
   d. Deletions, additions, and changes to scope of work.
   e. Any other changes made.

A-32 Pre-Construction Exploratory Excavations

Prior to any construction whatever on the project, Contractor shall excavate and expose all existing pipelines of the project that cross within 20-feet of proposed pipelines of the project and Contractor shall survey the exact vertical and horizontal location of each crossing and potentially conflicting pipeline. For existing pipelines which parallel and are within ten feet (10') of proposed pipelines of the project, Contractor shall excavate, and expose said exiting pipelines at a maximum of 300-feet O.C. and Contractor shall survey the accurate horizontal and vertical locations of said parallel pipelines at 300-feet maximum O.C.

Contractor shall then prepare a report and submit it to the CBBEP for approval indicating the Owner of pipelines excavated and surveyed, as well as the approximate station thereof, distance to the pavement centerline and elevations of the top of existing pipelines.

Contractor shall perform no construction work on the project until all exploratory excavations have been made in their entirety, the results thereof reported to the Engineer and until Contractor receives Engineer's approval of report. Contractor shall provide all his own survey work effort (no separate pay) for exploratory excavations.

A-33 Overhead Electrical Wires

Contractor shall comply with all OSHA safety requirements with regard to proximity of construction equipment beneath overhead electrical wires. There are many overhead wires crossing the construction route and along the construction route. Contractor shall use all due diligence, precautions, etc., to ensure that adequate safety is provided for all of his employees and operators of equipment and with regard to ensuring that no damage to existing overhead electrical wires or facilities occurs.

Contractor shall coordinate his work with AEP and inform AEP of his construction schedule with regard to said overhead lines and owner poles to be secure or relocated. Some overhead lines are shown in the construction plans, while others are not. It shall be the Contractor's sole responsibility to provide adequate safety with regard to overhead lines whether shown in the plans or not.

A-34 Mobilization and Demobilization Bid Item

The Mobilization and Demobilization Bid Item shall include bonds, insurance, mobilization, demobilization and shall not be greater than 5% of the total base bid. Seventy-Five percent (75%) of the item will be paid upon mobilization on the job and twenty-five percent (25%) will be paid upon job completion and demobilization.

A-35 Allowance for Unanticipated Adjustments

The item included in the Base Bid described as "Allowance for Unanticipated Adjustments" has been set as noted and shall be included in the Total Base Bid for each bidder. This allowance may be used at the Engineer’s discretion should an unanticipated adjustment of existing or planned improvements or heretofore unknown structure or similar situation warrant the use of the allowance funds. Should the use of funds from the allowance become necessary, the Engineer will provide written authorization at a cost negotiated between the CBBEP and the Contractor. There is no guarantee that any of these funds will be needed to be used throughout the course of the work.

A-36 Storm Water Pollution Prevention Plan

This project requires you to have a Notice of Intent (NOI) submitted as per Part II.D of the TPDES General Permit No. TXR150000. The Contractor will be required to submit an NOI along with the appropriate fee and complete a Construction Site Notice for this Project. The Contractor is required to provide copies of the NOI and Construction Site Notice to the CBBEP prior to commencement of any construction activities. The Contractor is also required to post a signed copy of the NOI and Construction Site Notice at the construction site in a conspicuous location where it is readily available for viewing by the public, local, state and federal authorities, prior to commencement of any construction activities. The Contractor will be required to submit a Notice of Termination (NOT) upon completion of this Project. The Contractor shall adhere to the requirements of the Storm Water Pollution Prevention Plan as per the drawings and specification 022410 “Stormwater Pollution Prevention” contained in the Contract Documents.

A-38 Permits

A nationwide USACE permit will be required for this project. The Engineer will obtain the permit and furnish to Contractor. Permit is attached in this set of contract documents as Appendix B.

A-39 Materials - Buy America

Contractor shall comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law and applicable CFR, which restrict funds being made available from Federal financial assistance programs unless all the iron products, steel products, manufactured products, and construction materials used in the project are produced in the United States.

SUBMITTAL TRANSMITTAL FORM

Project: Mission River Delta Circulation Enhancement

Owner: Coastal Bend Bays & Estuaries, Inc. (CBBEP)

Engineer: LJA Engineering, Inc.

Contractor: _____

Submittal Date: _____ **Submittal Number:** _____

Applicable Spec/Drawing	Submittal
025223	Crushed Limestone Flexible Base
027402	Reinforced Concrete Pipe Culverts
027404	Concrete Box Culverts
030020	Portland Cement Concrete
032020	Reinforcing Steel
037040	Epoxy Compounds
038000	Concrete Structures
038020	Cement Stabilized Sand

VII-A.
NOTICE TO CONTRACTORS “A”
INSURANCE REQUIREMENTS

VII-A.

NOTICE TO CONTRACTORS "A" INSURANCE REQUIREMENTS

A Certificate of Insurance indicating proof of coverage in the following amounts is required:

TYPE OF INSURANCE	MINIMUM INSURANCE COVERAGE
30-Day Notice of Cancellation Required on all Certificates	**Bodily Injury/Property Damage Per Occurrence/ Aggregate**
Commercial General Liability Including: 1. Commercial Form 2. Premises - Operations 3. Explosion and Collapse Hazard 4. Underground Hazard 5. Products/ Completed Operations Hazard 6. Contractual Liability 7. Broad Form Property Damage 8. Independent Contractors 9. Personal Injury	$2,000,000 Combined Single Limit
Automobile Liability Owned/Non-Owned or Rented	$1,000,000 Combined Single Limit Rented
Worker's Compensation Employer's Liability	Complies with the Texas Worker's Compensation Act & Paragraph II of this Exhibit. $500,000
Excess Liability	$1,000,000 Combined Single Limit
Professional Pollution Liability/Environmental Impairment Coverage Not limited to sudden & accidental discharge; to include long-term environmental impact for the disposal of contaminants	$2,000,000 Combined Single Limit ☐ Required ☒ Not Required
Builder's Risk	See Section B-6-11 & Supplemental Insurance Requirements ☐ Required ☒ Not Required
Installation Floater	See Section B-6-11 & Supplemental Insurance Requirements ☐ Required ☒ Not Required

The **Coastal Bend Bays & Estuaries Program, Inc. and LJA Engineering, Inc.** must be named as **additional insured** on all coverages except worker's compensation liability coverage.

The **Project Name** must be listed under "description of operations" on each certificate of insurance.

VII-B.
NOTICE TO CONTRACTORS "B"
WORKERS COMPENSATION
INSURANCE REQUIREMENTS

VII-B.
NOTICE TO CONTRACTORS "B"
WORKERS COMPENSATION INSURANCE REQUIREMENTS

TEXAS ADMINISTRATIVE CODE

TITLE 28: INSURANCE
PART 2: TEXAS DEPT. OF INSURANCE, DIVISION OF WORKER'S COMPENSATION
CHAPTER 110: REQUIRED NOTICES OF COVERAGE
SUBCHAPTER B: EMPLOYER NOTICES
RULE§110.110: REPORTING REQUIREMENTS FOR BUILDING OR CONSTRUCTION PROJECTS FOR GOVERNMENTAL ENTITIES

A. The following words and terms, when used in this rule, shall have the following meanings, unless the context clearly indicates otherwise. Terms not defined in this rule shall have the meaning defined in the Texas Labor Code, if so defined.

(1) Certificate of coverage (certificate). A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a workers' compensation coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.

(2) Certificate of coverage (certificate). A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a workers' compensation coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees (including those subject to a coverage agreement) providing services on a project, for the duration of the project.

(3) Building or construction. Has the meaning defined in the Texas Labor Code, §406.096(e) (l).

(4) Contractor. A person bidding for or awarded a building or construction project by a governmental entity.

(5) Coverage. Workers' compensation insurance meeting the statutory requirements of the Texas Labor Code, §401.011(44).

(6) Coverage agreement-A written agreement on form TWCC-81, form TWCC-82, form TWCC-83, or form TWCC-84, filed with the Texas Workers' Compensation Commission which establishes a relationship between the parties for purposes of the Texas Workers' Compensation Act, pursuant to the Texas Labor Code, Chapter 406, Subchapters F and G, as one of employer/employee and establishes who will be responsible for providing workers' compensation coverage for persons providing services on the project.

(7) Duration of the project. Includes the time from the beginning of work on the project until the work on the project has been completed and accepted by the governmental entity.

(8) Persons providing services on the project ("subcontractor" in §406.096 of the Act). With the exception of persons excluded under subsections (h) and (i) of this section, includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes but is not limited to independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity furnishing persons to perform services on the project. "Services" includes but is not limited to 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) Project. Includes the provision of all services related to a building or construction contract for a governmental entity.

B. Providing or causing to be provided a certificate of coverage pursuant to this rule is a representation by the insured that all employees of the insured who are providing services on the project are covered by workers' compensation coverage, that the coverage is based on proper reporting of classification codes and payroll amounts, and that all coverage agreements have been 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 certificates of coverage, or failing to provide or maintain required coverage, or failing to report any change that materially affects the provision of coverage may subject the contractor or other person providing services on the project to administrative penalties, criminal penalties, civil penalties, or other civil actions.

C. A governmental entity that enters into a building or construction contract on a project shall:

(1) include in the bid specifications, all the provisions of paragraph (7) of this subsection, using the language required by paragraph (7) of this subsection;

(2) as part of the contract, using the language required by paragraph (7) of this subsection, require the contractor to perform as required in subsection (d) of this section;

(3) obtain from the contractor a certificate of coverage for each person providing services on the project, prior to that person beginning work on the project;

(4) obtain from the contractor a new certificate of coverage showing extension of coverage:

(a) before the end of the current coverage period, if the contractor's current certificate of coverage shows that the coverage period ends during the duration of the project; and

(b) no later than seven days after the expiration of the coverage for each other person providing services on the project whose current certificate shows that the coverage period ends during the duration of the project;

(5) retain certificates of coverage on file for the duration of the project and for three years thereafter;

(6) provide a copy of the certificates of coverage to the commission upon request and to any person entitled to them by law; and

(7) use the language contained in the following Figure 1 for bid specifications and contracts, without any additional words or changes, except those required to accommodate the specific document in which they are contained or to impose stricter standards of documentation: Attached Graphic

D. A contractor shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage showing workers' compensation coverage to the governmental entity prior to beginning work on the project;

(3) provide the governmental entity, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown

on the contractor's current certificate of coverage ends during the duration of the project;

(4) obtain from each person providing services on a project, and provide to the governmental entity:
   (a) 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
   (b) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within ten 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;

(7) post a notice on each project site informing all persons providing services on the project that they are required to be covered, and stating how a person may verify current coverage and report failure to provide coverage. This notice does not satisfy other posting requirements imposed by the Act or other commission rules. This notice must be printed with a title in at least 30 point bold type and text in at least 19 point normal type, and shall be in both English and Spanish and any other language common to the worker population. The text for the notices shall be the following text provided by the commission on the sample notice, without any additional words or changes: Attached Graphic

(8) contractually require each person with whom it contracts to provide services on a project to:
   (a) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;
   (b) provide a certificate of coverage to the contractor prior to that person beginning work on the project;
   (c) include in all contracts to provide services on the project the language in subsection (e)(3) of this section;
   (d) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
   (e) obtain from each other person with whom it contracts, and provide to the contractor:
      (i) a certificate of coverage, prior to the other person beginning work on the project;
      (ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;
   (f) retain all required certificates of coverage on file for the duration of the project and for one year thereafter.
   (g) notify the governmental entity in writing by certified mail or personal delivery, within ten 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

(h) contractually require each other person with whom it contract, to perform as required by subparagraphs (A)-(H) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

E. A person providing services on a project, other than a contractor, shall:

(1) provide coverage for its employees providing services on a project, for the duration of the project based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements;

(2) provide a certificate of coverage as required by its contract to provide services on the project, prior to beginning work on the project;

(3) have the following language in its contract to provide services on the project: "By signing this contract or providing or causing to be provided a certificate of coverage, the person signing this contract is representing to the governmental entity that all employees of the person signing this contract who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions."

(4) provide the person for whom it is providing services on the project, prior to the end of the coverage period shown on its current certificate of coverage, a new certificate showing extension of coverage, if the coverage period shown on the certificate of coverage ends during the duration of the project;

(5) obtain from each person providing services on a project under contract to it, and provide as required by its contract:

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

(b) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(6) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(7) notify the governmental entity in writing by certified mail or personal delivery, of any change that materially affects the provision of coverage of any person providing services on the project and send the notice within ten days after the person knew or should have known of the change; and

(8) contractually require each other person with whom it contracts to:

(a) provide coverage based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements for all of its employees providing services on the project, for the duration of the project;

(b) provide a certificate of coverage to it prior to that other person beginning work on the project;

(c) include in all contracts to provide services on the project the language in paragraph (3) of this subsection;

(d) provide, prior to the end of the coverage period, a new certificate of coverage

showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

(e) obtain from each other person under contract to it to provide services on the project, and provide as required by its contract:
  (i) a certificate of coverage, prior to the other person beginning work on the project; and
  (ii) prior to the end of the coverage period, a new certificate of coverage showing extension of the coverage period, if the coverage period shown on the current certificate of coverage ends during the duration of the contract;

(f) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(g) notify the governmental entity in writing by certified mail or personal delivery, within ten 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

(h) contractually require each person with whom it contracts, to perform as required by this subparagraph and subparagraphs (A)-(G) of this paragraph, with the certificate of coverage to be provided to the person for whom they are providing services.

If any provision of this rule or its application to any person or circumstance is held invalid, the invalidity does not affect other provisions or applications of this rule that can be given effect without the invalid provision or application, and to this end the provisions of this rule are declared to be severable.

This rule is applicable for building or construction contracts advertised for bid by a governmental entity on or after September 1,1994. This rule is also applicable for those building or construction contracts entered into on or after September 1, 1994, which are not required by law to be advertised for bid.

The coverage requirement in this rule does not apply to motor carriers who are required pursuant to Texas Civil Statutes, Article 6675c, to register with the Texas Department of Transportation and who provide accidental insurance coverage pursuant to Texas Civil Statutes, Article 6675c, §4(j).

The coverage requirement in this rule does not apply to sole proprietors, partners, and corporate officers who meet the requirements of the Act, §406.097(c), and who are explicitly excluded from coverage in accordance with the Act, §406.097(a) (as added by House Bill 1089, 74th Legislature, 1995, §1.20). This subsection applies only to sole proprietors, partners, and corporate executive officers who are excluded from coverage in an insurance policy or certificate of authority to self-insure that is delivered, issued for delivery, or renewed on or after January 1, 1996.

Source Note: *The provisions of this §110.110 adopted to be effective September 1, 1994, TexReg 5715; amended to be effective November 6, 1995, 20 TexReg 8609*

T28S110.110(d)(7)
Required Worker's Compensation Coverage: "The law requires that each person working on this site or providing services related to this construction project must be covered by workers' compensation insurance. This includes persons providing, hauling, or delivering equipment or materials, or providing labor or transportation or other service related to the project, regardless of the identity of their employer or status as an employee".

"Call the Texas Workers' Compensation Commission at 512-440-3789 to receive information on the legal requirement for coverage, to verify whether your employer has provided the required coverage, or to report an employer's failure to provide coverage".

T28S110.110(c)(7)
Workers' Compensation Insurance Coverage:

A. Definitions

Certificate of coverage ("certificate"). A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement (TWCC-81, TWCC-82, TWCC-83, or TWCC-84), showing statutory workers' compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

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.

Persons providing services on the project ("subcontractor" in §406.096). Includes all persons or entities performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity, or employees of any entity which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or delivering equipment or materials, or providing labor, transportation, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries, and delivery of portable toilets.

B. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all employees of the contractor providing services on the project, for the duration of the project.

C. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

D. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

E. The contractor shall obtain from each person providing services on a project, and provide to the governmental entity:

(1) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage showing coverage for all persons providing services on the project; and

(2) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

F. The contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

G. The contractor shall notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the contractor knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project.

H. The contractor shall post on each project site a notice, in the text, form and manner prescribed by the Texas Workers' Compensation Commission, informing all persons providing services on the project that they are required to be covered, and stating how a person may verify coverage and report lack of coverage.

I. The contractor shall contractually require each person with whom it contracts to provide services on a project, to:

(1) provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements, which meets the statutory requirements of Texas Labor Code, Section 401.011(44) for all of its employees providing services on the project, for the duration of the project;

(2) provide to the contractor, prior to that person beginning work on the project, a certificate of coverage showing that coverage is being provided for all employees of the person providing services on the project, for the duration of the project;

(3) provide the contractor, prior to the end of the coverage period, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project;

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

(5) retain all required certificates of coverage on file for the duration of the project and for one year thereafter;

(6) notify the governmental entity in writing by certified mail or personal delivery, within 10 days after the person knew or should have known, of any change that materially affects the provision of coverage of any person providing services on the project; and

(7) contractually require each person with whom it contracts, to perform as required by paragraphs (1)-(7), with the certificates of coverage to be provided to the person for whom they are providing services.

J. By signing this contract or providing or causing to be provided a certificate of coverage, the contractor is representing to the governmental entity that all employees of the contractor who will provide services on the project will be covered by workers' compensation coverage for the duration of the project, that the coverage will be based on proper reporting of classification codes and payroll amounts, and that all coverage agreements will be filed with the appropriate insurance carrier or, in the case of a self-insured, with the commission's Division of Self-Insurance Regulation. Providing false or misleading information may subject the contractor to administrative penalties, criminal penalties, civil penalties, or other civil actions.

K. The contractor's failure to comply with any of these provisions is a breach of contract by the contractor which entitles the governmental entity to declare the contract void if the contractor does not remedy the breach within ten days after receipt of notice of breach from the governmental entity.

VIII.
GENERAL PROVISIONS OF THE AGREEMENT

VIII.
GENERAL PROVISIONS OF THE AGREEMENT

B-1 DEFINITIONS AND ABBREVIATIONS

B-1-1 Definition of Terms Wherever the words, forms or phrases defined herein, or pronouns used in their place occur in these specifications, in the contract, in the bonds, in the advertisement or any other documents or instrument herein contemplated, or to which these specifications apply or may apply, the intent and meaning shall be interpreted as follows:

Advertisement All of the legal publications pertaining to the work contemplated or under contract.

Bidder Any person, persons, partnership, company, firm, association, corporation, or joint venture acting directly or through a duly authorized representative submitting a proposal for work contemplated.

CBBEP (Also called **Owner**) The Coastal Bend Bays & Estuaries Program, Inc., a non-profit organization, acting by and through (a) its governing body or (b) its Executive Director, each of whom is required by Charter to perform specific duties. Responsibility for final enforcement of contracts involving the CBBEP is, by Charter, vested in the Executive Director.

CBBEP Attorney The CBBEP Attorney of the Coastal Bend Bays & Estuaries Program, Inc., or duly authorized assistants or agents.

Contract The written agreement covering the performance of the work. The contract includes the advertisement; proposal; specifications, including special provisions; plans or working drawings; any supplemental changes or agreements pertaining to the work or materials therefore, and bonds.

Contract Time The number of calendar days or working days allowed for completion of the contract, including any authorized time extensions.

Calendar Day A calendar day is defined as any day shown on the calendar beginning and ending at midnight.

Working Day A working day is defined as a calendar day, not including Sundays or legal holidays, in which the weather or other conditions affecting the site, not under the control of the Contractor, will in the judgment of the Engineer permit the performance of some substantial unit of work for a substantially continuous period of time of not less than six (6) hours between 7:00 AM and 8:00 PM, or during such other hours of the day as the Contractor does in fact work with the permission of the Engineer as elsewhere provided.

Each calendar day, not including Sundays or legal holidays, in which the Contractor carries on work on some unit of the contract for a period of more than six (6) hours shall be charged as one (1) working day, regardless of the number of hours worked in excess of the (6) hour minimum. Saturday will not be charged as a working day unless work of any type requiring the presence of the Engineer is in fact carried on for any period of time during the day.

On Sundays and legal holidays on which, by previous written permission of the Engineer as elsewhere provided the Contractor works as much as four hours on some unit of the contract, two working days shall be charged. If, under such permission, work is commenced but proceeds less than four hours, one working day shall be charged. In the determination of the hours above, no deduction shall be made for lunch time taken.

Contractor The person, persons, partnership, company, firm, association, corporation, or joint venture entering into the contract for the execution of the work, acting directly or through a duly authorized representative.

Engineer The Consulting Engineer retained by the CBBEP for this project. LJA Engineering, Inc. (LJA).

General Provisions This Section B of the specifications.

Holidays The terms regular holidays and legal holidays, for the purposes of charging working days, control of working days and hours, and wages of employees, shall include the following: January 1 (New Year's Day) July 4 (Independence Day) Thanksgiving Days, Memorial Day, Labor Day, and Christmas Day.

Maintenance Guaranty The approved form of security furnished by the Contractor and his surety as a guarantee that he will maintain the work constructed by him in good condition for the period of time required. This shall be in accordance with the provisions of the specifications and may be made a part of the Performance Bond.

Payment Bond The approved form of security furnished by the contractor and his surety for the use and benefit of the CBBEP as a guarantee for the protection of all claimants supplying labor and/or material in the prosecution of the work provided for in this contract.

Performance Bond The approved form of security furnished by the contractor and his surety for the use and benefit of the CBBEP as a guarantee of good faith on the part of the Contractor to execute the work in strict accordance with the plans, specifications, and terms of the contract, and that the Contractor will maintain the work constructed by him in good condition for the period of one year or such other period of time as may be specially provided.

Plan or Plans All the drawings pertaining to the contract and made a part thereof, including such supplemental drawings or addenda as the Engineer may issue in order to clarify other drawings or for the purpose of showing changes in the work hereinafter authorized, or for showing details not shown thereon.

Proposal The written statement or statements duly filed with the CBBEP, persons, partnership, company, firm, association, corporation, or joint venture proposing to do the work contemplated, including the approved form on which the formal bids for the work are to be prepared.

Proposal Guaranty The bid security designated in the advertisement and proposal to be furnished by each bidder as a guarantee of good faith to enter into a contract with the CBBEP and execute the required bonds for the work contemplated after the work is awarded to him.

Special Provisions The special clauses setting forth conditions or requirements peculiar to the specific project involved, supplementing the standard specifications, and taking precedence over any conditions or requirements of the standard specifications with which they are in conflict.

Specifications The directions, provisions, and requirements contained herein, together with the special provisions supplemental hereto, pertaining to the method and manner of performing the work or to the qualities or quantities of the material to be furnished under the contract.

Sureties The corporate bodies which are bound by such bonds as are required with and for the Contractor.

The Work All work, including the furnishing of labor, materials, tools, equipment, and incidentals, to be performed by the Contractor under the terms of the contract.

B-1-2 Abbreviations

Wherever the abbreviations defined herein occur on the plans, in the specifications, contract, bonds, advertisement, proposal, or in any other document or instrument herein contemplated or to which the specifications apply or may apply, the intent and meaning shall be as follows:

A.A.S.H.T.O.	American Association of State Hwy & Transportation Officials	H.N.G.	Houston Natural Gas Co.
Ac.	Acre	H.S.	Horseshoe
A.C.	Asbestos Cement	In. or "	Inches
A.C.I.	American Concrete Institute	Lb. or #	Pound
A.N.S.I.	American National Standards Institute	L.F.	Linear Foot
Asph.	Asphalt	Lin.	Linear
A.S.T.M.	American Society for Testing Materials	L.S.	Lump Sum
Ave.	Avenue	Max.	Maximum
A.W.P.A.	American Wood Preservers Association	M.H.	Manhole
A.W.S.	American Welding Society	Min.	Minimum
A.W.W.A.	American Water Works Association	Mono.	Monolithic
Blvd.	Boulevard	M.U.T.C.D.	Manual of Uniform Traffic Control Devices
C.F.	Cubic Foot	N.	North
C.I.	Cast Iron	No.	Number
C.L.	Center Line	%	Percent
C.M.P.	Corrugated Metal Pipe	P.L.	Property Line
C.O.	Cleanout	Prop.	Proposed or Property
Conc.	Concrete	P.V.C.	Poly Vinyl Chloride
Cond.	Conduit	R.	Radius
Corr.	Corrugated	R.C.P.	Reinforced Concrete Pipe
C.P. & L.	Central Power & Light Company	Reinf.	Reinforced
Cu.	Cubic	Rem.	Remove
Culv.	Culvert	Rep.	Replace
C.Y.	Cubic Yard	R.R.	Railroad
D.I.	Ductile Iron	R/W or ROW	Right-of-Way
Dia.	Diameter	S.	South
Dr. or Dwy	Drive or Driveway	San.	Sanitary
E.	East	S.F.	Square Foot
Ea.	Each	Sq.	Square
Elev.	Elevation	St.	Street or Storm
Exist.	Existing	Std.	Standard
F.	Fahrenheit	S.Y.	Square yard
F.L.	Flow Line	T.C.	Top of Curb
Ft. or '	Feet	Tel.	Telephone
Gal.	Gallon	V.F.	Vertical Foot
G.L.	Gutter Line	W.	West
G.P.M.	Gallons per Minute	W.U.T.	Western Union Telegraph
		Yd.	Yard
Metrics:			
cm	Centimeter		
gm	Gram	m	Meter
kgm	Kilogram	mgm	Milligram
km	Kilometer	mm	Millimeter

Other abbreviations that may appear shall have the meaning customarily intended in such usage, circumstances, and context.

B-2 PROPOSAL REQUIREMENTS AND CONDITIONS

B-2-1 Proposal Form

The CBBEP will furnish bidders with proposal forms which state the general location and description of the contemplated work, and which will contain an itemized list of items of work to be done or materials to be furnished, and upon which bid prices are asked. The proposal form will provide for the amount of proposal guaranty, the contract time, and the acknowledgement of addenda received.

B-2-2 Quantities in Proposal Form

The quantities of the work and materials set forth in the proposal form or on the plans approximately represent the work to be performed and materials to be furnished and are for the purpose of comparing the bids on a uniform basis. Payment will be made by the CBBEP to the Contractor only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications, and it is understood that the quantities may be increased or decreased as hereinafter provided without in any way invalidating the bid price.

B-2-3 Examination of Plans, Specifications, and Site of the Work

Bidders are advised that the plans and specifications and other documents on file with the Engineer shall constitute all of the information which the CBBEP will furnish. Bidders are required, prior to submitting any proposal, to read the specifications, proposal, contract, and bond forms carefully; to visit the site of the work; to examine carefully local conditions, soil and water conditions to be encountered, improvements to be protected, disposal sites for surplus materials not designated to be salvaged materials, methods of providing ingress or egress to private properties, and methods of handling traffic; to inform themselves, by their independent research, tests, and investigation, of the difficulties to be encountered and judge for themselves of the accessibility of the work and all attending circumstances affecting the cost of doing the work or time required for its completion; and obtain all information required to make an intelligent proposal. No information given by the CBBEP or any official thereof, other than that shown on the plans and contained in the specifications, proposal, and other documents, shall be binding upon the CBBEP. Bidders shall rely exclusively upon their own estimates, investigations, tests, and other data which are necessary for full and complete information upon which the proposal may be based. It is mutually agreed that submission of a proposal is evidence that the bidder has made the examinations, investigations, and tests required herein.

B-2-4 Forms, Plans and Specifications

Unless otherwise specified in the Notice to Bidders and Special Provisions, forms of proposal, contract and bonds and plans and specifications may be obtained at the offices of the Engineer, LJA Engineering, Inc., 5350 S. Staples Street, Suite 425, Corpus Christi, Texas 78411.

B-2-5 Addenda

Addenda to the plans and specifications, which are formal written notices of additions, deletions, modifications, or explanations of contract documents from the CBBEP to prospective bidders in advance of the bid date, may be issued by the Engineer. Such addenda will be mailed immediately to the address designated by prospective bidders taking out plans, specifications, and proposal forms.

B-2-6 Pre-Bid Conference

See Special Provisions for Time and Location of Pre-Bid Conference.

B-2-7 Preparation of Proposal

The bidder shall submit his proposal on the forms furnished by the CBBEP. All blank spaces in the forms shall be correctly filled in, and the bidder shall state the prices, written in ink, for which he proposes to do the work contemplated or furnish the material required; the unit prices shall be written both in words and numerals. Such prices shall be written distinctly legible. The unit price shall govern over the amount. If the proposal is submitted by an individual, his name must be signed by him or his duly authorized agent.

If the proposal is submitted by a firm, association, or partnership, the name and address of each member must be given and the proposal signed by a member of the firm, association, or partnership, or person duly authorized. If the proposal is submitted by a company or corporation, the company or corporate name and business address must be given, and the proposal signed by an official or duly authorized agent. Proposals submitted by a joint venture shall list all participants and their addresses. Powers of attorney, authorizing agents, or others to sign proposals, must be properly certified and must be in writing and submitted with the proposal.

B-2-8 Proposal Guaranty

No proposal will be considered unless accompanied by an individual bid security (bond) for the project in the amount of five percent (5%) of the highest amount bid. Such bid security shall be issued by a firm licensed for issuance in the State of Texas. A cashier's check, certified check, money order, or bank draft from any state or national bank will also be acceptable. The security shall be deemed a good faith offer on the part of the bidder to accept a contract, if awarded. In the event the successful bidder declines to accept such award or cannot provide the required bonds and insurance certificates within ten (10) calendar days of the award of the contract, then the amount of the bid security will become the property of the CBBEP, not as penalty but as liquidated damages. The bid securities of the unsuccessful bidders may be released within forty-eight (48) hours of the time bids are received. The bid security of the successful bidder will be released upon execution of the contract documents and submission of the required bonds and certificates.

B-2-9 Filing of Proposal

No proposal will be considered unless it is filed with the CBBEP Executive Directors office in the office of the Engineer, within the time limit for receiving proposals as stated in the advertisement. Each proposal shall be in a sealed envelope, plainly marked with the word "PROPOSAL" and the name and description of the project as designated in the "ADVERTISEMENT".

B-2-10 Withdrawing Proposals

Proposals filed with the CBBEP Executive Director cannot be withdrawn or modified prior to the time set for opening proposals. Request for non-consideration of proposals must be made in writing addressed to, and filed with, the CBBEP Executive Director prior to the time set opening proposals. After other proposals are opened and publicly read, the proposal for which withdrawal is properly requested may be returned unopened.

B-2-11 Cancellation of Bid Opening

The CBBEP may, at any time, before any bids are actually opened, cancel the opening of the bids and return all bids unopened.

B-2-12 Opening Proposals

The proposals filed with the CBBEP Executive Director will be opened at the time stated in the advertisement and publicly read aloud and shall thereafter remain on file with the CBBEP. No contract will be entered into based upon such proposals until after forty-eight (48) hours have elapsed. Proposals not accompanied by the required proposal guaranty will not be read.

B-2-13 Irregular Proposals

Proposals will be considered irregular if they show any omissions, failure to properly account for duly issued addenda, alterations of form, additions, conditions not called for, unauthorized alternate bids or irregularities or qualifications of any kind. However, the CBBEP reserves the right to waive any irregularities and to make the award in the best interest of the CBBEP.

B-2-14 Rejection of Proposals

The CBBEP reserves the right to reject any or all proposals, and all proposals submitted are subject to this reservation. Proposals containing any irregularities or showing an unbalanced value of any items may be rejected. Proposals will be rejected for any of the following specific reasons:

(a) Proposal received after the time limit for receiving proposals as stated in the advertisement.
(b) Proposal submitted without the required bid security.
(c) Proposal submitted and not sealed and/or identifiable to a particular project.

B-2-15 Disqualification of Bidders

Bidders may be disqualified, and their proposals not considered for any of the following specific reasons:

(a) Reason for believing collusion exists among the bidders.
(b) Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated.
(c) The bidder being interested in any litigation against the CBBEP.
(d) The bidder being in arrears on any existing contract, having defaulted on previous contracts, or being delinquent in the payment of CBBEP taxes.
(e) Uncompleted work which, in the judgment of the CBBEP, will prevent or hinder the prompt completion of additional work if awarded.
(f) Previous experience investigation reveals poor, incomplete, unacceptable, or inferior work performance and prosecution and lack of fiscal responsibility in paying for services, labor, or products rendered on such previous work.

B-3 AWARD AND EXECUTION OF CONTRACT

B-3-1 Consideration of Contract

After proposals are opened, the proposals will be tabulated for comparison on the basis of the bid prices and quantities shown in the proposal. Until final award of the contract, the CBBEP reserves the right to reject any or all proposals or proceed to do the work otherwise in the best interest of the CBBEP.

B-3-2 Award of Contract

The CBBEP reserves the right to withhold the award of the contract for a reasonable period of time from date of opening proposals, and no award will be made until after investigations are made as to the responsibilities of the low bidder. In the CBBEP's considering of an award, the bidder may be requested to submit statements regarding previous experience in performing comparable or similar work, his business or technical organization and equipment to help the CBBEP evaluate the bidder's abilities.

The basis for an award will be determined by the lowest responsible bidder (Article 2368a VATS) deemed most advantageous to the CBBEP and not necessarily the lowest bidder. In no case will a contract be awarded until at least forty-eight (48) hours have elapsed from the time of opening proposals.

B-3-3 Equal Opportunity Employer Provisions

Every Contractor must agree that during the performance of his contract he will:

(1) Treat all applicants and employees without discrimination as to race, color, religion, sex, or national origin.
(2) Identify himself as an equal opportunity employer in all help wanted advertising or requests.

B-3-4 Surety Bonds

With the execution and delivery of the contract, the Contractor shall furnish and file with the CBBEP, in the amounts herein required, the following surety bonds:

(a) Performance Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and faithful execution of the work and performance of the contract, and for the protection of the CBBEP and all other persons against damage by reason of negligence of the Contractor, or improper execution of the work, or the use of inferior materials. This bond shall provide for the repair and maintenance of all defects due to faulty materials, faulty combinations of materials, and/or faulty workmanship that appear within a period of one year from the date of completion and acceptance of the improvement by the CBBEP, or such lesser or greater period as may be designated in the Special Provisions. A Performance Bond will not be required if the contract amount does not exceed $25,000.00.
(b) Payment Bond: A good and sufficient bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, as evidenced by the proposal tabulation or otherwise, guaranteeing the full and proper protection of all claimants supplying labor and/or material in the prosecution of the work provided for in said contract and for the use of each such claimant. A Payment Bond will not be required if the contract amount does not exceed $25,000.00.
(c) Other Bonds: Other bonds, if required in the Special Provisions. No surety will be accepted by the CBBEP who is now in default or delinquent on any bonds or who is interested in any litigation against the CBBEP. All bonds shall be issued by an approved surety company authorized to do business in the State of Texas and acceptable to the CBBEP, and the surety shall designate an agent who is a resident of Refugio County, Texas. Each bond shall be executed by the Contractor and the surety.

Should any surety on the contract be determined unsatisfactory at any time by the CBBEP, notice will be given the Contractor to that effect, and the Contractor shall immediately provide a new surety satisfactory to the CBBEP. No payment will be made under the contract until the new surety, or sureties as required, has qualified, and been accepted by the CBBEP. The contract shall not be operative, nor will any payments be due or paid until approval of the bonds has been made by the CBBEP. The CBBEP requires that the Power of Attorney submitted with any surety bond (Performance, Payment, etc.) be signed with an original signature and properly dated and sealed.

In the event a facsimile Power of Attorney is used, the CBBEP must have on file a sworn statement from an officer of the surety company to the effect that the agent who signs the bond form for the surety is currently in good standing with the surety. It is also required that the facsimile be a true copy of the original Power of Attorney on file among the records of the surety in its home office, not be amended or abridge, still be in full force and effect, and that the CBBEP will be notified in the event of cancellation of the particular agent.

B-3-5 Execution of Contract

The person or persons, partnership, company, firm, association, corporation, or joint venture to whom a contract is awarded shall, within ten (10) calendar days after such award and after the Contractor has been requested to execute the documents, sign the required contract, furnish the required insurance certificates, and execute the required bonds. No contract shall be binding on the CBBEP until it has been attested by the CBBEP, approved as to form by the CBBEP Attorney, executed for the CBBEP by the Executive Director, and delivered to the Contractor.

B-3-6 Failure to Execute Contract

The failure of the bidder to execute the required bonds, furnish the required insurance certificates, and sign the required contract within ten (10) calendar days after the contract is awarded and the Contractor has been requested to execute the documents shall be considered by the CBBEP as an abandonment of his proposal, and the CBBEP may annul the award. By reason of the uncertainty of the market prices of materials and labor and its being impracticable and difficult to determine accurately the amount of damages accruing the CBBEP by reason of the said bidder's failure to execute said bonds and contract within ten (10) calendar days, the proposal guaranty accompanying the proposal shall be the agreed amount of damages which the CBBEP will suffer by reason of such failure on part of the bidder and shall thereupon immediately be forfeited to the CBBEP. The filing of a proposal will be considered an acceptance of this provision.

B-4 SCOPE OF WORK

B-4-1 Intent of Plans and Specifications

The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to do in full compliance with the plans, specifications, special provisions, proposal, and contract. The Contractor shall do all work as provided in the plans, specifications, special provisions, proposal, and contract, and shall do such additional extra work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The Contractor shall furnish all labor, tools, material, machinery, equipment, and incidentals necessary for the prosecution of the work.

B-4-2 Subsidiary Work

In the course of furnishing or constructing a complete work or improvement, certain work may be necessary which is subsidiary to the items which are established as pay items. Some such subsidiary work may be shown and specified in detail in the plans and specifications, other work may be less completely shown, and other such work which is entirely necessary for the satisfactory completion of the work as a whole may not be noted on the plans or in the specifications. It shall be the duty of the Contractor to carry out all such subsidiary work as if fully shown, and the cost of such work shall be made subsidiary to the established pay item.

B-4-3 Increased or Decreased Quantities of Work

(a) The CBBEP reserves the right to alter the quantities of the work to be performed or to extend or shorten the improvements at any time when and as found necessary, and the Contractor shall perform the work as altered. No allowance will be made for any change in anticipated profits not shall such changes be considered as waiving or invalidating any conditions or provisions of the contract or bonds.

(b) A Major Item as used in this Section shall be construed to be any individual bit item included in the proposal that has a total cost equal to or greater than five percent (5%) of the total contract cost computed on the basis of the proposal quantities and the contract unit prices.

(c) When the quantity of work to be done or of materials to be furnished under any Major Item of the contract is more than one hundred twenty-five (125%) of the quantity of that unit stated in the proposal, then either party, to the contract, upon demand, shall be entitled to revised

consideration on that portion of the work above one hundred twenty-five percent (125%) of the quantity stated in the proposal.

(d) When the quantity of work done or materials to be furnished under any Major Item of the contract is less than seventy-five percent (75%) of the quantity of that item stated in the proposal, then either party, to the contract, upon demand, shall be entitled to revised consideration on the work performed.

(e) Any revised consideration is to be determined by special agreement or as is hereinafter provided under "Payment for Extra Work".

B-4-4 Alteration of Plans and Specifications

The CBBEP reserves the right to make such changes in the plans and specifications and in the character of the work as may be necessary or desirable to ensure completion in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the contract and bonds.

B-4-5 Value Engineering Incentive Procedures

After the award of the contract, the Contractor may develop and submit, to the Engineer, Value Engineering Change Proposals (VECP's) identifying potential reductions in the contract cost by effective changes to the contract plans and specifications. Any VECP submittal shall include the following:

(1) The present contract requirement and description of the proposal change including any modifications to the plans and specifications.

(2) The comparative advantages and disadvantages of both the present requirement and the proposed change.

(3) An analysis of how the proposed change will alter the function, characteristics and/or performance of a component.

(4) A separate detailed cost estimate comparing the cost of the existing requirement and the cost of the proposed change including any costs which might be incurred in testing or evaluation of the proposed change.

(5) A comparative projection of the operational and maintenance costs of the existing requirement and the proposed change.

(6) A projection of the latest date which the VECP can be incorporated into the contract to achieve maximum cost savings. Any effect upon completion time or delivery schedule should also be noted.

The Engineer shall notify the Contractor of the status of the VECP within thirty (30) days of its receipt. Acceptance or rejection of the VECP by the Engineer shall be final. If the VECP is not accepted, written notification will be provided detailing the reasons for rejection. Any VECP may be accepted in whole or in part.

Execution by both parties of a change order to the contract covering the proposed changes shall constitute approval of the VECP and authorization to proceed with the changes. Until such time as the change order is executed, the Contractor shall perform in accordance with the provisions of the existing contract.

The Contractor's share of the savings resulting from approval of the VECP shall be fifty percent (50%) of the net cost savings calculated as follows: Contractor's Share = .50 (existing contract requirement cost – proposed change costs – testing and evaluation costs incurred by the CBBEP or Contractor).

This savings will be reflected on the change order approving the VECP and authorizing the change. Deletion of contract work or construction items and changes initiated by the CBBEP will not be considered as VECP's. In those instances, the CBBEP will realize 100% of the contract reduction or cost savings.

B-4-6 Extra Work

When additional work not shown in the plans and specifications or reasonably inferred as subsidiary work or as normal adaptation to existing conditions is required, the Contractor shall do such work when ordered in writing by the Engineer. Payment for such extra work will be made as hereinafter provided.

B-5 CONTROL OF THE WORK AND MATERIALS

B-5-1 Authority of the Engineer

All work shall be performed under the supervision of the Engineer in a workmanlike manner and to his/her satisfaction. He shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, sequence of the construction, interpretation of the plans and specifications, acceptable fulfillment of the contract, compensation, mutual rights between Contractors under these specifications and suspension of the work.

He shall determine the amount and quality of the work performed and materials furnished, and his decisions and estimates shall be final. His estimate in such event shall be a condition precedent to the right of the Contractor to receive money due him under the contract.

B-5-2 Authority and Duty of Engineers or Inspectors

The Engineer may appoint Engineers and/or Inspectors as assistants to inspect all work done and material furnished. Such inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. The Engineer or Inspector will not be authorized to revoke, alter, expand, relax, or waive any requirements of the contract documents. The Engineer or Inspector will keep a record of the progress of the work and the manner in which it is being performed and inform the Engineer of same.

He is authorized to call to the attention of the Contractor any deficiency of the work or of materials to conform to the contract documents; however, failure to do so shall not constitute acceptance of said work. The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work performed was in accordance with the requirements and intent of the plans and specifications.

The Engineer or Inspector shall in no case act as foreman or supervisor or perform other duties for the Contractor nor interfere with the management of the work by the latter. Any advice which the Engineer or Inspector may give the Contractor shall in no way be construed as binding to the CBBEP or release the Contractor from fulfilling all the terms of the contract.

The Engineer or Inspector shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Engineer. If the Contractor refuses to suspend operations on verbal order, the Engineer or Inspector shall issue a written order giving the reason for suspending the work.

After delivering the order to the person in charge, the Engineer or Inspector shall immediately leave the job site. Work done during the absence of the Engineer or Inspector under these circumstances will not be accepted or paid for.

B-5-3 Conformity with Plans

All work shall conform to the lines, grades, cross-sections, and dimensions shown on the plans. Any deviation from the plans which may be required by the exigencies of construction will be determined by the Engineer and authorized by him in writing.

B-5-4 Existing Structures

The plans show the location of all known surface and subsurface structures. However, the location of many gas mains, water mains, conduits, sewers, etc. is unknown, and the CBBEP assumes no responsibility for failure to shown any or all of these structures on the plans or to show them in their exact location.

It is mutually agreed such failure will not be considered sufficient basis for claims for additional compensation for extra work in any manner whatsoever unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades or requires the building of special work for which no provision is made in the plans and which is not essentially subsidiary to some item of work for which provision is made. It is assumed that, as elsewhere provided, the Contractor has thoroughly inspected the site, is informed as to the correct location of surface structures, has included the cost of such incidental work in the prices bid, and has considered and allowed for all foreseeable incidental work due to variable subsurface conditions, whether such conditions and such work are fully and properly described on the plans or not. Minor changes and variations of the work specified and shown on the plans shall be expected by the Contractor and allowed for as incidental to the satisfactory completion of a whole and functioning work or improvement.

B-5-5 Coordination of Plans, Specifications, Proposal and Special Provisions

The plans, general provisions, proposal, special provisions, standard specifications, and all supplemental documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over scale dimensions; plans shall govern over specifications; special provisions shall govern over both general and standard specifications; and plans and quantities shown on the plans shall govern over those shown in the proposal.

The Contractor shall not take advantage of any apparent error or omission in the plans and specifications, and the Engineer shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. In the event the Contractor discovers an apparent error or discrepancy, he shall immediately call this to the attention of the Engineer.

B-5-6 Cooperation of Contractor

The Contractor will be supplied with three (3) copies of the plans and specifications. The Contractor shall have available on the work site at all times, one copy of said plans and specifications. The Contractor shall give to the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the Engineer, his authorized representatives, and with other contractors in every way possible.

The Contractor shall provide a competent superintendent on the work at all times who is fully authorized as his agent on the work. Such superintendent shall be capable of reading and understanding the plans and specifications and shall receive and fulfill instructions from the Engineer or his authorized representatives.

The Contractor shall provide all facilities to enable the Engineer or Inspector to inspect the workmanship and materials entering into the work. On marine work, the Contractor shall furnish motorboat transportation as required by the Engineer for the purpose of inspecting the work.

The superintendent shall keep the Engineer, or his representative, informed of the work he is planning to do and the work schedule.

B-5-7 Construction Staking

The Engineer will furnish the Contractor with baseline monumentation and project benchmarks necessary for the proper prosection and control of the work contracted for under these specifications. Such monuments or markings as the Engineer may establish either for his own use or the Contractor's guidance shall be preserved by the Contractor until authorized by the Engineer to remove same. Unnecessary destruction of monuments shall not be allowed by the Contractor.

B-5-8 Source of Supply of Materials

The materials shall be the best procurable as required by the plans, specifications, and special provisions. The Contractor shall not start delivery of materials until the Engineer has approved the source of supply. Only material conforming to these specifications shall be used, only after written approval has been given by the Engineer, and only so long as the quality of said materials remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources if for any reason the product from any source at any time before commencement or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated with dirt or any other foreign substances during its delivery and handling will not be permitted to be used in the work. New material is required unless otherwise specially provided in the plans and specifications.

B-5-9 Samples and Tests of Materials

Where, in the opinion of the Engineer or as called for in the specifications, tests of material are necessary, such tests will be made at the expense of the Contractor unless otherwise provided. Tests, unless otherwise specified, will be made in accordance with the latest methods of the American Society for Testing Materials.

B-5-10 "Or Equal" Clause:

All bids shall be based on the specified products. Where two or more products are specified for an item of work, either one thereof is acceptable and the choice is left to the Contractor.

Where only one product is specified, and where the term "or approved equal"or similar wording is used in connection with specified products, the Contractor may, if he so desires, offer for consideration a substitute product which he judges to be equal in every respect to the required product.

When a specific process is specified as well as a guarantee of the results, the Contractor shall, if in his judgment the process may not produce the required result, offer for approval an alternative process which he would guarantee. All such offers shall be made in writing to the Engineer after award of contract.

The Contractor shall furnish the Engineer with the first submittal sufficient drawings, specifications, samples, performance data, and other information necessary to assist the Engineer in determining whether the proposed substitution is acceptable. The burden of proof shall be upon the Contractor. No consideration will be given to incomplete submittals. Substitutions must be approved in writing before they may be used.

B-5-11 Storage of Materials (N/A)

~~Materials shall be stored so as to insure the preservation of their quality and fitness for the work. When directed by the Engineer, they shall be placed on wooden platforms or other hard, clean surfaces and shall be placed under cover when directed.~~

~~Stored materials shall be placed and located so as to facilitate prompt inspection. Particular attention is directed to the storage or structural steel and reinforcing steel, which shall not be stored on the ground.~~

B-5-12 Removal of Defective and Unauthorized Work

All work which has been rejected or condemned shall be repaired, or if it cannot be repaired satisfactorily, it shall be removed and replaced at the Contractor's expense. Defective materials shall be immediately removed from the site of the work.

Work done without line and grade having been given, work done beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided, work done without proper inspection, or any extra or unclassified work done without written authority and prior agreement in writing as to prices shall be done at the Contractor's risk and will be considered unauthorized and, at the option of the Engineer, may not be measured and paid for and may be ordered removed at the Contractor's expense.

Upon failure of the Contractor to repair satisfactorily or to remove and replace rejected, unauthorized, or condemned work or materials immediately after receiving notice from the Engineer, the Engineer will, after giving written notice to the Contractor, have the authority to cause defective work to be remedied or removed and replaced or to cause unauthorized work to be removed, and to deduct the cost thereof from any monies due or to become due the Contractor.

B-5-13 Final Inspection

The Engineer will make final inspection of all work included in the contract as soon as practicable after the work is completed and ready for acceptance. If the work is not acceptable to the Engineer at the time of such inspection, he/she will inform the Contractor as to the particular defects to be remedied before final acceptance will be made.

Previous inspection by the Engineer or his/her representatives during the course of the work shall not be interpreted as approval or acceptance of work or materials which on final inspection are found to be defective or note in accordance with the contract and its duly authorized modifications.

B-5-14 Warranty Inspection

Forty-five (45) to sixty (60) days prior to the expiration of the maintenance guaranty period as specified in the contract documents, a warranty inspection will be made. The Contractor may be notified when this examination will be made so that he or his representatives may be present.

Within the maintenance guaranty period, the Contractor, when ordered by the Engineer, shall repair, replace, or rebuild such portions which are found to be faulty because of materials or workmanship. The Contractor shall begin the remedial work within ten (10) calendar days of written order by the Engineer. In case the Contractor does not start remedial work within the above time limit, or in case of an emergency condition caused by faulty work, the CBBEP may take remedial action and charge the cost thereof against the Contractor and/or his surety.

B-6 LEGAL RELATIONS AND PUBLIC RESPONSIBILITY

B-6-1 Laws to be Observed

The Contractor shall at all times observe and comply with all Federal and State Laws and CBBEP ordinances and regulations which in any manner affect the conduct of the work and shall observe and comply with all orders, laws, ordinances and regulations which exist, or which may be enacted later by bodies having jurisdiction or authority for such enactment. No pleas of misunderstanding or ignorance thereof will be considered.

The Contractor and his surety shall indemnify and save harmless the CBBEP and all its officials, agents, and employees against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, or order, whether by himself or his employees.

B-6-2 Permits and Licenses

The Contractor shall procure all legally required building, plumbing, electrical, TxDOT, TCEQ and other permits and licenses, pay all charges and fees (except CBBEP fees), give all notices necessary and incidental to the due and lawful prosecution of the work, and arrange for all building, plumbing, electrical or other inspections as appropriate.

B-6-3 Patented Devices, Materials and Processes

If the Contractor is required or desires to use any design, device, material, or process covered by letters, patent, or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. It is mutually agreed and understood that, without exception, contract prices shall include all royalties or costs arising from patents, trademarks and copyrights in any way involved in the work. The Contractor and his sureties shall indemnify and save harmless the CBBEP from any and all claims for infringement by reason of the use of any such patented design, device, material or process or any trademark or copyright in connection with the work agreed to be performed under this contract and shall indemnify the CBBEP for any cost, expense, or damage which it may be obliged to pay by reason of such infringement at any time during the prosecution of the work or after completion of the work.

B-6-4 Sanitary Provisions

The Contractor shall establish and enforce among his employees such regulations in regard to cleanliness and disposal of garbage and waste as will tend to prevent the inception and spread of infection or contagious diseases and to prevent effectively the creation of a nuisance about the work or any property either public or private, and such regulations as are required by the Engineer shall be put into immediate force and effect by the Contractor. The necessary sanitary conveniences for the use of laborers on the work, properly secluded from public observation, shall be constructed, and maintained by the Contractor in such manner and at such points as will be approved by the Engineer, and their use shall be strictly enforced by the Contractor. All sanitary laws and regulations of the State of Texas and the CBBEP shall be strictly complied with.

B-6-5 Public Convenience and Safety

Materials stored about the work shall be so placed and the work shall at all times be so conducted as to cause no greater obstruction to the traveling public than is considered necessary by the Engineer. The Contractor shall, upon direction of the Engineer, make provisions by bridges or otherwise at sidewalks and private driveways for the free passage of pedestrians and vehicles provided that, where bridging is impracticable or unnecessary in the opinion of the Engineer, the Contractor may make arrangements satisfactory to the Engineer for the diversion of traffic and shall, at his own expense, provide all material and perform all work necessary for the construction and maintenance of roadways and bridges. Sidewalks must not be obstructed except by special permission of the Engineer.

The materials excavated and the construction materials or plant used in the construction of the work shall be placed so as not to endanger the work or prevent free access to all fire hydrants, water valves, gas valves, manholes for telephone, telegraph, signal, or electric conduits, sanitary or storm sewers, and fire alarm or police call boxes in the vicinity.

The CBBEP reserves the right to remedy any neglect on the part of the Contractor as regards the public convenience and safety which may come to its attention after twenty-four hours notice in writing to the Contractor except in case of emergency when it shall have the right to remedy any neglect without notice, and in either case, the cost of such work done by the CBBEP shall be deducted from monies due or to become due the Contractor. The Contractor shall notify the Fire and Police Departments when any street is closed or obstructed.

Where the Contractor is required to construct temporary bridges or make other arrangements for crossings over ditches or streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

The Contractor shall mark all detours as directed by the Engineer so that the entire route of the detour is designated, such markings to be by neat and workmanlike signs large enough and so painted and so placed as to be clearly visible.

B-6-6 Privileges of Contractor in Streets and Right-of-Way

For the performance of the contract, the Contractor will be permitted to occupy such portions of streets or other right-of-way, as provided for in the ordinances of the CBBEP, as shown on the plans or as permitted by the Engineer. The Contractor's maximum allowable weight for loaded equipment is 54,000 lbs. on CBBEP streets.

B-6-7 Traffic Control Devices

Where the Contractor's operations are carried on in or adjacent to any public right-of-way or public place and which, in the opinion of the Engineer, interferes with normal vehicular and pedestrian traffic, the Contractor shall take appropriate measures to protect persons, property and the work. Such measures shall include but not be limited to barricades, lights, signs, fences, flag-person, and watchmen.

Such measures shall be taken to exclude or route pedestrian and vehicular traffic around the work and area of operations. Barricades, lights, signs, and flag-person shall be utilized in accordance with the Standards and Practices of the Texas Department of Transportation.

The Contractor shall be responsible for all damages to persons, property and the work occasioned by his operations and said responsibility shall not cease until the project has been accepted by the CBBEP.

B-6-8 Protection and Restoration of Property

Where the work passes over or through private property, the CBBEP will provide such right-of-way. The Contractor shall not enter upon private property for any purpose without having previously obtained permission from the owner.

The Contractor shall be responsible for the preservation of and shall use every precaution to prevent damage to all trees, shrubbery, plants, lawns, fences, culverts, bridges, pavements, driveways, sidewalks, etc., to all water, sewer & gas lines; to all conduits, to all overhead pole lines, or appurtenances thereof; and to all other public and private property along or adjacent to the work.

The Contractor shall be responsible for all damage or injury to the property of any character resulting from any act, omission, neglect or misconduct in the execution of the work or in consequence of the non-execution thereof on the part of the Contractor, he shall restore or have restored at his own cost and expense such property to a condition similar to equal to that existing before such damage or injury was done by repairing, rebuilding or otherwise restoring as may be directed, or he shall made good such damage from injury in a manner acceptable to the owner or the Engineer.

In case of failure on the part of the Contractor to restore such property or to make good such damage or injury, the Engineer may, after forty-eight (48) hours written notice under ordinary circumstances, and without notice when a nuisance or hazardous condition results, proceed to repair, rebuild or otherwise restore such property as may be determined necessary, and the cost thereof will be deducted from any monies due or to become due the Contractor under his contract.

B-6-9 Responsibility for Damage Claims

The Contractor shall not commence work under this contract until he has obtained all insurance required herein and such insurance has been approved by the CBBEP. The Contractor shall not allow any subcontractor(s) to commence work until all similar insurance required of the subcontractor(s) has been so obtained.

Within ten (10) calendar days after the date the CBBEP requests that the Contractor sign the contract documents, the Contractor shall furnish the CBBEP with certificates of insurance evidencing that the Contractor has obtained insurance coverage of the types more particularly described below in parts (a) through (e) of this section. (For self-insured workers' compensation coverage, other documents, specified hereafter, may be substituted for the certificate of insurance just described).

The workers' compensation insurance policy need not list the CBBEP as an additional insured. Additionally, all certificates of insurance shall state the name of the project in the "Description of Operations" section of such certificate. These certificates and any subsequent insurance certificates in connection with this particular contract shall be delivered to the offices of the Engineer. The Certificates of Insurance shall state that ten (10) days written notice will be given the CBBEP before any policy covered thereby is changed or canceled and shall shown the following minimum coverage in an insurance company acceptable to the CBBEP. The CBBEP reserves the right to modify minimum limits based upon the nature and scope of the work. The Contractor agrees to comply with the Supplemental Insurance Requirements stated in the "Special Provisions" section of this contract.

(a) General Liability – Including Commercial General Form; Premises - Operations; Explosion & Collapse Hazard; Underground Hazard; Products/Completed Operations Hazard; Contractual Insurance, with an endorsement on the face of the certificate that it includes the "Hold Harmless" in the last paragraph of this provision; Broad Form Property Damage; Independent Contractors; and Personal Injury:
(b) Automobile Liability – Owned, Non-Owner or Rented:
(c) Workers' Compensation and Occupational Diseases – The Contractor shall obtain worker's compensation insurance coverage through a licensed insurance company or through self-insurance obtained in accordance with Texas law. If such coverage is obtained through a licensed insurance company, then the contract for coverage shall be written on a policy and endorsements approved by the Texas State Board of Insurance.
(d) Employer's Liability

B-6-10 Contractor's Claim for Damages

Should the Contractor claim compensation for any alleged damage by reason of the acts or omissions of the CBBEP, he shall, within three (3) days after sustaining such alleged damage, make a written statement to the Engineer, setting out in detail the nature of the alleged damage; and on or before the twenty-fifth (25th) day of the month succeeding that in which any such damage is claimed to have been sustained.

The Contractor shall file with the Engineer an itemized statement of the details and amount of such alleged damage and, upon request, shall give the Engineer access to all books of accounts, receipts, vouchers, bills of lading and other books or papers containing any evidence as to the amount or such alleged damage.

Unless such statements shall be filed as hereinabove required, the Contractor's claim for compensation shall be waived and he shall not be entitled to payment on account of such damage.

B-6-11 Public Utilities and Other Property to be Changed

In case it is necessary to change or move, the property shall not be moved or interfered with until ordered to do so by the Engineer, unless the plans or specifications show that such work is to be done by the Contractor. The right is reserved to the owner of public utilities to enter upon the limits of the contract for the purpose of making such changes or repairs of their property that may be necessary by performance of the contract. The CBBEP reserves the right of entering upon the limits of the contract for the purpose of repairing or relaying sewer, gas and water lines and appurtenances, repairing structures, etc., and making other repairs, changes or extensions to any CBBEP property.

B-6-12 Arrangement and Charge for Water Furnished by the CBBEP

Where the Contractor desires to use CBBEP water in connection with any construction work, he shall make complete and satisfactory arrangements with the CBBEP. Payment will be at CBBEP standard rates.

B-6-13 Use of Fire Hydrants

No person shall open, turn off, interfere with, attach any pipe, or hose to, or connect anything with any fire hydrant, stop valve or stop cock, or tap and water main belonging to the CBBEP unless duly authorized to do so by the CBBEP, Public Works Department.

B-6-14 Use of a Section or Portion of the Work

Wherever, in the opinion of the Engineer, any section or portion of the work or any structure is in suitable condition, it may be put into use upon the written order of the Engineer, and such usage shall not be held to be in any way an acceptance of said work or structure or any part thereof or as a waiver of any of the provisions of these specifications or the contract pending final completion and acceptance of the work; all necessary repairs and removals of any section of the work so put into use, due to defective materials or workmanship or to operations of the Contractor, shall be performed by the Contractor at his own cost and expense.

B-6-15 Separate Contracts

The CBBEP reserves the right to make essential installation of items not included in the contract prior to acceptance of the project from the Contractor. Within this right, the CBBEP may let other contracts or may do such work with its own materials and labor forces. The CBBEP, in reserving this right, warrants that it will cooperate with the Contractor's forces and goals. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractor or company or by CBBEP employees. The Contractor shall cooperate to the end that the CBBEP may realize the complete functioning of the project on the date of Final Acceptance.

B-6-16 Contractor's Responsibility for the Work

Until written acceptance by the Engineer, as provided for in these specifications, the work shall be under the charge and care of the Contractor, and he shall take every necessary precaution to prevent injury or damage to the work or any part thereof by action of the elements or from any other cause whatsoever, whether arising from the execution or non-execution of the work. The Contractor will be responsible for damage to streets caused by overweight equipment. The Contractor shall rebuild, repair, restore and make good, at his own cost and expense, all injuries, or damages to any portion of the work occasioned by any of the hereinabove causes.

B-6-17 No Waiver of Legal Right

Inspection by the Engineer, any order, measurement, quantity, or certificate by the Engineer; any order by the CBBEP for payment of money; any payment for or acceptance of any work; or any extension of time; or any possession taken by the CBBEP shall not operate as a waiver of any provisions of the contract or any power therein reserved to the CBBEP of any rights or damages therein provided. Any waiver of any breach of contract shall not be held to be waiver of any other or subsequent breach.

The CBBEP reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the contract and specifications under the 1-Year Warranty.

The CBBEP reserves the right to claim and recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the work resulting from such error, dishonesty, or collusion, upon the conclusive proof of collusion or dishonesty by the Contractor or his agents and the Engineer or his assistants, discovered in the work after the final payment has been made.

B-6-18 No Waiver of Legal Right

Inspection by the Engineer, any order, measurement, quantity, or certificate by the Engineer; any order by the CBBEP for payment of money; any payment for or acceptance of any work; or any extension of time; or any possession taken by the CBBEP shall not operate as a waiver of any provisions of the contract or any power therein reserved to the CBBEP of any rights or damages therein provided. Any waiver of any breach of contract shall not be held to be waiver of any other or subsequent breach.

The CBBEP reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the contract and specifications.

The CBBEP reserves the right to claim and recover by process of law sums as may be sufficient to correct any error or make good any deficiency in the work resulting from such error, dishonesty, or collusion, upon the conclusive proof of collusion or dishonesty by the Contractor or his agents and the Engineer or his assistants, discovered in the work after the final payment has been made.

B-6-19 Indemnification and Hold Harmless

The Contractor shall hold the CBBEP, its officials, employees, attorneys, and agents harmless and shall indemnify the CBBEP, its officials, employees, attorneys, and agents or consultants from any and all damages, injury, or liability whatsoever from an act or omission of the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or any work done under the contract or in connection therewith by the Contractor, or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants, or the operations or activities of the Contractor or any subcontractor, supplier, materialman, or their officials, employees, agents, or consultants.

B-6-20 Tax Exemption Provision

Contracts awarded by the CBBEP qualify for exemption pursuant to the provision of Article 20.04 (H) of the Texas Limited Sales, Excise and Use Tax Act. The Contractor performing this contract may purchase, rent, or lease all materials, supplies, equipment used or consumed in the performance of this contract by issuing to his supplier an exemption certificate in lieu of the tax, said exemption certificate complying with State Comptroller's Ruling #95-0.07. Any such exemption certificate issued by the contractor in lieu of the tax shall be subject to the provisions of the State Comptroller's Ruling #95-0.09 as amended to be effective October 2, 1968.

B-7 PROSECUTION AND PROGRESS

B-7-1 Subletting the Work

The Contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than fifty percent (50%) of the value of all work embraced in the contract exclusive of items not commonly found in contracts for similar work or which require highly specialized knowledge, craftsmanship and/or equipment not ordinarily available in the organizations of Contractors performing work of the character embraced in the contract.

No portion of the work covered by these specifications and contract, except contracts for purchase and delivery of materials, shall be sublet without written permission of the CBBEP. If the Contractor sublets any part of the work to be done under his contract, he will not, under any circumstances, be relieved of his responsibility and obligations. All transactions of the Engineer will be with the Contractor. Subcontractors will be considered only in the capacity of employees and/or workmen and shall be subject to the same requirements as to character, competency, wages, and hours. The CBBEP will not recognize any subcontractor on the work. The Contractor shall at all times when the work is in operation, be represented either in person or by a qualified superintendent or other designated representative.

B-7-2 Assignment of Contract

The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or his right, title, or interest in or to the same, or any part thereof, without the previous consent of the CBBEP concurred in by the sureties.

If the Contractor does without such previous consent assign, transfer, convey or otherwise dispose of the contract or of his rights, title or interest therein, or any part thereof to any persons, partnership, company, firm or corporation, or by bankruptcy, voluntary or involuntary, or by assignment under the insolvency laws of any state, attempt to dispose of the contract or make default in or abandon said contract, then the contract may, at the option of the CBBEP, be revoked or annulled, unless the sureties shall successfully complete said contract; and any monies due or to become due under said contract shall be retained by the CBBEP as liquidated damages for the reason that it would be impracticable and extremely difficult to fix the actual damages.

B-7-3 Prosecution of the Work

Prior to beginning construction operations, the Contractor shall submit to the Engineer a chart or brief of his work schedule outlining the manner and sequence of prosecution of the work that he intends to follow in order to complete the contract within the allotted time.

Whenever, during the course of the work, this planned sequence and/or method must be revised, such revision shall be submitted in writing to the Engineer. Contractor needs approval by the Engineer prior to revisions being done.

The Contractor shall begin the work to be performed under this contract within the time limit stated in the Agreement and shall conduct the work in such a manner and with sufficient equipment, materials and labor as is necessary to insure its completion within the time limit.

The sequence of all construction operations shall be at all times as directed by or approved by the Engineer.

Such direction or approval by the Engineer shall not relieve the Contractor from full responsibility of the complete performance of the contract. Should the prosecution of the work be discontinued by the Contractor, he shall notify the Engineer at least twenty-four (24) hours in advance of resuming operations.

B-7-4 Limitation of Operations

The work shall be so conducted as to create a minimum amount of inconvenience to the public. At any time when, in the judgment of the Engineer, the Contractor has obstructed or closes or is carrying on operations on a greater portion of the street or public way than is necessary for the proper execution of the work, the Engineer may require the Contractor to finish the sections on which work is in progress before operations are started on any additional section.

B-7-5 Character of Workmen and Equipment

Local labor shall be used by the Contractor if available. The Contractor may bring in from outside the CBBEP his key employees and superintendent. All other employees, including equipment operators, may be imported only after the local supply is exhausted.

The Contractor shall employ such superintendents, foremen, and workmen as are careful and competent and the Engineer may demand the dismissal of any person or persons employed by the Contractor in, about or on the work who shall misconduct himself or be incompetent or negligent in the proper performance of his or their duties or neglect or refuse to comply with the directions of the Engineer, and such person or persons shall not be employed thereon again without the written consent of the Engineer.

All workmen shall have sufficient skill and experience to perform properly the work assigned them. The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress.

All equipment, tools and machinery used for handling materials and executing any part of the work shall be subject to the approval of the Engineer and shall be maintained in a satisfactory working condition. Equipment on any portion of the work shall be such that no injury to the work or adjacent property will result from its use.

B-7-6 Working Hours

Work shall be done only during the regular and commonly accepted and prescribed working hours. No work on any unit of this contract Phase 11 Paving Improvements Part 2 – Overlays and Reconstruction shall be performed before 7 am, or after 8 pm, or on Sunday, or on a regular holiday as listed in the definitions. The CBBEP will allow the Contractor to work on the weekends if necessary. Excepted from the preceding shall be the setting of flashers, maintenance of barricades, wetting of concrete curing mats, and such measures as the Contractor must take to protect life and property, as are of an emergency nature and not merely extensions of the regular working day. Attention is directed to the definition for contract time.

B-7-7 Time of Commencement and Completion

The Contractor shall commence the work within the time specified, and the rate of progress shall be such that the whole work will be performed, and the premises cleaned up in accordance with the contract, plans and specifications within the time limit specified in the contract unless an extension of time be made in the manner hereinafter specified.

B-7-8 Extension of Time of Completion

The Contractor shall be entitled to an extension of time as provided herein only when claim for such extension is submitted to the CBBEP in writing by the Contractor within seven (7) days from and after the time when any alleged cause of delay shall occur, and then only when such claim is approved by the CBBEP. In adjusting the contract time for the completion of the project, unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including but not restricted to inability to obtain supplies and materials, acts of God, or the public enemy, acts of the owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, unusually severe weather conditions (weather which is beyond the normal weather recorded and expected for the season or seasons of the year in the records of the National Oceanic and Atmospheric Administration's Climatic Data Center), or delays of subcontractors due to such causes; all provided that actual stoppage of work ensues and no fault of the Contractor is involved.

If the satisfactory execution and completion of the contract should require work and materials in a greater amount, or quantities, than those set forth in the contract, then the contract time shall automatically be increased the same proportion as the cost of the additional work bears to the cost of the original work contracted for. No allowance will be made for delays or suspension of the prosecution of the work due to the fault of the Contractor.

B-7-9 Computation of Contract Time for Completion

For the purpose of computation, the contract time shall begin with the tenth (10th) calendar day after the date of the written authorization by the Engineer to begin work, or such earlier date as work, other than the delivery of materials, is actually commenced. The Engineer shall furnish the Contractor a monthly statement showing the days (calendar or working) charged during the month. If no protest as to the correctness of the statement is filed within seven (7) days by the Contractor, the statement will stand. Contract time shall be charged as described under the definition thereof.

B-7-10 Failure to Complete on Time

The time of completion is the essence of the contract. For each day (calendar or working) that any work shall remain uncompleted after the time specified in the time specified in the proposal and contract, or the increased time granted by the CBBEP, or as automatically increased by additional work or materials ordered after the contract is signed, a sum per day will be deducted from the monies due the Contractor, not as a penalty but as liquidated damages. This sum of liquidated damages per day will be as shown in the special provisions, proposal or elsewhere in the contract documents.

The sum of money thus deducted for such delay, or noncompletion is not to be considered as a penalty but shall be deemed, taken, and treated as reasonable liquidated damages since it would be impracticable and extremely difficult to fix the actual damages, with such sums of money to be deducted from Contractor's monies at the time or times such damages begin to occur, thence to the completion of construction.

B-7-11 Suspension by Court Order

The Contractor shall suspend such part or parts of the work ordered by the Court and will not be entitled to additional compensation by virtue of such Court Order. Neither will he be liable to the CBBEP in the event and for the time the work is suspended by Court Order.

B-7-12 Temporary Suspension

The Engineer shall have the authority to suspend the work wholly or in part for such period or periods as he may deem necessary due to unsuitable weather conditions as are considered unfavorable for the suitable prosecution of the work. If it should become necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the public unnecessarily or become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed; he shall provide suitable drainage about the work and erect temporary structures where necessary. The Contractor shall not suspend work without written authority from the Engineer and shall proceed with work promptly when notified by the Engineer to resume operations.

B-7-13 Suspension of Work and Annulment of Contract

The work or any portion of the work under contract shall be suspended immediately on written order of the Engineer or the CBBEP Executive Director, a copy of such notice to be served on the Contractor's sureties, or the contract may be annulled by the CBBEP for any good cause or causes, among others of which special reference is made to the following:

(a) Failure of the Contractor to start the work within the specified number of calendar days from the date of written notice by the CBBEP to begin the work.
(b) Substantial evidence that the progress of the work being made by the Contractor is insufficient to complete the work within the specified time.
(c) Failure of the Contractor to provide sufficient and proper equipment for properly executing the work.
(d) Substantial evidence that the Contractor has abandoned the work.
(e) Substantial evidence that the Contractor has become insolvent or bankrupt, or otherwise financially unable to carry on the work.
(f) Deliberate failure on the part of the Contractor to observe any requirements of these specifications or to comply with any orders given by the Engineer as provided for in these specifications.
(g) Failure of the Contractor to promptly make good any defects in materials or workmanship, or any defects of any nature, the correction of which has been directed in writing by the Engineer.
(h) Substantial evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the CBBEP in the construction of the work under contract.

When the work is suspended for any of the causes itemized above or for any other cause or causes, the Contractor shall discontinue the work or such part thereof as the CBBEP shall designate, whereupon the sureties may, at their option, assume the contract or that potion thereof which the CBBEP has ordered the Contractor to discontinue, and may perform the same, or may, with the written consent of the CBBEP, sublet the work or that portion of the work so taken over, provided however that the sureties shall exercise their option, if at all, within two (2) weeks after the written notice to discontinue the work has been served upon the Contractor and upon the sureties or their authorized agents.

The sureties in such event shall assume the Contractor's place in all respects and shall be paid by the CBBEP for all work performed by them in accordance with the terms of the contract. All monies remaining due the Contractor at the time of his default shall thereupon become due and payable to the sureties as the work progresses, subject to all the terms of the contract.

In case the sureties do not, within the hereinabove specified time, exercise their right and option to assume the contract or that portion thereof which the CBBEP has ordered the Contractor to discontinue, then the CBBEP shall have the power to complete by contract or otherwise as it may deem necessary; and the Contractor hereto agrees that the CBBEP shall have the right to take

possession of and use any of the materials, plant, tools, equipment, supplies and property of every kind provided by the Contractor for the purpose of his work and to procure other tools, equipment and materials for the completion of the same, and to charge to the account of the Contractor the expenses of said contract or labor, materials, tools, equipment and expenses incidental thereto.

The expense so charged shall be deducted by the CBBEP out of such monies as may be due or may at any time thereafter become due the Contractor under and by virtue of the contract or any part thereof. The CBBEP shall not be required to obtain the lowest bid for the work of completing the contract, but the expenses to be deducted shall be the actual cost of such work. In case such expense is less than the sum which would have been payable under the contract if the same had been completed by the Contractor, then in such case, the CBBEP may pay to the Contractor the difference in cost provided that the Contractor shall not be entitled to any claim for damages or for loss of anticipated profits; in case such expense shall exceed the amount which would have been payable under the contract if the same had been completed by the Contractor, then the Contractor and his sureties shall pay the amount of such excess to the CBBEP on notice from the CBBEP of the excess due. When any particular part of the work is being carried on by the CBBEP by contract or otherwise under the provisions of this section, the Contractor shall continue the remainder of the work in conformity with the terms of the contract, and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the CBBEP.

B-7-14 Termination of Contract

The contract will be considered fulfilled, saved as provided in any maintenance stipulations, bond or by law, when all the work has been completed, the final inspection made by the Engineer, and final acceptance and final payment made by the CBBEP.

B-8 MEASUREMENT AND PAYMENT

B-8-1 Measurement of Quantities

The determination of quantities of work acceptably completed under the terms of the contract, or as directed by the Engineer in writing, will be made by the Engineer, based on measurements made by the Engineer. These measurements will be taken according to the US Standard Measurements, used in common practice, and will be the actual length, area, solid contents, numbers, and weight. It is pointed out that inclusion in the standard construction specifications of paragraphs describing methods of measurement and payment is not intended to imply that separate payments shall be made under each such standard specification. The units for which payment shall be made are those stated in the proposal.

B-8-2 Unit Price

Where in the proposal form a "Unit Price" is set forth, the "Unit Price" shall include the furnishing by the Contractor of all labor, tools, materials, machinery, appliances, plant, and equipment appurtenant to and necessary for construction in every detail and the completion in a first class, workmanlike manner of all the work to be done under these specifications. The "Unit Price" shall also include all permanent protection of overhead, surface, and underground structures, cleaning up, finish, overhead expense, bond, insurance, patent fees, royalties, risk due to the elements, delay, profit, injuries, damages, claims and all other items not specifically mentioned that may be required to construct fully each item of the work complete in place.

B-8-3 Scope of Payment

The Contractor shall receive and accept the compensation, as herein provided, in full payment for furnishing all labor, tools, materials, equipment and incidentals; for performing all work contemplated and embraced under the contract; for all lose or damage arising out of the nature of the work or from the action of the elements; for any unforeseen defects or obstructions which may

arise or be encountered during the prosecution of the work and before its final acceptance by the Engineer; for all risks of whatever description connected with the prosecution of the work; for all expense incurred by or in consequence of suspension or discontinuance of such prosecution of the work as herein specified; for any infringement of patents, trademarks or copyrights; and for completing the work in an acceptable manner according to the plans and specifications. The payment of any current or partial estimate prior to final acceptance of the work by the CBBEP shall in no way constitute an acknowledgement of the acceptance of the work nor in any way prejudice or affect the obligation of the Contractor to repair, correct, renew, or replace, at his expense, any defects or imperfections in the construction or in the strength or quality of the materials used in or about the construction of the work under contract and its appurtenances, nor any damage due or attributed to such defects, imperfections or damage shall have been discovered on or before the final inspection and acceptance of the work. The Engineer shall be the sole judge of such defects, imperfections, or damage; and the Contractor shall be liable to the CBBEP for failure to correct the same as provided herein.

B-8-4 Payment for Extra Work

Extra work authorized and approved by the Engineer and performed by the Contractor will be paid for in the manner hereinafter described, and the compensation thus provided shall be accepted by the Contractor as payment in full for all labor, material, tools, equipment and incidentals and all superintendents' time and timekeepers' services, all insurance, bond, and all other overhead expenses incurred in the prosecution of the extra work. Payment for extra work will be calculated on one of the following basis subject to, all other conditions of the contract:

(a) By unit prices agreed on in writing by both parties, payment to be for the quantity actually installed as finally measured.
(b) By a lump sum price agreed on in writing by both parties.
(c) By actual field cost of the work plus fifteen percent (15%) as described hereinbelow, agreed on in writing by both parties. In the event extra work is to be performed and paid for under this method, the actual field cost of the work will include the cost of all workmen, foremen, timekeepers, mechanics and laborers, and materials, supplies, trucks, rental or machinery equipment, only for the time actually employed or used on such extra work, plus all power, fuel, lubricants, water and similar operating expenses, and a rateable proportion of premiums on Performance and Payment Bonds, public liability and Workmen's Compensation and all other insurance required by law or ordinance. The Engineer will direct the form in which the accounts or actual field cost will be kept and will specify in writing the methods of doing the work, and the type and kind of machinery and equipment to be used and shall have authority to suspend such extra work if in his judgment it is being conducted in a manner wasteful of materials, equipment, or labor, or is not being prosecuted in an efficient manner. The fifteen percent (15%) of the actual field cost to be paid the Contractor shall cover and compensate him for profit, overhead, general superintendence and field office expense, and all other elements of cost and expense not embraced within the actual field cost as herein specified. The Contractor shall give the Engineer access to all accounts, bills, invoices, and vouchers relating thereto.

    In the event agreement cannot be reached on method or prices of payment for extra work, the CBBEP reserves the right to enter on the job with its own forces or to hire other contractors to perform such extra work.

B-8-5 Extra Work and Change Orders

(a) All change orders require written quotations and must be approved in writing by the Contractor and the CBBEP prior to the work being done.
(b) All change orders must be approved by the CBBEP Council.

(c) The CBBEP Executive Director has authority to approve some change orders. The CBBEP Executive Director may authorize change orders where undue delays could cause damages, either physical or monetary, to the CBBEP, Contractor, or the general public. However, final approval must be granted by the CBBEP Council.
(d) The total amount of all change orders to a contract shall not exceed 25% of the original contract price.

Contractors are advised that the CBBEP is under no obligation to appropriate change order(s) which have not been prepared and executed as stated herein. The addition of items of work covered by unit prices may be performed without written change orders unless the quantity and cost of such work, in the Engineer's opinion, require such written change orders, in which event the Contractor will be so notified.

B-8-6 Partial Estimates

After the twenty-fifth (25th) day of the month and at the Contractor's request, the Engineer will make an approximate estimate of the value of the work done during the month under the specifications, which approximate estimate may include the full net invoice value of acceptable non-perishable materials delivered to the work (i.e. materials on hand).

The Contractor shall furnish the Engineer such detailed information as he may request to aid him as a guide in the preparation of partial estimates. It is understood that the partial estimates from month to month will be approximate only and all partial estimates and payments will be subject to correction in the estimate rendered following the discovery of an error in any previous estimate, and such estimate shall not in any respect be taken as an admission of the CBBEP of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the Contractor of any of his responsibility under the contract.

In determining the partial payment to be made to the Contractor, the CBBEP will retain five percent (5%) of the total approximate estimate, unless otherwise stated, and will deduct payments previously made. No partial payment will be made when the said estimate or the estimates of work done since the last previous estimate is less than One Hundred Dollars ($100.00) in amount. All retainage is due and payable to the Contractor upon successful completion of the project and will be included in the final payment. Payment shall be withheld as elsewhere herein specified.

The CBBEP reserves the right to increase the retainage. In contracts in which the total amount bid is Four Hundred Thousand Dollars ($400,000) or more and providing for retainage of greater than five percent (5%) of the total estimate, the amount retained shall be deposited in an interest-bearing account and the interest earned shall be paid to the contractor upon completion of the contract with the final payment, unless withheld as otherwise specified.

B-8-7 Withholding Payment

Payment of estimates may be withheld if the work is not being executed in accordance with the specifications and contract and/or to cover known claims as elsewhere specified.

B-8-8 Final Cleanup

Upon completion of the work and before acceptance and final payment will be made, the Contractor shall clean and remove from the site of the work surplus and discarded materials, temporary structures, and debris of every kind. He shall leave the site of the work in a neat, orderly condition, equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer. Such final cleanup shall in general be considered as subsidiary to the established pay items as a whole.

B-8-9 Final Acceptance

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor, the Contractor shall notify the Engineer that the improvement is ready for final inspection. The Engineer will then make such final inspection; and if the work is satisfactory and in accordance with the specifications and contract, he will certify such completion for Final Acceptance.

B-8-10 Final Payment

Whenever the improvement provided for by contract shall have been completely performed on the part of the Contractor as evidenced by the Engineer in the Certificate of Final Inspection and Acceptance, a final estimate showing the value of the work will be prepared by the Engineer as soon as the necessary measurements and computations can be made. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment.

The amount of this final estimate, less any sums that have been deducted or retained under the provisions of the contract, will be paid the Contractor within thirty (30) days after Final Acceptance provided the Contractor has furnished to the CBBEP satisfactory evidence in the form of an affidavit(s) that all sums of money due for any labor, materials, apparatus, fixtures, or machinery furnished for and used in the prosecution of the work have been paid; or that the person or persons to whom the sum may respectively be due have consented to such final payment. The improvement will not be recommended for Final Acceptance until this payment affidavit has been submitted. The acceptance by the Contractor of the last payment as aforesaid shall operate as and shall be a release to the CBBEP from all claims or liabilities under the contract for anything done or furnished or relating to the work under the contract or for any act of neglect of said CBBEP relating to or connected with the contract.

B-8-11 Maintenance Guaranty

The Contractor shall maintain and keep in good repair the work herein contracted to be done and performed for a period of one (1) year through one winter cycle from the date of acceptance, or for such lesser or greater period as may be specially provided, shall do all necessary backfilling that may arise on account of sunken conditions in ditches, or otherwise, and shall do and perform all necessary work and repair any defective condition growing out of or arising from the improper joining of the same, or on account of any breaking of the same caused by the said Contractor, in laying or building the same, or on account of any defect arising in any of said parts of said work laid or constructed by said Contractor, or on account of improper excavation or backfilling; it being understood that the purpose of this section is to cover all defective conditions arising by reason of negligence of the Contractor, or by reason of defective materials, work or labor performed by the said Contractor, and in case the said Contractor shall fail to do so, it is agreed that the CBBEP may do said work and supply such materials, and charge the same against the said Contractor and sureties on this obligation. This provision shall further, and in addition, be evidenced by the provisions of the Performance Bond or such other bond as may be required.

The one-year maintenance guaranty period will commence upon final inspection and completion of roadway improvements in the entire neighborhood vicinity of “clustered” improvements or upon final inspection and completion of singular streets or parking lots.

IX.
TECHNICAL SPECIFICATIONS

SECTION 010010
GENERAL CONSTRUCTION REQUIREMENTS

1. GENERAL

1.01 SCOPE OF WORK: The work involved under this Contract consists of the furnishing of all materials, tools, equipment, transportation, services, and all labor and superintendence necessary for the construction and completion of the **"MISSION RIVER DELTA CIRCULATION ENHANCEMENT "** including but not limited to the following items:

A. Construction of the following new facilities: **MISSION RIVER DELTA CIRCULATION ENHANCEMENT, CBBEP NO. 2123.** The work consists of removing three existing concrete pipe crossings & damaged structures and installing three new crossings at the same location. Crossing #1 consists of a single 14” rise x 23” span elliptical pipe (18" RCP equivalent); Crossing #2 consists of three 18" RCP pipes and Crossing #3 consists of a double 6' span x 2' rise box culverts. Minor excavation to install new crossings, bulk rock for soil stabilization and erosion protection; and Type A, Grade 1-2 base material for trail surface on top of the new pipe crossings. The construction staging placement area will be located upland. Board mats may be placed to protect any vegetated area along the trail while moving material to the site. All excavated material should be removed from the site. This project is located at the end of Ermis Road, Mission River Delta marsh as part of the restoration program to enhance the tidal river circulation for the Coastal Bend Bays & Estuaries Program, Inc. All work shall be completed in accordance with the construction plans, specifications, and contract documents.

B. Unless otherwise specified, provide, and pay for:
   1. Labor, materials, and equipment.
   2. Tools, construction equipment, and machinery.
   3. Water, heat, and utilities required for construction.
   4. Coordination and supervision of all trades.
   5. Field surveying required for support of construction operations.
   6. Other facilities and services necessary for proper execution and completion of this project.
   7. Applicable permits, licenses, and inspections necessary to properly execute completion of the work.

1.02 WORKMANSHIP

A. These specifications contain instructions and descriptions covering the major items of construction and workmanship necessary for constructing new units and renovating or upgrading the various units or elements of the existing facility. The specifications are intended to be so written that only first-class workmanship and finish of the best grade and quality will result. The fact that these specifications may fail to be so complete as to cover all details will not relieve the CONTRACTOR of full responsibility for providing a completed project of high-quality, first-class finish and appearance and satisfactory for operation, all within the apparent intent of the plans and specifications.

1.03 SANITATION FACILITIES

The CONTRACTOR shall provide portable toilet facilities in sufficient number for the CONTRACTOR's use throughout the course of the project and in accordance with OSHA requirements. CONTRACTOR's personnel will not be permitted to use toilet facilities in the existing buildings. If desired by the CONTRACTOR, CONTRACTOR's sanitary facilities may discharge into the sewer system at a location to be specified by the OWNER.

1.04 PROJECT SIGN
None

1.05 PROJECT PHOTOGRAPHS
See Specification 013010, “Contractor’s Submittals”, paragraph 2.06.

1.06 POWER FOR CONSTRUCTION
The CONTRACTOR shall provide at his own expense electrical power for project construction.

1.07 SALVAGED MATERIAL
Surplus material that is removed by the CONTRACTOR as directed in the plans and specifications shall become the property of the CONTRACTOR unless shown otherwise in the plans or specifications or designated by the OWNER's Representative. This includes all excess material due to roadway, storm sewer, curb & gutter, sidewalks, and utilities excavation. The CONTRACTOR shall be responsible for disposing offsite.

1.08 CONNECTIONS TO EXISTING FACILITIES, DRIVEWAYS

A. The CONTRACTOR's attention is directed to the fact that the existing facilities and driveways must be kept in service throughout the construction period and that no interruptions will be permitted that adversely affect the operation of the facilities. When permission is obtained from the OWNER, portions of the existing facilities may be taken out of service for short periods corresponding with periods of minimum flow.

B. The CONTRACTOR shall make his own investigations and determine to his satisfaction the nature of work involved in making the connections and modifications to existing facilities in the manner intended by the Plans. The CONTRACTOR shall then coordinate the items requiring interruptions with the OWNER and proceed only when approval is obtained from the OWNER and within the time frame permitted by the OWNER.

C. All work involved in making connections which will require that existing facilities be taken out of service shall be carefully planned and coordinated with both the ENGINEER and the OWNER so that "down time" of the existing facilities may be held to a minimum.

D. If connections require encroachment onto private property, the Contractor shall coordinate with the Engineer and the CBBEP to obtain a signed temporary construction easement agreement form.

E. Sequencing, coordination, and project scheduling requirements are contained in Section 010100, CONSTRUCTION SEQUENCE ITEMS AND PROJECT SCHEDULING, and in the drawings.

1.09 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. CONTRACTOR shall repair or replace all damaged street surfaces, driveways, sidewalks, curb and gutter, fences, drainage structures, or other structures, to the satisfaction of the ENGINEER and the OWNER. Structures shall be restored to a condition equal to or better than the original condition and of a similar material and design. The costs of such repair or replacement shall be borne by the CONTRACTOR and shall be included in the Proposal.

B. The Plans show the locations of all known surface and subsurface structures and utilities. However, the OWNER and the ENGINEER assume no responsibility for failure to show any or all of these structures or utilities on the Plans, or to show them in their exact locations.

It is mutually agreed that such failure shall not be considered sufficient basis for claims for additional compensation for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate changes in the lines or grades, or require the building of special work, provisions for which are not made in the Plans and Proposal, in which case the provisions in these Specifications for extra work shall apply.

C. It is anticipated that some utilities exist which are not shown on the Plans. The CONTRACTOR, prior to ordering material and beginning work, shall make an independent survey to locate and identify the type and size of all existing piping and valves in the construction area, using hand excavation if necessary. The CONTRACTOR shall keep an accurate record of the location, depth, size, type of material, and type of service of all underground utilities encountered during construction. All piping, valves, electrical conduits, etc. in the construction area shall be protected as necessary, in a manner acceptable to the ENGINEER. No additional compensation will be considered for the protection of any of these items whether shown on the Plans or not. Also, no claims for delays will be considered as a result of encountering obstructions or conflicts not shown on the Plans. It is the sole responsibility of the CONTRACTOR to confirm the location of all subsurface piping, electrical conduits, etc. which affect the prosecution of his work prior to ordering materials or beginning work.

1.10 REFERENCE STANDARDS

Reference to the standards of any technical society, organization, or association, or to codes of local and state authorities, shall mean the latest standard codes, specification, or tentative specification adopted and published at the date of taking bids, unless specifically stated otherwise.

1.11 PUMPING AND DEWATERING OPERATIONS

A. Work to be performed may require draining, pumping, and dewatering, and certain cleaning operations necessary to complete the work as specified and as indicated on the Drawings. It is the intent of these specifications that such draining, pumping & dewatering, and cleaning operations shall be the obligation of the CONTRACTOR.

B. The CONTRACTOR shall provide all necessary pumping as required to remove all surface water, groundwater, leakage, and water from other sources from excavations. Excess water from dewatering operations shall be disposed of in a manner acceptable to the OWNER.

1.12 WATER FOR CONSTRUCTION

For potable water required for the CONTRACTOR'S operations, arrangements may be made to purchase water from the CBBEP at the current rates. The CBBEP shall provide a suitable meter and valves. Fittings, piping, and other appurtenances must be provided by the CONTRACTOR. CONTRACTOR shall take adequate precautions to protect the utility lines from contamination or damage.

1.13 BLASTING

No blasting will be allowed on this project.

1.14 SANITATION AND CLEANUP

During construction, the CONTRACTOR shall maintain the premises in an orderly, neat, and presentable condition. Scraps and debris shall not be left scattered around but shall be assembled in one place and disposed of weekly.

When construction under this contract has been otherwise completed, the CONTRACTOR shall remove all leftover construction materials, equipment, scraps, debris, and rubbish, and leave the site in a neat, well-kept appearance.

At the completion of the project the CONTRACTOR shall clean all project-related structures, piping, and equipment to remove dirt, stains, paint splatter and any other foreign materials.

1.15 SECURITY OF PROJECT SITE

Security of the work area shall be the responsibility of the CONTRACTOR.

1.16 LABORATORY TESTING

See Section VII. Special Provisions of the Agreement, A-18 Testing and Certification.

A. TESTING LABORATORY SERVICES: See Section VII. Special Provisions of the Agreement, A-18 Testing and Certification.

B. VERIFICATION TESTING FOR CORRECTIONS TO DEFECTIVE WORK: When tests made by the testing laboratory indicate that the work performed or materials provided are not in compliance with Contract Documents, subsequent testing shall be done on corrected work to verify that the corrected work is in compliance with the Contract Documents. All costs for subsequent testing shall be paid for the CONTRACTOR.

C. TRANSMITTAL OF TEST REPORTS: Written reports of tests, and engineering data furnished by the CONTRACTOR for the ENGINEER's review of materials and equipment proposed to be used in the work shall be in accordance with Section 013010, Contractor's Submittals. The testing laboratory will furnish four (4) copies of a written report of each test performed by laboratory personnel in the field or laboratory. One copy of each test report will be transmitted to the Resident Project Representative, one (1) copy will be sent to the ENGINEER, one (1) copy will be sent to the OWNER, and (1) copy to the CONTRACTOR within 3 days after each test is completed.

1.17 FIREARMS

Neither the Contractor nor any of his employees shall be allowed to carry firearms on the Project, either on their persons or within their automobiles. Any violation of this requirement will result in the permanent removal from the Project of the employee committing the violation.

1.18 HANDLING MATERIALS NOT APPROVED

The CONTRACTOR shall remove from the site any materials found to be damaged, and any materials not meeting the specifications. These materials shall be removed promptly unless the ENGINEER will accept the materials after repairing. Materials found to be damaged, or not acceptable to the ENGINEER, shall be removed. Examination before installation shall not relieve the CONTRACTOR from any responsibility to furnish good quality materials.

1.19 LIGHTING

CONTRACTOR shall provide lighting for construction operations and security and shall maintain lighting and make routine repairs. Permanent lighting may be used when available.

1.20 HEATING AND VENTILATION

CONTRACTOR shall provide heating and ventilation as required to maintain the conditions specified for construction operations and to protect materials and finishes from damage due to temperature or humidity as specified in the General Conditions. Provide ventilation of enclosed areas to cure materials, disperse humidity and prevent accumulations of dust, fumes, vapors, or gases.

1.21 TELEPHONE SERVICE

CONTRACTOR shall arrange for service with the Telephone Company and provide temporary telephone service for all construction needs throughout the construction period. Contractor may utilize cell phone service. A list of the following must be maintained by the project superintendent.

1. CONTRACTOR and all subcontractors employed at work site
2. OWNER'S representatives
3. Medical Services:
   a. Physicians
   b. Hospitals
   c. Ambulance service companies
4. Emergency numbers of all utilities
5. Police
6. Fire Departments.

1.22 FIRST AID FACILITIES

CONTRACTOR shall provide full complement of first aid supplies in weatherproof container at first aid station.

1.23 FIRE PROTECTION

A. Store flammable/combustible liquids in conformance with requirements of federal and local codes and regulations and prohibit storage of flammable/combustible liquids near exits, stairways, or common passageways. Provide approved metal safety containers for storage of flammable/combustible liquids in excess of 1-gallon.

1.24 FIELD OFFICES

A. No field office will be required.

B. The CONTRACTOR shall provide storage sheds as necessary for products in conformance with the General Conditions. The storage sheds shall have weather-tight construction, heating, ventilating and air conditioning as necessary to comply with the General Conditions, sufficient space to provide for inspection, and electric lighting.

1.25 RESIDENT PROJECT REPRESENTATIVE'S OFFICE

None

1.26 CONSTRUCTION ROADS

Provide and properly maintain construction roads as necessary to accomplish the project work. Perform dust control as required to maintain the project free of objectionable dust in a manner that will cause the least inconvenience to the public and wastewater department staff.

1.27 PROJECT MEETINGS

ENGINEER shall schedule and administrator periodic progress meetings during construction, as often as necessary, with a minimum of one official progress meeting per month with the Resident Project "Representative and wastewater department staff.

Representatives of CONTRACTOR, including Project Manager and/or Project Superintendent as a minimum, major subcontractors and other suppliers and representatives as necessary who are qualified and authorized to act on behalf of each entity shall be in attendance. CONTRACTOR shall notify those required to attend.

Time and location of the meetings shall be mutually agreed upon with the OWNER. CONTRACTOR shall provide an updated progress schedule at each official monthly progress meeting.

1.28 CONTRACT DOCUMENTS AT THE SITE

The CONTRACTOR shall maintain at the Project site one copy of the Contract Documents including Plans, Specifications, Addenda, Change Orders, approved Shop Drawings, and any other modifications approved by the ENGINEER. The CONTRACTOR shall also keep copies of all project correspondence and payment requests at the site.

These documents shall be kept in good order in file cabinets and shall be marked to accurately record all changes made during construction and to accurately record the location and size of existing buried pipe and valves encountered during construction of the Project. Upon completion of the Project, these drawings shall be made available to the ENGINEER for the OWNER.

1.29 VENUE

If any legal action is filed upon this Contract, venue shall lie in San Patricio County, State of Texas.

1.30 FINAL PROJECT CLEAN UP

Prior to final completion and acceptance of the Project by the OWNER, the CONTRACTOR shall thoroughly clean the entire project site including the roadways, sidewalks, affected grass areas, mowing of all grass and edging, etc. in a complete manner acceptable to the ENGINEER. The Project shall then be submitted to the OWNER for final acceptance.

1.31 STORMWATER DISCHARGE PERMITS

It is the responsibility of the CONTRACTOR to obtain and maintain for the life of the Project a permit for the discharge of stormwater runoff from the Project site. The CONTRACTOR shall include the cost of obtaining a baseline general permit in his Contract Amount. In the event that a site-specific permit is required, a change order covering any additional costs incurred by the CONTRACTOR will be negotiated.

SECTION 010100
CONSTRUCTION SEQUENCE ITEMS AND COSNTRUCTION SCHEDULE

1. GENERAL

A. The CONTRACTOR shall prepare and submit a project schedule within 30 days of beginning work, outlining the schedule and time requirements for each item involving all construction items.

B. The CONTRACTOR shall notify the OWNER at least 14 days in advance and again 3 days prior to beginning work on a particular area and coordinate with the OWNER the specific items to be isolated and duration for each. Obtain written approval from the OWNER prior to each shutdown. Any cost associated with rescheduling will be included in the Contractor's bid.

C. Prior to beginning work, the CONTRACTOR shall have on-site all materials, equipment, and personnel necessary to complete the work in the time scheduled.

D. Existing plugged pipelines, in which water has been standing, may have to be cleaned of debris prior to connecting to a new pipeline.

E. Hurricane Evacuation: Hurricane season is from June 1st thru November 30th. As the closet metropolitan City inland from the Texas coast, the City of San Antonio is a major shelter destination during mandatory hurricane evacuations. As such, planned work zone lane or road closures may be restricted and/or suspended during mandatory hurricane evacuation operations.

No time charges will be made if the Engineer determines that work on the project was impacted by the hurricane.

Contractor is responsible to prepare and implement an evacuation plan. Review TxDOT hurricane evacuation route maps from the Texas coast. If the state or local officials order mandatory evacuation – leave immediately. Be sure the project site is secure and safe, remove all erosion and sediment control structures to maximize rainwater flows without obstruction.

The Engineer may order changes in the Traffic Control Plan to accommodate evacuation traffic, and may suspend the work, all or in part, to ensure timely completion of this work. All work to implement changes in the Traffic Control Plan will be paid through existing bid prices. However, the CBBEP will not entertain any request for delay damages, loss of efficiency that may be attributed to the restriction or suspension of road or lane closures, or to changes in the Traffic Control Plan.

SECTION 011520
MOBILIZATION AND DEMOBILIZATION

1. DESCRIPTION

This item shall consist of mobilization and demobilization of personnel, facilities, equipment, costs of payment and performance bonds as required, all being in preparation for the start-up and completion of the "Work" under this Contract.

2. METHOD OF MEASUREMENT

Mobilization shall not be measured and paid for separately.

3. BASIS OF PAYMENT

The Mobilization and Demobilization Bid Item shall include bonds, insurance, mobilization, demobilization and shall not be greater than 5% of the total base bid. 75% of the item will be paid upon mobilization on the job and 25% will be paid upon job completion and demobilization.

SECTION 013010
CONTRACTOR'S SUBMITTALS

1. GENERAL

1.01 SCOPE: The CONTRACTOR shall submit descriptive information to:

A. Allow the ENGINEER to advise the OWNER whether the materials and equipment proposed for the project are in general conformance with the design concepts and in conformance with the drawings and specifications.

B. Provide a record for the OWNER of the materials and equipment, which have been incorporated into the project.

C. Provide a guide for operations and maintenance of equipment.

D. Provide information required for the administration of the Contract for construction of the project. This section of the specifications provides a more detailed description of the requirements for submittals as outlined in the General Conditions but does not alter any requirement for submittals as described in the General Conditions.

2. PROCEDURES

2.01 CONTRACTOR'S RESPONSIBILITIES: The CONTRACTOR shall be responsible for the accuracy and completeness of the information contained in each submittal and shall insure that the values, material, equipment, or method of work shall be as described in the submittal. **All submittals must be stamped by the CONTRACTOR, indicating that they have been checked by the CONTRACTOR for compliance with the Contract documents and approved by the CONTRACTOR, or contain certifications as required by the Contract Documents**. Submittals that do not have the stamp applied or that do not include the required certifications will be returned without processing to the CONTRACTOR.

The CONTRACTOR shall insure that there is no conflict with other submittals and notify the ENGINEER of each case where the proposed change may affect the work of another CONTRACTOR or OWNER. The CONTRACTOR shall insure coordination of submittals among the related crafts and Subcontractors. Submittals shall not be accepted from Subcontractors or suppliers.

2.02 MARKING OF SUBMITTALS: The CONTRACTOR shall assign a number to each submittal provided to the ENGINEER to allow each submittal to be tracked while processing through the review procedures. Assignment of numbers shall be by means of a sequence number, and letter suffix to indicate resubmittals. The sequence number shall be issued in chronological order for each submittal. Resubmittals shall be followed by a letter of the alphabet to indicate the number of times a submittal has been sent to the ENGINEER for processing.

As an example, a submittal with the number 25 indicates that the submittal is the 25th submitted. Submittal number 12-A indicates the submittal is the 12th shop drawing submitted and is being submitted for the second time. Correct assignment of numbers is essential as different submittal types are processed in different ways. Some submittals received do not require that any response be given for the material.

A. CONTRACTOR and ENGINEER shall both maintain a log of submissions to allow the processing of CONTRACTOR's submittals to be monitored. Logs will be reviewed periodically to determine that all submittals are received and processed.

B. Submittals shall be marked clearly to show the applicable sections of the specification and sheet number of drawings.

C. Submittals shall be accompanied by a Submittal Transmittal Form to be provided by the ENGINEER.

D. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate discrete sections, etc. for which a submittal is required. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that they should be checked as a unit.

2.03 CONTRACTOR MODIFICATION REQUEST / PROPOSED CONTRACT MODIFICATION: Any change(s) in the contract documents that is requested will be initiated by the CONTRACTOR issuing a CONTRACTOR'S Modification Request or by the ENGINEER issuing a Proposed Contract Modification on the form provided by the ENGINEER. Proposals will be considered and if found acceptable will be incorporated in a Field Order in accordance with the General Conditions or a Change Order in accordance with the General Conditions.

2.04 SHOP DRAWINGS:

A. Definitions:
1. Shop drawings consist of all drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.
2. Shop drawings shall indicate the kind, exact model, size, arrangement, and operation of component materials and devices; materials of construction, external connections, anchorages and supports required; performance characteristics; dimensions, weights, and other information required for installation and correlation with other materials and equipment.

B. Contractor’s Review and Certification:
1. The CONTRACTOR shall verify that the material and equipment in each shop drawing conforms to the requirements of the Contract Documents.
2. Shop drawings shall be in strict compliance with the Contract Documents and shall bear an executed statement to that effect by the CONTRACTOR as required in Section VII. Special Provisions of the Agreement, A-27 Other Submittals. Shop Drawings without this stamp applied will be returned without review.

C. Deviations from Contract Documents:
1. Requests for deviation from the Contract Documents shall be by CONTRACTOR'S Modification Request as outlined in paragraph 2.03 of this section of the specifications. The CONTRACTOR's Modification Request shall fully identify and describe the deviations and state the reason the change is requested. Any savings in cost related to the substitution is to be stated in the request for consideration.

D. Requirement for Complete Shop Drawings:
   1. Material in shop drawings shall be in sufficient detail to demonstrate compliance with all requirements of the Contract Documents. Shop drawings shall address material and/or methods of construction, design criteria, performance characteristics, and special provisions of the Specifications.
   2. Shop drawings for systems and related equipment shall include information for all components required for a complete and operational system, including electrical, mechanical, and any other information required to indicate how the various components of the system function, and shall be included in the same submittal.
   3. Where statements of certification, written guarantees, extended service agreements or extended warranties as defined in paragraph J are required, they will be provided with the shop drawing. The effective date of the guarantee and service agreements, however, shall not be until the date of acceptance for the project.
   4. Shop drawings shall be clearly marked to show the applicable sections of the specifications and sheet in the drawings. Other identification may also be required on drawings such as layout drawings or schedules to allow the reviewer to determine where a particular item is to be used in the project.
   5. A minimum of six (6) copies of each shop drawing shall be submitted. Three (3) copies will normally be retained by the ENGINEER and OWNER. Any remaining copies will be returned to the CONTRACTOR.
   6. Shop drawings, which do not have all the information, required for evaluation will be returned without benefit of review and comment.

E. Checking and Review of Shop Drawings:
   1. The ENGINEER will review the data for general conformity to the Contract Documents. Comments will be made on items called to the attention of the ENGINEER for review and verification. Markings will be based on this examination and do not constitute a blanket review of the shop drawing. The ENGINEER's review does not relieve the requirements. Shop drawings which contain substantial errors or omissions, or which are not clearly legible, will be returned without benefit of review.
   2. Shop drawings will be marked in one of the four following ways:
      a. Approved: Shop drawings are acceptable without correction and may be distributed for construction and/or manufacture.
      b. Approved, Except as Noted: Shop drawings are acceptable with minor corrections as marked and may be used with the corrections noted.
      c. Revise and Resubmit: Shop drawings having significant errors or incomplete data shall be revised and resubmitted for subsequent review after corrections have been made or additional materials are available.
      d. Not Approved: Material or equipment described is not acceptable.

F. Regarding the marking of shop drawings, it shall be understood that:
   1. Checking is only for conformance with the design concept of the project and compliance with the information given in the Contract Documents.
   2. Contractor is responsible for dimensions and quantities to be confirmed and correlated at the jobsite; and for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

G. Approval of Equal Substitutions: Where Contract Documents allow substitution of material or equipment as an approved equal to the specified product, shop drawings shall be provided.

Shop drawings shall include supporting data to indicate specifically, on a point-by-point basis for each feature of the design, how the proposed product is equal to or better than the specified product. Deviations from the Contract Documents must be requested and approved as described in Paragraph D.

H. Shop Drawings Required: Shop drawings are required for only those items of equipment or materials where submittals are listed in the individual specification section and for the determination of substitutions for approval as described in Paragraph G of this section. Only these shop drawings will be reviewed. Shop drawings, which are not required, may be returned with the notation "Not required by this contract."

I. Owner Selected Options: Where selections are to be made by the OWNER for color, texture or finish and shop drawings are required for that product, shop drawings will be submitted for approval of the materials of construction, composition, etc., prior to the selection of finished by the OWNER. Items requiring selection of finish for which shop drawings are not required shall be furnished as record data.

J. Certifications, Warranties and Other Requirements: Where indicated in the Contract documents the following items defined below are to be provided as part of the shop drawing.
   1. Certified Test Report. A report prepared by an approved testing agency on the results of tests performed on materials to indicate their compliance with the specifications. Reports are to be numbered consecutively for reference. Retest required to verify compliance with Contract Documents shall be identified with the same number as the original test with a letter to indicate retest, similar to the numbering system used for Shop Drawings.
   2. Certification of Local Field Service. A certified letter stating that field service is available from a factory or supplier approved service organization located within a 300-mile radius of the project site.
   3. Extended Warranty. A guarantee of performance for the product or system beyond the one-year warranty. The Warranty Certificate is to be issued in the name of the OWNER.
   4. Extended Service Agreement. A contract to provide operations and maintenance for equipment as specified beyond that required to full requirements for warranty repairs; or to perform routine maintenance at some period beyond the warranty period. The Service Agreement is to be issued in the name of the OWNER.
   5. Certification of Adequacy of Design. A certified letter from the manufacturer of the equipment stating that they have designed the equipment offered to account for structural stability to withstand all imposed loads without deformation, failure or adversely affecting the operational requirements of the unit; and operational capability, including mechanical and electrical equipment sizing to be fully operational in accordance with the conditions specified.
   6. Certification of Applicator/Subcontractor qualifications. A certified letter stating that the applicator/subcontractor proposed to perform a specified item of work is duly designated as factory-authorized and trained for the application or installation of the specified products.

2.05 RECORD DATA: Record data shall be submitted to provide information as to the general character, style, and manufacturer of the equipment to allow the OWNER to adequately identify the materials or equipment incorporated into the project. Record data shall be provided for all equipment and materials of construction.

Record data are not required for items for which Shop Drawings and or operations and maintenance manuals are required. Record data shall be complete to indicate where the material was incorporated into the project, provide schedules of materials and their use, colors, model numbers and other information which would allow this material to be replaced at some future date.

Record data will be received by the ENGINEER and logged for transmittal to the OWNER. Record data will not be reviewed for comment and no response will be made to the CONTRACTOR.

2.06 PROJECT PHOTOGRAPHS: The CONTRACTOR shall take photographs of the project site prior to construction, monthly during the construction of the Project and after completion of the Project. Photographs shall be taken with a quality electronic digital camera equipped to photograph either interior or exterior exposures.

A. Photographs shall be taken at locations as designated by the ENGINEER.

B. A CD disk shall be provided that contains the photographs taken. Each photo file shall be labeled or cross-referenced to indicate project name, date and time, location, direction of exposure, and a description of what is being photographed. Digital photographs shall be clear and sharp with proper exposure. If photographs of adequate quality are not produced, additional photographs shall be taken immediately.

C. The CONTRACTOR shall provide a minimum of ten (10) photographs of the site prior to construction. (Pre-construction and during-construction aerial photographs will not be required). Starting one (1) month after the date of the preconstruction photographs and continuing as long as the work is in progress, a minimum of six (6) photographs shall be taken each month to accurately record the work that has progressed during that period.

D. After the Project has been completed and all construction trailers, excess materials, etc., have been removed, the CONTRACTOR shall take digital photos of the completed project. Ten (10) photographs, one (1) of which is to be an aerial photograph, are to be taken. A CD disk shall be provided that contains the photographs taken, with the exception of the post-construction aerial photo, which may be a hard copy, glossy.

E. Aerial photographs shall be taken a maximum scale of 1” = 400’ and shall be clear (not grainy). Aerial photographs shall be approved by the ENGINEER.

2.07 PROJECT INFORMATION REQUEST: When necessary, for the CONTRACTOR to request additional information, or interpretation of the Contract Documents, or when CONTRACTOR believes there is a conflict between the drawings and specifications, he shall identify the conflict and request clarification using a Project Information request form.

A. Use of this form will allow requests for information to be routed to OWNER, design engineers, design consultants or others through the ENGINEER and allow these requests to be monitored to determine that clarification is provided when needed.

B. Sufficient information shall be attached to permit a written response without further information.

C. The ENGINEER will log each request and will review the request to determine that the information provided is adequate.

D. If the information is not adequate, the request will be returned for additional information.

E. When adequate information is provided, the request will be reviewed, and a response made.

F. If a change is required, the ENGINEER will provide additional information required to help the CONTRACTOR comply with the Contract Documents.

2.08 PAYMENT ESTIMATES: For contracts based on lump sum amounts, the CONTRACTOR is to submit to the ENGINEER for approval, a breakdown of cost for the Project. The breakdown is to provide adequate detail to allow easy determination of the percentage of completion for periodic payment review by the ENGINEER. Specification sections and add or deduct items in the proposal are to be used as a guide for preparing the breakdown. This breakdown is to be incorporated onto a form for the submission of payment request provided by the ENGINEER or in a form approved by the ENGINEER.

2.09 SCHEDULE OF VALUES: The schedule is to be in the form of a computer-generated critical path schedule, which includes all work to be performed on the Project.

A. The schedule is to be prepared by a person experienced in this field using the acceptable scheduling software.

B. The schedule is intended to accomplish the following:
   1. Give early warning of delays in time for correction.
   2. Require that detailed plans for the execution of the work be prepared in the form of future activities and events in sequential relationships.
   3. Establish interrelationships of significant planned work activities.
   4. Provide continuous current status information.
   5. Allow analysis of the CONTRACTOR's program for the completion of the Project.
   6. Permit preparation of new schedules when an existing schedule is not achievable.
   7. Log the progress of the work as it actually occurs.

C. A time scaled CPM arrow or precedence diagram shall be prepared to indicate each activity, and its start and stop dates. Milestone dates and project completion dates shall be developed to conform to time constraints, sequencing requirements, and the contract completion date. Durations for items shall be in calendar days, and normal holidays and weather conditions shall be accounted for in the projection of the duration of each activity.

D. The schedule shall clearly indicate by a graphical method, the critical path for work to complete the project.
   1. Only one critical path shall be shown on the construction schedule.
   2. As the work progresses, the CONTRACTOR shall enter on the chart the actual progress at the end of each partial payment period.

E. The schedule shall be revised to indicate any adjustments in contract time approved by change order.

F. Float time is to be defined as the amount of time between the earliest start date and the latest start date of a chain of activities on the CPM construction schedule. Float time is not for the exclusive use or benefit of either the CONTRACTOR or OWNER. Contract time cannot be changed by the submission of this schedule. Contract time can only be modified by approved Change Order.

G. Seven (7) copies of the updated schedule shall be submitted with each Periodical Estimate for partial payment. At any time, the project schedule indicates the CONTRACTOR has fallen more than 30 days behind schedule, the CONTRACTOR shall submit a written plan to the ENGINEER that indicates the action that the CONTRACTOR proposes to take to bring the project back on schedule. Progress payments will not be processed for recommendation to the OWNER unless accompanied by the required schedule and if required, the report for bringing the Project back on schedule.

2.10 SUPPLIERS AND SUBCONTRACTORS: CONTRACTOR is to provide a written list of subcontractors and suppliers prior to the pre-construction conference.

2.11 NOTIFICATION BY CONTRACTOR: Written notification of the need for testing, observation work by the ENGINEER, intent to work outside of the regular working hours, a request to shut down the facilities or to make utility connections shall be given to the ENGINEER by issuance of a Notification by Contractor on a form provided by the ENGINEER.

SECTION 021020
SITE CLEARING AND STRIPPING

1. DESCRIPTION

This specification shall govern all work necessary for clearing, grubbing, and stripping of objectionable matter as required to complete the project and shall include removing and disposing of trees, stumps, brush, roots, vegetation, rubbish, and other objectionable matter from the project site.

2. CONSTRUCTION METHODS

The site shall be cleared of all trees, stumps, brush, roots, vegetation, rubble, and other objectionable matter as indicated on drawings and/or as directed by the Engineer. Tree stumps and roots shall be grubbed to a minimum depth of 2 feet below natural ground. Areas, which underlie compacted backfill, shall be stripped of all vegetation, humus and other objectionable matter encountered within the top 6" of the soil. All material removed from site under this operation shall become the Contractor's responsibility. The material shall be disposed of either at a disposal site indicated on the drawings or at a site obtained by the Contractor.

3. MEASUREMENT AND PAYMENT

This work shall not be measured for payment but shall be subsidiary to the items in the Proposal of which it is a part. This item shall include, but not be limited to, supplying, placing, and compacting of fill material; and removing and disposing of excess material.

SECTION 021040
SITE GRADING

1. DESCRIPTION

This specification shall govern all work necessary for backfill and grading of the site to complete the project.

2. CONSTRUCTION METHODS

Prior to site grading, the site shall be cleared in accordance with Specification Section 021020, “Site Clearing and Stripping”. Unless specified otherwise on drawings, the existing surface shall be loosened by scarifying or plowing to a depth of not less than 6 inches. The loosened material shall be re-compacted with fill.

Fill shall be uniform as to material, density, and moisture content. Fill shall be free of large clods, large rocks, organic matter, and other objectionable material. No fill that is placed by dumping in a pile or windrow, shall be incorporated into a layer in that position; all such piles and windrows shall be moved by blading or similar method. All fill shall be placed in layers approximately parallel to the finish grade and in layers not in excess of 6 inches of un-compacted depth, unless indicated otherwise on drawings.

The fill shall be compacted to a density which approximates that of natural ground unless indicated otherwise on drawings.

The Engineer may order proof rolling test rolling to evaluate the uniformity of compaction. All irregularities, depressions, and soft spots which develop shall be corrected by the Contractor.

Excess material from excavation that is not incorporated into the site as fill, shall be become property of the Contractor and disposed of away from the job site, unless indicated otherwise on the drawings.

3. MEASUREMENT AND PAYMENT

This work shall not be measured for payment but shall be subsidiary to the items in the Proposal of which it is a part. This item shall include, but not be limited to, supplying, placing, and compacting of fill material; and removing and disposing of excess material.

SECTION 021080
REMOVING OLD STRUCTURES

1. DESCRIPTION

This specification shall provide for the removal and disposal of old structures or portions of old structures, as noted on the plans, and shall include all excavation and backfilling necessary to complete the removal. The work shall be done in accordance with the provisions of these specifications.

2. METHOD OF REMOVAL

A. Culverts or Sewers. Pipe shall be removed by careful excavation of all dirt on top and the sides in such manner that the pipe will not be damaged. Removal of sewer appurtenances shall be included for removal with the pipe. Those pipes, which are deemed unsatisfactory for reuse by the Engineer, may be removed in any manner the Contractor may select.

B. Concrete Structures. Unwanted Concrete structures or concrete portions of structures shall be removed. The unwanted structure shall be removed to the lines and dimensions shown on the plans, and these materials shall be disposed of as shown on the plans or as directed by the Engineer. Any portion of the existing structure, outside of the limits designated for removal, damaged during the operations of the Contractor shall be restored to its original condition at his entire expense. Explosives shall not be used in the removal of portions of the existing structure unless approved by the Engineer, in writing.

   Concrete portions of structures below the permanent ground line, which will not interfere in any manner with the proposed construction, may be left in place, but removal shall be carried at least 5-feet below the permanent ground line and neatly squared off. Reinforcement shall be cut off close to the concrete. Backfill and compact in one-foot lifts and to a minimum of 95% Standard Proctor.

C. Steel Structures. Steel structures or steel portions of structures shall be dismantled in sections as determined by the Engineer. The sections shall be stored if the members are to dand steel stringers of truss spans shall be removed by butting the heads with a "cold cut" & punching or drilling from the hole, or by such other method as will not injure the members for re-use and will meet the approval of the Engineer. The removal of rivets and bolts from connections of truss members, bracing members, and other similar members in the structure will not be required unless specifically called for on the plans or special provisions and the Contractor shall have the option of dismantling these members by flame-cutting the members immediately adjacent to the connections. Flame Cutting will not be permitted, however, when plans or special provisions call for the structure unit to be salvaged in such manner as to permit re-erection. In such case, all members shall be carefully match-marked with paint in accordance with diagram furnished by the Engineer prior to dismantling and all rivets and bolts shall be removed from the connections in the manner specified in the first portion of this paragraph.

D. Timber Structures. Timber structures or timber portions of structures to be reused shall be removed in such manner as to damage the timber for further use as little as possible. All bolts and nails shall be removed from such lumber as deemed salvable by the Engineer. Unless otherwise specified on the plans, timber piles shall be either pulled or cut off at the point not less than 2-feet below ground line, with the choice between these two methods resting with the Contractor, unless otherwise specified.

E. Brick or Stone Structures. Unwanted brick or stone structures or stone portions of structures shall be removed. Portions of such structures below the permanent ground line, which will not in any manner interfere with the proposed construction, may be left in place, but removal shall be carried at least 5-feet below the permanent ground line and neatly squared off. Backfill and compact in one-foot lifts and to a minimum of 95% Standard Proctor.

F. Salvage. All material such as pipe, timbers, railings, etc., which the Engineer deems as salvable for reuse and all salvaged structural steel shall be delivered to a designated storage area.

The I-Beams, stringers, etc., which are specified to be dismantled without damage for reuse, and all steel members when match-marked and dismantled for reuse, shall be blocked off the ground in an upright position to protect the members against further damage.

Materials, other than structural steel, which are not deemed salvable by the Engineer, shall become the property of the Contractor, and shall be removed to suitable disposal sites off of the right-of-way arranged for by the Contractor, or otherwise disposed of in a manner satisfactory to the Engineer. Where temporary structures are necessary for a detour adjacent to the present structure, the Contractor will be permitted to use the material in the old structure for the detour structure, but he shall dismantle and stack or dispose of the material as required above as soon as the new structure is opened for traffic.

G. Backfill. All excavation made in connection with this specification and all openings below the natural ground line caused by the removal of old structures or portions thereof shall be backfilled to the level of the original ground line, unless otherwise provided on the plans.

That portion of the backfill, which will support any portion of the roadbed or embankment, shall be placed in layers of the same depth as those required for placing embankment. Material in each layer shall be wetted uniformly, if required, and shall be compacted to a minimum of 95% Standard Proctor. In places inaccessible to blading and rolling equipment, mechanical or hand tamps, or rammers shall be used to obtain the required compaction. That portion of the backfill which will not support any portion of the roadbed or embankment shall be placed as directed by the Engineer in such manner and to such state of compaction as will preclude objectionable amount of settlement.

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, this work shall not be measured for pay but shall be subsidiary to the project.

SECTION 022020
EXCAVATION AND BACKFILL FOR UTILITIES

1. DESCRIPTION

This specification shall govern all work for excavation and backfill for utilities required to complete the project.

2. CONSTRUCTION

A. Unless otherwise specified on the drawings or permitted by the Engineer, all pipe and conduit shall be constructed in open cut trenches with vertical sides. Trenches shall be sheathed and braced as necessary throughout the construction period. Sheathing and bracing shall be the responsibility of the Contractor (refer to Section 022022 “Trench Safety for Excavations”).

Trenches shall have a maximum width of one foot beyond the horizontal projection of the outside surfaces of the pipe and parallel thereto on each side unless otherwise specified.

The Contractor shall not have more than 200 feet of open trench left behind the trenching operation and no more than 500 feet of ditch behind the ditching machine that is not compacted as required by the plans and specifications. No trench or excavation shall remain open after working hours.

For all utility conduit and sewer pipe to be constructed in fill above natural ground, the embankment shall first be constructed to an elevation not less than one foot above the top of the pipe or conduit, after which excavation for the pipe or conduit shall be made.

If quicksand, muck, or similar unstable material is encountered during the excavation, the following procedure shall be used unless other methods are called for on the drawings. If the unstable condition is a result of ground water, the Contractor, prior to additional excavation, shall control it. After stable conditions have been achieved, unstable soil shall be removed or stabilized to a depth of 2 feet below the bottom of pipe for pipes 2 feet or more in height; and to a depth equal to the height of pipe, 6 inches minimum, for pipes less than 2 feet in height. Such excavation shall be carried at least one foot beyond the horizontal limits of the structure on all sides. All unstable soil so removed shall be replaced with suitable stable material, placed in uniform layers of suitable depth as directed by the Engineer, and each layer shall be wetted, if necessary, and compacted by mechanical tamping as required to provide a stable condition. For unstable trench conditions requiring outside forms, seals, sheathing and bracing, any additional excavation and backfill required shall be done at the Contractor's expense.

B. Shaping of Trench Bottom. The trench bottom shall be undercut a minimum depth sufficient to accommodate the class of bedding indicated on the plans and specifications.

C. Dewatering Trench. Pipe or conduit shall not be constructed or laid in a trench in the presence of water. All water shall be removed from the trench sufficiently prior to the pipe or conduit planing operation to insure a relatively dry (no standing water), firm bed. The trench shall be maintained in such dewatered condition until the trench has been backfilled to a height at least one foot above the top of pipe. Removal of water may be accomplished by bailing, pumping, or by installation of well-points, as conditions warrant. Removal of well-points shall be at rate of 1/3 per 24 hours (every third well-point). The Contractor shall prevent groundwater from trench or excavation dewatering operations from discharging directly into the storm water system. Groundwater from dewatering operations shall be sampled and tested, if applicable, and disposed of, in accordance with Specification Section 022021 "Control of Ground Water".

D. Excavation in Streets. Excavation in streets, together with the maintenance of traffic where specified, and the restoration of the pavement riding surface, shall be in accordance with drawing detail or as required by other applicable specifications.

E. Removing Abandoned Structures. When abandoned masonry structures or foundations are encountered in the excavation, such obstructions shall be removed for the full width of the trench and to a depth one foot below the bottom of the trench. When abandoned inlets or manholes are encountered and no plan provision is made for adjustment or connection to the new utility, such manholes and inlets shall be removed completely to a depth one foot below the bottom of the trench. In each instance, the bottom to the trench shall be restored to grade by backfilling and compacting by the methods provided hereinafter for backfill. Where the trench cuts through utility lines which are known to be abandoned, these lines shall be cut flush with the sides of the trench and blocked with a concrete plug in a manner satisfactory to the Engineer.

F. Protection of Utilities. The Contractor shall conduct his work such that a reasonable minimum of disturbance to existing utilities will result. Particular care shall be exercised to avoid the cutting or breakage of water and gas lines. Such lines, if broken, shall be restored promptly by the Contractor. When active wastewater lines are cut in the trenching operations, temporary flumes shall be provided across the trench while open, and the lines shall be restored when the backfilling has progressed to the original bedding line of the sewer so cut.

The Contractor shall inform utility owners sufficiently in advance of the Contractor's operations to enable such utility owners to reroute, provide temporary detours, or to make other adjustments to utility lines in order that the Contractor may proceed with his work with a minimum of delay. The Contractor shall not hold the City liable for any expense due to delay or additional work because of utility adjustments or conflicts.

G. Excess Excavated Material. All materials from excavation not required for backfilling the trench shall be removed by the Contractor from the job site promptly following the completion of work involved.

H. Backfill

A. Backfill Procedure Around Pipe (Initial Backfill): All trenches and excavation shall be backfilled as soon as is practical after the pipes or conduits are properly laid. In addition to the specified pipe bedding material, the backfill around the pipe as applicable shall be granular material as shown on the standard details or as described in the applicable specification section and shall be free of large hard lumps or other debris. If indicated on the plans, pipe shall be encased with cement-stabilized sand backfill as described below. The backfill shall be deposited in the trench simultaneously on both sides of the pipe for the full width of the trench, in layers not to exceed ten (10) inches (loose measurement), wetted if required to obtain proper compaction, and thoroughly compacted by use of mechanical tampers to a density comparable to the adjacent undisturbed soil or as otherwise specified on the plans, but not less than 95% Standard Proctor density. A thoroughly compacted material shall be in place between the external wall of the pipe and the undisturbed sides of the trench and to a level twelve (12) inches above the top of the pipe.

B. Backfill Over One Foot Above Pipe (Final Backfill)

UNPAVED AREAS: The backfill for that portion of trench over one (1) foot above the pipe or conduit not located under pavements (including waterlines, gravity wastewater lines, wastewater force mains and reinforced concrete storm water pipe) shall be imported select material or clean, excess material from the excavation meeting the following requirements:

Free of hard lumps, rock fragments, or other debris, No clay lumps greater than 2" diameter Moisture Content: +/-3%

Backfill material shall be placed in layers not more than ten (10) inches in depth (loose measurement), wetted if required to obtain proper compaction, and thoroughly compacted by use of mechanical tampers to the natural bank density but not less than 95% Standard Proctor density, unless otherwise indicated. Flooding of backfill is not allowed. Jetting of backfill may only be allowed in sandy soils and in soils otherwise approved by the Engineer. Regardless of backfill method, no lift shall exceed 10 inches and density shall not be less than 95% Standard Proctor density. A period of not less than twenty-four (24) hours shall elapse between the time of jetting and the placing of the top four (4) feet of backfill. If jetting is used, the top four (4) feet of backfill shall be placed in layers not more than 10 inches in depth (loose measurement), wetted if required to obtain proper compaction, and thoroughly compacted by use of mechanical tampers to the natural bank density but not less than 95% Standard Proctor density (ASTM D698).

PAVED AREAS: At utility line crossings under pavements (including waterlines, gravity wastewater lines, wastewater force mains, and reinforced concrete storm water pipe), and where otherwise indicated on the drawings, trenches shall be backfilled as shown below: From top of initial backfill (typically twelve (12) inches above top of the pipe) to three (3) feet below bottom of road base course, backfill shall be select material meeting the requirements of 022100 “Select Material”.

Asphalt Roadways

The upper three (3) feet of trench below the road base course shall be backfilled to the bottom of the road base course with cement-stabilized sand containing a minimum of 2 sacks of Standard Type I Portland cement per cubic yard of sand and compacted to not less than 95% Standard Proctor density.

Concrete Roadways

The Contractor may elect to backfill the upper three (3) feet of trench below the road base course with cement stabilized sand as noted above, or in the case of storm water pipe or box installation the Contractor may backfill and compact select material to 98% Standard Proctor density (ASTM D698) following Specification Section 022100.

3. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, excavation and backfill for utilities, including select material or cement-stabilized sand backfill, shall not be measured, and paid for separately. It shall be considered subsidiary to the items for which the excavation and backfill is required.

SECTION 022021
CONTROL OF GROUNDWATER

1. GENERAL

1.1 SECTION INCLUDES

A. Dewatering, depressurizing, draining, and maintaining trenches, shaft excavations, structural excavations, and foundation beds in a stable condition, and controlling ground water conditions for tunnel excavations.

B. Protection of excavations and trenches from surface runoff.

C. Disposing of removed ground water by approved methods.

1.2 REFERENCES

A. ASTM D 698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5-lb (2.49 kg) Rammer and 12-inch (304.8 mm) Drop.

B. Federal Regulations, 29 CFR Part 1926, Standards-Excavation, Occupational Safety and Health Administration (OSHA).

C. Federal Register 40 CFR (Vol. 55, No. 222) Part 122, EPA Administered Permit Programs (NPDES), Para.122.26(b)(14) Storm Water Discharge.

1.3 DEFINITIONS

A. Ground water control includes both dewatering and depressurization of water-bearing soil layers.

1. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from slopes or bottoms of excavations, or into tunnels and shafts, and disposing of removed ground water by approved methods. The intent of dewatering is to increase the stability of tunnel excavations and excavated slopes; prevent dislocation of material from slopes or bottoms of excavations; reduce lateral loads on sheeting and bracing; improve excavating and hauling characteristics of excavated material; prevent failure or heaving of the bottom of excavations; and to provide suitable conditions for placement of backfill materials and construction of structures, piping and other installations.
2. Depressurization includes reduction in piezometric pressure within strata not controlled by dewatering alone, as required to prevent failure or heaving of excavation bottom or instability of tunnel excavations.

B. Excavation drainage includes keeping excavations free of surface and seepage water.

C. Surface drainage includes the use of temporary drainage ditches and dikes and installation of temporary culverts and sump pumps with discharge lines as required to protect the Work from any source of surface water.

D. Equipment and instrumentation for monitoring and control of the ground water control system includes piezometers and monitoring wells, and devices, such as flow meters, for observing and recording flow rates.

1.4 PERFORMANCE REQUIREMENTS

A. Conduct subsurface investigations as needed to identify ground water conditions and to provide parameters for design, installation, and operation of ground water control systems.

B. Design a ground water control system, compatible with requirements of Federal Regulations 29 CFR Part 1926 and City Standard Specification Section 022022 - Trench Safety for Excavations, to produce the following results:

1. Effectively reduce the hydrostatic pressure affecting:
   a) Excavations (including utility trenches);
   b) Tunnel excavation, face stability or seepage into tunnels.
2. Develop a substantially dry and stable subgrade for subsequent construction operations.
3. Preclude damage to adjacent properties, buildings, structures, utilities, installed facilities, and other work.
4. Prevent the loss of fines, seepage, boils, quick condition, or softening of the foundation strata.
5. Maintain stability of sides and bottom of excavations.

C. Provide ground water control systems which may include single-stage or multiple-stage well point systems, eductor and ejector-type systems, deep wells, or combinations of these equipment types.

D. Provide drainage of seepage water and surface water, as well as water from any other source entering the excavation. Excavation drainage may include placement of drainage materials, such as crushed stone and filter fabric, together with sump pumping.

E. Provide ditches, berms, pumps and other methods necessary to divert and drain surface water away from excavations.

F. Locate ground water control and drainage systems so as not to interfere with utilities, construction operations, adjacent properties, or adjacent water wells.

G. Assume sole responsibility for ground water control systems and for any loss or damage resulting from partial or complete failure of protective measures, and any settlement or resultant damage caused by the ground water control operations. Modify ground water control systems or operations if they cause or threaten to cause damage to new construction, existing site improvements, adjacent property, or adjacent water wells, or affect potentially contaminated areas. Repair damage caused by ground water control systems or resulting from failure of the system to protect property as required.

H. Provide an adequate number of piezometers installed at the proper locations and depths as required to provide meaningful observations of the conditions affecting the excavation, adjacent structures, and water wells.

I. Provide environmental monitoring wells installed at the proper locations and depths as required to provide adequate observations of hydrostatic conditions and possible contaminant transport from contamination sources into the work area or into the ground water control system.

J. Decommission piezometers and monitoring wells installed during design phase studies and left for Contractors monitoring and use, if applicable.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Comply with requirements of agencies having jurisdiction.

B. Comply with Texas Commission on Environmental Quality (TCEQ) regulations and Texas Water Well Drillers Association for development, drilling, and abandonment of wells used in dewatering system.

C. Prior to beginning construction activities, file Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity under the Texas Pollutant Elimination System (TPDES) General Permit No. TXR150000, administered by the Texas Commission on Environmental Quality (TCEQ). The general permit falls under the provisions of Section 402 of the Clean Water Act and Chapter 26 of the Texas Water Code.

D. Prepare submittal form and submit to TCEQ along with application fee.

E. Upon completion of construction, file Notice of Termination (NOT) for Storm Water Discharges Associated with Construction Activity under the TPDES General Permit with the TCEQ.

F. Obtain all necessary permits from agencies with control over the use of ground water and matters affecting well installation, water discharge, and use of existing storm drains and natural water sources. Because the review and permitting process may be lengthy, take early action to pursue and submit for the required approvals.

G. Monitor ground water discharge for contamination while performing pumping in the vicinity of potentially contaminated sites.

H. Conduct sampling and testing of ground water and receiving waters as outlined in Article 3 below.

2. PRODUCTS

2.1 EQUIPMENT AND MATERIALS

A. Equipment and materials are at the option of Contractor as necessary to achieve desired results for dewatering.

B. Eductors, well points, or deep wells, where used, shall be furnished, installed and operated by an experienced contractor regularly engaged in ground water control system design, installation, and operation.

C. All equipment must be in good repair and operating order.

D. Sufficient standby equipment and materials shall be kept available to ensure continuous operation, where required.

3. EXECUTION

3.1 GROUND WATER CONTROL

A. Perform a subsurface investigation by borings as necessary to identify water bearing layers, piezometric pressures, and soil parameters for design and installation of ground water control systems. Perform pump tests, if necessary to determine the drawdown characteristics of the water bearing layers.

B. Provide labor, material, equipment, techniques and methods to lower, control and handle ground water in a manner compatible with construction methods and site conditions. Monitor effectiveness of the installed system and its effect on adjacent property.

C. Install, operate, and maintain ground water control systems in accordance with the ground water control system design. Notify the City's Construction Inspector in writing of any changes made to accommodate field conditions and changes to the Work. Revise the ground water control system design to reflect field changes.

D. Provide for continuous system operation, including nights, weekends, and holidays. Arrange for appropriate backup if electrical power is primary energy source for dewatering system.

E. Monitor operations to verify that the system lowers ground water piezometric levels at a rate required to maintain a dry excavation resulting in a stable subgrade for prosecution of subsequent operations.

F. Where hydrostatic pressures in confined water bearing layers exist below excavation, depressurize those zones to eliminate risk of uplift or other instability of excavation or installed works. Allowable piezometric elevations shall be defined in the ground water control system design.

G. Remove ground water control installations.

1. Remove pumping system components and piping when ground water control is no longer required.
2. Remove piezometers and monitoring wells when directed by the City Engineer.
3. Grout abandoned well and piezometer holes. Fill piping that is not removed with cement- bentonite grout or cement-sand grout.

H. During backfilling, dewatering may be reduced to maintain water level a minimum of 5 feet below prevailing level of backfill. However, do not allow that water level to result in uplift pressures in excess of 80 percent of downward pressure produced by weight of structure or backfill in place. Do not allow water levels to rise into cement stabilized sand until at least 48 hour after placement.

I. Provide a uniform diameter for each pipe drain run constructed for dewatering. Remove pipe drain when it has served its purpose. If removal of pipe is impractical, provide grout connections at 50-foot intervals and fill pipe with cement-bentonite grout or cement-sand grout when pipe is removed from service.

J. Extent of construction ground water control for structures with a permanent perforated underground drainage system may be reduced, such as for units designed to withstand hydrostatic uplift pressure. Provide a means for draining the affected portion of underground system, including standby equipment. Maintain drainage system during operations and remove it when no longer required.

K. Remove system upon completion of construction or when dewatering and control of surface or ground water is no longer required.

L. In unpaved areas, compact backfill to not less than 95 percent of Standard Proctor maximum dry density in accordance with ASTM D 698. In paved areas (or areas to receive paving), compact backfill to not less than 98 percent of Standard Proctor maximum dry density in accordance with ASTM D 698.

3.2 REQUIREMENTS FOR EDUCTOR, WELL POINTS, OR DEEP WELLS

A. For above ground piping in ground water control system, include a 12-inch minimum length of clear, transparent piping between every eductor well or well point and discharge header so that discharge from each installation can be visually monitored.

B. Install sufficient piezometers or monitoring wells to show that all trench or shaft excavations in water bearing materials are pre-drained prior to excavation. Provide separate piezometers for monitoring of dewatering and for monitoring of depressurization. Install piezometers and monitoring wells for tunneling as appropriate for Contractor's selected method of work.

C. Install piezometers or monitoring wells not less than one week in advance of beginning the associated excavation (including trenching).

D. Dewatering may be omitted for portions of underdrains or other excavations, but only where auger borings and piezometers or monitoring wells show that soil is pre-drained by an existing system such that the criteria of the ground water control system design are satisfied.

E. Replace installations that produce noticeable amounts of sediments after development.

F. Provide additional ground water control installations, or change the methods, in the event that the installations according to the ground water control system design do not provide satisfactory results based on the performance criteria defined by the ground water control system design and by these specifications.

3.3 EXCAVATION DRAINAGE

A. Contractor may use excavation drainage methods if necessary to achieve well drained conditions. The excavation drainage may consist of a layer of crushed stone and filter fabric, and sump pumping in combination with sufficient wells for ground water control to maintain stable excavation and backfill conditions.

3.4 MAINTENANCE AND OBSERVATION

A. Conduct daily maintenance and observation of piezometers or monitoring wells while the ground water control installations or excavation drainage are operating in an area or seepage into tunnel is occurring. Keep system in good condition.

B. Replace damaged and destroyed piezometers or monitoring wells with new piezometers or wells as necessary to meet observation schedule.

C. Cut off piezometers or monitoring wells in excavation areas where piping is exposed, only as necessary to perform observation as excavation proceeds. Continue to maintain and make observations, as specified.

D. Remove and grout piezometers inside or outside the excavation area when ground water control operations are complete. Remove and grout monitoring wells when directed by the City Engineer.

3.5 MONITORING AND RECORDING

A. Monitor and record average flow rate of operation for each deep well, or for each wellpoint or eductor header used in dewatering system. Also monitor and record water level and ground water recovery. These records shall be obtained daily until steady conditions are achieved, and twice weekly thereafter.

B. Observe and record elevation of water level daily as long as ground water control system is in operation, and weekly thereafter until the Work is completed or piezometers or wells are removed, except when City Engineer determines that more frequent monitoring and recording are required. Comply with Construction Inspector's direction for increased monitoring and recording and take measures as necessary to ensure effective dewatering for intended purpose.

3.6 SAMPLING, TESTING AND DISPOSAL OF GROUND WATER

A. It is the intent that the Contractor discharge groundwater primarily into the existing storm water system in accordance with City Ordinance, Article XVI, Section 55-203, *only* if the groundwater is uncontaminated and the quality of the ground water is equal to or better than the quality of the receiving stream.

B. The Contractor shall prevent ground water from trench or excavation dewatering operations from discharging directly into the storm water system prior to testing and authorization. Ground water from dewatering operations shall be sampled and tested, and disposed of by approved methods.

C. Laboratory analysis of groundwater and receiving water quality is to be performed by the Contractor at the Contractor's expense, prior to commencing discharge, and groundwater analysis shall be performed by the Contractor at a minimum of once per week. Contractor shall coordinate with the City Storm Water Department on all laboratory analysis. Laboratory analysis of groundwater shall also be performed at each new area of construction prior to discharge from that location.

D. Sample containers, holding times, preservation methods, and analytical methods, shall either follow the requirements in 40 CFR Part 136 (as amended), or the latest edition of "Standard Methods for the Examination of Water and Wastewater." Any laboratory providing analysis must be accredited or certified by the Texas Commission on Environmental Quality according to Title 30 Texas Administrative Code (30 TAC) Chapters 25 for the matrices, methods, and parameters of analysis, if available, or be exempt according to 30 TAC §25.6.

E. Analysis of the ground water discharge shall show it to be equal to or better than the quality of the first natural body of receiving water. This requires testing of both the receiving water and a sample of the ground water. <u>All parts of this procedure shall be complete prior to any discharge</u> of ground water to the storm water system.

F. Steps to Determine Legitimate Discharge:
   1. Identify the First Receiving Water.
      a) When the first body of water is a freshwater system (Nueces River or Oso Creek), the analysis typically fails because the local ground water will likely be too high in Total Dissolved Solids (TDS). In the case of a perched aquifer, the ground water may turn out fairly fresh, but local experience shows this to be unlikely.
      b) If the receiving water is a marine environment, proceed with Step 2 below to compare the ground water quality to receiving water quality.
   2. Compare Ground Water Discharge Quality to Receiving Water Quality.
      The following table, Ground Water Discharge Limits, indicates that the parameters to compare to the receiving water are Total Dissolved Solids (TDS) and Total Suspended Solids (TSS). If the ground water results are equal to or better than the receiving water, then the discharge may be authorized as long as the discharge does not exceed the other parameters which would indicate hydrocarbon contamination. Note that the receiving water only needs to be tested initially as a baseline and the ground water shall be tested weekly to ensure compliance.

GROUND WATER DISCHARGE LIMITS

Parameter	Ground Water Monitoring Frequency	Receiving Water Monitoring Frequency	Maximum Limitation
Total Dissolved Solids (TDS)	Initial + Weekly	Once Prior to Discharge	< Receiving Water
Total Suspended Solids (TSS)	Initial + Weekly	Once Prior to Discharge	< Receiving Water
Total Petroleum Hydrocarbons	Initial + Weekly		15 mg/L
Total Lead	Initial + Weekly		0.1 mg/L
Benzene	Initial + Weekly		0.005 mg/L
Total BTEX	Initial + Weekly		0.1 mg/L
Polynuclear Aromatic Hydrocarbons	Initial + Monthly		0.01 mg/L

3. Analyze Ground Water for Hydrocarbon Contamination.
   All other parameters listed on the Ground Water Discharge Limits table must be analyzed prior to ground water discharge to the storm water system. If no limits are exceeded, ground water discharge to the storm water system may be authorized following notification to the MS4 operator (City of Corpus Christi) and all Pollution Prevention Measures for the project are in place. Analytical results shall be on-site or readily available for review by local, state or federal inspectors. Note that this step is frequently done simultaneously with Step 2 above to shorten analytical processing time.

4. Pollution Prevention Measures.
   A storm water pollution prevention plan or pollution control plan shall be developed and implemented prior to any ground water discharges to the storm water system. The plan's objectives are to limit erosion and scour of the storm water system and minimize Total Suspended Solids (TSS) and other forms of contamination and prevent any damage to the storm water system. Note that ground water discharges must cease immediately upon the first recognition of contamination, either by sensory or analytical methods. If the discharge of groundwater results in any damages to the storm water system, the responsible party shall remediate any damage to the storm water system and the environment to the satisfaction of the Storm Water Department and/or any State or Federal Regulatory Agency.

5. MS4 Operator Notification.
   The MS4 operator shall be notified prior to ground water discharge to the storm water system. Contractor shall contact the designated City MS4 representative to request authorization to discharge ground water to the storm water system.

   Notification shall include:
   Project Name:
   Responsible Party:
   Discharge Location:

Receiving Water:
Estimated Time of Discharge:
Linear Project: Yes / No
Pollution Prevention Measures Implemented:
Statement indicating all sampling and testing has been conducted and meets the requirements of a legitimate discharge.

G. Discharges to Wastewater System

In the event that the groundwater does not equal or exceed the receiving water quality, an alternative disposal option would include pumping to the nearest sanitary sewer system. Discharge to the sanitary sewer system requires a permit from the Wastewater Department. If discharging temporary holding tanks and trucking to a sanitary sewer or wastewater treatment plant, the costs for these operations shall be negotiated.

Contractor shall contact the Pretreatment Group for City Utility Operations to obtain a Wastewater Discharge Permit Application for authorization to discharge to the wastewater system. Authorization approval will include review of laboratory analysis of the ground water and estimated flow data. Note that groundwater discharges must cease immediately upon the first recognition of contamination, either by sensory or analytical methods. If the discharge of groundwater results in any damages to the wastewater collection system or wastewater overflows, the responsible party shall remediate any damage to the wastewater collection system and the environment to the satisfaction of the Wastewater Department and/or any State or Federal Regulatory Agency.

H. Other groundwater disposal alternatives or solutions may be approved by the Engineer on a case by case basis.

3.7 SURFACE WATER CONTROL

A. Intercept surface water and divert it away from excavations through the use of dikes, ditches, curb walls, pipes, sumps or other approved means.

B. Divert surface water into sumps and pump into drainage channels or storm drains, when approved by the City Engineer. Provide settling basins when required by the City Engineer.

C. Storm water that enters the excavation can be pumped out as long as care is taken to minimize solids and mud entering the pump suction and flow is pumped to a location that allows for sheet flow prior to entering a storm water drainage ditch or storm water inlet. An alternative to sheet flow is to pump storm water to an area where ponding occurs naturally without leaving the designated work area or by manmade berm(s) prior to entering the storm water system. Sheet flow and ponding is required to allow solids screening and/or settling prior to entering the storm water system. Storm water or groundwater shall not be discharged to private property.

4. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, control of ground water will not be measured and paid for separately but shall be considered subsidiary to other bid items.

SECTION 022022
TRENCH SAFETY FOR EXCAVATIONS

1. DESCRIPTION

This specification shall govern all work for providing for worker safety in excavations and trenching operations required to complete the project.

2. REQUIREMENTS

Worker Safety in excavations and trenches shall be provided by the Contractor in accordance with Occupational Safety and Health Administration (OSHA) Standards, 29 CFR Part 1926 Subpart P – Excavations.

It is the sole responsibility of the Contractor, and not the CBBEP or Engineer, to determine and monitor the specific applicability of a safety system to the field conditions to be encountered on the job site during the project.

The Contractor shall indemnify and hold harmless the CBBEP and Engineer from all damages and cost that may result from failure of methods or equipment used by the Contractor to provide for worker safety.

Trenches as used herein shall apply to any excavation into which structures, utilities, or sewers are placed regardless of depth.

Trench Safety Plan as used herein, shall apply to all methods and materials used to provide for worker safety in excavation and trenching operations required during the project.

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, this work shall not be measured for pay but shall be subsidiary to the items in the proposal of which it is a part of.

SECTION 022060
CHANNEL EXCAVATION

1. DESCRIPTION

This specification shall govern all work for Channel Excavation required to complete the project.

2. CONSTRUCTION METHODS

Trees, stumps, brush, and other vegetation shall be removed and hauled away. Excavated slopes shall be finished in conformance with the lines and grades established by the Engineer. When completed, the average plane of slopes shall conform to the slopes indicated on the drawings, and no point on completed slopes shall vary from the designated slopes by more than 0.5 foot measured at right angles to the slope. In no case shall any portion of the slope encroach on the roadbed. The tops of excavated slopes and the end of excavation shall be rounded. The bottom and sides of the ditch or channel shall be undercut a minimum depth sufficient to accommodate topsoil for seeding, sodding, or slope protection, as indicated on the drawings.

All suitable materials removed from the excavation shall be used, insofar as practicable, in the formation of embankments in accordance with Specification Section 022080 "Embankment" or shall be otherwise utilized or satisfactorily disposed of as indicated on drawings, or as directed, and the completed work shall conform to the established alignment, grades and cross sections. During construction, the channel shall be kept drained, insofar as practicable, and the work shall be prosecuted in a neat workmanlike manner.

Unsuitable channel excavation in excess of that needed for construction shall become the property of the Contractor and removed from the site and properly disposed of.

3. SELECTION OF MATERIALS

Where shown on the drawings, selected materials shall be utilized in the formation of embankment or to improve the roadbed, provided that the material meets the requirements specified in Specification Section 022100 “Select Material”, in which case the work shall be performed in such manner and sequence that suitable materials may be selected, removed separately and deposited in the roadway within the limits and at elevations required. Concrete for lining channels, where specified on the drawings, shall be Class "A" in accordance with Specification Section 030020 "Portland Cement Concrete".

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, this work shall not be measured for pay but shall be subsidiary to the items in the proposal of which it is a part of. Channel excavation shall include, but not be limited to, clearing and removal of vegetation, excavation, de-watering, embankment, compaction, hauling, and disposal. Channel excavation shall not include undercutting to accommodate topsoil, sod, or slope protection. Payment shall be at the bid price for the unit of measurement specified and shall be full compensation for furnishing all labor, materials, tools, equipment and incidentals necessary to complete the work.

SECTION 022080
EMBANKMENT

1. DESCRIPTION

This specification shall govern all work for embankment required to complete the project.

2. CONSTRUCTION METHODS

Prior to placing embankment, the area to be covered shall be stripped of all vegetation and the material so removed shall be disposed of off the job site. Washes, gulley's, wet areas, and yielding areas shall be corrected as directed by the Engineer.

Unless otherwise indicated on plans the surface of the ground which is to receive embankment shall be loosened by scarifying or plowing to depth of not less than 6 inches. The loosened material shall be re-compacted with the new embankment as hereinafter specified. Embankment shall be placed in layers not to exceed six inches un-compacted depth and the full width of the embankment, unless otherwise noted.

Where embankment is adjacent to a hillside or old roadbed, the existing slope shall be cut in steps to not less than the vertical depth of an un-compacted layer (6"). The fill material shall be placed from the low side and compacted. Each layer shall overlap the existing embankment by at least the width indicated by the embankment slope.

Trees, stumps, roots, vegetation, or other unsuitable materials shall not be placed in embankment.

Each layer of embankment shall be uniform as to material, density, and moisture content before beginning compaction. Where layers of unlike materials abut each other, each layer shall be featheredged for at least 100 feet or the material shall be so mixed as to prevent abrupt changes in the soil. No material placed in the embankment by dumping in a pile or windrow shall be incorporated in a layer in that position, but all such piles or windrows shall be moved by blading or similar methods. Clods or lumps of material shall be broken, and the embankment material mixed by blading, harrowing, disking, or similar methods to the end that a uniform material of uniform density is secured in each layer.

Except as otherwise required by the plans, all embankments shall be constructed in layers approximately parallel to the finished grade and each layer shall be so constructed as to provide a uniform slope of 1/4 inch per foot from the centerline of the embankment to the outside.

Each layer shall be compacted to the required density by any method, type and size of equipment which will give the required compaction. Prior to and in conjunction with the rolling operation, each layer shall be brought to the moisture content necessary to obtain the required density and shall be kept leveled with suitable equipment to insure uniform compaction over the entire layer.

For each layer of earth embankment and select material, it is the intent of this specification to provide the density as required herein, unless otherwise shown on the plans. Swelling soils (soils with plasticity index of 20 or more) shall be sprinkled as required to provide not less than optimum moisture and compacted to the extent necessary to provide not less than 95% Standard Proctor, AASHTO T99.

Non-swelling soils (soils with plasticity index less than 20) shall be sprinkled as required and compacted to the extent necessary to provide not less than 95% Standard Proctor. Field density determinations will be made in accordance with approved methods.

After each layer of earth embankment or select material is complete, tests as necessary will be made by the Engineer. If the material fails to meet the density specified, the course shall be reworked as necessary to obtain the specified compaction, and the compaction method shall be altered on subsequent work to obtain specified density. Such procedure shall be determined by, and subject to, the approval of the Engineer.

The Engineer may order proof rolling to test the uniformity of compaction of the embankment layers. All irregularities, depressions, weak or soft spots which develop shall be corrected immediately by the Contractor at the Contractor's expense.

Should the subgrade, due to any reason or cause, lose the required stability, density, or moisture, before the pavement structure is placed, it shall be re-compacted and refinished at the sole expense of the Contractor. Excessive loss of moisture in the subgrade shall be prevented by sprinkling, sealing, or covering with a subsequent layer or granular material. Excessive loss of moisture shall be construed to exist when the subgrade soil moisture content is more than 2 percent below the optimum.

Backfill adjacent to structures, pipe, etc. shall be as follows: Material for backfill shall be clean soil free of trash, vegetation, etc. The material is to be placed in layers not to exceed 6" and compacted to the density of the undisturbed soil adjacent to the structure, but not less than 95% Standard Proctor. Special care shall be taken to prevent any wedging action against the structure.

3. SELECTION OF MATERIAL

In addition to the requirement in the excavation items of the specifications covering the general selection and utilization of materials to improve the roadbed, embankments shall be constructed in proper sequence to receive the select material layers shown on plans, with such modifications as may be directed by the Engineer. The layer of embankment immediately preceding the upper layer of select material shall be constructed to the proper section and grade within a tolerance of not more than 0.10 foot from the established section and grade when properly compacted and finished to receive the select material layer.

4. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Embankment shall be subsidiary to the applicable contract item as specified on the plans. Payment shall be at the bid price for the unit of measurement specified.

SECTION 022100
SELECT MATERIAL

1. DESCRIPTION

This specification shall govern the use of select material to be used to treat designated sections of roadways, embankments, trenches, etc. Select material shall be a mixture of sand and clay or other suitable granular material. The material shall be free from vegetation, debris, and clay lumps. That portion of the select material passing a 40-mesh sieve shall have a liquid limit of 45 maximum, a plasticity index range from 6 to 13, and a calculated linear shrinkage of 8.5 maximum.

2. CONSTRUCTION METHODS

Select material shall be mixed uniformly and placed in layers not to exceed 6" loose depth. The material shall be brought to the wet side of optimum moisture content and compacted to a minimum of 95% Standard Proctor Density or as specified on the drawings. Each layer shall be complete before the succeeding layer is placed.

The finished surface of the select material shall conform to the grade and section shown on the plans.

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, select material shall not be measured for pay, but shall be subsidiary to the appropriate bid item.

SECTION 022410
STORM WATER POLLUTION PREVENTION

1. DESCRIPTION

This specification will govern all work required for stormwater pollution prevention measures during and after construction. The work shall include a Storm Water Pollution Prevention Plan (SWPPP), installation, maintenance and removal of erosion, sedimentation and environmental control devices. The specification includes removal of accumulated sediment and debris.

2. MATERIALS

All materials shall meet the requirements set forth in "TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, 2014" Item 506, Section 506.2 "Materials" or standard materials approved by the Engineer.

3. METHODS

A. Storm Water Pollution Prevention Plan

The contractor shall engage the services of an established Stormwater Quality Management Firm familiar with local conditions and requirements to:

1. Prepare a Storm Water Pollution Prevention plan (SWPPP) incorporating the ***Erosion & Sedimentation Control Plan***.
2. Submit the Notice of Intent (NOI)
3. Perform required inspections. Contractor shall supply inspection reports to the Engineer.
4. Submit the Notice of Termination (NOT)

All aspects of Items (l)-(4) shall be in strict accordance with all Federal, State and local regulations.

A copy of the SWPPP and an NOI form must be provided to the Engineer one (1) week prior to commencing construction activities. During construction, copies of all SWPPP documentation such as inspection reports, etc. must be provided to the City.

The SWPPP must be submitted to the Engineer prior to commencement of construction.

B. General

1. Phasing. Implement control measures in the area to be disturbed before beginning construction, or as directed. Limit the disturbance to the area shown on the plans or as directed. If, in the opinion of the Engineer, the Contractor cannot control soil erosion and sedimentation resulting from construction operations, the Engineer will limit the disturbed area to that which the Contractor is able to control. Minimize disturbance to vegetation.
2. Maintenance. Immediately correct ineffective control measures. Implement additional controls as directed. Remove excavated material within the time requirements specified in the SWPPP.
3. Stabilization. Stabilize disturbed areas where construction activities will be temporarily stopped in accordance with the applicable storm water plan. Establish a uniform vegetative cover. The project will not be accepted until grass growth has been

achieved in accordance with Specification **Item 028020-T "Seeding"**, unless otherwise shown on the plans. When shown on the plans, the Engineer may accept the project when adequate controls are in place that will control erosion, sedimentation, and water pollution until sufficient vegetative cover can be established.

4. Finished Work. Upon acceptance of vegetative cover, remove and dispose of all temporary control, measures, temporary embankments, bridges, matting, falsework, piling, debris, or other obstructions placed during construction that are not a part of the finished work, or as directed.
5. Restricted Activities. Do not locate disposal areas, stockpiles, or haul roads in any wetland, water body, or streambed. Do not install temporary construction crossings in or across any water body without prior approval of the CBBEP and the Engineer. Restrict construction operations in any water body to the necessary areas as shown on the plans or applicable permit, or as directed. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for stream crossings.

C. Installation, Maintenance and Removal Work. Perform work in accordance with the approved SWPPP. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until earthwork construction and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Engineer. If a device ceases to function as intended, repair or replace the device or portions thereof as necessary. Remove sediment, debris and litter.

Dispose of removed material in accordance with federal, state and local regulations. Remove devices upon approval or when directed. Upon removal, finish-grade and dress the area. Stabilize disturbed areas in accordance with the SWPPP, and as shown on the plans or directed. All disturbed areas shall be restored in accordance with Specification **Item 028020-T "Seeding"**. The Contractor retains ownership of stockpiled material and must remove it from the project when new installations or replacements are no longer required.

4. MEASUREMENT AND PAYMENT

If included as a bid item in the Proposal, Storm Water Pollution Prevention Plan shall be included in the unit price bid for "Storm Water Pollution Prevention Plan". Unless indicated in the Proposal, payment shall include but not be limited to furnishing the SWPPP, furnishing, installing, moving, replacing, inspecting and maintaining all temporary erosion, sediment, environmental measures and revegetating disturbed areas in accordance with Specification **Item 028020-T "Seeding"**. Unless shown in the Proposal, returning the vegetative cover disturbed during construction shall be included in the unit price bid for this item.

Payment shall be made on the following basis: The initial monthly estimate will include 50% of the unit price bid minus retainage. The balance will be paid according to the percent of construction complete after 50% completion has been surpassed, less retainage.

SECTION 022420
SILT FENCE

1. DESCRIPTION

This specification shall govern all work necessary for providing and installing silt fences required to complete the project.

2. MATERIAL REQUIREMENTS

Geotextile shall meet the requirements for temporary silt fence per AASHTO m288.

Fence Reinforcement Materials: Silt fence reinforcement shall be one of the following systems.

Type 1: Self-Supported Fence: This system consists of fence posts, spaced no more than 8-1/2 feet apart, and geotextile without net reinforcement. Fence posts shall be a minimum of 42 inches long, embedded at least 1 foot, and constructed of either wood or steel. Soft wood posts shall be at least 3 inches in diameter or nominal 2 x 4 in. and essentially straight. Hardwood posts shall be a minimum of 1.5 x 1.5 in. Fabric attachment may be by staples or locking plastic ties at least every 6 inches, or by sewn vertical pockets. Steel posts shall be T or L shaped with a minimum weight of 1.3 pounds per foot. Attachment shall be by pockets or by plastic ties if the posts have suitable projections.

Type 2: Net-Reinforced Fence: This system consists of fence posts, spaced no more than 8-1/2 feet apart, and geotextile with an attached reinforcing net. Fence posts shall meet the requirements of Self-Supported Fence. Net reinforcement shall be galvanized welded wire mesh of at least 12.5-gauge wire with maximum opening size of 4 inches square. The fabric shall be attached to the top of the net by crimping or cord at least every 2 feet, or as otherwise specified.

Type 3: Triangular Filter Dike: This system consists of a rigid wire mesh, at least 6-gauge, formed into an equilateral triangle cross-sectional shape with sides measuring 18 inches, wrapped with geotextile silt fence fabric. The fabric shall be continuously wrapped around the dike, with a skirt extending at least 12 inches from its upslope corner.

Packaging Requirements: Prior to installation, the fabric shall be protected from damage due to ultraviolet light and moisture by either wrappers or inside storage.

Certification and Identification: Each lot or shipment shall be accompanied by a certification of conformance to this specification. The shipment must be identified by a ticket or labels securely affixed to the fabric rolls. This ticket or label must list the following information:

a. Name of manufacturer or supplier
b. Brand name and style
c. Manufacturer's lot or control number
d. Roll size (length & width)
e. Chemical composition

3. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Silt fences shall not be measured for pay, but shall be subsidiary to the appropriate bid item. Payment shall include, but not be limited to, placing, maintaining, and removing the silt fence.

SECTION 025223
CRUSHED LIMESTONE FLEXIBLE BASE

1. DESCRIPTION

This Specification shall govern all work for furnishing and placing Crushed Limestone Flexible Base required to complete the project.

2. MATERIAL

Crushed Limestone Flexible Base shall consist of crushed limestone produced from oversize quarried aggregate, sized by crushing and produced from a naturally occurring single source, meeting the requirements for Type 'A' material as specified in Texas Department of Transportation (TxDOT) Specification Item 247 "Flexible Base". Crushed gravel or uncrushed gravel shall not be acceptable. No blending of sources and/or additive materials will be allowed. The material shall be free of vegetation and shall be approved by the Engineer. All acceptable material shall be screened and the oversize shall be crushed and returned to the screened material in such a manner that a uniform product will be produced which meets all of the physical requirements for Grade 1-2 as specified in TxDOT Specification Item 247 "Flexible Base".

3. TESTING

The CBBEP will engage a laboratory and pay for one test each gradation, liquid limit, plasticity index, modified proctor, moisture-density relation, CBR, and necessary field densities. The Engineer may call for additional tests at any time. The cost of all retests, in case of failure to meet specifications, will be deducted from the Contractor's payment. The CBBEP will pay for proctor and soil constants and abrasion tests at the rate described in the materials testing schedule. If material changes, the Contractor shall pay the cost of additional tests required by the Engineer. The Engineer may waive testing and/or lime admix for small amounts for unimportant uses.

4. CONSTRUCTION METHODS

Prior to placement of flexible base, the surface of the previous underlying course shall be finished true to line and grade as established, and in conformity with the typical section shown on the drawings. Grade tolerance shall be generally 1/2 inch, and highs and lows must approximately balance. If called for in the drawings or elsewhere in the contract documents, geogrid, as specified in Standard Specification Section 022060 "Channel Excavation", shall be placed as indicated.

Flexible base shall be delivered and spread the same day if possible (no later than the next day).

Base shall be mixed as required to produce a uniform mixture with water. Base shall be placed in uniform lifts not to exceed 10-inch loose lifts or 8-inch compacted lifts. Moisture and density requirements shall be as indicated on the drawings, typical minimum 98% Modified Proctor (ASTM D1557) under flexible pavements or typical minimum 98% Standard Proctor (ASTM D698) under concrete pavement and to within ± 2% of optimum moisture. The section may be accepted if no more than 1 of the 5 most recent moisture or density tests is outside of the specified limits, and the failed test is within ±1% deviation from specified moisture or density requirements. The surface of the compacted base, after meeting moisture and density requirements, shall be primed in accordance with Standard Specification Section 025412 "Prime Coat".

On completion of compaction and priming, the surface shall be smooth and conform to lines, grades, and sections shown on the drawings. Areas with any deviation in excess of 1/4 inch in cross-section and in lengths of 16 feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping, and recompacting by repriming and rolling.

Moisture and density shall be maintained until the paving is complete. Excessive loss of moisture shall be prevented by sprinkling, sealing, or covering with a subsequent layer. Should the base, due to any reason or cause, lose the required stability, density, or moisture before it is protected by placement of the next layer, it shall be re-compacted, refinished, and retested at the expense of the Contractor until acceptable to the CBBEP.

5. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, crushed limestone flexible base shall be measured by the square yard complete in place. Payment shall be full compensation for all materials, royalty, hauling, placing compacting labor, equipment, tools, incidentals necessary for the completion of work.

SECTION 027402
REINFORCED CONCRETE PIPE CULVERTS

1. DESCRIPTION

This specification shall govern the furnishing and placing of reinforced concrete pipe culverts and the material and incidental construction requirements for reinforced concrete pipe sewers. The culvert pipe shall be installed in accordance with the requirements of these specifications to the lines and grades shown on the plans, and shall be of the classes, sizes and dimensions shown thereon. The installation of pipe shall include all joints or connections to new or existing pipe, headwalls, etc., as may be required to complete the work.

2. MATERIALS

1. General. Except as modified herein, materials, manufacture and design of pipe shall conform to ASTM Designation: C-76 for Circular Pipe; ASTM Designation: C-506 for Arch Pipe, or ASTM Designation: C-507 for Elliptical Pipe. All pipe shall be machine made or cast by a process which will provide for uniform placement of the concrete in the form and compaction by mechanical devices which will assure a dense concrete. Concrete shall be mixed in a central batch plant or other approved batching facility from which the quality and uniformity of the concrete can be assured. Transit mixed concrete will not be acceptable for use in precast concrete pipe.

2. Design. All pipe shall be Class III (Wall "B") unless otherwise specified on the plans. The shell thickness, the amount of circumferential reinforcement and the strength of the pipe shall conform to the specified Class as summarized in ASTM Designation: C-76 for Circular Pipe; C-506 for Arch Pipe; C-507 for Elliptical pipe.

3. Physical Test Requirements. The acceptability of the pipe shall be determined by the results of the three-edge-bearing test for the load to produce the 0.01 inch crack and the ultimate load; by the appropriate material tests required in ASTM Designations: C-76, C-506 or C-507 by absorption tests on selected samples from the wall of the pipe; and by inspection of the finished pipe to determine its conformance with the design prescribed in these specifications and its freedom from defects. Three-edge-bearing tests for both the 0.01-inch crack and the ultimate load shall be performed on one pipe for each 100 pipe, or faction thereof, for each type, size and class. The methods of testing shall conform to ASTM Designations: C-76, C-506 or C-507, whichever is applicable.

   As an alternate to the three-edge-bearing test, concrete pipe 60 inches in diameter and over may be accepted, at the option of the manufacturer, on the basis of material tests and inspection of the completed product. Acceptability of pipe on this basis shall be determined by the results of material tests as required in ASTM Designation: C-76, C-506 or C-507; by crushing tests on cores taken from the barrel of the completed and cured pipe; by absorption tests on samples from the wall of the pipe; and by inspection of the finished pipe including amount and placement of reinforcement, to determine its conformance with the design prescribed in these specifications and its freedom from defects. The manufacturer shall furnish facilities and personnel for taking the cores from the pipe barrel and for determining the compressive strength of the samples. When the cores cut from a section of pipe successfully meet the strength requirement, the core holes shall be plugged and sealed by the manufacturer in a manner such that the pipe section will meet all test requirements of ASTM Designation: C-76 or C-506. Pipe sections, so sealed, will be accepted for use.

4. Sizes and Permissible Variations
   a. Variations in diameter, size, shape, wall thickness, reinforcement, placement of reinforcement, laying length and the permissible under run of length shall be in accordance with the applicable ASTM Specification for each type of pipe as referred to previously.
   b. Where rubber gasket pipe joints are to be used, the design of the Joints and Permissible Variations in Dimensions shall be in accordance with ASTM Designation: C-443.

5. Workmanship and Finish. Pipe shall be substantially free from fractures, large or deep cracks and surface roughness. The ends of the pipe shall be normal to the walls and centerline of the pipe within the limits of variations allowed under the applicable ASTM specification.

6. Curing. Pipe shall be cured in accordance with the applicable ASTM Specification for each type of pipe as referred to above.

7. Marking. The following information shall be clearly marked on each section of pipe:
   a. The class of pipe.
   b. The date of manufacture.
   c. The name of trade mark of the manufacturer.
   d. One end of each section of pipe with elliptical reinforcement shall be clearly marked during the process of manufacture or immediately thereafter on the inside and the outside of opposite walls to show the location of the "top" or "bottom" of the pipe as it should be installed, unless the external shape of the pipe is such that the correct position of the top and bottom is obvious. Marking shall be indented on the pipe section or painted thereon with waterproof paint.

8. Minimum Age for Shipment. Pipe shall be considered ready for shipment when it conforms to the requirements of the tests specified herein.

9. Inspection. The quality of materials, the process of manufacture, and the finished pipe shall be subject to inspection and approval by the Engineer at the pipe manufacturing plant. In addition, the finished pipe shall be subject to further inspection by the Engineer at the project site prior to and during installation.

10. Causes for Rejection. Pipe shall be subject to rejection on account of failure to conform to any of the specification requirements. Individual sections of pipe may be rejected because of any of the following:
    a. Fractures or cracks passing through the shell, except for a single end crack that does not exceed the depth of the joint.
    b. Defects that indicate imperfect proportioning, mixing and molding.
    c. Surface defects indicating honeycombed or open texture.
    d. Damaged ends, where such damage would prevent making a satisfactory joint.

11. Repairs. Pipe may be repaired if necessary, because of occasional imperfections in manufacture or accidental injury during the handling and will be acceptable if, in the opinion of the Engineer, the repairs are sound and properly finished and cured and the repaired pipe conforms to the requirements of the specifications.

12. Rejections. All rejected pipes shall be plainly marked by the Engineer and shall be replaced by the Contractor with pipe that meets the requirements of these specifications. Such rejected pipe shall be removed immediately from the worksite.

13. Jointing Materials. Unless otherwise specified on the plans, the Contractor shall have the option of making the joints by any of the following methods:

a. Ram-Nek, a pre-formed plastic base joint material manufactured by K. T. Knyder Company, Houston, Texas, or an approved equal. Use of Talcote as Joint Material not permitted. Ram-Nek joint material and primer shall be supplied for use on pipe in the following sizes, which is the minimum that will be required. Additional Ram-Nek may be required if, in the opinion of the Engineer, a proper joint is not secured, and additional Ram-Nek shall be required for non-circular concrete pipe as required by the Engineer.

Pipe Size	Primer Per 100 Jts.	Cut Lengths Per Joint
12"	1.5 gals.	12 pcs 1" x 2'5"
15"	1.9 gals.	2 pcs 1" x 2'5"
18"	2.7 gals.	12 pcs 12" x 3'5"
21"	3.8 gals.	2 pcs 12" x 3'5"
24"	6.2 gals.	2 pcs 12" x 3'5"
30"	8.5 gals.	22 pcs 12" x 3'5"
36"	9.5 gals.	3 pcs 1-3/4" x 3'5"
42"	12.0 gals.	32 pcs 1-3/4" x 3'5"
48"	15.0 gals.	4 pcs 1-3/4" x 3'5"
54"	20.0 gals.	42 pcs 1-3/4" x 3'5"
60"	25.0 gals.	5 pcs. 1-3/4 x 3'5"
66"	30.0 gals.	52 pcs 1-3/4" x 3'5"
72"	32.0 gals.	6 pcs 2" x 3'5"
84"	35.0 gals.	7 pcs 2" x 3'5"

b. TYLOX types "C", "C-P", or "CR", rubber gaskets, as applicable, as manufactured by Hamilton Kent Manufacturing Company, Kent, Ohio, or approved equal. All gaskets, lubricants, adhesives, etc., shall be manufactured, constructed, installed, etc., as recommended by the manufacturer of the rubber gasket material and conform to ASTM Designation C-443. In addition, the contractor shall furnish the City, for approval, manufacturer's brochures detailing the complete use, installation, and specifications of concrete pipe and rubber gaskets before any rubber gasket material is used on the project. All rubber gaskets shall be fabricated from synthetic rubber.

NOTE: Cement Mortar is prohibited from jointing pipe except at manholes, pipe junction, etc., or where specifically approved by the Engineer.

c. Geotextile for wrapping joints shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.

3. CONSTRUCTION METHODS

Reinforced concrete pipe culverts shall be constructed from the specified materials in accordance with the following methods and procedures:

1. Excavation. All excavation shall be in accordance with the requirements of the specifications Section 022020 "Excavation and Backfill for Utilities and Sewers", except where tunneling or jacking methods are shown on the plans or permitted by the Engineer.

When pipe is laid in a trench, the trench when completed and shaped to receive the pipe shall be of sufficient width to provide free working space for satisfactory bedding and jointing and thorough tamping of the backfill and bedding material under and around the pipe. The Contractor shall make such temporary provisions as may be necessary to insure adequate drainage of the trench and bedding during the construction operation.

2. Bedding. The pipe shall be bedded in accordance with the bedding details shown on the drawings. Bedding shall not be measured for pay but shall be subsidiary to other work.The type of bedding required shall depend on the depth of the pipe and the condition of the trench subgrade. The maximum allowable depth of pipe (the distance between the invert of the pipe and finished grade) is provided in the "RCP Bedding Table" as follows:

RCP Bedding Table

Pipe Size Nominal (Inches)	Maximum Allowable Depth (Feet)	
	Class "C" Bedding	Class "B" Bedding
15-18	8	11
21-33	9	12
36	10	13
42	11	14
48	12	15
54	13	16
60	14	17
66	15	17
72	16	18

Note:
1. Depth, from invert to finish grade
2. Soil, clay @ 130 lb. /ft.^{3}
3. Suitable for trench width > transition width
4. Safety factor = 1 @ D.01" crack, 1.5 @ ultimate

The pipe shall be laid and bedded such that the maximum depth is not exceeded. Generally, Class "C" bedding shall be adequate for most conditions. However, if the subgrade of the trench is unstable, Class "B" bedding, shall be required, even if this condition occurs at relatively shallow depths. If unstable conditions persist, full encasement of the pipe with crushed stone (well graded 3/4" to 1/4") shall be required. Crushed Stone Encasement shall extend from the top of pipe to 6" below the pipe or to stable subgrade, whichever is deeper. If it is necessary to install pipe at depths in excess of those allowable for Class "B" bedding the trench width shall be reduced or complete encasement with crushed stone shall be required as directed by the Engineer.

3. Laying Pipe. Unless otherwise authorized by the Engineer, the laying of pipe on the prepared foundation shall be started at the outlet end with the spigot or tongue end pointing downstream and shall proceed upstream with the abutting sections properly matched, true to the established lines and grades. Where bell and spigot pipe are used, cross trenches shall be cut in the foundation to allow the barrel of the pipe to rest firmly upon the prepared bed. These cross trenches shall be not more than two inches larger than the bell ends of the pipe. Proper facilities shall be provided for hoisting and lowering the sections of pipe into the trench without disturbing the prepared foundation and the sides of the trench. The ends of the pipe shall be carefully cleaned before the pipe is placed. As each length of pipe is laid, the mouth of the pipe shall be protected to prevent the entrance of earth or bedding material.

The pipe shall be fitted and matched so that when laid in the bed, it shall form a smooth, uniform conduit. When elliptical pipe with circular reinforcing or circular pipe with elliptical reinforcing is used, the pipe shall be laid in the trench in such position that the markings "Top" or "Bottom", shall not be more than 5 degrees from the vertical plane through the longitudinal axis of the pipe.

For the pipe over 42 inches in diameter, the Contractor may drill two holes not larger than 2 inches in diameter, in the top of each section of the pipe, to aid in lifting and placing.

The holes shall be neatly drilled, without spalling of the concrete, and shall be done without the cutting of any reinforcement. After the pipe is laid, the holes shall be filled with mortar and cured.

Multiple installations of reinforced concrete pipe shall be laid with the centerlines of individual barrels parallel. When not otherwise indicated on plans, the following clear distances between outer surfaces of adjacent pipe shall be used.

Diameter of Pipe	18"	24"	30"	36"	42"	48"	54"	60" to 84"
Clear Distance Between Pipes	0'-9"	0'-11"	1'-1"	1'-3"	1'-5"	1'-7"	1'-11"	2'-0"

4. Jointing.
   a. If the use of Portland cement mortar joints is allowed, all pipe shall be jointed tight and sealed with stiff mortar, composed of one part Portland cement and two parts sand, so placed as to form a durable water-tight joint. The installation shall be as required by the Engineer.
   b. Joints using Rubber Gaskets: Where rubber gasket pipe joints are required by the plans, the joint assembly shall be made according to the recommendations of the gasket manufacturer. Watertight joints will be required when using rubber gaskets.
   c. Joints using Cold Applied Preformed Plastic Gaskets shall be made as follows:
      A suitable prime to the type recommended by the manufacturer of the gasket joint sealer shall be brush applied to the tongue and groove joint surfaces and the end surfaces and allowed to dry and harden. No primer shall be applied over mud, sand or dirt or sharp cement protrusions. The surface to be primed must be clean and dry when primer is applied. Before laying the pipe in the trench, the plastic gasket sealer shall be attached around the tapered tongue or tapered groove near the shoulder or hub of each pipe joint. The paper wrapper shall be removed from one side only of the two-piece wrapper on the gasket and pressed firmly to the clean, dry pipe joint surface. The outside wrapper shall not be removed until immediately before pushing the pipe into its final position. When the tongue is correctly aligned with the flare of the groove, the outside wrapper on the gasket shall be removed and the pipe shall be pulled or pushed home with sufficient force and power (Back Hoe shovel, chain hoist, ratchet hoist or winch) to cause the evidence of squeeze-out of the gasket material on the inside or outside around the complete pipe joint circumference. Any joint material pushed out into the interior of the pipe that would tend to obstruct the flow shall be removed. (Pipe shall be pulled home in a straight line with all parts of the pipe on line and grade at all times.) Backfilling of pipe laid with plastic gasket joints may proceed as soon as the joint has been inspected and approved by the Engineer. Special precautions shall be taken in placing and compacting backfill to avoid damage to the joints.

When the atmospheric temperature is below 60° F, plastic joint seal gaskets shall either be stored in an area warmed to above 70□ F, or artificially warmed to this temperature in a manner satisfactory to the Engineer. Gaskets shall then be applied to pipe joints immediately prior to placing pipe in trench, followed by connection to previously laid pipe.

d. Pipe Joints for storm sewers constructed in sandy soils such as the Flour Bluff, Padre Island and North Beach areas shall be wrapped Geotextile or when shown on he drawings, pipe joints shall be wrapped. The wrap shall be at least 2 feet wide and shall be centered on each joint.

5. After the pipe has been placed, bedded and jointed as specified, filling and/or backfilling shall be done in accordance with the applicable requirements of the specification "Excavation and Backfill for Utilities and Sewers". When mortar joints are allowed, no fill or backfill shall be placed until the jointing material has been cured for at least six hours.

Special precautions shall be taken in placing and compacting the backfill to avoid any movement of the pipe or damage to the joints. For side drain culverts and all other culverts where joints consist of materials other than mortar, immediate backfilling will be permitted.

6. Unless otherwise shown on the plans or permitted in writing by the Engineer, no heavy earth-moving equipment will be permitted to haul over the structure until a minimum of 4 feet of permanent or temporary, compacted fill has been placed thereon. Pipe damaged by the Contractor's equipment shall be removed and replaced by the Contractor at no additional cost.

4. MEASUREMENT

Unless indicated otherwise in the Proposal, Reinforced Concrete Pipe will be measured by the linear foot. Such measurement will be made between the ends of the pipe barrel along its central axis. Where spurs or branches, or connections to existing pipelines are involved, measurement of the spur or new connecting pipe will be made from the intersection of its center axis with the outside surfaces of the pipe into which it connects. Where inlets, headwalls, catch basins, manholes, junction chambers, or other structures are included in lines of pipe that length of pipe tying into the structure wall will be included for measurement, but no other portion of the structure length or width will be so included. For multiple pipes, the measured length will be the sum of the lengths of the barrels measured as prescribed above.

5. PAYMENT

Payment for concrete pipe measured as prescribed above will be made at the contract unit price bid for the various sizes of "Reinforced Concrete Pipe", "Reinforced Concrete Pipe, Arch" and "Reinforced Concrete Pipe, Elliptical" of the class specified.

Payment shall be full compensation for furnishing and transporting the pipe; hauling and placing of earth cushion material where required for bedding pipe; for the preparation and shaping of beds; for hauling, placing and jointing of pipes; for end finish; for all connections to existing structures and for all other items of materials, labor, equipment, tools, excavation, backfill and incidentals necessary to complete the culvert or storm sewer in accordance with the plans and these specifications.

SECTION 027404
CONCRETE BOX CULVERTS

1. DESCRIPTION

This specification shall govern all work required for constructing, furnishing, and installing R.C. Boxes required to complete the project.

The Contractor shall have the option of furnishing cast-in-place and/or precast boxes unless a specific type is called for on the plans or in the special provisions. When cast-in-place boxes are used, they shall conform to the details of the culvert designs shown in the plans. When precast boxes are used, they shall conform to AASHTO M273 (ASTM C850) for HS20 loading.

Alternate designs of precast boxes will be considered for approval upon submission of shop drawings detailing the box and certifications that the box, as designed, is structurally comparable to or better than the box shown in the contract drawings and is designed to support HS20 loading per ASSHTO M273. The shop drawings and certifications shall be signed and sealed by a Texas Registered Professional Engineer.

2. MATERIALS

A. Concrete. Unless otherwise shown on the plans, Class "A" concrete shall be used for cast-in-place and precast (formed) boxes, conforming to the requirements of Section 030020 "Portland Cement Concrete" and Section 038000 "Concrete Structures", except that Class "C" concrete will be required for direct traffic boxes, cast-in-place box.

   Concrete for precast (machine-made) boxes shall meet the requirements of ASTM: C76, Sections: Cement, Aggregates and Mixture, and shall have a minimum 28 day compressive strength of 4,000 psi.

B. Reinforcement. Reinforcing steel shall conform to the requirements of Section 032020 "Reinforced Steel" and the details shown on the plans.

C. Jointing. Materials for jointing shall conform to the requirements of Section 027402 "Reinforced Concrete Pipe Culverts".

D. Membrane Curing. Materials for membrane curing shall conform to Section 038000 "Concrete Structures".

E. Giotextile for wrapping joints shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.

3. FABRICATION

The requirement of Section 030020 "Portland Cement Concrete" and Section 038000 "Concrete for Structures" shall govern for cast-in-place concrete culverts and for precast (formed) boxes except where otherwise specified herein.

Forms for precast (machine-made) boxes shall be made of steel. Forms for cast-in-place boxes and precast (formed) boxes may be either wood or steel.

Forms shall be mortar-tight and of sufficient strength to prevent excessive bulging or misalignment of adjacent boxes.

They shall be constructed to permit their removal without damage to the concrete. Offsets at form joints shall not exceed one-eighth of an inch. Forms shall be clean and free of extraneous matter when concrete is placed.

Positive means of supporting steel cages in place throughout forming and concrete placement shall be required and subject to the approval of the Engineer. Welding of reinforcing steel will be permitted only where shown on the plans. Welding shall be done by a qualified welder and shall conform to the requirements of Section 050200 "Welding".

Precast (machine-made) boxes shall be cast by a process which will provide for uniform placement of the concrete in the forms and compaction by mechanical devices which will assure dense concrete. Concrete shall be mixed in a central batch plant or other approved batching facility from which the quality and uniformity of the concrete can be assured. Transit mixed concrete shall not be acceptable for use in precast (machine-made) boxes.

4. TESTING AND CERTIFICATION

A. Physical Requirements. Precast boxes shall meet the requirement of ASTM C-850. Testing shall be done by a Materials Engineering Laboratory which meets the requirements for membership in the American Council of Independent Laboratories.

B. Fabrication Tolerances. Precast boxes shall conform to the following tolerances: When two box sections are fitted together on a flat surface, in proper alignment and in the position they will be installed, the longitudinal opening at any point shall not exceed one inch. Not more than four lifting holes may be provided in each box to facilitate handling. They may be cast-in, cut into the fresh concrete after form removal, or drilled, and shall not be more than 2 inches in diameter or 2 inches square. Cutting or displacement of reinforcement will not be permitted. Spalled areas around the holes shall be repaired. Concrete boxes shall be given an "Ordinary Surface Finish" in accordance with Section 038000 "Concrete Structures".

C. Certification. Certification of quality shall be provided with each delivery of materials to the job site by the manufacturer. Certification shall be a written report by the Materials Engineering Testing Laboratory.

5. DEFECTS AND REPAIRS

Fine cracks or checks on the surface of the member which do not extend to the plant of the nearest reinforcement will not be cause for rejection unless they are numerous and extensive. Cracks which extend into the plant of the reinforcing steel but are acceptable otherwise, shall be repaired in an approved manner.

Small damaged or honeycombed areas which are purely surface in nature may be repaired. Excessive damage, honeycomb or cracking will be subject to structural review. Repairs shall be sound, properly finished and cured in conformance with the pertinent specifications. When fine cracks or haircracks on the surface indicate poor curing practices, further production of precast boxes shall be discontinued until corrections are made and proper curing provided.

6. CONSTRUCTION METHODS

Excavation and backfill shall be in accordance with Section 022020 "Excavation and Backfill for Sewers and Utilities". Unless otherwise shown on the plans, the Contractor may use any of the jointing materials, except rubber gaskets, and shall comply with the jointing requirements specified in the Section 027402 "Reinforced Concrete Pipe Culverts".

When indicated on the Drawings, box joints shall be wrapped with geotextile. The wrap shall be at least 2' wide, centered on joint, and geotextile Shall be Class 1 geotextile for subsurface drainage with an average opening size, AOS, of .22 mm. and in accordance AASHTO M288.

Lifting holes shall be filled with mortar or concrete and cured to the satisfaction of the Engineer.

7. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Concrete Box Curverts shall be measured by the linear foot for each size of box installed. The measurement will be made between the ends of the box along the centerline. For boxes used in the multiple barrel structures, the measured length will be the sum of the lengths of all barrels.

Payment shall be made at the contract bid price and shall fully compensate the contractor for all materials required, all labor, all tools, all equipment, and all other incidentals required to complete the work as shown on the contract drawings and as specified herein.

SECTION 030020
PORTLAND CEMENT CONCRETE

1. DESCRIPTION

This specification shall govern for the materials used; for the storing and handling of materials; and for the proportioning and mixing of concrete for culverts and incidental concrete construction. The concrete shall be composed of Portland cement, aggregates (fine and coarse), admixtures if desired or required, and water, proportioned and mixed as hereinafter provided.

2. MATERIALS

Cement: The cement shall be either Type II or III Portland Cement conforming to ASTM Designation: C150, modified as follows: Unless otherwise specified by the Engineer, the specific surface area of Type I and II cements shall not exceed 2000 square centimeters per gram (Wagner Turbidimeter – Test Method Tex-310-D). For concrete piling, the above limit on specific surface area is waived for Type II cement only. The Contractor shall furnish the Engineer, with each shipment, a statement as to the specific surface area of the cement expressed in square centimeters per gram. For cement strength requirements, either the tensile or compressive test may be used.

Type II cement shall be used unless Type I is specified on the plans. Type III cement may be used when the anticipated air temperature for the succeeding 12 hours will not exceed 60° F. Type III cement may be used in all precast pre-stressed concrete, except in piling when Type II cement is required for substructure concrete.

Different types of cement may be used in the same structure, but all cement used in any one monolithic placement shall be of the same type and brand. Only one brand of each type will be permitted in any one structure unless otherwise authorized by the Engineer.

Cement may be delivered in bulk where adequate bin storage is provided. All other cement shall be delivered in bags marked plainly with the name of the manufacturer and the type of cement. Similar information shall be provided in the bills of lading accompanying each shipment of packaged or bulk cement. Bags shall contain 94 pounds net. All bags shall be in good condition at time of delivery.

All cement shall be properly protected against dampness. No caked cement will be accepted. Cement remaining in storage for a prolonged period of time may be retested and rejected if it fails to conform to any of the requirements of these specifications.

Mixing Water: Water for use in concrete and for curing shall be free from oils, acids, organic matter or other deleterious substances and shall not contain more than 1000 parts per million of chlorides as CL nor than 1000 parts per million of sulfates as SO_4.

Water from municipal supplies approved by the State Health Department will not require testing, but water from other sources will be sampled and tested before use in structural concrete.

Tests shall be made in accordance with the "Standard Method of Test for Quality of Water to be used in Concrete" (AASHO Method T-26), except where such methods are in conflict with provisions of this specification.

Coarse Aggregate: Coarse aggregate shall consist of durable particles of gravel, crushed blast furnace slag, crushed stone, or combinations thereof; free from frozen material or injurious amount of salt, alkali, vegetable matter, or other objectionable material either free or as an

adherent coating; and its quality shall be reasonably uniform throughout. It shall not contain more than 0.25 percent by weight of clay lumps, nor more than 1.0 percent by weight of shale, nor more than 5 percent of weight of laminated and/or friable particles when tested in accordance with Test Method Tex-413-A. It shall have a weir of not more than 40 percent when tested in accordance with Test Method Tex-410-A.

Unless otherwise specified on the plans, coarse aggregate will be subjected to five cycles of the soundness test in accordance with Test Method Tex-411-A. The loss shall not be greater than 12 percent when sodium sulfate is used, or 18 percent when magnesium sulfate is used.

Permissible sizes of aggregate shall be governed by Table 4, except that when exposed aggregate surfaces are required, coarse aggregate gradation will be as specified on the plans. When tested by approved methods, the coarse aggregate, including combinations of aggregates when used, shall conform to the grading requirements shown in Table 1.

TABLE 1
Coarse Aggregate Gradation Chart (Percent Retained on Each Sieve)

Aggregate Grade #	Nominal Size	2-1/2 In.	2 In.	1-1/2 In.	1 In.	3/4 In.	1/2 In.	3/8 In.	No. 4	No. 8
1	2 In.	0	0 to 20	15 to 50		60 to 80			95 to 100	
2 (467)*	1-1/2 In.		0	0 to 5		30 to 65		70 to 90	95 to 100	
4 (57)*	1 In.			0	0 to 5		40 to 75		90 to 100	95 to 100
8	3/8 In.						0	0 to 5	35 to 80	90 to 100

*Numbers in parenthesis indicate conformance with ASTM C33.

The aggregate shall be washed. The Loss by Decantation (Test Method Tex-406-A) plus the allowable weight of clay lumps, shall not exceed one percent, or the value shown on the plans, whichever is smaller.

Fine Aggregate: Fine aggregate shall consist of clean, hard, durable, and uncoated particles of natural or manufactured sand or a combination thereof, with or without a mineral filler. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent by weight of clay lumps. When subjected to the color test for organic impurities (Test Method Tex-408-A), it shall not show a color a darker than standard.

The fine aggregate shall produce a mortar having a tensile strength equal to or greater than that of Ottawa sand mortar when tested in accordance with Test Method Tex-317-D. Where manufactured sand is used in lieu of natural sand for slab concrete subject to direct traffic, the acid insoluble residue of the fine aggregate shall be not less than 28 percent by weight when tested in accordance with Test Method Tex-612-J. When tested by approved methods, the fine aggregate or combinations of aggregates, including mineral filler, shall conform to the grading requirements shown in Table 2.

TABLE 2
Fine Aggregate Gradation Chart Percent Retained on Sieve

Aggregate Grade #	3/8 In.	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200
1	0	0 to 5	0 to 20	15 to 20	35 to 75	70 to 90	90 to 100	97 to 100

NOTE 1: Where manufactured sand is used in lieu of natural sand, the percent retained on the No. 200 sieve shall be 94 to 100.
NOTE 2: Where the sand equivalent value is greater than 85, the retainage on the No. 50 sieve may be 70 to 94 percent.

Fine aggregate will be subjected to the Sand Equivalent Test (Test Method Tex-203-F). The sand equivalent shall not be less than 80 nor less than the value shown on the plans, whichever is greater.

For Class A and C and E Concrete, the fineness modulus as defined below for fine aggregates shall be between 2.30 and 3.10.

The fineness modulus will be determined by adding the percentages by weight retained on the following sieves, and dividing by 100; Nos. 4, 8, 16, 30, 50 and 100.

Mineral Filler: Mineral filler shall consist of stone dust, clean crushed sand, or other approved inert material.

Mortar (Grout): Mortar for repair of concrete shall consist of 1 part cement, 2 parts finely graded sand, and enough water to make the mixture plastic. When required to prevent color difference, white cement shall be added to produce the color required. When required by the Engineer, latex adhesive shall be added to the mortar.

Admixtures: Calcium Chloride will not be permitted. Unless otherwise noted, air-entraining, retarding and water reducing admixtures may be used in all concrete and shall conform to the following requirements:

A "water-reducing, retarding admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and will retard the initial set of the concrete. A "water-reducing admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency.

Retarding and Water Reducing Admixtures. The admixture shall meet the requirements for Type A and Type D admixture as specified in ASTM Designation: C 494, modified as follows:

(1) The water-reducing retarder shall retard the initial set of the concrete a minimum of 2 hours and a maximum of 4 hours, at a specified dosage rate, at a temperature of 90° F.

(2) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.

(3) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air entraining admixture used in the referenced and test concrete shall be neutralized Vinsol resin.

Air Entraining Admixture. The admixture shall meet the requirements of ASTM Designation: C 260 modified as follows:

(1) The cement used in any series of tests shall be either the cement proposed for specific work or a "reference" Type I cement from one mill.

(2) Unless otherwise noted on the plans, the minimum relative durability factor shall be 80.

The air entraining admixture used in the referenced concrete shall be neutralized Vinsol resin.

3. STORAGE OF CEMENT

All cement shall be stored in well ventilated weatherproof buildings or approved bins, which will protect it from dampness or absorption of moisture. Storage facilities shall be ample, and each shipment of packaged cement shall be kept separated to provide easy access for identification and inspection. The Engineer may permit small quantities of sacked cement to be stored in the open for a maximum of 48 hours on a raised platform and under waterproof covering.

4. STORAGE OF AGGREGATE

The method of handling and storing concrete aggregate shall prevent contamination with foreign materials. If the aggregates are stored on the ground, the sites for the stockpiles shall be clear of all vegetation and level. The bottom layer of aggregate shall not be disturbed or used without recleaning.

When conditions require the use of two or more sizes of aggregates, they shall be separated to prevent intermixing. Where space is limited, stockpiles shall be separated by physical barriers. Methods of handling aggregates during stockpiling and subsequent use shall be such that segregation will be minimized. Unless otherwise authorized by the Engineer, all aggregate shall be stockpiled at least 24 hours to reduce the free moisture content.

5. MEASUREMENT OF MATERIALS

The measurement of the materials, except water, used in batches of concrete shall be by weight. The fine aggregate, coarse aggregate and mineral filler shall be weighed separately. Where bulk cement is used it shall be weighed separately but batch weighing of sacked cement will not be required. Where sacked cement is used, the quantities of material per batch shall be based upon using full bags of cement. Batches involving the use of fractional bags will not be permitted. Allowance shall be made for the water content in the aggregates.

Bags of cement varying more than 3 percent from the specified weight of 94 pounds may be rejected, and when the average weight per bag in any shipment, as determined by weighing 50 bags taken at random, is less than the net weight specified, the entire shipment may be rejected.

If the shipment is accepted, the Engineer will adjust the concrete mix to a net weight per bag fixed by an average of all individual weights which are less than the average weight determined from the total number weighed.

6. CLASSIFICATION AND MIX DESIGN

It shall be the responsibility of the Contractor to furnish the mix design, using a Coarse Aggregate Factor acceptable to the Engineer, for the class (es) of concrete specified. The mix shall be designed by a qualified concrete technician to conform with the requirement contained herein and in accordance with the THD Bulletin C-11. The Contractor shall perform, at his own expense, the work required to substantiate the design, except the testing of strength specimens, which will be done by the Engineer. Complete concrete design data shall be submitted to the Engineer for approval.

It shall also be the responsibility of the Contractor to determine and measure the batch quantity of each ingredient, including all water, so that the mix conforms to these specifications and any other requirements shown on the plans. In lieu of the above mix design responsibility, the Contractor may accept a design furnished by the Engineer, however, this will not relieve him of providing concrete meeting the requirements of these specifications.

Trial batches will be made and tested using all the proposed ingredients prior to the placing of concrete, and when the aggregate and/or brand of cement or admixture is changed. Trial batches shall be made in the mixer to be used on the job. When Transit Mix concrete is to be used, the trial designs will be made in a transit mixer representative of the mixers to be used. Batch size shall not be less than 50 percent of the rated mixing capacity of the truck. Mix designs from previous or concurrent jobs may be used without trial batches if it is shown that no substantial change in any of the proposed ingredients has been made.

The coarse aggregate factor shall not be more than 0.82, except that when the voids in the coarse aggregate exceed 48 percent of the total dry loose volume, the coarse aggregate factor shall not exceed 0.85. The coarse aggregate factor shall not be less than 0.70 for Grades 1, 2 and 3 aggregate.

If the strength required for the class of concrete being produced is not secured with the cement specified in Table 4, the Contractor may use an approved water reducing or retarding admixture, or he shall furnish aggregates with different characteristics which will produce the required results. Additional cement may be required or permitted as temporary measure until the redesign is checked.

Water reducing or retarding agents may be used with all classes of concrete at the option of the Contractor. When water reducing or retarding agents are used at the option of the Contractor, reduced dosage of the admixture will be permitted. Entrained air will be required in accordance with Table 4. The concrete shall be designed to entrain 5 percent air when Grade 2 coarse aggregate is used and 6 percent when Grade 3 coarse aggregate is used. Concrete as placed in the structure shall contain the proper amount as required above with a tolerance of plus or minus 1-1/2 percentage points. Occasional variations beyond this tolerance will not be cause for rejection.

When the quantity of entrained air is found to be above 7 percent with Grade 2 coarse aggregate or 8 percent for Grade 3 coarse aggregate, additional test beams or cylinders will be made. If these beams or cylinders pass the minimum flexural or compressive requirements, the concrete will not be rejected because of the variation in air content.

7. CONSISTENCY

In cases where the consistency requirements cannot be satisfied without exceeding the maximum allowable amount of water, the Contractor may use, or the Engineer may require, an approved water reducing or retarding agent or the Contractor shall furnish additional aggregates, or aggregates with different characteristics, which will produce the required results. Additional cement may be required or permitted as a temporary measure until aggregates are changed and designs checked with the difference aggregates or admixture.

The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface. When field conditions are such that additional moisture is needed for the final concrete surface finishing operation, the required water shall be applied to the surface by fog spray only and shall be held to a minimum. The concrete shall be workable, cohesive, possess satisfactory finishing qualities, and of the stiffest consistency that can be placed and vibrated into a homogenous mass. Excessive bleeding shall be avoided. Slump requirements will be as specified in Table 3.

TABLE 3
Slump Requirements

Concrete Designation	Desired Slump	Max. Slump
Structural Concrete (1) Thin-Walled Sections (9" or less)	4	5
(2) Slabs, Caps, Columns, Piers, Wall Sections 9", etc.	3	4
Underwater or Seal Concrete	5	6
Riprap, Curb, Gutter & Other Misc. Conc.	2.5	4

NOTE: No concrete will be permitted with slump in excess of the maximums shown.

8. QUALITY OF CONCRETE

General: The concrete shall be uniform and workable. The cement content, maximum allowable water cement ration, the desired and maximum slump, and the strength requirements of the various classes of concrete shall conform to the requirements of Table 3 and Table 4 and as required herein. During the process of the work, the Engineer will cast test cylinders or beams as a check on the compressive or flexural strength of the concrete actually placed.

A test shall be defined as the average of the breaking strength of two cylinders, as the case may be. Specimen will be tested in accordance with Test Methods Tex-418-A or Tex-420-A. Test Cylinders will be required as specified on the plans. For small placements on structures such as manholes, inlets, culverts, wing walls, etc., the Engineer may vary the number of tests to a minimum of one for each 25 cubic yards placed over several day period. All test specimens, beams of cylinders, representing tests for removal of forms and/or falsework shall be cured using the same methods, and under the same conditions as the concrete represented. "Design Strength" beams and cylinders shall be cured in accordance with THD Bulletin C-11.

The Contractor shall provide and maintain curing facilities as described in Bulletin C-11 for the purpose of curing test specimens. Provision shall be made to maintain the water in the curing tank at temperatures between 70° F and 90° F. When control of concrete quality is by twenty-eight-day compressive tests, job control will be by seven-day compressive tests which are shown to provide the required twenty-eight-day strength, based on results from trial batches. If the required seven-day strength is not secured with the cement specified in Table 4, changes in the batch design will be made.

TABLE 4
Classes of Concrete

Class of Concrete	Sx Cement per CY	Min. Comp Strength (f'c) 28 Day psi	Min. Beam Strength 7 Day psi	Max. Water Cement Ratio	Coarse Aggr. No.
A*	5.0	3000	500***	6.5	2-4-8****
B*	4.5	2500	417	8.0	2-4-8****
C*	6.0	3600	600***	6.0	1-2-4**
D	6.0	3000	500	7.0	2-4
S	6.5	4000	570	5.0	2-4

*Entrained Air (slabs, pier and bent concrete)
**Grade 1 coarse Aggregate may be used in foundation only (except cased drilled shafts)
***When Type II Cement is used with Class C Concrete, the 7-day Test Cylinder requirement will be 550 psi; with Class A, 460 psi. min.
****Permission to use Grade 8 Aggregate must have prior approval of the Engineer

9. MIXING CONDITIONS

The concrete shall be mixed in quantities required for immediate use. Any concrete which is not in place within the limits outlined in Specification 038000, "Concrete Structures", Article "Placing Concrete General", shall not be used. Re-tamping of concrete will not be permitted.

In threatening weather, which may result in conditions that will adversely affect quality of the concrete to be placed, the Engineer may order postponement of the work. Where work has been started and changes in weather conditions require protective measures, the Contractor shall furnish adequate shelter to protect the concrete against damage from rainfall, or from freezing temperatures. If necessary, to continue operations during rainfall, the Contractor shall also provide protective coverings for the material stockpiles. Aggregate stockpiles need be covered only to the extent necessary to control the moisture conditions in the aggregates to adequately control the consistency of the concrete.

10. MIXING AND MIXING EQUIPMENT

All equipment, tools, and machinery used for hauling materials and performing any part of the work shall be maintained in such condition to insure completion of the work under way without excessive delays for repairs or replacements.

The mixing shall be done in a batch mixer of approved type and size that will produce uniform distribution of the material throughout the mass. Mixers may be either the revolving drum type or the revolving blade type and shall be capable of producing concrete meeting the requirements of these specifications.

After all the ingredients are assembled in the drum, the mixing shall continue not less than 1 minute for mixers of one cubic yard or less capacity plus 15 seconds for each additional cubic yard or portion thereof.

The mixer shall operate at the speed and capacity designated by the Mixer Manufacturers Bureau of the Associated General Contractors of America. The mixer shall have a plate affixed showing the manufacturer's recommended operating data.

The absolute volume of the concrete batch shall not exceed the rated capacity of the mixer.
The entire contents of the drum shall be discharged before any materials are placed therein for the succeeding batch.

The first batch of concrete materials placed in the mixer for each placement shall contain an extra quantity of sand, cement, and water sufficient to coat the inside surface of the drum.

Upon the cessation of mixing for any considerable length of time, the mixer shall be thoroughly cleaned.

The concrete mixer shall be equipped with an automatic timing device which is put into operation when the skip is raised to its full height and dumping. This device shall lock the discharging mechanism and prevent emptying of the mixer until all the materials have been mixed together for the minimum time required, and it shall ring a bell after the specified time of mixing has elapsed.

The water tank shall be arranged so that the amount of water can be measured accurately, and when the tank starts to discharge, the inlet supply shall cut off automatically.

Whenever a concrete mixer is not adequate or suitable for the work, it shall be removed from the site upon a written order from the Engineer and a suitable mixer provided by the Contractor. Pick-up and thro-over blades in the drum of the mixer which are worn down more than 10 percent in depth shall be repaired or replaced by new blades.

Improperly mixed concrete shall not be placed in the structure. Job mix concrete shall be concrete mixed in an approved batch mixer in accordance with the requirements stated above, adjacent to the structure for which the concrete is being mixed, and moved to the placement site, in non-agitating equipment.

11. READY-MIX PLANTS

General. It shall be the Contractor's responsibility to furnish concrete meeting all requirement of the governing specifications items and concrete not meeting the slump, workability and consistency requirements of the governing specification item shall not be placed in the structure or pavement. Ready-Mixed Concrete shall be mixed and delivered by means of one of the following approved methods.

(1) Mixed completely in a stationary mixer and transported to the point of delivery in a truck agitator or a truck mixer operating at agitator or a truck mixer operating at agitation speed. (Central-Mix Concrete)

(2) Mixed complete in a truck mixer and transported to the placement site at mixing and/or agitating speed (Transit-Mix Concrete), subject to the following provisions.
   (a) Truck mixers will be permitted to transport concrete to the job site at mixing speed if equipped with double actuated counters which will separate revolutions at mixing speed from total revisions.
   (b) Truck mixers equipped with a single actuated counter counting total revolutions of the drum shall mix the concrete at the plant not less than 50 nor more than 70 revolutions at mixing speed, transport it to the job site at agitating speed and complete the required mixing before placing the concrete.

(3) Mixed completely in a stationery mixer and transported to the job site in approved non-agitating trucks with special bodies. This method of transporting will be permitted for concrete pavement only.

Equipment

(1) Batching Plant. The batching plant shall be provided with adequate bins for batching all aggregates and materials required by the specifications. Bulk cement shall be weighed on a scale separate from those used for other materials and in a hopper entirely free and independent of that used for weighing the aggregates.

(2) Mixers and Agitators.
   (a) General: Mixers shall be of an approved stationary or truck-type capable of combining the ingredients into a thoroughly mixed and uniform mass. Facilities shall be provided to permit ready access to the inside of the drum for inspection, cleaning, and repair of blades. Mixers and agitators shall be subject to daily examination for changes in condition due to accumulation of hardened concrete and/or wear of blades and any hardened concrete shall be removed before the mixer will be permitted to be used. Worn blades shall be repaired or replaced with new in accordance with the manufacturer's design and arrangement for that particular unit when any part or section is worn as much as 10 percent below the original height of the manufacturer's design.

(b) Stationary Mixers: These shall conform to the requirements of Article "Mixing and Mixing Equipment". Truck mixers mounted on a stationary base will not be considered as a stationary mixer.

(c) Truck Mixer: In addition, truck mixers shall comply with the following requirements: An engine in satisfactory working condition and capable of accurately growing the desired speed of rotation shall be mounted as an integral part of the mixing unit for the purpose of rotating the drum. Truck mixers equipped with a transmission that will govern the speed of the drum within the specified rpm will not require a separate engine. All truck mixers shall be equipped with actuated counters by which the proper number of revolutions of the drum as specified in "Part A" above may be readily verified. The counters shall be read and recorded at the start of mixing at mixing speeds. Each until shall have adequate water supply and accurate metering or gauging devices for measuring the amount used.

(d) Agitators: Concrete agitators shall be of the truck type, capable of maintaining a thoroughly mixed and uniform concrete mass and discharging it within the same degree of uniformity specified for mixers. Agitators shall comply with all of the requirements for truck mixers, except for the actual mixing requirements.

Operation of Plant and Equipment

Delivery of ready-mixed concrete shall equal or exceed the rate approved by the Engineer for continuous placement. In all cases, the delivery of concrete to the placement site shall assure compliance with the time limits in the applicable specification for depositing successive batches in any monolithic unit. The Contractor shall satisfy the Engineer that adequate standby trucks are available.

A standard ticket system will be used for recording concrete batching, mixing and delivery date. Tickets will be delivered to the job inspector. Loads arriving without ticket and/or in unsatisfactory condition shall not be used.

When a stationary mixer is used for the entire mixing operation, the mixing time for one cubic yard of concrete shall be one minute plus 15 seconds for each additional cubic yard or portion thereof. This mixing time shall start when all cement, aggregates and initial water have entered the drum. The mixer shall be charged so that some of the mixing water will enter the drum in advance of the cement and aggregate.

All of the mixing water shall be in the drum by the end of the first one-fourth of the specified mixing time. Water used to flush down the blades after charging shall be accurately measured and included in the quantity of mixing water. The introduction of the initial mixing water, except blade wash down water and that permitted in this Article, shall be prior to or simultaneous with the charging of the aggregates and cement.

The loading of truck mixers shall not exceed 63 percent of the total volume of the drum. When used as an agitator only, the loading shall not exceed 80 percent of the drum volume.

When Ready-Mix Concrete is used, additional mortar (one sack cement, three parts sand and sufficient water) shall be added to the batch to coat the drum of the mixer or agitator truck and this shall be required for every load of Class C concrete only and for the first batch from central mix plants.

A portion of the mixing water, required by the batch design to produce the desired slump, may be withheld, and added at the job site, but only with permission of the Engineer and under his supervision. When water is added under the above conditions, it shall be thoroughly mixed as specified below for water added at the job site.

Mixing speed shall be attained as soon as all ingredients are in the mixer, and each complete batch (containing all the required ingredients) shall be mixed not less than 70 nor more than 100 revolutions of the drum at mixing speed except that when water is added at the job site, 25 revolutions (minimum) at mixing speed, will be required to uniformly disperse the additional water throughout the mix. Mixing speed shall be as designated by the manufacturer.

All revolutions after the prescribed mixing time shall be at agitating speed. The agitating speed shall be not less than one nor more than 5 rpm. The drum shall be kept in continuous motion from the time mixing is started until the discharge is completed.

12. PLACING, CURING AND FINISHING

The placing of concrete, including construction of forms and falsework, curing and finishing, shall be in accordance with the specification, Specification 038000, "Concrete Structures".

13. MEASUREMENT AND PAYMENT

The quantities of concrete of the various classifications which will constitute the completed and accepted structure of structures in place will be measured by the cubic yard, each, square foot, square yard, or linear foot as the case may be. Measurement will be as shown on the plans and in the proposal.

Unless indicated otherwise in the proposal, payment shall be compensation for finishing, hauling, and mixing all concrete material; placing, curing, and furnishing all concrete; all grouting and pointing; furnishing and placing drains; furnishing and placing metal flashing strips; furnishing and placing expansion joint material required by this specification; and for all forms and falsework, labor, tools, equipment, and incidentals necessary to complete the work.

SECTION 032020
REINFORCING STEEL

1. DESCRIPTION

This specification shall govern the furnishing and placing of reinforcing steel, deformed and smooth, of the size and quantity designated on the plans and in accordance with these specifications.

2. MATERIALS

Unless otherwise designated on the plans, all bar reinforcement shall be deformed, and shall conform to ASTM Designation: A 615, Grades 40, 60 and 75, and shall be open hearth, basic oxygen, or electric furnace new billet steel. Large diameter new billet steel (Nos. 14 and 18), Grade 75, will be permitted for straight bars only.

Where bending of bar sizes No. 14 or No. 18 of Grades 40 and 60 is required, bend testing shall be performed on representative specimens as described for smaller bars in the applicable ASTM Specification. The required bend shall be 90 degrees around a pin having a diameter of 10 times the nominal diameter of the bar.

Spiral reinforcement shall be smooth (not deformed) bars or wire of the minimum diameter shown on the plans and shall be made by one or more of the following processes: open hearth, basic oxygen, or electric furnace. Bars shall be rolled from billets reduced from ingots and shall comply with ASTM, Designation: A 306, Grade 65 minimum (Referenced to ASTM Designation: A 29 is voided. Dimensional tolerances shall be in accordance with ASTM Designation: A 615, or ASTM Designation: A 615, Grade 40 or 60, except for deformations. Wire shall be cold-drawn from rods that have been hot-rolled from billets and shall comply with ASTM Designation: A 185.

In cases where the provisions of this specifications are in conflict with the provisions of the ASTM Designation to which reference is made, the provisions of this specification shall govern. Report of chemical analysis showing the percentages of carbon, manganese, phosphorus, and sulphur will be required for all reinforcing steel, when it is to be welded. The nominal size and area and the theoretical weight of reinforcing steel bars covered by this specification is as follows:

Bar Size Number	Nominal Diameter In.	Nominal Area Sq. In.	Weight Per LF
2	0.250	0.05	0.167
3	0.375	0.11	0.376
4	0.500	0.20	0.668
5	0.625	0.31	1.043
6	0.750	0.44	1.502
7	0.875	0.60	2.044
8	1.000	0.79	2.670
9	1.128	1.00	3.400
10	1.270	1.27	4.303
11	1.410	1.56	5.313
14	1.693	2.25	7.6
18	2.257	4.00	13.60

Smooth round bars shall be designated by size number through No. 4. Smooth bars above No. 4 shall be designated by diameter in inches.

When wire is ordered by gauge numbers, the following relation between number and diameter, in inches, shall apply unless otherwise specified:

Gauge Number	Equivalent Diameter In.
0	0.3065
1	0.2830
2	0.2625
3	0.2437
4	0.2253
5	0.2070
6	0.1920
7	0.1770
8	0.1620
9	0.1483
10	0.1350
11	0.1205
12	0.1055
13	0.0915
14	0.800

3. BENDING

The reinforcement shall be bent cold, true to the shapes indicated on the plans. Bending shall preferably be done in the shop. Irregularities in bending shall be cause for rejection.

Unless otherwise shown on the plans, the inside diameter of bar bends, in terms of the nominal bar diameter (d), shall be as follows:

Bends of 90° F and greater in stirrups, ties and other secondary bars that enclose another bar in the bend.

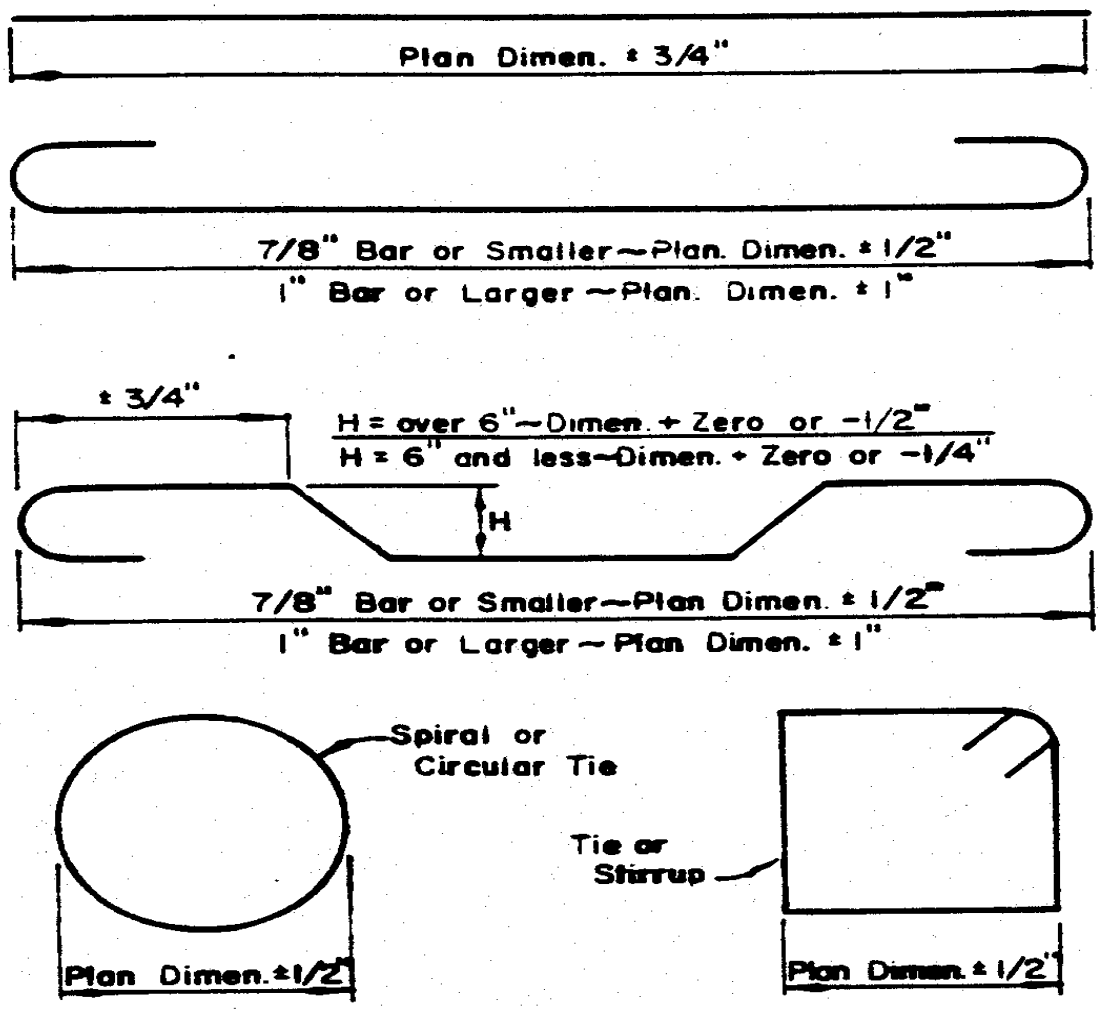
	Grade 40	Grade 60
#3, #4, #5	3d	4d
#6, #7, #8	4d	5d

All bends in main bars and in secondary bars not covered above.

	Grade 40	Grade 60	Grade 75
#3 thru #8	5d	6d	--
#9, #10	5d	8d	--
#11	5d	8d	8d
#14, #18	10d	10d	--

4. TOLERANCES

Fabricating Tolerances for bars shall be within 3% of specified or as follows:



5. STORING

Steel reinforcement shall be stored above the surface of the ground upon platforms, skids, or other supports and shall be protected as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placed in the work, reinforcement shall be free from dirt, paint, grease, oil, or other foreign materials. Reinforcement shall be free from injurious defects such as cracks and laminations. Rust, surface seams, surface irregularities or mill scale will not be cause for rejection, provided the minimum dimensions, cross-sectional area and tensile properties of a hand wire crushed specimen meets the physical requirements for size and grade of steel specified.

6. SPLICES

No splicing of bars, except when provided on the plans or specified herein, will be permitted without written approval of the Engineer. Splices not provided for on the plans will be permitted, but not included for measurement, in Grade 40 bars only, sizes No. 8 and smaller, subject to the following: For bars exceeding 40 feet in plan length, the distance center to center of splices shall not be less than 40 feet and no individual bar length shall be less than 10 feet.

Splices will not be permitted in bars less than 40 feet in plan length. Splices which are not shown on the plans, but permitted hereby, shall be made in accordance with Table 1 below. The specified concrete cover shall be maintained at such splices and the bars placed in contact and securely tied together.

Splices will not be permitted in main reinforcement at points of maximum stress. When permitted in main bars, splices in adjacent bars will be staggered a minimum of two splice lengths.

Table 1
Minimum Lap Requirements

Lap	Uncoated	Coated
Lap In Inches ≥	40d	60d
Where d = Bar Diameter in Inches		

Welding of reinforcing bars may be used only where shown on the plans or as permitted herein. All welding operations, processes, equipment, materials, workmanship, and inspection shall conform to the requirements of the plans and of the specifications and industry standards.

All splices shall be of such dimension and character as to develop the full strength of bar being spliced.

End preparation for butt welding reinforcing bars, shall be done in the field. Delivered bars shall be of sufficient length to permit this practice.

For box culvert extensions with less than one foot of fill, the existing longitudinal bars shall have a 20-diameter lap with the new bars. For extensions with more than one foot of fill, a minimum of 6-inch lap will be required.

Unless otherwise shown on the plans, dowel bars transferring tensile stresses, shall have a minimum embedment equal to the minimum lap requirements shown in Table 1. Shear transfer dowels shall have a minimum embedment of 12 inches.

7. PLACING

Reinforcement shall be placed as near as possible in the position shown on the plans. Unless otherwise shown on the plans, dimensions shown for reinforcement are to the centers of the bars. In the plane of the steel parallel to the nearest surface of concrete, bars shall not vary from plan placement by more than one-twelfth of the spacing between bars. In the plane of the steel perpendicular to the nearest surface of concrete, bars shall not vary from plan placement by more than one-quarter inch. Cover of concrete to the nearest surface of steel shall meet the above requirements but shall never be less than one inch.

Vertical stirrups shall always pass around the main tensions members and be attached securely thereto. The reinforcing steel shall be spaced its required distance from the form surface by means of approved galvanized metal spacers, metal spacers with plastic coated tips, stainless steel spacers, plastic spacers, or approved pre-cast mortar or concrete blocks. For approval of plastic spacers on project, representative samples of the plastic shall show no visible indications of deterioration after immersion in a 5 percent solution of sodium hydroxide for 120 hours.

All reinforcing steel shall be sited at all intersections, except that where spacing is less than one foot in each direction, alternate intersections only, need be tied.

Before any concrete is placed, all mortar shall be cleaned from the reinforcement. Pre-cast mortar or concrete blocks to be used for holding steel in position adjacent to formed surfaces shall be cast in molds meeting the approval of the Engineer and shall be cured by covering with wet burlap or cotton mats for a period of 72 hours.

The blocks shall be cast in the form of a frustrum of a cone or pyramid with the smaller face placed against the forms.

A suitable tie wire shall be provided in each block, to be used for anchoring to the steel. Except in unusual cases, and when specifically, otherwise authorized by the Engineer, the size of the surface to be placed adjacent to the forms shall not exceed two and one-half inches square or the equivalent thereof in cases where circular or rectangular areas are provided. Blocks shall be cast accurately to the thickness required, and the surface to be placed adjacent to the forms shall be a true plane free of surface imperfections.

Reinforcement shall be supported and tied in such manner that a sufficiently rigid case of steel is provided. If the cage is not adequately supported to resist settlement or floating upward of the steel, overturning of truss bars, or movement in any direction during concrete placement, permission to continue concrete placement will be withheld until corrective measures are taken. Sufficient measurements shall be made during concrete placement to ensure compliance with the first paragraph of this specification.

Mats of wire fabric shall overlap each other sufficiently to maintain a uniform strength and shall be fastened securely at the ends and edges.

No concrete shall be deposited until the Engineer has inspected the placement of the reinforcing steel and given permission to proceed.

8. MEASUREMENT AND PAYMENT

Reinforcing steel is considered subsidiary to the various items shown in the proposal and shall not be measured and paid for as a separate item.

SECTION 037040
EPOXY COMPOUNDS

1. DESCRIPTION

This specification shall govern all work necessary to provide and apply Epoxy compounds.

2. MATERIALS (USE – TYPE)

A. Epoxy Bonding Compound for bonding new concrete to hardened concrete or other structural material: Epoxy Bonding Compound shall be a two component, 100% solids, moisture insensitive system. Epoxy shall be "FX-75 Bonding Agent" as manufactured by Fox Industries Inc. of Baltimore, Maryland or "Sikastix 370, Sikadur Hi-Mod" as manufactured by Sika Chemical Corporation of Lyndhurst, New Jersey or approved equal.

B. Epoxy Grout for Epoxy patch on non-horizontal surfaces to concrete: Epoxy Compound shall be a low-modulus, high viscosity, moisture insensitive system. Epoxy shall be "Sikastix 360, Skadur Lo-Mod Gel" as manufactured by Sika Chemical Corporation or approved equal.

3. CONSTRUCTION METHODS

Bond New Concrete to Existing Concrete.

A. Surface Preparation: The existing concrete or structural surface to which the new concrete is to be bonded shall be cleaned. The existing surface shall be made free from dust, laitance, grease, curing compounds, waxes, and all foreign material. Cleaning shall be done by sandblasting, mechanical abrasion, or (by washing only if authorized by the Engineer). During application of bonding compound, surface may be dry, moist, or wet, but surface shall be free of standing water.

B. Proportioning and Mixing: The epoxy shall be proportioned and mixed in strict accordance with the manufacturers' instructions. The epoxy shall be used in a neat condition (without aggregate filler).

C. Application of Epoxy: The epoxy bonding compound shall be applied to the prepared surface with the minimum allowable coverages as follows: Concrete (float finished, cleaned by washing) 75 SF/gal, Concrete (rough finish, cleaned by sandblast or mechanical abrasion) 50 SF/gal. Other surfaces as specified on the drawings.

D. Concrete Overlay: The concrete overlay shall be in accordance with the drawings or 030020 of standard specifications. The concrete overlay shall be applied over the epoxy within a period of time which SHALL NOT EXCEED 60% of the tack free time of the epoxy. It is important for the Contractor to note that these times vary with the temperature and pot time.

   The following allowable times (60% of tack free time, where the tack free time is the period of time from initial mixing of the two components until the thin film of epoxy hardens) are provided below. The allowable times must be determined from the tack free times which are provided by the manufacturer. The following allowable times are averages and provided only as an aid to the Contractor:

Temperature	Allowable Elapse Time From Mixing Epoxy Until Placing Concrete Overlay
90°F	40 Minutes
80°F	12 Hours
70°F	22 Hours
60°F	32 Hours

If the allowable period of time is allowed to elapse before concrete overlay can be placed, another layer of epoxy shall be applied prior to placement of the concrete.

Epoxy Grout for Patch to Non-Horizontal Surfaces to Concrete:

A. Surface Preparation: The surface shall be prepared as described in (1) Bond new concrete to existing concrete Part a.

B. Proportioning and Mixing: The epoxy shall be proportioned and mixed in strict accordance with the manufacturer instruction. The epoxy may be mixed with dry masonry sand. Sand shall conform to ASTM C-144 with 100% passing a No. 8 sieve and not more than 15% to 35% passing a No. 50 mesh sieve. The amount of sand filler shall not exceed 3/4 to 1 (loose sand to epoxy by volume).

C. Application: Epoxy shall be applied in strict accordance with manufacturer instructions. Area adjacent to work shall be cleaned free of epoxy spills as to provide a neat appearance before work will be accepted.

4. GENERAL PRECAUTION

The Contractor is advised to become familiar with type of epoxy, method of application, and its basic limitations prior to using the epoxy.

5. MEASUREMENT AND PAYMENT

Unless indicated otherwise in the Proposal, Epoxy Compounds shall be considered subsidiary to the appropriate bid item.

SECTION 038000
CONCRETE STRUCTURES

1. DESCRIPTION

This specification shall govern for construction of all types of structures involving the use of structural concrete, except where the requirements are waived or revised by other governing specifications.

All concrete structures shall be constructed in accordance with the design requirements and details shown on the plans; in conformity with the pertinent provisions of the items contracted for; the incidental specifications referred to; and in conformity with the requirements herein.

2. MATERIALS

A. Concrete. All concrete shall conform to the provisions of Specification "Portland Cement Concrete". The class of concrete for each type of structure or unit shall be as specified on the plans, or by pertinent governing specifications.

B. Expansion Joint Material

C. Preformed Fiber Material. Preformed fiber expansion joint material shall be of the dimensions shown on the plans. At the Contractor's option, the material shall be one of the following types, unless otherwise noted on the plans:

1. "Preformed Bituminous Fiber Materials" shall meet the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM Designation: D1751.

2. "Preformed Non-Bituminous Fiber Material" shall meet the requirements of the Standard Specifications for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction, ASTM Designation: D1751, except that the requirements pertaining to bitumen content, density and water absorption shall be voided.

D. Joint Sealing Materials. Unless otherwise shown on the plans, joint sealing material shall conform to the following requirements. The material shall adhere to the sides of the concrete joint or crack and shall form an effective seal against infiltration of water and incompressible. The material shall not crack or break when exposed to low temperatures.

1. Class 1-a. (Two component, Synthetic Polymer, Cold Extruded Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. This type is specifically designed for vertical or sloping joints and hence not self-leveling. It shall cure sufficiently at an average temperature leveling. It shall cure sufficiently at an average temperature of 77° F ± 38° F maximum of 24 hours. For performance requirements see under b-2 below.

2. Class 1-b. (Two component, Synthetic Polymer, Cold Pourable, Self-Leveling Type). Curing is to be by polymerization and not by evaporation of solvent or fluxing of harder particles. It shall cure sufficiently at an average temperature of 77° F ± 3° F maximum of 3 hours.

E. Performance Requirements. Class 1-a and 1-b, when tested in accordance with Test Method Tex-525-C, shall meet the above curing times and requirements as follows: It shall be of such consistency that it can be mixed and poured, or mixed and extruded into joints at temperatures above 60° F.

Penetration, 77° F	
150 gm. cone, 5 sec., max.-cm	0.90
Bond and Extension 75%, O° F, 5 cycles	
Dry Concrete Blocks	Pass
Wet Concrete Blocks	Pass
Steel Blocks (Primed if specified by Manuf)	Pass
Flow at 200° F	None
Water Content % by weight, max	5.0
Resilience	
Original sample min. % (cured)	50
Oven aged at 158° F min. %	50
For Class 1-a Material Only	
Cold Flow (10 min.)	None

F. Asphalt Board. Asphalt Board shall consist of two liners of 0.016-inch asphalt impregnated paper, filled with a mastic mixture of asphalt and vegetable fiber and/or mineral filler. Boards shall be smooth, flat and sufficiently rigid to permit installation. When tested in accordance with Test Method Tex-524-C, the asphalt board shall not deflect from the horizontal more than one inch in three and one-half inches.

G. Rebonded Neoprene Filler. Rebonded neoprene filler shall consist of ground closed-cell neoprene particles, rebonded and molded into sheets of uniform thickness of the dimensions shown on plans. Filler material shall have the following physical properties and shall meet the requirements of ASTM Designation: D1752, Type 1 where applicable:

PROPERTY	METHOD	REQUIREMENT
Color	ASTM D1752 Type 1	Black
Density	ASTM D1752 Type 1	40 PCF Min
Recovery	ASTM D1752 Type 1	90% Min
Compression	ASTM D1752 Type 1	50 to 500 PSI
Extrusion	ASTM D1752 Type 1	0.25 In Max
Tensile Strength	ASTM D1752 Type 1	20 PSI Min
Elongation	ASTM D1752 Type 1	75% Min

The manufacturers shall furnish the Engineer with certified test results as to the compliance with the above requirements and a 12 inch x 12 inch x 1 inch sample from the shipment for approval.

Curing Materials. Membrane curing materials shall comply with the "Standard Specification Liquid Membrane-Forming Compounds for Curing Concrete", ASTM Designation: C309, Type 1 clear or translucent, or Type 2 white pigmented. The material shall have a minimum flashpoint of 80° F when tested by the "Pensky-Martin Closed Cup Method".

It shall be of such consistency that it can be satisfactorily applied as a fine mist through an atomizing nozzle by means of approved pressure spraying equipment at atmospheric temperatures above 40° F.

It shall be of such nature that it will not produce permanent discoloration of concrete surfaces nor react deleteriously with the concrete or its components. Type 1 compound shall contain a fugitive dye that will be distinctly visible not less than 4 hours nor more than 7 days after application.

The compound shall produce a firm, continuous, uniform moisture impermeable film free from pinholes and shall adhere satisfactorily to the surfaces of damp concrete.

It shall, when applied to the damp concrete surface, at the rate of coverage specified herein, dry to touch in not more than 4 hours and shall adhere in a tenacious film without running off or appreciable sagging. It shall not disintegrate, check, peel, or crack during the required curing period.

The compound shall not peel or pick up under traffic and shall disappear from the surface of the concrete by gradual disintegration.

The compound shall be delivered to the job only in the manufacturer's original containers, which shall be clearly labeled with the manufacturer's name, the trade name of the material, and a batch number or symbol with which test samples may be correlated.

The water retention test shall be in accordance with Test Method Tex-219-F. Percentage loss shall be defined as the water lost after the application of the curing material was applied. The permissible percentage moisture loss (at the rate of coverage specified herein) shall not exceed the following:

24 hours after application.....2 percent
72 hours after application.....4 percent

Type 1 (Resin Base Only) curing compound will be permitted for slab concrete in bridge decks and top slabs of direct traffic culverts.

Mat curing of concrete is allowed where permitted by Table 1 in this specification or where otherwise approved by the Engineer.

3. EXPANSION JOINTS

Joints and devices to provide for expansion and contraction shall be constructed where and as indicated herein or on the plans. All open joints and joints to be filled with expansion joint material, shall be constructed using forms adaptable to loosening or early removal. To avoid expansion or contraction damage to the adjacent concrete, these forms shall be loosened as soon as possible after final concrete set to permit free movement without requiring full form removal. Prior to placing the sealing material, the vertical facing the joint shall be cleaned of all laitance by sandblasting or by mechanical routing. Cracked or spalled edges shall be repaired. The joint shall be blown clean of all foreign material and sealed.

Where preformed fiber joint material is used, it shall be anchored to the concrete on one side of the joint by light wire or nails, to prevent the material from falling out. The top one inch of the joint shall be filled with joint sealing material.

Finished joints shall conform to the indicated outline with the concrete sections completely separated by the specified opening or joint material.

Soon after form removal and again where necessary after surface finishing, all projecting concrete shall be removed along exposed edges to secure full effectiveness of the expansion joints.

4. CONSTRUCTION JOINTS

The joint formed by placing plastic concrete in direct contact with concrete that has attained its initial set shall be deemed a construction joint. The term monolithic placement shall be interpreted to mean at the manner and sequence of concrete placing shall not create construction joints.

Construction joints shall be of the type and at the locations shown on the plans. Additional joints will not be permitted without written authorization from the Engineer, and when authorized, shall have details equivalent to those shown on the plans for joints in similar locations.

Unless otherwise provided, construction joints shall be square and normal to the forms. Bulkheads shall be provided in the forms for all joints, except when horizontal.

Construction joints requiring the use of joint sealing material shall be as detailed on the plans. The material will be specified on the plans without referenced to joint type.

A concrete placement terminating at a horizontal construction joint shall have the top surface roughened thoroughly as soon as practicable after initial set is attained. The surfaces at bulkheads shall be roughened as soon as the forms are removed.

The hardened concrete surface shall be thoroughly cleaned of all loose material, laitance, dirt or foreign material and saturated with water so it is moist when placing fresh concrete against it. Forms shall be drawn tight against the placing of the fresh concrete.

5. FORMS

A. General. Except where otherwise specified, forms may be of either timber or metal.

Forms for round columns exposed to view shall be of steel, except that other materials will be allowed with written permission of the Engineer.

Forming plans shall be submitted to the Engineer for approval as specified. Forms shall be designed for the pressure exerted by a liquid weighing 150 pounds per cubic foot. The rate of placing the concrete shall be taken into consideration in determining the depth of the equivalent liquid.

For job fabricated forms, an additional live load of 50 pounds per square foot shall be allowed on horizontal surfaces. The maximum unit stresses shall not exceed 125 percent of the allowable stresses used by the State Department of Highways and Public Transportation for the design of structures.

Commercially produced structural units used in form work shall not exceed the manufacturer's maximum allowable working load for moment, shear, or end reaction. The maximum working load shall include a live load of 35 pounds per square foot of horizontal form surface and sufficient details and data shall be submitted for use in checking form work details for approval.

Forms shall be practically mortar-tight, rigidly braced, and strong enough to prevent bulging between supports and maintained to the proper line and grade during concrete placement. Forms shall be maintained in a manner that will prevent warping and shrinkage.

Offset at form joints shall not exceed one-sixteenth of an inch.

Deflections due to cast-in-place slab concrete and railing shown in the dead load deflection diagram shall be taken into account in the setting of slab forms.
All forms and footing areas shall be cleaned of any extraneous matter before placing concrete.

Permission to place concrete will not be given until all such work is completed to the satisfaction of the Engineer.

If, at any stage of the work, the forms show signs of bulging or sagging, the portion of the concrete causing such condition shall be removed immediately, if necessary, and the forms shall be reset and securely braced against further movement.

B. Timber Forms. Lumber for forms shall be properly seasoned, of good quality, and free from imperfections which would affect its strength or impair the finished surface of the concrete. The lumber used for facing or sheathing shall be finished on at least one side and two edges and shall be sized to uniform thickness.

Form lining will be required for all formed surfaces, except for the inside of culvert barrels, inlets and manholes; surfaces that are subsequently covered by backfill material or are completely enclosed; and, any surface formed by a single finished board. Lining will not be required when plywood forms are used.

Form lining shall be of an approved type such as Masonite or plywood. Thin membrane sheeting, such as polyethylene sheets, shall not be used for form lining.

Forms may be constructed of plywood not less than one-half inch in thickness, with no form lining required. The grain of the face plies on plywood forms shall be placed parallel to the span between the supporting studs or joists.

Plywood used for forming surfaces which remain exposed shall be equal to that specified as B-B Plyform Class I or Class II Exterior of the U. S. Department of Commerce, National Bureau of Standard, latest edition.

Forms or form lumbers to be reused shall be maintained clean and in good condition. Any lumber which is split, warped, bulged, marred, or has defects that will produce inferior work shall not be used and, if condemned, shall be promptly removed from the work.

Studs and joists shall be spaced so that the facing form material remains in true alignment under the imposed loads.

Walls shall be spaced close enough to hold forms securely to the designated lines and scabbed at least 4 feet on each side of joints to provide continuity. A row of walls shall be placed near the bottom of each placement.

Facing material shall be placed with parallel and square joints and securely fastened to supporting studs.

Forms for surfaces receiving only an ordinary finish and exposed to view shall be placed with the form panels symmetrical, i.e., long dimensions set in the same direction. Horizontal joints shall be continuous.

Molding specified for chamfer strips or other uses shall be made of materials of a grade that will not split when nailed and which can be maintained to a true line without warping.

Wood molding shall be mill cut and dressed on all faces. Unless otherwise provided, forms shall be filleted at all sharp corners and edges with triangular chamfer strips measuring three-fourths inch on the sides.

Forms for railing and ornamental work shall be constructed to standards equivalent to first-class millwork. All moldings, panel work and bevel strips shall be straight and true with nearly mitered joints designed so the finished work is true, sharp, and clean cut.

All forms shall be constructed to permit their removal without marring or damaging the concrete. The forms may be given a slight draft to permit ease of removal.

Metal form ties of an approved type or a satisfactory substitute shall be used to hold forms in place and shall be of a type that permits ease of removal of the metal as hereinafter specified.

All metal appliances used inside of forms for alignment purposes shall be removed to a depth of at least one-half inch from the concrete surface. They shall be made so the metal may be removed without undue chipping or spalling, and when removed, shall leave a smooth opening in the concrete surface. Burning off of rods, bolts or ties will not be permitted.

Any wire ties used shall be cut back at least one-half inch from the face of the concrete.

Devices holding metal ties in place shall be capable of developing the strength of the tie and adjustable to allow for proper alignment.

Metal and wooden spreaders which are separate from the forms shall be removed entirely as the concrete is being placed.

Adequate clean-out openings shall be proved for narrow walls and other locations where access to the bottom of the forms is not readily attainable.

Prior to placing concrete, the facing of all forms shall be treated with oil or other bond breaking coating of such composition that it will not discolor or otherwise injuriously affect the concrete surface. Care shall be exercised to prevent coating of the reinforcing steel.

C. Metal Forms. The foregoing requirements for timber forms as regard to design, mortar-tightness, filleted corners, beveled projections, bracing, alignment, removal, reuse and wetting shall also apply to metal forms, except that these will not require lining, unless specifically noted on the plans.

The thickness of form metal shall be as required to maintain the true shape without warping or bulging. All bolt and rivet heads on the facing sides shall be countersunk. Clamps, pins, or other connecting devices shall be designed to hold the forms rigidly together and to allow removal without injury to the concrete. Metal forms which do not present a smooth surface or line up properly shall not be used. Metal shall be kept free from rust, grease, or other foreign materials.

6. PLACING REINFORCEMENT

Reinforcement in concrete structures shall be placed carefully and accurately and rigidly supported as provided in the specification, Section 032020, "Reinforcing Steel". Reinforcing steel supports shall not be welded to I-beams or girders.

7. PLACING CONCRETE-GENERAL

The minimum temperature of all concrete at the time of placement shall be not less than 50° F. The consistency of the concrete as placed should allow the completion of all finishing operations without the addition of water to the surface.

When conditions are such that additional moisture is needed for finishing, the required water shall be applied to the surface by fog spray only and shall be held to a minimum amount. Fog spray for this purpose may be applied with hand operated fogging equipment.

The maximum time interval between the addition of cement to the batch, and the placing of concrete in the forms shall not exceed the following:

Air or Concrete Temperature	Maximum Time
Non-Agitated Concrete	
Up to 80° F	30 minutes
Over 80° F	15 minutes
Agitated Concrete	
90° F or above	45 minutes
75° F to 89° F	60 minutes
35° F to 74° F	90 minutes

The use of an approved retarding agent in the concrete will permit the extension of each of the above temperature-time maximums by 30 minutes for direct traffic culverts, and one hour for all other concrete except that the maximum time shall not exceed 30 minutes for non-agitated concrete.

Before starting work, the Contractor shall inform the Engineer fully of the construction methods he proposes to use, the adequacy of which shall be subject to the approval of the Engineer.

The Contractor shall give the Engineer sufficient advance notice before placing concrete in any unit of the structure to permit the inspection of forms, reinforcing steel placement, and other preparations. Concrete shall not be placed in any unit prior to the completion of form work and placement of reinforcement therein.

Concrete mixing, placing and finishing shall be done in daylight hours, unless adequate provisions are made to light the entire site of all operations.

Concrete placement will not be permitted when impending weather conditions will impair the quality of the finish work. If rainfall should occur after placing operations are started, the Contractor shall provide ample covering to protect the work. In case of drop in temperature, the provisions set forth in Article "Placing Concrete in Cold Weather" of this specification shall be applied.

The placing shall be regulated so the pressures caused by the plastic concrete shall not exceed the loads used in form design.

The method of handling, placing and consolidation of concrete shall minimize segregation and displacement of the reinforcement, and produce a uniformly dense and compact mass. Concrete shall not have a free fall of more than 5 feet, except in the case of thin walls such as in culverts. Any hardened concrete spatter ahead of the plastic concrete shall be removed.

The method and equipment used to transport concrete to the forms shall be capable of maintaining the rate of placement approved by the Engineer. Concrete may be transported by buckets, chutes, buggies, belt conveyors, pumps, or other acceptable methods.

When belt conveyors or pumps are used, sampling for testing will be done at the discharge end. Concrete transported by conveyors shall be protected from sun and wind, if necessary, to prevent loss of slump and workability.

Pipes through which concrete is pumped shall be shaded and/or wrapped with wet burlap, if necessary, to prevent loss of slump and workability. Concrete shall not be transported through aluminum pipes, tubes, or other aluminum equipment.

Chutes, troughs, conveyors, or pipes shall be arranged and used so that the concrete ingredients will not be separated. When steep slopes are necessary, the chutes shall be equipped with baffle boards or made in short lengths that reverse the direction of movement, or the chute ends shall terminate in vertical downspouts. Open troughs and chutes shall extend, if necessary, down inside the forms or through holes left in them. All transporting equipment shall be kept clean and free from hardened concrete coatings. Water used for cleaning shall be discharged clean of the concrete.

Each part of the forms shall be filled by depositing concrete as near its final position as possible. The coarse aggregate shall be worked back from the face and the concrete forced under and around the reinforcement bars without displacing them. Depositing large quantities at one point and running or working it along the forms will not be allowed.

Concrete shall be deposited in the forms in layers of suitable depth but not more than 36 inches in thickness, unless otherwise directed by the Engineer.

The sequence of successive layers or adjacent portions of concrete shall be such that they can be vibrated into a homogenous mass with the previously placed concrete without a cold joint. Not more than one hour shall elapse between adjacent or successive placement of concrete.

Authorized construction joints shall be avoided by placing all concrete between the authorized joints in one continuous operation.

An approved retarding agent shall be used to control stress cracks and/or unauthorized cold joints in mass placements where differential settlement and/or setting time may induce stress cracking.

Opening in forms shall be provided, if needed, for the removal of laitance of foreign matter of any kind.

All forms shall be wetted thoroughly before the concrete is placed therein.

All concrete shall be well consolidated, and the mortar flushed to the form surfaces by continuous working with immersion type vibrators. Vibrators which operate by attachment to forms or reinforcement will not be permitted, except on steel forms. At least one stand-by vibrator shall be provided for emergency use in addition to the ones required for placement.

The concrete shall be vibrated immediately after deposit. Prior to the beginning of work, a systematic spacing of the points of vibration shall be established to insure complete consolidation and through working of the concrete around the reinforcement, embedded fixtures, and into the corners and angles of the forms.

Immersion type vibrators shall be inserted vertically, at point 18 to 30 inches apart, and slowly withdrawn. The vibrator may be inserted in a sloping or horizontal position in shallow slabs. The entire depth of each lift shall be vibrated, allowing the vibrator to penetrate several inches into the preceding lift.

Concrete along construction joints shall be thoroughly consolidated by operating the vibrator along and close to but not against the joint surface.

The vibration shall continue until thorough consolidation, and complete embedment of reinforcement and fixtures is produced, but not long enough to cause segregation. Vibration may be supplemented by hand spading or rodding, if necessary, to insure the flushing or mortar to the surface of all forms.

Slab concrete shall be mixed in a plant located off the structure. Carting or wheeling concrete batches over completed slabs will not be permitted until they have aged at least four full curing days. If carts are used, timber planking will be required for the remainder of the curing period. Carts shall be equipped with pneumatic tires. Curing operations shall not be interrupted for the purpose of wheeling concrete over finished slabs.

After concrete has taken its initial set, at least one curing day shall elapse before placing strain on projecting reinforcement to prevent damage to the concrete.

The storing of reinforcing or structural steel on completed roadway slabs generally shall be avoided and, when permitted, shall be limited to quantities and distribution that will not induce excessive stresses.

8. PLACING CONCRETE IN COLD WEATHER

A. Cast-in-Place Concrete. Concrete may be placed when the atmospheric temperature is not less than 35°F. Concrete shall not be placed in contact with any material coated with frost or having a temperature less than 32°F. Aggregates shall be free from ice, frost, and frozen lumps. When required, in order to produce the minimum specified concrete temperature, the aggregate and/or the water shall be heated uniformly, in accordance with the following: The water temperature shall not exceed 180°F, and/or the aggregate temperature shall not exceed 150°F. The heating apparatus shall heat the mass of aggregate uniformly. The temperature of the mixture of aggregates and water shall be between 50°F and 85°F before introduction of the cement. All concrete shall be effectively protected as follows:

1. The temperature of slab concrete of all unformed surfaces shall be maintained at 50° F or above for a period of 72 hours from time of placement and above 40° F for an additional 72 hours.

2. The temperature at the surface of all concrete in piers, culverts walls, retaining walls, parapets, wingwalls, bottoms of slabs, and other similar formed concrete shall be maintained at 40° F or above for a period of 72 hours from time of placement.

3. The temperature of all concrete, including the bottom slabs of culverts placed on or in the ground, shall be maintained above 32° F for a period of 72 hours from time of placement.

Protection shall consist of providing additional covering, insulated forms, or other means, and if necessary, supplementing such covering with artificial heating. Curing as specified under Article "Curing Concrete" of this specification shall be provided during this period until all requirements for curing have been satisfied.

When impending weather conditions indicate the possibility of the need for such temperature protection, all necessary heating and covering material shall be on hand ready for use before permission is granted to begin placement.

Sufficient extra test specimen will be made and cured with the placement to ascertain the condition of the concrete as placed prior to form removal and acceptance.

B. Precast Concrete. A fabricating plant for precast products which has adequate protection from cold weather in the form of permanent or portable framework and covering, which protects the concrete when placed in the forms, and is equipped with approved steam curing facilities, may place concrete under any low temperature conditions provided:

1. The framework and covering are placed, and heat is provided for the concrete and the forms within one hour after the concrete is placed. This shall not be construed to be one hour after the last concrete is placed, but that no concrete shall remain unprotected longer than one hour.

2. Steam heat shall keep the air surrounding the concrete between 50°F and 85°F for a minimum of three hours prior to beginning the temperature rise which is required for steam curing.

3. For fabricating plants without the above facilities and for job site precast products, the requirements of the Article "Curing Concrete" of this specification will apply.

The Contractor is responsible for the protection of concrete placed under any and all weather conditions. Permission given by the Engineer for placing during freezing weather will in no way relieve the Contractor of the responsibility for producing concrete equal in quality to that placed under normal conditions. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced at no additional cost.

9. PLACING CONCRETE IN WATER

Concrete shall be deposited in water only when specified on the plans or with written permission by the Engineer. The forms or cofferdams shall be sufficiently tight to prevent any water current passing through the space in which the concrete is being deposited. Pumping will not be permitted during the concrete placing, nor until it has set for at least 36 hours.

The concrete shall be placed with a tremie, closed bottom-dump bucket, or other approved method, and shall not be permitted to fall freely through the water nor shall it be disturbed after it has been placed. Its surface shall be kept approximately level during placement.

The tremie shall consist of a water-tight tube 14 inches or less in diameter. It shall be constructed so that the bottom can be sealed and opened after it is in place and fully charged with concrete. It shall be supported so that it can be easily moved horizontally to cover all the work area and vertically to control the concrete flow.

Bottom-dump buckets used for underwater placing shall have a capacity of not less than one-half cubic yard. It shall be lowered gradually and carefully until it rests upon the concrete already placed and raised very slowly during the upward travel; the intent being to maintain still water at the point of discharge and to avoid agitating the mixture.

The placing operations shall be continuous until the work is complete.

10. PLACING CONCRETE IN BOX CULVERTS

In general, construction joints will be permitted only where shown on the plans.

Where the top slab and walls are placed monlithically in culverts more than 4 feet in clear height, an interval of not less than one, nor more than 2 hours shall elapse before placing the top slab to allow for shrinkage in the wall concrete.

The base slab shall be finished accurately at the proper time to provide a smooth uniform surface. Top slabs which carry direct traffic shall be finished as specified for roadway slabs in Article "Finish of Roadway Slabs". Top slabs of fill type culverts shall be given a reasonable smooth float finish.

11. PLACING CONCRETE IN FOUNDATIONS AND SUBSTRUCTURE

Concrete shall not be placed in footings until the depth and character of the foundation has been inspected by the Engineer and permission has been given to proceed.

Placing of concrete footings upon seal courses will be permitted after the caissons or cofferdams are free from water and the seal course cleaned. Any necessary pumping or bailing during the concreting operation shall be done from a suitable sump located outside the forms.

All temporary wales or braces inside cofferdams or caissons shall be constructed or adjusted as the work proceeds to prevent unauthorized construction joints in footings or shafts.

When footings can be placed in a dry excavation without the use of cofferdams or caissons, forms may be omitted, if desired by the Contractor and approved by the Engineer, and the entire excavation filled with concrete to the elevation of the top of footing in which case measurement for payment will be based on the footing dimensions shown on the plans.

12. TREATMENT AND FINISHING OF HORIZONTAL SURFACES EXCEPT ROADWAY SLABS

All uniformed upper surfaces shall be struck off to grade and finished. The use of mortar topping for surfaces under this classification will not be permitted. After the concrete has been struck off, the surface shall be floated with a suitable float. Sidewalks shall be given a wood float or broom finish or may be stripped with a brush, as specified by the Engineer. Other surfaces shall be wood float finished and stripped with a fine brush leaving a fine-grained texture.

13. FINISH OF ROADWAY SLABS

As soon as the concrete has been placed and vibrated in a section of sufficient width to permit working, the surface shall be approximately leveled, struck off and screeded, carrying a slight excess of concrete ahead of the screed to insure filling of all low spots. The screed shall be designed rigid enough to hold true to shape and shall have sufficient adjustments to provide for the required camber. A vibrating screed may be used if heavy enough to prevent undue distortion. The screeds shall be provided with a metal edge.

Longitudinal screeds shall be moved across the concrete with a saw-like motion while their ends rest on headers or templates set true to the roadway grade or on the adjacent finished slab. The surface of the concrete shall be screeded a sufficient number of times, and at such intervals to produce a uniform surface, true to grade and free of voids. If necessary, the screeded surface shall be worked to smooth finish with a long-handled wood or metal float of the proper size, or hand floated from bridges over the slab.

When required by the Engineer, the Contractor shall perform sufficient checks with a long handled 10-foot straightedge on the plastic concrete to ensure that the final surface will be within the tolerances specified below. The check shall be made with the straightedge parallel to the centerline. Each pass thereof shall lap half of the preceding pass. All high spots shall be removed and all depressions over one-sixteenth inch in depth shall be filled with fresh concrete and floated. The checking and floating shall be continued until the surface is true to grade and free of depressions, high spots, voids, or rough spots. Rail support holes shall be filled with concrete and finished to match the top of the slab.

A broom finish shall be applied with longitudinal screeding. A broom or burlap drag finish shall be applied with transverse screeding. Unless otherwise specified, the burlap drag shall consist of four or more layers of 10-ounce burlap fabric, free of seams, dirt, or hardened concrete.

It shall be kept wet when in use and it shall be drawn over the surface in as many passes as required to produce the desired texture depth. Broom finishes shall be applied with stiff bristled brooms. The Contractor shall have on hand at all times brooms for the purpose of providing the desired texture depth when surface conditions are such that the burlap drag will not provide it.

Upon completion of the floating and/or straight edging and before the disappearance of the moisture sheen, the surface shall be given a broom or burlap drag finish. The grooves of these finishes shall be parallel to the structure centerline. It is the intent that the average texture depth resulting from the number of tests directed by the Engineer be not less than 0.035-inches with a minimum texture depth of 0.030-inches for any one test when tested in accordance with Test Method Tex-436-A. Should the texture depth fall below that intended, the finishing procedures shall be revised to produce the desired texture.

After the concrete has attained its final set, the roadway surface shall be tested with a standard 10 foot straight-edge. The straightedge shall be placed parallel to the centerline of roadway to bridge any depressions and touch high spots. Ordinates of irregularities measured from the face of the straight-edge to the surface of the slab shall not exceed one-eight of an inch, making proper allowances for camber, vertical curvature, and surface texture. Occasional variations, not exceeding three-sixteenth of an inch will be acceptable, if in the opinion of the Engineer it will not affect the riding qualities.

When directed by the Engineer, irregularities exceeding the above requirements shall be corrected. In all roadway slab finishing operations, camber for specified vertical curvature and transverse slopes shall be provided.

14. CURING CONCRETE

The Contractor shall inform the Engineer fully of the methods and procedures proposed for curing; shall provide the proper equipment and material in adequate amounts, and shall have the proposed method, equipment and material approved prior to placing concrete.

Inadequate curing and/or facilities therefore shall be cause for the Engineer to stop all construction on the job until remedial action is taken. All concrete shall be cured for a period of 4 curing days except as noted herein.

EXCEPTIONS TO 4-DAY CURING

DESCRIPTION	REQUIRED CURING
Top Slabs of Direct Traffic	8 Curing Days (Type I or III) Cement
Culverts	10 Curing Days (Type II) Cement
Concrete Piling (Non-Prestressed)	6 Curing Days

When the air temperature is expected to drop below 35° F, the water curing mats shall be covered with polyethylene sheeting, burlap-polyethylene blankets, or other material to provide the protection required by Article "Placing Concrete in Cold Weather" of these specifications.

A curing day is defined as a calendar day when the temperature, taken in the shade away from artificial heat, is above 50° F for at least 19 hours, (colder days if satisfactory provisions are made to maintain the temperature at all surfaces of the concrete above 40° F for the entire 24 hours). The required curing period shall begin when all concrete therein has attained its initial set.

The following methods are permitted for curing concrete subject to the restrictions of Table 1 and the following requirements for each method of curing.

A. Form Curing. When forms are left in contact with the concrete, other curing methods will not be required except for cold weather protection.

B. Water Curing. All exposed surfaces of the concrete shall be kept wet continuously for the required curing time. The water used for curing shall meet the requirements for concrete mixing water as specified in the specification, Specification 030020, "Portland Cement Concrete". Sea water will not be permitted. Water which stains or leaves an unsightly residue shall not be used.

1. Wet Mat. Cotton mats shall be used for this curing method. They shall be placed as soon as possible after the surface has sufficiently hardened to prevent damage to the concrete. (See Article, "Placing Concrete" of this specification.) Damp burlap blankets made from nine-ounce stock may be placed on the damp concrete surface for temporary protection prior to the application of the cotton mats which may be placed dry and wetted down after placement. The mats shall be weighted down adequately to provide continuous contact with all concrete surfaces where possible. The surfaces of the concrete shall be kept wet for the required curing time. Surfaces which cannot be cured by contact shall be enclosed with mats, anchored positively to the forms, or to the ground, so that outside air cannot enter the enclosure. Sufficient moisture shall be provided inside the enclosure to keep all surfaces of the concrete wet.

2. Water Spray. This method shall consist of overlapping sprays sprinklers that keeps all unformed surfaces continuously wet.

3. Ponding. This method requires the covering of the surfaces with a minimum of two inches of clean granular material, kept wet at all times, or a minimum of one-inch depth of water. Satisfactory provisions shall be made to provide a dam to retain the water or saturated sand.

C. Membrane Curing. This consists of curing concrete pavement, concrete pavement (base), curbs, gutters, retards, sidewalk, driveways, medians, islands, concrete riprap, cement stabilized riprap, concrete structures and other concrete as indicated on the plans by impervious membrane method. Unless otherwise provided herein or shown on the plans, either Type 1 or Type 2 membrane curing compound may be used where permitted except that Type 1 (Resin Base Only) will be permitted for slab concrete in bridge decks and top of direct traffic culverts.

Table 1

		REQUIRED		PERMITTED	
	Structure Unit Description	Water For Curing	Membrane For Interim Curing	Water For Curing	Membrane For Interim Curing
1.	Top Slabs of Direct Traffic	X	X		
2.	Top Surface of Any Concrete Unit Upon Which Concrete is to be placed and bonded at a later interval (Stub Walls, Risers, Etc) Other Superstructure Concrete (Wing Walls, Parapet, Etc)	X			
3.	Concrete Pavement (Base), Curbs, Gutters, Retards, Sidewalks, Driveways, Medians, Islands, Concrete Riprap, Etc			X*	X*
4.	All Substructure Concrete, Culverts, Box Sewers, Inlets, Manholes, Retaining Walls			X*	X*

*Polyethylene sheeting, burlap polyethylene mats or laminated mats to prevent outside air from entering will be considered equivalent to water or membrane curing for items 3 and 4.

Membrane curing shall be applied to dry surfaces but shall be applied just after free moisture has disappeared. Formed surfaces and surfaces which have been given a first rub shall be dampened and shall be moist at the time of application of the membrane. When membrane is used for complete curing, the film shall remain unbroken for the minimum curing period specified. Membrane which is damaged shall be corrected immediately by reapplication of membrane. Unless otherwise noted herein or on the plans, the choice of membrane type shall be at the option of the Contractor. Only one type of curing compound will be permitted on any one structure.

The membrane curing compound shall be applied after the surface finishing has been completed, and immediately after the free surface moisture has disappeared. The surface shall be sealed with a single uniform coating of curing compound applied at the rate of coverage recommended by the manufacturer and directed by the Engineer, but not less than 1 gallon per 180 square feet of area. The Contractor shall provide satisfactory means and facilities to properly control and check the rate of applications of the compound. The compound shall be thoroughly agitated during its use and shall be applied by means of approved mechanical power pressure sprayers. The sprayers used to apply the membrane to concrete pavement or concrete pavement (base) shall travel at uniform speed along the forms and be mechanically driven. The equipment shall be of such design that it will insure uniform and even application of the membrane material. The sprayers shall be equipped with satisfactory atomizing nozzles. Only on small miscellaneous items will the Contractor be permitted to use hand-powered spray equipment. For all spraying equipment, the Contractor shall provide facilities to prevent the loss of the compound between the nozzle and the concrete surface during the spraying operations.

The compounds shall not be applied to a dry surface and if the surface of the concrete has become dry, it shall be thoroughly moistened prior to application of membrane by fogging or mist application. Sprinkling or coarse spraying will not be allowed. At locations where the coating shows discontinuities, pinholes, or other defects; or if rain falls on the newly coated surface before the film has dried sufficiently to resist damage, an additional coat of the compound shall be applied immediately at the same rate of coverage specified herein.

To ensure proper coverage, the Engineer shall inspect all treated areas after application of the compound for the period of time designated in the governing specification for curing, either for membrane curing or for other methods.

Should the foregoing indicate that any area during the curing period is not protected, an additional coat or coats of the compound shall be applied immediately, and the rate of application of the membrane compound shall be increased until all areas are uniformly covered.

When temperatures are such as to warrant protection against freezing, curing by this method shall be supplemented with an approved insulating material capable of protecting the concrete for the specified curing period.

If at any time there is reason to believe that this method of curing is unsatisfactory or is detrimental to the work, the Contractor, when notified, shall immediately cease the use of this method and shall change to curing by one of the other methods specified under this contract.

15. REMOVAL OF FORMS

Except as herein provided, forms for vertical surfaces may be removed when the concrete has aged not less than one day when Type I and Type II cement is used, and not less than one-half day when Type III cement is used, provided it can be done without damage to the concrete. Forms for inside curb faces may be removed in approximately three hours provided it can be done without damage to the curb.

16. FINISHING EXPOSED SURFACES

Concrete shall be finished as required in the Standard Specifications for the respective items or as otherwise specified on the plans. An ordinary surface finish shall be applied to all concrete surfaces either as a final finish or preparatory to a higher finish.

Ordinary Surface Finish shall be as follows: After form removal, all porous or honey-combed areas and spalled areas shall be corrected by chipping away all loose or broken material to sound concrete.

Feather edges shall be eliminated by cutting a face perpendicular to the surface. Shallow cavities shall be repaired using adhesive grout or epoxy grout. If judged repairable by the Engineer, large defective areas shall be corrected using concrete or other material approved by the Engineer.

Holes and spalls caused by removal of metal ties, etc., shall be cleaned and filled with adhesive grout or epoxy grout. Exposed parts of metal chairs on surfaces to be finished by rubbing, shall be chipped out to a depth of one-half inch and the surface repaired. All fins, runs, drips or mortar shall be removed from surfaces which remain exposed. Form marks and chamfer edges shall be smoothed by grinding and/or dry rubbing.

Grease, oil, dirt, curing compound, etc., shall be removed from surfaces requiring a higher grade of finish. Discolorations resulting from spillage or splashing of asphalt, paint or other similar material shall be removed.

Repairs shall be dense, well bonded, and properly cured, and when made on surfaces which remain exposed and do not require a higher finish, shall be finished to blend with the surrounding concrete.

17. MEASUREMENT AND PAYMENT

No direct measurement or payment will be made for the work to be done or the equipment to be furnished under this specification, but it shall be considered subsidiary to the particular items required by the plans and the contract.

SECTION 038020
CEMENT STABILIZED SAND

1. DESCRIPTION

Scope: Use cement stabilized sand as shown on the plans.

2. MATERIALS

Bank Sand
Portland Cement
Water

3. EXECUTION

Cement stabilized sand shall be used to protect various existing utility pipes throughout this project. Place a minimum of 1½ bags of Portland cement per cubic yard of bank sand. Cement stabilized material shall be placed in a manner that will completely fill all voids in the area of placement. Moderate compaction methods shall be used to fill all voids. Hand-operated tampers may be used.

4. MEASUREMENT AND PAYMENT

Unless otherwise specified on the Bid Form, cement stabilized sand shall be measured by the cubic yard complete in place. Payment shall be full compensation for all materials, royalty, hauling, placing compacting labor, equipment, tools, incidentals necessary for the completion of work.

APPENDIX A

TOLUNAY-WONG
ENGINEERS

GEOTECHNICAL ENGINEERING REPORT
MISSION RIVER DELTA CIRCULATION ENHANCEMENT
REFUGIO COUNTY, TEXAS

Prepared for:

Coastal Bend Bays & Estuaries Program
Corpus Christi, Texas

Prepared by:

Tolunay-Wong Engineers, Inc.
826 South Padre Island Drive
Corpus Christi, Texas 78416

October 23, 2023

TWE Project No. 23.53.056 / Report No. 32996

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October 23, 2023

Mr. Jake Herring
Director of Land Conservation
Coastal Bend Bays & Estuaries Program
1305 N. Shoreline Blvd. #205
Corpus Christi, Texas 78401

Ref: Geotechnical Engineering Report
Mission River Delta Recirculation Enhancement
Refugio County, Texas
TWE Project No. 23.53.065 / Report No. 32996

Dear Mr. Herring,

Tolunay-Wong Engineers, Inc. (TWE) is pleased to submit this report of our geotechnical engineering study performed for the referenced project. This report contains a project overview description, our scope of services provided, details regarding the subsurface conditions encountered and our geotechnical analyses of drainage structures for the Mission River Delta Recirculation Enhancement project.

We appreciate the opportunity to work with you on this phase of the project and look forward to the opportunity of providing additional services as the project progresses. If you have any questions regarding this report or if we can be of further assistance, please contact us.

Sincerely,

TOLUNAY-WONG ENGINEERS, INC.
TBPELS Firm Registration No. F-000124

Justin M. Buchen
Geotechnical Staff Engineer

Don R. Rokohl, P.E.
Branch Manager

STATE OF TEXAS
DON R. ROKOHL
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LICENSED
PROFESSIONAL ENGINEER

10/23/23

DRR/JMB/drr

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APPENDICES

1 INTRODUCTION AND PROJECT DESCRIPTION

1.1 Introduction

This report presents the results of our geotechnical engineering study performed for the proposed drainage structure improvements as part of the Mission River Delta Recirculation Enhancement project in Refugio County, Texas. Our study was conducted in general accordance with TWE Proposal No. P23-C094R1, dated August 14, 2023, and authorized by the Agreement for Testing Services between CBBEP and TWE, signed by Ms. Kiersten Stanzel on August 16, 2023.

1.2 Project Description

The project includes construction of drainage structures (placement of precast concrete drainage culvert pipes) at the CBBEP Mission River Delta Recirculation Enhancement project location in Refugio County, Texas. We understand that the concrete drainage pipes will be placed at locations where foot trails/light utility vehicle trails cross natural drainage paths within the Mission River Delta. Further, we understand that near the boring B-1 location a single 18-in pipe culvert will be placed while near the boring B-2 location three 18-in pipe culverts will be placed.

2 PURPOSE AND SCOPE OF SERVICES

The purpose of our geotechnical engineering services was to investigate the subsurface conditions within the two drainage pipe placement locations and to provide geotechnical engineering ground bearing pressures, both as-is for existing conditions and, if needed, for improved conditions. Our scope of services for this study consisted of:

1. Drilling two (2) test borings, to depths of 20-ft, near the locations of where footpaths/light utility vehicles cross natural drainage ways within the Mission River Delta to evaluate subsurface stratigraphy and groundwater conditions;

2. Performing geotechnical tests on the recovered soil samples to evaluate the physical and engineering properties of the strata encountered;

3. Preparing a synopsis of our findings including existing project site conditions, subsurface soil and groundwater conditions and boring logs presenting tabulated field and laboratory test results;

4. Providing geotechnical analyses including allowable bearing capacity of the existing subsurface conditions and of improved conditions, if needed; and,

5. Providing geotechnical recommendations including subgrade preparation, excavation considerations, fill and backfill placement for erosion control, and overall quality control monitoring, inspection, and testing guidelines.

Our scope of services did not include any environmental assessment for the presence or absence of wetlands or of hazardous or toxic materials within or on the soil, air, or water at this site. Any statements in this report or on the boring logs regarding odors, colors, unusual items, and conditions are strictly for the information of the Client. A geological fault study was also beyond the scope of this study.

3 FIELD PROGRAM

3.1 Soil Borings

On September 20, 2023, TWE conducted an exploration of subsurface soil and groundwater conditions within the Mission River Delta by performing a total of two (2) test borings to depths of 20-ft below the existing ground surface. The test boring locations are presented on TWE Drawing No. 23.53.056-1 in Appendix A of this report. The logs of the borings and their testing data are included in Appendix B of this report. Our field personnel coordinated the field activities, drilled, sampled, and logged the boreholes. A desired third boring location was not performed due to that its location was inaccessible to our all-terrain mounted drilling equipment.

3.2 Drilling Methods

Field operations were performed in general accordance with the Standard Practice for Soil Investigation and Sampling by Auger Borings (ASTM D1452). Hollow stem auger drilling methods were implemented for both borings to their completion depths. Soil samples were obtained at 2-ft intervals above a depth of 12-ft below the existing ground surface and at 5-ft intervals thereafter to the boring completion depths. Upon drilling and sampling completion, the boreholes were backfilled with auger cuttings and bentonite pellets. Any excess cuttings were spread around the boring locations.

3.3 Soil Sampling

Fine-grained, cohesive soil samples were recovered from the test borings by hydraulically pushing a 3-in diameter, thin-walled tube a distance of about 24-in. The field sampling procedures were conducted in general accordance with the Standard Practice for Thin-Walled Tube Sampling of Soils (ASTM D1587). Our geotechnician visually classified the recovered soils and obtained field strength measurements of the recovered soils using a calibrated pocket penetrometer and/or hand torvane device. The tube samples were extruded in the field, wrapped in foil, placed in moisture-sealed plastic bags, and protected from disturbance prior to transport to the laboratory. The recovered soil sample depths and field strength measurements are shown on the project boring logs in Appendix B.

Very soft to soft cohesive soils, as well as cohesionless and semi-cohesionless coarse-grained soils, were collected with the Standard Penetration Test (SPT) sampler driven 18-in by blows from a 140-lb hammer falling 30-in in accordance with the Standard Test Method for Standard Penetration Test (SPT) and Spilt-Barrel Sampling of Soils (ASTM D1586). The number of blows required to advance the sampler three (3) consecutive 6-in depths are recorded for each corresponding sample on the boring logs. The N-value, in blows per foot, is obtained from SPTs by adding the last two (2) blow count numbers. The consistency of cohesive soils and the relative density of cohesionless and semi-cohesionless soils can be inferred from the N-value. The samples obtained from the split-barrel sampler were visually classified, placed in moisture-sealed plastic bags, and transported to our laboratory. SPT sampling intervals and blow counts are presented on the project boring logs in Appendix B.

3.4 Boring Logs

Our interpretations of general subsurface soil and groundwater conditions at the soil boring locations are included on the boring logs. Our interpretations of the soil types throughout the boring depths and the locations of strata changes were based on visual classifications during field sampling and laboratory testing in accordance with the Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System) (ASTM D2487) and the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) (ASTM D2488). The boring logs include the type and interval depth for each sample along with their corresponding field strength or resistance values. A key to terms and symbols used on boring logs is also presented in Appendix B of this report.

3.5 Groundwater Measurements

Groundwater level measurements were attempted in the open boreholes during dry-auger drilling. Water level readings were attempted in the open boreholes when groundwater was first encountered and after a fifteen (15) minute time period. The groundwater observations are summarized in Section 5.3 of this report entitled *"Groundwater Observations."*

4 LABORATORY SERVICES

A laboratory testing program was conducted on selected soil samples to assist in classification and evaluation of the physical and engineering properties of the soils encountered in the project borings. Laboratory tests were performed in general accordance with ASTM International standards. The types and brief descriptions of the geotechnical laboratory tests performed are presented in Table 4-1 below.

Table 4-1: Laboratory Testing Program

Test Description	Test Method
Amount of Material in Soils Finer than No. 200 Sieve	ASTM D1140
Water (Moisture) Content of Soil	ASTM D2216
Unconsolidated-Undrained Triaxial Compression on Cohesive Soils	ASTM D2850
Liquid Limit, Plastic Limit and Plasticity Index of Soils	ASTM D4318
Density (Unit Weight) of Soil Specimens	ASTM D7263

Standard geotechnical laboratory test results are presented on the boring logs in Appendix C of this report.

Amount of Materials in Soils Finer than No. 200 (75-µm) Sieve (ASTM D 1140)
This test method determines the amount of materials in soils finer than the No. 200 (75-µm) sieve by washing. The loss in weight resulting from the wash treatment is presented as a percentage of the original sample and is reported as the percentage of silt and clay particles in the sample.

Water (Moisture) Content of Soil by Mass (ASTM D 2216)
This test method determines water (moisture) content by mass of soil where the reduction in mass by drying is due to loss of water. The water (moisture) content of soil, expressed as a percentage, is defined as the ratio of the mass of water to the mass of soil solids. Moisture content may provide an indication of cohesive soil shear strength and compressibility when compared to Atterberg Limits.

Unconsolidated Undrained Triaxial Compressive Strength of Cohesive Soil (ASTM D 2850)
This test method determines the compressive strength of cohesive soil when subjected to strain-controlled axial load as the sample is subjected to a confining stress. The confining stress generally is that stress the sample is subjected to in the in-situ state. The test method provides an approximate value of shear strength of cohesive materials in terms of confined unconsolidated undrained (UU) stresses.

Liquid Limit, Plastic Limit and Plasticity Index of Soils (ASTM D 4318)
This test method determines the liquid limit, plastic limit and the plasticity index of soils. These tests, also known as Atterberg limits, are used from soil classification purposes. They also provide an indication of the volume change potential of a soil when considered in conjunction with the natural moisture content. The liquid limit and plastic limit establish boundaries of consistency for plastic soils. The plasticity index is the difference between the liquid limit and plastic limit.

Dry Unit Weight of Soils

This test method determines the weight per unit volume of soil, excluding water. Dry unit weight is used to relate the compactness of soils to volume change and stress-strain tendencies of soils when subjected to external loadings.

5 PROJECT SITE CONDITIONS

Our interpretations of soil and groundwater conditions at the project site are based on information obtained at the locations of the test borings performed for this study. This information has been used as the basis for our conclusions regarding ground bearing pressure and ground improvement analyses at the site. Subsurface conditions could vary at areas not explored by the soil borings. Significant variations at areas not explored by the soil borings will require reassessment of our recommendations.

5.1 Site Description and Surface Conditions

The existing surface of the two test borings were wet soft ground conditions covered by native plants (grasses and weeds). Drainage pipes or other structures that were previously located at test boring locations have been displaced downstream due to erosion from past fold events.

5.2 Subsurface Soil Stratigraphy and Design Parameters

The generalized subsurface soil conditions within the project site were interpreted from the boring logs presented in Appendix B. The generalized subsurface profiles encountered within the project borings were suitably grouped for the purpose of engineering analyses. Soil conditions and strata within test borings B-1 and B-2 were uniform enough to generate a general soil profile for design purposes. The soils encountered within the test borings generally consisted of cohesive very soft to stiff FAT CLAY with SAND (CH) and LEAN CLAY with SAND (CL) to depths of about 10-ft to 13-ft below natural grade and then underlain by cohesionless and semi-cohesionless, very loose to medium dense CLAYEY SAND (SC) and POORLY GRADED SAND with CLAY (SP-SC) to the test boring completion depths of 20-ft.

Subsurface conditions can vary within the individual project borings compared to the general strata descriptions presented above. Details of the soil conditions encountered in the project borings can be found on the corresponding boring logs presented in Appendix B.

5.3 Groundwater Observations

Groundwater measurements were attempted in the test borings during dry-auger drilling. Groundwater level measurements are shown in Table 5-1 below.

Table 5-1: Groundwater Level Measurements

Boring No.	Boring Depth (feet)	Groundwater Level Depth	
		Encountered During Drilling (feet)	Observed in the Open Borehole after 15 minutes (feet)
B-1	20	Dry	N/A
B-2	20	11.5	7.5

6 ALLOWABLE GROUND BEARING CAPACITY

TWE completed a bearing capacity evaluation of the existing shallow soil conditions for the project site. The general profile developed from the lab data and test borings performed at the project site was used to perform the evaluation.

We understand the precast concrete drainage culverts will be replaced for the access pathways (footpaths/light utility vehicle paths) so that natural water movement (flow) will occur in the natural drainage channels. Using the design subsurface soil profile developed for the project, the allowable bearing capacity for the existing conditions was calculated as 750 pounds per square foot (psf). The allowable bearing capacity is based on an estimated maximum settlement of 1-inch. If settlements of the structure greater than 1-inch can be tolerated, TWE should be contacted for further settlement analyses and recommendations.

We further understand that large stone aggregate (commonly referred to as "bull rock") will be placed at the locations of the concrete pipe culverts to improve the bearing capacity of the supporting soils. It is our opinion that placement of a sufficiently thick layer of interlocking rock could substantially raise the bearing capacity of the shallow firm clays by doubling the natural allowable bearing capacity from 750 psf to 1,500 psf. The placement of the rock will also stiffen the soil/rock matrix making it less susceptible to erosion during major flood events.

The interlocking rock should be a well graded material with sufficient smaller size rock to interlock between the larger rock. A rock with similar size throughout will not be as effective in increasing the stiffness (bearing capacity) of the on-site soils as a well graded material would be.

The backfill around the concrete pipe culverts is planned to be a cement stabilized sand or possibly a flowable fill. The use of this backfill material is highly suggested to prevent erosion of the backfill material. A flowable fill material is typically provided by a structural concrete supplier and would require access by a concrete delivery truck to the locations. Cement stabilized sand can be mixed on-site but would require delivery of sand and cement to the locations and mixing and placement would be labor intensive.

7 DESIGN REVIEW AND LIMITATIONS

Design Review and Construction Monitoring

Geotechnical Design Review

Geotechnical review of the design drawings and specifications should be performed prior to construction. This review is recommended to check that the geotechnical recommendations and construction guidelines presented herein have been properly interpreted and incorporated into the construction documents.

Construction Monitoring

The performance of the foundations and pavements for this project will be highly dependent on the quality of construction. Thus, it is recommended that construction activities be monitored by an experienced laboratory proficient in quality control testing/inspection procedures. TWE would be pleased to assist in the development of a plan for construction monitoring to be incorporated in the overall quality control program.

Construction surveillance is recommended and has been assumed in preparing our recommendations. These field services are required to check for changes in conditions that may result in modifications to our recommendations. Performance of the foundation system and pavements will be directly related to the Contractor's adherence to the recommendations in this report and the project plans and specifications. Testing should be provided for all site preparation, foundation concrete pours, and pavement construction activities. TWE would be pleased to provide these services to verify that construction has been performed in accordance with the intentions of this report upon request.

Limitations

Scope of Study

The scope of this study, as well as the conclusions and recommendations provided herein, were developed based on our understanding of the project. Assumptions were made when specific information was unknown. Revisions to our conclusions and recommendations could be necessary as a result of any significant project changes or if our assumptions are incorrect. Construction dewatering design, earth retention design, and construction site safety are the responsibility of the Contractor and have not been addressed herein. The scope of our study did not include evaluation of areal fill conditions or geologic faults. In addition, assessment of environmental conditions, including investigation for hazardous materials/pollutants/wastes, regulatory compliance, threatened or endangered species, cultural resources, floodplains, and jurisdictional wetlands were beyond the scope of our study.

Warranty

The professional services that form the basis for this report have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical

engineers practicing in the same locality. No warranty, expressed or implied, is made as to the professional advice set forth.

Subsurface Variations

Our interpretations of subsurface conditions are based on data obtained at the boring locations only and at the time of our field exploration. Subsurface variations could exist between the boring locations and at areas not explored. The validity of our recommendations is based, in part, on assumptions made about subsurface conditions in areas not explored. Such assumptions can only be confirmed during construction. Therefore, construction observations by qualified geotechnical representatives are recommended to check for variations in subsurface conditions. Significant changes from our assumptions could require modification to our findings and recommendations.

Construction Documents

This geotechnical engineering report is intended to assist in the planning and design of the project and is neither appropriate nor intended for use as technical specifications. This report should not be incorporated into the construction documents, either directly or by reference.

Report Reliance

This report was prepared as an instrument of service for the sole and exclusive use by LJA Engineering, Inc., subject to the limitations stated herein and with specific application to the referenced project. This report should not be applied for any other purpose or project, expect as described herein.

This report shall remain the property of Tolunay-Wong Engineers, Inc. No third party may use or rely upon the information provided herein without our express written consent. If any party other than LJA Engineering, Inc. chooses to rely on this instrument without our consent, said party expressly waives any rights it may otherwise have to claim its reliance on this instrument of professional service that resulted in injury, loss, or damage of any kind and will defend and indemnify Tolunay-Wong Engineers, Inc., from any such claim.

Report Distribution

This report is intended to be used in its entirety. This report should be considered in whole and should not be distributed or made available in partial form.

If any changes in the nature, design or location of the project are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and the conclusions modified or verified in writing by TWE. TWE is not responsible for any claims, damages or liability associated with interpretation or reuse of the subsurface data or engineering analyses without the expressed written authorization of TWE.

This geotechnical engineering report is intended to assist in the planning and design of the project and is neither appropriate nor intended for use as technical specifications. This report should not be incorporated into the construction documents either directly or by reference. We recommend the Client engage the services of a Design Engineer to perform final design of any site improvements and to prepare construction plans and specifications.

APPENDIX A

SOIL BORING LOCATION PLAN DRAWING NO. 23.53.056-1

VICINITY MAP

SOIL BORING COORDINATES

BORING	DEPTH	LATITUDE	LONGITUDE
B-1	20'	28°10'26.79"N	97°11'57.98"W
B-2	20'	28°10'32.12"N	97°11'57.14"W

SYMBOL	DESCRIPTION
	LEGEND
	BORING LOCATIONS

TOLUNAY-WONG ENGINEERS

TWE Boring Location Plan
CBBEP–Mission River Enhancement
Refugio County, TX

Drawn	*J.M.B.*	*10/6/2023*
Checked	*J.B*	
Approved	*D.R.R.*	
Scale	*N.T.S.*	

TWE DRAWING NO. 23.53.056-1

APPENDIX B

TEST BORING LOGS WITH A KEY TO TERMS AND SYMBOLS

LOG OF BORING B-1

PROJECT: Mission River Enhancement
Refugio, Tx

CLIENT: Coastal Bend Bays & Estuaries Program
Corpus Christi, Tx

COORDINATES: N 28°10'26.79"
W 97°11'57.98"

SURFACE ELEVATION:

DRILLING METHOD:
Dry Augered: 0 to 20
Wash Bored: to

ELEVATION (FT) / DEPTH (FT)	SAMPLE TYPE	SYMBOL	MATERIAL DESCRIPTION	(P) POCKET PEN (tsf) (T) TORVANE (tsf)	STD. PENETRATION TEST BLOWCOUNT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	PASSING #200 SIEVE (%)	OTHER TESTS PERFORMED
			Firm gray FAT CLAY with SAND (CH)		2/6" 3/6" 4/6"	27		67	49				74	
					2/6" 2/6" 4/6"									
5			-becomes very soft		W.O.H W.O.H W.O.H	51							85	
					W.O.H W.O.H W.O.H									
			-becomes stiff		W.O.H 2/6" 12/6"									
10			Medium dense gray CLAYEY SAND (SC)	(P)0.25		23	104	36	24	0.88	15	5	47	
			-becomes loose		4/6" 4/6" 4/6"									
15														
			Medium dense gray POORLY GRADED SAND with CLAY (SP-SC)		4/6" 7/6" 7/6"	20							9	
20			Bottom @ 20'											
25														
30														
35														

COMPLETION DEPTH: 20 ft
DATE BORING STARTED: 9/20/23
DATE BORING COMPLETED: 9/20/23
LOGGER: L.Castro
PROJECT NO.: 23.53.056

NOTES: Water not encountered during drilling. Boring was terminated at 20-ft.

LOG OF BORING B-2

PROJECT: Mission River Enhancement
Refugio, Tx

CLIENT: Coastal Bend Bays & Estuaries Program
Corpus Christi, Tx

COORDINATES: N 28°10'32.12"
W 97°11'57.14"

SURFACE ELEVATION:

DRILLING METHOD:
Dry Augered: 0' to 12'
Wash Bored: 12' to 20'

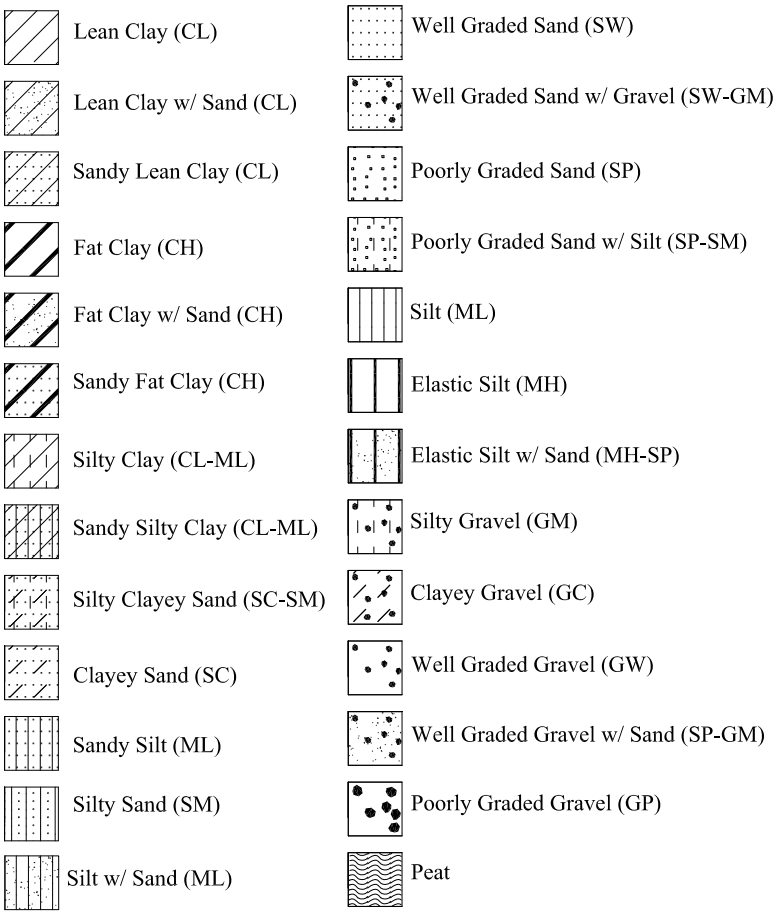
ELEVATION (FT) / DEPTH (FT)	SAMPLE TYPE	SYMBOL	MATERIAL DESCRIPTION	(P) POCKET PEN (tsf) (T) TORVANE (tsf)	STD. PENETRATION TEST BLOWCOUNT	MOISTURE CONTENT (%)	DRY UNIT WEIGHT (pcf)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	COMPRESSIVE STRENGTH (tsf)	FAILURE STRAIN (%)	CONFINING PRESSURE (psi)	PASSING #200 SIEVE (%)	OTHER TESTS PERFORMED
0			Firm gray LEAN CLAY with SAND (CL)		2/6" 2/6" 5/6"									
				(P)2.25		23	95	31	14	0.70	14	2	72	
5			-becomes soft	(P).25										
			-becomes very soft		W.O.H W.O.H W.O.H W.O.H W.O.H W.O.H	44		45	29				74	
10			-becomes soft		W.O.H 2/6" 2/6"									
			Loose gray CLAYEY SAND (SC)		2/6" 3/6" 3/6"	19							19	
15														
			-becomes very loose		W.O.H 2/6" 2/6"									
20			Bottom @ 20'											
25														
30														
35														

COMPLETION DEPTH: 20 ft
DATE BORING STARTED: 9/20/23
DATE BORING COMPLETED: 9/20/23
LOGGER: L. Castro
PROJECT NO.: 23.53.056

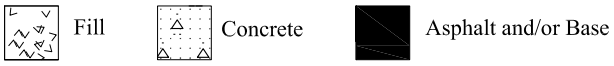
NOTES: Water encountered at a depth of about 11.5-ft while advancing the boring. After 15 minutes, water level measured at a depth of 7.5-ft. Boring was terminated at 20.0-ft.

KEY TO SYMBOLS AND TERMS USED ON BORING LOGS FOR SOIL

Most Common Unified Soil Classifications System Symbols



Miscellaneous Materials



Sampler Symbols	Meaning
	Pavement core
	Thin - walled tube sample
	Standard Penetration Test (SPT)
	Auger sample
	Sampling attempt with no recovery
	TxDOT Cone Penetrometer Test

Field Test Data

2.50	Pocket penetrometer reading in tons per square foot
(T)1.13	Torvane Measurement in tons per square foot
8/6"	Blow count per 6 - in. interval of the Standard Penetration Test
	Observed free water during drilling
	Observed static water level

Laboratory Test Data

Wc (%)	Moisture content in percent
Dens. (pcf)	Dry unit weight in pounds per cubic foot
Qu (tsf)	Unconfined compressive strength in tons per square foot
UU (tsf)	Compressive strength under confining pressure in tons per square foot
Str. (%)	Strain at failure in percent
LL	Liquid Limit in percent
PI	Plasticity Index
#200 (%)	Percent passing the No. 200 mesh sieve
( )	Confining pressure in pounds per square inch
*	Slickensided failure
**	Did not fail @ 15% strain

RELATIVE DENSITY OF COHESIONLESS & SEMI-COHESIONLESS SOILS

The following descriptive terms for relative density apply to cohesionless soils such as gravels, silty sands, and sands as well as semi-cohesive and semi-cohesionless soils such as sandy silts, and clayey sands.

Relative Density	Typical N_{60} Value Range*
Very Loose	0-4
Loose	5-10
Medium Dense	11-30
Dense	31-50
Very Dense	Over 50

* N_{60} is the number of blows from a 140-lb weight having a free fall of 30-in. required to penetrate the final 12-in. of an 18-in. sample interval, corrected for field procedure to an average energy ratio of 60% (Terzaghi, Peck, and Mesri, 1996).

CONSISTENCY OF COHESIVE SOILS

The following descriptive terms for consistency apply to cohesive soils such as clays, sandy clays, and silty clays.

Pocket Penetrometer (tsf)	Typical Compressive Strength (tsf)	Consistency	Typical SPT "N_{60}" Value Range**
pp< 0.50	q_u< 0.25	Very soft	≤ 2
0.50 ≤ pp< 0.75	0.25 ≤ q_u< 0.50	Soft	3-4
0.75 ≤ pp< 1.50	0.50 ≤ q_u< 1.00	Firm	5-8
1.50 ≤ pp< 3.00	1.00 ≤ q_u< 2.00	Stiff	9-15
3.00 ≤ pp< 4.50	2.00 ≤ q_u< 4.00	Very Stiff	16-30
pp ≥ 4.50	q_u ≥ 4.00	Hard	≥ 31

** An "N_{60}" value of 31 or greater corresponds to a hard consistency. The correlation of consistency with a typical SPT "N_{60}" value range is approximate.

APPENDIX B

USFWS INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

Title: Ermis Road Culvert Repair and Restoration - CBBEP
Originating Person: Tim Anderson
Telephone Number: 361-533-6052
Reference Number: 02ETCP00-2024-0069558
Date: 03/28/2024

I. Region: 2

II. Service Activity (Program): Partners for Fish and Wildlife Program

III. Pertinent Species and Habitat:

A. Listed species and/or their critical habitat within the action area:

Attwater's Greater Prairie-chicken (E) *Tympanuchus cupido attwateri*
Eastern Black Rail (T) *Laterallus jamaicensis ssp. jamaicensis*
Piping Plover (T) *Charadrius melodus*
Red Knot (T) *Calidris canutus rufa*
Whooping Crane (E) *Grus americana*
Northern Aplomado Falcon (E) *Falco femoralis*
Green Sea Turtle (T) *Chelonia mydas*
Hawksbill Sea Turtle (E) *Eretmochelys imbricata*
Kemp's Ridley Sea Turtle (E) *Lepidochelys kempii*
Leatherback Sea Turtle (E) *Dermochelys coriacea*
Loggerhead Sea Turtle (T) *Caretta caretta*
Black Lace Cactus (E) *Echinocereus reichenbachii var. albertii*

B. Proposed species and/or proposed critical habitat within the action area:
Tricolored Bat (E) *Perimyotis subflavus*

C. Candidate species within the action area:
Monarch butterfly *Danaus plexippus*

D. Include species/habitat occurrence on a map. (See section IV below.)

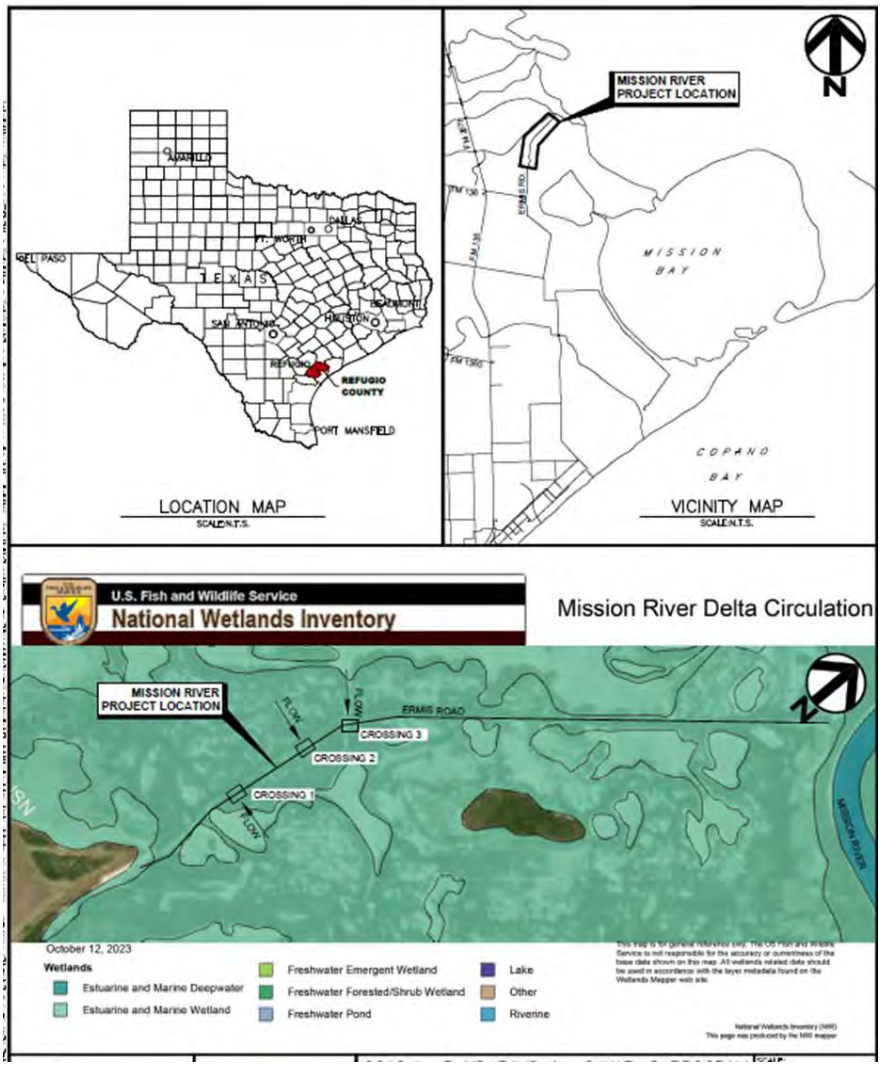
IV. Geographic area or station name and action:

The project area is shown in the location map below in Refugio County, Texas.

Action

The proposed project involves improving three existing, but failed culvert crossings located along an old oilfield road which bisects marsh habitat located on Coastal Bend Bays & Estuaries Program's property.

V. Location (attach map):



A. Ecoregion Name:
Gulf Coast Prairie and Marshes

B. County and State:
Refugio County, TX.

C. Section, township, and range (or latitude and longitude):
Latitude 28.1761, Longitude -97.1990

D. Distance (miles) and direction to nearest town:
Approximately 10 miles southeast of Woodsboro, TX and 7 miles northwest of Bayview, TX.

E. Species/habitat occurrence:

Attwater's Greater Prairie Chicken – The species is currently and historically known to occur on grasslands in several counties including Colorado, Galveston, Refugio, and Brazoria. This species occurs in coastal grassland prairies in areas of diverse vegetation, which provide a variety of cover. No critical habitat has been designated for this species.

Eastern Black Rail – Wintering and breeding areas of this species include coastal areas of Texas, particularly in marshes and wet prairies containing dense perennial herbaceous wetland vegetation. No critical habitat has been designated for this species.

Piping Plover – Wintering areas of this species include coastal areas of Texas, particularly mud/sand/salt flats. No critical habitat for this species is within the project area. Piping plovers are not expected to occur within the areas where construction work will take place. They may possibly use intertidal mudflats associated with the lower reaches of the Delta during migration or during specific periods when more preferable habitat conditions in other locations are not suitable.

Red Knot – This species is restricted to ocean coasts during winter and includes the northwest Gulf of Mexico including Texas. Red knots use marine habitats, generally preferring sandy coastal habitats at or near tidal inlets or the mouths of bays and estuaries. In Texas, this species forages on beaches, oyster reefs, and exposed bay bottoms, and roost on high sand flats, reefs and other sites protected from high tides. No critical habitat for this species is within the project area and are not expected to be present within the project area.

Whooping Crane – The species currently winters primarily on the Aransas National Wildlife Refuge (Texas), where critical habitat exists, and adjacent areas of Aransas, Calhoun, Refugio, and Matagorda Counties. In recent years, whooping cranes from the Louisiana experimental population have been documented in more coastal counties as the flock has expanded in size.

Northern Aplomado Falcon – The northern aplomado falcon is a medium sized falcon with a total length about 15 to 18 inches with a wingspan about 32 to 36 inches. Historically, this species was seen regularly along the coastal prairies of south Texas. Through reintroduction efforts, falcons were released annually until

2011 on the Laguna Atascosa National Wildlife Refuge, Matagorda Island, and private ranches and has been spotted in the Brazoria National Wildlife Refuge. The species uses open prairies and avoids woodland communities.

Green Sea Turtle – The green sea turtle is known to occur within the Gulf of Mexico along the Texas Coast, as part of the North Atlantic Distinct Population Segment. Nesting has been identified on San Jose, Mustang and Padre Islands. No critical habitat for this species is within the project area.

Hawksbill Sea Turtle – The hawksbill sea turtle is known to occur in estuaries, passes, and Gulf waters and beaches along the Texas coast. Only one nesting event for this species has been documented in Texas on Padre Island National Seashore. No critical habitat for this species is within the project area.

Kemp's Ridley Sea Turtle – The Kemp's ridley sea turtle is known to occur in estuaries, passes, and Gulf waters and beaches. This species is documented nesting on beaches, usually on Gulf-facing dune faces. No proposed critical habitat for this species is within the project area.

Leatherback Sea Turtle – The leatherback sea turtle is known to occur in estuaries, passes, and Gulf waters and beaches in Texas. Nesting has been documented only on Padre Island. No critical habitat for this species is within the project area.

Loggerhead Sea Turtle – The loggerhead sea turtle is known to occur in estuaries, passes, and Gulf waters and beaches in Texas. Nesting has occurred at various beaches in Texas but is extremely rare. No critical habitat for this species is within the project area.

Black Lace Cactus – Inhabits grasslands, thorn shrublands, mesquite woodlands on sandy, possibly somewhat saline soils on coastal prairie. Found sometimes growing in ecotonal areas along creeks or drainages between upland habitats and lower areas dominated by halophytic grasses and forbs. Currently known populations are in San Patricio, Nueces, Goliad, Bee, Atascosa, Aransas, Jim Wells, Kleberg, and Refugio counties. No critical habitat for this species is within the project area.

Tricolored Bat – The tricolored bat is a small insectivorous bat distinguished by its unique tricolor fur. During the winter, tricolored bats are often found in caves and abandoned mines, although in the southeastern United States, where caves are sparse, tricolored bats are often found roosting in large road-associated culverts where they exhibit shorter torpor bouts and forage during warm nights. No work will be performed in their habitat.

Monarch Butterfly – This is a generational migratory species of butterfly that depends on overwintering habitat, nectar, and the presence of milkweed plants to maintain its generational migratory journey.

VI. Description of proposed action (attach additional pages as needed):

The work consists of removing and replacing each failed culvert crossing and associated structure at the same location as the existing crossing.

- Crossing #1 consists of a single 14" rise x 23" span elliptical pipe (18" RCP equivalent)
- Crossing #2 consists of three 18" RCP pipes
- Crossing #3 consists of a double 6' span x 2' rise box culverts.

Minor excavation will occur to install new crossings, installation of bulk rock for soil stabilization and erosion protection followed by placement of Type 1, Grade A base material for trail surface on top of new pipe crossings. The construction staging placement area will be located in uplands on CBBEP property adjacent to the project location. Board Mats will be placed to protect any vegetated area along the oil field road while moving material to the site. All excavated material will be removed from the project site and placed in uplands before removal from the property. Approximately 73 CY of bulk rock will be placed under the pipe's crossings and 4-feet outside of the safety end treatment structures for scour protection. A cofferdam will be constructed upstream and downstream of each crossing for dewatering operations prior to beginning any construction of each crossing. The dewatering area will be surrounded with a double silt curtain. The silt curtain will allow water flow during construction but will prevent total suspended solids from entering the neighboring waterways.

VII. Determination of effects:

A. Explanation of effects of the action on species and critical habitats in items III. A, B, and C:

This project is expected to have no effects to the following species because they do not occur in the project/action area: Attwater’s greater prairie-chicken, red knot, green sea turtle, hawksbill sea turtle, Kemp’s ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, black lace cactus and tricolor bat.

Eastern black rails are cryptic species that occur in fresh, brackish, and saltwater marshes with clumping grass, rushes, or sedges. Eastern black rails require dense vegetative cover that allows movement underneath the canopy, and, because birds are found in a variety of salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced, plant structure is considered more important than plant species composition in predicting habitat suitability Eastern black rails could occur in the project area, most likely in moist/ephemeral wetlands and other freshwater wetlands. Most of the activities for this project will occur

outside of areas considered suitable habitat on pre-established roads. Additionally, suitable habitat along the road will be delineated and avoided as much as possible to limit impacts on vegetation and direct impacts to black rail. If eastern black rails were to be present, temporary disturbance would occur and the effects would be localized and temporary. Because of the large amount of habitat available adjacent to the road the temporary disturbance would not adversely affect foraging or other activities. In addition, implementation of the conservation measures recommended below will avoid and minimize any potential for adverse effects. After the project in implemented, wetlands within the project area will experience extended hydroperiods and are expected to improve wetland conditions that benefit the eastern black rail. The Service has determined that the proposed project is not likely to adversely affect this species.

Piping plovers are not expected to occur within the areas where construction work will take place. However, there is a possibility that they use intertidal mudflats associated with the lower reaches of the delta during migration or during specific periods when habitat conditions in preferable areas are not suitable. They are usually found on gulf beaches, tidal inlets, and large exposed mud flats and their presence in the construction areas is extremely unlikely. However, if present these birds may be disturbed by work activities and may move to adjacent undisturbed areas causing temporary displacement of individuals as a result of project activities. No direct or indirect impacts to nesting habitats will occur because the birds do not nest in Texas. Therefore, it is determined that the proposed project may affect, but is not likely to adversely affect these species.

Northern aplomado falcon are known to use open terrain such as that present in the Mission Delta area however, there are no documented breeding pairs in the project area. If an aplomado falcon is present in the area, noise disturbance due to project activities could cause temporary displacement of foraging or roosting aplomado falcons, but the potential for disturbance would be temporary, infrequent, and localized and therefore insignificant. In addition, implementation of the conservation measures recommended below will avoid and minimize any potential for adverse effects. The Service has determined that the proposed project is not likely to adversely affect this species.

The Aransas Whooping Crane Wood Buffalo population spends winters on the Texas coast from November 1 to April 1. Whooping cranes establish distinct territories that are used year after year, which include shallow bays, salt marsh, sandflats, upland habitats, and sources of freshwater. Adult whooping cranes remain within their territories most of the time but must leave the territory to seek out fresh water to drink when marsh salinities exceed 23 parts per thousand. The project site is located outside of designated critical habitat however, it is located within the delineated high priority winter region. Areas within the lower reaches of Mission Delta provide intertidal wetland habitat that might be used by whooping cranes. However, in the highly unlikely event that a whooping crane is present while crews are working, conservation measures to avoid or minimize effects to this species are recommended below. The project is expected to enhance wetland habitat within the project area by providing a better supply of

nutrients, sediments, and macro phytic detritus more frequently and for extended hydroperiods therefore enhancing whooping crane habitat. The Service has determined that the effects are discountable due to the low potential for a whooping crane to be present at the site along with conservation measures, and therefore we determined that the project is not likely to adversely affect the whooping crane.

B. Conservation Measures - Explanation of actions to be implemented to avoid or minimize the potential for adverse effects:

Eastern Black Rail

The species may be present in all of the Texas coastal counties year-round. The species is most vulnerable during breeding, chick rearing, and the flightless molt period. If the proposed project area is located in or near a wetland with potential eastern black rail habitat (e.g., dense overhead cover, moist soils that are occasionally dry and interspersed or adjacent to shallow water, depths up to 5 cm but typically <3 cm) as described in the Final Rule (pgs. 63767, 63798, and 63800) the site will be evaluated for black rails and the following conservation measures are recommended.

- On-site vegetative field surveys will be conducted before work begins to identify potential black rail habitat within the project area. If suitable habitat is found, surveys should be done to assess black rail presence within the project area. If surveys are not possible, black rails should be presumed to be present.
- Sites where black rails are known or presumed to be present, will be avoided and no construction activities will occur within the habitat from March 1 through September 30 (breeding, nesting, chick rearing, and flightless molting season). If this timing restriction cannot be achieved, then we recommend the following measures:

    - All individuals working on the project will be provided with information on how to identify the species and means to minimize disturbance to the species and their habitat.
    - Project activities shall be limited to daylight hours.
    - Habitat where black rails have been detected or presumed to be present will be marked to avoid placement of material, traffic, equipment movement, etc.
    - If work is conducted outside March 1 through September 30, and temporary access routes, pipeline routes, or staging areas must transit across identified black rail habitat, the contractor must minimize traffic in these areas and therefore minimize the construction footprint, (i.e., limited paths) to the maximum extent possible and restrict traffic to the same pathways. In addition, to further minimize impacts, areas of high marsh habitat should be left intact to provide refugia for the black rail to ensure escape access routes.

- If suitable habitat is present within the construction area, work activities should be restricted to roads, levees and other pre-established routes that are routinely disturbed to avoid affecting any eastern black rails that may be present.
- A biological monitor should ensure a sufficiently slow pace of all equipment moving through potential habitat to allow birds to escape ahead of equipment. This secretive species will run to escape oncoming disturbance and are highly unlikely to fly. Equipment should be operated from one side to the other so birds can move outside the path of the equipment and eventually escape. Equipment operators shall avoid using circular routes that might entrap the birds.
- Do not remove all suitable BLRA habitat in a day. Leave pockets of suitable BLRA habitat (refugia) and/or have a biological monitor ensure dense herbaceous covered pathways are maintained into unaffected areas. The refugia remaining within the project area may be cleared after two days, as needed. Acceptable refugia size is approximately 10 feet by 20 feet.
- The biological monitor will have authority to stop work immediately upon discovery of any BLRA (alive, injured, or dead). The Texas Coastal Ecological Service's Office should be contacted immediately at (281)286-8282.
- Projects involving revegetation of disturbed areas should use native herbaceous plants mimicking the local site composition. Propagation of woody species should be avoided in BLRA habitat restoration areas.

Piping Plover

- All individuals working on the project will be provided with information on how to identify the species and means to minimize disturbance to the species and their habitat.
- Prior to implementing the project, qualified monitor(s) or other qualified personnel will survey the work area to ensure no birds are present.
- Use care to avoid birds when operating machinery or vehicles near birds. If a bird approaches the construction area within 75 feet, work will stop until the bird(s) leave(s) the construction site. USFWS should be contacted for additional guidance.

Whooping Crane

- All individuals working on the project will be provided with information on how to identify the species and means to minimize disturbance to the species and their habitat.
- If a whooping crane is identified within 1,000 feet of an active management area, all work should immediately stop. When the crane has left the 1,000-foot area on its own accord, work may continue.

- All equipment greater than 15 feet high should be laid down at dusk and overnight, to avoid whooping crane strikes during times of low visibility.
- If equipment cannot be laid down at dusk or overnight, then such equipment will be marked using surveyors flagging tape, red plastic balls or other suitable marking devices and lighted during inclement weather conditions when low light and/or fog is present.
- All whooping crane sightings should be immediately reported to the Texas Coastal and Central Plains Ecological Services Field Office at (281) 286-8282 or the Coastal Program Project Manager (281) 682-0750.

Northern Aplomado Falcon

- Provide all individuals working in the action area with information in support of general awareness of presence of aplomado falcons and the means to minimize disturbance to the species and their habitat.
- During March 15 through August 15, the site should be evaluated for suitable habitat and all large stick nests should be examined from a distance for signs of adults incubating eggs or brooding chicks. If a nest is occupied, a 1,000- foot buffer shall be maintained around the nest or perch depending on the sensitivity of the individual bird to keep human impacts to a minimum.

VIII. Effect determination and response requested:

A. Listed species/designated critical habitat:

Determination	Response requested
no effect to species/critical habitat (species/unit:)	
Attwater's Greater Prairie-chicken Red Knot Green Sea Turtle Hawksbill Sea Turtle Kemp's Ridley Sea Turtle Leatherback Sea Turtle Loggerhead Sea Turtle	
may affect, but is not likely to adversely affect species/critical habitat (species/unit_)	

Eastern Black Rail
Piping Plover
Northern Aplomado Falcon
Whooping Crane **_X_ Concurrence**

may affect, and is likely to adversely affect species/critical habitat (species/unit:)

None **____Formal Consultation**

B. Proposed species/proposed critical habitat:

Determination	**Response requested**
no effect:	
Tricolor bat	
is likely to jeopardize proposed species/ adversely modify proposed critical habitat (species/unit:)	**____Concurrence**
None	
is likely to jeopardize proposed species/ adversely modify proposed critical habitat (species/unit:)	**____Conference**
None	

C. Candidate species:

Determination	**Response requested**
is not likely to jeopardize candidate species (species:)	
Monarch butterfly	**_X_ Concurrence**
is likely to jeopardize candidate species (species:)	
None	

Conference

Adriana Leiva

Digitally signed by Adriana Leiva
Date: 2024.04.02 15:15:59 -05'00'

Adrian Leiva, Section 7 Biologist, Gulf Restoration Office **Date**

IX. Reviewing ESO Evaluation:

A. Concurrence **X** **Nonconcurrence** _____

B. Formal consultation required _____

C. Conference required _____

D. Informal conference required _____

E. Remarks (attach additional pages as needed):

For a "No Effect" Determination no ES Field Office concurrence is necessary.

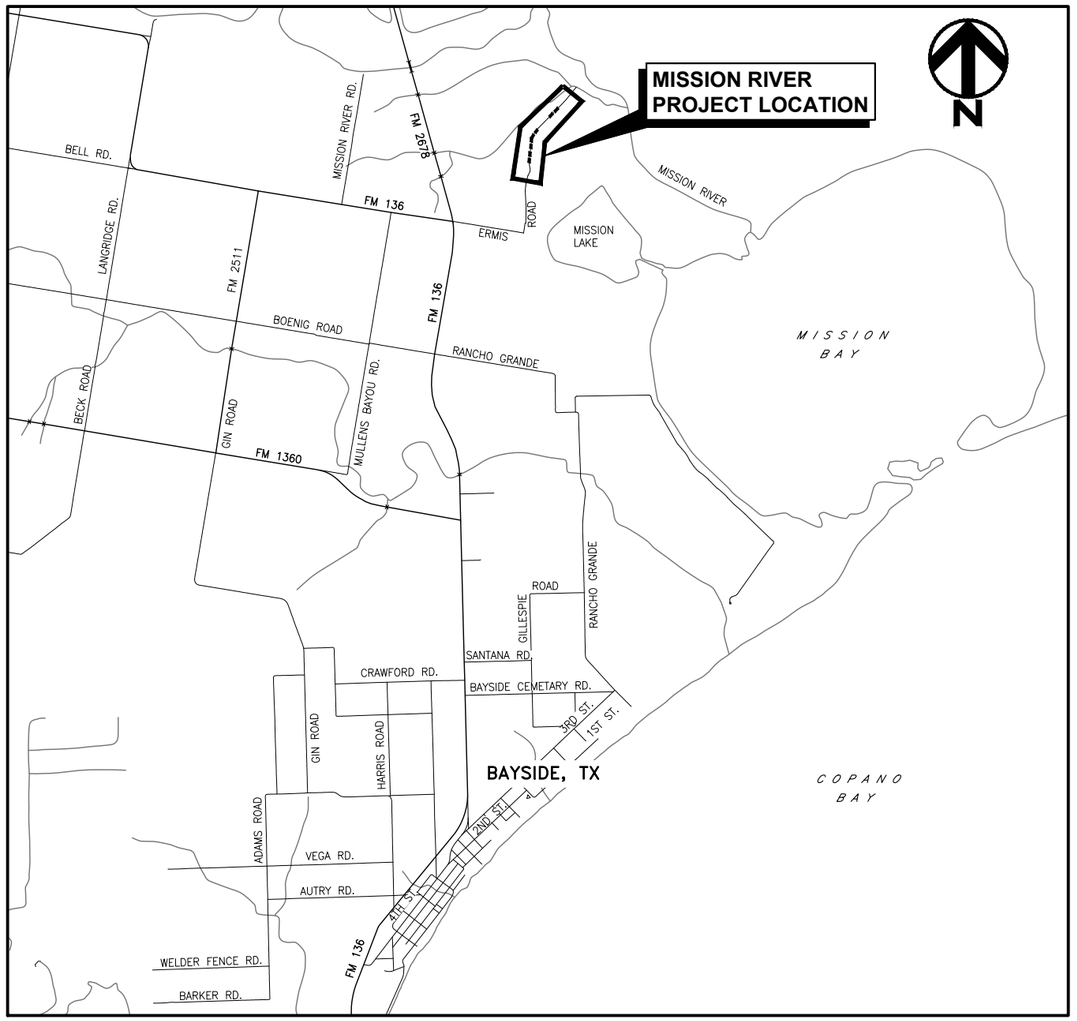
BILLY HARDEGREE Digitally signed by BILLY HARDEGREE
Date: 2024.04.02 15:32:19 -05'00'

Texas Gulf Restoration Program Office Supervisor **Date**

CONSTRUCTION PLANS FOR

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. (CBBEP)

MISSION RIVER DELTA CIRCULATION ENHANCEMENT



VICINITY MAP

0 3000' 6000' 9000' 12000'

SHEET INDEX

SHEET No.	SHEET TITLE
01	TITLE SHEET
02	OVERALL LAYOUT,GENERAL NOTES, LEGEND, ABBREVIATIONS & SCHEDULE
03	CROSSING No. 1 PLAN & SECTIONS
04	CROSSING No. 2 PLAN & SECTIONS
05	CROSSING No. 3 PLAN & SECTIONS
06	CONSTRUCTION DETAILS (1 OF 2)
07	CONSTRUCTION DETAILS (2 OF 2)
08	ENVIRONMENTAL PERMITS ISSUES AND COMMITMENTS–EPIC
09	STORMWATER POLLUTION PREVENTION NOTES
10	STORMWATER POLLUTION PREVENTION PLAN & DETAILS

JULY 2024

QUANTITIES SHOWN REFLECT MEASUREMENTS TAKEN FROM THE DRAWINGS AND ARE ESTIMATED FOR BIDDING PURPOSES. CONTRACTOR IS RESPONSIBLE FOR REVIEWING SCOPE OF WORK, THE PLANS AND SPECS AND FOR GENERATING THEIR FINAL QUANTITIES, TO INCLUDE ALL MATERIALS, LABOR, SERVICES, AND INCIDENTALS FOR CONTRACT PRICE.

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

LJA ENGINEERING
TEXAS ENGINEERING FIRM F-1386
5350 S. Staples Street, Suite 425
Corpus Christi, Texas 78411
phone.361.991.8550
www.LJA.com

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THE LONE STAR NOTIFICATION COMPANY AT 1-800-669-8344

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

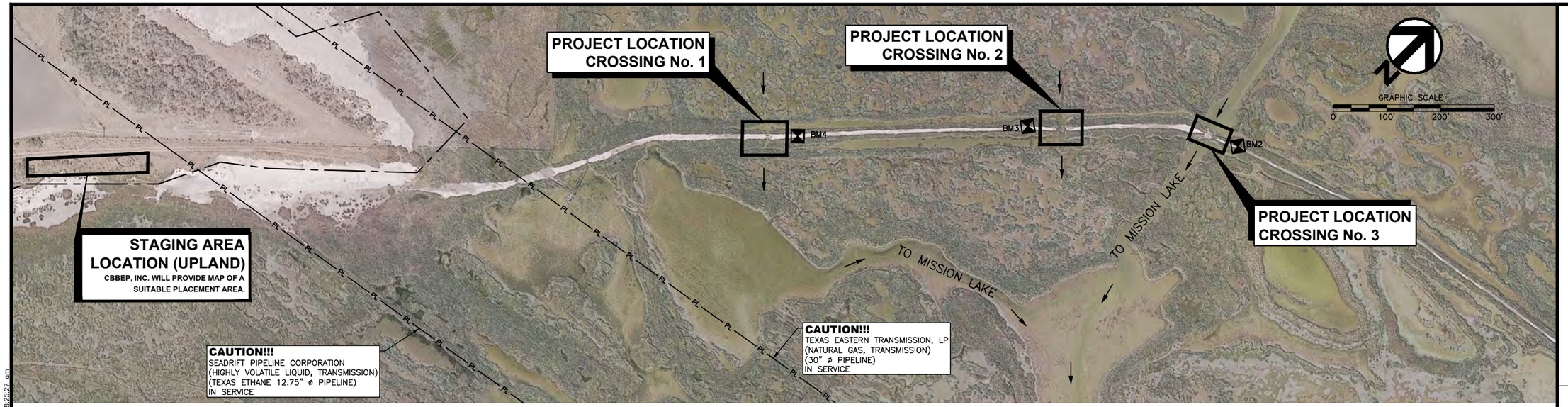
COASTAL BEND BAYS & ESTUARIES PROGRAM

REVISION NO.	DATE	BY	DESCRIPTION

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

TITLE SHEET

01 / 10



GENERAL NOTES:

A. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SAFETY OF HIS EMPLOYEES, THE PUBLIC AND (CBBEP) SITE INSPECTOR DURING ALL PHASES OF THE CONSTRUCTION. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE AND LOCAL SAFETY REGULATIONS.

B. CONTRACTOR SHALL REPAIR OR REPLACE, AT CONTRACTOR'S EXPENSE, ANY & ALL EXISTING UTILITIES, SIGNS, FENCES, GATES, PROPERTY PINS OR OTHER ITEMS DAMAGED OR DISTURBED AREAS BY CONTRACTOR'S OPERATIONS.

C. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION AND SAFETY OF THE WORK, WORKERS, SUBCONTRACTORS, MATERIALS AND EQUIPMENT.

D. CONTRACTOR SHALL REMOVE ANY CONSTRUCTION WASTE, ALL LOOSE ROCK FROM THE SITE AND IT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

E. THE STOCKPILE LOCATIONS WILL BE AT THE DESIGNATED AREA, THE CONTRACTOR SHALL HAVE APPROPRIATE SIGNS AND PERSONNEL AT ALL STOCKPILE LOCATIONS DURING DELIVERY. STOCKPILES ARE TO BE PLACED SO THAT THEY NEITHER OBSTRUCT TRAFFIC NOR INTERFERE WITH ROADWAY ACCESS, NOR BEEN PLACED ON WETLAND SENSITIVE AREAS.

F. CONTRACTOR SHALL NOT DISTURB EXISTING SET SURVEY CONTROL SHOWN ON THE PLANS.

PERMITS:

G. THE CONTRACTOR WILL BE ISSUED A NATION WIDE "USACE" PERMIT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY CONDITIONS NOTED IN PERMIT OBTAINED.

STORMWATER POLLUTION PREVENTION:

A. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT SILT AND DEBRIS FROM CONSTRUCTION OPERATIONS DOES NOT ENTER INTO THE RIVER OR BODY OF WATER.

B. CONTRACTOR SHALL PROVIDE TEMPORARY SEDIMENT CONTROL FENCE AT STOCKPILE LOCATIONS.

C. THE CLEANING OF ASPHALTIC EQUIPMENT SHALL BE DONE OUTSIDE OF PROJECT SITE. ANY PETROLEUM PRODUCTS SPILLED WITHIN THE PROJECT LIMITS SHALL BE CLEANED UP AND DISPOSED OF PROPERLY. NO CONSTRUCTION WASTE MATERIALS WILL BE BURIED WITHIN THE SITE.

EARTHWORK:

A. AREAS THAT RECEIVE MORE THAN 12" OF FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR DENSITY PER ASTM D-698 AND A MOISTURE CONTENT WITHIN +3% TO -1% OF OPTIMUM. FILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 6" ON UNDISTURBED SOIL FREE OF DEBRIS AND ORGANIC MATERIALS.

B. CONTRACTOR TO REMOVE ALL EXCESS SPOIL, STRIPPED MATERIAL AND DEBRIS WITHIN LIMITS OF PROPOSED CONSTRUCTION OR AS SHOWN ON PLANS. DISPOSAL SHALL BE CONTRACTOR'S RESPONSIBILITY.

C. ALL BACKFILL TO BE PLACED IN ACCORDANCE WITH MATERIAL TECHNICAL SPECIFICATIONS.

D. THE EXCAVATION AND BACKFILL QUANTITIES ARE APPROXIMATE ONLY AND ARE INTENDED TO GIVE A GENERAL INDICATION OF THE AMOUNT OF MATERIAL TO BE NEEDED.

E. AVOID ANY WETLAND AREAS BEYOND THE LIMITS OF EXCAVATION.

F. THE TOP 1-FOOT OF MATERIAL EXCAVATED FROM BELOW THE NORMAL WATER SURFACE ELEVATION IS TO REMAIN ON SITE AND REUSED AS TOP SOIL TO RE-VEGETATE DISTURBED AREAS.

G. THE ENGINEER WILL DETERMINE THE ACCEPTABILITY OF STRIPPED VEGETATION AND TOPSOIL MATERIAL FOUND ACCEPTABLE FOR REUSE AND SHALL BE STOCKPILED ON SITE. NO SEPARATE PAYMENT WILL BE MADE FOR STRIPPING, STOCKPILING AND PLACING MATERIAL FOUND TO BE ACCEPTABLE FOR REUSE. COST SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

GEOTECHNICAL REPORT:

A. CONTRACTOR SHALL COMPLY WITH TOLUNAY-WONG ENGINEER "TWE", GEOTECHNICAL ENGINEERING REPORT NO. 32996 FOR MISSION RIVER DELTA CIRCULATION ENHANCEMENT PROJECT, DATED OCTOBER 23, 2023..

UTILITIES:

A. CONTRACTOR SHALL CONTACT AND COORDINATE WITH EACH EXISTING UTILITIES COMPANIES PRIOR TO CROSS OVER WITH CONSTRUCTIONS EQUIPMENTS.

B. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE APPROXIMATELY, CONTRACTOR TO FIELD VERIFY EXACT LOCATION PRIOR TO BEGIN CONSTRUCTIONS ACTIVITIES.

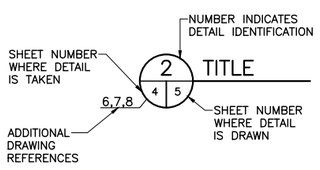
MATERIALS:

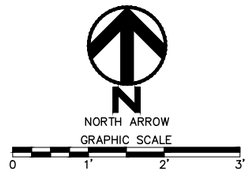
A. CONTRACTOR SHALL COMPLY WITH THE LATEST PROVISIONS OF BUILD AMERICA, BUY AMERICA ACT (BABA ACT) OF THE BIPARTISAN INFRASTRUCTURE LAW AND APPLICABLE CFR, WHICH RESTRICT FUNDS BEING MADE AVAILABLE FROM FEDERAL FINANCIAL ASSISTANCE PROGRAMS UNLESS ALL THE IRON PRODUCTS, STEEL PRODUCTS, MANUFACTURED PRODUCTS, AND CONSTRUCTION MATERIALS USED IN THE PROJECT ARE PRODUCED IN THE UNITED STATES.

TESTING SCHEDULE

DESCRIPTION	RATE
SOILS:	
STANDARD PROCTOR – TRENCH BACKFILL	PER MATERIAL SOURCE
STANDARD PROCTOR – SUBGRADE	PER STREET/MATERIAL
DENSITIES – TRENCH BACKFILL	PER 200 LF TRENCH/LIFT
DENSITIES – SUBGRADE	PER 100 LF/LIFT
FLEXIBLE BASE:	
SIEVE ANALYSIS (GRADATION)	PER 3,000 CY.
ATTERBERG LIMITS	PER 3,000 CY.
MODIFIED PROCTOR	PER 3,000 CY.
L.A. ABRASION	PER 3,000 CY.
CBR (STANDARD)	PER MATERIAL SOURCE
WET BALL MILL TEST	PER MATERIAL SOURCE
TRIAXIAL TEST	PER MATERIAL SOURCE
CONCRETE (UNCONFINED COMPRESSION, 7, 14 & 28 DAY):	
BOX CULVERTS (CAST-IN-PLACE)	PER 100 LF
WINGWALLS	PER EACH

1. ALL TESTING SHALL BE PROVIDED BY THE CBBEP.
2. THE ABOVE TESTING RATES ARE ONLY ANTICIPATED GUIDELINES. THE ENGINEER RESERVES THE RIGHT TO CONDUCT ADDITIONAL TESTING AT THE ENGINEER'S DISCRETION. RE-TEST FOR FAILURES ARE NOT INCLUDED.
3. MOISTURE CONTENTS TO BE INCLUDED WITH DENSITY TEST.
4. IN THE EVENT OF FAILURES, ADDITIONAL TESTS WILL BE REQUIRED. IF EXCESSIVE RAIN OR DRY PERIOD OCCURS ON A PREVIOUSLY TESTED SECTION, THE COUNTY MAY ORDER RE-TESTS AS NECESSARY.





TYPICAL DETAIL SYMBOLS

LEGEND:

- EXISTING SPOT ELEVATION (16.76)
- PROPOSED SLOPE DRAIN ARROW
- STORMWATER SWALE FLOWLINE ARROW
- BENCHMARK
- SCF — SILT CONTROL FENCE
- 1+00 — MISSION RIVER CENTERLINE (BASELINE)
- OHE — OVERHEAD ELECTRICITY
- BL — BRUSHLINE
- TOP OF BANK
- BOTTOM OF BANK
- FENCE
- BRUSHLINE
- WETLAND BOUNDARY LINE

ABBREVIATIONS:

TOC	TOP OF CONCRETE
EX.	EXISTING
LT	LEFT
SY.	SQUARE YARDS
SF.	SQUARE FEET
LF.	LINEAR FEET
RT	RIGHT
ELEV.	ELEVATION
EOA	EDGE OF ASPHALT
FL	FLOWLINE
PROP.	PROPOSED
STA.	STATION
R.O.W.	RIGHT-OF-WAY

PROJECT CONTROL – CITY OF PORTLAND WASTEWATER TREATMENT PLANT

POINT No.	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP 1	17315207.89	1403145.62	20.21	
BM 2	17318666.12	1403465.55	2.20	CLOSE TO CROSSING 3
BM 3	17318321.03	1403374.60	2.41	CLOSE TO CROSSING 2
BM 4	17317857.85	1403317.43	2.50	CLOSE TO CROSSING 1

PROJECT No.: C285-22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

REVISION NO.	DATE	BY	DESCRIPTION

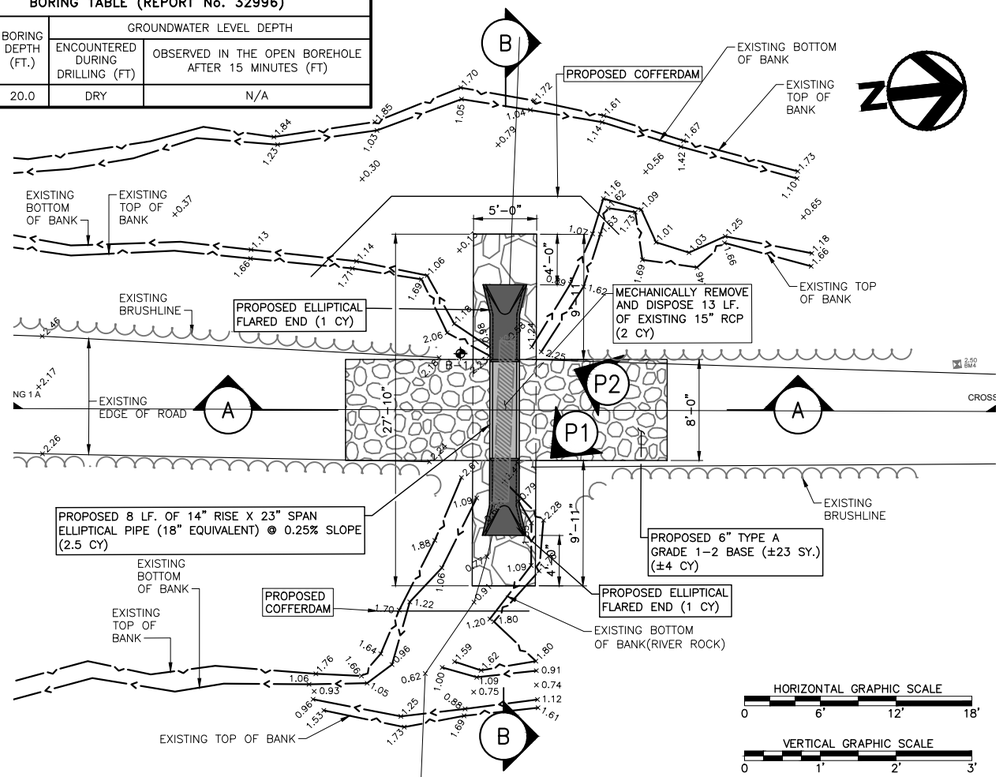
COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

OVERALL LAYOUT,GENERAL NOTES, LEGEND, ABBREVIATIONS & SCHEDULE

02
10

R:\CLIENTS\COASTAL BEND BAYS & ESTUARIES PROGRAM - C285\22106-WA #1 Mission River Delta Circulation Enhancement\CAD\02 GEN NOTES & TESTING SCHEDULE.dwg maflores Tue, Jul 09, 2024 @ 8:25:27 am

BORING TABLE (REPORT No. 32996)			
BORING No.	BORING DEPTH (FT.)	GROUNDWATER LEVEL DEPTH	
		ENCOUNTERED DURING DRILLING (FT)	OBSERVED IN THE OPEN BOREHOLE AFTER 15 MINUTES (FT)
B–1	20.0	DRY	N/A



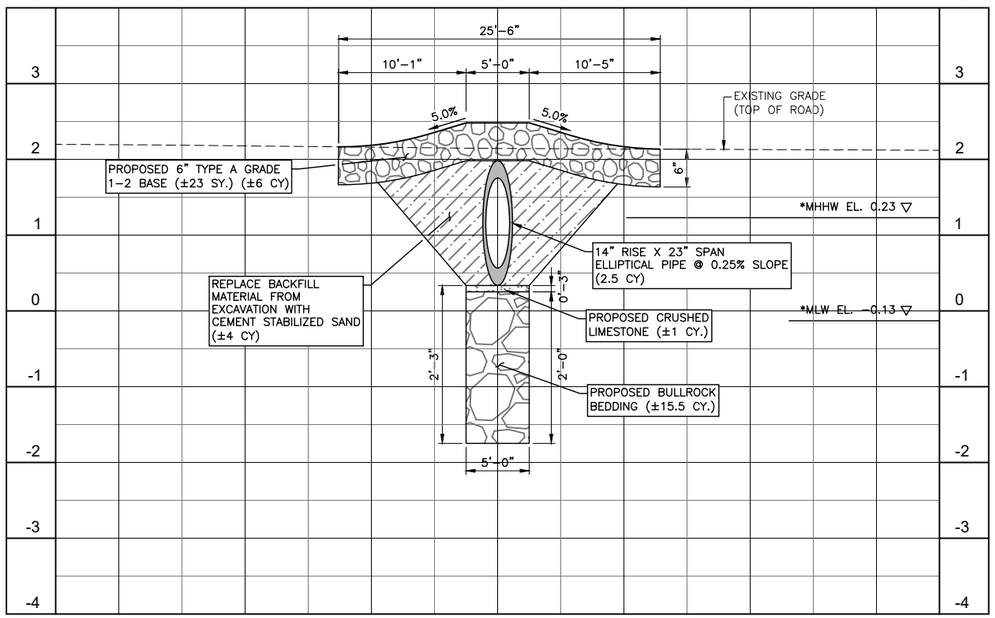
HORIZONTAL GRAPHIC SCALE
0 6' 12' 18'

VERTICAL GRAPHIC SCALE
0 1' 2' 3'

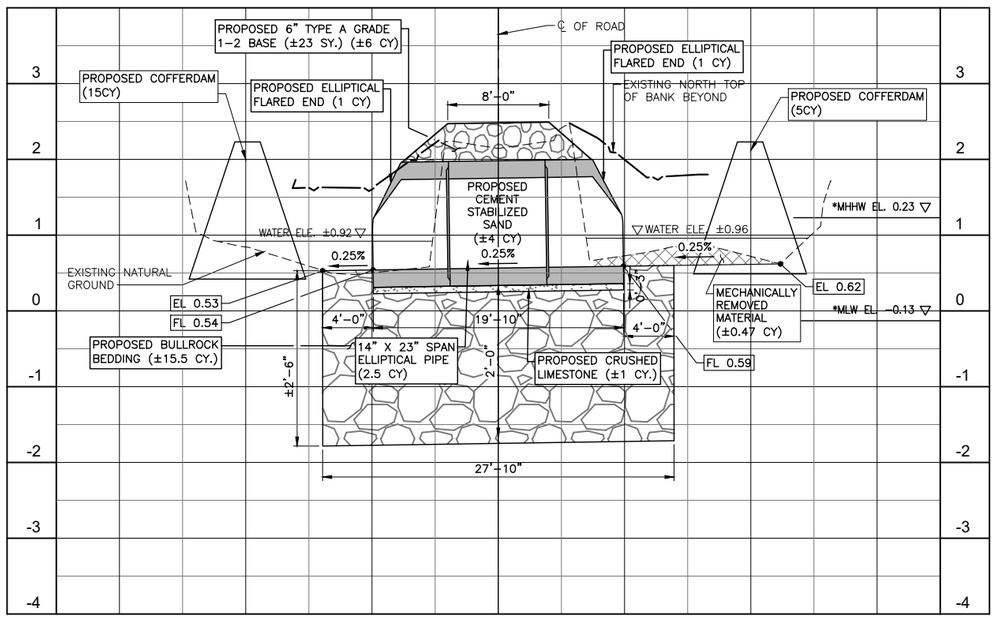
CROSSING No. 1 PLAN VIEW

P1 CROSSING No. 1 EXISTING CONDITIONS PHOTO

P2 CROSSING No. 1 EXISTING CONDITIONS PHOTO



A CROSSING No. 1 SECTION 'A–A'



B CROSSING No. 1 SECTION 'B–B'

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

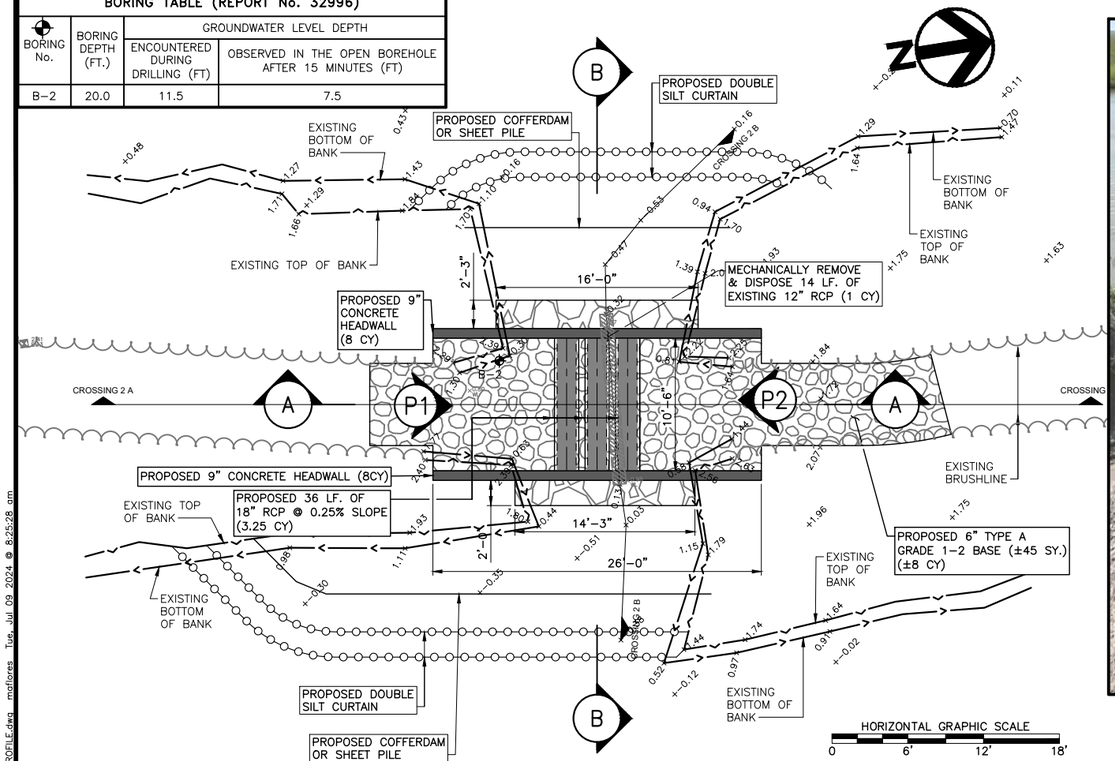
CROSSING No. 1 PLAN & SECTIONS

03
10

REVISION NO. | DATE | BY | DESCRIPTION

R:\CLIENTS\COASTAL BEND BAYS & ESTUARIES PROGRAM – C285\22106-WA #1 Mission River Delta Circulation Enhancement\CAD\03-04 MISSION RIVER PLAN & PROFILE.dwg mdfarias Tue, Jul 09 2024 @ 8:25:28 am

BORING TABLE (REPORT No. 32996)			
BORING No.	BORING DEPTH (FT.)	GROUNDWATER LEVEL DEPTH	
		ENCOUNTERED DURING DRILLING (FT)	OBSERVED IN THE OPEN BOREHOLE AFTER 15 MINUTES (FT)
B–2	20.0	11.5	7.5



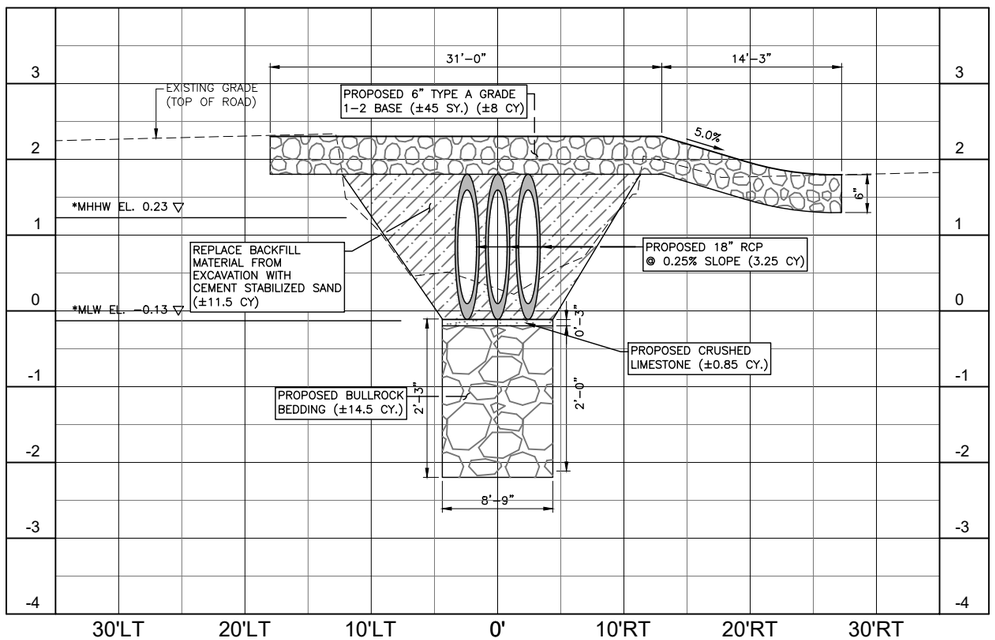
CROSSING No. 2 PLAN VIEW

HORIZONTAL GRAPHIC SCALE
0 6' 12' 18'

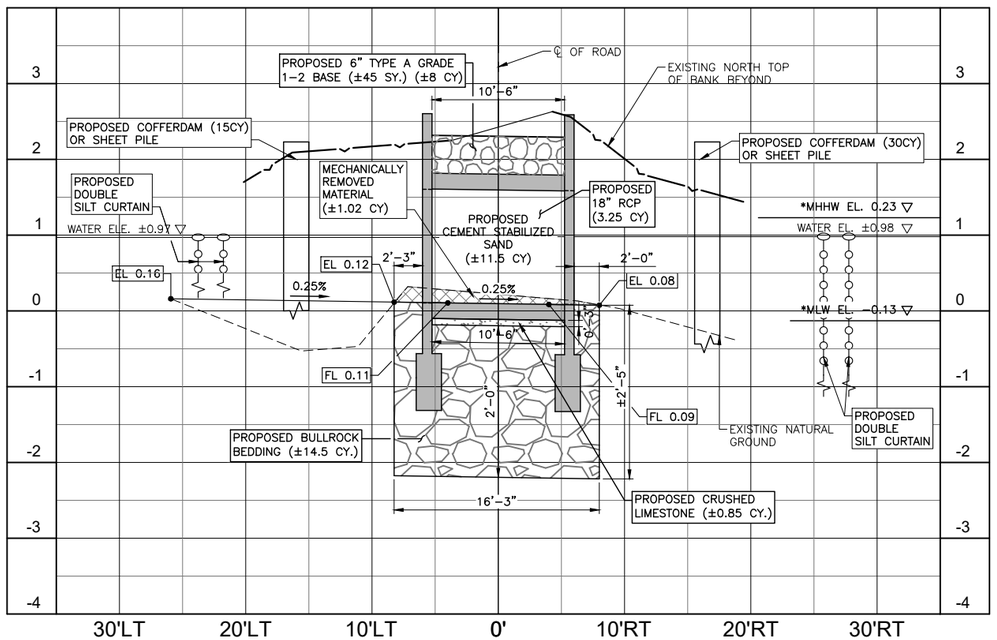
VERTICAL GRAPHIC SCALE
0 1' 2' 3'

P1 CROSSING No. 2 EXISTING CONDITIONS PHOTO

P2 CROSSING No. 2 EXISTING CONDITIONS PHOTO



A CROSSING No. 2 SECTION 'A–A'



B CROSSING No. 2 SECTION 'B–B'

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

COASTAL BEND BAYS & ESTUARIES PROGRAM

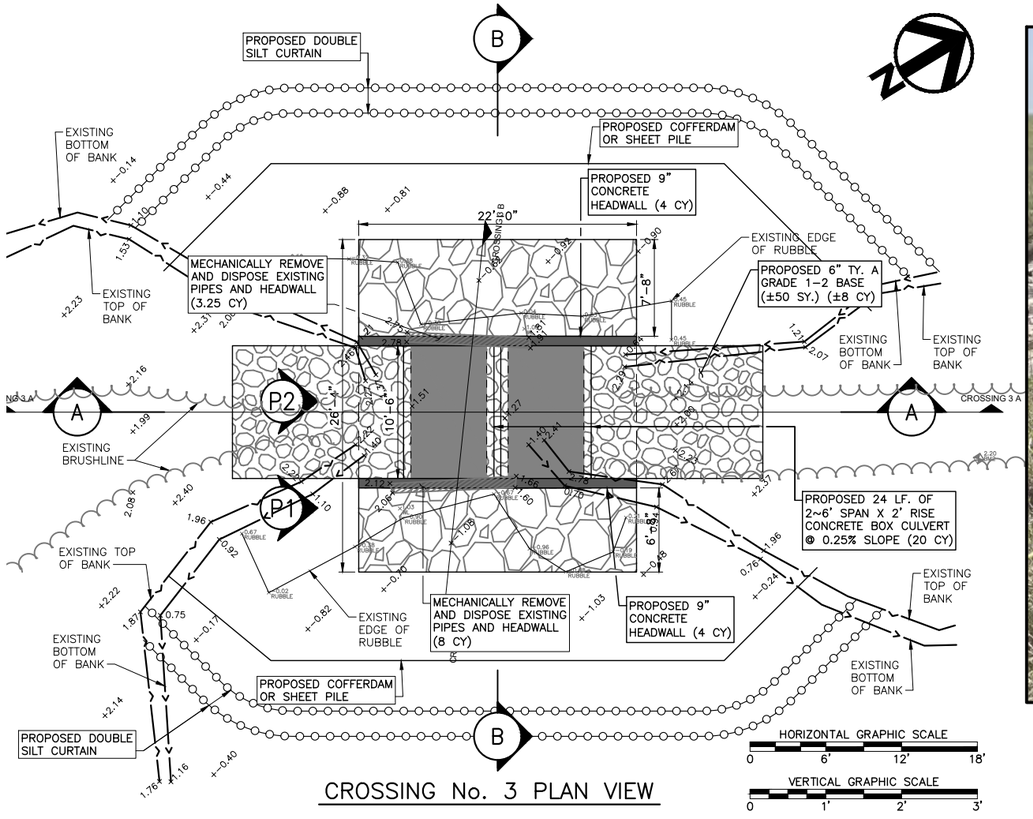
REVISION NO.	DATE	BY	DESCRIPTION

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

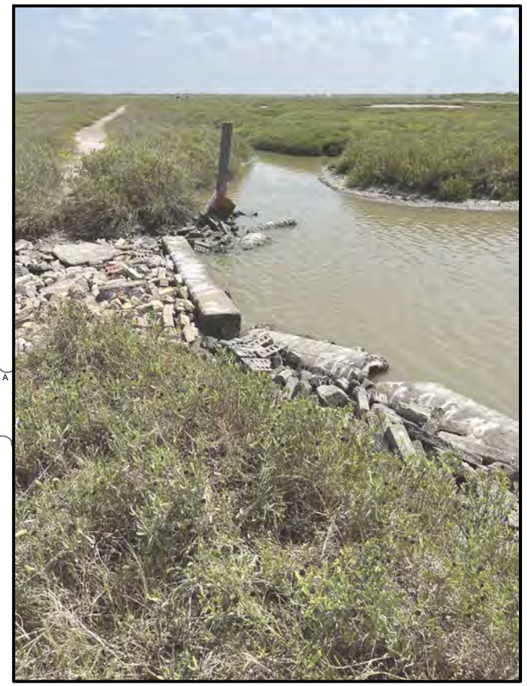
CROSSING No. 2 PLAN & SECTIONS

04
10

R:\CLIENTS\COASTAL BEND BAYS & ESTUARIES PROGRAM – C285\22106-WA #1 Mission River Delta Circulation Enhancement\CAD\03-04 MISSION RIVER PLAN & PROFILE.dwg mdflores Tue, Jul 09, 2024 @ 8:25:28 am



CROSSING No. 3 PLAN VIEW



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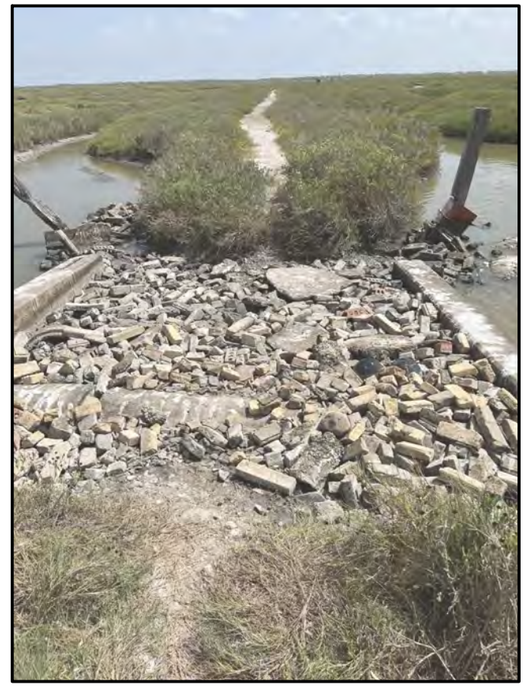

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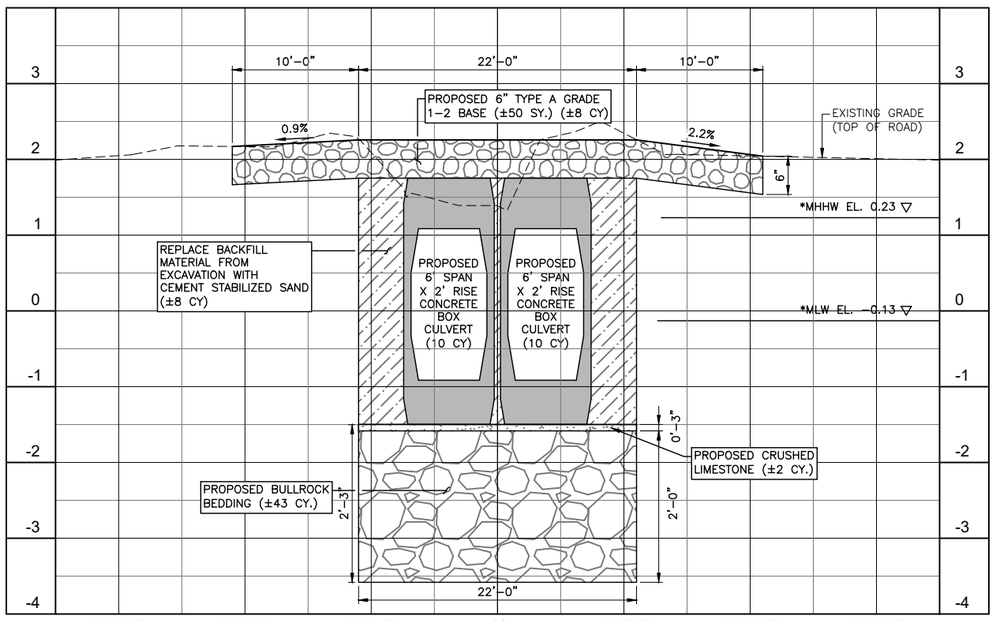

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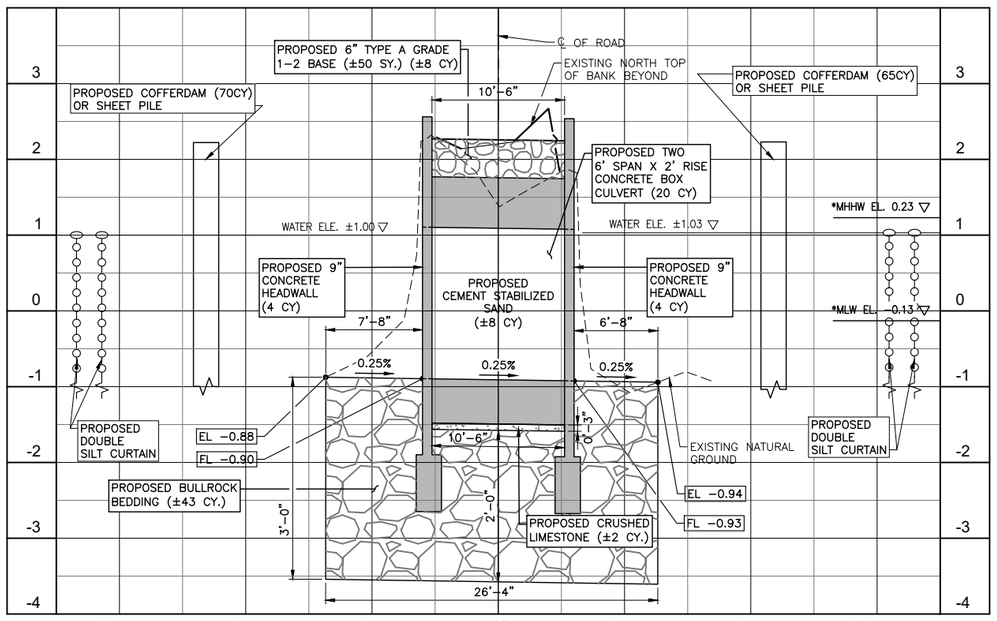

B CROSSING No. 3 SECTION 'B-B'

PROJECT No.: C285-22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

REVISION NO.	DATE	BY	DESCRIPTION

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA
CIRCULATION ENHANCEMENT

CROSSING No. 3 PLAN & SECTIONS

05
10

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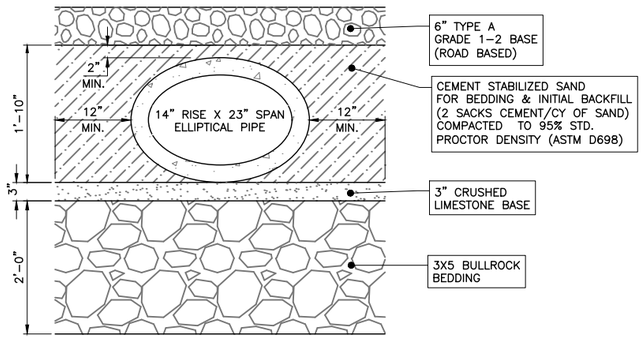
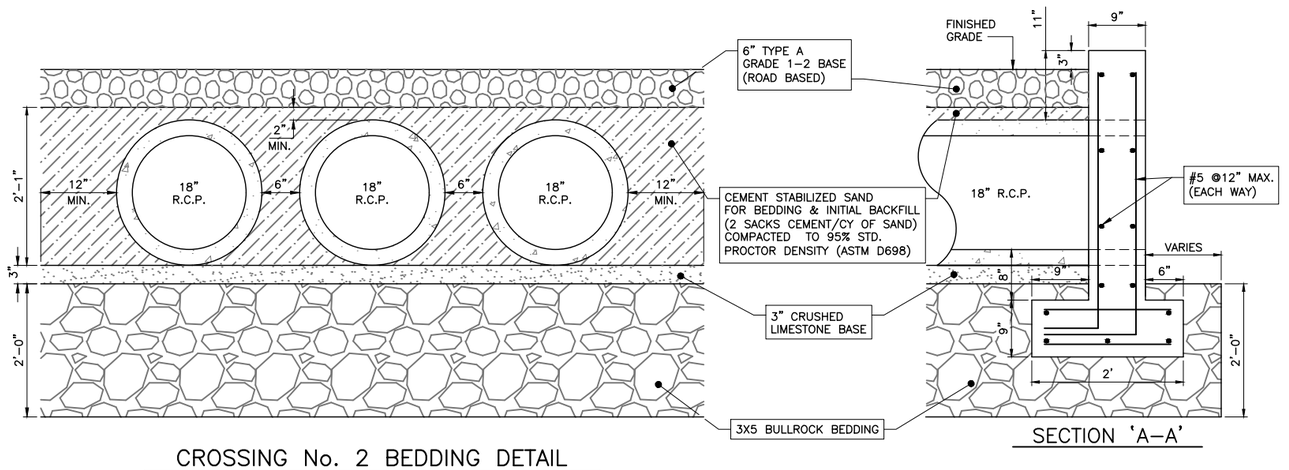


CROSSING No. 1 BEDDING DETAIL

NOT TO SCALE



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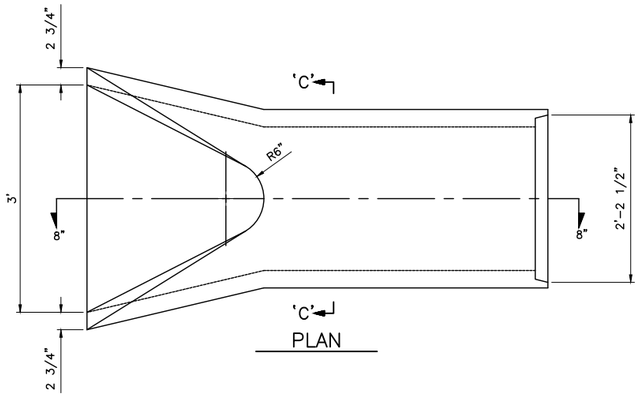
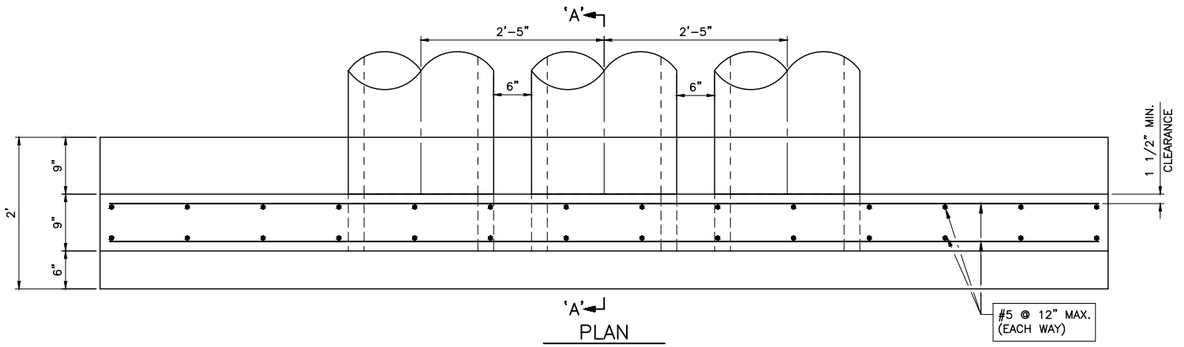
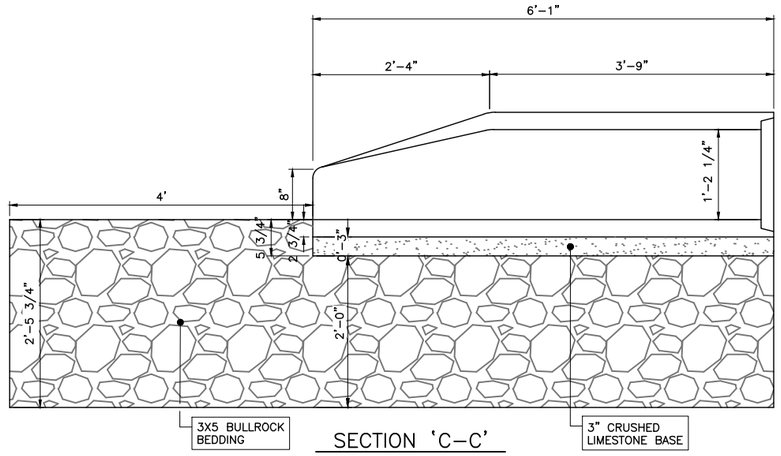
SECTION 'A-A'



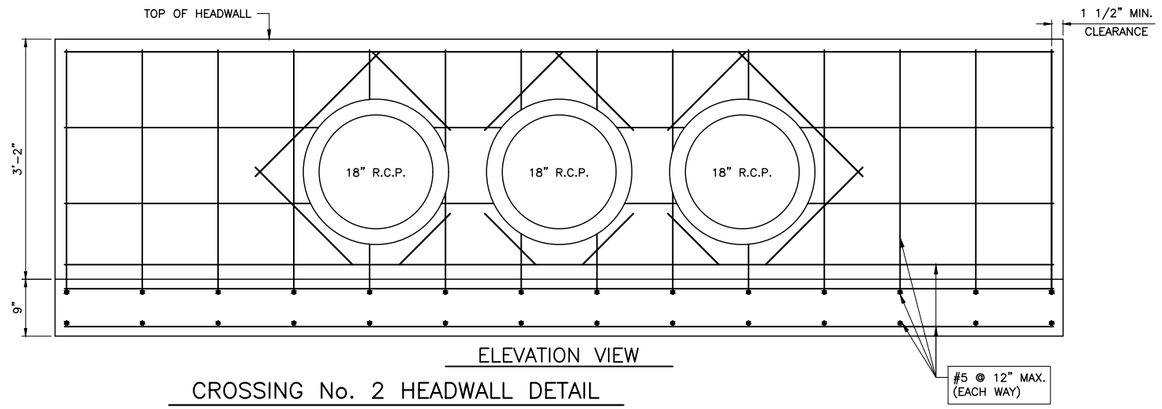
'C'
PLAN



'A'
PLAN



SECTION 'C-C'



ELEVATION VIEW

CROSSING No. 2 HEADWALL DETAIL

NOT TO SCALE

PROJECT No.:
C285-22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED
PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
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COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA
CIRCULATION ENHANCEMENT

CONSTRUCTION DETAILS (1 OF 2)

06
10

REVISION NO.	DATE	BY	DESCRIPTION

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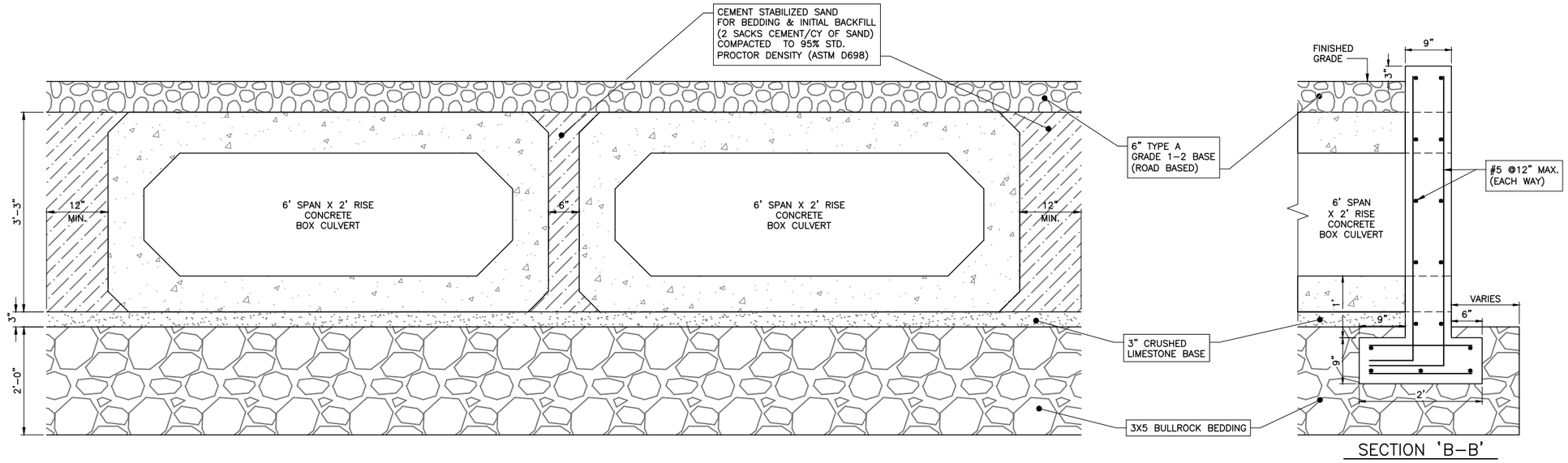
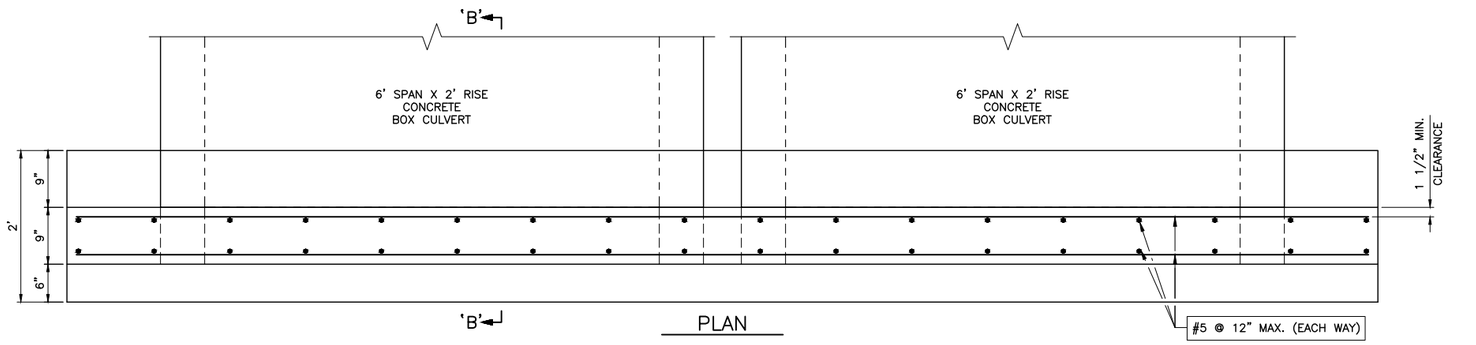


CROSSING No. 3 BEDDING DETAIL

NOT TO SCALE

SECTION 'B-B'



PLAN

ELEVATION VIEW

CROSSING No. 3 HEADWALL DETAIL

NOT TO SCALE

PROJECT No.:
C285-22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED
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COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA
CIRCULATION ENHANCEMENT

CONSTRUCTION DETAILS (2 OF 2)

07
10

REVISION NO.	DATE	BY	DESCRIPTION

I. STORMWATER POLLUTION PREVENTION–CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1.

2.

☑ No Action Required ☐ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

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

☐ No Permit Required
☑ Nationwide Permit 14 – PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 – PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post–project TSS.

1.

2.

3.

4.

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☑ No Action Required ☐ Required Action

Action No.

1.

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.
Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

☑ No Action Required ☐ Required Action

Action No.

1.

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

☐ No Action Required ☑ Required Action

Action No.

1. The Federal Migratory Bird Treaty Act(MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit. In accordance with this regulation, the Contractor will avoid disturbing, destroying, removing, or relocating active nests found in trees, culverts, bridges, on the ground, etc. Typical breeding season occurs from March through August; therefore, tree trimming and other activities that may disturb breeding birds should be done in the non –breeding season (September–February), when possible. If work must be performed during the breeding season, the Contractor shall have a qualified biologist conduct a survey of the right of way to determine if bird nests are present. In the event that active nests are encountered on –site during construction, the Contractor shall notify the Engineer and measures shall be taken to avoid disturbance of these birds, their occupied nest,eggs, and/or young, in accordance with the MBTA. Phasing of work during construction may be necessary to stay in compliance with the MBTA. The Contractor can discuss other preventative measures with the Project Engineer and/or District Environmental Staff.

   Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed. Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season. Avoid the removal of unoccupied, inactive nests, as practicable. Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair. Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.

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

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre–Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):
Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on–site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on–site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☑ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☑ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☑ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12–12–2011 (DS)				
05–07–14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01–23–2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				

REVISION NO. | DATE | BY | DESCRIPTION

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS · YESENIA SINGLETON · 102398 · LICENSED PROFESSIONAL ENGINEER

July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

COASTAL BEND BAYS & ESTUARIES PROGRAM

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

ENVIRONMENTAL PERMITS ISSUES AND COMMITMENTS–EPIC

08
10

SITE DESCRIPTION

PROJECT LIMITS: THE PROJECT WILL BEGIN AT THE END OF ERMIS ROAD, WOODSBORO,TEXAS AND CONTINUE ALONG DIRT ROAD NEAR MISSION RIVER.
CULVERT CROSSING #1 IS LOCATED AT LAT:N28° 10' 27" LONG: W97° 11' 58"
CULVERT CROSSING #2 IS LOCATED AT LAT:N28° 10' 32" LONG: W97° 11' 57"
CULVERT CROSSING #3 IS LOCATED AT LAT:N28° 10' 34" LONG: W97° 11' 56"

PROJECT DESCRIPTION: THE WORK CONSISTS OF IMPROVING THREE EXISTING STORM CROSSINGS, LOCATED AT MISSION RIVER DELTA MARSH, AS PART OF THE RESTORATION PROGRAM TO ENHANCE THE RIVER CIRCULATION FOR THE COASTAL BEND BAYS & ESTUARIES PROGRAM, INC. PROJECT CONSISTS OF REMOVING EXISTING CONCRETE PIPES AND DAMAGED STRUCTURES AND INSTALL THREE NEW CROSSINGS AT THE SAME LOCATION. CROSSING #1 CONSIST OF SINGLE 18" RCP EQUIVALENT ELLIPTICAL PIPE; CROSSING #2 CONSIST OF THREE 18" RCP PIPES AND CROSSING#3 CONSIST OF DOUBLE 6' SPAN X 2' RISE BOX CULVERTS. MINOR EXCAVATION TO INSTALL NEW CROSSING, BULK ROCK FOR SOIL STABILIZATION AND EROSION PROTECTION; AND TYPE A, GRADE 1–2 BASE MATERIAL FOR TRAIL SURFACE ON TOP OF THE NEW PIPE CROSSINGS.

MAJOR SOIL DISTURBING ACTIVITIES: SOIL DISTURBING ACTIVITIES WILL INCLUDE MECHANICALLY REMOVE AND DISPOSE OF EXISTING PIPE CROSSING AND DEBRIS AND INSTALLATION OF NEW REINFORCED CONCRETE PIPE CROSSINGS TO ENHANCE RIVER CIRCULATION.

TOTAL PROJECT AREA: ± 0.50 ACRES

TOTAL AREA TO BE DISTURBED: ± 0.50 ACRES

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): 0.40

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: THE EXISTING SURFACE IS DISTURBED AREA, FOOT TRAILS WHERE LIGHT UTILITY VEHICLE TRAILS CROSS NATURAL DRAINAGE PATHWAY WITHIN THE MISSION RIVER DELTA. THE SOIL CONSISTS OF TWO DIFFERENT STRATUMS. LEAN CLAY (CL), WITH SAND, FIRM GRAY, VERY SOFT AND FAT CLAY (CH), WITH SAND, FIRM GRAY, VERY SOFT.

NAME OF RECEIVING WATERS: THE RECEIVING WATERS FOR THE STORM WATER RUNOFF FROM THIS PROPERTY IS THE MISSION RIVER TIDAL SEGMENT 2001. THE TCEQ HAS CLASSIFIED THE AQUATIC LIFE USE FOR THE MISSION RIVER AS, CONTACT RECREATION, AND GENERAL USE ARE FULLY SUPPORTED. THE FISH CONSUMPTION USE WAS NOT ASSESSED.

IMPACTS TO ENDANGERED SPECIES OR HABITAT: THERE WILL BE NO IMPACTS TO ANY ENDANGERED SPECIES OR HABITAT BY THE PERMITTED STORM WATER DISCHARGES.

CONSERVATION MEASURES:

EASTERN BLACK RAIL: THE SPECIES MAY BE PRESENT IN ALL OF THE TEXAS COASTAL COUNTIES YEAR–ROUND. THE SPECIES IS MOST VULNERABLE DURING BREEDING, CHICK REARING, AND THE FLIGHTLESS MOLT PERIOD. IF THE PROPOSED PROJECT AREA IS LOCATED IN OR NEAR A WETLAND WITH POTENTIAL EASTERN BLACK RAIL HABITAT (E.G., DENSE OVERHEAD COVER, MOIST SOILS THAT ARE OCCASIONALLY DRY AND INTERSPERSED OR ADJACENT TO SHALLOW WATER, DEPTHS UP TO 5 CM BUT TYPICALLY <3 CM) AS DESCRIBED IN THE FINAL RULE (PGS. 63767, 63798, AND 63800) THE SITE WILL BE EVALUATED FOR BLACK RAILS AND THE FOLLOWING CONSERVATION MEASURES ARE RECOMMENDED.
ON–SITE VEGETATIVE FIELD SURVEYS WILL BE CONDUCTED BEFORE WORK BEGINS TO IDENTIFY POTENTIAL BLACK RAIL HABITAT WITHIN THE PROJECT AREA. IF SUITABLE HABITAT IS FOUND, SURVEYS SHOULD BE DONE TO ASSESS BLACK RAIL PRESENCE WITHIN THE PROJECT AREA. IF SURVEYS ARE NOT POSSIBLE, BLACK RAILS SHOULD BE PRESUMED TO BE PRESENT.
SITES WHERE BLACK RAILS ARE KNOWN OR PRESUMED TO BE PRESENT, WILL BE AVOIDED AND NO CONSTRUCTION ACTIVITIES WILL OCCUR WITHIN THE HABITAT FROM MARCH 1 THROUGH SEPTEMBER 30 (BREEDING, NESTING, CHICK REARING, AND FLIGHTLESS MOLTING SEASON). IF THIS TIMING RESTRICTION CANNOT BE ACHIEVED, THEN WE RECOMMEND THE FOLLOWING MEASURES: ALL INDIVIDUALS WORKING ON THE PROJECT WILL BE PROVIDED WITH INFORMATION ON HOW TO IDENTIFY THE SPECIES AND MEANS TO MINIMIZE DISTURBANCE TO THE SPECIES AND THEIR HABITAT. PROJECT ACTIVITIES SHALL BE LIMITED TO DAYLIGHT HOURS.HABITAT WHERE BLACK RAILS HAVE BEEN DETECTED OR PRESUMED TO BE PRESENT WILL BE MARKED TO AVOID PLACEMENT OF MATERIAL, TRAFFIC, EQUIPMENT MOVEMENT, ETC.
IF WORK IS CONDUCTED OUTSIDE MARCH 1 THROUGH SEPTEMBER 30, AND TEMPORARY ACCESS ROUTES, PIPELINE ROUTES, OR STAGING AREAS MUST TRANSIT ACROSS IDENTIFIED BLACK RAIL HABITAT, THE CONTRACTOR MUST MINIMIZE TRAFFIC IN THESE AREAS AND THEREFORE MINIMIZE THE CONSTRUCTION FOOTPRINT, (I.E., LIMITED PATHS) TO THE MAXIMUM EXTENT POSSIBLE AND RESTRICT TRAFFIC TO THE SAME PATHWAYS. IN ADDITION, TO FURTHER MINIMIZE IMPACTS, AREAS OF HIGH MARSH HABITAT SHOULD BE LEFT INTACT TO PROVIDE REFUGIA FOR THE BLACK RAIL TO ENSURE ESCAPE ACCESS ROUTES. IF SUITABLE HABITAT IS PRESENT WITHIN THE CONSTRUCTION AREA, WORK ACTIVITIES SHOULD BE RESTRICTED TO ROADS, LEVEES AND OTHER PRE–ESTABLISHED ROUTES THAT ARE ROUTINELY DISTURBED TO AVOID AFFECTING ANY EASTERN BLACK RAILS THAT MAY BE PRESENT.
A BIOLOGICAL MONITOR SHOULD ENSURE A SUFFICIENTLY SLOW PACE OF ALL EQUIPMENT MOVING THROUGH POTENTIAL HABITAT TO ALLOW BIRDS TO ESCAPE AHEAD OF EQUIPMENT. THIS SECRETIVE SPECIES WILL RUN TO ESCAPE ONCOMING DISTURBANCE AND ARE HIGHLY UNLIKELY TO FLY.

EROSION AND SEDIMENT CONTROLS

CONSERVATION MEASURES (CONTINUED):

EQUIPMENT SHOULD BE OPERATED FROM ONE SIDE TO THE OTHER SO BIRDS CAN MOVE OUTSIDE THE PATH OF THE EQUIPMENT AND EVENTUALLY ESCAPE. EQUIPMENT OPERATORS SHALL AVOID USING CIRCULAR ROUTES THAT MIGHT ENTRAP THE BIRDS. DO NOT REMOVE ALL SUITABLE BLRA HABITAT IN A DAY. LEAVE POCKETS OF SUITABLE BLRA HABITAT (REFUGIA) AND/OR HAVE A BIOLOGICAL MONITOR ENSURE DENSE HERBACEOUS COVERED PATHWAYS ARE MAINTAINED INTO UNAFFECTED AREAS. THE REFUGIA REMAINING WITHIN THE PROJECT AREA MAY BE CLEARED AFTER TWO DAYS, AS NEEDED. ACCEPTABLE REFUGIA SIZE IS APPROXIMATELY 10 FEET BY 20 FEET. THE BIOLOGICAL MONITOR WILL HAVE AUTHORITY TO STOP WORK IMMEDIATELY UPON DISCOVERY OF ANY BLRA (ALIVE, INJURED, OR DEAD). THE TEXAS COASTAL ECOLOGICAL SERVICE'S OFFICE SHOULD BE CONTACTED IMMEDIATELY AT (281)286– 8282. PROJECTS INVOLVING REVEGETATION OF DISTURBED AREAS SHOULD USE NATIVE HERBACEOUS PLANTS MIMICKING THE LOCAL SITE COMPOSITION. PROPAGATION OF WOODY SPECIES SHOULD BE AVOIDED IN BLRA HABITAT RESTORATION AREAS.

PIPING LOVER: ALL INDIVIDUALS WORKING ON THE PROJECT WILL BE PROVIDED WITH INFORMATION ON HOW TO IDENTIFY THE SPECIES AND MEANS TO MINIMIZE DISTURBANCE TO THE SPECIES AND THEIR HABITAT. PRIOR TO IMPLEMENTING THE PROJECT, QUALIFIED MONITOR(S) OR OTHER QUALIFIED PERSONNEL WILL SURVEY THE WORK AREA TO ENSURE NO BIRDS ARE PRESENT. USE CARE TO AVOID BIRDS WHEN OPERATING MACHINERY OR VEHICLES NEAR BIRDS. IF A BIRD APPROACHES THE CONSTRUCTION AREA WITHIN 75 FEET, WORK WILL STOP UNTIL THE BIRD(S) LEAVE(S) THE CONSTRUCTION SITE. USFWS SHOULD BE CONTACTED FOR ADDITIONAL GUIDANCE.

WHOOPING CRANE: ALL INDIVIDUALS WORKING ON THE PROJECT WILL BE PROVIDED WITH INFORMATION ON HOW TO IDENTIFY THE SPECIES AND MEANS TO MINIMIZE DISTURBANCE TO THE SPECIES AND THEIR HABITAT. IF A WHOOPING CRANE IS IDENTIFIED WITHIN 1,000 FEET OF AN ACTIVE MANAGEMENT AREA, ALL WORK SHOULD IMMEDIATELY STOP. WHEN THE CRANE HAS LEFT THE 1,000–FOOT AREA ON ITS OWN ACCORD, WORK MAY CONTINUE. ALL EQUIPMENT GREATER THAN 15 FEET HIGH SHOULD BE LAID DOWN AT DUSK AND OVERNIGHT, TO AVOID WHOOPING CRANE STRIKES DURING TIMES OF LOW VISIBILITY. IF EQUIPMENT CANNOT BE LAID DOWN AT DUSK OR OVERNIGHT, THEN SUCH EQUIPMENT WILL BE MARKED USING SURVEYORS FLAGGING TAPE, RED PLASTIC BALLS OR OTHER SUITABLE MARKING DEVICES AND LIGHTED DURING INCLEMENT WEATHER CONDITIONS WHEN LOW LIGHT AND/OR FOG IS PRESENT. ALL WHOOPING CRANE SIGHTINGS SHOULD BE IMMEDIATELY REPORTED TO THE TEXAS COASTAL AND CENTRAL PLAINS ECOLOGICAL SERVICES FIELD OFFICE AT (281) 286–8282 OR THE COASTAL PROGRAM PROJECT MANAGER (281) 682–0750.

NORTHERN APLOMADO FALCON: PROVIDE ALL INDIVIDUALS WORKING IN THE ACTION AREA WITH INFORMATION IN SUPPORT OF GENERAL AWARENESS OF PRESENCE OF APLOMADO FALCONS AND THE MEANS TO MINIMIZE DISTURBANCE TO THE SPECIES AND THEIR HABITAT. DURING MARCH 15 THROUGH AUGUST 15, THE SITE SHOULD BE EVALUATED FOR SUITABLE HABITAT AND ALL LARGE STICK NESTS SHOULD BE EXAMINED FROM A DISTANCE FOR SIGNS OF ADULTS INCUBATING EGGS OR BROODING CHICKS. IF A NEST IS OCCUPIED, A 1,000– FOOT BUFFER SHALL BE MAINTAINED AROUND THE NEST OR PERCH DEPENDING ON THE SENSITIVITY OF THE INDIVIDUAL BIRD TO KEEP HUMAN IMPACTS TO A MINIMUM.

STRUCTURAL PRACTICES:

- ✓ SILT FENCES
- ✓ HAY BALES
- ___ ROCK BERMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- ✓ ROCK BEDDING AT CONSTRUCTION EXIT
- ___ TIMBER MATTING AT CONSTRUCTION EXIT
- ___ CHANNEL LINERS
- ___ SEDIMENT TRAPS
- ___ SEDIMENT BASINS
- ___ STORM INLET SEDIMENT TRAP
- ___ STORM OUTLET STRUCTURES
- ___ CURBS AND GUTTERS
- ✓ STORM SEWERS
- ___ VELOCITY CONTROL DEVICES
- ___ CONCRETE RIP RAP
- ___ BIODEGRADABLE EROSION CONTROL LOGS

SOIL STABILIZATION PRACTICES:

- ___ TEMPORARY SEEDING
- ___ PERMANENT SEEDING
- ___ MULCHING
- ___ SOIL RETENTION BLANKET
- ___ BUFFER ZONES
- ✓ PRESERVATION OF NATURAL RESOURCES

GENERAL :

THE TOP 1–FOOT OF MATERIAL EXCAVATED FROM BELOW THE NORMAL WATER SURFACE ELEVATION IS TO REMAIN ON SITE AND REUSED AS TOP SOIL TO RE–VEGETATE DISTURBED AREAS.

OTHER CONTROLS:

MAINTENANCE: ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER, IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE.

INSPECTION: AN INSPECTION WILL BE PERFORMED BY THE CONTRACTOR EVERY WEEK AS WELL AS AFTER EVERY HALF INCH OR MORE OF RAIN (AS RECORDED ON A RAIN GAUGE TO BE LOCATED AT THE PROJECT SITE). AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER EACH INSPECTION, AND CONTROLS SHALL BE REVISED AS INDICATED BY INSPECTION REPORT.

WASTE MATERIALS: ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE & LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS AND THE TRASH WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE OR ANY OTHER UNAUTHORIZED SITE. WASHOUT AREAS SHALL BE RESTORED UPON PROJECT COMPLETION.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHALL BE CONTACTED IMMEDIATELY (1–800–633–9363). CLEAN UP PROCEDURES SHALL BE CLEARLY POSTED AS WELL AS NAMES OF SPILL RESPONSE PERSONNEL. HAZARDOUS MATERIALS SHALL BE HANDLED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, COUNTY, CITY AND TEXAS WATER COMMISSION RULES.

SANITARY WASTE: ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY, OR AS REQUIRED BY LOCAL REGULATION, BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR, IN ACCORDANCE WITH ALL STATE LAWS AND TEXAS WATER COMMISSION RULES.

OFFSITE VEHICLE TRACKING:

- ✓ HAUL ROADS DAMPENED FOR DUST CONTROL
- ✓ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- ✓ EXCESS DIRT ON ROAD REMOVED DAILY
- ✓ STABILIZED CONSTRUCTION ENTRANCE

POLLUTANT SOURCES FROM AREAS OTHER THAN CONSTRUCTION:

PORTABLE SANITARY WASTE UNITS

REMARKS: DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY OR STREAMBED.

CONSTRUCTION STAGING AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR. CONSTRUCTION SHOULD BE ACCOMPLISHED IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.

ALL WATERWAYS SHALL BE CLEARED OF TEMPORARY EMBANKMENT, TEMPORARY MATTING, FALSE WORK, OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK. NO CONSTRUCTION WASTE WILL BE ALLOWED TO BE BURIED WITHIN THE LIMITS OF THE RIGHT OF WAY.

STORM WATER MANAGEMENT : WE WILL INSTALL A COFFERDAM FOR DE–WATERING OPERATION AND DOUBLE SILT CURTAIN BE NO DEVICES INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL STORM WATER DISCHARGES.

POST–CONSTRUCTION STORM WATER MANAGEMENT : THE THREE NEW PIPE CROSSINGS WILL REMAIN AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED. ROCK RIP–RAP WILL PREVENT SCOURING.

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

COASTAL BEND BAYS & ESTUARIES PROGRAM

REVISION NO.	DATE	BY	DESCRIPTION

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA
CIRCULATION ENHANCEMENT

STORMWATER POLLUTION PREVENTION NOTES

09
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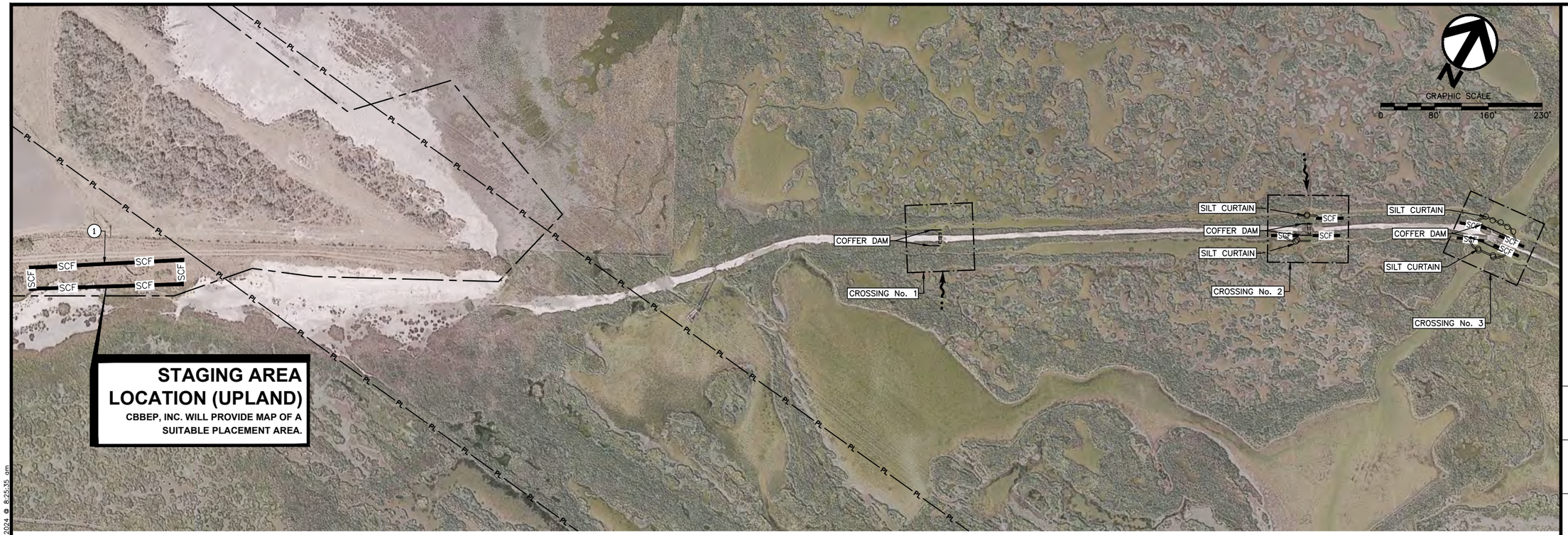
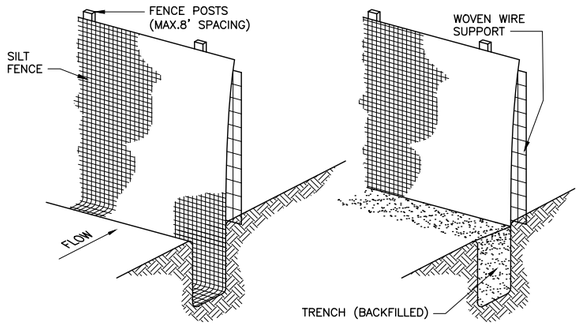


BEST MANAGEMENT PRACTICES NOTES:

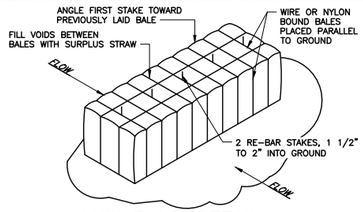
1. THE CONTRACTOR IS RESPONSIBLE FOR PREPARATION OF A SWPPP AND FILING A NOTICE OF INTENT WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) AND OBTAINING A TEXAS POLLUTANT DISCHARGE ELIMINATION SYSTEM (TPDES) PERMIT. THE CONTRACTOR SHALL MAINTAIN A COPY OF THE TPDES PERMIT ON SITE AT ALL TIMES DURING CONSTRUCTION.
2. THE CONTRACTOR SHALL ABIDE BY THE PROVISIONS OF TCEQ STORM WATER POLLUTANT DISCHARGE ELIMINATION SYSTEM REGULATIONS CONCERNING PERMITS FOR CONSTRUCTION ACTIVITIES, INCLUDING IMPLEMENTATION OF THE POLLUTION PREVENTION PLAN AND BEST MANAGEMENT PRACTICES.
3. FUELING AND MAINTENANCE OF VEHICLES AND EQUIPMENT SHALL BE PERFORMED IN COMPLIANCE WITH EPA AND ALL OTHER FEDERAL AND STATE REGULATIONS.
4. ALL TEMPORARY EROSION/SEDIMENTATION CONTROL DEVICES SHALL BE IN PLACE PRIOR TO BEGINNING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE EROSION/ SEDIMENTATION CONTROL MEASURES TO PROTECT ADJACENT PROPERTIES, STORM SEWERS AND DRAINAGEWAYS.
5. NATURAL AND CULTIVATED VEGETATION SHALL BE LEFT UNDISTURBED AS MUCH AS POSSIBLE.
6. THE CONTRACTOR SHALL CONSTRUCT STRUCTURAL BEST MANAGEMENT PRACTICES AS NEEDED AND AS REQUIRED TO PREVENT SILT AND DEBRIS FROM ENTERING INTO THE STORM SEWER SYSTEM.
7. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES AT SUFFICIENT LOCATIONS (AS NEC.) TO PREVENT VEHICLES AND EQUIPMENT FROM TRACKING MUD ONTO EXISTING STREETS.
8. THE CONTRACTOR SHALL BE REQUIRED TO SPRINKLE FOR DUST CONTROL AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
9. THE CONTRACTOR SHALL INSPECT TEMPORARY EROSION/SEDIMENTATION CONTROLS PERIODICALLY TO ENSURE THAT THE CONTROLS HAVE NOT BEEN SIGNIFICANTLY DISTURBED. ANY SEDIMENT OR DEBRIS THAT HAS ACCUMULATED SHALL BE REMOVED AND PLACED IN A DESIGNATED SPOILS DISPOSAL SITE.
10. ALL TREES WITHIN THE LIMITS OF CONSTRUCTION SHALL BE PROTECTED DURING CONSTRUCTION WITH TEMPORARY FENCING OR OTHER APPROVED MEANS. WHERE CONDITIONS PREVENT INSTALLING TEMPORARY FENCING AT LEAST 4 FEET FROM THE TREE TRUNK, THE CONTRACTOR SHALL PROTECT THE TREE TRUNK WITH STRAPPED–ON PLANKING. USE OF NAILS IS PROHIBITED.
11. THE CONTRACTOR SHALL NOT USE MECHANICAL EXCAVATORS, TO THE MAXIMUM EXTENT PRACTICAL, WITHIN THE CRITICAL ROOT ZONE OF TREES TO AVOID DAMAGE TO THE TREE'S ROOT SYSTEM. THE CONTRACTOR SHALL DIRECTIONAL BORE UTILITY LINES OR HAND DIG UTILITY LINES WITHOUT DAMAGING ROOTS.
12. ALL DISTURBED AREAS SHALL BE RESTORED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. A MINIMUM OF 4 INCHES OF TOPSOIL SHALL BE PLACED IN ALL DISTURBED AREAS. THE CONTRACTOR SHALL BEGIN RESTORATION AS SOON AS FINAL SHAPING OR USE OF THE AREA IS COMPLETE, PRIOR TO FINAL COMPLETION OF ALL IMPROVEMENTS. RESTORATION SHALL INCLUDE HYDRO MULCHING, SEEDING OR SODDING, FERTILIZING, FIBER MULCHING AND WATERING. RESTORATION SHALL BE ACCEPTABLE ONLY WHEN THE GRASS HAS REACHED A HEIGHT OF AT LEAST 1 INCH WITH 85 PERCENT COVERAGE, AND NO BARE SPOTS GREATER THAN 10 SQUARE FEET EXIST.
13. ALL NEW GRASS SOD AREAS SHALL BE IRRIGATED OR SPRINKLED IN A MANNER WHICH WILL NOT ERODE THE TOPSOIL BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF 6 INCHES.



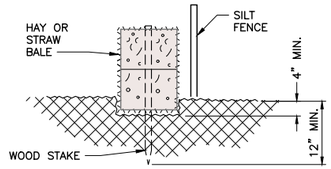
1 SILT FENCE
NOT TO SCALE

SILT FENCE NOTES:

1. POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW.
3. THE TRENCH SHOULD BE A MINIMUM OF 6 INCHES DEEP AND 4–8 INCH WIDE TO ALLOW FOR THE SILT FENCE TO BE LAID IN THE GROUND AND BACKFILLED.
4. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POSTS.
5. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
6. SILT FENCE SHALL BE REMOVED WHEN IT HAS SERVED ITS USEFULNESS, SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. SEDIMENT TRAPPED BY THIS PRACTICE SHALL BE DISPOSED OF IN AN APPROVED SITE IN A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.
8. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES.



HAY BALE DETAIL



BEDDING DETAIL

2 HAY BALE BARRIER FENCE
NOT TO SCALE

HAY BALE NOTES:

1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES. FILL THE VOIDS BETWEEN BALES WITH SURPLUS STRAW. PLACE BALES WITH BINDING PARALLEL TO GROUND SURFACE.
2. WHERE POSSIBLE EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4 INCHES.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY 3/8–INCH REBAR STAKES DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARDS THE PREVIOUS BALE TO FORCE THE BALES TOGETHER.
4. BALES SHALL BE BOUND BY EITHER WIRE OR NYLON ROPE TIED ACROSS THE HAY BALES.
5. INSPECTION SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY BY CONTRACTOR, AS NEEDED.
6. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES.

LEGEND

		QUANTITY
	COFFER DAM (SEE DETAIL ON PAGES 3, 4 & 5).	535 LF.
SCF	SILT CONTROL FENCE (SEE DETAIL 1 ON THIS SHEET).	1,365 LF.
	SILT CURTAIN (SEE DETAIL ON PAGES 3, 4 & 5).	220 LF.
	LIMITS OF IMPROVEMENTS	
	STORMWATER DIRECTIONAL DRAINAGE ARROW	

CONTRACTOR/OPERATOR IS RESPONSIBLE FOR PREPARATION AND IMPLEMENTATION OF A SPECIFIC STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH TCEQ REQUIREMENTS PRIOR TO COMMENCING WORK. THE SWPPP SHOULD INCLUDE THIS SHEET TO DEFINE THE TYPE AND LOCATION OF PROPOSED BMP'S.

PROJECT No.: C285–22106.Task 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER
July 9, 2024

LJA ENGINEERING
TBPE FIRM REG. NO. F-1386

COASTAL BEND BAYS & ESTUARIES PROGRAM

REVISION NO.	DATE	BY	DESCRIPTION

COASTAL BEND BAYS & ESTUARIES PROGRAM, INC.
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

STORMWATER POLLUTION PREVENTION PLAN & DETAILS

10
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G:\CLIENTS\COASTAL BEND BAYS & ESTUARIES PROGRAM – C285\22106-Wk #1 Mission River Delta Circulation Enhancement\CAD\10 SWPP.dwg mcflores Tue, Jul 09, 2024 @ 8:25:35 am

361.991.8550
TBPELS F-1386
TBPELS 10110501
www.LJA.com
5350 South Staples Street, Suite 425, Corpus Christi, Texas 78411

ADDENDUM NO. 1

Date: August 12, 2024
Project: Mission River Delta Circulation Enhancement
LJA Project No. C285-22106.Task1
Client: Coastal Bend Bays & Estuaries Program, Inc

Prospective bidders are hereby notified of the following modifications to the contract documents. These modifications shall become a part of the contract documents. The provisions of the contract documents not specifically affected by the addendum shall remain unchanged.

I. QUESTIONS/CLARIFICATIONS

1. **It was mentioned during the pre-bid meeting that all existing vegetation needs to be protected. Do crane mats on the ground count as protecting the vegetation? Will we be able to create a turnaround/staging area at each crossing utilizing the crane mats so that equipment and trucking can come in and out?** *Yes, board mats can be used to make staging areas at the crossings on top of the vegetation, while the vegetation may be temporarily affected, the board mats main purpose is to prevent rutting the soil. After construction is complete, the area should be returned to pre-construction contours.*

2. **Bid Item 8, is the (13.5" X 22" arched pipe) equivalent to elliptical pipe an acceptable substitute?** *Yes*

3. **Bid item 12 "Filter Fabric for wrap rock rip rap" is not referenced in drawings. Unclear what that is referring to.** *This will be used to wrap the crushed limestone base material on top of the existing road.*

4. **Bid item 13 on the bid form refers to "flowable backfill" with a quantity of 10 CY. I don't see this referenced in the drawings as the other materials in the bid form are.** *This is alternate material in lieu of the 3" crushed limestone base under the piping for the contractor's constructability.*

5. **Bid item 19 "reshape/regrade ditch" referring to either side of the new crossings?** *Yes, minimum excavation on both sides of the ditch to allow water circulation varies from 2' min to 18' max, refer to section B-B in each crossing.*

6. **Bid Item 20, Where is a soil retention blanket required?** *The soil retention blanket may be needed for soil stabilization and permanent erosion protection on the roadway side slope.*

7. **Bid Item 21, Where are the bollards to be placed and what are the details for setting them?** *Four (4) wooden bollards with delineators, size 2 per each crossing, TxDOT standard detail. (See details on next page).*

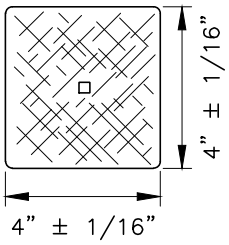
Please acknowledge receipt of this addendum in the appropriate place in your PROPOSAL FORM.

End of Addendum No. 1

STATE OF TEXAS
YESENIA SINGLETON
102398
LICENSED PROFESSIONAL ENGINEER

Yesenia Singleton

Yesenia Singleton, PE
Project Engineer



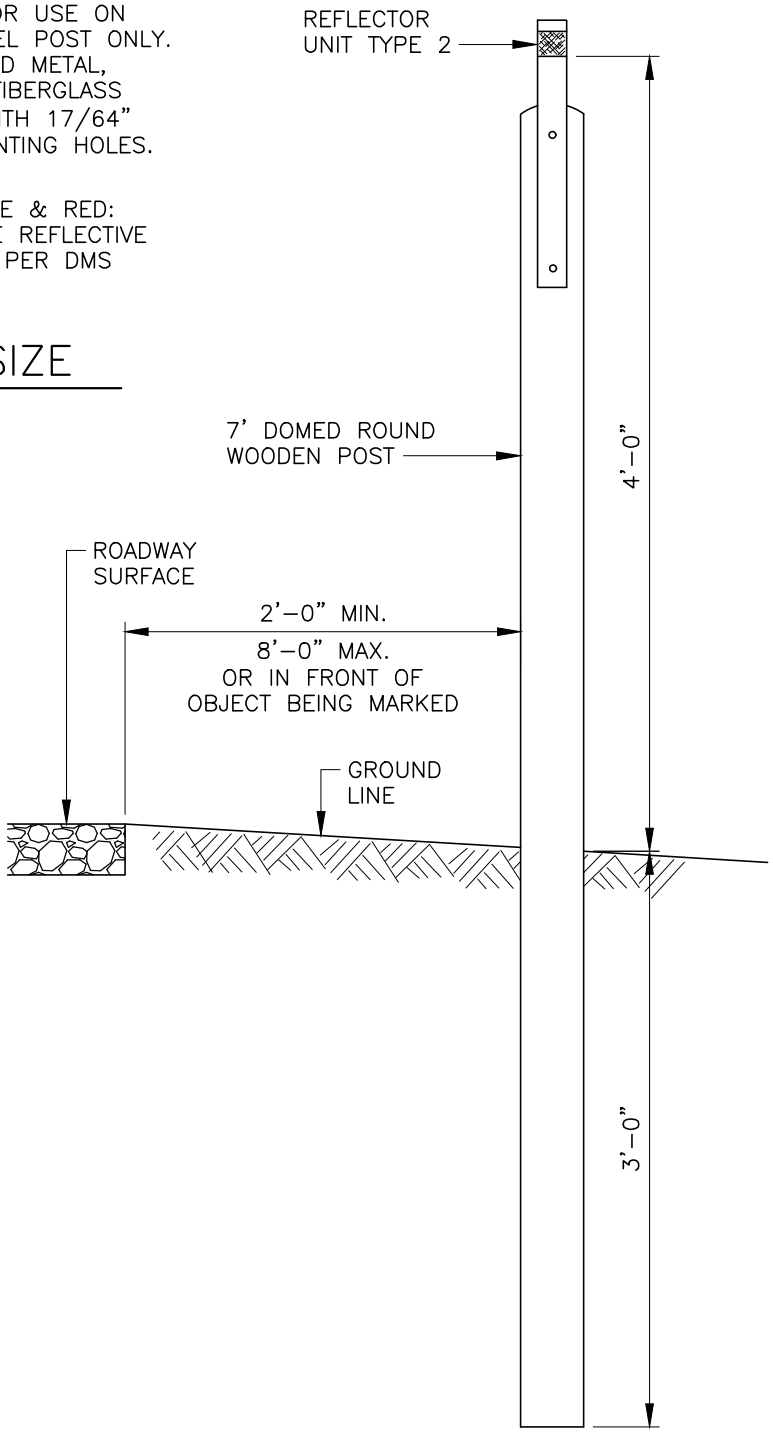
TYPE 2

NOTES:

1. TYPE 2 – FOR USE ON WIING CHANNEL POST ONLY. USE APPROVED METAL, PLASTIC OR FIBERGLASS BACKPLATE WITH 17/64" SQUARE MOUNTING HOLES.
2. YELLOW, WHITE & RED: CONFORMABLE REFLECTIVE SHEETING AS PER DMS 8300.

REFLECTOR UNIT SIZE

NOT TO SCALE



GENERAL NOTES:

1. PLACE DELINEATORS ON A SECTION OF ROADWAY AT A CONSISTENT DISTANCE FROM THE EDGE OF ROAD.
2. WHERE A RESTRICTION PREVENTS CONSISTENT PLACEMENT FROM THE EDGE OF ROAD, PLACE THE AFFECTED OBJECT MARKERS IN LINE WITH THE INNERMOST EDGE OF THE OBSTRUCTION.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE TRANSITION.

TYPICAL POST INSTALLATION

NOT TO SCALE

Addendum No. 1
Page 2 of 2

LJA ENGINEERING
TEXAS ENGINEERING FIRM F-1386

COASTAL BEND BAYS & ESTUARIES
MISSION RIVER DELTA CIRCULATION ENHANCEMENT

DELINEATOR & OBJECT MARKER

SCALE:	AS NOTED
DRAWN BY:	sd
APPROVED BY:	YS
DATE:	08.12.2024
JOB NO.	C285-22106-WA#1
SHEET NO.	1 OF 1