LAGUNA MADRE

BIDDING AND CONTRACT DOCUMENTS

FOR

Tarpon Ave. & Island Ave, Water and Sanitary Sewer Improvements in Port Isabel Texas

BID NO.: WS-19-10-01

Laguna Madre Water District

BOARD OF DIRECTORS:

SCOTT D. FRIEDMAN.....CHAIRMAN
HERB HOUSTON.....VICE CHAIRMAN
ALEX AVALOS..... SECRETARY
ADAM LALONDE..... .....DIRECTOR
JASON STARKEY ..... DIRECTOR

LAGUNA MADRE WATER DISTRICT ADMINISTRATION:

CARLOS J. GALVAN Jr..... .....GENERAL MANAGER
ROBERT GOMEZ. .....DIRECTOR OF OPERATIONS
EDUARDO SALAZAR ..... DIRECTOR OF FINANCE
CHARLES ORTIZ, P.E. .....DISTRICT ENGINEER
ENRIQUE SAMANIEGO.....PURCHASING AGENT

PREPARED BY:

AGH
Engineering & Surveying
6305 Paredes Line Road 78526 Tel. (956) 574-8300
Firm No. F-5197 Fax. (956) 574-8305

STATE OF TEXAS
ALFREDO G HERNANDEZ
70958
REGISTERED
PROFESSIONAL ENGINEER

SET NO. ___

AGH Job #2019-0043

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INVITATION TO BIDDERS
NOTICE TO BIDDERS OF THE LAGUNA MADRE WATER DISTRICT
TARPON AVE. AND ISLAND AVE., WATER AND SANITARY SEWER IMPROVEMENTS PROJECT
Bid No. WS-19-10-01

SEALED PROPOSALS addressed to Carlos Galvan, General Manager, Laguna Madre Water District, 105 Port Road, Port Isabel, Texas, 78578, will be received until_October 30, 2019_, at the District's offices for construction of: 8 and 12 inch gravity sewers with new fiberglass manholes and the reconnection of existing services within Tarpon Street right of way and water line along Island Ave.
A Pre-Bid Conference will be held on Wednesday, October 23, 2019 at 10:00 AM, Laguna Madre Water District, Board Room, 105 Port Rd, Port Isabel, TX 78578.

CONTRACT DOCUMENTS, as needed for bidding on the project, may be purchased from the Engineer, **AGH Engineering & Surveying, LLC, (956) 574-8300,** at a non-refundable cost of **$75.00** per set for pickup at the address of 6305 Paredes Line Road; Brownsville, Texas; 78526. Sets can be ordered upon receipt of shipping vendor account number and prepayment of deposit. Copies of the Contract Documents have also been provided to the following locations where the documents can be examined free of charge:

1. Rio Grande Valley AGC of Texas, 6918 West Expressway 83, Harlingen, TX 78552, Phone: (956) 423-4091; and
2. Laguna Madre Water District, 105 Port Rd., Port Isabel, TX 78578, Phone: (956) 943-2626.

Proposals shall be accompanied by either an **ACCEPTABLE BID BOND OR CERTIFIED CHECK** in an amount not less than five (5) percent of the total maximum bid price, payable without recourse to Laguna Madre Water District, as a guarantee that the bidder will within ten (10) days after notice of award enter into a Contract with District and furnish a Performance Bond and Payment Bond, each in the amount of 100 percent of the Contract Price.

BIDDERS are expected to review the contract documents to inform themselves of requirements for the project.

Equal Opportunity in Employment – All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin. Bidders will be required to comply with the President's Executive Order No. 11246, as amended by Executive Order No. 11375, and as supplemented in Department of Labor regulations 41CFR Part60.

IN CASE OF AMBIGUITY or lack of clearness stating the price in the bids, the Laguna Madre Water District reserves the right to consider the lowest responsive, responsible bidder. The **LAGUNA MADRE WATER DISTRICT** reserves the right to reject any or all bids, waive any or all informalities, and to award the Contract to the bidder who in the opinion of the District offers the proposal in the District's best interests.

BIDDERS are cautioned that conditional or qualified bids, or bids not in the proper form may be rejected.

Mr. Carlos Galvan, General Manager
Laguna Madre Water District
105 Port Road; Port Isabel, Texas 78578

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The LAGUNA MADRE WATER DISTRICT (herein called the "Owner") invites bids on the form attached hereto, all blanks of which must be appropriately filled in, in ink. Bids will be received by the Owner at this office of the **General Manager, Mr. Carlos Galvan** until **2:00** o'clock (P.M., CST) on **October 30, 2019** and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to Laguna Madre Water District General Manager, 105 Port Rd, Port Isabel, Texas 78578 and designated as Bid for: **TARPON STREET SANITARY SEWER IMPROVEMENTS IN PORT ISABEL TEXAS**

The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above schedule time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within (30) days after the actual date of the opening thereof.

2. PREPARATION OF BID & USE OF SEPARATE BID FORMS

This Project Manual includes a complete set of bidding forms, which are for the convenience of the bidders and are not to be detached from the Manual. Bid form furnished in this Manual for the bidder and should be filled in, in ink.

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his address and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

3. SUBCONTRACTS

The bidder is specifically advised that any person, firm or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the owner.

4. TELEFAXED MODIFICATION

Any bidder may modify his bid by telefaxed communication at any time prior to the scheduled closing time for receipt of bids, provided such telefaxed communication is received by the Owner prior to the closing time, and, provided further, the Owner is satisfied that a written confirmation of the telefaxed modification over the signature of the bidder was mailed prior to the closing time. The telefaxed communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written

confirmation is not received within two (2) days from the closing time, no consideration will be given to the telefaxed modification.

5. METHOD OF BIDDING

Owner invites the following bid(s): Bid for unit price contract. A responsible bidder may bid the Base Bid items, the Alternate Bid items or the Total Bid items consisting of the total sum of the Base Bid items and the Alternate Bid Items.

6. QUALIFICATIONS OF BIDDER

The Owner may make such investigations as he deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

7. BID SECURITY

Each bid must be accompanied by cash, certified cashier's check or a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the Owner, in the amount of five percent (5%) of the bid. Such cash, checks or bid bonds will be returned to all except the three lowest bidders within three (3) days after the opening of bids, and the remaining cash, checks, or bid bonds will be returned promptly after the Owner and the accepted bidder have executed the contract, or, if no award has been made within thirty (30) days after the date of the opening of bids, upon demand of the bidder at any time thereafter, so long as he has not been notified of the acceptance of his bid.

8. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the contract and bonds required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid.

9. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within one hundred and fifty (150) consecutive calendar days thereafter. Bidder must agree also to pay as liquidated damages, the sum of Two-Hundred and Fifty ($250.00) dollars per day for each consecutive calendar day thereafter as hereinafter provided in the General Conditions. The bid form included herewith provides a blank space for the Contractor to submit his proposed time for completion in calendar days. The Contractor is hereby advised that the number of calendar days bid may be a consideration in award of the contract.

10. CONDITIONS OF WORK

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. 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 his contract. Insofar, as possible the contractor, in carrying out his work, must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

11. ADDENDA AND INTERPRETATIONS

No interpretations of the meaning of the plans, specifications or other pre-bid documents will be made to any bidder orally to any bidder. Every request for such interpretation should be in writing addressed to: Laguna Madre Water District, 105 Port Road, Port Isabel, Texas 78578 and to be given consideration must be received at least five (5) calendar days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than three (3) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.

12. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner.

13. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

14. NOTICE OF SPECIAL CONDITIONS

Attention is particularly called to those parts of the contract documents and specifications, which deal with the following:

A. Inspections and testing of materials.
   Contractor will provide documentation of testing for materials.
   All re-testing due to failure shall be at the contractor's expense.
B. Insurance requirements.

15. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable State Laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

16. METHOD OF AWARD - LOWEST QUALIFIED BIDDER

If at the time this contract is to be awarded, the lowest base bid submitted by a responsible bidder does not exceed the amount of funds then estimated by the Owner as available to finance the contract; the contract will be awarded on the base bids only. If such bid exceeds such amount, the Owner may reject all bids or may award the contract on the base bid combined with such deductible alternates applied in numerical order in which they are listed in the Form of Bid, as produces a net amount which is within the available funds.

17. OBLIGATION OF BIDDER

At the time of the opening of bids each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the plans and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument or document shall in no way relieve any bidder from any obligation in respect of his bid.

18. SAFETY STANDARDS & ACCIDENT PREVENTION

With respect to all work performed under this contract, the contractor shall:

1. Comply with the safety standards provisions of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No. 75, Saturday, April 17, 1971.

2. Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees and property).

3. Maintain at his office of other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or a doctor's care of persons (including employees), who may be injured on the job site. In no case shall employees be permitted to work at a job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

19. PRE-BID CONFERENCE

Prior to opening the bids, there shall be a pre-bid conference made available to all bidders. The purpose shall be to discuss any questions the bidders may have concerning the project. The pre-bid conference shall begin at**10:00 AM** on **Wednesday, Oct 30, 2019** at the **Laguna Madre Water District Conference Room** located at **105 Port Rd** in **Port Isabel, Texas 78578**.

20. NOTIFICATION PRIOR TO CONSTRUCTION

Contractor shall notify the Laguna Madre Water District seventy-two (72) hours prior to construction activity.

21. TRAFFIC CONTROL PLAN

Contractor shall implement the Traffic Control Plan prepared by a Registered Texas Professional Engineer of his choosing provided that such Plan has received the approval of the Owner prior to commencing the work.

22. MISCELLANEOUS

a. TERMINATION BY THE LAGUNA MADRE WATER DISTRICT - The Laguna Madre Water District reserves the right of unilateral termination of the contract by providing a thirty (30) day written notice of such intent.

b. POINT OF CONTACT – All information regarding the specifications or bidding procedures please contact Mr. Charles Ortiz, PE, District Engineer, at (956) 943-2626 Extension 130.

c. DISCLOSURE OF INTEREST FORM - Please complete the attached Disclosure of Interest Form and submit with your bid proposal.

d. STATEMENT OF NON-COLLUSION FORM – Enclosed is a Statement of Non-Collusion which must be completed by the vendor and submitted with the bid.

e. ADDENDA-The following Addenda have been received. The modifications to the Contract Documents noted therein have been considered and all costs thereto are included in the Bid Price.

Addendum No. ..... Dated .....

Addendum No. ..... Dated .....

Addendum No. ..... Dated .....

Addendum No. ..... Dated .....

The Laguna Madre Water District reserves the right to reject any and all bids.

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ as Surety, as hereby held and firmly bound unto **Laguna Madre Water District** as OWNER in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed, this _____ day of _____, 20_____.

The Condition of the above obligation is such that whereas the Principal has submitted to **Laguna Madre Water District** certain bid, attached hereto and hereby made a part hereof to enter into a contract in writing, for the **TARPON AVE AND ISLAND AVE, WATER AND SANITARY SEWER IMPROVEMENTS IN PORT ISABEL TEXAS**

NOW, THEREFORE,

(a) If said Bid shall be rejected or in the alternate.

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers the day and year first set forth above.

_____ (L.S.)
Principal

_____
Surety

By: _____

_____
SEAL

BID SCHEDULE

TARPON AVE. AND ISLAND AVE., WATER AND SANITARY SEWER IMPROVEMENTS PROJECT
Bid No. WS-19-10-01

The Bidder, in compliance with the Invitation for Bids having examined the scope of work and written Specifications, hereby proposes to furnish "turn-key" construction services with Labor, Equipment, Materials and Parts for the following Unit prices and lump sums.

TARPON AVENUE					
ITEM	**DESCRIPTION**	**QTY**	**UNIT**	**UNIT PRICE**	**TOTAL**
1	Remove and Replace 8-Inch Sewer Pipe, SDR 26, Polyvinyl Chloride (PVC) Pipe, Incl. Fittings and Bedding. Complete In Place. (All depths)	900	LF		
2	Remove and Replace 12-Inch Sewer Pipe, SDR 26, Polyvinyl Chloride (PVC) Pipe, Incl. Fittings and Bedding. Complete In Place. (All depths)	485	LF		
3	Remove and Replace 48 Inch Fiberglass Manhole. (All depths)	6	EA		
4	Dewatering Complete In Place	1,385	LF		
5	Bypass to Remove and Replace 1385 L.F. Sewer Line and Manholes, as Necessary	1	LS		
6	Design of Trench Safety System Plan	1	LS		
7	Remove and Replace Curb & Gutter Complete In Place	710	LF		
8	Remove and Replace Sewer Services	61	EA		
9	"Trench Safety System", 5' and Greater Depth for Construction, Complete In Place	700	LF		
10	1.5 Inch HMAC and 5" Limestone base, Include Prime Coat	1,828	SY		
11	Traffic Control During Construction, Per Lump Sum	1	LS		
12	Traffic Control Plan By Registered Engineer	1	LS		

13	Install 8-Inch Clean-out as per plans (cul-de-sac area)	1	EA		
14	Install 4-inch PVC 150 psi Waterline as shown on plans. Complete In Place. (All depths)	1,690	LF		
15	Install 4-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	1	EA		
16	Install 6-inch PVC 150 psi Waterline as shown on plans. Complete In Place. (All depths)	798	LF		
17	Install 6-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	2	EA		
18	Reconnect Fire Hydrant as shown on plans	1	EA		
19	Wet Connection (Include Fittings) Complete In Place	1	EA		
	SUB-TOTAL AMOUNT				

ISLAND AVENUE

ITEM	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
20	Install 6-inch PVC 150 psi Waterline on 12" PVC casing as shown on plans. Complete In Place. (All depths)	200	LF		
21	Install 6-inch PVC 150 psi Waterline as shown on plans. Complete In Place. (All depths)	1945	LF		
22	Remove and Replace Water Services	12	EA		
23	Install 6-inch Wet Connection, Include fittings	8	EA		
24	1.5 Inch HMAC and 5" Limestone Base, Include Prime Coat	100	SY		
25	Remove & and Replace 6-Inch Reinforced Concrete Pavement (Saw-cut)	130	SY		
26	Remove and Replace Reinforced Concrete Driveway	3490	SF		

27	Traffic Control During Construction, Per Lump Sum	1	LS		
28	Traffic Control Plan By Registered Engineer	1	LS		
29	Asbestos mitigation (existing 4" water line)	250	LF		
30	Install 2-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	1	EA		
26	Install 4-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	3	EA		
27	Install 6-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	11	EA		
28	Install 8-Inch AWWA Gate Valve Resilient w/valve box (Include Fittings) Complete In Place	1	EA		
29	Reinforced Concrete Valley-gutter (3 ft wide) Include Base Complete In Place	35	LF		
30	Remove and Relocate mailbox structure, Include Concrete Base Sta 7+50, as shown on plans Complete In Place	1	EA		
31	Remove and replace Curb & Gutter Complete In Place	130	LF		
				SUB-TOTAL AMOUNT	$ -
				TOTAL Tarpon Ave + Island Ave	$ -

TOTAL AMOUNT OF BID:_____

(Written in Words)

CONTRACTOR REPRESENTATIVE

NAME (PRINT):_____

SIGNATURE:_____

DATE: _____

CONTRACTOR'S
PRE-BID DISCLOSURE STATEMENT

All questions must be answered or you will be deemed non-responsive and subject to rejection. The data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit an additional information if he/she desires.

1. This Pre-bid Disclosure Statement is submitted to the Laguna Madre Water District by:

_____

_____ a corporation, _____ a co-partnership, or _____ an individual.

2. Year in business under present business name? : _____

3. Years of experience in construction work of the type called for in this contract as: _____ a general contractor, _____ a sub-contractor _____.

4. What projects has your organization completed? List most recent FIRST.

Contracts Amount Type of Work Date Completed Owner's Name and Address

_____

_____

_____

_____

5. What projects does your organization have under way as of this date? :

Contracts Amount Type of Work Date Completed Owner's Name and Address

_____

_____

_____

_____

6. Have you ever failed to complete any work awarded to you?
_____ Yes _____ No. If yes, state where and why?

_____

_____

_____

7. Are you present in any major litigation or lawsuits involving construction work of any type?
_____ Yes _____ No. If yes, explain?

_____

_____

_____

_____

8. Explain in detail the manner in which you have inspected the work proposed in this contract:

9. Explain in detail you plan or layout for performing the work proposed in this contract:

10. If this contract is awarded to you, your company's administrative manager for the work will be Mr. (Ms.) _____, and your resident construction superintendent will be Mr. (Ms.) _____.

11. What experience in this type of work is enjoyed by the individual designated as superintendent above?

12. What portions of the work do you intend to sublet?

13. What equipment do you own that is available for the proposed work?

Quantity	Description, Size, Capacity, Etc…	Condition	Years in Service	Present Location

14. Have you received firm offers for all major items of material and/or equipment within the prices used in preparing your proposal? _____ Yes _____ No

The signatory of this questionnaire guarantees the truth and accuracy of all statements herein made and all answers herein expressed.

Dated this _____ day of _____, 20_____.

By: _____

Title: _____

STATE OF _____

COUNTY OF _____

Subscribe and sworn to before me this _____ day of _____, 20_____.

_____

Notary Public

My Commission expires: _____

SUB-CONTRACTOR'S
PRE-BID DISCLOSURE STATEMENT

All questions must be answered or you will be deemed non-responsive and subject to rejection. The data given must be clear and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit an additional information if he/she desires.

15. This Pre-bid Disclosure Statement is submitted to the Laguna Madre Water District by:

_____

_____ a corporation, _____ a co-partnership, or _____ an individual.

16. Year in business under present business name? : _____

17. Years of experience in construction work of the type called for in this contract as: _____ a general contractor, _____ a sub-contractor _____.

18. What projects has your organization completed? List most recent FIRST.

Contracts Amount	Type of Work	Date Completed	Owner's Name and Address

19. What projects does your organization have under way as of this date? :

Contracts Amount	Type of Work	Date Completed	Owner's Name and Address

20. Have you ever failed to complete any work awarded to you?
_____ Yes _____ No. If yes, state where and why?

_____

_____

_____

21. Are you present in any major litigation or lawsuits involving construction work of any type?
_____ Yes _____ No. If yes, explain?

_____

_____

_____

22. Explain in detail the manner in which you have inspected the work proposed in this contract:

23. Explain in detail you plan or layout for performing the work proposed in this contract:

24. If this contract is awarded to you, your company's administrative manager for the work will be Mr. (Ms.) _____, and your resident construction superintendent will be Mr. (Ms.) _____.
25. What experience in this type of work is enjoyed by the individual designated as superintendent above?

26. What portions of the work do you intend to sublet?

27. What equipment do you own that is available for the proposed work?

Quantity	Description, Size, Capacity, Etc…	Condition	Years in Service	Present Location

28. Have you received firm offers for all major items of material and/or equipment within the prices used in preparing your proposal? _____ Yes _____ No

The signatory of this questionnaire guarantees the truth and accuracy of all statements herein made and all answers herein expressed.

Dated this _____ day of _____, 20_____.

By: _____

Title: _____

STATE OF _____

COUNTY OF _____

Subscribe and sworn to before me this _____ day of _____, 20_____.

_____

Notary Public

My Commission expires: _____

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 20 ___ , by and between

LAGUNA MADRE WATER DISTRICT hereinafter called "OWNER" doing business as _____ hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the construction of **TARPON AVE. AND ISLAND AVE, WATER AND SANITARY SEWER IMPROVEMENTS IN PORT ISABEL TEXAS.**

2. The CONTRACTOR will furnish all of the material, supplies, tools, equipment, labor and other services necessary for the construction and completion of the PROJECT described herein.

3. The CONTRACTOR will commence the work required by the CONTRACT DOCUMENTS within TEN (10) calendar days after the date of the NOTICE TO PROCEED and will complete the same within 150 calendar days unless the period for completion is extended otherwise by the CONTRACT DOCUMENTS.

4. The CONTRACTOR agrees to perform all the WORK describe in the CONTRACT DOCUMENTS and comply with the terms therein for "Unit Prices" as shown in the BID schedule.

5. The term "CONTRACT DOCUMENTS" means and includes the following:
   (A) Advertisement for Bids
   (B) Invitation for Bids
   (C) Information for Bidders
   -Miscellaneous
   -Ethics forms
   -Definitions
   -Award of contract
   -Contractor's Certification
   -TxDOT –DBE Business Form
   -Public Work Performance and Payment Bonds.
   (D) Vendor Acknowledgement Form
   (E) Certifications
   (F) Safety Records Questionnaire
   (G) Bid Bond
   (H) Bid for Unit Price Contract

(I) Contractor's Pre-Bid Disclosure Statement

(J) Subcontractor's Pre-Bid Disclosure Statement

(K) Agreement

(L) Subcontractor's Certification

(M) Bonding & Insurance Requirements

(N) Performance Bond

(O) Payment Bond

(P) Certificate of Insurance & Power of Attorney

(Q) Certificate of Owner's Attorney

(R) General Conditions

(S) Supplemental General Conditions

(T) Notice to Award

(U) Notice to Proceed

(V) Affidavit of Bills Paid

(W) Index for Technical Specifications

(X) Drawings prepared by AGH Engineering & Surveying, LLC numbered 1 through 14, and dated, September 20, 2019.

(Y) SPECIFICATIONS prepared or issued by AGH Engineering & Surveying, LLC and dated September 24, 2019 .

(Z) ADDENDA:

No. 1, dated _____, 20

No.___, dated _____, 20

No.____, dated _____, 20

6. The OWNER will pay to the CONTRACTOR in the manner and at such times as set forth in the General Conditions such amounts as required by the CONTRACT DOCUMENTS.

7. This Agreement shall be binding upon all parties hereto and their respective heirs, executors, administrators, successors, and assigns.

8. CONTRACTOR GUARANTEE: Neither the final certificate of payment nor any provisions in the CONTRACT DOCUMENTS, nor partial or entire occupancy of the premises by the OWNER, shall constitute an acceptance of work not done in accordance with the CONTRACT DOCUMENTS or relieve the CONTRACTOR of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The CONTRACTOR shall remedy any defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The OWNER will give notice of observed defects with reasonable promptness.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in (5) FIVE each of which shall be deemed an original on the date first above written.

Before me, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribe to the foregoing instrument, and acknowledges to me that he/she executed the same for the purposes and consideration therein stated.

Given under my hand and seal of office on this _____ day of _____, 20__.

_____ Notary Commission expires: _____.

Notary Public in & for Cameron County, Texas.

OWNER: Laguna Madre Water District

BY: _____ _____

Name, Title: Scott Friedman, Chairman

Before me, the undersigned authority, on this day personally appeared _____, known to me to be the person whose name is subscribed to the foregoing instrument, and acknowledges to me that he/she executed the same for the purposes and consideration therein stated.

Given under my hand and seal of office on this _____ day of _____, 20__.

_____ Notary Commission expires: _____.

Notary Public in & for Cameron County, Texas.

CONTRACTOR: _____

BY _____

Name _____

Address _____

_____

BONDING & INSURANCE REQUIREMENTS

A State or local unit of government receiving a grant form the Federal Government which requires contracting for construction or facility improvement shall follow its own requirements relating to bid guarantees, performance bonds, and payment bonds except for contracts exceeding $100,000. For contracts exceeding $100,000, the minimum requirements shall be as follows:

a. A bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" shall consist of a firm commitment such as bid bond, certified check, or other negotiable instrument accompanying a bid as assurance that the bidder will, upon acceptance of his bid, execute such contractual documents as may be required within the time specified.

b. A performance bond on the part of the contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

c. A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and material in the execution of the work provided for in the contract.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

_____

(Name of Contractor)

_____a

(Address of Contractor)

_____ hereinafter called Principal,

(Corporation, Partnership, or Individual)

_____

(Name of Surety)

_____

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Laguna Madre Water District

(Name of Owner)

105 Port Isabel Rd, Port Isabel, Texas 78578

(Address of Owner)

hereinafter called OWNER, in the penal sum of _____ Dollars, $(_____) in lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by the presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, date the _____ day of _____, 20__, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the OWNER, with or without notice to the Surety and during the one year guaranty period, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the OWNER from all coasts and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good an default, then this obligation shall be void: otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise 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 or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in 5 counterparts, each one of which shall be deemed an original, this _____day of _____, 20__.

ATTEST:

_____

By _____ By

_____

(Title) (Title)

(Seal if Corporation)

_____

(Address)

_____

(City, State, Zip Code)

ATTEST:

_____

(Surety Name)

(Seal)

_____ By

_____

(Witness as to Surety) (Attorney-in-Fact)

_____

(Address)

_____

(City, State, Zip Code)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

PAYMENT BOND

KNOW ALL MEN THESE PRESENTS: that

_____

(Name of Contractor)

_____

(Address of Contractor)

a_____hereinafter called Prinicpal, and (Corporation, Partnership or Individual)

_____

(Name of Surety)

_____

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Laguna Madre Water District

(Name of Owner)

105 Port Rd, Port Isabel, Texas 78578

(Address of Owner)

Hereinafter called OWNER, in the penal sum of _____ dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITIONS OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____ 2019, a copy of which is hereto attached and made a part hereof for the construction of:

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, SUBCONTRACTORS, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such WORK, and all insurance premiums on said WORK, and for all labor, performed in such WORK whether by SUBCONTRACTOR or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise 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 or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in 5 counterparts, each one of which shall be deemed an original, this _____day of _____, 20__.

ATTEST:

_____

By _____

_____

(Title)

(SEAL if Corporation)

_____

(Address)

_____

(City, State, Zip Code)

ATTEST:

_____

(Surety Name)

(SEAL)

_____

_____

(Witness as to Surety) (Attorney-in-Fact)

_____

(Address)

_____

(City, State, Zip Code)

NOTE: Date of BOND must not be prior to date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located.

CERTIFICATE OF INSURANCE

AND

POWER OF ATTORNEY

TO BE FURNISHED BY CONTRACTOR

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal representative of Laguna Madre Water District, do hereby certify as follows:

I have examined the attached contract(s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly executed by the proper parties thereto acting through their duly authorized representatives; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

DATE: _____

_____

City Attorney

GENERAL CONDITIONS

1. CONTRACT AND CONTRACT DOCUMENTS

The project to be constructed pursuant to this contract will be financed with assistance from the Department of Housing and Urban Development and is subject to all applicable Federal laws and regulations.

The Plans, Specifications and Addenda, hereinafter enumerated in Paragraph 1 of the Supplemental General Conditions shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained herein and in said documents is solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit or cast light on the interpretation of the provisions to which they refer.

Contents

2. DEFINITIONS

The following terms as used in this contract are respectively defined as follows:

(a) "Contractor": A person, firm or corporation with whom the contract is made by the Owner.
(b) "Subcontract": A person, firm or corporation supplying labor and materials or only labor for work at the site of the project for, and under separate contract or agreement with the Contractor.
(c) "Work on (at) the project": Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employee of the Contractor and any Subcontractor.

3. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

The Contractor will be furnished additional instructions and detail drawings as necessary to carry out the work included in the contract. The additional drawings and instructions thus supplied to the Contractor will coordinate with the Contract Documents and will be so prepare that they can be reasonably interpreted as part thereof. The Contract shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor and the Architect/Engineer will prepare jointly (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment an the completion of the various parts of the work: each such schedule to be subject in change from time to time in accordance with the progress of the work.

4. SHOP OR SETTING DRAWINGS

The Contract shall submit promptly to the Architect/Engineer two copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with two corrected copies. If requested by the Architect/Engineer the Contractor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

5. MATERIALS, SERVICES AND FACILITIES

(a) It is understood that expect as otherwise specifically stated in the Contract Document, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light power, transportation superintendent, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.
(b) Any work necessary to be performed after regular working hours, on Sunday or Legal Holidays, shall be performed without additional expense to the Owner.

6. CONTRACTOR'S TITLE TO MATERIALS

No materials supplies for the work shall be purchased by the Contractor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contract other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

7. INSPECTION AND TESTING MATERIALS

(a) All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or

inspection agency shall be selected by the Owner. The Owner will pay for all laboratory inspection service direct, and not as part of the contract.

(b) Materials of construction, particularly those upon which the strength and durability of the structure may depend, shall be subject to inspection and testing to established conformance with specifications and suitability for uses intended.

8. "OR EQUAL" CLAUSE

Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufactures or vendors names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, any material, article, or equipment of other manufacturers an vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment as proposed, is in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the contractor without the Architect/Engineer's written approval.

9. PATENTS

(a) The Contractor shall hold and save the Owner and its officers, agents, servants, and employees harmless from liability of any nature of kind, including cost and expenses for, or on account of, any patented or unpatented invention, process article, or appliance manufactured or used in the performance of the contract, including its use by the Owner, unless otherwise specifically stipulated in the Contract Documents.

(b) License of Royalty Fees: License and/or Royalty Fees for the use of a process which is authorized by the Owner of the project must be reasonable, and paid to the holder of the patent, or his authorized licensee, direct by the Owner and not by or through the Contractor.

(c) If the Contractor uses any design, device or materials covered by letters, patent or copyright, he shall provide for such use by suitable agreement with the Owner of such patented or copyrighted design, device or material. It is mutually agreed and understood, that, without exception, the contract prices shall include all royalties or costs arising from the use of such design, device or materials, in any way involved in the work. The Contractor and/or his Sureties shall indemnify and save harmless the Owner of the project from any and all claims for infringement by reason of the use of such patented or copyrighted design, device or materials or any trademark or copyright in connection with work agreed to be performed under this contract, and shall indemnify the Owner 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.

10. SURVEYS, PERMITS AND REGULATIONS

Unless otherwise expressly provided for in the Specifications, the Owner will furnish to the Contractor all surveys necessary for the execution of the work.

The Contractor shall procure and pay all permits, licenses and approvals necessary for the execution of his contract.

The Contractor shall comply with all laws, ordinances, rules, orders, and regulations relating to performance of the work, the protection of adjacent property, and the maintenance of passageway, guard fences or other protective facilities.

11. CONTRACTOR'S OBLIGATIONS

The Contractor shall and will, in good workmanlike manner, do and perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, expect as herein otherwise expressly specified, necessary or proper to perform and complete the work required by this contract, within the time herein specific in accordance with the provisions of this contract and said specifications and in accordance with the plans and drawings covered by this contract and any all supplemental plans and drawings, and in the progress of the work. He shall furnish, erect, maintain, and remove such construction plant and such temporary works as may be required.

The Contractor shall observe, comply with, and be subject to all terms, conditions, requirements, and limitations of the contract and specifications, and shall to, carry on, and complete the entire work to the satisfaction of the Architect/Engineer and the Owner.

12. WEATHER CONDITIONS

In the event of temporary suspension of work, or during inclement weather, or whenever the Architect/Engineer shall direct, the Contractor will, and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his Subcontractors so to protect his work, such materials shall be removed and replaced at the expense of the Contractor.

13. PROTECTION OF WORK AND PROPERTY -- EMERGENCY

The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this contract. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury unless such is caused directly by errors contained in the contract by the Owner, or his duly authorized representatives.

In case of an emergency, which threatens loss or injury or property, and/or safety of life, the Contractor will be allowed to act, without previous instructions from the Architect/Engineer, in a diligent manner. He shall notify the Architect/Engineer immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Architect/Engineer for approval.

Where the Contractor has not taken action but has notified the Architect/Engineer of an emergency threatening injury to persons or damage the work or any adjoining property, he shall act as instructed or authorized by the Architect/Engineer.

The amount of reimbursement claimed by the Contractor on account of any emergency action shall be determined in the manner provided in Paragraph 17 of the General Conditions.

14. INSPECTION

The authorized representatives and agents of the Department of Housing and Urban Development shall be permitted to inspect all work, materials, payrolls, and records of personnel, invoices of materials, and other relevant data and records.

15. REPORTS, RECORDS, AND DATA

The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data as the Owner may request concerning work performed or to be performed under this contract.

16. SUPERINTENDENT BY CONTRACTOR

At the site of the work the Contractor shall employ a construction superintendent or foreman who shall have full authority to act for the Contractor. It is understood that such representative shall be acceptable to the Architect/Engineer and shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll.

17. CHANGE IN WORK

No changes in the work covered by the approved Contract Documents shall be made without having prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following methods:

(a) Unit bid prices previously approved.
(b) An agreed lump sum.
(c) The actual cost of:

1. Labor, including foremen;
2. Materials entering permanently into the work;
3. The ownership or rental cost of construction plant and equipment during the time of use on the extra work;
4. Power and consumable supplies for the operation of power equipment;
5. Insurance;
6. Social Security and old age and unemployment contributions.

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of the work. The fee shall be compensation to cover the cost of supervision, overhead, bond, profit and any other general expense.

18. EXTRAS

Without invalidating the contract, the Owner may order extra work or make changes by altering, adding to or deducting from the work, the contract sum being adjusted accordingly, and the consent of the Surety being first obtained where necessary or desirable. All the work of the kind bid upon shall be paid for at the price stipulated in the proposal, and no claims for any extra work or material shall be allowed unless the work is ordered in writing by the Owner or its Architect/Engineer, acting officially for the Owner, and the price is stated in such order.

19. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done here under are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed".

The Contractor agrees that said work shall l be prosecuted regularly, diligently, and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount specified in the contract, not as penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the contract for completing the work.

The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain and said amount is agreed to be the amount of damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.

It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein and definite and certain length of time is fixed for a performance of any act new time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government:

(b) To unforeseeable cause beyond the control and without the fault or negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics quarantine restrictions, strikes, freight embargoes, and severe weather: and

(c) To any delays of Subcontractors or suppliers occasioned by any other the causes specified in subsections (a) and (b) of this article.

Provided, further, that the Contractor shall, within (ten) 10 days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

20. CORRECTION OF THE WORK

All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced and/or corrected, as the case may be by the Contract at his own expense. Rejected material shall immediately be removed any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor here under shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

21. SUBSURFACE CONDITIONS FOUND DIFFERENT

Should the Contractor encounter subsurface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, he shall immediately give notice to the Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans or indicated in the Specifications, he will at once make such changes in the Plans and/or Specifications as he may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

22. CLAIMS FOR EXTRA COST

No claims for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the owner, as aforesaid and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 (c) of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

23. RIGHT OF THE OWNER TO TERMINATE CONTRACT

In the event that any of the provisions of this contract are violated by the Contractor or by any of his subcontractors, the Owner may serve written notice upon the Contractor and the Surety of its intention to terminate the contract, such notices to contain the reason for such intention to terminate the contract, and unless within ten (10) days after the serving of such notice upon the Contractor, such violation or delay shall cease and satisfactory arrangement of correction be made, the contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of such termination, the Owner shall immediately serve notice thereof upon the Surety and Contractor and the Surety shall not have the right to take over and perform the contract: Provided, however, that if the Surety does not commence performance thereof within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion by contract or by force account for the account and at the expense of the Contractor and the Contractor and his Surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may take possession of and utilities in completing the work, such materials, appliance, and plant as may be on the site of the work and necessary therefor.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contract shall

also furnish on forms to be supplied by the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payment thereon. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

25. PAYMENTS TO CONTRACTOR

(a) Not later than the 15th day of each calendar month the Owner shall make a progress payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract, but to insure the proper performance of this contract, the Owner shall retain ten percent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this contract: Provided, that the Contractor shall submit his estimate no later than the first day of the month; Provided, further, that the Owner at any time after fifty percent (50%) of the work has been completed, if it finds that satisfactory progress is being made, may make any of the remaining progress payments in full; Provided, further that on completion of acceptance of each separate building, public work, or other division of the contract, on which the price is stated separately in the contract, payment may be made in full, including retained percentage thereon, less authorized deductions.

(b) In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

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

(d) Owner's Right to Withhold Certain and Make Application Thereof: The Contractor agrees that he will indemnify and save the Owner harmless from all claims growing out of the lawful demands of subcontractors, laborers, workmen, mechanisms, material men, and furnishes of machinery and parts thereof, equipment power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this contract. The Contractor shall, at the Owner's request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If the Contractor fails so to do, then the Owner may, after having served written notice on the said Contractor, either pay unpaid bills, of which the Owner has written notice, direct, or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of this contract, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Owner to either the Contractor or his Surety. In paying any unpaid bills of the Contractor, the Owner shall be deemed the agent of the Contractor, and any payment so made by the Owner shall be considered as a payment made under the contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for any such payments made in good faith.

26. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor for all things done or furnished in connection with this work and for every act and neglect of the Owner and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this contract or the Performance and Payment Bond.

27. PAYMENTS BY CONTRACTOR

The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the

respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extend of each subcontractor's interest therein.

28. INSURANCE

The Contractor shall not commence work under the contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved.

(a) Compensation Insurance: The Contractor shall procure and shall maintain during the life of this contract Workmen's Compensation Insurance as required by applicable State or territorial law for all his employees to be engaged in work at the site of the project under this contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the Contractor's Workmen's Compensation Insurance. In case any class of employees engaged in hazardous work on the project under this contract is not protected under the Workmen's Compensation Statute, the Contractor shall provide and shall cause each subcontractor to provide adequate employer's liability insurance of the protection of such of his employees as are not otherwise protected.

(b) Contractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall procure and shall maintain during the life of this contract Contractor's Public Liability Insurance. Contractor's Property Damage Insurance and Vehicle Liability Insurance in the amounts specified in the Supplemental General Conditions.

(c) Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance: The Contractor shall either (1) require each of his subcontractors to procure and to maintain during the life of his subcontract, Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance of the type and in the amounts specified in the Supplemental General Conditions specified in subparagraph (b) hereof or, (2) insure the activities of his policy, specified in subparagraph (b) hereof,

(d) Scope of Insurance and Special Hazards: The insurance required under subparagraphs (b) and (c) hereof shall provide adequate protection for the Contractor and his subcontractors, respectively, against damage claims which may arise from operation under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him and, also against any of the special hazards which may be encountered in the performance of this contract as enumerated in the Supplemental General Conditions.

(e) Builder's Risk Insurance (Fire and Extended Coverage): Until the project is completed and accepted by the Owner, the Owner, or Contractor (at the Owner's option as indicated in the Supplemental General Conditions, Form HUD 4238-N) is required to maintain Builder's Risk Insurance (fire and extended coverage) on a 100 percent completed value basis on the insurable portion of the project for the benefit of the Owner, the Contractor, subcontractors as their interest may appear. The Contractor shall not include any costs for Builder's Risk Insurance (fire and extended coverage) premium during construction unless the Contractor is required to provide such insurance: however, this provision shall not release the Contractor from his obligation to complete, according to plans and specifications, the project covered by the contract, and the Contractor and his Surety shall be obligated to full performance of the Contractor's undertaking.

(f) Proof of Carriage of Insurance: The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates and date of expiration of policies. Such certificates shall also contain substantially the following statement: "The insurance covered by this certificate will not be canceled or materially altered, except after (10) day's written notice has been received by the Owner."

29. CONTRACT SAFETY

The Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the contract prices as security for the faithful performance of this contract and also payment bond in an

amount not less than one hundred percent (100%) of the contract price or in a penal sum not less than prescribed by State, territorial
Or local law, as security for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract. The performance bond contract and furnishing materials in connection with this contract. The performance bond and payment bond may be in one or in separate instruments in accordance with local law.

30. ADDITIONAL OR SUBSTITUTE BOND

If at any time the Owner for justifiable cause shall be or become dissatisfied with any survey or sureties, then upon the Performance or Payment Bonds, the Contractor shall within five (5) days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond to the Owner.

31. ASSIGNMENTS

The Contractor shall not assign the whole or part of this contract or any moneys due or to become due here under without consent of the Owner. In case the Contractor assigns all or any part of any moneys due or to become due under this contract, the instrument of assignments shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and moneys due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporation of services rendered or materials supplied for the performance of the work called for in this contract.

32. MUTUAL RESPONSIBILITY OF CONTRACTORS

If, through acts of neglect on the part of the Contractor, any other Contractor or any subcontractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other Contractor or subcontractor by agreement or arbitration if such other Contractor or subcontractor will so settle. If such other Contractor or subcontractor shall assert any claim against the Owner on account of any damage alleged to have been sustained, the Owner shall notify the Contractor, who shall indemnify and save harmless the Owner against any such claim.

33. SEPARATE CONTRACT

The Contractor shall coordinate his operations with those of other Contractors; Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep informed of the progress and the detail work of other Contractors and shall notify the Architect/Engineer immediately of lack of progress or defective workmanship on the part of other Contractors. Failure of a contractor to keep informed of the work progressing on the site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by him of the status of the work as being satisfactory for proper coordination with his own work.

34. SUBCONTRACTING

(a) The Contractor may utilize the services of specialty subcontractors on those parts of the work, which, under normal contracting practices, are performed, by specialty subcontractors.
(b) The Contractor shall not award any work to any subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the subcontractor, which statement shall contain such information as the Owner may require.
(c) The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.
(d) The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to work to bind subcontractors to the Contractor by terms of the General Conditions and other contract documents insofar as applicable to the work of subcontracts and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provisions of the contract documents.

(e) Nothing contained in this contract shall create any contractual relation between any subcontractor and the Owner.

35. ARCHITECT/ENGINEER'S AUTHORITY

The Architect/Engineer shall give all orders and directions contemplated under this contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability and fitness of the several kinds of work and materials which are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimate and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties herein relative to said contract or specifications, the determination or decision of the Architect/Engineer shall be a condition precedent to the right of the Contractor to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work, which may arise between the Contractor under this contract and other Contractors performing work for the Owner, shall be adjusted and determined by the Architect/Engineer.

36. STATED ALLOWANCES

The Contractor shall include in his proposal the cash allowances stated in this Supplemental General Conditions. The Contractor shall purchase the "Allowed Materials" as directed by the Owner on the basis of the lowest and best bid of at least three competitive bids. If the actual price for purchasing the "Allowed Materials" is more or less than the "Cash Allowance", the contract price shall be adjusted accordingly. The adjustment in contract price shall be made on the basis of the purchase price without additional charges for overhead, profit, insurance or any other incidental expenses. The cost of installation of the "Allowed Materials" shall be included in the applicable of the Contract Specifications covering this work.

37. USE OF PREMISES AND REMOVAL OF DEBRIS

(a) To take every precaution against injuries to persons or damage to property;
(b) To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors;
(c) To place upon the work or any part thereof only such loads as are consistent with the safety of that portion of the work;
(d) To clean up frequently all refuse, rubbish, scrap materials and debris caused by his operations, to the end that all times the site of the work shall present a near, orderly and workmanlike appearance;
(e) Before final payment to remove all surplus material, false-work, temporary structures including foundations thereof, plant of any description and debris of every nature resulting from his operations and to put the site in a neat, orderly condition;
(f) To effect all cutting, fitting or patching of his work required to make the same to conform to the plans and specifications and except with the consent of the Architect/Engineer, not to cut or otherwise alter the work of any other Contractor.

38. QUANTITIES OF ESTIMATES

Wherever the estimate quantities of work to be done and materials to be furnished under this contract are shown in any of the documents including the proposal, they are given for use in comparing bids and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the work contemplated by this contract and such increase or diminution shall in no way vitiate this contract, nor shall any such increase or diminution give cause for claims or liability for damages.

39. LANDS AND RIGHTS-OF-WAY

Prior to the start of construction, the Owner shall obtain all lands and right-of-way necessary for carrying out and completion of work to be performed under this contract.

40. GENERAL GUARANTY

Neither the final certificate of payment nor any provision in the Contract Documents, not partial or entire occupancy of the premises by the Owner, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy and defects in the work and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final acceptance of the work unless a longer period is specified. The Owner will give notice of observed defect with reasonable promptness.

41. CONFLICTING CONDITIONS

Any provisions in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in these General Conditions shall be void to the extent of such conflict or consistency.

42. NOTICE AND SERVICE THEREOF

Any notice to any Contractor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor at his last given address, or delivered in person to the said Contractor or his authorized representatives of the work.

43. PROVISIONS REQUIRED BY LAW DEEMED INSERTED

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion or correction.

44. PROTECTION OF LIVES AND HEALTH

"The Contractor shall exercise proper precaution at all times for the protection of persons and property and shall be responsible for all damages to persons or property, either on or off the site, which occur as a result of his prosecution of the work. The safety provisions of applicable laws and building and construction codes, in addition to specific safety and health regulations described by Chapter XIII, Bureau of Labor Standards, Department of Labor, Part 1518, Safety and Health Regulations for Construction, as outlined in the Federal Register, Volume 36, No. 75, Saturday, April 17, 1971. Title 29 - Labor shall be observed and the Contractor shall take or cause to be taken, such additional safety and health measures the Contracting Authority may determine to be reasonably necessary."

45. SUBCONTRACTS

"The Contractor will insert in any subcontracts the Federal Labor Standards Provisions contained herein and such other clauses as the Department of Housing and Urban Development may, by instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made."

46. EQUAL EMPLOYMENT OPPORTUNITY

During the performance of this contract the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, religion, sex, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, religion, sex, color or national origin. Such action shall include, but not be limited to, the following: employment upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available

to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the labor union or workers' representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965 and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and order of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the Department of Housing and Urban Development and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and in the Contractor may be declared ineligible for further Government contracts or Federally assisted construction contracts, in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965 and such other sanctions may be imposed and remedies invoked as provided in Executive Order No. 11236 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order No. 11246 of September 25, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Department of Housing and Urban Development may direct as means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Department of Housing and Urban Development, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

47. INTEREST OF MEMBER OF OR DELEGATE TO CONGRESS

No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or to any benefit that may arise therefrom, but this provision shall not be constructed to extend to this contract if made with a corporation for its general benefit.

48. OTHER PROHIBITED INTERESTS

No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the project, shall become directly interested personally in this contractor in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construct of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other pertaining to the project.

49. USE AND OCCUPANCY PRIOR TO ACCEPTANCE BY OWNER

The Contractor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the Owner, provided the Owner:

a. Secures written consent of the Contractor except in the event, in the opinion of the Architect/Engineer, the Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other contract requirements.
b. Secures endorsement from the insurance-carrier and consent of the surety permitting occupancy of the building or use of the project during the remaining period of construction, or
c. When the project consists of more than one building, and one of the building is occupied, secures permanent fire and extended coverage insurance, including a permit to complete construction. Consent of the surety must also be obtained.

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color or national origin. The Contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not limited to, the following: employment, upgrading, demotion, or transfer: recruitment or recruitment advertising; layoff or termination: rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employee and applicants for employment notice to be provided setting forth the provisions of this no discrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, or national origin.

50. PHOTOGRAPHS OF THE PROJECT

If required by the Owner, the Contractor shall furnish photographs of the project, in the quantities and as described in the Supplemental General Conditions.

51. SUSPENSION OF WORK

Should the Owner be prevented or enjoined from proceeding with work either before or after the start of construction by reason of any litigation or other reason beyond the control of the Owner, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay; but time for completion of the work will be extended to such reasonable time as the Owner may determine will compensate for time lost by such delay with such determination to be set forth in writing.

52. MINIMUM WAGES

All laborers and mechanisms employed upon the work covered by this Contract shall be paid unconditionally and not less often than once each week and without subsequent deduction of rebate on any account (except such payroll deductions as are made mandatory by law and such other payroll deductions as are permitted by the applicable regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to the Anti-Kickback Act hereinafter identified), the full amount due at time of payment computed at wage rates not less than those contained in the wage determination decision of said Secretary of Labor (a copy of which is attached and herein incorporated by reference), regardless of any contractual relationship which may be alleged to exist between the Contractor or any subcontractor and such laborers and mechanisms. All laborers and mechanics employed upon such work shall be paid in cash, except that payment may be by check if the employer provides or secures satisfactory facilities approved by the Local Public Agency or Public Body for the cashing of the same without cost or expense to the employee. For the purpose of this clause, contributions made or costs reasonably anticipated under Section 1 (b) (2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of Section 5.5 (a) (1) (iv) of Title 29, Code of Federal Regulations. Also, for the purpose of this clause, regular contributions made or costs incurred for more than a weekly period under plans, funds, or programs, but covering the particular weekly period, are deemed to be constructive made or incurred during such weekly period.

53. UNDERPAYMENTS OF WAGES OR SALARIES

In case of underpayment of wages by the Contractor or by any subcontractor to laborers or mechanisms employed by the Contractor or subcontractor upon the work covered by this Contract, the Local Public Agency or Public Body in addition to such other rights as may be afforded it under this Contract shall withhold from the Contractor, out of any payments due the Contractor, so much thereof as the Local Public Agency or Public Body may consider necessary to pay such laborers or mechanisms the full amount of wages required by the Contract. The amount so withheld may be disbursed by the Local Public Agency or Public Body, for and on account of the Contractor or the subcontractor (as may be appropriate), to the respective laborers or mechanisms to whom the same is due on their behalf to plans, funds, or programs for any type or fringe benefit prescribed in the applicable wage determination.

54. ANTICIPATED COSTS OF FRINGE BENEFITS

If the Contractor does not make payment to trustee or other third person, he may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing fringe benefits under a plan or program of a type expressly listed in the wage determination decision of the Secretary of Labor which is a part of the Contract: Provided, however, The Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to se aside in a separate account asset for the meeting of obligations under the plan or program. A copy of any findings made by the Secretary of Labor in respect to fringe benefits being provided by the Contractor must be submitted to the Local Public in respect to fringe benefits being provided by the Contractor must be submitted to the Local Public Agency or Public Body with the first payroll filed by the Contractor subsequent to receipt of the findings.

55. OVERTIME COMPENSATION REQUIRED BY CONTRACT WORK HOURS AND SAFETY STANDARDS ACT (76 Stat. 357-360: Title 40 U.S.C., Sections 327-332.)

a. Overtime requirements. No Contractor or subcontractor contracting for any part of the Contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any laborer or mechanic in any workweek in which he is employed on such work to work in excess of 8 hours in any calendar day or in excess of 40 hours in such work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times his basic rate of pay for all hours worked in excess of 8 hours in any calendar day or in excess of 40 hours in such work wee, as the case may be.

b. Violation: liability for unpaid wages liquidated damages: In the event of any violation of the clause set forth in paragraph (a), the Contractor and any subcontractor responsible therefor shall be liable to any affected employee for his unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic employed in violations of the clause set forth in paragraph (a), in the sum of $10 for each calendar day on which such employee was required or permitted to work in excess of 8 hours or in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in paragraph (a).

c. Withholding for liquidated damages: The Local Public Agency or Public Body shall withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor, such sums as may administratively be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for liquidated damages as provided in the clause set forth in paragraph (a), (b), and (c) of the Section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may in turn be made.

d. Subcontracts. The Contractor shall insert in any subcontracts the clause set forth in paragraph (a), (b), and (c) of this Section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts which they may enter into, together with a clause requiring this insertion in any further subcontracts that may be in turn be made.

56. EMPLOYMENT OF APPRENTICES/TRAINEES

a. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Manpower Administration, Bureau of

Apprenticeship and Training or with a State Apprenticeship program, who is not individually registered in the program, but who has been certified in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen in any craft classification shall not be greater than the ration permitted to the contractor as to his entire work force wage rate, who is not a trainee as defined in subdivision (b) of this subparagraph or is not registered or otherwise employed as stated above, shall be paid the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The Contractor or subcontractor will be required to furnish to the contracting officer or a representative of the Wage-Hour Division of the U.S. Department of Labor written evidence of the registration of his program and apprentices as well as the appropriate ratios and wage rates (expressed in percentages of the journeyman hourly rates), for the area of construction prior to using any apprentices on the contract work. The wage rate paid apprentices shall not less than the appropriate percentage of the journeyman's rate contained in the applicable wage determination.

b. Trainees. Except as provided in 29 CFR 5.15 trainee will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification, by the U.S. Department of Labor, Manpower Administration, Bureau of Apprentice and Training. The ratio of trainees to journeymen shall not be greater than permitted under the plan approved by the Bureau of Apprenticeship and Training. Every trainee must be paid at not less than the rate specified in the approved program for his level of progress. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Bureau of Apprenticeship and Training shall be paid not less than the wage rate determined by the Secretary of Labor for the classification of work he actually performed. The contractor or subcontractor will be required to furnish the contracting officer or a representative of the Wage-Hour Division of the U.S. Department of Labor written evidence of the certification of his program, the registration of the trainee, and the ratios and wage rates prescribed in the program. In the event the Bureau of Apprenticeship and Training withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended and 29 CFR Part 30.

57. EMPLOYMENT OF CERTAIN PERSONS PROHIBITED

No person under the age of sixteen years and no person who, at the time, is serving sentence in a penal or correctional institution shall be employed on the work covered by this Contract.

58. REGULATIONS PURSUANT TO SO-CALLED "ANTI-KICKBACK ACT"

The Contractor shall comply with the applicable regulations (a copy of which is attached and herein incorporated by reference) of the Secretary of Labor, United States Department of Labor, made pursuant to the so-called "Anti-Kickback Act" of 1934 (48 Stat. 8948: 62 Stat. 862; Title U.S.C., Section 874: and Title 40 U.S.C., Section 276c), and any amendments or modifications thereof, shall cause appropriate provisions to be inserted in subcontracts to insure compliance therewith by all subcontractors subject thereto, and shall be responsible for the submission of affidavits required by subcontractors thereunder, except as said Secretary of Labor may specifically provide for reasonable limitations, variations, tolerance, and exemptions from the requirements thereof.

59. EMPLOYMENT OF LABORERS OR MECHANICS NOT LISTED IN AFORESAID WAGE DETERMINATION DECISION

Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the Contract will be classified or reclassified conformably to the wage determination by the Local Public Agency or Public Body, and a report of the action taken shall be submitted by the Local Public Agency or Public Body, through the Secretary of Housing and Urban Development, to the Secretary of Labor, United States Department of Labor. In the event the interested parties cannot agree on the proper

classification or reclassification of a particular class of laborers and mechanics to be used, the question accompanied by the recommendation of the Local Public Agency or Public Body shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for determination.

60. FRINGE BENEFIT NOT EXPRESSED AS HOURLY WAGE RATE

The Local Public Agency or Public Body shall require, whenever the minimum wage rate prescribed in the Contract for a class of laborers or mechanics include a fringe benefit which is not expressed as an hourly wage rate and the Contractor is obligated to pay cash equivalent of such a fringe benefit, an hourly cash equivalent thereof to be established. In the event the interested parties cannot agree upon a cash equivalent of the fringe benefit, the question, accompanied by the recommendation of the Local Public Agency or Public Body, shall be referred, through the Secretary of Housing and Urban Development, to the Secretary of Labor for determination.

61. POSTING WAGE DETERMINATION DECISIONS AND AUTHORIZED WAGE DEDUCTIONS

The applicable wage poster of the Secretary of Labor, United States Department of Labor and the applicable wage determination decision of said Secretary of Labor with respect to the various classification of laborers and mechanics employed and to be employed upon the work covered by this Contract, and a statement showing all deductions, if any, in accordance with the provisions of this Contract, to be made from wages actually earned by persons so employed or to be employed in such classifications, shall be posted at appropriate conspicuous points at the site of the work.

62. COMPLAINTS, PROCEEDINGS, OR TESTIMONY BY EMPLOYEES

No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

63. CLAIMS AND DISPUTES PERTAINING TO WAGE RATES

Claims and disputes pertaining to wage rates or to classifications of laborers and mechanics employed upon the work covered by this Contract shall be promptly reported by the Contractor in writing to the Local Public Agency or Public Body for referral by the latter through the Secretary of Housing and Urban Development to the Secretary of Labor, United States Department of Labor, whose decision shall be final with respect thereto.

64. QUESTIONS CONCERNING CERTAIN FEDERAL STATUTES AND REGULATIONS

All questions arising under this Contract which relate to the application or interpretation of (a) the aforesaid Anti-Kickback Act, (b) the Contract work Hours and Safety Standard Act, (c) the aforesaid Davis-Bacon Act, (d) the regulations issued by the Secretary of Labor, United States Department of Labor, pursuant to said Acts, or (c) the labor standards provisions of any other pertinent Federal statute, shall be referred, through the Local Public Agency or Public Body and the Secretary of Housing and Urban Development, to the Secretary of Labor, United States Department of Labor, for said Secretary's appropriate ruling or interpretation which shall be authorized and may be relied upon for the purposes of this Contract.

65. PAYROLLS AND BASIC PAYROLL RECORDS OF CONTRACTOR OR SUBCONTRACTORS

The Contractor and each subcontractor shall prepare his payrolls on forms satisfactory to and in accordance with instructions to be furnished by the Local Public Agency or Public Body. The Contractor shall submit weekly to the Local Public Agency or Public Body two certified copies of all payrolls of the Contractor and of the subcontractors, it being understood that the Contractor shall be responsible for the submission of copies of payrolls of all subcontractors. Each such payroll shall contain the "Weekly Statement of Compliance" set forth in Section 3.3 of Title 29, Code of Federal Regulations. The payrolls and basic payroll records of the Contractor and each subcontractor covering all laborers and mechanics employed upon the work covered by this Contract shall be maintained during the course of the work and preserved for a period of 3 years thereafter. Such payrolls and basic payroll records shall contain the name and address of each such employee, his correct classification, rate of pay (including rates of contributions or costs

anticipated of the types described in Section 1 (b) (2) of the Davis-Bacon Act), daily and weekly number of hours worked, deduction made, and actual wage paid. In addition, whenever the Secretary of labor has found under Section 5.5 (a) (1) (iv) of Title 29, Code of Federal Regulations, than the wages of any labor or mechanic include the amount of any cost reasonably anticipated in providing benefits under a plan or program described in Section 1 (b) (2) (B) of the Davis-Bacon Act, the Contractor or subcontractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. The Contractor and each subcontractor shall make his employment records with respect to persons employed by him upon the work covered by this Contract available for inspection by authorized representatives of the Secretary of Housing and Urban Development, the Local Public Agency or Public Body, and the United States Department of Labor. Such representatives shall be permitted to interview employees of the Contractor or of any subcontractor during working hours on the job.

66. SPECIFIC COVERAGE OF CERTAIN TYPES OF WORK BY EMPLOYEES

The transporting of materials and supplies to or from the site of the Project or Program to which this Contract pertains by the employees of the Contractor or of any subcontractor, and the manufacturing or furnishing of materials, articles, supplies, or equipment on the site of the Project or Program to which this Contract pertains by persons employed by the Contractor or by any subcontractor, for the purposes of this Contract, and without limiting the generality of the foregoing provisions of this Contract, be deemed to be work to which these Federal Labor Standards Provisions area applicable.

67. INELIGIBLE SUBCONTRACTORS

The Contractor shall not subcontract any part of the work covered by this Contract or permit subcontracted work to be further subcontracted without the Local Public Agency's or Public Body's prior written approval of the subcontractor. The Local Public Agency or Public Body will not approve any subcontractor for work covered by this Contract who is at the time ineligible under the provisions of any applicable regulations issued by the Secretary of Labor, United States Department of Labor or the Secretary of Housing and Urban Development, to receive an award of such subcontract.

68. PROVISIONS TO BE INCLUDED IN CERTAIN SUBCONTRACTS

The Contractor shall include or cause to be included in each subcontract covering any of the work covered by this Contract, provisions which are consistent with these Federal Labor Standards Provisions and also a clause requiring the subcontractors to include such provisions in any lower tier subcontracts which they may enter into, together with a clause requiring such insertion in any further subcontracts that may in turn be made.

69. BREACH OF FOREGOING FEDERAL LABOR STANDARDS PROVISIONS

In addition to the cause for termination of this Contract as herein elsewhere set forth, the Local Public Agency or Public Body reserves the right to terminate this Contract if the Contractor or any subcontractor whose subcontract covers any of the work covered by this Contract shall breach any of these Federal Labor Standards Provisions. A breach of these Federal Labor Standards may also be grounds for department as provided by the applicable regulations issued by the Secretary of Labor, United States Department of Labor.

70. EMPLOYMENT PRACTICES

The Contractor (1) shall to the greatest extent practicable, follow hiring and employment practices for work on the project which will provide new job opportunities for the unemployed and under employed, and (2) shall insert or cause to be inserted the same provision in each construction subcontract.

71. CONTRACT TERMINATION: DEBARMENT

A breach of Section 45 and the Federal Labor Standards Provisions may be grounds for termination of the contract, and for debarment as provided in 29 CFR 5.6.

SUPPLEMENTAL GENERAL CONDITIONS

1. GENERAL

The Standard General Conditions of the Construction Contract prepared by the ENGINEER's Joint Contract Documents Committee (No. 1910-8 1990 Edition) shall form a part of this contract, together with the following Supplementary General Conditions. A copy of the Standard General Conditions (No. 1910-8) is bound herewith.

The following supplements modify, change, delete, or add to the General Conditions, where any part of the General Conditions is modified or voided by these articles, the unaltered provisions of that part shall remain in effect.

2. DETAILED AMENDMENTS TO THE GENERAL CONDITIONS

The following Articles of the Standard General Conditions are hereby amended as follows:

ARTICLE 1: The definition for Contract Documents is hereby amended to insert the word "General and Supplementary General Conditions", after the word "Agreement"

ARTICLE 2: Add the following definitions:

a. Standard abbreviations: Wherever reference is made to standard specifications, standard of quality or performance, as established by a recognized national authority, the reference may be by initials as generally recognized throughout the authority.

b. Addenda: Supplements to, change in, or corrections to the Drawings and/or Specifications issued in writing by the Engineer during the period of bidding. These addenda shall become a part of the contract and modify the Drawings and/or Specifications as indicated. No verbal changes in the work as shown or described shall become binding.

c. Alternates: Additions, omissions from, or changes to requirements for the project, each of which shall be bid separately and shall be included in or omitted from the contract at the discretion of the owner.

d. Furnish: To supply at the job site the material, equipment, etc., referred to. Installation is not required of the supplier by the Specifications, but shall be arranged for by the General CONTRACTOR.

e. Provide: To furnish and install in the location shown or approved at the job site, the material, equipment, etc., referred to.

ARTICLE 5: BONDS AND INSURANCE

Delete the last sentence of Article 5.1 delaying with U.S. Treasury Department Listing and substitute the following:

All the surety companies providing bonds for this project must be registered with the Secretary of State of the State of Texas.

Add to Article 5.3 the following subparagraphs:

5.3.1. COMPENSATION INSURANCE. The Contractor shall procure and shall maintain during the life of this Contract, Workmen's Compensation Insurance for all of his employees to be engaged in work on this project under this Contract, and in case of any such work sublet, the CONTRACTOR shall require the subcontractor similarly to provide Workmen' Compensation Insurance for all the latter's employees to be engaged in such work unless employees are covered by the protection afforded by the CONTRACTOR's Compensation Insurance. In case of any class of employees engaged in hazardous work on the project, under this Contract and is not protected under the Workmen's Compensation Statute, the CONTRACTOR shall provide and shall cause each subcontractor to provide adequate insurance for employees not otherwise protected.

5.3.2. CONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE. The Contractor shall procure and shall maintain during the life of this contract CONTRACTOR's Public Liability Insurance for injuries, including accidental death, to any one person, and subject to the same limit for each person, on account of one accident, and CONTRACTOR's Property Damage Insurance in amount as follows:

Public Liability	One person	$250,000.00
	Aggregate	$500,000.00
Property Damage		$300,000.00

5.3.3. SUBCONTRACTOR'S PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE. The CONTRACTOR shall require each of his subcontractors to procure and to maintain, during the life of this subcontract, Subcontractor's Public Liability and Property Damage Insurance of the type specified in subparagraph

5.3.4. Hereof, in amounts approved by the OWNER.

5.3.5. SCOPE OF INSURANCE AND SPECIAL HAZARDS. The insurance required under subparagraph 5.3.2. and 5.3.3. hereof shall provide adequate protection for the Contractor and his subcontractors respectively against damage claims which may arise form operations under this Contract, whether such operations are by the insured or by anyone against any special hazards which may be encountered in the performance of this contract.

ARTICLE 6. CONTRACTOR'S RESPONSIBILITIES

Add to subparagraph 6.5:

The CONTRACTOR shall notify the OWNER in writing of any conflict between the Manufacturer's directors and the Contract Documents and shall not perform any work on any item until such conflict has been resolved.

Upon reward of the Contract, the OWNER will, on written request of the CONTRACTOR, furnish the CONTRACTOR with a certificate of exemption from the Limited Sales, Excise and Use Tax in an amount not exceeding the above mentioned bid price for materials or property have been or will be utilized in the performance of the Contract to the full extent of the amount for which a certificate of exemption is requested.

Add the following Subparagraph:

6.3.3. The CONTRACTOR shall acquaint himself with all matters and conditions concerning site and existing construction. any practical criticism or exception regarding feature of the work presented in writing with the Proposal will be considered at that time. If no criticism or exception is given with the Proposal, it shall be assumed that the Contractor agrees that the project, as outlined in the Drawings and Specifications, can be completed satisfactorily. After a Contract Agreement to perform the work has been signed by the CONTRACTOR, it shall then be his responsibility to provide satisfactory work that will meet the full intent of the Contract Documents. The CONTRACTOR shall then pursue this work with the other trades so that all phases of the work may be properly coordinated without delays or damage to any parts of the work.

ARTICLE 13. WARRANTY AND GUARANTEE: TESTS AND INSPECTIONS: CORRECTIONS, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.

Add the following subparagraph:

13.1 Disputes over Improper Functioning. In case of dispute as to the cause of improper functioning of all or any part of the work, the burden of proof that he has complied with the Contract Documents rests with the CONTRACTOR for this work. He shall submit in writing his opinion of the cause of his recommendation for proving the adequacy of his work. The OWNER shall have those tests made, which he deems advisable, by an independent testing laboratory of this choice. If any tests so made indicate a defect in material or workmanship, or that one or more manufactured components of the work are performing below the standard set by the manufacturer's published data and specifications, the entire cost of all such tests shall be paid for the by the CONTRACTOR, and he shall also pay for retesting of the corrected work until it functions satisfactorily.

ARTICLE 14. PAYMENTS AND COMPLETION.

Add the following to Paragraph 14.11:
A qualified person representing the CONTRACTOR shall be present at this final inspection to demonstrate the systems and prove the performance of the equipment. Prior to this inspection, all work shall have been completed, tested, balanced and adjusted and in final operating condition.

Make the following change to Paragraph 14.4 "Approval of Payments"

OWNER shall, within twenty (20) days of presentation to him of an approved application for Payment, pay Contractor the amount approved by Engineer.

ARTICLE 16. ARBITRATION. Delete this entire Article.

Add the following Article.

ARTICLE 18. THE CONTRACTOR SHALL COMPLY WITH THE COMPELAND ACT 48, STATUTE 948 AND ALL AMENDMENTS OR MODIFICATIONS OF THE ORIGINAL ACT OF JUNE 13, 1934.

3. <u>TEMPORARY FACILITIES</u>

(a) Sanitary Facilities for Workmen

(1) CONTRACTOR, shall provide and maintain suitable weathertight, painted sanitary toilet facilities for all workmen for the entire construction period. Comply with all requirements of applicable health authorities. When toilet facilities are no longer required, promptly remove from the site, disinfect and clean the area as required.

(2) CONTRACTOR shall keep toilet facility swept and supplied with toilet tissue at all times.

(b) Weather Protection

(1) Except where otherwise, specified, CONTRACTOR shall, at all times, provide protection against weather, so as to maintain all work, materials, and fixtures free from injury or damages. All new work likely to be damaged shall be covered or otherwise protected as required.

(c) Work Areas

(1) The CONTRACTOR shall be confined to all working easements provided. Storage of excavation material and all contractor equipment and material shall remain within the limits of working easements.

4. <u>TEMPORARY UTILITIES</u>

The CONTRACTOR shall furnish all temporary utilities as required, for the completion of the work.

5. CONSTRUCTION SEQUENCE

(1) That the following sequence of work be used as a basis for preparation to the Construction Schedule.

(2) To cooperate with and facilitate the Contractor in the whole of the work to be carried out subject to the following being observed:

(a) The CONTRACTOR shall, within ten (10) calendar days after the date of the General Contract, submit a Construction Schedule for the approval of the Owner and Engineer. This Schedule shall outline an orderly sequence of construction as required to meet the completion time stipulated in the contract.

(b) The CONTRACTOR shall coordinate his work with that of other contractors whose work may occur at a conflicting time and location. The coordination shall be such that work will be maintained at a normal rate.

(c) Satisfactory access or detour roads shall be provided where necessary due to construction.

6. MEASUREMENT

Before ordering any material or doing any work, the CONTRACTOR will verify all measurements of any existing and new work and shall be responsible for their correctness. Any differences which may be found shall be submitted to the Engineer for consideration before proceeding with the work. No extra compensation will be allowed because of differences between actual dimensions and measurements indicated on the working drawings.

7. PROTECTION

a. The CONTRACTOR shall send proper notices, make all necessary arrangements and perform all other services required for the care, protection and maintenance of all public utilities, including fire plugs, telephone and telegraph poles and wires, and all other items of this character on or about the site, assuming all responsibility and paying all costs for which the OWNER may be liable.

b. Temporary Drainage. The CONTRACTOR shall construct and maintain all necessary temporary drainage and do all pumping necessary to keep the excavation fee of water.

c. Bracing, Shoring and Sheeting. The CONTRACTOR shall provide all shoring, bracing and sheeting as required for safety and for the proper execution of the work; and have same removed when the work is completed.

d. Fires shall not be built on the premises except by the express consent of the OWNER and City Fire Marshall.

8. CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE

a. The CONTRACTOR shall not commence work under this Contract until he has obtained all the insurance required under this paragraph and such insurance has been approved by the OWNER, nor shall the CONTRACTOR allow any subcontractor to commence work on this Contract until the insurance required of the subcontractor has been so obtained and approved.

b. Compensation Insurance. The CONTRACTOR shall procure and shall maintain, during the life of his Contract, Workmen's Compensation Insurance for all of his employees to be engaged in work on this project under this Contract and, in case of any such work sublet, the Contractor shall require the subcontractor similarly to provide Workmen's Compensation Insurance for all the latter's employees to be engaged in such work unless employees are covered by the protection afforded by the CONTRACTOR'S Compensation.

Insurance. In case of any class of employees engaged in hazardous work on the project under this Contract is not protected under the Workmen's Compensation Statute, the CONTRACTOR shall provide and shall cause each subcontractor to provide adequate insurance for employees not otherwise protected.

c. CONTRACTOR's Public Liability and Property Damage Insurance. The CONTRACTOR shall procure and shall maintain during the life of this contract, Contractor's Public Liability Insurance for injuries, including accidental death, to any one person, and subject to the same limit for each person, on account of one accident, and CONTRACTOR'S Property Damage Insurance in amounts as follows:

Public Liability:	One Person	$250,000.00
	Aggregate	$500,000.00
Property Damage		$300,000.00
Automobile Property Damage:		$100,000.00
Automobile Public Liability:	One Person	$250,000.00
	Aggregate	$500,000.00

NOTE: Automobile insurance shall cover all automobiles and trucks owned by the CONTRACTOR.

d. Subcontractor's Public Liability and Property Damage Insurance. The CONTRACTOR shall require each of his subcontractors to procure and maintain during the life of his subcontract, Subcontractor's Public Liability and Property

Damage Insurance of the type specified in subparagraph C hereof, in amounts approved by the OWNER.

e. Proof of Carriage of Insurance. The CONTRACTOR shall furnish the OWNER with certificates showing the type, amount class of operations covered, effective dates and dates of expiration of policies. Such certificates shall also contain substantially the following statements. "The insurance covered by this certificate will not be concealed or materially altered except after ten days written notice has been received by the "OWNER".

9. ACCIDENT PREVENTION

Precaution shall be exercised at all times for the protection of persons (including employees) and property, and hazardous conditions shall be guarded against or eliminated.

10. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

a. It is hereby understood and mutually agreed, by and between the parties hereto, that the date of beginning, rate of progress and the time for completion of the work to be done thereunder are ESSENTIAL CONDITIONS of this Contract; and it is further mutually understood and agreed, by and between the parties hereto, that the work embraced in this Contract shall be commences on a date to be specified in the work order.

b. The CONTRACTOR agrees that said work shall be prosecuted regularly, diligently, and uninterrupted at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed, by and between the parties hereto, that the time for the completion of the work described herein is a reasonable time for completion of same, taking into consideration the average climatic range and usual industrial conditions prevailing in the locality.

c. If the said CONTRACTOR shall neglect, fail or refuse to complete the work within the time herein specified, then the said Contractor does hereby agree, as a part consideration for awarding of this Contract, not as a penalty but as liquidated damages for such breach of calendar day that the CONTRACTOR shall be in default after the time stipulated in the Contract for completing the work.

d. The Damage to OWNER by reason of this contract not being completed as of that date are parties hereto have therefore fixed and limited such damages to the amount stated in the agreement per day for each day the job runs beyond such date and the fixing of such damages constitutes a part of the consideration for the Contract.

e. It is further agreed that time is of the essence of each and every portion of this contract and of the specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where, under the Contract, additional time is allowed for the completion of any work, the new time fixed by such extension

shall not be charged with liquidated damages or any excess cost when the delay in the completion of work is due:

(1) To any preference, priority or allocation order duly issued by the Government.

(2) To enforceable cause, beyond the control and without the fault or negligence of the CONTRACTOR, including, but not restricted to, acts of God, or the public enemy, acts of the OWNER, acts of another Contractor in the performance of the Contract with OWNER, fires, floods, epidemics, Quarantine restriction, strikes, freights embargoes, and unusually severe weather.

(3) To any delays of subcontractors and/or material suppliers occasioned by any of the causes specified in (1) and (2).

(4) Provided, further, that the Contractor shall, within seven (7) days from the beginning of such delay, notify the OWNER, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the CONTRACTOR within a reasonable time of its decision in the matter.

11. INSPECTION AND TESTING OF MATERIALS

a. All materials and equipment/furnished by manufacturers shall be tested, inspected, and certified in accordance with the Contract Documents, laws, ordinances, or any public authority requiring any work to be specifically tested. The cost of such tests, inspections and certifications shall be borne by the CONTRACTOR.

b. The CONTRACTOR shall cooperate with the testing laboratory to the end that the function and services of the laboratory may be properly performed. The Contractor shall give the OWNER's representative and testing laboratory a minimum of twenty-four (24) hours notice of readiness for all testing as required. Costs of all field tests by such a laboratory shall be borne by the OWNER, unless otherwise stipulated in the Supplementary General Conditions, Article 13.

12. REFERENCE POINTS

The ENGINEER will establish horizontal and vertical controls only (reference points and benchmarks) as shown on the construction plans.

The CONTRACTOR must notify the ENGINEER at least 48 hours prior to starting work on any section or part of the work where controls have not been established or are not identifiable or visible to the CONTRACTOR.

The ENGINEER will upon such advance notice assist the CONTRACTOR in locating and identifying the various CONTRACTORS in locating and identifying the various control

points and will replace any control points that have been destroyed by others prior to beginning of CONTRACTOR's operations.

After the control points are established and/or identified as outlined above, maintenance of such control points will be the responsibility of the CONTRACTOR. Any re-staking required for any reason thereafter shall be the final responsibility of the CONTRACTOR.

The CONTRACTOR will provide all other construction staking (cut stakes, blue topping, intermediate string line control, etc.) required to verify grades, depths, thickness and alignment of the various items of construction.

13. SERVICES AT START UP

The CONTRACTOR shall provide the services of technical representative, for the CONTRACTOR furnished equipment, for a sufficient period to assist in start up and initial adjustment of all equipment and to train, advise and consult with the OWNER's operating personnel.

14. PERMITS

Permits, fees and licenses necessary for the pursuit of the work shall be obtained and paid for by the CONTRACTOR.

15. MAINTENANCE OF SITE AND CLEANUP

The work site shall be kept reasonably clean at all times. Surplus materials shall be disposed of by the CONTRACTOR except for those designated to be salvaged. In final cleanup operations, all equipment, scrap materials and temporary structures shall be removed and the site left clean.

16. PROTECTION AND REPLACEMENT OF PROPERTY

Driveways, culverts, storm sewer inlets and laterals, and other public or private property that is destroyed or removed during the construction shall be replaced to its original condition by the CONTRACTOR. Temporary drainage is to be provided as necessary.

17. CONSTRUCTION AREA

CONTRACTOR shall be responsible to maintain and protect in good condition the construction area while under construction and all exposed areas that become damaged shall be CONTRACTOR's responsibility to repair at no cost to owner. This includes construction area being exposed to rainfall, vehicular traffic, etc.

18. PROTECTION OF TREES, AND SHRUBS

Care shall be exercised to prevent damage to trees, plants and shrubs along the work site. No tree, plant or shrub shall be removed unless it interferes unduly with the construction work.

Permission for such removal must first be obtained from the ENGINEER. Provisions of the Technical Specifications shall govern in matters of this nature.

19. BARRICADES AND WARNINGS

Adequate barricades and warning devices shall be provided at the work site. Lights shall be provided between sunset and sunrise when necessary in the opinion of the ENGINEER in accordance with the Traffic Controllers Manual.

20. LOCATION OF & DAMAGE TO EXISTING UTILITIES AND STRUCTURES

The CONTRACTOR is responsible for locating underground obstacles. It is not represented that the Plans show all sewers, water lines, gas lines, telephone lines, and other underground obstacles. The CONTRACTOR shall exercise caution to prevent damage to existing facilities during the progress of the construction work, taking care to locate same, where possible, in advance of the actual work. The ENGINEER will render all assistance possible to the CONTRACTOR in the matter of determining the location of existing utilities by making available such maps, records and other information as may be accessible to him, when requested to do so, but the accuracy of such information will not be guaranteed. The CONTRACTOR shall make good all damage existing utilities resulting from his operations. Where a pipe, duct or other structure of a utility is exposed, which, in the opinion of the ENGINEER requires strengthening, altering or moving, the CONTRACTOR shall perform such work on same, as the ENGINEER may order, which work will be paid for as extra work in accordance with the terms of the Contract relating to extra work. Should the CONTRACTOR, in the layout of his work, encounter any pipe, underground utility, or structure, the location of which has not been furnished to him by the ENGINEER, he shall bring such conditions to the attention of the ENGINEER for his determination of the method to be used to remove or bypass such obstructions.

It is essential that in the event of any damage being caused to existing units then immediate attention be given to their repair, if necessary, at the expense of labor and material scheduled to be employed at the new work. Any repair work carried out shall be at the cost of the CONTRACTOR and shall be to the complete satisfaction of the OWNER, who will acknowledge the same in writing.

It is therefore the duty of the CONTRACTOR prior to the commencement of construction to inspect and accurately record in writing to the OWNER and ENGINEER, the conditions of any unit which he reasonably suspect or knows to be damaged, faulty, or defective.

In addition, any such unit(s) so recorded, which in the opinion of the Contractor may deteriorate further as a result of the proposed mode of operations should be protected and/or remedial measures employed as agreed to, and at the cost of the Owner.

21. MATERIALS AND WORKMANSHIP

No material which has been used by the CONTRACTOR for any temporary purpose whatsoever is to be incorporated in the permanent structure without written consent of the

ENGINEER. Where materials or equipment are specified by a trade for brand name, it is not the intention of the Owner to discriminate against an equal product of another manufacturer, but rather to set a definite standard of quality or performance and to establish an equal basis for the evaluation of bids. Where the words "equivalent", "proper" or "equal to" are used, they shall be understood to mean that the thing referred to shall be properly the equivalent of or equal to some other thing, in the opinion of judgment of the ENGINEER. Unless otherwise specified. all materials shall be of the best of their respective kinds and shall be in all cases fully equal to the approved samples.

Notwithstanding that the words "or equal to" or other such expressions may be used in the Specifications in connection with a material, manufactured article or process, the material,, article or process specifically designated shall be used, unless a substitute shall be approved in writing by the ENGINEER, and the ENGINEER shall have the right to require the use of such specifically designated material, article or process.

22. CUTTING, PATCHING AND FITTING

The CONTRACTOR shall perform all cutting, patching, or fitting of this work that may be required to make its several parts come together properly and fit it to receive or be received by work or others shown on, or reasonably implied to the drawings and Specifications for the completed structure or facility. The CONTRACTOR shall not endanger any work by cutting, digging or otherwise, and shall not cut or alter the work of others unless specifically noted on the drawings and specifications or authorized in writing by the ENGINEER and the OWNERS of such other work.

23. RIGHT OF ENTRY

The OWNER reserves the right to enter the property or location on which the work herein contracted for is to be constructed or installed, by such agents as it may elect, for the purpose of supervising and inspecting the work, or for the purpose of constructing or installing collateral work as said OWNER may desire.

24. SUPERINTENDENT AND INSPECTION BY OWNER

It is agreed by the CONTRACTOR that the OWNER shall be and is hereby authorized to appoint from time to time subordinate engineers, supervisors, or inspectors, as the said OWNER may deem proper, to inspect the material furnished and work done under this agreement, and to see that the said material is furnished and said work is done in accordance with the Specifications. The CONTRACTOR shall regard and obey the directions and instructions of any sub-coordinate engineers, supervisors, or inspectors as appointed, when such directions are consistent with the obligations of this agreement and these accompanying Specifications, provided, however, that should the CONTRACTOR object to any order by any subordinate engineer, supervisor, or inspector, the CONTRACTOR may, within six (6) days, make written notice to the ENGINEER for his decision. Except, as herein before provided, the authority of subordinate engineers, supervisors, or inspectors shall be limited to the rejection of unsatisfactory work and materials and to the suspension of the work, until the question of acceptability can be referred to the ENGINEER.

25. SUPERINTENDENT BY CONTRACTOR

Except where the CONTRACTOR is an individual and gives his personal superintendent to the work, the CONTRACTOR shall provide a competent superintendent, satisfactory to the OWNER and the ENGINEER, on the work at all times during working hours with full authority to act from him. The CONTRACTOR shall provide an adequate staff for the proper coordination and expediting of his work.

The CONTRACTOR shall provide an on-site representative, satisfactory to the OWNER and the ENGINEER, available at all times (i.e., twenty-four (24) hours per day, seven (7) days per week). The on-site representative shall be stationed close enough to be on the site within 30 minutes of notification. The on-site representative shall have full access to all equipment and material and have full authority necessary to correct any problems, deficiencies, or emergencies which may arise during non-working hours and during the absence of the superintendent.

The name, address, and phone number of both the superintendent and the on-site representative shall be given in writing to the ENGINEER and the Local Public Agency prior to the beginning of construction.

Additional provisions concerning superintendent by the CONTRACTOR are given in General Condition 102 of these Contract Documents.

26. "AS BUILT" DRAWINGS

A complete set of contract drawings shall be stapled together and the official "As Built" set on which the CONTRACTOR shall record currently the work carried out through all phases of construction.

The set shall be kept in the office in a neat and clean condition and be available for inspection by the OWNER or ENGINEER at any time during the Contract period. At the completion of the Contract it shall be handed to the ENGINEER accompanied by a letter stating that each drawing has been signed by the CONTRACTOR to the effect that the drawings are a true and accurate record of the work carried out.

27. ACCEPTANCE AND FINAL PAYMENT

Upon written notice that the work is ready for inspections and acceptance, the OWNER shall promptly make such inspection, and when he finds the work acceptable under the Contract fully performed, he shall promptly issue a final certificate over his own signature, stating that the work provided for in this Contract has been completed and is accepted by him under the terms and conditions thereof, and the entire balance found to be due the CONTRACTOR, including the retained percentages, shall be paid to the CONTRACTOR at the office of the OWNER within fifteen (15) days after the date of said final certificate. The CONTRACTOR shall submit satisfactory evidence to the OWNER that all payrolls, material bills, and other indebtedness connected with the work have been paid before the final certificate is issued.

The making and acceptance of the final payment shall constitute a waiver of all claims by the OWNER, other than those arising from unsettled liens, from faulty work appearing after final payment or from requirements of the Specifications, and of all claims by the CONTRACTOR, except those previously made and still unsettled.

28. GUARANTEE

The work shall be guaranteed to be free from defects due to faulty workmanship or materials for a period of one year from the date of issue of the Certificate of Acceptance. Work found to be improper or imperfect shall be replaced or drone without cost to the OWNER within the year guarantee period. Neither the Certificate nor Acceptance, final payment, of any provision of the Contract Documents shall free the CONTRACTOR from his guarantee. Failure to repair or replace faulty work entitles the OWNER to repair or replace the same and recover the costs from the CONTRACTOR and/or his Surety. The CONTRACTOR shall be the sole guarantor of the work installed under this contract and no third party guarantees by subcontractors or suppliers of various components or materials will be acceptable, nor shall agreements with subcontractors or material or component suppliers by the CONTRACTOR reduce the CONTRACTOR's responsibility under this agreement. The Performance Bond shall remain in full force and effect through the guarantee period.

29. PREFERENCE IN EMPLOYMENT

Preference employment shall be given to resident citizens of the area where such persons are available and fully qualified to perform the work to which the employment relates.

30. ANTI-KICKBACK REGULATIONS

The CONTRACTOR shall comply with the Copeland Act 48, Statute 948 and all amendments or modifications of the original act of June 13, 1934.

31. CONTRACTOR'S RESPONSIBILITY

Nothing in these documents shall be constructed as relieving the CONTRACTOR of sole responsibility for coordinating all work, work schedules, and securing proper interface between the various trades, and Subcontractors.

32. BRAND NAMES

The items listed by brand name are to indicate level of quality only and are not a propriety name. They should have added to the listing of a brand name the phrase- "Or Equal".

33. OPERATIONS & MAINTENANCE LITERATURE

All items of equipment required for this contract shall be bid to provide and include as part of the price, literature explaining "Operation & Maintenance" of that item of equipment. If a manufacturer does not print such a standard O & M Manual approved, in writing, by the Manufacturer.

34. MODIFICATIONS OR BID OR WITHDRAWAL PRIOR TO OPENING

At any time prior to bid opening, the CONTRACTOR may, after handing in or submitting his bid, obtain his bid for purposes of modification or withdrawal. Bid opening is defined at the time and date at which bids are received and publicly opened. No bid will be received after that time and date.

35. RETAINAGE AND PROGRESS PAYMENTS

OWNER will make monthly progress payments to CONTRACTOR in response to properly submitted and approved pay requests utilizing the format included in this project manual. Amount due each pay request shall be equal to the Gross amount of work completed to date, less five percent (5%) retainage, less previous payments made on the project.

NOTICE OF AWARD

To: _____

_____

PROJECT Description: **TARPON AVE. AND ISLAND AVE, WATER AND SANITARY SEWER IMPROVEMENTS IN PORT ISABELTEXAS.**

BID No. WS-19-10-01

The OWNER has considered the BID submitted by you for the above described WORK in response to its Advertisement for Bids dated September 22, 2019, and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of _____.

You are required by the Information for Bidders to execute the Agreement within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER by signing the following ACCEPTANCE OF NOTICE.

Dated this _____day of _____, 2019

For Laguna Madre Water District
(Owner)

By _____
Alfredo G. Hernandez, PE, RPLS

Title: Project Manager

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by

_____ this the _____ day of _____, 20__

By _____

Title _____

NOTICE TO PROCEED

Date: _____

To: _____
Contractor

Address: _____

Owner's Project No._____

Project: **TARPON AVE AND ISLAND AVE, WATER AND SANITARY SEWER IMPROVMENTS**

IN PORT ISABEL TEXAS

You are notified that the Contract Time under the above contract will commence to run on _____, 2019. By that date, you are to start performing your obligations under the Contract Documents. You will be given 150 calendar days to complete the work and be ready for final payment. The date of Final Completion is _____, 20__

Before you may start any Work at the site, paragraph 2.7 of the General Conditions provides that you and Owner must each deliver to the other (with copies to ENGINEER) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

Also, before you may start any Work at the site, you must (add other requirements)

GIVE A 48 HOURS NOTICE TO CITY STAFF AND RESIDENTS ALONG STREET IMPROVEMENTS AREA PRIOR TO COMMENCING PROJECT

For, Laguna Madre Water District

By: _____
Alfredo G. Hernandez, PE

Project Engineer
TITLE

ACCEPTANCE OF NOTICE TO PROCEED

Receipt of the above NOTICE OF TO PROCEED is hereby acknowledged by: _____ this _____ day of _____, 20__.

By:_____

Name: _____

Title: _____

AFFIDAVIT OF BILLS PAID

STATE OF TEXAS

COUNTY OF TEXAS

BEFORE ME, the undersigned authority, on this day personally appeared _____ party to that certain Contract entered into on the _____day of _____, 20_____, between _____ and _____ for the erection, construction and completion of certain improvements and/or additions upon the following described premises, to wit;

TARPON AVE AND ISLAND AVE, WATER AND SANITARY SEWER IMPROVEMENTS IN PORT ISABELTEXAS.

Said party being by me duly sworn states upon oath that the said improvements have been erected and completed in full compliance with the above referred to Contract and the agreed Plans and Specifications therefor.

Deponent further states that he has paid all bills and claims for materials furnished and labor performed on said Contract and that there are no outstanding unpaid bills or legal claims for labor performed or materials furnished upon said job.

This affidavit is being made by the undersigned realizing that it is in reliance upon the truthfulness of the statements contained herein that final and full settlement of the balance due on said Contract is being made, and in consideration of the disbursement of funds by_____, deponent expressly waives and releases all liens, claims and rights to assert a lien on said premises and agrees to indemnify and hold

_____ safe and harmless from and against all losses, damages, costs and expenses of any character whatsoever specifically including court costs, bonding fees and attorney fees, arising out of or in any way relating to claims for unpaid labor or material used or associated with construction of improvements on the above-described premises.

_____

_____

BY: _____

Subscribed and sworn to before me, the undersigned authority, on this _____ day of _____, 20 _____.

_____

Notary Public in and for
Cameron County, Texas

SUBCONTRACTOR'S CERTIFICATION
CONCERNING LABOR STANDARDS & PREVAILING WAGE REQUIREMENTS

TO (Appropriate Recipient):	**DATE:**
C/O	**PROJECT NAME & NUMBER:**

1. **The undersigned, having executed a contract with** _____
   For the construction of the above-identified project, acknowledges that:

   (a) The Labor Standards provisions are included in the aforesaid contract:

   (b) Corrections of any infraction of the aforesaid conditions, including infractions by any of his subcontractors and any lower tier subcontractors, are his responsibility.

2. **He certifies that:**

   (a) Neither he nor any firm, partnership or association in which he has substantial interest is designated as an ineligible contractor by Comptroller General of the United States pursuant to Section 5.6(b) of the Regulations of the Secretary of Labor, Part 5 (29 CFR, Part 5) or pursuant to Section 3 (a) of the Davis-Bacon Act, as amended (40 U.S.C. 276u-2(s)).
   (b) No part of the aforementioned contract has been or will be subcontracted to any subcontractor if such subcontractor or any firm, corporation, partnership or association in which such subcontractor has a substantial interest is designated as n ineligible contractor pursuant to say of the aforementioned regulatory or statutory provisions.
3. **He agrees to obtain and forward to the aforementioned recipient within ten days after the execution of any subcontract, including those executed by his subcontractors and any lower ties subcontractors, a Subcontractor's Certification Concerning Labor Standards & Prevailing Wage Requirements executed by the sub-contractors.**

4. **He certifies that:**
(a) The legal name and the business address of the undersigned are:
(b) The undersigned is:

(1) A SINGLE PROPRIETORSHIP	**(4) OTHER ORGANIZATION (DESCRIBE)**
(2) A PARTNERSHIP	**(3) A CORPORATION IN THE STATE OF**

(c) The name, title and address of the owner, partners or officers of the undersigned are:

NAME	TITLE	ADDRESS

(e) The names and addresses of all other persons, both natural and corporate, having a substantial interest in the undersigned, and the nature of this interest are (if names, so state):

NAME	TITLE	ADDRESS

(e) The names, addresses and trade classification of all other building construction contractors in which the undersigned has a substantial interest are (if names, so state):

NAME	TITLE	ADDRESS

DATE

By _____ _____

SIGNATURE **CONTRACTOR**

WARNING

U.S. Criminal Code, Section 1010, Title 18, U.S.C., provides in part: "Whoever…makes, passes, utters or publishes any statement knowing the same to be false…Shall be fined not more that $5,000 or imprisoned not more than two years or both.

INDEX FOR

TECHNICAL SPECIFICATIONS

ADJUSTING MANHOLES, CLEANOUTS, INLETS & WATER VALVE RISERS

A. DESCRIPTION

This item shall govern for the furnishing of materials and for adjusting manholes, cleanouts inlets or water valves risers where required by the plans. Manholes, cleanouts, inlets and water valve risers shall be adjusted to position and/or elevation as shown on the plans or as ordered by the Engineer and in accordance with these specifications.

B. MATERIALS

Manhole, cleanout, and inlet covers, water valve risers, and brick in good condition, removed in the process of adjustment, may be re-used. Additional materials required shall be provided as required.

Mortar for brick work shall be composed of one-part Portland cement and two parts clean, sharp mortar sand suitably graded for the purpose. Lime may be added to the mix but in no case shall it exceed 10% by weight of the total dry mix.

Bricks for Sanitary Sewer Manholes shall be clay brick conforming to the requirements of ASTM Designation C 32, Grade NA or equal.

Concrete for inlets shall be 3000 p.s.i. (28-day compressive strength) concrete containing a minimum of 5 sacks cement per cubic yard.

Reinforcing steel shall be deformed and shall conform to ASTM Designation A-615.

When prefabricated steel extension rings are furnished, the material shall be ASTM A36 or equal.

C. CONSTRUCTION

Existing manholes, cleanouts and water valve risers located within areas of base and sub-base construction shall be located and referenced and the rings and covers and risers removed carefully and stored by the Contractor. Rings, covers, plates, or grates broken in the process of removal and cleaning or lost or stolen shall be replaced in kind by the Contractor at his expense. Manholes shall be broken down to below subgrade elevation and covered with hatch covers prior to beginning excavation and subgrade preparation. If manholes are to be lowered the brick work shall be removed to a point where the corbell will not exceed 1" per course of brick, in order to obtain the proper diameter at the top for resetting the ring and cover. Upon completion of the flexible base, the manholes, and water valves shall be located from the reference points and the top portion of the manhole rebuilt and water valve risers reset so that they will be flush with the proposed asphalt surfacing.

When manholes are located within pavement areas to be overlaid with hot mix asphaltic concrete, the Contractor may in lieu of removing the cast iron ring and adding concrete adjustment rings, provide prefabricated steel extension rings. They shall be either of the one-piece or two-piece type as necessary for the amount of adjustment. They shall be installed in accordance with the manufacturer's instructions.

Inlets to be adjusted shall be broken down as necessary and rebuilt to the elevations as shown on the plans.

D. MEASUREMENT AND PAYMENT

Manholes, cleanouts, inlets, and water valve risers completely adjusted as prescribed above will be measured and paid for by the unit price bid for each type manhole, inlet or water valve riser adjusted. The excavation and backfill required will not be measured for payment. The price bid shall be full compensation for furnishing all labor, materials, tools, and equipment necessary to complete the work.

When no bid item is established for these items, this work shall be considered subsidiary to the contract and no direct payment will be made.

CONCRETE FOR STRUCTURES

A. DESCRIPTION

This item shall govern for the materials used; for the storing and handling of materials; and for the proportioning and mixing of concrete for bridges, culverts, prestressed concrete, and incidental concrete construction.

The concrete shall be composed of Portland cement, aggregates (fine and coarse), mixtures if desired or required, and water, proportioned and mixed as hereinafter provided. Accelerating admixtures will be used only on the express approval of the Engineer. Accelerating admixtures will not be permitted in bridge decks direct traffic culvert slabs at any time, nor when Type II cement is specified.

B. MATERIAL

1. Cement
   a. Use cement conforming to ASTM C150, Type I, unless authorized to use Type III.

   b. Meet ASTM specifications for weight variations and length of storage. Use no caked cement. Deliver in bags for site-mixed concrete. Use only one brand of cement in any one construction.

2. Water. Furnish clean water, free from harmful amounts of oils, acids, alkalis, or other damaging substances.

3. Coarse Aggregate. Provide aggregates conforming to ASTM C33. Unless otherwise specified, use standard size from No. 4 to 1-1/2 inch and modify only in accordance with the following. Supply aggregate not larger than 1/5 to the narrowest dimension between sides of forms, nor larger than 3/4 of the minimum clear spacing between reinforcing bars.

4. Fine Aggregates. Provide fine aggregates meeting the requirements of ASTM C33.

5. Air Entraining Admixtures. Use an air entraining admixture conforming to ASTM C260.

C. STORAGE OF MATERIALS

1. Cement. Store cement off the ground in a well-ventilated weatherproof building.

2. Aggregate. Prevent mixture of foreign materials with aggregate and preserve gradation of aggregate.

3. Reinforcing Steel. Store reinforcing steel to protect it from mechanical injury and rust.

D. CONCRETE

Use ready-mixed concrete conforming to ASTM C94.

E. MEASUREMENT OF MATERIALS

1. Measure materials by weight.

2. Water may be measured by volume.

3. Cement may be measured by bag. One bag weighs 94 pounds.

F. CLASSIFICATION AND MIX DESIGN

1. Proportioning. Proportioning concrete materials on the basis of maximum water-cement ratio and minimum strength allowable with limits set on minimum cement content. Increase cement content above the minimum if, at any time, the type, gradation, or sizes of aggregate being supplied requires that extra cement be added to meet strength and workability requirements. Such changes must be made without change in the contract sum.

2. Classification

Class	Type	Minimum Compressive Strength (lbs. per square inch)		Max. Water Content per Bag of Cement (gallons)	Minimum Cement (bags per cubic yard)	Consistency Range in Slump Inches
		7-Day	28-Day			
A	Structural	2000	3000	6.50	5.0	3 to 5
B	Precast Piling	2400	3600	6.00	6.0	2 to 5

a. Include for maximum water, a calculation of free water aggregate minus absorption of aggregate based on thirty-minute absorption period.

b. Use a minimum of 6.5 bags of cement per cubic yard if concrete is to be placed under water.

3. Consistency. Use concrete with consistency that can be worked readily into corners and around reinforcing steel without segregation of materials or having free water collect on the surface. Proportions will be changed if satisfactory mix is not being obtained.

4. Air Content. Approximately 3% air content is required. Determine in accordance with approved ASTM standard method.

5. Changes in Mixes. Make changes in proportions or materials, or both, necessary to secure desired concrete properties as directed by the Engineer. Obtain prior approval should changes in materials, gradation, or proportions of mixture, or use of special concrete additives be required.

G. QUALITY OF CONCRETE

The concrete shall be uniform, workable, and of a consistency acceptable to the Engineer. The cement content, maximum water/cement ratio, the desired and maximum slump, the proper amount of entrained air and the strength requirements for all classes of concrete shall conform to the requirement of these specifications. It shall be the responsibility of the contractor to provide concrete meeting these requirements.

During the progress of the work, the Engineer will cast test cylinders or beams, perform slump and entrained air tests, and will make temperature checks, as required, to ensure compliance with the specifications.

A strength test shall be defined as the average of the breaking strength of two cylinders or two beams as the case may be. Specimens will be tested in accordance with Test Methods Tex-418-A or Tex-420-A.

If the required strength of consistency of the class of concrete being produced cannot be secured with minimum cement specified or without exceeding the maximum water/cement ratio, the Contractor will be required to furnish different aggregates, use a water reducing agent, an air-entraining agent, or increase the cement content in order to provide concrete meeting these specifications.

All test specimen, beams, or cylinders, representing tests for removal of forms and/or false work 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 SDHPT Bulletin C-11 and Supplement thereto.

When control of concrete quality is by 28-day compressive test, job control will be 7-day compressive tests which are shown to provide the required 28-day strength, based on results from trial batches. Thereafter if the required seven-day strength is not secured with the quantity of cement specified, changes in the batch design will be made as specified in this article.

H. WORKING CONDITIONS

1. Timing. Mix concrete in quantities required for immediate use, and place concrete within 1 hour after start mixing. Clock-stamp delivery ticket of all batches with time of mixing at ready-mix plant.

2. Weather. When adverse weather conditions affect quality of concrete, postpone the work. Do not mix concrete when the air temperature is at or below 40°F and falling. Concrete may be mixed when temperature is 35°F and rising. Take temperature readings in the shade away from artificial heat. If authorized for placement during cold weather, place concrete in accordance with PCA Standard Design and Control of Concrete Mixtures. Protect concrete from temperatures below 32°F until the concrete has cured for a minimum of 3 days at 70°F or 5 days at 50°F.

I. MIXING & MIXING EQUIPMENT

1. Mixer. Use approved type and size. Do not load beyond manufacturer's rated capacity.

2. Mixing Time. Mix at least 1-1/2 minutes after materials are placed in mixer. Increase mixing time 15 seconds for each 1/2-yard increase in mixer capacity over 1 cubic yard size.

3. Batch Material Control. Maintain positive batch control, accurate to within 1 percent.

4. Operation & Maintenance of Equipment. Clean, maintain, and operate equipment so that it is at all times capable of thoroughly mixing material as required.

5. Hand Mixing. Hand mixing only when approved by the Engineer.

J. MEASUREMENT & PAYMENT

No direct measurement or payment will be made for concrete furnished under this item. Payment for concrete shall be considered subsidiary to the various items of concrete structures as required by the plans and the contract.

SECTION 02601

FLEXIBLE BASE

PART I - GENERAL

1.01 GENERAL DESCRIPTION OF WORK:

A. This work shall consist of furnishing and placing a foundation course for surface courses or for other base courses.

B. Flexible base shall be composed of either caliche (argillaceous limestone, calcareous or calcareous clay particles, with or without stone, conglomerate, gravel, sand or other granular materials), crushed stone, gravel, iron ore topsoil, shell, or crushed slag.

C. Flexible base shall be constructed as specified herein in one or more courses in conformance with the details, lines and grades shown on the plans, and as established by the ENGINEER.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Materials for flexible base shall be crushed or uncrushed as necessary to comply with the requirements hereinafter specified.

B. Materials shall consist of durable, coarse aggregate particles mixed with approved binding materials.

2.02 LIME STABILIZATION:

A. Where shown on the plans, or directed by the ENGINEER, material for flexible base shall be lime stabilized in accordance with the provisions of Section 02240.

2.03 TYPES:

A. Type A - Crushed or broken aggregate (excluding gravel aggregate).

B. Type B - Gravel Aggregate

C. Type C - Iron Ore Topsoil

D. Type D - Shell Aggregate with Sand Admixture

E. Type E - Shell Aggregate with Sand and Caliche Admixture

F. Type F – Caliche

G. Type G - Crushed Slag

H. Unless otherwise noted on the plans or directed by the ENGINEER, the CONTRACTOR may use any one type of these types provided the material used meet the requirements set forth in the specification test limits herein.

2.04 GRADES:

A. Unless otherwise shown on the plans or directed by the ENGINEER, the final course of base material shall consist of Grades 1,2,3, or 4, as specified in Table 02601-1.

B. Base courses or subbase materials, unless otherwise noted on the plans or directed by the ENGINEER, may consist of Grades 1, 2, 3, or 4, as specified in Table 02601-1.

C. All grades shall, when tested in accordance with standard laboratory test procedures, meet the physical requirements set forth in Table 02601-1.

D. Testing of flexible base materials shall be in accordance with the following test procedures:

TEST	TESTING PROCEDURE
Preparation for soil constants and sieve analysis	TEX-101-E
Liquid Limit	TEX-104-E
Plastic Limit	TEX-105-E
Plasticity Index	TEX-106-E
Sieve Analysis	TEX-110-E
Wet Ball Mill	TEX-116-E
Triaxial Test	TEX-117-E (Part I or II)

E. Unless otherwise specified on the plans, samples for testing the material for Soil constants, Gradation and Wet Ball Mill shall be taken prior to the compaction operations.

F. Unless otherwise specified on the plans, samples for triaxial tests shall be taken from the stockpile or from production, as directed by the ENGINEER, where stockpiling is required and from production where stockpiling is not required.

TABLE 02601-1

PHYSICAL REQUIREMENTS FOR FLEXIBLE BASE MATERIALS

	GRADES			
TYPES	Grade 1: (Triaxial class 1 Min. compressive strength, psi: 45 at 0 psi lateral pressure and 175 at 15 psi lateral pressure	Grade 2: (Triaxial Class 1 to 2.3) Min. compressive strength, psi: 35 at 0 psi lateral pressure and 175 at 15 psi lateral pressure	Grade 3: (Unspecified Tri axial Class)	Grade 4: (Unspecified Tri axial Class)
TYPE A Crushed or. Broken Aggregate (excluding gravel aggregate)	Retained on Sq. Sieve % 1-3/4".....0 7/8".....10-35 3/8".....30-50 No. 4.....45-65 No. 40.....70-85 Max LL.....35 Max PI.....10 Wet Ball Mill Max Amt .....40 Max Increase in Passing No. 40.....20	Retained on Sq. Sieve % 1-3/4".....0-10 No. 4.....45-75 No. 40.....60-85 Max LL.....40 Max PI.....12 Wet Ball Mill Max. Amt.....50 Max Increase in Passing No. 40.....20	Retained on Sq. Sieve % 1-3/4".....0-10 No. 40.....60-85 Max LL.....45 Max PI.....15 Wet Ball Mill Max Amt.....55 Max Increase in Passing No. 40.....20	As Shown on Plans
TYPE B Gravel Aggregate		Retained on Sq. Sieve % 1-3/4".....0-10 No. 4.....30-75 No. 40.....70-85 Max LL.....35 Max PI.....12	Retained on Sq. Sieve % 1-3/4".....0-5 No. 4.....30-75 No. 40.....65-85 Max LL.....35 Max PI.....12	As Shown On Plans
TYPE C Iron Ore Topsoil		Retained on Sq. Sieve % 2-1/2".....0	Retained on Sq. Sieve % 2-3/4".....0	As

	No. 40.....50-85 Max LL.....35 Max PI.....12	No. 40.....45-85 Max LL.....35 Max PI.....12	Shown on Plans
TYPE D Sand-Shell	Retained on % Sq. Sieve 1-3/4".....0-10 No. 4.....45-65 No. 40.....50-70 Max LL.....35 Max PI.....12	Retained % Sq. Sieve 1-3/4".....0 No. 40.....45-65 Max LL.....35 Max PI.....,12	As Shown on Plans

TABLE 02601-1 CONTD.

Grade 1:	Grade 2:	Grade 3:	Grade 4:
TYPE E Shell with Sand and Caliche	Retained % Sq. Sieve 1-3/4".....0 No. 40.....45-65 Max LL.....35 Max PI.....10	Retained % Sq. Sieve 1-3/4".....0 No. 40.....45-65 Max LL.....35 on Max PI.....12 Plans	As Shown
TYPE F Caliche	Retained % Sq. Sieve 1-3/4".....0 No. 4.....45-75 No. 40.....50-85 Max LL.....40 Max PI.....12	Retained % Sq. Sieve 1-3/4".....0 No. 40.....50-85 Max LL.....40 on Max PI.....12	As Shown Plans
TYPE G Crushed Blast Furnace Slag			As Shown on Plans

G. Materials exhibiting reasonably close conformity with the specified gradation and plasticity index are defined by the following criteria:

1. The ENGINEER may accept the material, providing not more than 2 of 10 consecutive gradation tests performed are outside the specified limits on any individual or combination of sieves by no more than 5% and where no two consecutive tests are outside the specified limits.

2. The ENGINEER may accept the material providing not more than 2 of 10 consecutive plasticity index samples tested are outside the specified limit by no more than two points and where no two consecutive tests are outside the specified limit.

2.05 STOCKPILING:

A. When specified on the plans, the material shall be stockpiled prior to delivery on the road. The stockpile shall be not less than the height indicated and shall be made up of layers of material not to exceed the depth shown on the plans.

B. After a sufficient stockpile has been constructed as specified on the plans, the CONTRACTOR may proceed with loading from the stockpile for delivery to the road.

C. In loading from the stockpile for delivery to the road, the material shall be loaded by making successive vertical cuts through the entire depth of the stockpile.

D. If the CONTRACTOR elects to produce the Type A material from more than one material or more than one source, each material shall be crushed separately and placed in separate stockpiles so that at least 75 percent of the material in the course aggregate stockpiles will be retained on the No. 4 sieve and at least 70 percent of the material in the fine aggregate stockpile will pass the No. 4 sieve.

E. The materials shall be combined in a central mixing plant in the proportions determined by the ENGINEER to produce a uniform mixture which meets all of the requirements of the specification. In the event that combinations of the materials produced fail to meet all of the specification requirements, the CONTRACTOR will be required to secure other materials which will meet specifications requirements.

F. The central mixing plant shall be of either the batch or continuous flow type, and shall be equipped with feeding and metering devices which will add the materials into the mixer in the specified quantities.

G. Mixing shall continue until a uniform mixture is obtained.

PART 3 - EXECUTION

3.01 PREPARATION OF SUBGRADE:

A. The roadbed shall be excavated and shaped in conformity with the typical

sections shown on the plans and to the lines and grades as established by the ENGINEER.

B. All unstable or otherwise objectionable material shall be removed from the subgrade and replaced with approved material.

C. All holes, ruts and depressions shall be filled with approved material and, if required, the subgrade shall be thoroughly wetted with water and reshaped and rolled to the extent directed in order to place the subgrade in an acceptable condition to receive the base material.

D. The surface of the subgrade shall be finished to line and grade as established and in conformity with the typical section shown on plans. Any deviation in excess of 1/2 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

E. Sufficient subgrade shall be prepared in advance to insure satisfactory execution of the work.

F. Material excavated in the preparation of the subgrade shall be utilized in the construction of adjacent shoulders and slopes or otherwise disposed of as directed. Any additional material required for the completion of the shoulders and slopes shall be secured from sources indicated on plans or as directed by the ENGINEER.

3.02 PLACEMENT OF FIRST COURSE - TYPE A, TYPE B, TYPE C, TYPE F, AND TYPE G MATERIAL:

A. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section.

B. The material shall be delivered in approved vehicles of a uniform capacity, and it shall be the charge of the CONTRACTOR that the required amount of specified material shall be delivered to each 100-foot station.

C. Material deposited upon the subgrade shall be spread and shaped the same day.

D. In the event that inclement weather, or other unforeseen circumstances, render the spreading of the material during the first 24-hour period impractical, the materials shall be scarified and spread as directed by the ENGINEER.

E. The material shall be sprinkled, if directed, and shall then be bladed, dragged and shaped to conform to typical sections as shown on plans.

F. All areas and "nests" of segregated coarse or fine material shall be removed and replaced with well graded material, as directed by the ENGINEER.

G. If additional binder is considered desirable or necessary after the material is spread and shaped, it shall be furnished and supplied in the amount directed by the ENGINEER. Such binder material shall be carefully and evenly incorporated with the material in place by scarifying, harrowing, brooming or by other approved methods.

H. The course shall be compacted by methods of compaction hereinafter specified as the "Ordinary Compaction" method or the "Density Control" method of compaction as indicated on the plans, or as directed by the ENGINEER.

1. When the "Ordinary Compaction" method is to be used, the following provisions shall apply:

   a) The course shall be sprinkled as required and rolled as directed until a uniform compaction is secured. Throughout this entire operation, the shape of the course shall be maintained by blading. Upon completion, the surface shall be smooth and in conformity with the typical sections shown on plans and the established lines and grades.

   b) In the area on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and in a length of 16-feet measured longitudinally shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

   c) All irregularities, depressions and weak spots which develop in the laid course shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling.

2. When the "Density Control" method of compaction is to be used, the

following provisions shall apply:

a) The course shall be sprinkled as required and compacted to the extent necessary to provide not less than the percent density as hereinafter specified under "Density".

b) In addition to the requirement specified for density, the full depth of the flexible base shown on the plans shall be compacted to the extent necessary to remain firm and stable under construction equipment.

c) After each section of flexible base is completed, tests as necessary will be made by the ENGINEER. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements.

d) Throughout this entire operation, the shape of the course shall be maintained by blading, and the surface upon completion shall be smooth and in conformity with the typical sections shown on the plans and to the established lines and grades.

e) In the areas on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and 16 feet in length, measured longitudinally, shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

f) All irregularities, depressions, or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling.

I. Should the base course, due to any reason or cause, lose the required stability, density or finish before the surfacing is complete, it shall be re-compacted and refinished at the sole expense of the CONTRACTOR.

J. Where Type C material is used, the material shall be scarified, thoroughly wetted, mixed, manipulated, and bladed so as to secure a uniformly wetted material, and pulled in over the subgrade in courses and set under the action of blading and rolling. The work of mixing, blading, rolling, shaping, and subsequent maintenance shall be performed by the continuous use of sufficient

number of satisfactory rollers and power maintainers with adequate scarifier attachments.

3.03 PLACEMENT OF FIRST COURSE - TYPE D MATERIAL:

A. Immediately before placing the base material, the subgrade shall be checked as to conformity with grade and section, and corrections made if necessary.

B. All materials shall be delivered in approved vehicles of a uniform capacity.

C. The required amount of shell shall be uniformly spread across the section and allowed to dry sufficiently to insure proper slaking and mixing of the binder material. Immediately upon completion of the drying period, as determined by the ENGINEER, the specified amount of sand admixture, as required to produce a combined material meeting the requirements hereinbefore specified, shall be spread uniformly across the shell.

D. The material shall then be sprinkled as required and thoroughly mixed by blading and harrowing, or other approved methods.

E. Failure to proceed with the placing of sand admixture or mixing and placing operations will be grounds for the suspension of placing of shell.

F. Under no conditions will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.

G. The course shall be compacted by the method of compaction hereinafter specified as the "Ordinary Compaction" method or the "Density Control" method of compaction as indicated on the plans, or as directed by the ENGINEER.

1. When the plans indicate that the "Ordinary Compaction" method is to be used, the following provisions shall apply:

    a) After mixing, all material shall be windrowed, and then spread over the section in layers.

    b) The layer shall not exceed 2 inches in loose depth.

    c) If necessary to prevent segregation, the material shall be wetted in the

windrow prior to spreading.

d) After each lift is spread, it shall be sprinkled and rolled to secure

maximum compaction as directed by the ENGINEER. Succeeding layers shall then be placed similarly until the course is completed.

e) All areas and "nests" of segregated coarse or fine material shall be

removed and replaced with well graded material, as directed by the ENGINEER.

f) The course shall then be sprinkled as required and rolled as directed

until a uniform compaction is secured.

g) Throughout this entire operation, the shape of the course shall be maintained by blading; and the surface, upon completion, shall be smooth and in conformity with the typical sections shown on plans, and to the established lines and grades.

h) In the areas on which pavement is to be placed, any deviation in excess of 1/4 inch in cross section and 16-feet in length, measured

longitudinally, shall be corrected by loosening, adding or removing material, reshaping and re-compacting by sprinkling and rolling.

i) All irregularities, depressions, or weak spots which develop shall be

corrected immediately by scarifying the areas affected, adding suitable material as required, reshaping and re-compacting by sprinkling and rolling.

2. When the plans indicate that the "Density Control" method of compaction is

to be used, the compaction method shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G material.

H. When indicated on the plans or permitted by the ENGINEER, Type D material

may be mixed in a central mixing plant and delivered to the road as a combined mixture. When this method is used, the combined mixture shall meet the requirements for type D material as hereinbefore specified and the placing and compaction requirement shall be the same as prescribed for Type A, Type B, Type C, Type F and Type G material.

3.03 PLACEMENT OF FIRST COURSE - TYPE E MATERIAL:

A. The construction methods for placing the first course of Type E material shall be the same as prescribed for Type D material except that after the shell and sand have been placed, the prescribed amount of caliche shall then be spread across the sand and shell.

B. The composite mixture shall then be sprinkled as required and thoroughly mixed by blading and harrowing or other approved methods.

C. Compaction of the first course of Type E material shall be the same as prescribed above for Type D material.

D. Failure to proceed with placing the sand and caliche admixture or mixing and placing operations will be grounds for the suspension of placing of shell.

E. Under no conditions will the CONTRACTOR be allowed to place an excessive amount of shell without proceeding with the mixing and placing operations.

3.05 PLACEMENT OF SUCCEEDING COURSES - ALL MATERIAL TYPES:

A. Construction methods shall be the same as prescribed for the first course.

B. Prior to placing the surfacing on the completed base, the base shall be "dry cured" to the extent directed by the ENGINEER.

3.06 REWORKING AN EXISTING BASE COURSE

A. Existing base courses shall be reworked in accordance with TxDOT Item 251, or as directed by the ENGINEER, and result in a section that conforms the approved lines and grades.

3.07 DENSITY CONTROL:

A. When the "Density Control" method of compaction is indicated on the plans, each course of flexible base shall be compacted to the percent density shown on the plans.

B. The testing will be as outlined in Test Method Tex-114-E.

C. It is the intent of this specification to provide that the part of the base included in the top 8 inches, immediately below the finished surface of the roadway, be not less than 100 percent of the density, as determined by the compaction ratio method.

D. Field density determination shall be made in accordance with Test Method Tex-115-E.

3.08 TOLERANCES:

A. Flexible base will be measured by the square yard of surface area of completed and accepted work based on the thickness of flexible base as shown on the plans.

1. The ENGINEER may accept the work providing not more than 25 percent of the density tests performed each day are outside the specified density by no more than three pounds per cubic foot and where no two consecutive tests on continuous work are outside the specified limits.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT:

A. No bid item is established for these items, this work shall be considered subsidiary to the contract and no direct payment will be made.

*** * * * END OF SECTION * * ***

CURB & GUTTER, VALLEY GUTTER, CONCRETE GUTTER, SIDEWALKS & DRIVEWAYS

A. DESCRIPTION

Concrete curb and gutter, valley gutter, concrete gutter, sidewalks, and driveways shall consist of Portland Cement concrete Valley gutter, sidewalks, and driveways with or without reinforcing steel as required, constructed on an approved subgrade or foundation material in accordance with these specifications, in conformity with the lines and grades established by the Engineer and details shown on the plans. Item 530 of the SDHPT Standard Specification 1982 shall apply.

B. MATERIALS

1. Reinforcing Steel and/or dowel bar-billet steel ASTM A-15 intermediate grade. When shown on the drawings provide.
2. Concrete shall be Class "A", 3,000 psi conforming to the requirement of "Reinforced Concrete Structures" and shall contain 1.5 lbs. of "Fibermesh" or approved equal.
3. Expansion joint material shall be specification premolded bituminous expansion joint material conforming to ASTM D-994 (not wood-fiber type). Provide 1/2" thickness in 6-inch curb and gutter.
4. Curing compound resin base ASTM C-309, Type 1 with light red tint of fugitive dye.

C. CONSTRUCTION METHODS

The construction methods shall conform to Section 530.3 of the SDHPT Standard Specifications 1982.

D. MEASUREMENT

Concrete curb and gutter will be measured by the linear foot. Curb and gutter will be measured along the nominal "back of curb".

Concrete valley gutter, concrete gutter, concrete sidewalks, and concrete driveways will be measured by the square foot of completed valley gutter, sidewalk, or driveway to the limits shown on the drawings.

E. PAYMENT

Payment will be made at the contract unit price bid per linear foot of curb and gutter and square foot of valley gutter, concrete gutter, sidewalk or driveway. Payment will include full compensation for all materials required, labor, tools, equipment, forms, and incidentals to complete the work.

EMBANKMENT

A. DESCRIPTION

This item shall govern for the placement and compaction of all materials necessary for the construction of embankments, levees and dykes or any designated section of the project where additional material is required.

B. MATERIAL

Materials may be furnished from required excavation in the areas shown in the plans or from off right of way sources obtained by the Contractor and meeting the requirements herein. All embankments shall conform to one of the following types as shown on the plans. Except that material used for pipe bedding shall be as shown on t he plans.

Type A. This material shall consist of suitable granular material, free from vegetation or other objectionable matter, and reasonably free from lumps of earth. These materials shall be suitable for forming a stable embankment and, when tested in accordance with Test Methods Tex-104-E, Tex-105-E, and teex-107-E, Part II shall meet the following requirements:

The liquid limit shall not exceed 45
The plasticity index shall not exceed..... 15
The bar linear shrinkage shall not be less than 2

Type B. This material shall consist of suitable earth material such as loam, clay, or other such materials as approved by the Engineer that will form a stable embankment.

Type C. This material shall be suitable and shall conform to the specification requirements shown on the plans.

Type D. This material shall be that obtained from required excavation are shown on the plans and will be used in embankment.

C. CONSTRUCTION METHODS

1. General.

Prior to placing any embankment, all work in accordance with “Preparing Right of Way”, shall have been completed on the areas over which the embankment is to be placed. Stump holes or other small excavations in the limits of the embankments shall be backfilled with suitable material and thoroughly tamped by approved methods before commencing embankment construction. The surface of the ground, including disk-loosened ground or any surface roughened by small washes or otherwise, shall be restored to approximately its original slope by blading

or other methods. Where shown on the plans or required by the Engineer, the ground surface thus prepared shall be compacted by sprinkling and rolling.

The engineer shall be notified sufficiently in advance of opening any material source to allow performance of any required testing.

Unless otherwise shown on the plans, the surfaces of unpaved areas (except rock) which are to receive embankment shall be loosened by scarifying to a depth of at least 6 inches. Hillsides shall be cut into steps before embankment materials are placed. Placement of embankment materials shall begin at low side of hillsides and slopes. Materials which have been loosened shall be recompacted simultaneously with the new embankment materials placed upon it. The total depth of loosened and new materials shall not exceed the permissible depth of the layer to be compacted.

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

Unless otherwise shown on the plans, all embankments shall be constructed in layers approximately parallel to the finished grade.

Embankments shall be constructed to the grade and sections shown on the plans or as established by the Engineer. Each section of the embankment shall correspond to the detailed section or slopes established by the Engineer. After completion, it shall be continuously maintained to its finished section and grade until the project is accepted.

2. Constructing Embankments.

a. Earth Embankments. Earth embankments shall be defined as those composed principally of material other than rock, and shall be constructed of acceptable material from approved sources.

Unless otherwise specified, earth embankments shall be constructed in successive layers for the full width of the cross section and in such lengths as are best suited to the sprinkling and compacting methods utilized.

Layers of embankment may be formed by utilizing equipment and methods which will evenly distribute the material.

Each layer 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 materials 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 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 until a uniform material of uniform density is achieved in each layer.

It shall be the responsibility of the Contractor to secure uniform moisture content throughout the layer by such methods as may be necessary. In order to facilitate uniform wetting of the embankment material, the Contractor may apply water at the material source if the sequence and methods used do not cause an undue waste of water. Such procedures shall be subject to the approval of the Engineer.

Each embankment layer shall be rolled and sprinkled when and to the extent directed by the Engineer.

3. Compaction Methods.

Compaction of embankments shall be by "Ordinary Compaction".

a. Ordinary Compaction. When "Ordinary Compaction" is specified, the following provisions shall govern:

Each layer shall not exceed twelve (12) inches of loose depth, unless otherwise directed by the Engineer. Each layer shall be compacted. Unless otherwise specified on the plans, the rolling equipment shall be as approved by the Engineer. Compaction shall continue until there is no evidence of further compaction. Prior to and in conjunction with the rolling operation, each layer shall be brought to the moisture content directed by the Engineer, and shall be kept leveled with suitable equipment to insure uniform compaction over the entire layer. Should the grade for any reason or cause, lose the required stability or finish, it shall be recompacted and refinished at the Contractor's expense.

D. MEASUREMENT

This item will be measured and paid for as a lump sum item.

E. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Embankment", Type B. This price shall be full compensation for furnishing embankment; for hauling; for placing, compacting, finishing and reworking; and for all labor, royalty, tools, equipment and incidentals necessary to complete the work.

SECTION 02612

HOT MIX ASPHALT CONCRETE PAVEMENT

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Hot mix asphalt concrete (HMAC) pavement shall consist of a binder course, a leveling up course, a surface course or a combination of the courses as shown on the plans, or as directed by the ENGINEER.

B. HMAC pavement shall be composed of a compacted mixture of mineral aggregate and asphaltic material, constructed on previously completed and approved subgrade, subbase course, base course, or existing pavement.

C. HMAC pavement shall be in accordance with the specifications herein and in conformity with the lines, grades, quantities and typical sections in the contract and/or as directed by the ENGINEER.

1.02 QUALITY CONTROL:

A. HMAC pavement and its constituent part shall conform to the ASTM, AASHTO and/or TxDOT test methods noted below.

PART 2 - PRODUCTS

2.01 ASPHALTIC MATERIALS:

A. Asphalt cement binders shall be uncracked petroleum asphalt and shall be carefully refined, by steam, vacuum, or solvent, from asphaltic or semi-asphaltic base crude petroleum at a temperature not to exceed 700° F. Asphalt cements shall be free from thermal decomposition products and shall not be blended with any materials which have been subjected to cracking or produced from a crude petroleum source other than that of the original material. The asphalt cement shall not contain residues from non-asphaltic sources. Asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 347° F.

B. Paving asphalt shall be classified by penetration or viscosity and shall conform to the requirements set forth in one of the following tables as designated by the ENGINEER. The CONTRACTOR may supply asphalt meeting the requirements of one of the following tables provided that he obtains prior approval of the ENGINEER and with the provision that once approval has been obtained, that the CONTRACTOR will remain with that grade throughout the project.

TABLE 02612-1

Specification Designation	AASHTO Test Method	ASTM Test Method	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Flash Point (Open cup) Min	T48	D92	--	450	450	450	425	350
Penetration of Orig. Sample at 77° F	T49	D5	40 to 50	60 to 70	85 to 100	120 to 150	150 to 200	200 to 250
Thin-Film Oven Loss, Hours at 325° F, % Max	T179	D1754	0.75	0.75	0.75	0.75	1.00	1.00
Test of Residue from Thin-Film Oven Test: % of Orig. Pen., Min.	T49	D5	52	50	50	50	50	50
Ductility at 77°F cm. after loss at 325° F, Min.	T51	D113	50	50	100	100	100	100
Solubility in CCl_4 Min.	T44*	None	99.5	99.5	99.5	99.5	99.5	99.5
Reaction to Spot Test	T102**	None	-0-	-0-	-0-	-0-	-0-	-0-

* Procedure No. 1 with CCl_4 substituted for CS_2.

** Using 85% Standard Naphtha Solvent and 15% Xylene.

TABLE 02612-2

TYPE-GRADE	OA-30 Min.	OA-30 Max	OA-175*8 Min.	OA-175*8 Max	OA-400 Min.	OA-400 Max
Penetration at 32° F, 200g., 60 sec	15	--	--	--	--	--
Penetration at 77° F, 100g., 5 sec	25	35	150	200	--	--
Penetration at 115° F, 50g., 5 sec	--	65	--	--	--	--
Ductility at 77° F, 5 cm/min., cms: Original OA	2	--	70	--	--	--
Flash Point C.O.C., °F	450	--	425	--	425	--
Softening Point, R.&B., °F	185	--	95	130	--	--
Thin Film Oven Test, 1/8 in. Film 50 g., 5 hrs., 325° F, % Loss by wt.	--	0.4	--	1.4	--	2.0
Penetration of Residue, at 77° F, 100g., 5 sec. % of Original Pen	--	--	40	--	--	--
Ductility of Residue at 77° F, 5 cm/min., cms	--	--	--	100	--	--
Solubility in Trichloroethylene, %	99.0	--	99.0	--	99.0	--
Spot Test on Original OA	Neg.		Neg.		Neg.	
Float Test at 122° F, sec	--	--	--	--	120	150
Test on 85 to 115 Pen.Residue* Residue by Wt., %	--	--	--	--	75	--
Ductility, 77° F, 5 cm/min: Original Res., cms	--	--	--	--	100	--
Subjected to Thin Film Test, cms	--	--	--	100	--	

* Determined by Vacuum Distillation (by evaporation if unable to reduce by vacuum).

** For use with Latex Additive only.

TABLE 02612-3

PROPERTIES	AC-1.5		AC-3		AC-5		AC-10		AC-20		AC-40	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Viscosity, 140° F. stokes. . . .	150	50	300	100	500	100	1000	200	2000	400	4000	800
Viscosity, 275° F. stokes. . . .	0.7	--	1.1	--	1.4	--	1.9	--	2.5	--	3.5	--
Penetration, 77° F. 100 g, 5 sec.	250	--	210	--	135	--	85	--	55	--	35	--
Flash Point, C.O.C.,°F.	425	--	425	--	425	--	450	--	450	--	450	--
Solubility in trichloroethylene, percent. . . .	99.0	--	99.0	--	99.0	--	99.0	--	99.0	--	99.0	--
Test on residues from thin film oven test: Viscosity, 140° F stokes. . . .	--	450	--	900	1500	--	3000	--	6000	--	--	12000
Ductility, 77° F, 5 cms per min,cms	100	--	100	--	100	--	70	--	50	--	30	--
Spot test	----------Negative for all grades----------											

C. A minimum of two percent, by weight, latex additive (solids basis) shall be added to the OA-175 Asphalt or to AC-5 Asphalt when specified in the contract. The latex additive shall be governed by the following specifications:

The latex is to be an anionic emulsion of butadiene-styrene low-temperature copolymer in water, stabilized with fatty-acid soap so as to have good storage stability, and possessing the following properties:

Monomer ratio, B/S	70/30
Minimum solids content	67%
Solids content per gal.@ 67%	5.3 lbs.
Coagulum on 80-mesh screen	0.01% max.
Type Anti-oxidant	staining
Mooney viscosity of Polymer(M/L 4@212° F)	100 min.
pH of Latex	9.4 - 10.5
Surface tension	28-42 dynes/cm2

The finished latex-asphalt blend shall met the following requirements:

Viscosity at 140° F, stokes	1500 max.
Ductility at 39.2° F, 1 cm. per min., cm.	100 min.

D. Asphalt content shall be within the limits noted below:

Table 02612-4

HMAC Type	Percent of Mixture by Weight	Percent of Mixture by Volume
"A"	3.5 - 7.0	8.0 - 16.0
"B"	3.5 - 7.0	8.0 - 16.0
"C"	3.5 - 7.0	8.0 - 16.0
"D"	4.0 - 8.0	9.0 - 19.0
"F"	3.5 - 6.5	8.0 - 16.0

E. At the time of delivery of each shipment of asphalt, the vendor supplying the material shall deliver to the purchaser certified copies of the test report which shall indicate the name of the vendor, type and grade of asphalt delivered, date and point of delivery, quantity delivered, delivery ticket number, and results of the above-specified tests. The test report shall be certified and signed by an authorized representative of the vendor that the product delivered conforms to the specifications for the type and grade indicated.

F. Until the certified test reports and samples of the material have been checked by

the ENGINEER to determine their conformity with the prescribed requirements, the material to which such report relates and any work in which it may have been incorporated as an integral component will be only tentatively accepted by the City. Final acceptance will be dependent upon the determination of the ENGINEER that the material involved fulfills the requirements prescribed therefor. The certified test reports and the testing required in connection with the reports will be at the expense to the City.

G. Unless otherwise specified in these specifications or in the Supplementary Specifications, the various grades of paving asphalt shall be applied at a temperature range of from 210° F to 325° F, the exact temperature to be determined by the ENGINEER.

H. Paving asphalt shall be heated in such a manner that steam or hot oils will not be introduced directly into the paving asphalt during heating. The CONTRACTOR shall furnish and keep on the site, at all times, an accurate thermometer suitable for determining the temperature of the paving asphalt.

I. HMAC asphalt shall be the grade having the highest penetration, within specified limits, to produce a mix having a maximum stability of the compacted mixtures.

J. Only one (1) grade of asphalt shall be required unless otherwise shown on the plans or as required by the ENGINEER.

2.02 AGGREGATES:

A. HMAC aggregate will be tested in accordance with the following test standards:

AASHTO T-30 Mechanic Testing
AASHTO T-27 Passing No. 200 Sieve
AASHTO T-89 Liquid Limit
AASHTO T-96 Los Angeles Abrasion

AASHTO T-104 Soundness (Magnesium Sulfate)
ASTM C – 131 Resistance to Degradation
ASTM C – 136 Sieve Analysis
ASTM C – 2419 Sand Equivalence Value
TxDOT Tex -106-E Method of Calculating Plasticity Index of Solids
TxDOT Tex-217 – F (I & II) Determination of Deleterious Materials and Decantation Test
TxDOT Tex-203 – F Quality Tests for Mineral Aggregates

B. Aggregates shall have an abrasion of not more than 40 for all courses except the non-skid surface course, which shall have an abrasion of not more than 35.

C. When properly proportioned, HMAC aggregate shall produce a gradation which will conform to the limitations for classification for HMAC type shown below, or as directed by the ENGINEER.

D. Course aggregate to be crushed limestone rock or crushed gravel with hydrated lime or limestone filler. (Crushed gravel shall be per TxDOT Specifications.)

E. Binder aggregate to be composed of 15% crushed limestone screening or as directed by the engineer.

1. Type "A" - Course Graded Base Course

	Percent Aggregate by Weight or Volume
Passing 2" sieve	100
Passing 1-3/4" sieve	95 to 100
Passing 1-3/4" sieve, retained on 7/8"sieve	16 to 42
Passing 7/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	10 to 26
Passing No. 4 sieve, retained on No. 10 sieve	5 to 21
Total retained on No. 10 sieve	68 to 84
Passing No. 10 sieve, retained on No. 40 sieve	5 to 21
Passing No. 40 sieve, retained on No. 80 sieve	3 to 16
Passing No. 80 sieve, retained on No. 200 sieve	2 to 16
Passing No. 200 sieve	1 to 8

2. Type "B" - Fine Graded or Leveling-Up Course

	Percent Aggregate by Weight or Volume
Passing 1" sieve	100
Passing 7/8" sieve	95 to 100
Passing 7/8" sieve, retained on 3/8" sieve	21 to 53
Passing 3/8" sieve, retained on No. 4 sieve	11 to 42
Passing No. 4 sieve, retained on No. 10 sieve	5 to 26
Total retained on No. 10 sieve	58 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 21
Passing No. 80 sieve, retained on No. 200 sieve	3 to 21
Passing No. 200 sieve	1 to 8

3. Type "C" - Course Graded Surface Course

	Percent Aggregate by Weight or Volume

Passing 7/8" sieve	100
Passing 5/8" sieve	95 to 100
Passing 5/8" sieve, retained on 3/8" sieve	16 to 42
Passing 3/8" sieve, retained on No. 4 sieve	11 to 37
Passing No. 4 sieve, retained on No. 10 sieve	11 to 32
Total retained on No. 10 sieve	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 27
Passing No. 200 sieve	1 to 8

4. Type "D" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 1/2" sieve	100
Passing 3/8" sieve	85 to 100
Passing 3/8" sieve, retained on No. 4 sieve	21 to 53
Passing No. 4 sieve, retained on No. 10 sieve	11 to 32
Total retained on No. 10 sieve	54 to 74
Passing No. 10 sieve, retained on No. 40 sieve	6 to 32
Passing No. 40 sieve, retained on No. 80 sieve	4 to 27
Passing No. 80 sieve, retained on No. 200 sieve	3 to 27
Passing No. 200 sieve	1 to 8

5. Type "F" - Fine Graded Surface Course

	Percent Aggregate by Weight or Volume
Passing 3/8" sieve	100
Passing No. 4 sieve	95 to 100
Passing No. 4 sieve, retained on No. 10 sieve	58 to 73
Passing No. 10 sieve, retained on No. 40 sieve	6 to 26
Passing No. 40 sieve, retained on No. 80 sieve	3 to 13
Passing No. 80 sieve, retained on No. 200 sieve	2 to 11
Passing No. 200 sieve	1 to 8

2.03 PRIME COAT:

A. Prime coat, when specified on the plans, or directed by the ENGINEER, shall

be in accordance with Section 02610 - Prime Coat, and as specified herein.

B. Prime coat shall be applied to surfaces of bases at least 12 hours prior to placing the HMAC unless otherwise directed by the ENGINEER.

C. Asphalt prime shall be applied uniformly at the rate of 0.10 to 0.30 gallon per square yard, or as directed by the ENGINEER. It shall be applied only when permitted by the ENGINEER and when the air temperature is not less than 40°F.

D. In order to prevent lapping at the junction of two applications, the distributor shall be promptly shut off. A hand spray shall be used to touch up all spots unavoidably missed by the distributor.

E. Immediately prior to application of the asphalt prime, an inspection will be made by the ENGINEER to verify that the base course has been constructed as specified. Also, all loose and foreign material shall be removed by light sweeping. Material so removed shall not be mixed with cover aggregate.

F. The surface to be primed shall be in a smooth and well-compacted condition, true to grade and cross section, and free from ruts and inequalities.

G. The pressure distributor used for applying prime coat material shall be equipped with pneumatic tires and shall be so designed and operated as to distribute the prime material in a uniform spray without atomization, in the amount and between the limits of temperature specified. It shall be equipped with a speed tachometer registering feet per minute and so located as to be visible to the truck driver to enable him to maintain the constant speed required for application at the specified rate.

H. The pressure distributor shall be equipped with a tachometer registering the pump speed, pressure gauge, and a volume gauge. The rates of application shall not vary from the rates specified by the ENGINEER by more than 10%. Suitable means for accuracy indicating at all times the temperature of the prime material shall be provided. The thermometer well shall be so placed as not to be in contact with a heating tube.

I. The distributor shall be so designed that the normal width of application shall be not less than 6 feet, with provisions for the application of lesser width when necessary. If provided with heating attachments, the distributor shall be so equipped and operated that the prime material shall be circulated or agitated through the entire heating process.

J. The asphalt prime coat should preferably be entirely absorbed by the base course and, therefore, require no sand cover. If, however, it has not been completely absorbed prior to the start of placing the asphalt concrete mixture and in the meantime it is necessary to permit traffic thereon, sufficient sand shall be spread over the surface to blot up the excess liquid asphalt and prevent it from being picked it up under traffic. Also, sand shall be used in areas where traffic may pass over the prime coat. Prior to placing the asphalt concrete, loose or excess sand shall be swept from the base. If a sand cover is specified in the Supplementary Specifications or noted on the plans to cover asphalt prime, it shall be applied within 4 hours after the application of said prime coat, unless otherwise ordered by the ENGINEER.

K. Liquid asphalt shall be prevented from being sprayed upon adjacent pavements, structures, guard rails, guide posts, culvert markers, trees, and shrubbery that are not to be removed; adjacent property and improvements; other facilities or that portion of the traveled way being used by traffic.

L. The CONTRACTOR shall protect the prime coat against all damage and markings, both from foot and vehicle traffic. Barricades shall be placed where necessary to protect the prime coat. If, after the prime coat has been applied to the satisfaction of the ENGINEER and has been accepted, if it is disturbed by negligence on the part of the CONTRACTOR, it shall be restored at his expense to its condition at the time of acceptance. No material shall be placed until the prime coat is in a condition satisfactory to the ENGINEER.

2.04 TACK COAT:

A. If the asphalt concrete pavement is being constructed directly upon an existing hard-surfaced pavement, a tack coat shall be evenly and uniformly applied to the existing pavement proceeding the placing of the new

asphalt concrete. The surface shall be free of water, all-foreign material, or dust when the tack coat is applied. No greater area shall be treated in any one day than will be covered by the asphalt concrete during the same day. Traffic will not be permitted over tack coating.

B. Tack coat for HMAC shall consist of either rapid curing cut-back asphalt RC-2 diluted by addition of (not to exceed 15 percent by volume) an approved grade of gasoline and/or kerosene; emulsified asphalt, EA-11M diluted with 50 percent water, or a cut-back asphalt made by combining 50 to 70 percent of the asphaltic materials specified for the paving mixture with 30 to 50 percent gasoline and/or kerosene by volume.

C. Tack coat shall conform to the requirements of Section 2620 - Tack Coat, or as specified herein.

D. Application rate shall be 0.10 to 0.15 gallons per square yard, or as directed by the ENGINEER.

E. A similar tack coat shall be applied to the surface of any course if in the opinion of the ENGINEER, the surface is such that a satisfactory bond cannot be obtained between it and the succeeding course.

F. When required, the contact surfaces of all cold pavement joints, curbs, gutters, manholes, and the like shall be painted with a tack coat immediately before the adjoining asphalt concrete is placed. Asphalt tack coat shall be applied in controlled amounts as shown on the plans or determined by the ENGINEER. Surfaces where a tack coat is required shall be cleaned to the satisfaction of the ENGINEER before the tack coat is applied.

2.05 MINERAL FILLER:

A. Mineral filler, other than hydrated lime, shall consist of a thoroughly dry stone dust, portland cement or other mineral dust approved by the ENGINEER.

B. The mineral filler shall be free from foreign or other deleterious matter.

C. When tested by the method outlined in TxDOT Test Method Tex-200-F (Part 1 or 3), mineral filler shall meet the following gradations by weight:

Passing No. 30 Sieve	95-100%
Passing No. 80 Sieve	75%
Passing No. 200 Sieve	55%

2.06 ANTI-STRIPPING COMPOUND

A. Anti-Stripping compound, as required in the job mix formula, shall be furnished in the amounts calculated therein.

2.07 JOB MIX FORMULA:

A. A job mix formula based on representative samples, including filler if required, shall be determined by the ENGINEER, or submitted by the CONTRACTOR for approval of the ENGINEER.

B. The resultant job mix formula shall be within the master range for the specified type of HMAC.

C. The job mix formula for each mixture shall establish a single percentage of aggregate passing each required sieve size and a single percentage of bituminous material to be added to the aggregate and shall provide for 3 to 5% air voids in the resultant design mix. During the mix design process the ENGINEER will consider other factors, in addition to air voids and Marshall stability, such as durability, water resistance, and asphalt film thickness when developing the mix design.

D. After the job mix formula is established, mixtures for the project shall conform to the following tolerances which may fall outside of the specified master range:

	Percent by Weight or Volume as Applicable	
Passing 1-3/4" sieve, retained on 7/8" sieve	± 5	
Passing 7/8" sieve, retained on 5/8" sieve		± 5
Passing 5/8" sieve, retained on 3/8" sieve		± 5
Passing 3/8" sieve, retained on No.4 sieve	± 5	
Passing No.4 sieve, retained on No.10 sieve	± 5	
Total retained on No.10 sieve	± 5	
Passing No.10 sieve, retained on No.40 sieve	± 3	
Passing No.40 sieve, retained on No.80 sieve		± 3
Passing No.80 sieve, retained on No.200 sieve	± 3	
Passing No.200 sieve	± 3	
Asphaltic Material	± 0.05 by wt or 1.2 by vol.	
Mixing Temperature	± 20° F	

E. Asphaltic mixture shall be tested in accordance with TxDOT Test Method Tex-200-4 (Part I or Part III) and shall have the following laboratory values:

		Surface Course	Base Course
Density:	Minimum	95%	95%
	Maximum	99%	99%
	Optimum	97%	97%
Stability (Hveem)			
	Minimum	30%	30%
	Maximum	45%	45%
Stability (Marshall – 75 Blow Briquette)		1500 lbs	1500 lbs.
Voids		3 - 7%	4 - 7%
Voids Filled With Asphalt		75 - 85%	65 - 80%
Sand Equivalent		40	40

2.08 EQUIPMENT:

A. All equipment for the handling of all material, mixing, and placing of HMAC shall be in accordance with the provisions of TxDOT Item 340.

2.09 STOCKPILING, STORAGE, PROPORTIONING AND MIXING:

A. Stockpiling, storage proportioning and mixing operations shall be in accordance with the Provisions of TxDOT Item 340.

PART 3 - EXECUTION

3.01 WEATHER AND TEMPERATURE LIMITATIONS:

A. Asphaltic mixture, when placed with a spreading and finishing machine, or the tack coat shall not be placed when the air temperature is 50° F and falling, but may be placed when the air temperature is 40° F and rising.

B. Asphaltic mixture, when placed with a motor grader, shall not be placed when the air temperature is 60° F and falling, but may be placed when the air temperature is 50° F and rising.

C. Mat thicknesses of 1 inch or less shall not be placed when the temperature on which the mat is to be laid is below 50° F.

D. No tack coat or asphaltic mixture shall be placed when the humidity, general weather conditions and temperature and moisture condition of the base, in the opinion of the ENGINEER, are unsuitable.

E. If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture is 50° F or more below the temperature established by the ENGINEER, all or any part of the load may be rejected and payment will not be made for the rejected material.

3.02 EQUIPMENT:

A. Hauling Equipment:

1. Trucks used for hauling asphaltic mixtures shall have tight, clean, smooth

   metal beds that have been thinly coated with a minimal amount of paraffin oil, lime slurry, tine solution or other approved material to prevent mixture adhesion to the bed.

2. The dispatching of hauling equipment shall be arranged so that all material delivered may be placed and all rolling completed during daylight hours, unless otherwise directed by the ENGINEER.

3. All trucks shall be equipped with a cover of canvas, or other suitable material to protect the mixture from weather or on hauls where the temperature of the mixture will fall below specified level. Use of covers will be as directed by the ENGINEER.

B. Rollers:

1. Pneumatic Tire Roller. This roller shall consist of not less than seven pneumatic tire wheels, running on axles in such manner that the rear group of tires shall cover the entire gap between adjacent tires of the forward group; mounted in a rigid frame; and provided with a loading platform or body suitable for ballast loading. The front axle shall be attached to the frame in such manner that the roller may be turned within a minimum circle. The tire shall afford surface contact pressures up to 90 pounds per square inch or more. The roller shall be so constructed as to operate in both a forward and a reverse direction with suitable provisions for moistening the surface of the tires while operating; and shall be approved by the ENGINEER.

2. Two Axle Tandem Roller. This roller shall be an acceptable power-driven, steel-wheel, tandem roller weighing not less than eight tons. It must operate in forward and reverse directions; contain provision for moistening the surface of the wheels while in motion; and shall be approved by the ENGINEER.

3. Three Wheel Roller. This roller shall be an acceptable power- driven, all steel, three wheel roller weighing not less than 10 tons. It must operate in forward and reverse directions; contain provisions for moistening the surface of the wheel while in motion; and shall be approved by the ENGINEER.

4. Vibratory Steel Wheel Roller. If approved for use by the OWNER, this roller shall have a minimum weight of six tons. The compactor shall be equipped with amplitude and frequency controls and shall be specifically designed to compact the material on which it is used. It shall be operated in accordance with the manufacturer's recommendations.

C. Straight Edges:

1. The CONTRACTOR shall provide an acceptable 16-foot straight-edge for surface testing. Satisfactory templates shall be provided as required by the ENGINEER.

D. Spreading and Finishing Machine:

1. Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or a strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and thickness shown on the plans.

2. The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed. Design will be such that no part of the truck weight will be supported by the paver.

3. The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving or gouging the mixture. When laying mixtures, the paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. The screed shall be adjustable for both height and crown and shall be equipped with a controlled heating device.

4. The bituminous paver shall be equipped with an automatic leveling device controlled from an external guide. The initial pass for each course shall be made using a paver equipped with a 40-foot minimum external reference, except that this requirements will not apply when asphalt concrete is placed adjacent to portland cement concrete pavement. Subsequent passes may utilize the matching device of one foot minimum length riding on the adjacent lay.

3.03 CONSTRUCTION METHODS:

A. Spreading and Finishing:

1. The asphalt concrete mixture shall be laid on the approved surface, spread and struck off to the grade and elevation established. It shall be spread and compacted in layers as shown on the plans or as directed by the ENGINEER. Bituminous pavers shall be used to distribute the mixture either over the entire width or over such partial width as may be practicable.

2. The ENGINEER will determine a minimum placement temperature within a range from 220° F to 300° F, which will produce the required density. The established placement temperature, which is measured immediately behind the lay down machine, shall not vary more than 20° F.

3. A conventional paver or suitable equipment approved by the ENGINEER may be used to place asphalt concrete material on shoulders depressed from the traveled lanes in order to established a uniform typical section. Approval of the equipment used will be based upon the results obtained.

4. The asphalt concrete may be dumped from the hauling vehicles directly into the paving machine or it may be dumped upon the surface being paved and subsequently loaded into the paving machine; however, no asphaltic concrete shall be dumped from the hauling vehicles at a distance greater than 250 feet in front of the paving machine. When asphaltic concrete is dumped first upon the surface being paved, the loading equipment shall be self-supporting and shall not exert any vertical load on the paving machine. Substantially all of the asphaltic concrete dumped shall be picked up and loaded into the paving machine.

5. To achieve, as far as practicable, a continuous operation, the speed of the paving machine shall be coordinated with the production of the plant. Sufficient hauling equipment shall be available to insure continuous operation.

6. The control system shall control the elevation of the screed at each end by controlling the elevation of one end directly and the other indirectly either through controlling the transverse slope or alternately when directed, by controlling the elevation of each end independently, including any screed attachment used for widening, etc. Failure of the control system to function properly shall be cause for the suspension of the asphaltic concrete operations.

7. When dumping directly into the paving machine from trucks, care shall be taken to avoid jarring the machine or moving it out of alignment.

8. All courses of asphaltic concrete shall be placed and finished by means of self-propelled paving machines except under certain conditions or at certain locations where the ENGINEER deems the use of self-propelled, paving machines impracticable.

9. Self-propelled paving machines shall spread the asphaltic concrete without segregation or tearing within the specified tolerances, true to the line, grade, and crown indicated on the plans. Pavers shall be equipped with hoppers and augers, which will place the asphaltic concrete evenly in front of adjustable screeds without segregation. Screeds shall include any strike-off device operated by tamping or vibrating action which is effective without tearing, shoving or gouging the asphaltic concrete and which produces a finished surface of an even and uniform texture for the full width being paved. Screeds shall be adjustable as to height and crown and shall be equipped with a controlled heating device for use when required.

10. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked, fluted and compacted with hand tools. For such areas the mixture shall be dumped, spread and screed to give the required compacted thickness.

B. Compaction:

1. Rolling with the 3-wheel and tandem roller shall start longitudinally at the sides and proceed toward the center of the surface course, overlapping on successive trips by at least half the width of the rear wheels.

2. Alternate trips of the roller shall be slightly different in length.

3. Rolling with a pneumatic tired roller shall be as directed by the ENGINEER.

4. Rolling shall continue with no further compression can be obtained and all roller marks are eliminated.

5. The motion of the roller shall be slow enough at all times to avoid displacement of asphaltic materials. If displacement occurs, it shall be corrected immediately by use of rakes and fresh asphaltic mixtures, where required.

6. The roller shall not be allowed to stand on the surface course when it has not been fully compacted and allowed to cool.

7. To prevent adhesion of the surface course to the roller, the wheels shall be kept thoroughly moistened with water; however, excess water shall not be allowed.

8. All precautions shall be taken to prevent dripping of gasoline, oil, grease, or other foreign substances on the surface or base courses during rolling operations or while rollers are standing.

9. With the approval of the ENGINEER, a vibratory steel wheeled roller may be substituted for the 3-wheel roller and tandem roller.

10. Along forms, curbs, headers, walls and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot hand tampers, smoothing irons, or with mechanical tampers. On depressed areas, a trench roller may be used or cleated compression strips may be used under the roller to transmit compression to the depressed area.

11. Any mixture that becomes loose, broken, mixed with dirt, segregated, or is in any way defective shall be removed and replaced with fresh hot bituminous mixture, which shall be compacted to conform with the surrounding area. Any area showing excess or deficiency of bituminous material shall be corrected immediately as directed by the ENGINEER.

C. In-Place Density:

1. In-place density shall be required for all mixtures except thin irregular depth leveling courses.

2. Each course, after final compaction, shall have a density of not less than 95 percent of the density developed in the laboratory test method outlined in TxDOT Bulletin C-14.

3. Density shall be determined with a portable nuclear test device in conformity with ASTM D-2950.76.

4. Calibration of the portable nuclear device will be established by the ENGINEER from cut pavement samples tested in accordance with AASHTO T-166 (weight, volume method). The density readings of the cut pavement samples determined in accordance with AASHTO T-166 (weight, volume method), and the density readings of the pavement samples determined by the portable nuclear test device in conformity with ASTM D 2950 will be correlated by the ENGINEER.

5. Other methods of determining in-place density may be used as deemed necessary by the ENGINEER.

6. It is intended that acceptance density testing will be done while the bituminous mixture is hot enough to permit further compaction if necessary. If the density of an acceptance section does not meet the specified requirements, the CONTRACTOR shall continue the compaction effort until the optimum density is obtained. Rolling for any compactive effort will not be allowed when the temperature of the mix is below 175° F unless authorized in writing by the ENGINEER. Rerolling the paved surface after it has initially cooled will not be allowed.

7. If in-place density tests of the mixture produce a value lower than specified and in the opinion of the ENGINEER is not due to a change in the quality of the material, production may proceed with subsequent changes in the mix and/or construction procedures until in-place density equals or exceeds the specified density.

8. In-place density tests will be provided by the ENGINEER unless otherwise specified.

D. Joints:

1. Placing of the asphalt concrete shall be as continuous as possible. Rollers shall not pass over the unprotected end of a freshly laid mixture unless authorized by the ENGINEER.

2. When plant mix bituminous pavement is placed over plant mix bituminous treated base or when plant mixed seal coat is placed over plant mix bituminous pavement, longitudinal joints shall be staggered at least 6 inches with relation to the longitudinal joints of the underlying course.

3. Transverse joints shall have a two-foot or 12:1 minimum taper. Longitudinal joints shall have a one-foot or 6:1 minimum taper. All transverse tapers shall be cut and squared off prior to commencing new work. Tapered longitudinal joints from previous operations shall be cleaned and tack coated if directed by the ENGINEER. All joints shall be completely bonded. The surface of each course at all joints shall be smooth and shall not show any deviations in excess of 3/16 of an inch when tested with a 10-foot straightedge in any direction.

4. When paving under traffic, the CONTRACTOR shall plan his daily surfacing operations on a schedule, which will result in not more than one (1) day's operation of exposed longitudinal joints. The longitudinal joints shall not have a height greater than two (2) inches and shall not be left exposed longer than 24 hours.

E. Surface Tolerance:

1. Upon completion, the pavement shall be true to grade and cross section.
Except at intersections or any changes of grade, when a 16 foot straight edge is laid on the finished surface parallel to the centerline of the roadway, the surface shall not vary from the edge of the straight edge more than 1/16-inch per foot. Areas that are not within this tolerance shall be brought to grade immediately following the initial rolling. After the completion of final rolling, the smoothness of the course shall be checked, and the irregularities that exceed the specified tolerances or that retain water on the surface shall be corrected by removing the defective work and replacing with new material as directed by the ENGINEER at the expense of the CONTRACTOR.

F. Manholes and Valve Covers:

1. Manhole frames and valve covers shall be adjusted prior to placing the

surface course.

G. Compacted Thickness of HMAC Surface and Base Courses:

1. Surface Courses. The compacted thickness or depth of the asphaltic concrete surface course shall be as shown on the plans. Where the plans require a depth or thickness of the surface course greater than two inches compacted depth, same shall be placed in multiple courses of equal depth, each of which shall not exceed two inches compacted depth. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple courses, it shall be applied at the rate as directed.

2. Base Courses. The compacted thickness or depth of each base course shall be as shown on the plans. Where the plans require a depth or thickness of the course greater than 4 inches, same shall be accomplished by constructing multiple lifts of approximately equal depth, each of which shall not exceed these maximum compacted depths. If, in the opinion of the ENGINEER, an additional tack coat is considered necessary between any of the multiple lifts, it shall be applied as hereinbefore specified and at the rate as directed.

H. Pavement Thickness Tests:

1. Pavement Thickness Test. Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness test shall be made by the ENGINEER or his authorized representative unless otherwise specified in the special provisions or in the plans. The number and location of tests shall be at the discretion of the OWNER. The cost for the initial pavement thickness test shall be at the expense of the ENGINEER. In the event a deficiency in the thickness of pavement is revealed during normal testing operations, subsequent tests necessary to isolate the deficiency shall be at the CONTRACTOR'S expense. The cost for the additional coring test shall be at the same rate charged by commercial laboratories.

I. Price Adjustment for Roadway Density

1. The payment of the unit price will be adjusted for roadway density as outlined in the following table. The adjustment will be applied on a lot-by-lot basis for each lift. The adjustment will be based on the average of five density tests. The price adjustment will be applied to the entire asphalt concrete mix, which includes the HMAC aggregate, the asphalt cement and anti-stripping compound, if used.

Average Density

Percent of Contract % of Lab Density	Price To Be Paid
Above 95%	100%
94.0 to 94.99	96%
93.0 to 93.99	91%
92.0 to 92.99	85%
Less than 92.00	*

* This lot shall be removed and replaced to meet specification requirements as ordered by the ENGINEER. In lieu thereof, the CONTRACTOR and the ENGINEER may agree in writing that for practical purposes, the lot shall not be removed and will be paid for at 50% of the contract price.

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT AND PAYMENT:

A. No bid item is established for these items, this work shall be considered subsidiary to the contract and no direct payment will be made.

*** * * * END OF SECTION * * * ***

PRIME COAT

A. DESCRIPTION

"Prime Coat" shall consist of an application of asphaltic material on the completed base course and/or other approved areas in accordance with these specifications as directed by the Inspector.

B. MATERIALS

The asphalt material for prime coat shall meet the requirement for Cut-Back Asphalt, MC-30, Item 300, "Asphalt, Oils, and Emulsions" of the Texas Highway Department Standard Specifications.

C. CONSTRUCTION METHODS

When, in the opinion of the Inspector, the area and/or base are satisfactory to receive the prime coat, the surface shall be cleaned by sweeping or other approved methods as directed by the Inspector. If directed by the Inspector, the surface shall be lightly sprinkled with water just prior to application of the asphaltic material. The asphaltic material shall be applied on the clean surface by an approved distributor at a rate not to exceed 0.20 gallons per square yard of surface, evenly, and smoothly, under a pressure necessary for proper distribution. During the application of prime coat, care shall be taken to prevent splattering of adjacent pavment, curb and gutter or structures.

Prime coat shall not be applied when the air temperature is below 60^{o}F and falling, but may be applied when the air temperatur is about 50^{o}F and is rising; the air temperature being taken in the shade and away from artificial heat. Asphaltic material shall not be placed when general weather conditions, in the opinion of the Inspector, are not suitable.

D. MEASUREMENT

The quantity of asphaltic material for prime coat in gallons will be calculated by multiplying the measured surface are of accepted asphaltic pavement by the application rate 0.2 gallons per square yard.

E. PAYMENT

The work performed and materials furnished as prescribed by this item will not be paid for separately. The cost of prime coat material, cleaning the area and/or base; for furnishing, heating, hauling, and distributing the prime coat as specified, for all freight involved and for all manipulations, labor, tools, equipment, and incidentals necessary to complete the work shall be included in the unit price for "Hot Mix Asphaltic Concrete".

ROADWAY EXCAVATION AND SUBGRADE PREPARATION

A. DESCRIPTION

The work covered by this section consist of excavating and properly utilizing or satisfactorily disposing of all excavated material, of whatever character, within the limits of the work and the constructing, compacting, and shaping, and finishing of all earthwork on the entire length of the street and approaches to same in accordance with specification requirements herein outlined and in conformity with the required lines, grades, and typical cross sections shown on the plans.

All excavation shall be unclassified, and shall include all materials encountered regardless of their nature or the manner in which they are removed, except those covered by pay items.

B. CONSTRUCTION METHODS

The subgrade shall be shaped in conformity with the typical sections shown on the plans and to the lines and grades established by the Engineer. All unstable or otherwise objectionable material shall be removed from the subgrade and replaced with approved material. All holes, ruts, and depressions shall be filled with approved material. The surface of the subgrade shall be finished to the lines and grades as established, and be in conformity with the typical sections shown on the plans. Any deviation in excess of one-half (1/2) inch in cross section and in a length of sixteen (16) feet measured longitudinally shall be corrected by loosening, adding, or removing material, reshaping and compacting by sprinkling and rolling. Sufficient subgrade shall be prepared in advance to insure satisfactory prosection of the work.

Material removed may be utilized in the addition of material to the subgrade if approved by the Inspector. All other material required for completion of the subgrade shall also be subject to approval by the Inspector. All other material required for completion of the subgrade shall also be subject to approval by the Inspector.

Unless otherwise indicated on plans. The surface of the ground of all unpaved areas which are to receive embankment shall be loosened by scarifying or plowing to a depth of not less than 4 inches. The loosened material shall be recompacted with the new embankment as hereinafter specified. The embankment shall be placed in layers not to exceed 6" in thickness for the full width of the individual roadway cross section and i, such lengths as are best suited to the sprinkling and compaction methods utilized.

C. MEASUREMENT & PAYMENT

Work and materials required under this item will not be measured or paid separately. The cost of work and materials required under this item shall be included in the unit price bid for other items of the work.

TEMPORARY EROSION, SEDIMENT, AND WATER POLLUTION CONTROL
(TXDOT Item # 506)

A. Description

This item shall consist of temporary soil erosion, sediment and water pollution control measures deemed necessary by the Engineer for the duration of the contract. The temporary pollution-control provisions contained herein shall be coordinated with the permanent soil-erosion-control features specified elsewhere in the contract to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post construction period. These control measures shall at no time be used as a substitute for the permanent control measures unless otherwise directed by the Engineer and they shall not include measures taken by the Contractor at his expense under Sub articles 4(a) through (e) to control conditions created by his construction operations. The temporary measures shall include dikes, dams, berms, sediment basins, fiber mats, jute netting, temporary seeding, straw mulch, asphalt mulch, plastic liners, rubble liners, baled-hay retards, dikes, slope drains and other devices specified by the Engineer.

B. Items of Work &Materials

The estimated items of temporary erosion control will be indicated on the plans; however, the Engineer may increase or decrease the quantity of these Items as the need arises. The materials will be specified in the plans, standard specifications, special specifications or special provisions. The Engineer may specify other materials and work as the need arises.

C. Pre-construction Conference

Prior to the start of the applicable construction, the Contractor shall submit for approval his schedules for accomplishment of soil-erosion-control work and his plan to keep the area of erodible-earth material to a minimum. He shall also submit for acceptance his proposed method of soil-erosion control on construction and haul roads and material sources and his plan for disposal of waste materials. N o work shall be started until the soil-erosion control schedules and methods of operations have been reviewed and approved by the Engineer.

D. Construction Requirements

The Engineer has the authority to define erodible earth and the authority to limit the surface area of erodible- earth material exposed by preparing right of way, clearing and grubbing, the surface area of erodible-earth material exposed by excavation, borrow and embankment construction operations (except for commercial operations) and to direct the Contractor to provide temporary pollution-control measures to prevent contamination of adjacent streams, other water- courses, lakes, ponds or other areas of water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains and use of temporary mulches, mats, seeding or other control devices or methods directed by the Engineer as necessary to control soil erosion.

The Contractor will be required to incorporate all permanent soil- erosion-control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution-control measures shall be used to prevent or correct erosion that may develop during construction prior to installation of permanent pollution-control features, but are not associated with permanent control features on the project.

The Engineer will limit the area of preparing right of way, clearing and grubbing, excavation, borrow and embankment operations (other than commercially-operated sources) to be proportional to the capability and progress in keeping the finish grading, mulching, and other such permanent pollution-control measures current in accordance with the accepted schedule. Should seasonal conditions make such limitations unrealistic, temporary soil-erosion-control measures shall be performed as directed by the Engineer. The amount of surface area of erodible- earth material exposed at one time shall not exceed 750,000 SF for each Excavation operation, 750,000 SF for each Material Source operation (other than from commercially-operated sources), 750,000 SF for each Preparing of Right of Way operation or 750,000 SF for each Clearing and Grubbing operation, unless otherwise shown on the plans or with prior approval by the Engineer in writing.

The Contractor shall maintain the top of the earthwork in all roadway sections through all construction stages in such a manner as to permit the runoff of precipitation to the outer edges. When directed by the Engineer, earth berms shall be constructed along the top and/or bottom edges of embankment or cuts to intercept the runoff water at the close of the day's grading operations. Earth berms shall be compacted to the satisfaction of the Engineer. Temporary slope drain facilities shall be provided to carry the runoff to the bottom of the slopes. The slope drains may be of flexible or rigid construction, but shall be capable of being readily shortened or ex- tended as the cut or fill progresses. Pipe and/or sheeting shall be provided at the entrance to the temporary slope drains, and where necessary, energy dissipaters shall be provided at the outlet. Open drains shall be stabilized as necessary to prevent erosion. On embankments with flat slopes where slope drains are impractical, temporary grasses and/or mulch stabilization shall be constructed concurrently with the embankment formation.

Should preventive measures fail to function effectively, the Engineer will require the Contractor to act immediately to bring the erosion and siltation under control by whatever additional temporary means are necessary.

The Contractor shall also conform to the following practices and con- trols. All labor, tools, equipment and incidentals to complete the work will not be paid for directly but shall be considered as subsidiary work to the various items included in the contract.

a. Waste or disposal areas and construction roads shall be located and constructed in a manner that will minimize the amount of sediment entering streams.

b. Frequent fordings of live streams will not be permitted; therefore, temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the Engineer, mechanized equipment shall not be operated in live streams.

c. When work areas or material sources are located in or adjacent to live streams, such areas shall be separated from the stream by a dike or other barrier to keep sediment from entering

a flowing stream. Care shall be taken during the construction and removal of such barriers to minimize the muddying of a stream.

d. All waterways shall be cleared as soon as practicable of false work, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.

e. The Contractor shall take sufficient precautions to prevent pollution of streams, lakes and reservoirs with fuels, oils, bitumens, calcium chloride or other harmful materials. He shall conduct and schedule his operations so as to avoid or minimize siltation of streams, lakes and reservoirs and to avoid interference with movement of migratory fish.

D. Measurement and Payment

In the event that temporary erosion, sediment and water-pollution-control measures required on projects are due to the Contractor's negligence, carelessness or failure to install permanent controls as a part of the work as scheduled, and are ordered by the Engineer, such work shall not be measured for payment but shall be per- formed by the Contractor at his own expense.

Where the work to be performed on projects involving earthwork, pre- paring right of way or clearing and grubbing, is not attributed to the Con- tractor's negligence, carelessness or failure to install permanent controls and falls within the specifications for a bid item in the contract, the units of work shall be measured and paid for in accordance with the appropriate specification. Should the work not be comparable to the work under the applicable contract bid items, the Contractor shall be ordered to perform the work on a force-account basis in accordance with Article 9.4., "Force Ac- count", or by agreed unit prices.

In case of failure on the part of the Contractor to control soil erosion, pollution and/or siltation, the Engineer reserves the right to employ outside assistance or to use State forces to provide the necessary corrective measures. Such incurred direct costs plus project-engineering costs will be deducted from any money due or to become due to the Contractor.

Temporary pollution control may include construction work outside the right of way where such work is necessary as a result of roadway construction such as material-source operations, haul roads and equipment-storage sites. Temporary pollution control work outside the right of way will not be measured for payment but shall be performed by the Contractor at his own expense.

SECTION 02221

EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES (CIVIL)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES:

A. Excavating, trenching, backfilling and compacting for water distribution mains, sanitary sewers, manholes and other utility systems and appurtenances, and the disposal of excess excavated material.

1.3 RELATED SECTIONS:

A. Excavation, Backfill and Grading for Site Work Outside of Building.
B. Excavating, backfilling and compacting for pavement.
C. Cement sand backfill.
D. Water main.
E. Sanitary sewerage.

1.4 REFERENCES:

A. ASTM C33 - Grading Requirements for Coarse Aggregates.
B. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.
C. ASTM D698 - Moisture-Density Relations of Soils.

1.5 PROTECTION OR REMOVAL OF UTILITY LINES:

A. The Contractor shall anticipate all underground obstructions such as, but not limited to, water mains, gas lines, storm and sanitary sewers, telephone or electric light or power ducts, concrete, and debris. Any such lines or obstructions indicated on the Drawings show only the approximate locations and shall be verified in the field by the Contractor. The Engineer will endeavor to familiarize the Contractor with all known utilities and obstructions, but this shall not relieve the Contractor from full responsibility in anticipating all underground obstructions whether or not shown on the Drawings.
B. The Contractor shall, at his own expense, maintain in proper working order and without interruption of service all existing utilities and services which may be encountered in the work, except that with the consent of the Architect, Utility Owner and Owner, such service connections may be temporarily interrupted to permit the Contractor to remove designated lines or to make temporary changes in the locations thereof as will aid in the completion of the work and at the same time maintain service to the property so originally benefited. The cost of making any temporary changes shall be at the Contractor's expense.
C. Before starting construction, the Contractor shall notify all utility companies involved to have their utilities located and marked in the field. All underground utilities shall then be uncovered to verify location and elevation before construction begins. The Contractor shall obtain all necessary permits.

PART 2 - PRODUCTS

2.1 EARTH BACKFILL:

A. Earth Backfill shall be free of lumps, stones, trash and spongy or otherwise objectionable material, inclusive of materials with a plasticity between 7 and 20 percent, as approved. Approved backfill material may be from the excavation or borrowed.

2.2 CEMENT SAND BACKFILL:

A. Prepare cement-sand backfill as specified in Section "Cement Sand Backfill".

2.3 SAND:

A. Use sand that is free from clay lumps, organic and other deleterious material, and having a plasticity index of not less than 4 or greater than 12, as determined by ASTM D424.

2.4 CRUSHED ROCK:

A. Provide durable crushed rock free of clay lumps, organic or other deleterious material. Crushed rock size shall meet gradation requirement criteria of TxDOT Item 247, Ty A, Grade 1-5.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION:

A. Examine utility routes and coordinate excavation work to eliminate installation conflicts.
B. Allow room for stockpiling excavated material and utility construction material during utility construction.

3.2 TRENCH EXCAVATION:

A. Procedure: Excavate to indicated or specified depths.
   1. Excavate by open cut, unless directed otherwise.
   2. Do not use excavated material composed of rocks, chunks or clods larger than 6-inches for backfill. Dispose of such material and provide other suitable material for backfill without additional expense.
   3. During excavation, stock pile material suitable for backfilling in an orderly manner far enough from the bank of the trench to avoid overloading, slides or cave-ins.
   4. Grade as necessary to prevent surface water from flowing into trenches or other excavations.
   5. Cut banks of trench as nearly vertical as practical. Remove stones as necessary to avoid point-bearing. Over-excavate wet or unstable soil from the trench bottom to permit construction of a more stable bed for pipe. Over excavation shall be filled and tamped with clean dry sand or other approved material to the required grade.
   6. Dig the trench the proper width as shown. If the trench width below the top of pipe is wider than specified in this Section or shown on Drawings, then install additional approved material. No additional payment will be made.
   7. Accurately grade the trench bottom to provide proper bedding as required for pipe installation.
   8. If any excavation is carried beyond the lines and grades required or authorized, the Contractor shall, at his own expense, fill such space with concrete or other approved material. No additional payment will be made.
   9. At the Contractor's option, the entire width of the utility corridor may be opened, utilities placed and backfilled as a unit. Contractor may elect to install each utility in a separate trench. No additional payment shall be made for selecting either option.
B. Sheeting and Bracing: Install sheeting and bracing necessary to support the sides of trenches and other excavations with vertical sides, as specified in contract documents.
C. Pipe Zone: The pipe zone is defined as including the pipe bedding, backfill to one-half the pipe diameter (the springline) and the initial backfill to 12 inches above the top of the pipe.
   1. Wastewater Bedding: Accurately grade the bottom of the trench 6 inches below the bottom of the pipe and limit clear space on either side of the pipe to 12 inches at and below the top of the pipe or as specified. Place a minimum of 6 inches of crushed rock up to the flow line of the pipe or above before pipe is laid. Install pipe and place additional crushed rock around the pipe and to the springline of the pipe. Lightly compact the crushed rock by tamping with mechanical tamper. Complete bedding with crushed stone to 12-inches above the top of the pipe. Crushed rock shall conform to size and gradation specified in Article 2.4 above.
   2. Water Bedding: Accurately grade the bottom of the trench 6 inches below the bottom of the pipe and limit clear space on either side of the pipe to 12 inches at and below the top of the pipe or as specified. Place a minimum of 6 inches of crushed rock up to the flow line of the pipe or above before pipe is laid. Install pipe and place additional crushed rock around the pipe and to the

springline of the pipe. Lightly compact the crushed rock by tamping with mechanical tamper. Complete bedding with fine grained material to 12-inches above the top of the pipe. Crushed rock shall conform to size and gradation specified in Article 2.4 above.

D. Water in Excavation: Keep work free from ground or surface water at all times. Provide pumps of adequate capacity or other approved method to remove water from the excavation in such a manner that it will not interfere with the progress of the work or the proper placing of other work. Ground or surface water will not be allowed to drain into or be pumped into an existing sanitary sewer system. If the work includes connection to an existing sanitary sewer, a temporary water-tight plug shall be installed and maintained within the pipe for the duration of the contract and bedding material interrupted in a manner approved by the Architect to isolate new construction from the existing system.

E. Do not endanger spread footings with trench excavations. Trench excavations shall not encroach within the area below a footing defined by a 1:1 slope away from the bottom corner of any footing.

F. 3-inches to 6-inches wide, colored marker tape shall be placed in trench above pipe 36-inches +. Marker tap face shall indicate utility type in writing. Marker tape shall be approved prior to placement.

3.3 UTILITY INSTALLATION:

A. Sanitary Sewers: Limit clear space on either side of the pipe to 12 inches at and below the top of the pipe or as specified. Above the pipe, cut as wide as necessary to sheet and brace and properly perform the work. Provide bedding as specified in Article 3.2, Section C.1, above. Install piping and appurtenances as specified in Section 02730 - Sanitary Sewerage.

B. Water Supply and Distribution Lines: Grade trenches to avoid high points requiring vacuum and relief valves in water lines. Provide a minimum cover over the top of the pipe as indicated on the Drawings. Avoid interference of water lines with other utilities. Provide bedding as specified in Article 3.2, Section C.2, above. Install piping and appurtenances as specified in plans.

C. Gas Distribution Lines: Provide cover over the top of the pipe as indicated on the Drawings. Avoid interference with other utilities. Install piping as specified in specification section for Natural Gas Distribution System.

D. Electrical and Telephone System: Trench banks for concrete duct lines need not be kept vertical but may be sloped or widened to such general limits as may be set, provided there is no interference with other utilities.

1. Over-excavating and backfilling with suitable selected material where rock is encountered will not be required except for a gradual cushioning toward points of abrupt drop-off of the rock to levels considerably below the grade of the duct.
2. Special trenching requirements for conduits, direct-buried electrical cables and duct lines are specified in specification division for Electrical.

E. Storm Sewer Culverts: Grade trenches to the line and grade required for proper installation of the pipe. Provide bedding as specified in plan details, above for concrete pipe or culvert installation.

F. Excavation for Appurtenances: Excavate sufficiently for manholes, utility pull boxes, solid waste wash rack, and similar structures to leave at least 2 feet clear between the outer surfaces and the embankment or timber that may be used to hold and protect the banks. Any over-depth excavation below such appurtenances not directed will be considered unauthorized and will be refilled with cement-sand or concrete, as approved, at no additional cost to the Owner.

3.4 BACKFILLING:

A. Criteria: Do not backfill trenches to a point greater than 2 feet above top of pipe until all required pressure tests are performed and utility systems as installed conform to specified requirements of appropriate sections. Backfill trenches to ground surface with material as specified. Reopen trenches improperly backfilled to depth required for proper compaction. Refill and recompact as specified, or otherwise correct the condition in an approved manner.

B. Open Areas:

1. In the pipe zone, place backfill (bedding) evenly and carefully around, under and over pipe in lifts no thicker than 6 inches. Compact with mechanical hand tampers to 95 percent density according to ASTM D698, until there is a cover of not less than 1 foot over utility lines. Use bedding and backfill material as scheduled for on plans. Take special care not to damage pipe wrapping or coating.
2. Above the pipe zone, deposit earth backfill in 8-inch lifts. Compact each lift to 95 percent maximum dry density according to ASTM D698 at optimum to +4 percent of optimum moisture content.

3. All forms, lumber, trash and debris shall be removed from trenches, manholes and other utility structures. Backfill for manholes, utility pull boxes, solid waste wash rack, and other utility structures shall be placed symmetrically on all sides in lifts no thicker than 6-inches. Each lift shall be compacted to 95 percent dry density according to ASTM D698. Use cement-sand backfill material of optimum moisture content to depth indicated and then complete backfilling with earth backfill to grade, compacted at a moisture content at or up to 3% above optimum, allowing for depth of topsoil.

C. Pavement Sections:
   1. In the pipe zone, deposit cement-sand backfill material in 6-inch lifts. Compact each lift to 95 percent density according to ASTM D698.
   2. Above the pipe zone, deposit earth scheduled backfill in 6-inch lifts. Compact each lift to 95 percent maximum dry density according to ASTM D698 at optimum to +3 percent of optimum moisture content. Cement-sand backfill material shall be placed as required by the construction drawings. Cure cement-sand layer at least 3 days before placing pavement.
   3. For manholes and utility pull boxes in pavement sections, backfill with cement-sand to bottom of proposed pavement. Cure cement-sand layer at least 3 days before placing pavement. Cement sand back fill material shall be deposited in 6-inch lifts, compacted to 95 percent density according to ASTM D698.

3.5 TEST FOR DISPLACEMENT OF SANITARY SEWERS:

A. After the trench has been backfilled to 2 feet above the pipe and tamped as specified, check the alignment as follows. Flash a light through the sewer between manholes. Use a flashlight or reflect sunlight with a mirror. If the illuminated interior of the pipeline shows poor horizontal and/or vertical alignment, pipe displacement or other defects, correct the alignment to true line and grade as shown on Drawings.

B. All plastic pipes shall be tested for deflection by pulling a mandrel with an outside diameter equal to 95 percent of the original inside diameter of the pipe through the pipe after backfilling is complete. Mandrel shall be pulled by hand line. Should the mandrel meet any resistance, the Contractor shall clean the line, or correct the resistance, and repeat the test. Any pipe not meeting this test shall be removed and installed, or replaced if damaged.

3.6 DISPOSAL OF EXCESS MATERIAL:

A. Excess Excavated Material (soil material free of trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has been approved. Remove excess excavated material from the construction site before Pre-final Inspection. Approved excess material shall be deposited on the Owner's property in an approved location.

B. Waste Material (soil material including trees, stumps, logs, brush, roots, rubbish and other objectionable matter which has not been approved. Remove waste material from the project site before Pre-final Inspection. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site. All costs associated with waste material removal and disposal shall be paid for by the Contractor.

3.7 TESTING:

A. Laboratory Testing and Inspection Services: As specified in specification section for Testing Laboratory Services.

END OF SECTION

SECTION 4 - SANITARY SEWER PIPEWORK

Work Included:

4.1 Under this section is included the furnishing, laying, jointing and testing of all sewer pipe, including sewer pipe and sewer appurtenances, both in open cut and in tunnels, as shown on the drawings or as directed by the engineer.

Materials:

4.2 The materials to be used in pipe work shall be furnished by the contractor, as approved by the engineer to meet the requirements of the work of this contract as specified herein.

Gravity Sewer Pipe:

4.2.1 Gravity sewer pipe may be of any of the following classifications. Any pipe found defective, not meeting the specifications, or improperly installed shall be rejected and so marked and shall be replaced by pipe approved by the engineer at no additional cost to PUB.

4.2.1.1 Pipe and fittings shall be manufactured in conformance with the materials and methods described in ASTM Specification D-3034. Joint seals shall be compression type rubber gaskets in compliance with the requirements of ASTM Specification D-1869.

4.2.1.2 Pipe and fittings shall be manufactured in conformance with the materials and methods described in ASTM Specification F-789 and UNI-B-10. Gaskets shall comply with the requirements of ASTM Specification F-477.

4.2.1.3 SDR-26 pipe shall be used when pipe depths are greater than 12 feet. All sewer mains going through easements shall be SDR-26 regardless of depths.

Force Mains:

4.2.2 Pressure sewer pipe will be the following classification. Any pipe found defective, not meeting the specifications, or improperly installed shall be rejected and so marked and shall be replaced by pipe approved by the engineer at no additional cost to PUB.

4.2.2.1 Polyvinyl chloride pipe for force mains shall conform to AWWA Standard "Polyvinyl Chloride (PVC) Pressure Pipe" C-900 - 750 Class 100 DR25 latest revision. Fittings for polyvinyl chloride (PVC) pipe shall be Ductile Iron Class 125 "Compact Fittings" short body, epoxy coated (not cement lined). Transition gaskets shall also be included, unless otherwise noted on the contract bid document or drawings

Watertight Joint Materials:

4.2.3 The contractor must exert every reasonable effort to secure a watertight joint and prevent infiltration of ground water into or exfiltration of sewage out of all pipe sewers and property service connections. To achieve this, joint material shall be made of the materials as specified herein, unless otherwise set forth in Special Provisions or Proposal. Any joint materials found to be defective or not meeting the specifications shall be rejected and replaced by approved joint materials at no additional cost to PUB.

Pipe Jointing:

4.2.3.1 In laying the sewer pipe to line and grade, the pipe shall be jointed in accordance with one of the approved jointing methods. PUB reserves the right, before construction is in progress, to change the type of joints if its engineer so directs.

Polyvinyl Chloride Pipe (PVC) Jointing:

4.2.3.2 The contractor shall make certain before jointing polyvinyl chloride pipe that the ring groove in the bell of the pipe is clean with no dirt or foreign material that could interfere with proper seating of the ring. Make sure pipe end is clean. Wipe with a clean dry cloth around the entire circumference from the end to one (1) inch beyond the reference mark. Lubricate the spigot end of the pipe, using only the lubricant supplied by the manufacturer. Be sure the entire circumference is covered. The coating shall be the equivalent of a brush coat of enamel paint. It can be applied by hand, cloth, pad, sponge, or glove. Do not lubricate the rubber ring or the ring groove in the bell because such lubricant could cause ring displacement. The level end is then inserted into the bell so that it is in contact with the ring. Brace the bell, while the level end is pushed in under the ring, so that previously completed joints in the line will not be closed up. The spigot end is pushed until the reference mark on the spigot end is flush with the end of the bell. If undue resistance to insertion of the level end is encountered or the reference mark does not reach the flush position, disassemble the joint and check the position of the ring. If it is twisted or pushed out of its seat, lean the ring, bell and level end and repeat the assembly steps.

4.2.3.3 Water stop joints shall be Polyvinyl Chloride (PVC) or other similar approved joint materials.

4.3. Property service connections shall be installed using Polyvinyl Chloride Pipe (PVC). The pipe shall be SDR-35 or SDR-26 and shall be manufactured in accordance with ASTM D-3034. The joints shall be compression type rubber gasket joints conforming to ASTM D-1869 (ASTM D-3212 for SDR-26). The location of all laterals and service lines shall be shown on the plans. Where not approved street grade has been established, the depth of the

connection shall be based on the assumed future street grade or on the present street or ground surface, as determined by the engineer. At times when pipe laying is not in process, the open ends of the pipe shall be closed by a watertight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

Sewer Pipe Laying Procedures:

4.4 After the trench is excavated to a subgrade as specified, it shall be filled to grade with a minimum 6-inch gravel layer. This material shall be mechanically tamped to a density minimum of 90%. This material shall provide a smooth and uniform pipe bed for the entire length of the sewer pipe barrel. Ditching and pipe laying shall be uniformly in a straight line and to uniform elevations unless otherwise specified on the plans. Pipe and fittings shall be carefully handled to avoid damage. Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry, free from oil and grease. Every precaution shall be taken to prevent foreign material from entering the pipe. During layout operation, no debris, tools, clothing or other material shall be placed into the pipe. After placing a length of pipe into the trench, the spigot end shall be centered in the bell; the pipe forced home, brought to the correct alignment and covered with an approved backfill material. When the pipe is installed, metallic tape shall be buried as directed by the PUB inspector, but no greater than 2' below the finished grade for location purposes.

4.4.1 In areas where the existing sewer main line is to be removed and replaced using the same alignment, the contractor will make all necessary provisions to ensure that continuous flow is maintained with no interruption of service. If the contractor chooses to plug the manholes upstream from the area they are working, the contractor will install a by-pass or approved pumping assembly to remove the sewer from one manhole to the other while they work on the new main line. All existing sewer services encountered while removing the old line will be re-connected to the new line using approved materials as shown on the wastewater details. At the end of the work day, the contractor will temporarily connect the new sewer main line to the existing main line with an approved coupling. The trench will be back filled to give access to the public at the end of the work day. Pipe laying procedures listed on **Sec**. **4.4** will also be used for this type of work.

Sewer Appurtenances:

4.5 Appurtenances to the sewer shall be provided and laid in accordance with the drawings and in the manner as specified herein. Appurtenances in addition to those required by the drawings or the proposal, as approved or directed by the engineer, shall be paid for under the appropriate items of the proposal.

Branches and Fittings:

4.5.1 Branches and fittings shall be provided and laid as and where directed. T-branches and Y-branches, placed in the sewer for property service connections, shall be

located by the contractor, as directed by the engineer, at such points in the sewer so as to result in the property service connection having the shortest length possible between the sewer and property line or easement line, unless otherwise indicated on the drawing or directed by the engineer.

4.5.2 All fittings at a depth of 12’ or greater shall be SDR-26 class.

Stubs:

4.5.3 Stubs for future sewer pipe shall be installed as indicated by the drawings. If the specified length of the stub is exceeded, there will be no additional cost to PUB unless the extra length is ordered by the engineer. Existing sewer pipe stubs shall be removed as required, but only when directed by the engineer.

Stacks:

4.5.4 Stacks shall be constructed as and where directed. The height of the stack shall be as indicated on the drawings, set forth in the proposal, as determined by the engineer. The stack shall be encased in-concrete in accordance with the "Typical Sewer Details" drawings.

Drop Inlets:

4.5.5 Drop inlets to the manhole shall be constructed as and where indicated by the drawings of either of the types shown on the "Typical Sewer Details" drawings, as directed by the engineer.

Cleanouts:

4.5.6 Cleanouts on all service laterals shall be installed at the location shown on the plans and in accordance with the Wastewater Construction Standards.

Manholes:

4.5.7 Manholes shall be constructed of the type shown on the "Typical Sewer Details" drawings to the elevations shown on the plan-profile sheets, or as directed. The manholes specified shall be Glass Fiber-Reinforced Polyester Manholes for use in sanitary sewer applications. They shall be a one-piece unit of one class, fabricated in a composite laminate. Walls shall be of uniform thickness and shall be free from thin spots and voids. Exterior surface shall be free of ridges and sharp protrusions and reinforcement. Interior surface shall also be smooth and free of ridges so as to facilitate self-cleaning. The exterior surface shall be covered with graded sand to facilitate bonding to the concrete base pad, cement stabilized sand backfill and cement grout used to seal around all incoming lines. The main line over which the manhole cut-out will be set shall be fitted with a seal ring as manufactured by Johns-Manville Manufacturing or equal. The manholes shall conform to ASTM D. 3753-81, Standard Specifications for Glass Fiber--

Reinforced Polyester Manholes and all noted applicable documents. Materials, method of manufacture and manufacturing requirements must all conform to the above-mentioned specification. The manufacturer shall submit written certification that their product meets the requirements of ASTM D. 3753-81 with test results of specified manholes included.

Stoppers and Bulkheads:

Open ends of pipes and branches smaller than 15 inches in diameter shall be sealed with stoppers, cemented into place in an acceptable manner using a rubber gasket between the stopper and socket. Openings 15 inches in diameter and larger shall be closed with brick bulkheads at least 4 inches thick or by other approved methods as authorized. All openings to the pipeline shall be satisfactorily protected from the entrance of earth, water or other material. If a temporary bulkhead is constructed to prevent sewage from backing into the trench excavation or to prevent foreign material from entering the sewer from the new sewer trench, the contractor shall be responsible for reconstructing, repairing, or replacing those portions of the existing sewers removed or damaged by his operations. Existing bulkheads shall be removed as indicated by the drawings or set forth in the proposal, but not until directed by the engineer.

Air Testing:

4.6 This shall cover the testing of completed sections of installed sewer pipe using low air pressure. The contractor shall conduct low air pressure tests on completed sections of sewer mains. The air test results will be used to evaluate materials and construction methods on the pipe line sections, and successful air tests shall be mandatory for the acceptance of the lines. The Contractor shall furnish all labor and material required to complete all testing required by this specification.

Materials for Air Testing:

4.6.1 The following materials will be furnished by the contractor and utilized for air testing sewer mains:

4.6.1.1 Compressor Air Supply: Any source which will provide at least three hundred (300) cubic feet per minute at one hundred (100) pounds per square inch. The compressor air supply shall be furnished by the contractor.

4.6.1.2 Plugs, valves, pressure gauges, air hose, connections and other equipment necessary to conduct the air test shall be furnished by the contractor. The test equipment for air testing will consist of valves, plugs, and pressure gauges used to control the rate at which air flows to the test section and to monitor the air pressure inside the plugs. Test equipment shall be assembled as follows:

a. hose connection
b. shut off valve
c. throttle valve
d. pressure reduction valve
e. gauge cock
f. monitoring pressure gauge

Test Procedures:

4.6.2 The following procedures will be utilized for air testing sewer mains:

4.6.2.1 Determine section of line to be tested.

4.6.2.2 Apply air pressure until the pressure inside the pipe reaches 4 psig.

4.6.2.3 Allow the pressure inside the pipe to stabilize, and then bleed back to 3.5 psig.

4.6.2.4 At 3.5 psig, the time, temperature and pressure will be observed and recorded. A minimum of five (5) readings will be required for each test. If the time in seconds for the air pressure to decrease from 3.5 psig to 2.5 psig is greater than that shown in the following table, the pipe shall be presumed to be free from defect. When these rates are exceeded, pipe breakage, joint leakage, or leaking plugs are indicated and an inspection must be made to determine the cause. The contractor shall affect such repairs as may be required to accomplish a successful air test.

Table 1 Minimum Test Time for Various Pipe Sizes

Nominal Pipe Size, in.	T(time) min/100 ft.	Nominal Pipe Size, in.	T(time) min/100 ft.
3	0.2	21	3.0
4	0.3	24	3.6
6	0.7	27	4.2
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3

Leakage Test:

4.7 A leakage test may be requested by the engineer at any time to determine whether or not there is excessive infiltration and to assure that the sewer section is substantially watertight. The engineer may order the contractor to make leakage tests of as many sections as may be necessary to determine whether the work complies with the criteria for the rate of leakage. A section shall consist of a reach from one manhole to the next manhole provided the manholes are at least 300 feet apart and preferably 400 feet. Leakage tests shall be conducted, and measurements made, for a minimum of one hour. The tests may be conducted over a longer period of time with no reduction in the rate of leakage.

Leakage into the Sewer:

4.7.1 Leakage into the sewer including manholes shall not exceed a rate of 250 gallons per 24 hours per inch diameter per mile of sewer. There shall be no gushing or spurting streams entering the sewer or manhole and where encountered they shall be repaired regardless of the rate of infiltration at no additional cost to PUB. Where practicable, the tests for leakage into the sewers shall be made at a time when the groundwater level is at a maximum, but it must be at least one foot above the top of the pipe of the highest elevation in the section being tested.

Leakage out of the Sewer:

4.7.2 Where the groundwater level is less than one foot above the top of-the pipe and where conditions will permit, the sewers shall be subjected to an internal pressure by plugging the pipe at both ends and then filling the sewer and manholes with clean water to a height above the top of the pipe sufficient to obtain satisfactory measurements to determine the rate of leakage. The rate of leakage from the sewers may be determined by either the amount of subsidence in the water surface level of the amount of water required to maintain the original water surface level above the top of the pipe. Leakage from the sewers under test shall not exceed the requirement of leakage into sewers as specified in Section 4.7.1, except that an allowance of an additional 10 percent of gallonage shall be permitted for each additional 2 feet of head over a basic 2-foot minimum internal head.

Requirements of the Contractor:

4.7.3 The contractor shall construct such weirs or other means of measurements as may be required, shall furnish water and shall do all necessary pumping to enable the tests to be properly made. When a leakage test fails, the contractor shall do such other work as may be necessary until the rate of leakage meets the above requirements, as determined by additional leakage tests.

Deflection Testing for Gravity PVC Sewer Lines:

4.8 No sooner than 30 days, nor later than 12 months after the pipe has been installed and backfilling has been completed, tests for deflection will be made. A deflection of more than 5 percent of the inside diameter of the pipe shall be cause for rejection, and the line will be removed and replaced at the contractor's expense. A GO NO-GO Deflection Testing Mandrel, to be furnished by the contractor, and certified by the engineer, shall be used. The testing shall consist of the following:

1. Completely flush the line, if required, making sure the pipe is clean of any mud or debris that would hinder the passage of the mandrel.
2. During the final flushing of the line, attach a floating block or ball to the end of the mandrel pull rope and float the rope through the line.
3. After the rope is threaded through the line, connect the pull rope to the mandrel and place the mandrel in the entrance of the rope.
4. Connect a retrieval rope to the back of the mandrel to pull it back if necessary.
5. Remove all slack in the pull rope and place a tape marker on the rope at the ends of the pipe where the mandrel will exit, determining the location of the mandrel in the line.
6. Using manhole guide pulleys draw mandrel through the sewer line, if any irregularity of pipe deformation exceeding the allowable 5 percent is encountered in the line, the line shall be uncovered at the point.
7. If an obstructed or over-deflected section is found, locate it; dig down and uncover pipe; inspect the pipe; if any damaged pipe is found, replace it. If pipe is not damaged, re-round the pipe, replace and thoroughly tamp the embedment and initial backfill; replace remainder of backfill.
8. Re-test this entire section for deflection.
9. Any pipe removed shall be replaced by use of gasketed repair couplings. Each and every deflection test shall be conducted in the presence of the owner's or engineer's representative.

The Contractor shall furnish all labor and material required to clean and flush and complete all testing required by this specification. The owner, at their discretion, may televise the sewer lines in lieu of the mandrel test. Televising equipment will be furnished by the owner. The contractor shall furnish labor to assist PUB to operate televising equipment. Labor shall consist of a minimum of 2 persons. Televising work will normally be performed during other than normal working hours, including Saturdays and after 5 PM on weekdays.

If there are insufficient roadways within the project area, the contractor will furnish the equipment necessary to gain full access to the site

SECTION 6 - WATERLINE PIPEWORK

6.1 SCOPE. This section shall cover the furnishing, laying, jointing and testing of all water pipe, including water appurtenances, both in open cut and in tunnels, as shown on the drawings, or as directed by the engineer.

6.2 MATERIALS. The material used in pipe work shall be furnished by the CONTRACTOR, as approved by the OWNER, to meet the requirements of the Work of the CONTRACTOR as specified herein.

6.2.1 Water Pipe. Water pipe for main lines may be of any of the following classifications. Any pipe found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked, and shall be replaced by pipe approved by the OWNER at no additional cost to the OWNER.

6.2.1.1 Polyvinyl chloride pipe for waterlines 16" in diameter shall conform to or exceed Uni-Bell PVC Pipe Association Specification "Polyvinyl Chloride (PVC) Transmission Pipe (Normal diameters 14-36 inch)" UNI-B-11-84.

6.2.1.2 Polyvinyl chloride pipe for waterlines 4 inch to 12 inch shall conform to or exceed AWWA Standard "Polyvinyl Chloride (PVC) Pressure Pipe" C900, Class 100 DR-25, or Class 150 DR-18, latest revision.

6.2.2 Waterline Fittings. Fittings for water lines may be of any of the following classifications. All fittings shall be wrapped in a plastic protector in conformance with AWWA Standard C-105 and ANSI A21.5 "Polyethylene Encasement for Gray and Ductile Cast-Iron piping for Water and Other Liquids." Fitting wrapping shall be installed in such a manner as to curtail or prevent corrosion of the metallic fittings. Any fittings found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked, and shall be replaced by fittings approved by the OWNER, at no additional cost to the OWNER.

6.2.2.1 Fittings for polyvinyl chloride (PVC) pipe 4 inch through 12 inch shall meet AWWA Standard C-100 or C153 cement lined "Ductile-Iron Compact Fittings, 3 inch through 12 inch for Water and Other Liquids," and C104, latest revision, and shall be sized to fit PVC water pipe in conformance with 3.2.1.1. No adapters for fittings with outside diameters different from PVC pipe shall be used.

6.2.2.2 Fittings for polyvinyl chloride (PVC) Schedule 40 pipe less than 4 inch shall conform to ASTM Standard D2466, latest revision.

6.2.3 Service Connections. Water service connections shall be installed with rubber gasket double strap bronze saddles. "Modified" double strap saddles will not be acceptable substitutes. The service lines and casings shall be of the following classifications. Any material found defective, not meeting the specifications, or improperly installed, shall be rejected and so marked and shall be replaced with material approved by the OWNER'S Engineer at no additional cost to the OWNER. Service line tubing crossings under traveled roadways shall be installed as specified on the plans with a minimum cover of 36" below roadway surface.

6.2.3.1 Copper tubing for water service lines shall be type "K" and shall conform to ASTM Standard "Seamless Copper Water Tube" B_88, latest revisions.

6.2.3.2 Polyvinyl chloride casing for water service lines shall be Schedule 40 PVC and shall conform to ASTM Standard "Polyvinyl Chloride (PVC) Plastic Pipe" D_1785, latest revision.

6.3 PIPE LAYING. All water mains shall be installed as specified in plans with a minimum cover of 48 inches from the top of pipe to an established subgrade. Where pipe is installed beneath railroad tracks, there shall be

a minimum vertical distance of 4 feet-0 inches from the top of pipe to top of railroad ties. Construction clearance to cross under railroad trackage will be obtained from Railroad Authority by OWNER. Any expense of bracing or supports to tracks during excavation operation beneath trackage shall be considered part of the Contract. Where pipe is installed beneath State Highways, there shall be a minimum vertical distance of 4 feet from top of pipe to top of paving at center line of highway, or 3 feet from top of pipe to bottom of ditch (if existing), whichever is greater. In special locations, Highway Department may require additional cover. Construction clearance and other requirements to cross under State Highways shall be obtained by OWNER.

6.3.1 Procedure. After the trench is excavated to subgrade as specified, it shall be filled to grade as specified in SECTION 6 of these standard specifications. This material shall provide a smooth and uniform pipe bed for the entire length of the water pipe barrel. Trenching and pipe laying shall be uniformly in a straight line and to uniform elevation unless otherwise specified on plans. Pipe, fittings and valves shall be carefully handled to avoid damage. Before placing pipe into the trench, the outside of the spigot and the inside of the bell shall be wiped clean and dry, free from oil and grease. Every precaution shall be taken to prevent foreign material from entering the pipe. During layout operation, no debris, tools, clothing or other material shall be placed into the pipe. After placing a length of pipe in the trench, the spigot end shall be centered in the bell; the pipe forced home, brought to the correct alignment and covered with an approved backfill material. Metallic tape shall be buried above pipe at a depth of 24 inches below finished grade for surface locating purposes. At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other approved means. This provision shall apply during the noon hour as well as overnight. If water is in the trench, the seal shall remain in place until the trench is pumped completely dry.

6.4 PIPE JOINTING. In laying the water pipe to line and grade, the pipe shall be jointed in accordance with one of the following approved jointing methods. OWNER reserves the right, before construction, or while construction is in progress, to change the type of joints if OWNER's Engineer so directs.

6.4.1 Polyvinyl Chloride (PVC) Pipe Jointing. The CONTRACTOR shall make certain before jointing polyvinyl chloride pipe that the ring groove in the bell of the pipe is clean, with no dirt or foreign material that could interfere with proper seating of the ring. Make sure pipe end is clean. Wipe with a clean dry cloth around the entire circumference from the end to one inch beyond the reference mark. Lubricate the spigot end of the pipe, using only the lubricant supplied by the manufacturer. Be sure the entire circumference is covered. The coating should be the equivalent of a brush coat of enamel paint. It can be applied by hand, cloth, pad, sponge or glove. Do not lubricate the ring groove in the bell because such lubrication could cause ring displacement. The level end is then inserted into the bell so that it is in contact with the ring. Brace the bell, while the level end is pushed in under the ring, so that previously completed joints in the line will not be closed up. The spigot end is pushed until the reference mark on the spigot end is flush with the end of the bell. If undue resistance to inserting of the level end is encountered or the reference mark does not reach the flush position, disassemble the joint and check the position of the ring. If it is twisted or pushed out of its seat, clean the ring, bell and level end and repeat the assembly steps.

6.5 WET CONNECTIONS. Schedules of existing fittings and proposed new fittings needed to make wet connections to existing waterlines as shown on the plans are estimates only. It is to be recognized that after existing lines and fittings are uncovered, that some discrepancies may occur. Where discrepancies occur, the CONTRACTOR shall request a decision by the OWNER as to how the connection in question shall be made. CONTRACTOR shall plan his work concerning wet connections in such a way that a minimum of inconvenience shall occur to existing water customers due to water service interruptions. Before water service interruptions are made to any customer, CONTRACTOR shall notify designated official and cooperate with operating personnel in every way to minimize service interruptions due to wet conditions. In certain locations, other utility lines or conduits will be obstructing the normal path of proposed waterlines. In such instances, gravity lines of all kinds hold priority as to grade over water pressure lines, gas lines, electric conduits, or other obstruction conduits or combinations of conduits, which may be encountered. CONTRACTOR is to analyze conditions carefully and then use best judgment in determining proper method of proceeding through obstructed area with waterline construction,

and shall notify the OWNER forty-eight (48) hours in advance of making such connection after obtaining approval from the OWNER's Engineer.

6.6 APPURTENANCES. Appurtenances to the waterline shall be provided and laid in accordance with the drawings and in the manner as specified herein.

6.6.1 Valves. Valves shall be installed at the locations indicated on, and with concrete thrust blocks as specified in the construction drawings, shall be wrapped in polyethylene as described in 3.2.2., and shall conform to the following requirements:

6.6.2 Gate valves shall conform to AWWA Standard "Resilient Seated Gate Valves, 3 inch through 12 inch" C509, latest revision, and shall be utilized for lines 12 inch and smaller, unless otherwise specified in the construction drawings. All gate valves shall be iron body, bronze mounted, double disc parallel seats, non-rising stem, internal wedging type. Valves must embody the best workmanship and finish, and open and close freely and easily. In closing, the gates must move without friction to their position opposite their ports, both discs being then closed squarely against the seat rings. When valves are in full open position, the disc shall be raised to clear the waterway and provide an opening equal to the full nominal diameter of the valves. All gate valves shall open by turning hand wheel or square nut operator counterclockwise. Hydrostatic and leakage tests shall conform to AWWA Standard "Resilient Seated Gate Valves, 3 inch through 12 inch" C509-80, latest revision.

6.6.3 Butterfly valves shall conform to AWWA Standard "Rubber Seated Butterfly Valves" C504, latest revision; and shall be Class 150B, long body flanged, and shall be utilized for lines 16 inch and larger, unless otherwise specified in the construction drawings. Valves shall be provided with manual operators with enclosed gear grease housing and hand wheels. Manual operators shall be composed of work gearing, totally enclosed in a grease-packed gear case. Work gears shall be bronze and worm gears shall be hardened steel. Manual operators shall be furnished with devices (externally mounted) to hold the valve in a fixed position for an extended period of time and to indicate valve position. All butterfly valves shall open by turning hand wheel or square nut operator counterclockwise. Hydrostatic and leakage tests shall conform to AWWA Standard "Rubber-Seated Butterfly Valves" C504, latest revision.

6.6.4 Fire Hydrants. Unless otherwise specified, fire hydrants shall conform to AWWA Standard "Dry-Barrel Fire Hydrants" C502, latest revision. Hydrants shall be cast iron, fully bronze mounted and have a working pressure of 150 psi. Fire hydrants shall have a minimum valve opening of 5-1/4 inch. All fire hydrants shall be located as shown in the plans, and in a manner to provide complete accessibility, and to minimize the possibility of damage from vehicles or injury to pedestrians. All hydrants shall stand plumb with the pumper nozzle facing the curb and the bury line of the hydrant at the finished grade. The barrel of the fire hydrant shall be set so that no portion of the pumper nozzle or hose nozzle will be less than 12 inches from the curb, walkway, or bike path or more than 20 feet from the face of the curb. The preferred location for the fire hydrant shall be 2 feet clear of the right-of-way line. All fire hydrants shall be placed in accordance with any City or County ordinances. Fire hydrants installed near State Highways shall be in accordance with State Department of Highways and Public Transportation requirements. All fire hydrants shall be connected to the main in the manner shown in the Water Connection Standards.

6.7 TESTING. All newly laid sections of pipe shall be hydrostatically tested at a gauge pressure of 150 psi. CONTRACTOR has the option of running hydrostatic test before or after trench has been completely backfilled. Trenches must be at least partially backfilled before hydrostatic testing to prevent pipe shift. Hydrostatic tests shall be in accordance with AWWA Standard C600 Section 4 "Hydrostatic Testing" latest revision.

6.7.1 Hydrostatic Test Procedure. The CONTRACTOR shall provide all necessary equipment and shall perform all Work required in connection with the tests. All pressure pipe, fittings and valves shall be subjected to a hydrostatic pressure of 150 psi. Air pressure testing will not be allowed. The line under test shall be slowly filled with water to the specified test pressure. The lowest elevation point of the section

being tested shall be determined and any corrections necessary shall be corrected to the elevation of the test gauge by means of a hand pump, gasoline or electrically driven test pump connected to the pipe. A blow off or fire hydrant shall be installed at the end of the line under test. Before applying the specified test pressure, all air shall be expelled from the test section including service connections. If hydrants or blow offs are not available at high places, tap at points of highest elevation shall be made before the test is made and brass plugs inserted after the test has been completed. The required test pressure shall be applied for not less than two (2) hours and longer if ordered by the OWNER. Leakage tests shall be conducted concurrently with pressure tests. OWNER will inspect all pipe, fittings, valves and joints under tests. Any faults found to be due to improper workmanship shall be corrected by the CONTRACTOR at no expense to OWNER.

6.8 STERILIZATION. Pipeline construction shall be in accordance with Section 4. of AWWA Standard C601-01, latest revision. Upon or during completion of the hydrostatic test, the new section of pipe shall be sterilized in accordance with AWWA Standard "Disinfecting Water Mains" C601, latest revision; and the State of Texas Health Standards. Chlorine may be applied by the following methods: Continuous Feed Method and Chlorine Tablet Method. CONTRACTOR shall provide all equipment and chemicals necessary for sterilization.

6.8.1 Continuous Feed Method. This method is suitable for general application. Water from the existing distribution system or other approved sources of supply shall be made to flow at a constant, measured rate into the newly laid pipeline. The water shall receive a dose of chlorine, also fed at a constant, measured rate. The two rates shall be proportioned so that the chlorine concentration in the water in the pipe is maintained at a minimum of 50 mg/l available chlorine. During the application of the chlorine, valves shall be manipulated to prevent the treatment dosage from flowing back into the line supplying the water. Chlorine application shall not cease until the entire main to be tested is filled with the chlorine solution. The chlorine water shall be retained in the main for at least 24 hours during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24 hour period, the treated water shall contain no less than 25 mg/l chlorine throughout the length of the main.

6.8.2 Chlorine Tablet Method. Tablet disinfection is best suited to short extensions (up to 2,500 feet) and smaller diameter mains (up to 12 inches). Because the preliminary flushing step must be eliminated, this method shall be used only when scrupulous cleanliness has been exercised. It shall not be used if trench water or foreign material has entered the main or if the water is below 5`C (41`F). Calcium hypochlorite tablets are placed in each section of pipe and also in hydrants, hydrant branches and other appurtenances. They shall be attached by an adhesive, except for the tablets placed in hydrants and in the joints between the pipe sections. All the tablets within the main must be at the top of the main. If the tablets are fastened before the pipe section is placed in the trench, their position should be marked on the section to assure that there will be no rotation. In placing tablets in joints, they are either crushed and placed on the inside annular space or, if the type of assembly does not permit, they are rubbed like chalk on the butt ends of the sections to coat them with calcium hypochlorite. The adhesive may be Permatex No. 1 or any alternative approved by the OWNER. There shall be no adhesive on the tablet except on the broad side next to the surface to which the tablet is attached. If desired, the calcium hypochlorite may be placed in the pipe in granular form at a rate of one (1) cup (4 fl. oz.) per each pipe. When installation has been completed, the main shall be filled with water at a velocity of less than 1-ft./sec. This water shall remain in the pipe for at least 24 hours. Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

6.8.3 Final Flushing. After the applicable retention period, the heavily chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than that generally prevailing in the system, or less than 1 mg/1. Chlorine residual determination shall be made to ascertain that the heavily chlorinated water has been removed from the pipeline. Flush into open field area or into existing sanitary sewer main.

6.8.4 Bacteriologic Tests. After final flushing, and before the water main is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriologic quality and shall show the absence of coliform organisms. If the number and frequency or samples is not prescribed by the public health authority having jurisdiction, at least one sample shall be collected from chlorinated supplies when a chlorine residual is maintained throughout the new main. From unchlorinated supplies, at least two samples shall be collected at least 24 hours apart. In the case of extremely long mains, it is desirable that samples be collected the length of the line as well as at its end. Samples for bacteriologic analysis shall be collected in sterile bottles treated with sodium thiosulfate. No hose or fire hydrant shall be used in collection of samples. A suggested sampling tap consists of a standard corporation cock installed in the main with a copper tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.

6.8.5 Repetition of Procedure. If the initial disinfection fails to produce satisfactory samples, disinfection shall be repeated until satisfactory samples have been obtained. The tablet method cannot be used in these subsequent disinfections. When the samples are satisfactory, the main may be placed in service.

SECTION 11 - CONTRACTOR'S TRENCH EXCAVATION SYSTEM AND SHORING SAFETY PLAN

11.1. SCOPE. This section shall cover CONTRACTOR'S furnishing a Safety System Plan, and all labor and materials for installation and maintenance of the Trench Safety System.

11.2. APPLICATION. For any trench excavation at a depth of five (5) feet or greater, or where shown on plans, provide trench safety system. Trench safety system shall be in accordance with details shown on CONTRACTOR's Trench Excavation and Shoring Safety Plan.

11.3. QUALITY ASSURANCE. Trench safety system to meet appropriate requirements established in Section 756.022 of the Texas Health and Safety Code and Occupational Safety and Health Administration (OSHA) Safety & Health Regulations, 29 CFR 1926, Subpart P - Excavations, Trenching and Shoring, as may be amended, and OSHA's proposed standards on trenching excavation published in Volume 54, No. 209 of the Federal Register, October 31, 1989; Pages 45959-45991. Those standards are incorporated into these specifications by reference. Should the applicable OSHA standards be modified or amended, the more stringent standards shall apply.

11.4. SUBMITTALS. The CONTRACTOR shall provide Trench Safety System Plan for Project prior to Award of the Contract. The Plan shall incorporate the detailed plans and specifications for a Trench Safety system conforming to OSHA standards. The Plan shall account for project site conditions, CONTRACTOR's trench construction means, methods, techniques or procedures, the relationship of spoil to edge of trench, and CONTRACTOR's equipment to be used in construction of project facilities requiring trench Safety System(s). CONTRACTOR shall submit a certificate signed and sealed by a Registered Professional Engineer licensed in the State of Texas stating that CONTRACTOR's Trench Safety System Plan has been designed in conformance with appropriate OSHA standards and applicable specifications as required by this item. CONTRACTOR's Trench Safety System Plan shall demonstrate the type(s) of Trench Safety System to be used on the project.

11.5. MATERIALS. The materials used in the Trench Safety System shall be furnished by the CONTRACTOR, as approved by the OWNER, to comply with the requirements of the work of the CONTRACTOR as specified therein.

11.5.1. Timber. Trench sheeting materials to be full size, a minimum of two inches in thickness, solid and sound, free from weakening defects such as loose knots and splits.

11.5.2. Steel Sheet Piling. Steel sheet piling shall at a minimum conform to one of the following specifications:

a. ASTM A328.
b. ASTM A572, Grade 50.

c. ASTM A690.

Steel for stringers (wales) and cross braces shall conform to ASTM A588.

11.5.3. Steel Trench Boxes. Portable steel trench box shall at a minimum be constructed of steel conforming to ASTM Specification A-36. Connecting bolts used shall conform to Specifications ASTM A-307. Welds to conform to requirements of AWS Specification D1.1.

11.5.4. Other Materials. Other materials to be utilized shall at a minimum conform to applicable ASTM standards.

11.6. INSTALLATION. Trench safety system shall be constructed, installed, and maintained in accordance with the Trench Safety System Plan prepared by the CONTRACTOR's Registered Professional Engineer.

11.6.1. Timber Sheeting. Timber sheeting and size of uprights, stringers (wales), and cross bracing to be installed in accordance with CONTRACTOR's plan. Place cross braces in true horizontal position, spaced vertically, and secured to prevent sliding, falling, or kickouts. Cross braces to be placed at each end of stringers (wales), in addition to other locations required. Cross braces and stringers (wales) to be placed at splices of uprights, in addition to other locations required.

11.6.2. Steel Sheet Piling. Steel sheet piling of equal or greater strength may be used in lieu of timber trench shoring shown in the OSHA tables (proposed standards). Drive steel sheet piling to at least minimum depth below trench bottom as recommended by CONTRACTOR's Registered Professional Engineer providing design. Place cross braces in true horizontal position, spaced vertically and secured to prevent sliding, falling, or kickouts. Cross braces to be placed at each end or stringers (wales), in addition to other locations required.

11.6.3. Trench Boxes. Portable trench box may be used in lieu of timber trench shoring shown in the OSHA tables (proposed standards) and shall be designed to provide equal or greater protection than timber trench shoring shown in the OSHA tables. In cases where top of portable trench box will be below top of trench, the trench must be sloped to the maximum allowable slope for the soil conditions existing on the Project. In areas where a sloped trench will affect the integrity of existing structures, CONTRACTOR to protect structures prior to sloping trench.

11.6.4. Trench Jacks. When trench jacks are used for cross bracing and/or stringers (wales), the trench jacks shall provide protection greater than or equal to the timber cross bracing shown in the OSHA tables (proposed standards). Trench jacks to be placed at each end of stringers (wales) in addition to other locations required.

11.7. SUPERVISION. CONTRACTOR must provide competent supervisory personnel at each trench while Work is in progress to ensure CONTRACTOR's methods,

procedures, equipment, and materials pertaining to the safety systems in this Item are sufficient to meet requirements of current Texas Law and OSHA Standards.

11.8. MAINTENANCE OF SAFETY SYSTEM. The safety system shall be maintained in the condition as shown on the Trench Excavation and Shoring Safety Plan as designed by the CONTRACTOR's Registered Professional Engineer. The CONTRACTOR shall take all necessary precaution to ensure the safety systems are not damaged during their use. If at any time during its use a safety system is damaged, personnel shall be immediately removed from the trench excavation area and the safety system repaired. The CONTRACTOR shall take all necessary precautions to ensure no loads, except those provided for in the plan, are imposed upon the trench safety system.

11.9. INSPECTION. CONTRACTOR shall make daily inspection of trench safety system to ensure that the system meets OSHA requirements. Daily inspection to be made by competent personnel. If evidence of possible cave-ins or slides is apparent, all Work in the trench shall cease until necessary precautions have been taken to safeguard personnel entering trench. CONTRACTOR to maintain permanent record of daily inspections.

11.10 REMOVAL. Bed and backfill pipe to a point at least one (1) foot above top of pipe or other embedded items prior to removal of any portion of trench safety system. Bedding and backfill to be in accordance to other applicable specification items. Backfilling and removal of trench supports shall be in accordance with CONTRACTOR's Trench Excavation and Shoring Safety Plan. Removal of trench safety system to be accomplished in such a manner to cause no damage to pipe or other embedded items. Remove no braces or trench supports until all personnel have evacuated the trench. Backfill trench to within five (5) feet of natural ground prior to removal of entire trench safety system.

11.11 MEASUREMENT AND PAYMENT. The Trench Safety System and related items shall be measured and paid as follows:

11.11.1. Measurement. Measure "Trench Safety System" by linear foot of trench excavated. Shoring of trench at manholes and other line structures to be included in the lineal foot cost.

11.11.2. Payment. The Work performed in conformance with this specification shall be paid as follows:

11.11.2.1. Pay for "Trench Safety System" measured as stated above by the linear feet of trench excavated and as shown on PROPOSAL. Payment shall be full compensation for all Work materials and advance trench safety training employed. There shall be no increase in the Contract price because of the incorporation of CONTRACTOR's Trench Excavation and Shoring Safety Plan or CONTRACTOR's detailed plans and specifications for the trench safety system into the bid documents and the Construction Contract. There shall be no increase in the Contract price because of modifications to CONTRACTOR's plans and/or the CONTRACTOR's detail plans and specifications for the trench safety system, whether or not the result of unforeseen or differing site or soil conditions.

11.11.2.2. Pay for "Design of Trench Safety System Plan" developed by CONTRACTOR's Registered Professional Engineer by lump sum as shown on Bid Proposal. Payment by OWNER shall be full compensation for all professional services relating to the CONTRACTOR's submittal to OWNER of the Trench Safety System Plan.

VIDEO RECORDING

The Contractor shall video recording the entire job site, including access to job site, prior to commencing work. A copy of the video will be provided to the City at the pre-construction conference. The video will be held for historical purposes and for resolving complaints/claims from affected property owners. Failure to provide such tape shall render the contractor liable for claims. Acceptable is standard DVD or USB.

Monthly video RECORDING by the contractor during construction is recommended to protect contractor's interest against claims and as a basis for extras.

This item will not be measured or paid for separately but will be considered subsidiary to the various bid items.

SECTION 3000

HANDLING ASBESTOS CEMENT PIPE

PART 1 GENERAL

1.01 INTRODUCTION

A. This item shall govern the uncovering, dislodging, handling, removing, transporting, and disposing of asbestos cement (AC) pipe and other asbestos containing materials (ACM). AC pipe is also known as transite pipe. AC pipe typically contains from 15% to 20% chrysotile and crocidolite asbestos and is considered to be an asbestos-containing material. The disturbance and /or removal of this material is governed by the National Emissions Standards for Hazardous Air Pollutants (NESHAP) 40 Code of Federal Regulations (CFR) 61; by the Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1101; the State of Texas Occupation Code, Chapter 1954 and Health Code (TAC), 25 TAC Chapter 295 and 30 TAC Chapter 330.3 and 330.171. The material is classified by definition under 40 CFR 61, Subpart M, Section 61.141 as Category II, non-friable ACM, unless, when dry, it can be crumbled, pulverized, or reduced to powder by hand pressure. At that time, it becomes classified as regulated ACM (RACM) and subject to regulation under Subpart M. It is the intent of this specification to define procedures that maintain the AC pipe in an intact state. Contractors shall not use procedures that subject the AC pipe to forces that will crumble, pulverize, or reduce to powder the AC pipe. By using procedures that have a low to no probability of fiber release, the pipe retains its classification as Category II, non-friable ACM. These procedures will protect workers from the health risk associated with airborne asbestos.

References to the City of South Padre Island (SPI) pertain only to those joint bid projects, where joint jurisdiction occurs due to the contract's binding agreement. Definitions used and incorporated as part of this specification are located in Appendix One. Applicable standards and guidelines used and incorporated as part of this specification are located in Appendix Two.

1.02 GUIDANCE

A. If the project specifies an Asbestos Removal Work Plan (or, Asbestos Abatement Plan) be provided and approved as part of the project documents, the following guidelines should be used for the document to be considered acceptable. Refer to Appendix Three of this specification for more specific guidance of addressing an acceptable procedure for handling AC pipe. Plans submitted with insufficient detail will be returned requesting more information be provided.

1. The governing documents for asbestos-cement (AC) pipe are as follows:

    a. U.S. Environmental Protection Agency (EPA), 40 Code of Federal Regulations (CFR) Part 61, Subpart M – National Emission Standards for Asbestos.

b. Occupational Safety and Health Administration (OSHA), 29 CFR 1926.1101, Asbestos;

c. The State of Texas Statute, Health and Safety Code, Chapter 363;

d. Texas Administrative Code (TAC) 30 TAC Chapter 330.

2. OSHA classifies the handling and removal of asbestos containing material (ACM) as Class II asbestos work. As such each contractor shall acknowledge that their program complies with OSHA standard 29 CFR 1926.1101 and shall describe how their program complies with that standard.

3. AC pipe is considered by the U.S. EPA as Category II, non-friable asbestos containing material (ACM). The Laguna Madre Water District (LMWD) wants its pipe to retain that asbestos categorization. To accomplish that goal LMWD requires that no force be applied to the pipe that would cause it to become crumbled, pulverized, or reduced to powder by hand pressure unless wet techniques are used when a force is applied. Once the pipe becomes crumbled, pulverized, or reduced to powder it becomes classified as regulated ACM. (40 CFR 61.141)

4. The plan submitted shall contain the following:

   a. The scope of work to be accomplished shall be described in detail. Be specific as to the involvement with the existing AC pipe. For example: abandoning/removing X feet of AC pipe; tying into one or more joint(s)/section(s) of an existing water main and replacing one or more joints/sections (X feet) of pipe to make the connection; removing X feet of buried AC pipe encased in concrete crossing a drainage way not accessible by road; or connecting to an existing joint/section of AC pipe by tapping into the AC pipe.

   b. Detailed procedures that describe the methods/techniques to be employed to uncover, dislodge, handle, remove, secure, transport, and dispose of the AC pipe and any generated ACM waste. For illustrative purposes only the following is an example of the level of detail expected in a plan. The contractor could use them as a basis for preparing their plan. If the contractor employs this example, LMWD requires greater site specific detail in the plan submitted.

1.03 DESCRIPTION

This item shall consist of the uncovering, dislodging, handling, removing, transporting, and disposing of AC pipe, joints, wrappings and other ACM. To comply with NESHAP and OSHA requirements, this project will require workers trained in using wet technique procedures to dislodge and remove AC pipe, AC pipe joints, valves (any type) containing ACM, and any surrounding soils that may contain ACM. The Contractor shall develop an Asbestos Removal Work Plan, herein referred to as "the plan", (see Appendix Three, Example Procedures) that provides specific and detailed procedures they and/or any of their subcontractors will follow to maintain the AC pipe in an intact state. The Plan shall specify

the wet techniques to be followed when the pipe collars are dislodged. The Plan shall include procedures/actions to be followed if the intact AC pipe becomes broken and the possibility exists of asbestos fibers becoming airborne. By regulatory definition, if and when the pipe and/or collar are broken, they become a regulated ACM (RACM) and subject to NESHAP. The Plan shall state or reference procedures in the contractor's Safety and health program document that they will follow to comply with the federal OSHA asbestos standard. Finally, the Plan shall contain provisions for the environmentally compliant disposal of the intact AC pipe and any RACM created during the removal process. The Plan shall be provided to the San Antonio Water System (LMWD) at the pre-construction (pre-con) meeting for its review and approval prior to initiating uncovering operations to verify the contractor has met the contractual requirements. No handling and disposing of AC pipe will begin without approval from LMWD. Any ACM encountered that is not LMWD pipe and not previously identified by LMWD or shown on LMWD plans will not be authorized for disposal payment. Preparation and submission of the Plan shall be considered subsidiary to the work required and no direct payment will be made.

If the project is joint bid with SPI, the Plan shall also be submitted to SPI Environmental representatives for their review and approval, as required. The Contractor shall comply with the SPI and any other agencies requirements. Any uncovering, dislodging, handling, or disposing of AC pipe and associated written handling and removal plans, such as an abatement plan, required by another agency will be paid for by that agency using their specification/bid item number. Again, no handling and disposing of AC pipe will begin without approval from LMWD.

To meet and/or exceed NESHAP and OSHA guidelines, the contractor may subcontract the AC pipe handling plan and work to an Environmental Protection Agency (EPA) accredited and Texas Department of State Health Services (DSHS) licensed asbestos abatement contractor, DSHS licensed asbestos consultant, and DSHS air monitoring technician.

NESHAP guidelines apply to facility projects in which the combined amount of regulated asbestos containing material (RACM) is at least 260 linear feet (LF) or 35 cubic feet or 160 square feet. This means that if the combined amount of RACM is at least 260 linear feet of the AC pipe, including AC collars, and it is expected to become or becomes crumbled, pulverized, or reduced to powder, then the project is subject to the NESHAP provisions of reporting and asbestos emission control paragraphs in 40 CFR Section 61.145. If the DSHS RACM limit of 260 LF is exceeded, the contractor is responsible for any DSHS administrative fees and fines. The contractor shall be responsible for submitting the DSHS notification with copies to LMWD and SPI Environmental Division for joint bid projects.

If the scope of the project may involve the threshold amount (260 linear feet or greater), a Demolition/Renovation Notification Form will be sent to DSHS by the Contractor. This form shall be post-marked no later than 10 working days prior to the start of any asbestos handling work.

All projects involving AC pipe require that NESHAP and OSHA standards are met and/or exceeded. The contractor shall perform all work in a manner that meets or exceeds those standards. The contractor shall have and follow a written Plan that describes their detailed handling and disposal procedures of the AC pipe. The contractor shall submit copies of the Plan to LMWD for review and approval and for joint bids, SPI Environmental

representatives, as required. OSHA requires that during any ACM disturbance, regardless of amount, the asbestos worker(s) shall be protected from potential airborne asbestos exposure in excess of the permissible exposure limit or excursion limit as stipulated in 29 CFR 1926.1101.

1.04 MEASUREMENTS

A. AC pipe will be measured by the linear foot.

1. At the Pre-construction Conference/Meeting the following shall be submitted for review and approval to LMWD, and when applicable SPI Environments representatives, as required.

    a. The Plan in accordance with: NESHAP, OSHA, this Special Specifications, Section 3000, and State requirements. The number of copies submitted of the Plan is the same as the number of copies required under other bid submittal requirements with one copy being submitted electronically. The work plan shall provide detailed procedures for retaining the AC pipe's Category II, non-friable NESHAP classification. The contractor shall incorporate working with ACM and complying with mandated OSHA requirements for Class II, asbestos work in their project specific Safety and Health Plan. The guidance provided in these special specifications is not intended and does not constitute an asbestos abatement project design as described under 25 TAC, Chapter 295.

    b. Submit proof satisfactory to LMWD, and as applicable, SPI Environmental representatives, that required permits, site location, and arrangements for transport and disposal of asbestos containing waste material (ACWM) have been made that meet Texas environmental statutes and regulations. Include the name of the transporter, their Texas asbestos transporter license number, and the name of the approved landfill where the AC pipe and ACM waste will be buried.

2. During Asbestos Handling and Disposal Activities: Submit copies to LMWD and if applicable, SPI Environmental representatives of all transport manifests, trip tickets, and disposal receipts for all ACWM removed from the work area during the project. The Contractor will sign manifests as the LMWD' representative (generator) for the AC pipe and provide copies to the LMWD Construction Inspection Department for final payment.

1.05 CONSTRUCTION REQUIREMENTS

1. The Work includes all work specified herein, to include mobilization and demobilization, labor, materials, overhead, profit, taxes, transportation, disposal fees, administrative fees, and incidental cost. Estimating areas, quantities, and weight are the sole responsibility of the Contractor.

2. The Contractor shall remove and double bag with 6-mil polyethylene sheeting to yield a total of at least 12-mil, the asbestos pipe in the trench or immediately when it comes out of the trench, seal, label, transport, and dispose of all Category II non-friable ACM and

RACM in compliance with applicable current Federal, State and local regulations, laws, ordinances, rules, standards and regulatory agency recommended requirements.

3. The Contractor shall notify LMWD and, if applicable SPI representatives, at least 72 hours prior to beginning uncovering, dislodging, handling, and removing the AC pipe. AC pipe uncovering, dislodging, handling, and/or removing shall be conducted during regular business hours, 8 a.m. to 5 p.m., Monday-Friday. No uncovering, dislodging, handling, and/or removing of AC pipe outside of the normal business hours or during the weekend is allowed unless special circumstances require the contractor to do so and the work has been approved in writing at least 72 hours before the commencement of the work.

4. Time is of the essence in removing the ACM from the project area. All work must be completed within the time period specified in the contract. LMWD, and if applicable SPI representative will be responsible for coordinating this work in high-density areas, such as schools, church facilities, and residential areas.

5. All notifications required to state regulatory agencies will be made by the Contractor with copies provided to LMWD and as applicable, SPI representatives, including but not limited to the DSHS Demolition/Renovation Notification Form. If 260 linear feet or greater of RACM pipe will become crumbled, pulverized, or reduced to powder, the project is subject to NESHAP regulations and a Demolition/Renovation Notification Form will be sent to DSHS by the Contractor. This form will need to be post-marked no later than 10 working days prior to the start of any asbestos disturbance.

6. The Contractor shall have an on-site supervisor, who is an OSHA Competent Person, present on the job site at all times that the AC pipe work is in progress. This supervisor shall be thoroughly familiar with and experienced at asbestos pipe handling using wet techniques and shall be familiar with and shall enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of all applicable EPA, OSHA, and DSHS asbestos requirements and guidelines.

7. The Contractor has: sole and primary responsibility for the "means and/or methods" of the work; an obligation to LMWD to inspect all stages of the work; and sole responsibility to supervise the performance of the work. Certain work practices for AC pipe disturbance are prohibited as per Section 3000.5.C.

8. The Contractor shall be responsible for site safety and for taking all necessary precautions to protect the Contractor's LMWD, and SPI personnel and the public from airborne asbestos exposure and/or injury. The Contractor shall be responsible for maintaining the integrity of the work area.

9. The Contractor shall confine operations at the site to the area requiring interface with the AC pipe and the general site area in close proximity to the project. The Contractor will not unreasonably encumber the site with materials or equipment. If ACWMs are required to be stored overnight in a secured area, the waste material and waste containers shall be labeled according to OSHA and EPA, and the State of Texas requirements, & containerized to preclude unauthorized disturbance of the ACWMs.

10. The Contractor shall be responsible for obtaining and coordinating waste disposal and transport of ACWM to a Texas Commission on Environmental Quality (TCEQ) permitted asbestos waste landfill. Waste manifests shall be generated for the transport of the AC pipe and ACWMs from the project site to the landfill disposal site. The Contractor will sign the manifests as the LMWD's representative (generator) for the AC pipe and provide copies to the LMWD Construction Inspection Department for final payment.

1.06 SITE SECURITY

1. The Contractor shall demarcate the area of AC pipe interface ("regulated area") with barrier tape and warning signs, per OSHA regulation 29 CFR 1926.1101. Access to the regulated area will be limited to authorized personnel and visitors. The contractor shall identify in their site specific safety and health plan how they intend to limit access and who is authorized to be in the demarcated area.

1.07 AC PIPE HANDLING

1. General: Any project involving AC pipe, the Contractor shall comply with OSHA standards and shall develop a Safety and Health Plan that complies with LMWD Specification Section902,

1. The Contractor shall uncover, dislodge, handle, remove, transport, and dispose of all AC pipe specified in the contract documents for this project using wet technique procedures. All work involving AC pipe and other ACM products must be addressed in the Plan. The Contractor shall take precautions to prevent damage to adjacent structures and material/finished material not required for AC pipe handling.

2. Prohibited Work Practices and Engineering Controls: Contractors shall not use procedures that subject the AC pipe to forces that will crumble, pulverize, or reduce to powder the AC pipe. The following work practices and engineering controls shall **not** be used for work related to AC pipe or for work which disturbs ACM, regardless of asbestos exposure or the results of Initial Exposure Assessments:

   a. High-speed abrasive disc LMWD and sanders not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air;

   b. Carbide-tipped cutting blades;

   c. Electrical drills, chisels, and rasps used to make field connections in AC pipe;

   d. Shell cutters used to cut entry holes in AC pipe;

e. A hammer and chisel without using wet techniques to remove pipe connections;

f. Compressed air used to remove asbestos or material containing asbestos;

g. Dry sweeping, dry shoveling, or other dry clean-up of dust and ACM debris;

h. Employee rotation as a means of reducing employee exposure to asbestos;

3. General Removal Work Practices: See Appendix Three for an example of the detailed general work practices a contractor could use in preparing an Asbestos Removal Work Plan. If the contractor uses the example, they must expand upon the provisions in the appendix to describe its specific procedures. The appendix is provided for illustrative purposes only. If the contractor employs this example, LMWD requires greater site specific detail to be included in the Plan submitted for approval.

4. Disposal bags for RACM shall be 6-mil polyethylene and labeled as required by EPA Regulation 40 CFR 61.150 (a)(1)(iv) or OSHA requirement 29 CFR 1926.1101(k)(8).

5. Stick-on labels identifying the generator's name (LMWD) and address and the project site location shall be applied to any asbestos waste disposal bag that contains RACM, as per EPA or OSHA and Department of Transportation requirements.

6. Abandonment of AC water mains/pipes:

a. The Contractor is responsible for isolating the existing mains to remain in place by capping, plugging and blocking as necessary. The opening of an abandoned AC water main and all other openings or holes shall be blocked off by manually forcing cement grout or concrete into & around the openings in sufficient quantity to provide a permanent watertight seal. Abandonment of AC water mains will be considered subsidiary to the work required, and no direct payment will be made.

b. Abandonment of Valves that contain ACM: Valves to be abandoned in the execution of the work shall have the valve box and extension packed with sand to within eight inches (8") of the street surface. The remaining eight inches (8") shall be filled with 3,000 psi concrete or an equivalent sand-cement mix

and finished flush with the adjacent pavement or ground surface. The valves covers shall be salvaged & returned to LMWD. The abandonment of valves containing ACM will be considered subsidiary to the work required, and no direct payment will be made.

c. Verification of Removal & Clean-up Procedures: The Contractor's on-site Competent Person shall inspect the work area, verify, and certify that no residual AC pipe fragments and debris remain.

7. Disposal Procedures: Submit copies to LMWD Environmental Division and, if applicable SPI Environmental representatives, of all transport manifests, trip tickets, and disposal receipts for all asbestos waste materials removed from the work area during the project. The Contractor will sign manifests as the LMWD representative (generator) for the AC pipe and provide copies to LMWD Construction Inspections for final payment.

1.08 PAYMENT:

1. The work performed as prescribed by these items shall be paid for at the contract unit price bid per linear foot for "exist 6" ac waterline removal/disposal", which prices shall be full compensation for the work herein specified including the furnishing of all materials, equipment, tools and for the material disposal, submittals, and labor necessary to complete the work. No payment shall be made for the plan.

1.09 BID ITEM:

1. Existing 6" ac waterline removal/disposal -- linear foot

1.10 STANDARD PLAN NOTE:

1. Asbestos cement (ac) pipe, also known as transite pipe, contains asbestos-containing material (acm) and is located within the project limits. Special waste management procedures and health and safety requirements are applicable when handling, removing, and disposing of this pipe. Payment for such work is to be made under Special Specification Item No 3000, "Special Specification for Handling Asbestos Cement Pipe."

1.11 APPENDIX ONE: DEFINITIONS

As used anywhere in Section. 3000, Specifications for Handling Asbestos-Cement Pipe, including all appendices, the following shall be defined to mean:

8. Amended Water: Water to which a surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

9. Approval: Means the LMWD contract requirements have been met but does not mean that the LMWD stipulates any written documents adequately comply with federal and state occupational safety and health regulatory requirements.

10. Asbestos: A group of naturally occurring silicate minerals and includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered.

11. Asbestos Containing Material (ACM): Material or products that contain more than 1.0% of any kind of asbestos.

12. Asbestos Containing Waste Material (ACWM): Asbestos containing material or asbestos contaminated objects requiring disposal.

13. Authorized Personnel: Any person authorized by the Contractor and required by work duties to be present in the regulated area.

14. Authorized Visitor: LMWD representatives, and any representative of a regulatory or other agency having jurisdiction over the project.

15. Asbestos Consultant: A person licensed by the Texas Department of State Health Services to perform the following asbestos abatement related functions in public buildings:

    a. Project design;

    b. Asbestos surveys and condition assessment of ACM;

    c. Asbestos Management Planning;

    d. The collection of bulk material samples, airborne substance samples and the planning of sampling strategies;

    e. Owner-representative services for asbestos abatement projects or O&M programs, including air monitoring and project management;

    f. Consultation regarding regulatory compliance and all aspects of technical specifications and contract documents;

    g. The selection, fit testing, and appropriate use of personal protection equipment & the development of asbestos related engineering

controls.

16. Abatement Contractor: The company, agency, or entity licensed by the Texas Department of State Health Services that has been retained to perform asbestos abatement and other associated functions.

17. Class II Asbestos Work (OSHA Standard): Activities involving the removal of ACM, which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

18. Competent Person: An individual, who is capable of identifying existing asbestos hazards in the workplace, can select the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate them.

19. Friable Asbestos: Asbestos containing material, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure and includes previously non-friable material that has become damaged to the extent that, when dry, it may be crumbled, pulverized, or reduced to powder by hand pressure.

20. NESHAP: The National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61).

21. OSHA: The Occupational Safety and Health Administration.

22. Regulated Area: An area established by the Contractor or employer to demarcate areas where asbestos work is conducted and any adjoining area where debris and waste from such asbestos work accumulate; and an area within which airborne concentrations of asbestos exceed or there is a reasonable possibility they may exceed the permissible exposure limit.

23. Regulated Asbestos Containing Material (RACM): (1) Friable asbestos material; (2) Category I non-friable ACM that has become friable; (3) Category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading; or, (4) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by forces expected to act on the material in the course of the demolition or renovation operations regulated by 40 CFR Part 61, Subpart M.

24. Staging area: A pre-selected area where wrapped or containerized asbestos containing waste material will be placed prior to removal from the project site.

25. Surfactant: A chemical wetting agent added to water to improve

penetration.

26. Uncovering operations: The use of mechanical, pneumatic, and/or manual procedures that disturb the material and/or soil above and/or around the AC pipe that would expose personnel to the AC pipe.

1.12 APPENDIX TWO: APPLICABLE STANDARDS AND GUIDELINES

All work under these specifications shall be done in strict accordance with all applicable Federal, State, and local regulations, standards, and codes governing asbestos disturbance, handling, removal and disposal. Work activities shall also comply with LMWD and City of South Padre Island Specifications related to safety and health.

The most recent edition of any relevant regulation, standard, or code shall be in effect. Where there is a conflict between the regulations, standards, codes, and/or these specifications, the most stringent requirements shall apply.

As a minimum, the Contractor shall comply with the applicable portions of the following:

1. Occupational Safety and Health Administration (OSHA) including but not limited to:

    a. Title 29 Code of Federal Regulations (CFR) Section 1926 – Safety and Health Regulations for Construction

    b. Title 29 CFR Section 1926.1101 – Safety and Health Regulations for Construction - Asbestos.

    c. Title 29 CFR Section 1910.134 – Occupational Health and Safety Standards - Respiratory Protection.

    d. Title 29 CFR Section 1910.1020 – Occupational Health and Safety Standards - Access to Employee Exposure and Medical Records.

    e. Title 29 CFR Section 1910.1200 – Occupational Health and Safety Standards - Hazard Communication.

2. Environmental Protection Agency (EPA) including but not limited to: Title 40 Code of Federal Regulations Part 61 Subpart M – National Emission Standard for Asbestos.

3. Texas Statutes, including but not limited to:

a. Occupation Code, Chapter 1954, Asbestos Health Protection

b. Health and Safety Code Chapters 361 and 363, Solid Waste

4. Texas Administrative Code including but not limited to:

a. Department of State Health Services, Title 25, Chapter 295, Subchapter C – Texas Asbestos Health Protection.

b. Texas Administrative Code, Title 30, Chapter 330 Municipal Solid Waste.

5. Department of Transportation – Hazardous Materials Regulations 49 CFR, Parts 170 – 180.

1.13 APPENDIX THREE: EXAMPLE OF PROCEDURES FOR HANDLING AC PIPE

The following is an example of procedures for handling AC pipe. A contractor could use them as a basis for preparing an Asbestos Removal Work Plan. The contractor must expand upon the provisions of this appendix to describe its specific procedures. This appendix is provided for illustrative purposes only. The contractor is required to develop a site specific Asbestos Removal Work Plan that complies with the provisions of this specification. If the contractor employs this example, LMWD will require greater site specific detail to be included in the plan submitted for approval.

Scope of Work: Describe the work and be specific as to the intended involvement with the existing AC pipe. For example: abandoning/removing X feet of AC pipe; tying into a section of an existing waterline and replacing one section (X feet) of pipe to make the connection; or connecting into an existing section of AC pipe by tapping into the AC pipe.

1) Excavation to Pipe:

a. Excavate to within X inches/feet of the section of AC pipe to be replaced/removed. Depending upon the depth of the excavation, shoring may be needed following company procedures (provide or reference those procedures).

b. Once the pipe is located, excavate (by machine or hand) on one/both sides of the pipe to expose the collars and pipe. Dig the earth from around the collars by hand to create a clearance space completely around the collar. DO NOT SCRAPE OR ABRADE THE PIPE WITH THE EXCAVATION DEVICE(S).

c. Set up pumps to evacuate any residual water when the AC pipe is

dislodged.

2) Wet Method Use:

a. Make the amended water solution by mixing 1 ounce of a liquid detergent (Dawn, Joy, other) with 2 to 3 gallons of water in a 2 to 3 gallon mist sprayer. Other size sprayers may be used.

b. Wet each portion of the pipe, normally just the collar, to be removed with the amended water (water/soap) solution.

c. Use the mist sprayer to produce a "mist" application and continuously wet the collars throughout the wrapping, cracking, and removal process. A worker shall be assigned to and is responsible for this procedure during the entire dislodging process.

3) Only Cracking AC Pipe Collars is Approved:

a. Wrap wet towels/burlap/other defined absorbent material around the collar. Wrap the collar with at least two layers of 6-mil polyethylene sheeting to provide a total of at least 12-mil. It is recommended that additional poly be used on the collars to minimize possible tearing of the plastic.

b. Place another layer of wet towels/burlap/ other defined absorbent material on the wrapped collar.

c. Use the flat head end of a sledgehammer to crack the collar while continuously "misting" the collar. Strike the collar on the side of the section of pipe to be removed to prevent the remaining section of pipe from being broken.

d. Put all of the pieces of collar into a 6-mil polyethylene waste bag. Look for small pieces that may have been generated during the cracking process, wet them, and place them in the waste bag.

4) **NOTE:** When the collars are cracked and removed from a shutdown waterline, residual water may drain from the dislodged AC pipe. Follow company safety procedures to control the water (provide or reference those procedures).

5) Double Bag All AC Waste Materials:

a. All visible AC pipe materials including collars, towels, rubber gloves, gaskets, and other items suspected of containing asbestos shall be double bagged using two (2) 6- mil AC waste bags. The inner bag contents shall be mist sprayed with amended water or mixed with water from the trench prior to closing to maintain the contents wet. Close the bag when it is half full by twisting the top of the bag and sealing with moisture resistant tape.

b. If the asbestos waste bag is small enough, it may be placed inside the

section of intact pipe before the pipe is wrapped in at least two layers of 6-mil poly. If placing the waste bag inside the pipe, do not force it causing it to tear.

6) Removal of Pipe and Waste Bag from Trench:

a. All sections of "intact" pipe shall be wrapped in a minimum of two (2) layers of 6-mil poly sheets (12-mil total) while in the trench and lifted out of the trench using only nylon slings. If the trench contains water, the pipe shall be lifted out of the trench using only nylon slings and placed on a minimum of two (2) layers of 6-mil poly sheets (12-mil total) on the ground next to the trench.

b. Wrap each pipe segment in at least 12-mil of poly and secure with tape.

c. Lift the ACM waste bag(s) from the trench and move it/them to a secure location to prevent accidental contact with the bag(s) that would cause it/them to tear.

7) **NOTE:** Any valves, bends, tees, fittings, or other items that have AC pipe connected shall be wrapped whole as required with the same minimum total of 12-mil of poly material.

8) AC Pipe and Waste Storage/Transfer:

a. Wrapped AC pipe and ACM waste bags shall be stored in a secure area away from traffic that could damage the wrapped pipe and/or waste bags while awaiting transport to the permitted landfill.

b. If daily transport to a permitted landfill cannot be provided, a roll-off type dumpster/disposal container may be used to hold only the wrapped AC pipe and bagged RACM waste to prevent damage to the wrapping.

c. DO NOT TOSS THE PIPE OR WASTE BAGS INTO THE ROLL-OFF OR DISPOSAL CONTAINER.

d. DO NOT MIX SPOILS WITH THE AC WRAPPED PIPE AND AC WASTE.

e. All wrapped or bagged materials shall be moved to the AC pipe/waste fenced holding area for storage. If a roll-off or other type disposal container is used, place the wrapped pipe and waste bags in the roll-off/container using methods that do not cause the wrapping/bagging to be torn.

f. Any bagged or wrapped materials that are torn in handling shall be mended and taped. If the tear is too extensive for a simple tape repair, wrap/bag with an additional equivalent of 12-mil minimum thickness of poly wrap/bagging.

9) AC Pipe and Waste Disposal: The wrapped AC pipe and ACM bagged

waste shall be transported to an approved AC waste landfill with the manifests being generated at the time of transfer. Include the name of the transporter, their Texas asbestos transporter license number, and the name of the permitted landfill where the AC pipe and ACM waste will be buried.

END OF SECTION