



## Contract Documents and Specifications

CITY OF EDINBURG

**Bid Number 2013-92**

### **STREET 2013 PROJECTS**

FREDDY GONZALEZ WIDENING IMPROVEMENT at McCOLL

Edinburg, Texas

2013-14

City Officials

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Richard H. Garcia,	Mayor
Vacant,	Councilmember - Place 1
J. R. Betancourt,	Councilmember - Place 2
Elias Longoria,	Mayor Pro-Tem
Homer Jasso Jr.,	Councilmember - Place 4
Ramiro Garza,	City Manager

Prepared By:  
City of Edinburg  
Public Works Department – Engineering  
415 W. University Drive  
Edinburg, Texas 78540

August 2013



**Ponciano Longoria, P.E., C.F.M.**  
Director of Public Works



415 W. University Drive • P.O. Box 1079 • Edinburg, Texas 78539  
Phone: (956)388-8810 • Fax: (956)383-7111



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- Preparation of Right-of-way
- Barricaded, Signs, and Traffic Control Handling
- Erosion and Sediment Control during Construction
- Subgrade Preparation (Lime Treated)
- Flexible Base Material
- Concrete Curb, Gutter, and Combined Curb and Gutter
- Hydraulic Cement Concrete
- Reinforcing Steel
- Asphalts, Oils and Emulsions
- Dense-Graded Hot-Mix Asphalt (Method)
- Proof Rolling



## NOTICE TO BIDDERS

The City of Edinburg is soliciting sealed bids to be received by the City Secretary's Office located at 415 W. University Drive, Edinburg, Texas 78541. City of Edinburg normal business days are Monday through Friday between the hours of 8:00 a.m. to 5:00 p.m. and shall be closed on recognized holidays.

Bids will be received until **3:00 p.m. Central Time**, on **Monday, September 16, 2013**, shortly thereafter all submitted bids will be gathered and taken to the Edinburg City Hall Community Room, 1<sup>st</sup> Floor, to be publicly opened and read aloud. Any bid received after the closing time will not be accepted and will be returned to the bidder unopened. It is the responsibility of the bidder to see that any bid submitted shall have sufficient time to be received by the City Secretary's Office prior to the bid opening date and time. The receiving time in the City Secretary's Office will be the governing time for acceptability of the bids. Bids will not be accepted by telephone or facsimile machine. All bids must bear original signatures and figures. The Bid shall be for:

### **BID NO. 2013-92 STREET 2013 PROJECT – FREDDY GONZALEZ WIDENING IMPROVEMENTS**

**Bidders receiving a "NOTICE TO BIDDERS" and/or "REQUEST FOR PROPOSALS" notice in the mail or reading same in the newspaper are advised that the bidding documents may be downloaded from the City of Edinburg web page address: [www.cityofedinburg.com](http://www.cityofedinburg.com), or may obtain copies of same by contacting the office of:**

**LORENA FUENTES, PURCHASING AGENT, LOCATED AT 415 W. UNIVERSITY DRIVE, Edinburg, TX 78541 by calling (956) 388-8972 or by e-mailing your request to the following e-mail address: [lfuentes@cityofedinburg.com](mailto:lfuentes@cityofedinburg.com)**

**If Hand-delivering Bids:** 415 West University Drive,  
c/o City Secretary Department (1<sup>st</sup> Floor)

**If using Land Courier (i.e., FedEx, UPS):** City of Edinburg  
c/o City Secretary  
415 West University Drive  
Edinburg, Texas 78541

**If Mailing Bids:** City of Edinburg  
c/o City Secretary  
P.O. Box 1079  
Edinburg, TX 78540-1079

The City of Edinburg reserves the right to refuse and reject any or all bids and to waive any or all formalities or technicalities and to accept the bid deemed most advantageous to the City, and hold the bids for a period of **60** days without taking action.

**Bids must be submitted in an envelope sealed with tape and prominently marked on the lower left hand corner of the bid envelope with corresponding bid number and title.**

## CITY OF EDINBURG INSTRUCTIONS TO BIDDERS

### **DEVIATION FROM SPECIFICATION**

Please read your specifications/requirements thoroughly and be sure that the SERVICES offered comply with all specifications/requirements. Any variation from the specifications/requirements must be clearly indicated by letter attached to your bid referencing variations on a point-by-point basis. If no exceptions are noted, and you are the successful bidder, it will be required that the SERVICES be provided as specified.

### **PURPOSE**

1. The purpose of these specifications/requirements and bidding documents is for the **Street 2013 Project – Freddy Gonzalez Widening Improvements** for the City of Edinburg.
2. The SERVICES to be furnished under this bid shall be as specified in these bid documents. All specifications/requirements shown are minimum. There is no intention to disqualify any bidder who can meet these specifications/requirements.

### **SUBMITTAL OF BID**

Bids will be submitted in sealed envelopes upon the blank bid form attached hereto. Each bid must be completely filled out and SUBMITTED IN ORIGINAL FORM, complete with all supporting documentation. Bids submitted by facsimile (fax) or electronically will **NOT** be accepted. Submittal of a bid in response to this solicitation for Bids constitutes an offer by the Bidder. Bids which do not comply with these specifications/requirements may be rejected at the option of the City. Bids must be filed with the City of Edinburg, before opening day and hour. No late Bids will be accepted. They will be returned to Bidder unopened (if properly identified).

**If Hand-delivering Bids:** 415 West University Drive, c/o City Secretary Department (1<sup>st</sup> Floor)  
**If using Land Courier (i.e., FedEx, UPS):** 415 West University Drive, c/o City Secretary Department (1<sup>st</sup> Floor), Edinburg, Texas  
78541  
**If Mailing Bids:** P.O. Box 1079, Edinburg, TX 78540-1079

A pre-bid conference will be held at 2:00 p.m., Tuesday, September 3, 2013 at the Edinburg City Hall Community Room, 1<sup>st</sup> Floor, located at 415 W. University Drive, Edinburg, Texas. All prospective bidders are encouraged to attend. If you have any questions or require additional information regarding this bid, please contact Insert Contact name, Position Title, at (956) phone number.

### **PREPARATION OF BID**

Bids **MUST** give full firm name and address of bidder, and be manually signed. Failure to do so will disqualify your bid. Person signing bid must show title or AUTHORITY TO BIND HIS/HER FIRM IN A CONTRACT.

Firm name and authorized signature must appear on each page that calls for this information. The legal status of the Respondent/Bidder whether corporation, partnership, or individual, shall also be stated in the bid. A corporation shall execute the bid by its duly authorized officers in accordance with its corporate by-laws and shall also list the state in which it is incorporated. A partnership Respondent/Bidder shall give full names and addresses of all partners. All partners shall execute the bid. Partnership and Individual Respondent/Bidder shall state in the bid the names and addresses of all persons with a vested interest therein. The place of residence of each Respondent/Bidder, or the office address in the case of a firm or company, with county and state and telephone number, shall be given after the signature.

## **INSTRUCTIONS TO BIDDERS (Continued):**

### **ALTERATIONS/AMENDMENTS TO BID**

Bids **CANNOT** be altered or amended after opening time. Alterations made before opening time must be initialed by bidder guaranteeing authenticity. No bid may be withdrawn after opening time without acceptable reason in writing and only after approval by the City of Edinburg.

### **SALES TAX**

State sales tax must not be included in the bid.

### **SUBSTITUTIONS**

No substitutions or cancellations will be permitted without written approval of City of Edinburg.

### **NO BID RESPONSE**

If unable to submit a bid, bidder should return inquiry giving reasons.

### **EXCEPTIONS**

Any additions, deletions, or variations from the following specifications/requirements must be noted. The bidder shall attach to his/her bid sheet a list of any exceptions to the specifications/requirements if unable to do so, on specification sheet.

### **BRAND OR MANUFACTURER REFERENCE**

Unless otherwise specified, any catalog or manufacturer's reference or brand name used in describing an item is merely descriptive, and not restrictive, and is used only to indicate type and style of product desired. Bids on alternate brands will be considered if they meet specification requirements. If a bidder quotes on equipment other than the one(s) specified in the bid, sufficient specifications and descriptive (pictured literature) data must accompany same to permit thorough evaluation. In the absence of these qualifications, he/she will be expected to furnish the product called for.

### **DELIVERY**

Number of days required to deliver SERVICES after receiving order must be stated in the bid. Failure to so state will obligate bidder to complete service delivery within ONE day. Delivery time may be considered as basis of award.

### **DELAY IN SERVICE DELIVERY**

When delay can be foreseen, Bidder shall give prior notice to City of Edinburg. Bidder must keep City of Edinburg advised at all times of status of order. Default in promised service delivery (without acceptable reasons) or failure to meet specifications/requirements, authorizes the City of Edinburg to purchase such SERVICES elsewhere and charge increase in cost to defaulting vendor. Acceptable reasons for delayed delivery are as follows: Acts of God (floods, tornadoes, hurricanes, etc.), acts of government, fire, strikes, war; Actions beyond the control of the successful bidder.

### **SERVICE DELIVERED PRICING**

Bids in units of quantity specified - extend and show total. In the event of discrepancies in extension, unit prices will govern. Bids subject to unlimited price increase will not be considered.

### **VALID BID TIME FRAME**

The City may hold bids 60 days after bid opening without taking action. BIDDERS shall be required to hold their Bids firm for the same period of time.

## **INSTRUCTIONS TO BIDDERS (Continued):**

### **RIGHT TO REJECT/AWARD**

The City of Edinburg reserves the right to refuse and reject any or all Bids, and to waive any or all formalities or technicalities, and to make such awards of contract as may be deemed to be the best and most advantageous to the City of Edinburg.

### **MULTIPLE VENDOR CONTRACTS**

Bidders are advised that the City of Edinburg may award Contracts to multiple vendors based on low bid per item basis. All items specified on the "Bid Form" **must** reflect the individual unit prices. The City of Edinburg reserves the right to award all items individually or in any combination thereof.

### **INDEMNIFICATION CLAUSE**

The Bidder agrees to indemnify and save harmless the City, from all suits and actions of every nature and description brought against them or any of them, for or on account of the use of patented appliances, products or processes, and he shall pay all royalties and charges which are legal and equitable. Evidence of such payment or satisfaction shall be submitted upon request of the Purchasing Agent, as a necessary requirement in connection with the final estimate for payment in which such patented appliance, products or processes are used.

### **ADDENDA**

Bidder shall carefully examine the bid forms, specifications/requirements, and instructions to Bidders. Should the bidder find discrepancies in, or omissions from bid forms, specifications/requirements, or other documents, or should he/she be in doubt as to their meaning, he/she should at once notify the Purchasing Agent (Edinburg City Hall, 956-388-8972) and obtain clarification by addendum prior to submitting any bid. Explanations, interpretations, and supplemental instructions shall be in the form of written Addenda which shall become a part of the Contract documents. Said Addenda shall be mailed, e-mailed, hand delivered and/or faxed, to all prospective Bidders. All Addenda issued in respect to this project shall be considered official changes to the original bid documents. Verbal statements in response to inquiries and/or requests for explanations shall not be authoritative or binding. It shall be the Bidder(s) responsibility to ensure that they have received all Addenda in respect to this project. Furthermore, Bidders are advised that they must recognize, comply with, and attach a signed copy of each Addendum which shall be made part of their Bid Submittal. Bidder(s) signature on Addenda shall be interpreted as the bidder's "recognition and compliance to" official changes as outlined by the City of Edinburg and as such are made part of the original solicitation documents. Failure of any bidder to receive any such addendum or interpretation shall not relieve such Bidder from its terms and requirements. Addendums are available online at [www.cityofedinburg.com](http://www.cityofedinburg.com).

### **PAYMENT**

The City of Edinburg will execute payment by mail in accordance with the State of Texas Pay Law after SERVICES have been provided and invoiced. No other method of payment will be considered.

### **SYNONYM**

Where in this bid package ITEMS OR SERVICES is used its meaning shall refer to the STREET 2013 PROJECT – FREDDY GONZALEZ WIDENING IMPROVEMENTS.

### **ASSIGNMENT**

Neither the Bidder's contract nor payment due to an awarded vendor may be assigned to a third party without the written approval of the Purchasing Department for the City of Edinburg.

## **INSTRUCTIONS TO BIDDERS (Continued):**

### **INTERPRETATIONS**

Any questions concerning the conditions and/or specifications/requirements with regards to this solicitation for Bids shall be directed to the designated individuals as outlined in the Request for Bids. Such interpretations, which may affect the eventual outcome of this request for Bids, shall be furnished in writing to all prospective Bidders via Addendum. No interpretation shall be considered binding unless provided in writing by the City of Edinburg in accordance with paragraph entitled "Addenda".

### **STATUTORY REQUIREMENTS**

It shall be the responsibility of the successful Bidder to comply with all applicable State & Federal laws, Executive Orders and Municipal Ordinances, and the Rules and Regulations of all authorities having jurisdiction over the work to be performed hereunder and such shall apply to the contract throughout, and that they will be deemed to be included in the contract as though written out in full in the contract documents. (To include issues related to health, environmental, and safety to name a few.)

### **BIDDER'S EMPLOYEES**

Neither the Bidder nor his/her employees engaged in fulfilling the terms and conditions of this Purchase Contract shall be considered employees of the City. The method and manner of performance of such undertakings shall be under the exclusive control of the vendor on contract. The City shall have the right of inspection of said undertakings at any time.

### **RIGHT TO WAIVE**

City of Edinburg reserves the right to waive or take exception to any part of these specifications/requirements when in the best interest of the City of Edinburg.

### **COOPERATIVE PRICING**

Bidders are advised that in addition to responding to our "local" solicitation for bids/Bids with Dealer pricing, vendors/contractors are encouraged to provide pricing on the below referenced items/products/services based on BuyBoard, TX-MAS, H-GAC and/or any other State of Texas recognized and approved cooperative which has complied with the bidding requirements for the State of Texas. If bidding other than or in addition to "dealer" pricing, kindly duplicate the bid forms for each bid being provided from a cooperative contract. Any and all applicable fees must be included. All cooperative pricing must be submitted on or before bid opening date and hour.

### **TIME ALLOWED FOR ACTION TAKEN**

The City of Edinburg may hold bids **60** days after the opening of Bids without taking action. Bidders are required to hold their Bids firm for same period of time.

### **PREPARATION OF BID**

The City of Edinburg shall not be held liable for any costs incurred by any bidder for work performed in the preparation of and production of a bid or for any work performed prior to execution of contract.

### **CONFIDENTIAL INFORMATION**

Any information deemed to be confidential by the bidder should be clearly noted on the pages where confidential information is contained; however, the City cannot guarantee that it will not be compelled to disclose all or part of any public record under Texas Public Information Act, since information deemed to be confidential by the bidder may not be considered confidential under Texas Law, or pursuant to a Court order.

## **INSTRUCTIONS TO BIDDERS (Continued):**

### **VERBAL THREATS**

Any threats made to any employee of the City, be it verbal or written, to discontinue the providing of item/material/services for whatever reason and/or reasons shall be considered a breach of contract and the City will immediately sever the contract with the Vendor on contract.

### **MATHEMATICAL ERRORS**

In the event that mathematical errors exist in any bid, unit prices/rates -v- totals, unit prices/rates will govern.

### **AUDIT**

The City of Edinburg reserves the right to audit the vendor's books and records relating to the performance of this contract. The City of Edinburg, at its own expense, shall have the right at all reasonable times during normal business hours and upon at least twenty-four (24) hours' advance notice, to audit, to examine, and to make copies of or extracts from the books of account and records maintained by the vendor(s) with respect to the Supply/Service and/or Purchase Contract. If such audit shall disclose overpayment by City to vendor, written notice of such overpayment shall be provided to the vendor and the amount of overpayment shall be promptly reimbursed by vendor to the City. In the event any such overpayment is not paid within ten (10) business days after receipt of such notice, the unpaid amount of such overpayment shall bear interest at the rate of one percent (1%) per month from the date of such notice until paid.

### **PAST PERFORMANCE**

Vendor's past performance shall be taken into consideration in the evaluation and award of Service Contract for the Purchase of SERVICES.

### **JURISDICTION**

Contract(s) executed as part of this solicitation shall be subject to and governed under the laws of the State of Texas. Any and all obligations and payments are due and performable and payable in Hidalgo County, Texas.

### **VENUE**

The parties agree that venue for purposes of any and all lawsuits, cause of action, arbitration, and/or any other dispute(s) shall be in Hidalgo County, Texas.

### **CONFLICT OF INTEREST**

#### **CHAPTER 176 OF THE TEXAS LOCAL GOVERNMENT CODE**

Effective January 1, 2006, Chapter 176 of the Texas Local Government Code requires that any vendor or person considering doing business with a local government entity disclose in the Questionnaire Form CIQ, the vendor or person's affiliation or business relationship that might cause a conflict of interest with a local government entity. By law, this questionnaire must be filed with the records administrator of the City of Edinburg not later than the 7<sup>th</sup> business day after the date the person becomes aware of facts that require the statement be filed. See Section 176.006, Local Government Code. A person commits an offense if the person violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor. For more information or to obtain Questionnaire CIQ go to the Texas Ethics Commission web page at [www.ethics.state.tx.us/forms/CIQ.pdf](http://www.ethics.state.tx.us/forms/CIQ.pdf).

**IF YOU HAVE ANY QUESTIONS ABOUT COMPLIANCE, PLEASE CONSULT YOUR OWN LEGAL COUNSEL. COMPLIANCE IS THE INDIVIDUAL RESPONSIBILITY OF EACH PERSON OR AGENT OF A PERSON WHO IS SUBJECT TO THE FILING REQUIREMENT. AN OFFENSE UNDER CHAPTER 176 IS A CLASS "C" MISDEMEANOR.**

## **INSTRUCTIONS TO BIDDERS (Continued):**

### **AWARD**

For purposes of this project, award will be contingent on approval of budget.

### **SPECIAL CIRCUMSTANCES**

In the event that the City of Edinburg has an immediate need for a particular service(s) that is/are on contract and the successful vendor on contract is not able to meet the special service delivery needs of the City of Edinburg, the City of Edinburg reserves the right to purchase such services elsewhere to fulfill its' immediate need.

### **TERMINATION OF CONTRACT**

The City of Edinburg reserves the right to terminate the contract if, in the opinion of the City of Edinburg, the successful vendor's performance is not acceptable, if the City is being repeatedly over charged, improperly charged, no funds are available, or if the City wishes, without cause, to discontinue this contract. Termination will be in written form allowing a 30-day notice. The bidder shall be afforded the same right to terminate this contract in the same manner.

**INSURANCE REQUIREMENTS:** Staff may waive insurance requirements for contracts \$0 - \$4,999.99, including but not limited to contracts for food, materials, supplies, and construction. Workers' Compensation in amounts which satisfy statutory coverage shall be required for construction projects.

The following insurance requirements will be included in all City contracts of \$5,000 - \$14,999.99. In contracts not involving building and construction projects, as that activity is defined in TEX. LABOR CODE §406.096, contractors may obtain alternative form of worker accident insurance with minimum limits of liability of \$100,000 per claim.

<b>Minimum Insurance Requirements</b>	
<b>Type of Coverage</b>	<b>Limits of Liability</b>
Worker's Compensation	Statutory Coverage
Comprehensive General Liability (City named as additional insured) Bodily Injury	\$250,000 each person/\$500,000 each occurrence
Property Damage	\$100,000 each occurrence/\$100,000 aggregate or \$500,000 combined single limits

The following insurance requirements will be included in all City contracts of \$15,000 or more.

(1) The successful bidder will be required to carry the following insurance coverage and limits of coverage, as well as list the City as an additional insured to liability coverage as requested by the City. In addition, the successful bidder shall provide the City with evidence of coverage and furnish acceptable proof of payment of insurance premiums.

(2) The successful bidder will be required to secure and/or have insurance coverage in force with an admitted property and casualty insurance company licensed by the State of Texas to conduct business in the State of Texas.

**INSTRUCTIONS TO BIDDERS (Continued):**

(3) In contracts not involving building and construction projects, as that activity is defined in TEX. LABOR CODE §406.096, contractors may obtain alternative form of worker accident insurance with minimum limits of liability of \$100,000 per claim.

<b>Minimum Insurance Requirements</b>	
<b>Type of Coverage</b>	<b>Limits of Liability</b>
Worker's Compensation	Statutory Coverage
Employer's Liability	Bodily Injury by Accident: \$100,000 each accident  Bodily Injury by Disease: \$100,000 each employee/\$500,000 policy limit
Comprehensive General Liability Bodily Injury	\$250,000 each person/\$500,000 each occurrence
Property Damage	\$100,000 each occurrence/\$100,000 aggregate or \$500,000 combined single limits
Comprehensive Auto Liability Bodily Injury	\$100,000 each person/\$500,000 each occurrence
Property Damage	\$100,000 each occurrence/\$100,000 aggregate or \$500,000 combined single limits
City's Protective Liability Bodily Injury	\$250,000 each person/\$500,000 each occurrence
Property Damage	\$100,000 each occurrence/\$100,000 aggregate or \$500,000 combined single limits

Policies must name the City of Edinburg as an Additional Insured.

Certificates of insurance naming the CITY as an additional insured shall be submitted to the CITY for approval prior to any services being performed by Contractor. Each policy of insurance required hereunder shall extend for a period equivalent to, or longer than the term of the Contract, and any insurer hereunder shall be required to give at least thirty (30) days written notice to the CITY prior to the cancellation of any such coverage on the termination date, or otherwise. This Contract shall be automatically suspended upon the cancellation, or other termination, of any required policy of insurance hereunder, and such suspension shall continue until evidence that adequate replacement coverage is provided to the CITY. If replacement coverage is not provided within thirty (30) days following suspension of the Contract, the Contract shall automatically terminate.

**BID BOND REQUIREMENTS**

If the contract amount is over twenty-five-thousand dollars (\$25,000) for construction of the project, the successful bidder shall provide a bid guarantee, give a good and sufficient bond in the full amount of the contract price for the faithful performance of such contract, executed by a surety company authorized to do business in the State of Texas, in accordance with Article 5160, Vernon's Texas Civil Statutes, and amendments thereto. A payment bond in the full amount of the contract price to assure payment shall be required by law of all persons supplying labor and material in the execution of the project provided for in the contract documents.

## **INSTRUCTIONS TO BIDDERS (Continued):**

A bid guarantee equivalent to five percent (5%) of the bid price will be required from each bidder. The "bid guarantee" shall consist of a firm commitment, such as a bid bond, certified check or other negotiable instrument accompanying a bid as assurance that the bidder will upon acceptance of his/her bid, execute such contractual documents as may be required within the time specified.

A performance bond on the part of the contractor for one-hundred percent (100%) of the contract price will be required. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

A payment bond on the part of the contractor for one-hundred percent (100%) of the contract price will be required. 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 execution of the work provided for in the contract documents.

Bidders are expressly advised to review the contract documents fully and insurance requirements of the proposed contract as to their legal requirements and the causes which may lead to the disqualification of a bidder and/or rejection of a bid proposal. No bid may be withdrawn within a period of sixty (60) days after the dated fixed for opening the bids. Unless all bids are rejected, the Owner will give Notice of Award of Contract to the successful bidder as soon as possible consistent with the time for a thorough analysis of bids submitted. Bidders are expected to inspect the site of work and to inform themselves regarding all local conditions which may affect their bid.

A bid guarantee, performance and payment bond will not be required for contracts zero to \$25,000. The City will specify in the contract that no money will be paid to the contractor until the project has been completed and final acceptance has been made by the City.

# **BID PROPOSAL FORM**

**BID NO. 2013-92**

**STREET 2013 PROJECTS  
FREDDY GONZALEZ WIDENING IMPROVEMENTS  
EDINBURG, TEXAS**

**MR. PONCIANO LONGORIA, P.E., C.F.M.  
DIRECTOR OF PUBLIC WORKS  
CITY OF EDINBURG  
415 W. UNIVERSITY DRIVE  
EDINBURG, TEXAS 78541**

The undersigned, as bidder(s), declares that the only person or parties interested in this proposal as principals are those named herein, that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the Form of Contract, Notice to Bidders, General Conditions, Special Provisions, Measurement and Basis of Payment, specifications and the plans thereon referred to, and has carefully examined the locations, and conditions and classes of materials of the proposed work; and agrees that he will provide all the necessary labor, machinery, tools, and apparatus, and other items incidental to construction, and will do all the work and furnish all the materials called for in the contract and specifications in the manner prescribed therein and according to the requirements of the Engineer/Architect as therein set forth.

It is understood that the following quantities of work to be done at unit prices are approximate only and are intended principally to serve as a guide in evaluating bids.

It is further agreed that the quantities of work to be done at unit price and materials to be furnished, may be increased or diminished as may be considered necessary, in the opinion of the Engineer, to complete the work fully as planned and contemplated, and that all quantities of the work, whether increased or decreased, are to be performed at the unit prices set forth below except as provided for in the specifications.

It is further agreed that lump sum prices may be increased to cover additional work ordered by the Engineer, but not shown on the plans or required by the specifications, in accordance with the provisions of the General Conditions. Similarly, they may be decreased to cover deletion of work so ordered.

The 5% bid security accompanying this proposal shall be returned to the bidder, unless in case of the acceptance of the proposal the bidder shall fail to execute a contract and file a performance bond and payment bond within the fifteen (15) days after Notice of Award, in which case the bid security shall become the property of the OWNER, and shall be considered as payment for damages due to delay and other inconveniences suffered by the Owner on account of such failure of the bidder. It is understood that the Owner reserves the right to reject any or all bids.

**BID PROPOSAL FORM :**

**BID PROPOSAL FORM MUST BE SUBMITTED IN DUPLICATE FORM**

BIDDERS BOND in the amount of \_\_\_\_\_, (5%) of the greatest amount bid in compliance with the INSTRUCTION TO BIDDER.

The above Bank Certificate Check or Bidder's Bond is to become the property of the City of Edinburg, Texas, in the event the construction contract (when offered by the Owner) and bonds are not executed within the time set forth.

**BASE BID : STREET IMPROVEMENTS PROJECT (Widening of Freddy Gonzalez at McColl Road)**

**ENGINEER ESTIMATE OF QUANTITIES - APPROXIMATE ONLY**

Item No.	Estimated Quantity	Unit	Item Description	Unit Cost	Total Amount
1	1	LS	BARRICADES, SIGNS, & TRAFFIC CONTROL PLAN (TX-Dot Item 502), all complete in place, for the lump sum price of	\$ _____	\$ _____
2	1	LS	EROSION CONTROL DEVISE (TX-Dot ITEM 506), as per Plans & Specifications, all complete in place including maintenance and removal after the Project for the lump sum of	\$ _____	\$ _____
3	400	SY	6" COMPACTED LIME TREATED SUBGRADE, with lime by weight (24 ilbs/sy), compacted as per plans and specifications, conforming to TX-Dot 2004 Standard Specification Item 260, complete and in place per square yard for	\$ _____	\$ _____
4	380	SY	8" COMPACTED LIME TREATED FLEXIBLE BASE, Type "E" Grade 4, compacted as per plans and specifications, conforming to TX-Dot 2004 Standard Specification Item 247, complete and in place per square yard for	\$ _____	\$ _____
5	56	GAL	PRIME COAT (MC-30)(TX-Dot ITEM 310), shall be applied as per Standards Specifications for the recycling process in mixing with scarified or recycled material, for the square yards shown, all complete in a part of in gallons for	\$ _____	\$ _____
6	40	TNS	3" COMPACTED HOT-MIX ASPHALTIC CONCRETE, Type "D" surface course conforming to TX-Dot 2004 Standard Specification Item 247, complete and in place for 340-square yard for in tons at 342 lbs per square yard	\$ _____	\$ _____
7	210	TNS	1.5" COMPACTED HOT-MIX ASPHALTIC CONCRETE OVERLAY, Type "D" surface course conforming to TX-Dot 2004 Standard Specification Item 247, complete and in place for 2,450-square yard for in tons at 171-lbs per square yard	\$ _____	\$ _____
8	165	LF	24" CONCRETE CURB & GUTTER, Type "A" barrier, as per plans and specification, all complete and in place per linear foot for	\$ _____	\$ _____
9	1	LS	HANDICAP RAMP (TYPE 5), adjust lid and curb & gutter surrounding lid, as per plans and specifications, and all completed in place per each for	\$ _____	\$ _____
10	45	SY	REINFORCED CONCRETE DRIVEWAY, with 6" reinforced concrete pavement, removal of existing material, re-grading and compaction, conforming to TX-Dot 2004 Standard Specification Item 247, as per plans and specifications, and all completed in place per each for	\$ _____	\$ _____

**BASE BID TOTAL : STREET IMPROVEMENTS PROJECT :**

(Item 1-11) (Widening of Freddy Gonzalez Drive at McColl Road)

\$ \_\_\_\_\_

BID PROPOSAL FORM Continued :

**BID PROPOSAL FORM MUST BE SUBMITTED IN DUPLICATE FORM**

**ALTERNATE BID : STREET IMPROVEMENTS PROJECT (Striping Freddy Gonzalez Drive)**

**ENGINEER ESTIMATE OF QUANTITIES - APPROXIMATE ONLY**

Item No.	Estimated Quantity	Unit	Item Description	Unit Cost	Total Amount
1	344	LF	REFL PAV. MARK TY (Y) 4" (BRK)(100MIL)	\$ _____	\$ _____
2	344	LF	REFL PAV. MARK TY (Y) 4" (SLD)(100MIL)	\$ _____	\$ _____
3	180	LF	REFL PAV. MARK TY (Y) 4" (SLD)(100MIL)	\$ _____	\$ _____
4	220	LF	REFL PAV. MARK TY (W) 4" (BRK)(100MIL)	\$ _____	\$ _____
5	200	LF	REFL PAV. MARK TY (W) 4" (SLD)(100MIL)	\$ _____	\$ _____
6	205	LF	REFL PAV. MARK TY (W) 24" (SLD)(100MIL)	\$ _____	\$ _____
7	7	EA	REFL PAV. MARK TY (W) ARROW (100MIL)	\$ _____	\$ _____
8	2	EA	REFL PAV. MARK TY (W) WORD (100MIL)	\$ _____	\$ _____

**ALTERNATE BID TOTAL : STREET STRIPING :**

(Item 1-8) (Widening of Freddy Gonzalez Drive Striping)

\$ \_\_\_\_\_

**BID PROPOSAL FORM Continued :**

**BID PROPOSAL FORM MUST BE SUBMITTED IN DUPLICATE FORM**

The number of Calendar Days to complete contract 45 .

The undersigned agrees, unless hereinafter stated otherwise to furnish all material as shown and specified in the Plans and Specifications.

Bidder hereby agrees to commence work under this Contract within 10 days after the "NOTICE TO PROCEED" is issued, and to complete all the work in the Contract within 45 Calendar Days.

ADDENDUM NO.	DATE	BY
ADDENDUM No. 1		
ADDENDUM No. 2		
ADDENDUM No. 3		
ADDENDUM No. 4		

Respectfully Submitted :

Date : \_\_\_\_\_

By : \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Type or Print Name)

\_\_\_\_\_  
(Title)

\_\_\_\_\_  
(Company)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(City, State, Zip)

\_\_\_\_\_  
(Phone Number)

\_\_\_\_\_  
(Fax Number)

(Seal - If Bidder is a Corporation)

## MEASUREMENT AND BASIS OF PAYMENT

Freddy Gonzalez Widening Project 2013-92

### GENERAL

IT IS THE INTENT OF THIS CONTRACT TO COVER ALL THE WORK TO BE PERFORMED SUBSIDIARY TO ALL THE ITEMS INCLUDED IN THE BID AND SUCH PRICES SHALL BE BALANCED INDIVIDUALLY AND SHALL INCLUDE FURNISHING ALL MATERIALS, SUPERINTENDENCY, SUPERVISION, CONSTRUCTION SURVEYING AND LAYOUT, LABOR, INSURANCE, BONDS, BENEFITS, MACHINERY, FUEL, VEHICLES, SAFETY EQUIPMENT, ADMINISTRATIVE COSTS, QUALITY CONTROL, GUARANTEES AND WARRANTIES, OVERHEAD, AND ALL INCIDENTALS FOR COMPLETING THE ASSIGNED WORK IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS COMPLETE IN PLACE. ***IN CASE THE FOLLOWING MEASUREMENT AND BASIS OF PAYMENT DESCRIPTIONS CONFLICT WITH THE CORRESPONDING DESCRIPTIONS CONTAINED WITHIN THE TECHNICAL SPECIFICATIONS FOR THIS PROJECT, THE FOLLOWING DESCRIPTIONS SHALL GOVERN.***

THE FOLLOWING APPLICABLE ITEMS SHALL BE CONSIDERED AS PAY ITEMS. ALL OTHER WORK NOT SPECIFICALLY LISTED OR INDICATED BELOW SHALL BE SUBSIDIARY TO THE OVERALL COST OF THE PROJECT. ALL EXCAVATION IS UNCLASSIFIED.

### PAVING IMPROVEMENTS (FREDDY GONZALEZ WIDENING PROJECT)

**PREPARATION OF RIGHT-OF-WAY, CLEARING AND EXCAVATION (Subsidiary to all items):** When called for in the proposal, shall be measured and paid from ROW line to ROW line for the entire length of the roadway, calculated to the nearest 100-ft. STATION (STA.) and shall include all clearing and grubbing, parkway grading from edge of pavement or curb line to R.O.W. line (or beyond as noted), demolition, removal of existing fences at the locations indicated, removal and disposal of unsuitable material such as asphalt, organic materials, and shall include stripping of underlying soil, excavation, excavation and fine grading of adjacent swales and bar ditches, filling and compaction behind curbs, cutting down to sub-grade depth and width, disposal of debris and other material deemed not suitable for filling, hauling in fill material as required, , all complete in place. Any material deemed salvageable by the Owner or Engineer shall be carefully removed and hauled to a designated location as directed by the Owner or Engineer within the City, with such cost being subsidiary to this item.

**BARRICADES, SIGNS AND TRAFFIC CONTROL (Line Item #1):** When called for in the proposal, shall be measured and paid per LUMP SUM (L.S.), and shall include all necessary materials, labor, barricades, flagmen and construction signs as required in the Traffic Control Plan including all necessary regular inspection and maintenance of barricades and signage all in accordance with the plans and in conformance the Texas Department of Transportation Permit Instructions as applicable and TRAFFIC CONTROL PLAN (as prepared by a Registered Professional Engineer and approved by the City of Edinburg, which cost is subsidiary to this Item), including all necessary traffic control for temporary road closures as approved by the City of Edinburg for installation of underground facilities, all in accordance with the UNIFORM TRAFFIC CODE, all complete in place.

**EROSION AND SEDIMENT CONTROL DEVICES (Line Item #2):** When called for in the proposal, shall be measured and paid per LUMP SUM (L.S.) for silt fence, hay bales, construction Entrances/Exits, maintenance of all devices as specified on the plans, street sweeping, dust and debris control, watering, all to the limits and locations shown, all complete in place.

**COMPACTED LIME OR PORTLAND CEMENT STABILIZED SUBGRADE (Line Item #3):** When called for in the proposal, shall be measured and paid from BACK OF CURB (OR EDGE OF PAVEMENT) TO BACK OF CURB (OR EDGE OF PAVEMENT) per SQUARE YARD (S.Y.) for the **constructed length and width laid in accordance with Typical Details** measured with a surveyor's flat steel chain, and shall include all necessary excavation, compaction as shown, working of lime or Portland cement material to the strength specified (Calculated from unit weight of sub-grade material), as shown in the plans and specifications, all complete in place.

**COMPACTED LIME TREATED FLEXIBLE BASE (Line Item #4):** When called for in the proposal, shall be measured and paid from BACK OF CURB (OR EDGE OF PAVEMENT) TO BACK OF CURB (OR EDGE OF PAVEMENT) per SQUARE YARD (S.Y.) for the **constructed length and width laid in accordance with Typical Details**, measured with a surveyor's flat steel chain, and shall include furnishing all new material to the required compacted thickness, working of Lime as specified, prime coat, spreading, watering, fine grading and compacting as shown in the plans and specifications, all complete in place.

**PRIME COAT (MC-3)(TX-Dot ITEM 310) (Line Item #5):** When called for in the proposal, shall be measured and paid from LIB OF CURB TO EDGE OF PAVEMENT per GALLONS (GAL) for the **constructed length and width laid in accordance with Typical Details**, measured with Calibrated percent of gallons per square yard, and shall include furnishing all material to the required compacted thickness, working of Lime as specified, prime coat, spreading, watering, fine grading and compacting as shown in the plans and specifications, all complete in place.

**COMPACTED HOT-MIX ASPHALTIC CONCRETE (Line Item #6 & 7):** When called for in the proposal, shall be measured and paid from LIP OF CURB (OR EDGE OF PAVEMENT) TO LIP OF CURB (OR EDGE OF PAVEMENT), per TONS (TN) for the **constructed length and width laid in accordance with Typical Details**, measured with a surveyor's flat steel chain, for the TYPE AND COMPACTED THICKNESS SPECIFIED (3" at Widening section, 1.5" overlay as noted on plans and shall include PRIME COAT as shown in the plans and specifications, all complete in place. Tamping and Proof Rolling may be required in certain locations of the roadway as determined by the Owner's Representative, and the cost for such work shall be considered subsidiary to the Paving Improvement Items of the Proposal.

**CONCRETE CURB AND GUTTER (24" )(Line Item #8):** When called for in the proposal, shall be measured and paid along the gutter line for catch, lay-down or spills section, per LINEAL FOOT (L.F.), for the **constructed length in accordance with Typical Details**, measured with a surveyor's flat steel chain, for all Types indicated in the plans and specifications, and shall include all necessary labor, excavation, joints, backfilling, reinforcement, concrete of thickness and strength specified, as shown in the plans and specifications, all complete in place. *(Concrete Curb and Gutter shall be laid over prepared base and sub-grade as indicated in the typical sections. The prepared base and sub-grade shall be paid for separately).*

**HANDICAP RAMP (TYPE 5)(Line Item #9):** When called for in the proposal, shall be measured and paid per LUMP SUM (L.S.) for the **constructed length and width laid in accordance with Typical Details**, measured with a surveyor's flat steel chain, for the TYPE AND THICKNESS SPECIFIED, and shall include all necessary labor, excavation, backfilling, reinforcement, concrete of the strength specified, Compacted Subgrade as shown, Compacted Flexible Base, joints, all complete in place. (Wings and connections to sidewalk ramps shall comply with Texas Accessibility Standards (TAS) Requirements.)

**COMMERICAL / RESIDENTIAL DRIVEWAYS (REINFORCED CONCRETE ENTRANCE APRONS)(Line Item #10):** When called for in the proposal, shall be measured and paid per SQUARE FEET (S.F.) for the **constructed length and width laid in accordance with Typical Details**, measured with a surveyor's flat steel chain, for the TYPE AND THICKNESS SPECIFIED, and shall include all necessary labor, excavation, backfilling, reinforcement, concrete of the strength specified, Compacted Subgrade as shown, Compacted Flexible Base, joints, all complete in place. (Wings and connections to sidewalk ramps shall comply with Texas Accessibility Standards (TAS) Requirements.)

## SPECIAL PROVISIONS

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IN ALL CASES WHERE THESE SPECIAL PROVISIONS CONFLICT WITH THE TECHNICAL SPECIFICATION SECTIONS, GENERAL CONDITIONS OF THE AGREEMENT, SUPPLEMENTARY GENERAL CONDITIONS, CONTRACT CONDITIONS, OR ANY OTHER DOCUMENT CONTAINED HEREIN, THESE SPECIAL PROVISIONS SHALL GOVERN.

1. Definitions:
  - a. OWNER – shall be the City of Edinburg,
  - b. City – shall be the City of Edinburg
  - c. ENGINEER – shall be the City of Edinburg, City Director of Public Works or their duly appointed representative.
2. The CONTRACTOR shall do all necessary excavation, trenching, demolition, grading, backfill, etc., to complete the project. All excavation is unclassified. All material removed such as concrete, broken pipe, excess backfill, etc., shall become the property of the CONTRACTOR and he shall be responsible for removing it from the site at no extra expense to the OWNER. Any existing material deemed salvageable by the ENGINEER or the OWNER shall be carefully removed and hauled to a designated location as directed by the OWNER or ENGINEER within the City at no extra expense to the OWNER.
3. All trees, plants, grass and shrubs, except those which will be affected by construction shall be protected at all times. The areas in and adjacent to the construction site shall be restored to their original conditions after necessary fine grading are completed. The CONTRACTOR shall provide new grass of the same type removed to restore damaged areas. Only quality sandy loam topsoil shall be used for filling the top four inches of those areas damaged or filled.
4. Relocations/Damages done to existing utilities, power poles, fences, signs, mailboxes, driveways, culverts, pavement, drainage systems, etc. shall be repaired by the CONTRACTOR at no cost to the OWNER, and such costs shall be subsidiary to the various unit items in the Proposal.
5. Existing lawns are to remain intact as far as practical. The CONTRACTOR shall duly restore such areas disturbed to as good as or better than original condition using the same type of grass, shrubs, or cover as the original. The CONTRACTOR shall be responsible for correcting any erosion that occurs at his cost without claim for extra compensation.
6. The CONTRACTOR shall be limited only to existing ROW for operations and/or easements provided by the City of Edinburg. The CONTRACTOR at no extra cost to the OWNER will correct any damages done to property outside these designated work areas to its original or better conditions. It is important that the CONTRACTOR be aware of the work limits so that no damage can result to those areas outside these limits.
7. It is important that traffic be interrupted at a minimum during construction. A Traffic Control Plan (TCP), prepared by a Registered Professional Engineer, must be submitted by the CONTRACTOR and written approval must be issued by the ENGINEER and OWNER prior to any road closures. The OWNER may, at its sole discretion, require continuous operation of construction activities to minimize traffic interruption. The preparation and submittal of the TCP, its approval process, or continuous operation requirement shall not constitute a claim for additional compensation or time extension of the Project.

8. Contractor shall make every effort to ensure the safety of the public and property as provided in the contract. Follow the safety provisions of applicable rules, codes, regulations and as may be required to adjust to existing conditions. Maintain the roadway in a good and passable condition, provide for ingress and egress to adjacent property and provide suitable drainage of the roadway and erect temporary structures as required. Store all equipment not in use in a manner and at locations that will not interfere with the safe passage of traffic.
9. The City of Edinburg shall provide all testing. Testing shall be paid by the OWNER on all necessary testing selected by ENGINEER, but re-testing shall be charged to the CONTRACTOR from his monthly estimates, and no additional compensation will be made or allowed for reworking the necessary defective work not meeting the specified work of the plans and specifications. Any re-testing required by no-passing results shall be paid for by the CONTRACTOR and shall be deducted from the contract amount. The OWNER, at its sole discretion, may require the CONTRACTOR to perform any necessary uncovering of any improvements to verify compliance with specifications by either visual observation or materials testing at no extra expense to the OWNER.
10. The CONTRACTOR shall furnish the Site Inspector and Observer, OWNER, and ENGINEER the names, address and telephone numbers of all personnel responsible for the work in case of Emergencies.
11. The successful CONTRACTOR shall attend a Pre-Construction Conference Meeting with the OWNER, ENGINEER, and other PUBLIC WORKS AND UTILITY DEPARTMENTS staff members at the date and time specified.
12. The CONTRACTOR shall submit to the ENGINEER a proposed sequence of work outline with approximate completion dates to be reviewed at the pre-construction conference. During the course of construction, the ENGINEER may request updates to the schedule indicating the start of the several part of the work and the estimated dates of completion of the several parts. Unless otherwise noted on the plans, the ENGINEER may require modification of construction schedule to meet any CITY recognized or CITY sponsored events which may be affected by the CONTRACTOR'S activities without claim for extra compensation.
13. The CONTRACTOR is solely responsible for notifying the Public Works Department - Engineering Division, Police Department, Fire Department, School District, Emergency Services, and other interested entities at least 48 hours in advance of any OWNER approved road closures or detours.
14. All traffic control devices shall be in accordance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), latest edition.
15. All work must be performed during regular business hours of 8 a.m. to 5 p.m., Monday thru Friday, except City recognized holidays. It is the CONTRACTOR'S sole responsibility to complete all work within the time specified in the Contract during the designated hours of operation. The CONTRACTOR may request work outside these hours, but will require the presence of the City's Field Inspector, the cost of which will be borne by the CONTRACTOR. No cost for the City's Field Representative will be charged should the work be requested by the CITY OF EDINBURG.
16. The CONTRACTOR shall be responsible for construction staking for the entire project and shall be done in accordance with the Specifications. The OWNER shall provide horizontal

and vertical control. Staking shall be performed by a Registered Professional Land Surveyor or Professional Engineer of the State of Texas qualified to do such construction staking at no additional cost to the OWNER. CUT SHEETS shall be submitted to the ENGINEER and OWNER for review and approval.

17. The Plans show approximate locations of existing utilities including gas lines, telephone lines, power lines, water lines, sewer lines, storm sewers and irrigation lines within the vicinity. The CONTRACTOR is responsible for locating all existing utilities and shall exercise extreme care in working in the vicinity of these lines. The CONTRACTOR shall notify the Utility Companies while working in the vicinity of the corresponding private or public utilities.
18. All existing lines, whether belonging to the City of Edinburg or Private shall remain in operation at all times. Switchover time, re-connecting new service from existing lines or services (if any) shall be kept to a minimum. Unless otherwise shown as a Bid Item, reconnections to existing water and sanitary sewer services shall be subsidiary to all items of the Bid Proposal at no additional cost to the OWNER.
19. The OWNER reserves the right to add or delete quantities of bid items in the Proposal at the Unit Prices given, provided however that such additions or reductions are within the aggregate limits specified in the General Conditions of the Agreement. No additional compensation will be made to the CONTRACTOR for increases in quantities resulting from deviations from the dimensions of the plans unless such deviation is approved in writing and in accordance with the Change Order provisions of the Contract Documents.
20. The CONTRACTOR is expected to conduct his work in such a manner as to minimize any soil erosion or sediment runoff from the construction site. CONTRACTOR shall provide ENGINEER and OWNER an Erosion Control Plan (ECP) as part of a permit application to be completed and approved by the PUBLIC WORKS DEPARTMENT prior to commencement of work. Earth cuts and fills shall have smooth, flat side slopes, as generally indicated on the Plans, to preclude erosion of the soil. Such operations should be times consistent with the actual need for doing the work and only to leave raw, unprotected surfaces for a minimum of time. The preparation and submittal of the ECP or its approval process shall not constitute a claim for additional compensation or time extension of the Project.
21. Until acceptance by the ENGINEER of any part of all of the material, as provided for in these specifications, it shall be under the charge and care of the CONTRACTOR, and he shall take every necessary precaution against injury or damage to any part of the material by action of the elements of the non-execution of the work. The CONTRACTOR shall rebuild, repair, restore and make good, at his own expense, all injuries or damage to any portion of the material occasioned by any of the above causes before its completion and acceptance.
22. In cases where the CONTRACTOR deems extra compensation is due him for materials not clearly covered in the contract, or not ordered by the ENGINEER as an extra item, the CONTRACTOR shall notify the ENGINEER in writing of his intention to make claim for such extra compensation before he begins the work. The CONTRACTOR shall not proceed until the OWNER, ENGINEER, and CONTRACTOR approves a written CHANGE ORDER. Failure on the part of the CONTRACTOR to give such notification or to afford the ENGINEER proper facilities for keeping strict account of actual cost shall constitute a waiver of the claim for such extra compensation. The filing of such notice by the CONTRACTOR

and the keeping of costs by the ENGINEER shall not in any way be construed to prove the validity of the claim. When the work has been completed, the CONTRACTOR shall, within 10 days, file his claim for extra compensation with the ENGINEER.

23. Upon the failure of the CONTRACTOR to repair satisfactorily or to remove and replace, if so directed, rejected, unauthorized, or condemned materials immediately after receiving written notice from the ENGINEER, the OWNER may recover for such defective materials on the CONTRACTOR'S bond, or by action in a court having proper jurisdiction over such matters, or may employ labor and equipment and satisfactorily repair or remove and replace such work and charge the cost of the same to the CONTRACTOR, which cost will be deducted from any money due him.
24. The CONTRACTOR shall warrant all work for a period of not less than one (1) year from the date of final acceptance of the work by the City of Edinburg. CONTRACTOR is responsible for scheduling a final inspection in the presence of the OWNER, ENGINEER, and CONTRACTOR, whereupon all items must be in accordance with plans and specifications prior to final acceptance.
25. The CONTRACTOR is solely responsible for familiarizing himself and following the 2007 Standards Manual latest addition for those items not specifically or clearly shown on the project plans or project specifications and performing the work in such a manner. The Manual can be purchased at the ENGINEERING Department or downloaded from the City's website at [www.cityofedinburg.com](http://www.cityofedinburg.com). No additional compensation will be made for items covered in the City's Standards.
26. All items shall be completed as per the construction plans and specifications. Failure by the CONTRACTOR to make the necessary repairs within the time specified by the OWNER may result in corrective action by the OWNER including the employ of materials, labor and equipment to satisfactorily perform such work and charge the cost of the same to the CONTRACTOR, which cost will be deducted from any money due him.

THE STATE OF TEXAS §                    **AGREEMENT BETWEEN THE CITY OF  
EDINBURG AND**  
COUNTY OF HIDALGO §               **FOR THE STREET IMPROVEMENT  
PROJECT OF – FREDDY GONZALEZ  
WIDENING IMPROVEMENTS AT McColi**

SERVICE CONTRACT §

The **City of Edinburg** (hereinafter called "City"), and \_\_\_\_\_,  
(herein called "Contractor"), entered into an agreement for the street improvements for  
Freddy Gonzalez Drive.

**RECITALS**

**WHEREAS**, the City desires to engage the Contractor for certain services in  
connection therewith; and,

**WHEREAS**, Contractor represents that it has the knowledge, ability, and  
personnel to properly provide services needed by the City;

**NOW, THEREFORE**, the City and Contractor do mutually agree as follows:

**SECTION I**  
**EMPLOYMENT OF CONTRACTOR**

City agrees to employ Contractor to provide the following basic services as stated  
in the following sections and upon receipt of such satisfactory services, City agrees to  
pay Contractor as stated in the sections to follow.

**SECTION II**  
**BASIC SERVICES OF CONTRACTOR**

The Contractor agrees to perform the work in connection therewith, under the  
terms of the installation of the Pavement Improvements, and Pavement Markings; at  
his/her (its or their) own proper cost and expense to furnish all the labor, insurance and  
other accessories and services necessary to complete the said tasks in accordance  
with the conditions and prices stated.

**SECTION III**  
**TIME OF PERFORMANCE**

The Contractor shall be completed upon request of the City and during the period  
of ninety days (90) calendar days end on from the notice to proceed. Contractor shall  
not be liable for any delay due to circumstance beyond its control.

**SECTION IV**  
**STANDARD OF PERFORMANCE**

Contractor warrants to City that all labor furnished to perform the Work under the Contract Documents will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by the Contract Documents, and that the Work will be of good quality, free from faults and defects, and in strict conformance with the Contract Documents. Any Work not strictly conforming to these requirements may be considered defective.

**SECTION V**  
**TERMS OF PAYMENT**

City agrees to pay Contractor for services herein contracted for as follows:

- A. Payment for basic services shall be upon receipt of invoice by City. Invoice shall be submitted to City upon completion and inspection of each project in accordance with the contract Documents in Unit Price amounts set forth in the Bid Proposal forms(s) the total compensation to the Contractor not to exceed the amount of \$\_\_\_\_\_.
- B. Invoice shall be completed and processed in accordance with City regulations. Contractor shall submit Applications for Payment in accordance with the general Conditions. Application for Payment will be processed by the consulting Engineers and the Department of Public Works as provided in the General Conditions.
- C. City shall authorize all payments made for services rendered. Payment terms shall be net thirty (30) days from receipt of invoice.
- D. If changes in plans or specifications are necessary after the performance of the contract is begun or if it is necessary to decrease or increase the quantity of work to be performed or of materials, equipment, or supplies to be furnished, the governing body of the municipality must approve change orders before making the changes.
- E. The total contract price may not be increased because of the changes unless additional money for increased costs is appropriated for that purpose from available funds or is provided for by the authorization of the issuance of time warrants.

**SECTION VI**  
**TIME OF COMPLETION**

City and the Contractor recognize that time is of the essence of this agreement and that the City may suffer financial loss if the WORK is not completed within the time specified in Section III herein, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. Accordingly, instead of requiring any such proof, the City and the Contractor agree that not as a penalty, but as added expense for Engineering/Architectural supervision the Contractor shall pay the City for each day that expires after the time specified in Section III herein the amount corresponding below:

<b><u>FOR AMOUNT OF CONTRACT</u></b>	<b><u>COST PER DAY</u></b>
\$ 5,000.00 to \$ 25,000.00	\$100.00
\$ 25,001.00 to \$ 100,000.00	\$200.00
\$ 100,001.00 to \$ 500,000.00	\$250.00
\$ 500,001.00 to \$1,000,000.00	\$300.00
\$1,000,001.00 to \$2,000,000.00	\$400.00
\$2,000,001.00 to \$3,000,000.00	\$500.00
\$3,000,001.00 to \$4,000,000.00	\$600.00
\$4,000,001.00 to \$5,000,000.00	\$700.00
\$5,000,001.00 and over	\$800.00

**SECTION VII**  
**SCHEDULE REQUIREMENTS**

Whenever, in the opinion of City, the Work falls behind schedule, the Contractor shall, to the extent necessary to meet said schedule, increase its labor force and/or provide overtime, Saturday, and Sunday and/or holiday work, and shall have each Subcontractor do likewise, all at no additional cost to or compensation from City. Further, City shall have the right to offset against any amounts then or thereafter due to the Contractor, or to be reimbursed by the Contractor for, any additional costs City may incur as a direct result of said increase in labor force or overtime, Saturday, Sunday, and/or holiday work.

**SECTION VIII**  
**WRITTEN NOTICE OF ISSUE**

In the event that any issue arises relating to any of the provisions contained in this Agreement, including, but not limited to potential delays, change orders, time extensions, weather delays, etc. Contractor agrees to notify the City, in writing, immediately, relating to such issue and proposed resolution. Failure to give such notice shall constitute a waiver of any other remedies available to Contractor hereunder.

**SECTION IX**  
**NO DAMAGE FOR DELAY**

In the event of any delay, not the fault of the Contractor, the Contractor shall be entitled to an extension of time for completion only, and shall not be entitled to any additional payment on account of such delay. Without limiting the foregoing, the Contractor shall not be entitled to payment or compensation of any kind from the City for direct, indirect or impact damages, and/or consequential damages, including but not limited to costs of acceleration arising because of hindrance or from any cause or whatsoever, whether such hindrances or delays be reasonable or unreasonable, foreseeable or unforeseeable, or avoidable or unavoidable; provided, however, that this provision shall not preclude recovery by the Contractor of damages for hindrances or delays due solely to fraud or bad faith on part of the City or his agents.

**SECTION X**  
**UNREASONABLE SITE INSPECTION REQUIREMENTS**

The Contractor acknowledges that it has taken steps necessary to ascertain the nature and location of the Work and that it has investigated and satisfied itself as to the general and local conditions which can affect the Work and its costs. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered or difficulties or access insofar as this information is ascertainable from an inspection of the site, and available documents, including all information from exploratory work done by the City and its design consultants as well as from the Drawings and Specifications made a part of this Contract. The Contractor has the right to make any additional tests necessary to assure himself that the site conditions are satisfactory for the work contemplated.

**SECTION XI**  
**DUTY TO COORDINATE AMONG SEPARATE PRIME CONTRACTORS**

The City reserves the right to engage separate contractors to perform aspects of the Project other than the Work under this Agreement. In such case, contractor shall coordinate sequence and schedule its work together and in cooperation with such other contractors. In the event of any difficulties caused by any such other separate contractor, this contractor shall look solely for relief to such other contractors and shall not make claim against City.

**SECTION XII**  
**CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire agreement between City and Contractor concerning the WORK consist of this Agreement and the following attachments to this Agreement:

- Notice to Bidders
- Addenda
- Instructions to Bidders
- Bid Proposal Forms including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates and affidavits
- Special Provisions
- Agreement for Engineering/Architectural Construction
- Performance Bond
- Payment Bond
- General Conditions of Contract for Engineer/Architectural Construction
- Supplemental General Conditions
- Affidavit and Waiver of Lien Prime Contractor
- Release and Waiver by Subcontractor and Product Vendor
- Contractor's Affidavit as to Status of Lien
- Technical Specifications, as listed in the Table of Contents.
- Drawings
- Change Orders which may be delivered or issued after Effective Date of the Agreement and are not attached hereto.

There are no Contract Documents other than those listed in this Section VI. The Contract Documents may only be amended by Change Order as provided in the General Conditions.

### **SECTION XIII** **ASSIGNMENT**

No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

### **SECTION XIV** **NON-APPROPRIATIONS**

Notwithstanding anything in the contract documents to the contrary, any and all payments which the City is required to make under this contract shall be subject to annual appropriation or other availability of funds, as certified by the Director of Finance.

If the City cannot appropriate sufficient funding, then either party has the right to

terminate the contract by providing (10) ten days written notice to the other party.

Furthermore, execution of this contract does not automatically guarantee a renewal of contract upon expiration.

**SECTION XV**  
**MINIMUM INSURANCE REQUIREMENTS**

In accordance with City ordinances, Contractor shall be required to hold the following minimum insurance coverage throughout the duration of this Agreement:

A. Workers Compensation-

In accordance with the State statute

B. Employer's Liability

Bodily Injury by Accident: \$100,000 each accident  
Bodily Injury by Disease: \$100,000 each employee  
\$500,000 policy limits

C. Comprehensive General Liability

Bodily Injury \$250,000 each person  
\$500,000 each occurrence  
Property Damage \$100,000 each occurrence  
\$100,000 aggregate  
-or- \$500,000 combined single limits

D. Comprehensive Auto Liability

Bodily Injury \$250,000 each person  
\$500,000 each occurrence  
Property Damage \$100,000 each occurrence  
\$100,000 each aggregate  
-or- \$500,000 combined single limits

E. City's Protective Liability

Bodily Injury \$250,000 each person  
\$500,000 each occurrence  
Property Damage \$100,000 each occurrence  
\$100,000 each aggregate  
-or- \$500,000 combined single limits

Evidence of the above insurance coverage shall be required prior to final execution of the agreement. The City shall be listed as an additional insured.

Contractor warrants that it is adequately insured and carries liability, workers compensation, and automobile insurance for injury to its employees and others incurring loss or injury as a result of the acts of Contractor or its employees.

Contractor shall not commence work under this agreement until all insurance requirements have been obtained and proof of such insurance shall have been provided to the City, nor shall Contractor allow any Sub-Contractor to commence work until all insurance as noted above has been so obtained and provided to the City. Approval of the insurance by City shall not relieve or decrease the liability of the Contractor.

#### **SECTION XVI** **TERMINATION OF CONTRACT**

Either party to this agreement shall have the right to terminate this contract at any time after thirty (30) days' written notice.

#### **SECTION XVII** **SEVERABILITY**

If any term or provision of this Agreement is held by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions of this Agreement shall remain in full force and effect and shall in no way be affected, impaired or invalidated.

#### **SECTION XVIII** **ALTERNATE DISPUTE RESOLUTION/NEUTRAL PARTY**

- A. Any controversy, claim or dispute between the parties arising out of or relating to the provisions of this Agreement or the breach, termination or validity thereof shall, upon written request of either party, immediately be referred jointly for resolution of the controversy by non-binding mediation.
- B. The mediation must be concluded within any period mutually agreed upon by the parties but in no event no later than within forty-five (45) days after written notice is given by either party of its intent to proceed to mediation. Unless the parties expressly agree otherwise, each party shall bear its own costs, legal and expert fees incurred in the mediation, and evenly share the costs of the mediator. If, after proceeding in good faith the parties, with the assistance of a neutral mediator, do not resolve the dispute within the forty-five (45) day period, the parties may proceed in accordance with paragraph (C) below.

C. After exhausting the procedures set forth above, either party may initiate litigation to resolve the dispute. The Law of the State of Texas shall control the matter in controversy. Venue is mandatory in Hidalgo County, Texas.

**SECTION IXX**  
**NOTICE**

All notices or other communications required under this Agreement may be affected either by personal delivery in writing or by Certified Mail, Return Receipt Requested. Notice shall be deemed to have been given when delivered or mailed to the parties at their respective addresses as set for the below or when mailed to the last address provided in writing to the other party by the addressee.

**SECTION XX**  
**HOLD HARMLESS CLAUSE**

Contractor hereby agrees to indemnify and hold harmless and defend Lessor, its agents, employees, and officers from and against any claim, loss, damage, liability, and expense, including reasonable attorney's fees, incurred or suffered by it, by reason of any and all claims, demands, or causes of action asserted or that may be asserted, against any or all of the above named parties, whether alleging intentional or negligent acts or omissions, and whether seeking compensatory or punitive damages, and involving, arising out of, or in any manner relating to this Contract.

**SECTION XXI**  
**MISCELLANEOUS**

Any changes to this document must be approved by City and signed by both parties to the agreement.

EXECUTED by the parties in triplicate originals on this \_\_\_\_\_ day of \_\_\_\_\_, 2013.

**CITY OF EDINBURG:**

BY: \_\_\_\_\_  
Ramiro Garza Jr., City Manager  
415 W. University Dr.  
Edinburg, Texas 78540  
Phone: (956) 388-8207  
Fax: (956) 383-7111

**ATTEST:**

BY: \_\_\_\_\_  
Myra L. Ayala Garza, City Secretary

**APPROVED AS TO FORM:  
PALACIOS & ASSOCIATES, P.C.**

By: \_\_\_\_\_  
City Attorney

BY: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**ATTACHMENTS:** Exhibit A: Scope of Work  
Exhibit B: Certificates of Insurance

**Exhibit A: Scope of Work**

**Please Refer to Section C Bid Proposal Form**

**Exhibit B: Certificates of Insurance**

PERFORMANCE BOND

STATUTORY PERFORMANCE BOND PURSUANT TO ARTICLE 2253  
OF THE TEXAS LOCAL GOVERNMENT CODE AS AMENDED BY ACTS OF THE 1993, 73<sup>RD</sup>  
LEGISLATURE, CH. 268, § 1, EFF. SEPT. 1, 1993

\*\*\*\*\*

KNOW ALL MEN BY THESE PRESENTS, THAT \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Principal(s), as Principal(s), and \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Surety(s), as Surety(s), are held and firmly bound unto \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Obligee), in the amount of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_ )

for the payment whereof the said Principal and Surety bind themselves, and their heirs,  
administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated the

\_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, for the \_\_\_\_\_  
\_\_\_\_\_

**PERFORMANCE BOND Continued:**

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform the work in accordance with plans, specifications and contract documents, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Performance Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73rd Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, , and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_.

\_\_\_\_\_  
Principal

**ATTEST:**

\_\_\_\_\_  
(Principal) Secretary  
(SEAL)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

**ATTEST:**

\_\_\_\_\_  
Surety

\_\_\_\_\_  
(Surety) Secretary  
(SEAL)

\_\_\_\_\_  
Attorney-in-Fact (Signature)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

NOTE: Date of Bond must not be prior to date of Contract

- (1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

PAYMENT BOND

STATUTORY PAYMENT BOND PURSUANT TO ARTICLE 2253  
OF THE TEXAS LOCAL GOVERNMENT CODE AS AMENDED BY ACTS OF THE 1993, 73<sup>RD</sup>  
LEGISLATURE, CH. 268, § 1, EFF. SEPT. 1, 1993

\*\*\*\*\*

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Principal(s), as Principal(s), and \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Surety(s), as Surety(s), are held and firmly bond unto \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(hereinafter called the Oblige), in the amount of \_\_\_\_\_

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

for the payment whereof, the said Principal and Surety bind themselves, and their heirs,  
administrators, executors, successors and assigns, jointly severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Oblige,  
dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, to

**PAYMENT BOND Continued:**

which contract is hereby referred to and made a part hereof as fully and to the same extent as if copies at length herein.

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

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Statutory Payment Bond Pursuant To Article 2253 of the Texas Local Government Code as Amended by Acts of the 1993, 73rd Legislature, Ch. 268, § 1, Eff. Sept. 1, 1993, , and all liabilities on this bond shall be determined in accordance with the provisions of said Article to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, this instrument is executed in four counterparts, each one of which shall be deemed an original, this the \_\_\_\_\_ day of \_\_\_\_\_ A.D., 20\_\_\_\_\_.

\_\_\_\_\_  
Principal

**ATTEST:**

\_\_\_\_\_  
(Principal) Secretary  
(SEAL)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

**ATTEST:** \_\_\_\_\_

\_\_\_\_\_  
Surety

\_\_\_\_\_  
(Surety) Secretary  
(SEAL)

\_\_\_\_\_  
Attorney-in-Fact (Signature)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
(Print/Type Name)

\_\_\_\_\_  
(Address)

\_\_\_\_\_  
(Address)

NOTE: Date of Bond must not be prior to date of Contract  
(1) Correct name of Contractor; (2) A Corporation, a Partnership or an Individual, as case may be; (3) Correct name of Surety; (4) Correct name of Owner; (5) County or Parish and State; (6) Owner; (7) If Contractor is Partnership, all partners should execute bond.

## GENERAL CONDITIONS

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## **ARTICLE 1 – DEFINITIONS :**

Wherever used in these General Conditions or in the other Contract Documents, the following terms have the meanings indicated in this Article 1 which meanings are applicable to both the singular and plural thereof. If a word which is entirely in upper case in these definitions is found in lower case in the Contract Documents, then the lower case word will have its ordinary meaning.

**Addenda** - Written or graphic instruments issued prior to the opening of Bids which make additions, deletions, or revisions to the Contract Documents.

**Agreement** -The written contract between the OWNER and the CONTRACTOR covering the WORK to be performed; other documents are attached to the Agreement and made a part thereof as provided therein.

**Application for Payment** - The form accepted by the ENGINEER which is to be used by the CONTRACTOR to request progress payments or final payment and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

**Asbestos** -Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

**Bid** -The offer or proposal of the Bidder submitted on the prescribed form setting forth the price or prices for the WORK.

**Bonds** - Bid, Performance, and Payment Bonds and other instruments of security.

**Change Order** -A document recommended by the ENGINEER, which is signed by the CONTRACTOR and the OWNER, and authorizes an addition, deletion, or revision in the WORK, or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

**Clarification** -A document issued by the ENGINEER to the CONTRACTOR that interprets the requirement(s) and/or design intent of the Contract Documents, which may not represent an addition, deletion, or revision in the WORK or an adjustment in the Contract Price or the Contract Times.

**Contract Documents**- The Notice Inviting Bids, Instructions to Bidders, Bid Forms (including the Bid, Bid Schedule(s), Information Required of Bidder, Bid Bond, and all required certificates, affidavits and other documentation), Agreement, Performance Bond, Payment Bond, General Conditions, Supplementary General Conditions, Technical Specifications, Drawings, all Addenda, and Change Orders executed pursuant to the provisions of the Contract Documents. Shop Drawings are not Contract Documents.

**Contract Price**- The total monies payable by the OWNER to the CONTRACTOR under the terms and conditions of the Contract Documents.

**Contract Times** - The number or numbers of successive calendar days or dates stated in the Contract Documents for the completion of the WORK.

**CONTRACTOR** -The individual, partnership, corporation, joint-venture, or other legal entity with whom the OWNER has executed the Agreement.

**Day**- A calendar day of 24 hours measured from midnight to the next midnight.

**Defective Work** - Work that is unsatisfactory, faulty, or deficient; or that does not conform to the Contract Documents; or that does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents; or work that has been damaged prior to the ENGINEER's recommendation of final payment.

**Drawings** -The drawings, plans, maps, profiles, diagrams, and other graphic representations which indicate the character, location, nature, extent, and scope of the WORK and which have been prepared by the ENGINEER and are included and/or referred to in the Contract Documents. Shop Drawings are not Drawings as so defined.

**Effective Date of the Agreement** - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

**ENGINEER** - The individual, partnership, corporation, joint-venture, or other legal entity named as such by the OWNER as set forth in the Supplementary General Conditions.

**Field Order** -A written order issued by the ENGINEER which may or may not involve a change in the WORK.

**General Requirements** - Division 1 of the Technical Specifications.

**Hazardous Waste** - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

**Laws and Regulations; Laws or Regulations** -Any and all applicable laws, rules, regulations, ordinances, codes, and/or orders of any and all governmental bodies, agencies, authorities and courts having jurisdiction.

**Lien or Mechanic's Lien** - A form of security, an interest in real property, which is held to secure the payment of an obligation. When related to public works construction, Lien or Mechanic's Lien may be called Stop Notice.

**Milestone** - A principal event specified in the Contract Documents relating to an intermediate completion date of a separately identifiable part of the WORK or a period of time within which the separately identifiable part of the WORK should be performed prior to Substantial Completion of all the WORK.

**Notice of Award** -The written notice by the OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein within the time specified, the OWNER will enter into an Agreement.

**Notice of Completion** - A form signed by the ENGINEER and the CONTRACTOR recommending to the OWNER that the WORK is Substantially Complete and fixing the date of Substantial Completion. After acceptance of the WORK by the OWNER's governing body,

the form is signed by the OWNER and filed with the County Recorder. This filing starts the 30 day lien filing period on the WORK.

**Notice to Proceed** -The written notice issued by the OWNER to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK and establishing the date of commencement of the Contract Times.

**OWNER** - The public body or authority, corporation, association, firm, or person with whom the CONTRACTOR has entered into the Agreement and for whom the WORK is to be provided.

**Partial Utilization** - Use by the OWNER of a substantially completed part of the WORK for the purpose for which it is intended prior to Substantial Completion of all the WORK.

**PCBs** - Polychlorinated biphenyls.

**Petroleum** - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Wastes and crude oils.

**Project** -The total construction project of which the WORK to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

**Radioactive Material** - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

**Resident Project Representative** - The authorized representative of the ENGINEER who is assigned to the Site or any part thereof.

**Samples** -Physical examples of materials, equipment, or workmanship that are representative of some portion of the WORK and which establish the standards by which such portion of the WORK will be judged.

**Shop Drawings** - All drawings, diagrams, illustrations, schedules, and other data which are specifically prepared by or for the CONTRACTOR and submitted by the CONTRACTOR to illustrate some portion of WORK.

**Site** - Lands or other areas designated in the Contract Documents as being furnished by the OWNER for the performance of the construction, storage, or access.

**Specifications** - (Same definition as for Technical Specifications hereinafter).

**Stop Notice** - A legal remedy for subcontractors and suppliers who contribute to public works, but who are not paid for their work, which secures payment from construction funds possessed by the OWNER. In some states, for public property, the Stop Notice remedy is designed to substitute for a mechanic's lien.

**Subcontractor** -An individual, partnership, corporation, joint-venture, or other legal entity having a direct contract with the CONTRACTOR or with any other Subcontractor for the performance of a part of the WORK at the Site.

**Substantial Completion** - The time at which the WORK (or specified part) has progressed to the point where it is sufficiently complete, in accordance with the Contract Documents, as evidenced by Notice of Completion (or Notice of Partial Utilization) so that the WORK (or specified part) can be utilized for the purposes for which it is intended; or, if no such notice is issued, when final payment is due in accordance with Paragraph 14.8. The terms "substantially complete" and "substantially completed" as applied to any work refer to substantial completion thereof.

**Supplementary General Conditions** -The part of the Contract Documents which make additions, deletions, or revisions to these General Conditions.

**Supplier** - A manufacturer, fabricator, distributor, material man, or vendor having a direct contract with the CONTRACTOR or with any Subcontractor to furnish materials, equipment, or product to be incorporated in the WORK by the CONTRACTOR or any Subcontractor.

**Technical Specifications** - Divisions 1 through 17 of the Contract Documents consisting of the General Requirements and written technical descriptions of products and execution of the WORK.

**Utilities** - All pipelines, conduits, ducts, cables, wires, tracks, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities which have been installed underground or above the ground to furnish any of the following services or materials: water, sewage, sludge, drainage, fluids, electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, traffic control, or other control systems.

**WORK** -The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. WORK is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

## **ARTICLE 2 -- PRELIMINARY MATTERS :**

### **2.1 DELIVERY OF BONDS AND INSURANCE CERTIFICATES:**

- A. When the CONTRACTOR delivers the signed Agreement to the OWNER, the CONTRACTOR shall also deliver to the OWNER such Bonds and insurance policies and certificates as the CONTRACTOR may be required to furnish in accordance with the Contract Documents.

### **2.2 COPIES OF DOCUMENTS:**

- A. The OWNER will furnish to the CONTRACTOR the required number of copies of the contract Documents specified in the Supplementary General Conditions.

### 2.3 COMMENCEMENT OF CONTRACT TIMES; NOTICE TO PROCEED:

- A. The Contract Times will start to run on the commencement date stated in the Notice to Proceed.

### 2.4 STARTING THE WORK:

- A. The CONTRACTOR shall begin to perform the WORK on the commencement date stated in the Notice to Proceed, but no work shall be done at the Site prior to said commencement date.
- B. Before undertaking each part of the WORK, the CONTRACTOR shall review the Contract Documents in accordance with Paragraph 3.3.

### 2.5 PRECONSTRUCTION CONFERENCE:

- A. The CONTRACTOR is required to attend a preconstruction conference. This conference will be attended by the OWNER, ENGINEER, and others as appropriate in order to discuss the WORK in accordance with the applicable procedures specified.
- B. The CONTRACTOR's initial schedule submittals for shop drawings, obtaining permits, and Plan of Operation and Schedule will be reviewed and finalized. As a minimum, the CONTRACTOR's representatives should include its project manager and schedule expert. The CONTRACTOR should plan on this meeting taking no less than 3 hours. If the submittals are not finalized at the end of the meeting, additional meetings will be held so that the submittals can be finalized prior to the submittal of the first Application for Payment. No Application for Payment will be processed prior to receiving acceptable initial submittals from the CONTRACTOR.

## **ARTICLE 3 -- INTENT AND USE OF CONTRACT DOCUMENTS :**

### 3.1 INTENT:

- A. The Contract Documents comprise the entire agreement between the OWNER and the CONTRACTOR concerning the WORK. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the State in which the Project is located.
- B. It is the intent of the Contract Documents to describe the WORK, functionally complete, to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not called for specifically.
- C. When words or phrases which have a well-known technical or construction industry or trade meaning are used to describe work, materials, or equipment such words or phrases shall be interpreted in accordance with that meaning unless a definition has been provided in Article 1 of the General Conditions.

### 3.2 REFERENCE TO STANDARDS:

- A. Reference to standard specifications, manuals, or codes of any technical society, organization, or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code shall be effective to change the duties and responsibilities of the OWNER, the CONTRACTOR, the ENGINEER, or any of their consultants, agents, or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to OWNER, ENGINEER, or any of ENGINEER's consultants, agents, or employees any duty or authority to direct the performance of the WORK or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

### 3.3 REVIEW OF CONTRACT DOCUMENTS:

- A. If, during the performance of the WORK, CONTRACTOR discovers any conflict, error, ambiguity or discrepancy within the Contract Documents or between the Contract Documents and any provision of any such Law or Regulation applicable to the performance of the WORK or of any such standard, specification, manual, or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once, and CONTRACTOR shall not proceed with the work affected thereby (except in an emergency as authorized by Paragraph 6.12) until a Clarification, Field Order, or Change Order to the Contract Documents has been issued.

### 3.4 ORDER OF PRECEDENCE OF CONTRACT DOCUMENTS:

- A. In resolving conflicts resulting from errors or discrepancies in any of the Contract Documents, the order of precedence shall be as follows:
  - 1. Permits from other agencies as may be required by law
  - 2. Change Orders
  - 3. Agreement
  - 4. Addenda
  - 5. Contractor's Bid (Bid Form)
  - 6. Special Provisions
  - 7. Notice to Bids
  - 8. Instructions to Bidders
  - 9. Supplementary General Conditions
  - 10. General Conditions
  - 11. Technical Specifications
  - 12. Referenced Standard Specifications
  - 13. Drawings
- B. With reference to the Drawings the order of precedence is as follows:
  - 1. Figures govern over scaled dimensions
  - 2. Detail drawings govern over general drawings

3. Addenda/Change Order drawings govern over any other drawings
4. Drawings govern over standard drawings

### 3.5 AMENDING CONTRACT DOCUMENTS:

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the WORK or to modify the terms and conditions thereof by a Change Order (pursuant to Article 10).

### 3.6 REUSE OF DOCUMENTS:

- A. Neither the CONTRACTOR, nor any Subcontractor or Supplier, nor any other person or organization performing any of the WORK under a contract with the OWNER shall have or acquire any title to or ownership rights in any of the Drawings, Technical Specifications, or other documents used on the WORK, and they shall not reuse any of them on the extensions of the Project or any other project without written consent of OWNER.

## **ARTICLE 4 -- SITE OF THE WORK :**

### 4.1 AVAILABILITY OF LANDS:

- A. The OWNER will furnish, as indicated in the Contract Documents, the lands upon which the WORK is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of the CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the OWNER, unless otherwise provided in the Contract Documents. Nothing contained in the Contract Documents shall be interpreted as giving the CONTRACTOR exclusive occupancy of the lands or rights-of-way provided. The CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment; provided, that the CONTRACTOR shall not enter upon nor use any property not under the control of the OWNER until a written temporary construction easement agreement has been executed by the CONTRACTOR and the property owner, and a copy of said easement furnished to the ENGINEER prior to said use; and, neither the OWNER nor the ENGINEER will be liable for any claims or damages resulting from the CONTRACTOR's trespass on or use of any such properties. The CONTRACTOR shall provide the OWNER with a signed release from the property owner confirming that the lands have been satisfactorily restored upon completion of the WORK.

### 4.2 REPORTS OF PHYSICAL CONDITIONS:

- A. Subsurface Explorations: Reference is made to the Supplementary General conditions for identification of those reports of explorations and tests of subsurface conditions at the Site that have been utilized by the ENGINEER in the preparation of the Contract Documents.
- B. Existing Structures: Reference is made to the Supplementary General Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except underground Utilities referred to in Paragraph 4.3

herein) which are at or contiguous to the Site that have been utilized in the preparation of the Contract Documents.

- C. Neither the OWNER nor ENGINEER makes any representation as to the completeness of the reports or drawings referred to in Paragraph 4.2 A or B above or the accuracy of any data or information contained therein. The CONTRACTOR may rely upon the accuracy of the technical data contained in such reports and drawings. However, the CONTRACTOR may not rely upon any interpretation of such technical data, including any interpolation or extrapolation thereof, or any non-technical data, interpretations, and opinions contained therein.

#### 4.3 PHYSICAL CONDITIONS - UNDERGROUND UTILITIES:

- A. Indicated: The information and data indicated in the Contract Documents with respect to existing underground Utilities at or contiguous to the Site are based on information and data furnished to the OWNER or the ENGINEER by the owners of such underground Utilities or by others. Unless it is expressly provided in the Supplementary General Conditions and/or Section 01011 – Site Conditions, the OWNER and the ENGINEER will not be responsible for the accuracy or completeness of any such information or data, and the CONTRACTOR shall have full responsibility for reviewing and checking all such information and data, for locating all underground Utilities indicated in the Contract Documents, for coordination of the WORK with the owners of such underground Utilities during construction, for the safety and protection thereof and repairing any damage thereto resulting from the WORK, the cost of all of which are deemed to have been included in the Contract Price.
- B. Not Indicated: If an underground Utility is uncovered or revealed at or contiguous to the Site which was not indicated in the Contract Documents and which the CONTRACTOR could not reasonably have been expected to be aware of, the CONTRACTOR shall identify the owner of such underground Utility and give written notice thereof to that owner and shall notify the ENGINEER in accordance with the requirements of the Supplementary General Conditions and Section 01011 – Site Conditions.

#### 4.4 DIFFERING SITE CONDITIONS:

- A. The CONTRACTOR shall notify the ENGINEER, in writing, of the following unforeseen conditions, hereinafter called differing Site conditions, promptly upon their discovery (but in no event later than 14 days after their discovery) and before they are disturbed:
  1. Subsurface or latent physical conditions at the Site of the WORK differing materially from those indicated, described, or delineated in the Contract Documents, including those reports discussed in Paragraph 4.2, 4.3, and 4.5; and
  2. Unknown physical conditions at the Site of the WORK of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents, including those reports and documents discussed in Paragraph 4.2, 4.3, and 4.5.

- B. The ENGINEER will review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto, and advise the OWNER, in writing, of the ENGINEER's findings and conclusions.
- C. If the OWNER concludes that because of newly discovered conditions a change in the Contract Documents is required; a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the difference.
- D. In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Times, or any combination thereof, will be allowable to the extent that they are attributable to any such difference. If the OWNER and the CONTRACTOR are unable to agree as to the amount or length thereof, a claim may be made therefore as provided in Articles 11 and 12.
- E. The CONTRACTOR's failure to give notice of differing Site conditions within 14 days of their discovery and before they are disturbed shall constitute a waiver of all claims in connection therewith, whether direct or consequential in nature.

#### 4.5 HAZARDOUS MATERIALS:

- A. Reference is made to the Supplementary General Conditions for identification of those reports and drawings relating to Asbestos, Hazardous Waste, PCBs, Petroleum and/or Radioactive Material identified at the Site that have been utilized by the ENGINEER in the preparation of the Contract Documents.
- B. OWNER shall be responsible for any Asbestos, Hazardous Waste, PCBs, Petroleum, or Radioactive Material uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the WORK and which may present a substantial danger to persons or property exposed thereto in connection with the WORK at the Site. OWNER will not be responsible for any such material brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.
  1. Upon discovery of any Asbestos, Hazardous Waste, PCBs, Petroleum, or Radioactive Material, the CONTRACTOR shall immediately stop all work in any area affected thereby (except in an emergency as required by Paragraph 6.12) and notify OWNER and ENGINEER (and thereafter confirm such notice in writing). CONTRACTOR shall not be required to resume any work in any such affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR special written notice. Such written notice will specify that such condition and any affected area is or has been rendered safe for the resumption of the work or specify any special conditions under which the work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of adjustment, if any, in Contract Price or Contract Times as a result of such work stoppage or such special conditions under which work is agreed by CONTRACTOR to be resumed, either party may make a claim therefore as provided in Articles 11 and 12.
  2. If, after receipt of such special written notice, CONTRACTOR does not agree to resume such WORK based on a reasonable belief it is unsafe, or does not agree to resume such WORK under special conditions, then OWNER may order such portion

of the WORK that is in connection with such hazardous condition or in such affected area to be deleted from the WORK. If OWNER and CONTRACTOR cannot agree as to entitlement to or the amount or extent of an adjustment, if any, in Contract Price or Contract Times as a result of deleting such portion of the WORK then either party may make a claim therefore as provided in Articles 11 and 12. OWNER may have such deleted portion of the WORK performed by OWNER's own forces or others in accordance with Article 7.

- C. To the fullest extent permitted by Laws and Regulations, OWNER will indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's consultants, and the officers, directors, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages arising out of or resulting from such hazardous condition; provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the WORK itself), including the loss of use resulting there from. Nothing in this Paragraph shall obligate OWNER to indemnify a person or entity from and against the consequences of that person's or entity's own negligence.
- D. The provisions of Paragraphs 4.2, 4.3, and 4.4 are not intended to apply to Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material uncovered or revealed at the Site.

#### 4.6 REFERENCE POINTS:

- A. The OWNER will provide one bench mark, near or on the Site of the WORK, and will provide two points near or on the Site to establish a base line for use by the CONTRACTOR for alignment control. Unless otherwise specified in the Supplementary General Conditions, the CONTRACTOR shall furnish all other lines, grades, and bench marks required for proper execution of the WORK.
- B. The CONTRACTOR shall preserve all bench marks, stakes, and other survey marks, and in case of their removal or destruction by any party, the CONTRACTOR shall be responsible for the accurate replacement of such reference points by personnel qualified under the applicable state codes governing land surveyors.

### **ARTICLE 5 -- BONDS AND INSURANCE :**

#### 5.1 BONDS:

- A. The CONTRACTOR shall furnish Performance and Payment Bonds, each in the amount set forth in the Supplementary General Conditions, as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date of Substantial Completion, except as otherwise provided by Law or Regulation or by the Contract Documents. The CONTRACTOR shall also furnish such other Bonds as are required by the Supplementary General Conditions.
- B. All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as

are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff, Bureau of Government Financial Operations, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

- C. If the surety on any Bond furnished by the CONTRACTOR is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the WORK is located, the CONTRACTOR shall within 7 days thereafter substitute another Bond and surety, which must be acceptable to the OWNER.
- D. All Bonds required by the Contract Documents to be purchased and maintained by CONTRACTOR shall be obtained from surety companies that are duly licensed or authorized in the State in which the Project is located to issue Bonds for the limits so required. Such surety companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.

## 5.2 INSURANCE:

- A. The CONTRACTOR shall purchase and maintain the insurance required under this Paragraph. Such insurance shall include the specific coverage's set out herein and be written for not less than the limits of liability and coverage's provided in the Supplementary General Conditions, or required by Laws or Regulations, whichever are greater. All insurance shall be maintained continuously during the life of the Agreement up to the date of Substantial Completion and at all times thereafter when the CONTRACTOR may be correcting, removing, or replacing Defective Work in accordance with Paragraph 13.5. The CONTRACTOR's liabilities under this Agreement shall not be deemed limited in any way to the insurance coverage required.
- B. All insurance required by the Contract Documents to be purchased and maintained by the CONTRACTOR shall be obtained from insurance companies that are duly licensed or authorized to issue insurance policies for the limits and coverage's so required in the State in which the Project is located. Such insurance companies shall have a current Best's Rating of at least an "A" (Excellent) general policy holder's rating and a Class VII financial size category and shall also meet such additional requirements and qualifications as may be provided in the Supplementary General Conditions.
- C. The CONTRACTOR shall furnish the OWNER, with copies to each additional insured who is indicated in the Supplementary General Conditions, with certificates and original endorsements showing the type, amount, class of operations covered, effective dates and dates of expiration of policies. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, reduced in coverage, or renewal refused until at least 30 days' prior written notice has been given to the OWNER and additional insured by certified mail. All such insurance required herein (except for worker's compensation and employer's liability) shall name the OWNER, the ENGINEER, and their consultants and subconsultants and their officers, directors, agents, and employees as "additional insured" under the policies. The CONTRACTOR shall purchase and maintain the following insurance:

1. **Workers' Compensation and Employer's Liability:** This insurance shall protect the CONTRACTOR against all claims under applicable workers' compensation laws or federal acts, including claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This insurance shall include an "all states" endorsement. In the event of a "monopolistic" state, CONTRACTOR shall certify all employees are covered by the state fund or shall provide a separate policy providing "all states" benefits. Employer's liability "stop gap" coverage for monopolistic states shall be provided under either a worker's compensation policy or general liability policy. The CONTRACTOR shall require each subcontractor similarly to provide workers' compensation insurance for all of the latter's employees to be engaged in such work unless such employees are covered by the protection afforded by the CONTRACTOR's workers' compensation insurance. In case any class of employees is not protected under the workers' compensation laws, the CONTRACTOR shall provide and shall cause each Subcontractor to provide adequate employer's liability insurance for the protection of such of its employees as are not otherwise protected. The CONTRACTOR and each Subcontractor shall provide a waiver of subrogation in favor of the OWNER and ENGINEER.
2. **Comprehensive or Commercial General Liability:** This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims arising from injuries to persons other than its employees or damage to property of the OWNER or others arising out of any act or omission of the CONTRACTOR or its agents, employees, or subcontractors. The policy shall also include protection against claims insured by personal injury liability coverage and contractual coverage to insure the contractual liability assumed by the CONTRACTOR under the indemnification provisions in the General Conditions. To the extent that the CONTRACTOR's work, or work under its direction, may require blasting, explosive conditions, or underground operations, the comprehensive or commercial general liability coverage shall specifically include coverage relative to blasting, explosion, collapse, and/or underground hazards.
3. **Commercial Automobile Liability:** This insurance shall be written in comprehensive form and shall protect the CONTRACTOR against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, and shall cover operation on or off the Site of all motor vehicles licensed for highway use, whether they are owned, no owned, or hired.
4. **Subcontractor's Public Liability and Property Damage Insurance and Vehicle Liability Insurance:** The CONTRACTOR shall either require each of the Subcontractors to procure and to maintain subcontractor's public liability and property damage insurance and vehicle liability insurance of the type and in the same amounts specified in the Supplementary General Conditions for the CONTRACTOR or insure the activities of the Subcontractors under the CONTRACTOR's own policies.
5. **Builder's Risk:**
  - a. This insurance shall be of the "all risks" type, shall be written in completed value form, and shall protect the CONTRACTOR, Subcontractors, the OWNER, and the ENGINEER, against risks of damage to buildings, structures, and materials and equipment (including any stored off-site and while in transit), CONTRACTOR'S equipment, debris removal and including demolition and contingent loss

occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for ENGINEER'S services and expenses required as a result of such insured loss. The amount of such insurance shall be not less than the insurable value of the WORK at completion plus equipment. Builder's risk insurance shall provide for losses to be payable to the CONTRACTOR and the OWNER, as their interests may appear. This insurance shall contain a provision that in the event of payment for any loss under the coverage provided, the insurance company shall have no rights of recovery against the CONTRACTOR, the OWNER, and the ENGINEER. This insurance shall insure against all risks of loss (including earthquake, flood and collapse) and, at the option of the OWNER, shall include comprehensive boiler and machinery coverage including coverage for installation and testing.

- b. If the OWNER finds it necessary to occupy or use a portion or portions of the Project prior to Substantial Completion thereof, such occupancy shall not commence prior to the time mutually agreed to by the OWNER and CONTRACTOR and to which the insurance company or companies providing the Builder's Risk Insurance have consented by endorsement to the policy or policies.

## **ARTICLE 6 -- CONTRACTOR'S RESPONSIBILITIES :**

### **6.1 COMMUNICATIONS:**

- A. Written communications with the OWNER shall be only through or as directed by the ENGINEER.

### **6.2 SUPERVISION AND SUPERINTENDENCE:**

- A. The CONTRACTOR shall supervise, inspect, and direct the WORK competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the WORK in accordance with the Contract Documents. The CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction and all safety precautions and programs incidental thereto. The CONTRACTOR shall be responsible to see that the completed WORK complies accurately with the Contract Documents.
- B. The CONTRACTOR shall designate in writing and keep on the Site at all times during the performance of the WORK a technically qualified, English-speaking superintendent, who is an employee of the CONTRACTOR and who shall not be replaced without written notice to the OWNER and the ENGINEER. The superintendent will be the CONTRACTOR's representative at the Site and shall have authority to act on behalf of the CONTRACTOR. All communications given to the superintendent shall be as binding as if given to the CONTRACTOR.
- C. The CONTRACTOR's superintendent shall be present at the Site at all times while work is in progress and shall be available by phone for emergencies 24 hours per day, 7 days per week. Failure to observe this requirement shall be considered suspension of the WORK by the CONTRACTOR until such time as such superintendent is again present at the Site.

### 6.3 LABOR, MATERIALS, AND EQUIPMENT:

- A. The CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the WORK and perform construction as required by the Contract Documents. The CONTRACTOR shall furnish, erect, maintain, and remove the construction plant and any required temporary works. The CONTRACTOR shall at all times maintain good discipline and order at the Site. Except in connection with the safety or protection of persons or the WORK or property at the Site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all work at the Site shall be performed during regular working hours, and the CONTRACTOR will not permit overtime work or the performance of work on Saturday, Sunday, any City of Edinburg observed holiday, or any federally observed holiday without the OWNER's written consent. The CONTRACTOR shall apply for this consent through the ENGINEER in writing a minimum of 48 hours in advance.
- B. Except as otherwise provided in this Paragraph, the CONTRACTOR shall receive no additional compensation for overtime work, i.e., work in excess of 8 hours in any one calendar day or 40 hours in any one calendar week, even though such overtime work may be required under emergency conditions and may be ordered by the ENGINEER in writing.
- C. All increased costs of inspection and testing performed during overtime work by the CONTRACTOR which is allowed solely for the convenience of the CONTRACTOR shall be borne by the CONTRACTOR. The OWNER has the authority to deduct the cost of all such inspection and testing from any partial payments otherwise due to the CONTRACTOR.
- D. Unless otherwise specified in the Contract Documents, the CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, lubricants, power, light, heat, telephone, water, sanitary facilities, and all other facilities, consumables, and incidentals necessary for the furnishing, performance, testing, start-up, and completion of the WORK.
- E. All materials and equipment incorporated into the WORK shall be of specified quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of the OWNER. If required by the ENGINEER, the CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provisions of any such instructions will be effective to assign to the OWNER, ENGINEER, or any of their consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the WORK or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 C.

### 6.4 SCHEDULE:

- A. The CONTRACTOR shall comply with the schedule requirements in the General Requirements.

6.5 SUBSTITUTES OR "OR EQUAL" ITEMS:

- A. The CONTRACTOR shall submit proposed substitutes or "or equal" items in accordance with the provisions set forth in the Supplemental General Provisions SGC-6.5.

6.6 CONCERNING SUBCONTRACTORS, SUPPLIERS, AND OTHERS:

- A. The CONTRACTOR shall be responsible to the OWNER and the ENGINEER for the acts and omissions of its Subcontractors, Suppliers, and their employees to the same extent as CONTRACTOR is responsible for the acts and omissions of its own employees. Nothing contained in this Paragraph shall create any contractual relationship between any Subcontractor and the OWNER or the ENGINEER nor relieve the CONTRACTOR of any liability or obligation under the Contract Documents. The CONTRACTOR shall include these General Conditions and the Supplementary General Conditions as a part of all its subcontract and supply agreements.

6.7 PERMITS:

- A. Unless otherwise provided in the Supplementary General Conditions, the CONTRACTOR shall obtain and pay for all construction permits and licenses from the agencies having jurisdiction, including the furnishing of insurance and bonds if required by such agencies. The enforcement of such requirements shall not be made the basis for claims for additional compensation by CONTRACTOR. When necessary, the OWNER will assist the CONTRACTOR, in obtaining such permits and licenses. The CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the WORK, which are applicable at the time of opening of Bids. The CONTRACTOR shall pay all charges of utility owners for inspection or connections to the WORK.

6.8 PATENT FEES AND ROYALTIES:

- A. The CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the WORK or the incorporation in the WORK of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the WORK and if to the actual knowledge of the OWNER or the ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed by the OWNER in the Contract Documents. The CONTRACTOR's indemnification obligation under this Paragraph 6.7 A. for all claims and liabilities arising out of any infringement of patent rights or copyrights incident to the use in the performance of the WORK or resulting from the incorporation in the WORK of any invention, design, process, product, or device not specified in the Contract Documents shall be in accordance with Paragraph 6.16 of these General Conditions.

6.9 LAWS AND REGULATIONS:

- A. The CONTRACTOR shall observe and comply with all Laws and Regulations which in any manner affect those engaged or employed on the WORK, the materials used in the WORK, or the conduct of the WORK. If any discrepancy or inconsistency should be discovered between the Contract Documents and any such Laws or Regulations, the CONTRACTOR shall report the same in writing to the ENGINEER. Any particular Law or Regulation specified or referred to elsewhere in the Contract Documents shall not in any way limit the obligation of the CONTRACTOR to comply with all other provisions of federal, state, and local laws and regulations. The CONTRACTOR's indemnification obligations for all claims or liability arising from violation of any such law, ordinance, code, order, or regulation, whether by CONTRACTOR or by its employees, Subcontractors or Suppliers shall be in accordance with Paragraph 6.17 of these General Conditions.

6.10 TAXES:

- A. The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by the CONTRACTOR in accordance with the laws and regulations of the place of the Project which are applicable during the performance of the WORK.

6.11 USE OF PREMISES:

- A. The CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site, the land and areas identified in and permitted by the Contract Documents, and the other land and areas permitted by Laws and Regulations, rights-of-way, permits, and easements. The CONTRACTOR shall assume full liability and responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the WORK. Should any claim be made against the OWNER or the ENGINEER by any such owner or occupant because of the performance of the WORK, the CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim through litigation at the CONTRACTOR's sole liability expense. The CONTRACTOR's indemnification obligations for all claims and liability, arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any such owner or occupant against the OWNER, the ENGINEER, their consultants, subconsultants, and the officers, directors, employees and agents of each and any of them to the extent caused by or based upon the CONTRACTOR's performance of the WORK shall be in accordance with Paragraph 6.17 of these General Conditions.

6.12 SAFETY AND PROTECTION:

- A. The CONTRACTOR shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:
  - 1. All persons at the Site and other persons and organizations who may be affected thereby;

2. All the WORK and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
  3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of the performance of the WORK.
- B. The CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property or to the protection of persons or property from damage, injury, or loss and shall erect and maintain all necessary safeguards for such safety and protection. The CONTRACTOR shall notify owners of adjacent property and utilities when prosecution of the WORK may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. CONTRACTOR'S duties and responsibilities for safety and for protection of the WORK shall continue until such time as all the WORK is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with Paragraph 14.7 B. that the WORK is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- C. The CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- D. Materials that contain hazardous substances or mixtures may be required on the WORK. A Material Safety Data Sheet shall be made available at the Site by the CONTRACTOR for every hazardous product used.
- E. Material usage shall strictly conform to OSHA safety requirements and all manufacturer's warnings and application instructions listed on the Material Safety Data Sheet and on the product container label.
- F. The CONTRACTOR shall be responsible for the exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.
- G. The CONTRACTOR shall notify the ENGINEER if it considers a specified product or its intended use to be unsafe. This notification must be given to the ENGINEER prior to the product being ordered, or if provided by some other party, prior to the product being incorporated in the WORK.

#### 6.13 EMERGENCIES:

- A. In emergencies affecting the safety or protection of persons or the WORK or property at the Site or adjacent thereto, CONTRACTOR, without special instruction or authorization from OWNER or ENGINEER, is obligated to immediately act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the WORK or variations from the Contract Documents have been caused thereby. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by

CONTRACTOR in response to such an emergency, a Change Order will be issued to document the consequences of such action.

#### 6.14 SUBMITTALS:

- A. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the CONTRACTOR shall submit to the ENGINEER for review all Shop Drawings.
- B. The ENGINEER'S review will be only to determine if the items covered by the submittals will, after installation or incorporation in the WORK, generally conform to the Contract Documents and with the design concept of the completed Project.
- C. The CONTRACTOR shall also submit to the ENGINEER for review all Samples in accordance with the accepted schedule of Sample submittals.
- D. Before submittal of each Shop Drawing or Sample, the CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the WORK and the Contract Documents. The CONTRACTOR shall provide submittals in accordance with the requirements of Submittal Requirements.

#### 6.15 CONTINUING THE WORK:

- A. The CONTRACTOR shall carry on the WORK and adhere to the progress schedule during all disputes or disagreements with the OWNER. No WORK shall be delayed or postponed pending resolution of any disputes or disagreements, except as the CONTRACTOR and the OWNER may otherwise agree in writing.

#### 6.16 CONTRACTOR'S GENERAL WARRANTY AND GUARANTEE:

- A. CONTRACTOR warrants and guarantees that all WORK will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:
  - 1. Abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, or Suppliers, or any other individual or entity for whom CONTRACTOR is responsible;
  - 2. Normal wear and tear under normal usage.
- B. CONTRACTOR's obligation to perform and complete the WORK in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of WORK that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents:
  - 1. Observations by ENGINEER;

2. Recommendation by ENGINEER or payment by OWNER of any progress or final payment;
3. The issuance of a Certificate of Completion by the OWNER;
4. Use or occupancy of the WORK or any part thereof by the OWNER;
5. Any acceptance by OWNER or any failure to do so;
6. Any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice or acceptability by ENGINEER pursuant to Paragraph 14.7 B.;
7. Any inspection, test, or approval by others; or
8. Any correction of Defective Work by OWNER.

#### 6.17 INDEMNIFICATION:

- A. To the fullest extent permitted by Laws and Regulations, the CONTRACTOR shall indemnify, defend, and hold harmless the OWNER, the ENGINEER, their consultants, subconsultants, and the officers, directors, employees, and agents of each and any of them, against and from all claims and liability arising under, by reason of, related, or incidental to the Contract Documents or any performance of the WORK, but not from the sole negligence or willful misconduct of the OWNER and/or the ENGINEER. Such indemnification by the CONTRACTOR shall include, but not be limited to, the following:
1. Liability or claims resulting directly or indirectly from the negligence or carelessness of the CONTRACTOR, its employees, or agents in the performance of the WORK, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the CONTRACTOR, its employees, or agents;
  2. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the CONTRACTOR's, Subcontractor's, or Supplier's own employees, or agents engaged in the WORK resulting in actions brought by or on behalf of such employees against the OWNER and/or the ENGINEER;
  3. Liability or claims arising directly or indirectly from or based on the violation of any Laws or Regulations, whether by the CONTRACTOR, its employees, or agents;
  4. Liability or claims arising directly or indirectly from the use or manufacture by the CONTRACTOR, its employees, or agents in the performance of this Agreement of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specifically stipulated in this Agreement;
  5. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the OWNER and/or ENGINEER or any other parties by the CONTRACTOR, its employees, or agents;
  6. Liability or claims arising directly or indirectly from the willful misconduct of the CONTRACTOR, its employees, or agents;
  7. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the CONTRACTOR;
  8. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the CONTRACTOR, Subcontractors, Suppliers, or any of their employees or agents, and;
  9. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the OWNER, the ENGINEER, their consultants, subconsultants, and the officers, directors, employees and agents of each or any of them, to the extent caused by the CONTRACTOR's use of any premises acquired

by permits, rights of way, or easements, the Site, or any land or areas contiguous thereto or its performance of the WORK thereon.

- B. The CONTRACTOR shall reimburse the OWNER and the ENGINEER for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs including all costs of appeals) incurred by said OWNER and ENGINEER in enforcing the provisions of this Paragraph 6.17.
- C. The indemnification obligation under this Paragraph 6.17 shall not be limited in any way by any limitation on the amount or type of insurance carried by CONTRACTOR or by the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

#### 6.18 CONTRACTOR'S DAILY REPORTS:

- A. The CONTRACTOR shall complete a daily report indicating location worked, total manpower for each construction trade, major equipment on Site, each Subcontractor's manpower and equipment, weather conditions, and other related information involved in the performance of the WORK. The daily report shall be completed on forms furnished by the ENGINEER, and shall be submitted to the ENGINEER at the conclusion of each workday. The daily report shall comment on the daily progress and status of each major component of the WORK. These components will be decided by the ENGINEER.

### **ARTICLE 7 -- OTHER WORK :**

#### 7.1 RELATED WORK AT SITE:

- A. The OWNER may perform other work related to the Project at the Site by the OWNER's own forces, have other work performed by utility owners, or let other direct contracts for such other work. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the CONTRACTOR prior to starting any such other work.
- B. The CONTRACTOR shall afford each person who is performing the other work (including the OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the WORK with theirs. The CONTRACTOR shall do all cutting, fitting, and patching of the WORK that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. The CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of the ENGINEER and the others whose work will be affected.
- C. If the proper execution or results of any part of the CONTRACTOR's work depends upon such other work by another, the CONTRACTOR shall inspect and report to the ENGINEER in writing any delays, defects, or deficiencies in such other work that render

it unavailable or unsuitable for such proper execution and results. The CONTRACTOR's failure to report such delays, defects, or deficiencies will constitute an acceptance of the other work as fit and proper for integration with the CONTRACTOR's work except for latent or no apparent defects and deficiencies in the other work.

## 7.2 COORDINATION:

- A. If the OWNER contracts with others for the performance of other work at the Site, OWNER will have sole authority and responsibility in respect of such coordination unless otherwise provided in the Supplementary General Conditions.

## **ARTICLE 8 -- OWNER'S RESPONSIBILITIES :**

### 8.1 COMMUNICATIONS:

- A. Except as may be otherwise provided in these General Conditions or the Supplementary General Conditions, the OWNER will issue all its communications to the CONTRACTOR through the ENGINEER.

### 8.2 PAYMENTS:

- A. The OWNER will make payments to the CONTRACTOR as provided in Article 14.

### 8.3 LANDS, EASEMENTS, AND SURVEYS

- A. The OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.1 and 4.6.

### 8.4 REPORTS AND DRAWINGS:

- A. The OWNER will identify and make available to the CONTRACTOR copies of reports of physical conditions at the Site and drawings of existing structures which have been utilized in preparing the Contract Documents as set forth in Paragraph 4.2.

### 8.5 CHANGE ORDERS:

- A. The OWNER will execute Change Orders as indicated in Article 10.

### 8.6 INSPECTIONS AND TESTS:

- A. The OWNER's responsibility for inspections and tests is set forth in Paragraph 13.3.

### 8.7 SUSPENSION OF WORK:

- A. The OWNER's right to stop work or suspend work is set forth in Paragraphs 13.4 and 15.1.

### 8.8 TERMINATION OF AGREEMENT:

- A. The OWNER's right to terminate services of the CONTRACTOR is set forth in Paragraphs 15.2 and 15.3.

8.9 LIMITATION ON OWNER'S RESPONSIBILITIES:

- A. The OWNER shall not supervise, direct or have control or authority over, nor be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the furnishing or performance of the WORK. OWNER will not be responsible for CONTRACTOR's failure to perform or furnish the WORK in accordance with the Contract Documents.

8.10 UNDISCLOSED HAZARDOUS ENVIRONMENTAL CONDITIONS:

- A. OWNER's responsibility in respect to an undisclosed hazardous environmental condition is set forth in Paragraph 4.5.

**ARTICLE 9 -- ENGINEER'S STATUS DURING CONSTRUCTION :**

9.1 OWNER'S REPRESENTATIVE:

- A. The ENGINEER will be the OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of the ENGINEER as the OWNER's representative during construction are set forth in the Contract Documents.

9.2 OBSERVATIONS ON THE SITE:

- A. The ENGINEER will make observations on the Site during construction to monitor the progress and quality of the WORK and to determine, in general, if the WORK is proceeding in accordance with the Contract Documents. The ENGINEER will not be required to make exhaustive or continuous inspections to check the quality or quantity of the WORK.

9.3 PROJECT REPRESENTATION:

- A. The ENGINEER may furnish a Resident Project Representative to assist in observing the performance of the WORK. The duties, responsibilities, and limitations of authority of any such Resident Project Representative will be as provided in the Supplementary General Conditions.

9.4 CLARIFICATIONS:

- A. The ENGINEER will issue with reasonable promptness such written Clarifications of the requirements of the Contract Documents as the ENGINEER may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

9.5 AUTHORIZED VARIATIONS IN WORK:

- A. The ENGINEER may authorize variations in the WORK from the requirements of the Contract Documents. These may be accomplished by a Field Order and will require the CONTRACTOR to perform the WORK involved in a manner that minimizes the impact to the WORK and the Contract Times. If the CONTRACTOR believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Times, the CONTRACTOR may make a claim therefore as provided in Article 11 or 12.

#### 9.6 REJECTING DEFECTIVE WORK:

- A. The ENGINEER will have authority to reject Defective Work and will also have authority to require special inspection or testing of the WORK as provided in Article 13.

#### 9.7 CONTRACTOR SUBMITTALS, CHANGE ORDERS, AND PAYMENTS:

- A. In accordance with the procedures set forth in the General Requirements, the ENGINEER will review all CONTRACTOR submittals.
- B. The ENGINEER's responsibilities for Change Orders are set forth in Articles 10, 11, and 12.
- C. The ENGINEER's responsibilities for Applications for Payment are set forth in Article 14.

#### 9.8 DECISIONS ON DISPUTES:

- A. The ENGINEER will be the initial interpreter of the requirements of the Contract Documents and of the acceptability of the WORK thereunder. Claims, disputes, and other matters relating to the acceptability of the WORK and interpretation of the requirements of the Contract Documents pertaining to the performance of the WORK shall be determined by the ENGINEER. Any claims in respect to changes in the Contract Price or Contract Times shall be resolved in accordance with the requirements set forth in Articles 10, 11, and 12.

#### 9.9 LIMITATION ON ENGINEER'S RESPONSIBILITIES:

- A. Neither the ENGINEER's authority to act under this Article 9 or other provisions of the Contract Documents nor any decision made by the ENGINEER in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the ENGINEER to the CONTRACTOR, any Subcontractor, any Supplier, any surety for any of them, or any other person or organization performing any of the WORK.
- B. Whenever in the Contract Documents the terms "as ordered," "as directed," "as required," "as allowed," "as reviewed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," or "satisfactory," or adjectives of like effect or import are used to describe a requirement, direction, review, or judgment of the ENGINEER as to the WORK, it is intended that such requirement, direction, review, or judgment will be solely to evaluate the WORK for compliance with the requirements of the Contract Documents, and conformance with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents, unless there is a specific statement indicating otherwise. The use of any such term or adjective shall not be effective to assign to the ENGINEER any duty or authority to supervise or direct the performance of the WORK or

any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.9 C.

- C. The ENGINEER will not supervise, direct, control, or have authority over or be responsible for the CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of the CONTRACTOR to comply with Laws and Regulations applicable to the performance of the WORK. The ENGINEER will not be responsible for the CONTRACTOR's failure to perform the WORK in accordance with the Contract Documents. The ENGINEER will not be responsible for the acts or omissions of the CONTRACTOR nor of any Subcontractor, Supplier, or any other person or organization performing any of the WORK.

## **ARTICLE 10-- CHANGES IN THE WORK :**

### 10.1 GENERAL:

- A. Without invalidating the Agreement and without notice to any surety, the OWNER may at any time or from time to time, order additions, deletions, or revisions in the WORK. Such additions, deletions or revisions will be authorized by a Change Order or Field Order. Upon receipt of any such document, CONTRACTOR shall promptly proceed to implement the additions, deletions, or revisions in the WORK in accordance with the applicable conditions of the Contract Documents.
- B. The CONTRACTOR shall not be entitled to an increase in the Contract Price nor an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented by Change Order, except in the case of an emergency and except in the case of uncovering work as provided in Paragraph 13.3.F and G.
- C. The OWNER and the CONTRACTOR shall execute appropriate Change Orders covering:
  - 1. Changes in the WORK which are ordered by the OWNER pursuant to Paragraph 10.1 A.;
  - 2. Changes required because of acceptance of Defective Work under Paragraph 13.6; and
  - 3. Changes in the Contract Price or Contract Times which are agreed to by the parties under Articles 11 and/or 12, respectively.
- D. If notice of any change in the WORK is required to be given to a surety, the giving of any such notice shall be the CONTRACTOR's responsibility. If the change in the WORK affects the Contract Price, the OWNER may require an adjustment to the amount of any applicable Bond and the amount of each applicable Bond shall be adjusted accordingly.
- E. If the OWNER and CONTRACTOR agree as to the extent, if any, of an increase in the Contract Price or an extension or shortening of the Contract Times that should be allowed as a result of a Field Order, the CONTRACTOR shall proceed so as to minimize the impact on and delays to the WORK pending the issuance of a Change Order.

- F. If the OWNER and the CONTRACTOR are unable to agree as to the extent, if any, of an increase in the Contract Price or an extension or shortening of the Contract Times that should be allowed as a result of a Field Order, the ENGINEER can direct the CONTRACTOR to proceed on the basis of time and materials so as to minimize the impact on and delays to the WORK, and the CONTRACTOR may make a claim as provided in Articles 11 and 12.

10.2 ALLOWABLE QUANTITY VARIATIONS:

- A. In the event of an increase or decrease in the quantity of any bid item under a unit price contract, the total amount of work actually done or materials or equipment furnished will be paid for according to the unit price established for such work under the Contract Documents, wherever such unit price has been established; provided, that an adjustment in the Contract Price may be made for changes which result in an increase or decrease in excess of 25 percent of the estimated quantity of any unit price bid item of the WORK.
- B. In the event a part of the WORK is to be entirely eliminated and no lump sum or unit price is named in the Contract Documents to cover such eliminated work, the price of the eliminated work shall be agreed upon by the OWNER and the CONTRACTOR by Change Order.

**ARTICLE 11 -- CHANGE OF CONTRACT PRICE :**

11.1 GENERAL:

- A. The Contract Price constitutes the total compensation payable to the CONTRACTOR for performing the WORK. All duties, responsibilities, and obligations assigned to or undertaken by the CONTRACTOR to complete the WORK shall be at its expense without change in the Contract Price.
- B. The Contract Price may only be changed by a Change Order. The value of any work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:
  - 1. Where the work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved.
  - 2. By mutual acceptance of a lump sum, which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.4; or
  - 3. On the basis of the cost of work (determined as provided in Paragraph 11.3) plus the CONTRACTOR's overhead and profit (determined as provided in Paragraph 11.4).
- C. Any claim for an increase in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 10 days) after the start of the event giving rise to the claim and shall state the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within 60 days after the start of such event (unless the ENGINEER allows an additional period of time to ascertain more accurate data in support of the claim)

and shall be accompanied by the CONTRACTOR's written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of such event. All claims for adjustment in the Contract Price will be determined by the ENGINEER. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this Paragraph 11.1 C.

#### 11.2 COSTS RELATING TO WEATHER:

- A. The CONTRACTOR shall have no claims against the OWNER for damages for any injury to work, materials, or equipment, resulting from the action of the elements. If, however, in the opinion of the ENGINEER, the CONTRACTOR has made all reasonable efforts to protect the materials, equipment, and work, the CONTRACTOR may be granted a reasonable extension of Contract Times to make proper repairs, renewals, and replacements of the work, materials, or equipment.

#### 11.3 COST OF WORK (BASED ON TIME AND MATERIALS):

- A. General: The term "cost of work" means the sum of all costs necessarily incurred and paid by the CONTRACTOR for labor, materials, and equipment in the proper performance of extra work. Except as otherwise may be agreed to in writing by the OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items and shall not include any of the costs itemized in Paragraph 11.5.
- B. Labor: The costs of labor will be the actual cost for wages prevailing for each craft or type of workers performing the extra work at the time the extra work is done, plus employer payments of payroll taxes, workers compensation insurance, liability insurance, health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from federal, state or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. Labor costs for equipment operators and helpers will be paid only when such costs are not included in the invoice for equipment rental. The labor costs for foremen shall be proportioned to all of their assigned work and only that applicable to extra work shall be paid. Nondirect labor costs including superintendence shall be considered part of the markup set out in Paragraph 11.4.
- C. Materials: The cost of materials reported shall be at invoice or lowest current price at which materials are locally available and delivered to the Site in the quantities involved, plus the cost of freight, delivery and storage, subject to the following:
  - 1. All trade discounts and rebates shall accrue to the OWNER, and the CONTRACTOR shall make provisions so that they may be obtained;
  - 2. For materials secured by other than a direct purchase and direct billing to the purchaser, the cost shall be deemed to be the price paid to the actual supplier as determined by the ENGINEER. Except for actual costs incurred in the handling of such materials, markup will not be allowed;
  - 3. Payment for materials from sources owned wholly or in part by the purchaser shall not exceed the price paid by the purchaser for similar materials from said sources on extra work items or the current wholesale price for such materials delivered to the Site, whichever price is lower; and

4. If in the opinion of the ENGINEER the cost of material is excessive, or the CONTRACTOR does not furnish satisfactory evidence of the cost of such material, then the cost shall be deemed to be the lowest current wholesale price for the quantity concerned delivered to the Site less trade discount. The OWNER reserves the right to furnish materials for the extra work and no claim will be allowed by the CONTRACTOR for costs and profit on such materials.
- D. Equipment: The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the Supplementary General Conditions. Such rental rate will be used to compute payments for equipment whether the equipment is under the CONTRACTOR's control through direct ownership, leasing, renting, or another method of acquisition. The rental rate to be applied for use of each item of equipment will be the rate resulting in the least total cost to the OWNER for the total period of use. If it is deemed necessary by the CONTRACTOR to use equipment not listed in the publication specified in the Supplementary General Conditions, an equitable rental rate for the equipment will be established by the ENGINEER. The CONTRACTOR may furnish cost data which might assist the ENGINEER in the establishment of the rental rate. Payment for equipment shall be subject to the following:
1. All equipment shall, in the opinion of the ENGINEER, be in good working condition and suitable for the purpose for which the equipment is to be used;
  2. Before construction equipment is used on the extra work, the CONTRACTOR shall plainly stencil or stamp an identifying number thereon at a conspicuous location, and shall furnish to the ENGINEER, in duplicate, a description of the equipment and its identifying number;
  3. Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer;
  4. Individual pieces of equipment or tools having a replacement value of \$500 or less, whether or not consumed by use, will be considered to be small tools and no payment will be made therefore.
- E. Equipment Rental Time: The rental time to be paid for equipment on the Site will be the time the equipment is in productive operation on the extra work being performed and, in addition, will include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location; except, that moving time will not be paid if the equipment is used on other than the extra work, even though located at the Site of the extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made for loading and transporting costs when the equipment is used at the Site of the extra work on other than the extra work. Rental time will not be allowed while equipment is inoperative due to breakdowns. The rental time of equipment on the work Site will be computed subject to the following:

1. When hourly rates are listed, any part of an hour less than 30 minutes of operation will be considered to be half-hour of operation, and any part of an hour in excess of 30 minutes will be considered one hour of operation;
  2. When daily rates are listed, any part of a day less than 4 hours operation will be considered to be half-day of operation. When owner-operated equipment is used to perform extra work to be paid for on a time and materials basis, the CONTRACTOR will be paid for the equipment and operator, as set forth in Paragraphs 3, 4, and 5, following;
  3. Payment for the equipment will be made in accordance with the provisions in Paragraph 11.3 D., herein;
  4. Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the CONTRACTOR to other workers operating similar equipment already on the Site, or in the absence of such labor, established by collective bargaining agreements for the type of workmen and location of the extra work, whether or not the operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein in accordance with the provisions of Paragraph 11.3 B., herein, which surcharge shall constitute full compensation for payments imposed by state and federal laws and all other payments made to or on behalf of workers other than actual wages; and
  5. To the direct cost of equipment rental and labor, computed as provided herein, will be added the allowances for equipment rental and labor as provided in Paragraph 11.4, herein.
- F. Special Services: Special work or services are defined as that work characterized by extraordinary complexity, sophistication, innovation, or a combination of the foregoing attributes which are unique to the construction industry. The ENGINEER will make estimates for payment for special services and may consider the following:
1. When the ENGINEER and the CONTRACTOR, determine that a special service or work is required which cannot be performed by the forces of the CONTRACTOR or those of any of its Subcontractors, the special service or work may be performed by an entity especially skilled in the work to be performed. After validation of invoices and determination of market values by the ENGINEER, invoices for special services or work based upon the current fair market value thereof may be accepted without complete itemization of labor, material, and equipment rental costs;
  2. When the CONTRACTOR is required to perform work necessitating special fabrication or machining process in a fabrication or a machine shop facility away from the Site, the charges for that portion of the work performed at the off-site facility may, by agreement, be accepted as a special service and accordingly, the invoices for the work may be accepted without detailed itemization; and
  3. All invoices for special services will be adjusted by deducting all trade discounts. In lieu of the allowances for overhead and profit specified in Paragraph 11.4, herein, an allowance of 15 percent will be added to invoices for special services.
- G. Sureties: All work performed hereunder shall be subject to all of the provisions of the Contract Documents and the CONTRACTOR's sureties shall be bound with reference thereto as under the original Agreement. Copies of all amendments to Bonds or supplemental Bonds shall be submitted to the OWNER for review prior to the performance of any work hereunder.

11.4 CONTRACTOR'S OVERHEAD AND PROFIT:

- A. Extra work ordered on the basis of time and materials will be paid for at the actual necessary cost as determined by the ENGINEER, plus allowances for overhead and profit. The allowance for overhead and profit will include full compensation for superintendence, taxes, field office expense, extended overhead, home office overhead, and all other items of expense or cost not included in the cost of labor, materials, or equipment provided for under Paragraph 11.3. The allowance for overhead and profit will be made in accordance with the following schedule:

Overhead and Profit Allowance	
Labor	10 percent
Materials	10 percent
Equipment	10 percent

To the sum of the costs and markups provided for in this Article, an additional 2 percent of the sum will be added as compensation for Bonds and insurance.

- B. It is understood that labor, materials, and equipment for extra work may be furnished by the CONTRACTOR or by the Subcontractor on behalf of the CONTRACTOR. When all or any part of the extra work is performed by a Subcontractor, the allowance specified herein will be applied to the labor, materials, and equipment costs of the Subcontractor, to which the CONTRACTOR may add 5 percent of the Subcontractor's total cost for the extra work. Regardless of the number of hierarchical tiers of Subcontractors, the 5 percent increase above the Subcontractor's total cost which includes the allowances for overhead and profit specified herein may be applied one time only.

11.5 EXCLUDED COSTS:

- A. The term "cost of the work" shall not include any of the following:
1. Payroll costs and other compensation of CONTRACTOR's officers, executives, proprietors, partners, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by CONTRACTOR whether at the Site or in CONTRACTOR's principal or a branch office for general administration of the WORK all of which are to be considered administrative costs covered by the CONTRACTOR's allowance for overhead and profit;
  2. Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site;
  3. Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the WORK and charges against CONTRACTOR for delinquent payments;
  4. Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except as provided by Paragraph 11.4 above);

5. Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of Defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property; and
6. Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in Paragraph 11.4.

#### 11.6 CONTRACTOR'S EXTRA WORK REPORT:

- A. In order to be paid for extra work, the CONTRACTOR must submit a daily extra work report on the form furnished by the ENGINEER. The form must be completely filled out based on the provisions of Paragraphs 11.3 through 11.5 and signed by the CONTRACTOR and ENGINEER at the end of each work day. Failure to complete the form and obtain appropriate signatures by the next working day after the extra work of the previous day was completed will result in CONTRACTOR's costs for extra work being disallowed.

### **ARTICLE 12-- CHANGE OF CONTRACT TIMES :**

#### 12.1 GENERAL:

- A. The Contract Times may only be changed by a Change Order. Any claim for an extension of the Contract Times shall be based on written notice delivered by the CONTRACTOR to the ENGINEER promptly (but in no event later than 10 days) after the start of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within 30 days after the start of such event (unless the ENGINEER allows an additional period of time for the submission of additional or more accurate data in support of the claim) and shall be accompanied by the CONTRACTOR's written statement that the adjustment claimed is the entire adjustment to which the CONTRACTOR is entitled as a result of said event. All claims for adjustment in the Contract Times will be determined by the ENGINEER. No claim for an adjustment in the Contract Times will be valid if not submitted in accordance with the requirements of this Paragraph 12.1 A. An increase in Contract Times does not mean that the CONTRACTOR is due an increase in Contract Price. Only compensable time extensions will result in an increase in Contract Price.
- B. All time limits stated in the Contract Documents are of the essence of the Agreement.
- C. When CONTRACTOR is prevented from completing any part of the WORK within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost on the critical path of the WORK due to such delay, if a claim is made therefore as provided in Paragraph 12.1.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER; acts or neglect of those performing other work as contemplated by Article 7; and fires, floods, epidemics, abnormal weather conditions, or acts of God. Delays attributable to and within the control of any Subcontractor or Supplier shall be deemed to be delays within the control of the CONTRACTOR.

D. In no event will OWNER be liable to CONTRACTOR, any Subcontractor, any Supplier, any other person or organization, or to any surety for or employee or agent of any of them, for any increase in the Contract Price or other damages arising out or resulting from the following:

1. Delays caused by or within the control of CONTRACTOR; or
2. Delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by those performing other work as contemplated by Article 7.

#### 12.2 EXTENSIONS OF CONTRACT TIMES FOR DELAY DUE TO WEATHER:

- A. The CONTRACTOR's construction schedule shall anticipate delay due to unusually severe weather.
- B. Contract Times may be extended by the ENGINEER because of delays in excess of the anticipated delay. The CONTRACTOR shall, within 10 days of the beginning of any such delay, notify the ENGINEER in writing and request an extension of Contract Times. The ENGINEER will ascertain the facts and the extent of the delay and extend the Contract Times when, in its judgment, the findings of the fact justify such an extension.

### **ARTICLE 13 -- INSPECTIONS AND TESTS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK :**

#### 13.1 NOTICE OF DEFECTIVE WORK:

- A. Prompt notice of Defective Work known to the OWNER or ENGINEER will be given to the CONTRACTOR. All Defective Work, whether or not in place, may be rejected, corrected, or accepted as provided in this Article 13. Defective Work may be rejected even if approved by prior inspection.

#### 13.2 ACCESS TO WORK:

- A. OWNER, ENGINEER, their consultants, sub-consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests shall have access to the WORK at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.

#### 13.3 INSPECTIONS AND TESTS:

- A. The CONTRACTOR shall give the ENGINEER not less than 24 hours notice of readiness of the WORK for all required inspections, tests, or approvals, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. The OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. For inspection, tests, or approvals covered by Paragraphs 13.3C. and 13.3D. below;
  2. That costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.3G. shall be paid as provided in said Paragraph 13.3G.; and
  3. As otherwise provided in the Contract Documents.
- C. If Laws and Regulations of any public body having jurisdiction require any WORK (or any part thereof) to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests or approvals; pay all costs in connection therewith; and furnish the ENGINEER the required certificates of inspection or approval.
- D. The CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for the ENGINEER's acceptance of materials or equipment to be incorporated in the WORK or acceptance of materials, mix designs, or equipment submitted for approval prior to the CONTRACTOR's purchase thereof for incorporation in the WORK. Such inspections, tests, or approvals shall be performed by organizations acceptable to the ENGINEER.
- E. The ENGINEER will make, or have made, such inspections and tests as the ENGINEER deems necessary to see that the WORK is being accomplished in accordance with the requirements of the Contract Documents. Unless otherwise specified in the Supplementary General Conditions, the cost of such inspection and testing will be borne by the OWNER. In the event such inspections or tests reveal non-compliance with the requirements of the Contract Documents, the CONTRACTOR shall bear the cost of corrective measures deemed necessary by the ENGINEER, as well as the cost of subsequent re-inspection and retesting. Neither observations by the ENGINEER nor inspections, tests, or approvals by others shall relieve the CONTRACTOR from the CONTRACTOR's obligation to perform the WORK in accordance with the Contract Documents.
- F. If any WORK (including the work of others) that is to be inspected, tested, or approved is covered without written concurrence of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for observation. Such uncovering shall be at the CONTRACTOR's expense unless the CONTRACTOR has given the ENGINEER not less than 24 hours notice of the CONTRACTOR's intention to perform such test or to cover the same and the ENGINEER has not acted with reasonable promptness in response to such notice.
- G. If any WORK is covered contrary to the written request of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for the ENGINEER's observation and recovered at the CONTRACTOR's expense.
- H. If the ENGINEER considers it necessary or advisable that covered WORK be observed by the ENGINEER or inspected or tested by others, the CONTRACTOR, at the ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, material, and equipment. If it is found that such work is Defective Work, the CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such uncovering, exposure, observation,

inspection, and testing and of satisfactory reconstruction, including but not limited to, fees and charges of engineers, architects, attorneys, and other professionals. However, if such work is not found to be Defective Work, the CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, the CONTRACTOR may make a claim therefore as provided in Articles 11 and 12.

#### 13.4 OWNER MAY STOP THE WORK:

- A. If Defective Work is identified, the OWNER may order the CONTRACTOR to stop performance of the WORK, or any portion thereof, until the cause for such order has been eliminated; however, this right of the OWNER to stop the WORK shall not give rise to any duty on the part of the OWNER to exercise this right for the benefit of the CONTRACTOR or any other party.

#### 13.5 CORRECTION OR REMOVAL OF DEFECTIVE WORK:

- A. If required by the ENGINEER, the CONTRACTOR shall promptly either correct all Defective Work, whether or not fabricated, installed, or completed, or, if the work has been rejected by the ENGINEER, remove it from the Site and replace it with non-defective WORK. The CONTRACTOR shall bear all direct, indirect, and consequential costs and damages of such correction or removal, including but not limited to fees and charges of engineers, architects, attorneys, and other professionals made necessary thereby.

#### 13.6 ACCEPTANCE OF DEFECTIVE WORK:

- A. If, instead of requiring correction or removal and replacement of Defective Work, the OWNER prefers to accept the Defective Work, the OWNER may do so. The CONTRACTOR shall bear all direct, indirect, and consequential costs attributable to the OWNER's evaluation of and determination to accept such Defective Work. If any such acceptance occurs prior to final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK, and the OWNER shall be entitled to an appropriate decrease in the Contract Price.

#### 13.7 OWNER MAY CORRECT DEFECTIVE WORK:

- A. If the CONTRACTOR fails within a reasonable time after written notice from the ENGINEER to correct Defective Work, or to remove and replace Defective Work as required by the ENGINEER in accordance with Paragraph 13.5A., or if the CONTRACTOR fails to perform the WORK in accordance with the Contract Documents, or if the CONTRACTOR fails to comply with any other provision of the Contract Documents, the OWNER may, after seven days written notice to the CONTRACTOR, correct and remedy any such deficiency.
- B. In exercising the rights and remedies under this paragraph, the OWNER shall proceed with corrective and remedial action. In connection with such corrective and remedial

action, the OWNER may exclude the CONTRACTOR from all or part of the Site, take possession of all or part of the WORK, and suspend the CONTRACTOR's services related thereto and incorporate in the WORK all materials and equipment for which the OWNER has paid the CONTRACTOR whether stored at the Site or elsewhere. The CONTRACTOR shall provide the OWNER, OWNER's representatives, ENGINEER, and ENGINEER's consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.

- C. All direct, indirect, and consequential costs and damages incurred by the OWNER in exercising the rights and remedies under this paragraph will be charged against the CONTRACTOR and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the WORK; and the OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, the OWNER may make a claim therefore as provided in Article 11. Such claim will include, but not be limited to, all costs of repair or replacement of work of others, destroyed or damaged by correction, removal, or replacement of CONTRACTOR's Defective Work and all direct, indirect, and consequential damages associated therewith.
- D. The CONTRACTOR shall not be allowed an extension of Contract Times (or Milestones) because of any delay in the performance of the WORK attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph.

#### 13.8 CORRECTION PERIOD:

- A. The correction period for Defective Work shall be the longer of:
  - 1. One year after the date of final acceptance;
  - 2. Such time as may be prescribed by Laws and Regulations;
  - 3. Such time as specified by the terms of any applicable special guarantee required by the Contract Documents; or
  - 4. Such time as specified by any specific provision of the Contract Documents.
- B. If, during the correction period as defined in Paragraph 13.8A above, any work is found to be Defective Work, the OWNER shall have the same remedies as set forth in Paragraphs 13.5, 13.6, and 13.7 above.
- C. Where Defective Work (and damage to other work resulting there from) has been corrected, removed, or replaced under this paragraph, the correction period hereunder with respect to such work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

### **ARTICLE 14-- PAYMENTS TO CONTRACTOR AND COMPLETION :**

#### 14.1 SCHEDULE OF VALUES (LUMP SUM PRICE BREAKDOWN):

- A. The schedule of values or lump sum price breakdown established as provided in the General Requirements shall serve as the basis for progress payments and shall be incorporated into a form of Application for Payment acceptable to the ENGINEER.

14.2 UNIT PRICE BID SCHEDULE:

- A. Progress payments on account of unit price work will be based on the number of units completed.

14.3 APPLICATION FOR PROGRESS PAYMENT:

- A. Unless otherwise prescribed by law, on the 25th of each month, the CONTRACTOR shall submit to the ENGINEER for review, the Application for Payment filled out and signed by the CONTRACTOR covering the WORK completed as of the date of the Application for Payment and accompanied by such supporting documentation as is required by the Contract Documents.
- B. The Application for Payment shall identify, as a subtotal, the amount of the CONTRACTOR total earnings to date; plus the value of materials stored at the Site which have not yet been incorporated in the WORK; and less a deductive adjustment for materials installed which were not previously incorporated in the WORK, but for which payment was allowed under the provisions for payment for materials stored at the Site, but not yet incorporated in the WORK.
- C. The net payment due the CONTRACTOR shall be the above-mentioned subtotal from which shall be deducted the amount of retainage specified in the Supplementary General Conditions and the total amount of all previous payments made to the CONTRACTOR.
- D. The value of materials stored at the Site shall be an amount equal to the specified percent of the value of such materials as set forth in the Supplementary General Conditions. Said amount shall be based upon the value of all acceptable materials and equipment not incorporated in the WORK but delivered and suitably stored at the Site or at another location agreed to in writing; provided, each such individual item has a value of more than \$5,000 and will become a permanent part of the WORK. The Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that the CONTRACTOR has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the OWNER's interest therein, all of which will be satisfactory to the OWNER.

14.4 CONTRACTOR'S WARRANTY OF TITLE:

- A. The CONTRACTOR warrants and guarantees that title to all WORK, materials, and equipment covered by an Application for Payment, whether incorporated in the WORK or not, will pass to the OWNER no later than the time of payment, free and clear of all Liens.

14.5 REVIEW OF APPLICATIONS FOR PROGRESS PAYMENT:

- A. The ENGINEER will, within 7 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the application to the OWNER, or return the application to the CONTRACTOR indicating in writing the

ENGINEER's reasons for refusing to recommend payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the application. If the ENGINEER still disagrees with a portion of the application, it will submit the application recommending the undisputed portion of the application to the OWNER for payment and provide reasons for recommending non-payment of the disputed amount. Thirty days after presentation of the Application for Payment with the ENGINEER's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.5B.) become due and when due will be paid by the OWNER to the CONTRACTOR.

- B. The ENGINEER, in its discretion, may refuse to recommend the whole or any part of any payment. ENGINEER may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:
  - 1. The work is Defective Work or the completed WORK has been damaged requiring correction or replacement.
  - 2. The Contract Price has been reduced by written amendment or Change Order.
  - 3. The OWNER has been required to correct Defective Work or complete WORK in accordance with Paragraph 13.7.
  - 4. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.1 through 15.4 inclusive.
  
- C. The OWNER may refuse to make payment of the full amount recommended by the ENGINEER because:
  - 1. Claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the WORK.
  - 2. Liens have been filed in connection with the WORK, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens.
  - 3. There are other items entitling OWNER to a set-off against the amount recommended, or
  - 4. OWNER has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.5B. through 14.5C and 15.1 through 15.4 inclusive. The OWNER must give the CONTRACTOR immediate written notice (with a copy to the ENGINEER) stating the reasons for such action and promptly pay the CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

#### 14.6 SUBSTANTIAL COMPLETION:

- A. When the CONTRACTOR considers the WORK ready for its intended use, the CONTRACTOR shall notify the OWNER and the ENGINEER in writing that the WORK is substantially complete. The CONTRACTOR shall attach to this request a list of all work items that remain to be completed and a request that the ENGINEER prepare a Notice of Completion. Within a reasonable time thereafter, the OWNER, the CONTRACTOR, and the ENGINEER shall make an inspection of the WORK to determine

the status of completion. If the ENGINEER does not consider the WORK substantially complete, or the list of remaining work items to be comprehensive, the ENGINEER will notify the CONTRACTOR in writing giving the reasons therefore. If the ENGINEER considers the WORK substantially complete, the ENGINEER will prepare and deliver to the OWNER for its execution and recordation the Notice of Completion signed by the ENGINEER and CONTRACTOR, which shall fix the date of Substantial Completion.

#### 14.7 PARTIAL UTILIZATION:

- A. The OWNER shall have the right to utilize or place into service any item of equipment or other usable portion of the WORK prior to completion of the WORK. Whenever the OWNER plans to exercise said right, the CONTRACTOR will be notified in writing by the OWNER, identifying the specific portion or portions of the WORK to be so utilized or otherwise placed into service.
- B. It shall be understood by the CONTRACTOR that until such written notification is issued, all responsibility for care and maintenance of all of the WORK shall be borne by the CONTRACTOR. Upon issuance of said written notice of Partial Utilization, the OWNER will accept responsibility for the protection and maintenance of all such items or portions of the WORK described in the written notice.
- C. The CONTRACTOR shall retain full responsibility for satisfactory completion of the WORK, regardless of whether a portion thereof has been partially utilized by the OWNER, and the CONTRACTOR's one year correction period shall commence only after the date of Substantial Completion for the WORK.

#### 14.8 FINAL APPLICATION FOR PAYMENT:

- A. After the CONTRACTOR has completed all of the remaining work items referred to in Paragraph 14.6 and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in the General Requirements), and other documents, all as required by the Contract Documents, and after the ENGINEER has indicated that the WORK is acceptable, the CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the OWNER) of all Liens arising out of or filed in connection with the WORK.

#### 14.9 FINAL PAYMENT AND ACCEPTANCE:

- A. If, on the basis of the ENGINEER's observation of the WORK during construction and final inspection, and the ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, the ENGINEER is satisfied that the WORK has been completed and the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will, within 14 days after receipt of the final Application for Payment, indicate in writing the ENGINEER's recommendation of payment and present the application to the OWNER for payment.

- B. After acceptance of the WORK by the OWNER's governing body, the OWNER will make final payment to the CONTRACTOR of the amount remaining after deducting all prior payments and all amounts to be kept or retained under the provisions of the Contract Documents, including the following items:
1. Liquidated damages, as applicable;
  2. Amounts withheld by OWNER under Paragraph 14.5B. and C. which have not been released; and
  3. Two times the value of outstanding items of correction work or punch list items yet uncompleted or uncorrected, as applicable. All such work shall be completed or corrected to the satisfaction of the OWNER within the time stated on the Notice of Completion, otherwise the CONTRACTOR does hereby waive any and all claims to all monies withheld by the OWNER to cover the value of all such uncompleted or uncorrected items.
- C. As a condition of final payment, the CONTRACTOR shall be required to execute a release on the form provided by OWNER, releasing the OWNER from any and all claims of liability for payment on the Project except for such amounts as may be specifically described and excluded from the release.

#### 14.10 RELEASE OF RETAINAGE AND OTHER DEDUCTIONS:

- A. After executing the necessary documents to initiate the Lien period, and not more than 45 days thereafter (based on a 30-day Lien filing period and 15-day processing time), the OWNER will release to the CONTRACTOR the retainage funds withheld pursuant to the Agreement, less any deductions to cover pending claims against the OWNER pursuant to Paragraph 14.5C.
- B. After filing of the necessary documents to initiate the Lien period, the CONTRACTOR shall have 30 days to complete any outstanding items of correction work remaining to be completed or corrected as listed on a final punch list made a part of the Notice of Completion. Upon expiration of the 45 days, referred to in Paragraph 14.10A., the amounts withheld pursuant to the provisions of Paragraph 14.9B. herein, for all remaining work items will be returned to the CONTRACTOR; provided, that said work has been completed or corrected to the satisfaction of the OWNER within said 30 days. Otherwise, the CONTRACTOR does hereby waive any and all claims for all monies withheld by the OWNER under this Agreement to cover two times the value of such remaining uncompleted or uncorrected items.

### **ARTICLE 15 -- SUSPENSION OF WORK AND TERMINATION :**

#### 15.1 SUSPENSION OF WORK BY OWNER:

- A. The OWNER may, at any time and without cause, suspend the WORK or any portion thereof for a period of not more than 90 days by notice in writing to the CONTRACTOR without claim by CONTRACTOR for additional compensation. Beyond the ninety (90) day period, the CONTRACTOR shall resume the WORK on receipt of a notice of resumption of work. The CONTRACTOR will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any

suspension if the CONTRACTOR makes an approved claim therefore as provided in Articles 11 and 12.

#### 15.2 TERMINATION OF AGREEMENT BY OWNER FOR DEFAULT:

- A. In the event of default by the CONTRACTOR, the OWNER may give seven days written notice to the CONTRACTOR of OWNER's intent to terminate the Agreement and provide the CONTRACTOR an opportunity to remedy the conditions constituting the default within a specified period of time. It will be considered a default by the CONTRACTOR whenever CONTRACTOR shall:
  - 1. Declare bankruptcy, become insolvent, or assign its assets for the benefit of its creditors;
  - 2. Disregard or violate the Laws or Regulations of any public body having jurisdiction;
  - 3. Fail to provide materials or workmanship meeting the requirements of the Contract Documents;
  - 4. Disregard or violate provisions of the Contract Documents or ENGINEER's instructions;
  - 5. Fail to prosecute the WORK according to the approved progress schedule;
  - 6. Fail to provide a qualified superintendent, competent workmen, or materials or equipment meeting the requirements of the Contract Documents; or
  - 7. Disregard the authority of the ENGINEER.
- B. If the CONTRACTOR fails to remedy the conditions constituting default within the time allowed, the OWNER may then issue the notice of termination.
- C. In the event the Agreement is terminated in accordance with Paragraph 15.2A., herein, the OWNER may take possession of the WORK and may complete the WORK by whatever method or means the OWNER may select. The cost of completing the WORK will be deducted from the balance which would have been due the CONTRACTOR had the Agreement not been terminated and the WORK completed in accordance with the Contract Documents. If such cost exceeds the balance which would have been due, the CONTRACTOR shall pay the excess amount to the OWNER. If such cost is less than the balance which would have been due, the CONTRACTOR shall not have claim to the difference.

#### 15.3 TERMINATION OF AGREEMENT BY OWNER FOR CONVENIENCE:

- A. Upon seven days' written notice to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy of the OWNER, elect to terminate the Agreement. In such case, the CONTRACTOR shall be paid (without duplication of any items):
  - 1. For completed and acceptable WORK executed in accordance with the Contract Documents, prior to the effective date of termination, including fair and reasonable sums for overhead and profit of such WORK;
  - 2. For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted WORK, plus fair and reasonable sums for overhead and profit on such expenses;

3. For all reasonable claims, costs, losses, and damages incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
4. For reasonable expenses directly attributable to termination, CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.4 TERMINATION OF AGREEMENT BY CONTRACTOR:

- A. The CONTRACTOR may terminate the Agreement upon 14 days written notice to the OWNER, whenever:
  1. The WORK has been suspended under the provisions of Paragraph 15.1, herein, for more than 90 consecutive days through no fault or negligence of the CONTRACTOR, and notice to resume work or to terminate the Agreement has not been received from the OWNER within this time period; or
  2. The OWNER should fail to pay the CONTRACTOR any monies due him in accordance with the terms of the Contract Documents and within 60 days after presentation to the OWNER by the CONTRACTOR of a request therefore, unless within said 14-day period the OWNER shall have remedied the condition upon which the payment delay was based.
- B. In the event of such termination, the CONTRACTOR shall have no claims against the OWNER except for those claims specifically enumerated in Paragraph 15.3, herein, and as determined in accordance with the requirements of said paragraph.

### **ARTICLE 16 -- MISCELLANEOUS :**

#### 16.1 GIVING NOTICE:

- A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

#### 16.2 TITLE TO MATERIALS FOUND ON THE WORK:

- A. The OWNER reserves the right to retain title to all soils, stone, sand, gravel, and other materials developed and obtained from excavations and other operations connected with the WORK. Unless otherwise specified in the Contract Documents, neither the CONTRACTOR nor any Subcontractor shall have any right, title, or interest in or to any such materials. The CONTRACTOR will be permitted to use in the WORK, without charge, any such materials which meet the requirements of the Contract Documents.

#### 16.3 RIGHT TO AUDIT:

- A. If the CONTRACTOR submits a claim to the OWNER for additional compensation, the OWNER shall have the right, as a condition to considering the claim, and as a basis for evaluation of the claim, and until the claim has been settled, to audit the

CONTRACTOR's books to the extent they are relevant. This right shall include the right to examine books, records, documents, and other evidence and accounting procedures and practices, sufficient to discover and verify all direct and indirect costs of whatever nature claimed to have been incurred or anticipated to be incurred and for which the claim has been submitted. The right to audit shall include the right to inspect the CONTRACTOR's plant, or such parts thereof, as may be or have been engaged in the performance of the WORK. The CONTRACTOR further agrees that the right to audit encompasses all subcontracts and is binding upon Subcontractors. The rights to examine and inspect herein provided for shall be exercisable through such representatives as the OWNER deems desirable during the CONTRACTOR's normal business hours at the office of the CONTRACTOR. The CONTRACTOR shall make available to the OWNER for auditing, all relevant accounting records and documents, and other financial data, and upon request, shall submit true copies of requested records to the OWNER.

16.4 SURVIVAL OF OBLIGATIONS:

- A. All representations, indemnifications, warranties, and guaranties made in, required by or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion and acceptance of the WORK or termination or completion of the Agreement.

16.5 CONTROLLING LAW:

- A. This Agreement is to be governed by the law of the state in which the Project is located.

16.6 SEVERABILITY:

- A. If any term or provision of this Agreement is declared invalid or unenforceable by any court of lawful jurisdiction, the remaining terms and provisions of the Agreement shall not be affected thereby and shall remain in full force and effect.

16.7 WAIVER:

- A. The waiver by the OWNER of any breach or violation of any term, covenant or condition of this Agreement or of any provision, ordinance, or law shall not be deemed to be a waiver of any other term, covenant, condition, ordinance, or law or of any subsequent breach or violation of the same or of any other term, covenant, condition, ordinance, or law. The subsequent payment of any monies or fee by the OWNER which may become due hereunder shall not be deemed to be a waiver of any preceding breach or violation by CONTRACTOR or any term, covenant, condition of this Agreement or of any applicable law or ordinance.

**- END OF GENERAL CONDITIONS -**

## **SUPPLEMENTARY GENERAL CONDITIONS**

### **PART 1- GENERAL:**

These Supplementary General Conditions make additions, deletions, or revisions to the General Conditions as indicated herein. All provisions which are not so added, deleted, or revised remain in full force and effect. Terms used in these Supplementary General Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

### **SGC-1 DEFINITIONS:**

Add the following definitions to Article 1:

ENGINEER - In accordance with this contract, the ENGINEER is further defined as the City of Edinburg DIRECTOR OF PUBLIC WORKS, Ponciano H. Longoria, P.E., C.F.M.

OWNER -The OWNER is further defined as the City of Edinburg, 415 E. University, Edinburg, Texas, 78541.

### **SGC-2.2 COPIES OF DOCUMENTS**

The OWNER shall furnish to the CONTRACTOR two copies of the Contract Documents which may include bound reduced drawings, if any, together with two sets of full-scale Drawings. Additional quantities of the Contract Documents will be furnished at reproduction cost plus mailing cost if copies are mailed.

### **SGC-2.4 STARTING THE WORK:**

Add the following as Paragraphs 2.4C and 2.4D of the General Conditions:

- C. The CONTRACTOR shall notify the Texas Excavation Safety System (TESS), Phone No. 1-800-DIG-TESS, at least 48 hours in advance of the commencement of work at any site to allow the member utilities to examine the construction site and mark the location of the utilities' respective facilities.
- D. The CONTRACTOR acknowledges that some (or all) of the utility companies with facilities shown on the drawings may not be members of TESS and, therefore, not automatically contacted by the above referenced telephone number. The CONTRACTOR shall be responsible for making itself aware of utility company facilities not reported by the USA System, and shall be liable for any and all damages stemming from repair or delay costs or any other expenses resulting from the unanticipated discovery of underground utilities. The CONTRACTOR shall be responsible for notifying all of the utilities at least 48 hours in advance of the commencement of work at any site to allow the utilities to examine the construction site and mark the location of the utilities' respective facilities. The CONTRACTOR shall also be responsible for verifying that each utility has responsibly responded to such notification.

#### **SGC-4.2      REPORTS OF PHYSICAL CONDITIONS:**

In the preparation of the Contract Documents, the ENGINEER has relied upon reports of explorations and tests of subsurface conditions at the site prepared by a Geotechnical Engineer engaged for this project. The Geotechnical Engineer prepared a report for this project. A copy of this report and drawings may be examined at the office of Engineer/Architect, during regular business hours if said reports and drawings are not bound herein. The CONTRACTOR may rely upon the accuracy of the technical data contained in the geotechnical report and drawings; however, the interpretation of such technical data, including any interpolation or extrapolation thereof, and opinions contained in the report and drawings are not to be relied on by the CONTRACTOR.

#### **SGC-4.5      HAZARDOUS MATERIALS:**

No reports have been made available to the ENGINEER to indicate there will be discovery of Asbestos, PCB's, Petroleum, Hazardous Wastes, and/or Radioactive Materials at the Site. If the Contractor encounters existing material on sites owned or controlled by the Owner or in material sources that are suspected by visual observation or smell to contain hazardous materials, the Contractor shall immediately notify the Engineer and the Owner. The Owner will be responsible for the testing for and removal or disposition of hazardous materials on sites owned or controlled by the Owner. The Owner may suspend the work, wholly or in part during the testing, removal or disposition of hazardous materials on sites owned or controlled by the Owner. Materials utilized in the project shall be free of any hazardous materials, except as may be specifically provided for in the specifications.

#### **SGC-5.1      BONDS**

Delete the first sentence of Paragraph 5.1 A and add the following:

The CONTRACTOR shall furnish a satisfactory Performance Bond in the amount of 100 percent of the Contract Price and a satisfactory Payment Bond in the amount of 100 percent of the Contract Price as security for the faithful performance and payment of all the CONTRACTOR's obligations under the Contract Documents.

Add the following as Paragraph 5.1.D of the General Conditions (and renumber GC 5.1.D as 5.1.E):

#### **SGC-5.1.D    MAINTENANCE AND GUARANTY BOND:**

The CONTRACTOR shall provide a Maintenance and Guaranty Bond in the amount of 100 percent of the contract price to provide a guarantee against defects in the WORK occurring during the year following the one-year correction period. The Bond shall meet all of the requirements listed in Paragraph 5.1 BONDS, shall be payable to the OWNER, and be at the sole cost of the CONTRACTOR.

#### **SGC-5.2      INSURANCE:**

- A. The limits of liability for the insurance required by Paragraph 5.2 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations. Limits may be provided by a combination of

primary and excess liability policies or through a single policy. If the limits are provided by a combination of primary and excess liability policies, then the excess or umbrella liability overages shall include commercial general, comprehensive automobile, and employer's liability and shall provide coverage at least as broad as the underlying policies.

1. Workers' Compensation:

a. State: In accordance with State Statute

b. Applicable Federal (e.g. USL&H): Statutory

Note: If the WORK called for in the Contract Documents involves work in or on any navigable waters, the CONTRACTOR shall provide Workers' Compensation coverage which shall include coverage under the Longshore and Harbor Workers' Compensation Act, the Jones Act, Maritime Law, and any other coverage required under Federal or State laws pertaining to workers in or on navigable waters.

2. Comprehensive or Commercial General Liability:

Combined Single Limit:

a. Bodily Injury                    \$250,000 each person  
    \$500,000 each occurrence

b. Property Damage            \$100,000 each occurrence  
    \$100,000 aggregate

-or-        \$500,000 combined single limits

3. Comprehensive Automobile Liability (including owned, hired, and non-owned vehicles): Combined Single Limit:

a. Bodily Injury                    \$100,000 each person  
    \$500,000 each occurrence

b. Property Damage            \$100,000 each occurrence  
    \$100,000 each aggregate

-or-        \$500,000 combined single limits

4. City's Protective Liability:

a. Bodily Injury                    \$250,000 each person  
    \$500,000 each occurrence

b. Property Damage            \$100,000 each occurrence  
    \$100,000 each aggregate

-or-        \$500,000 combined single limits

- B. All policies shall provide that the CONTRACTOR agrees to waive all rights of subrogation against the OWNER, the ENGINEER, and their sub-consultants, employees, officers and directors, for WORK performed under the Agreement. Endorsements shall be provided with certificates of insurance.
- C. All policies shall also specify that the insurance provided by the CONTRACTOR will be considered primary and not contributory to any other insurance available to the OWNER or ENGINEER.
- D. All policies except Workers' Compensation and Builders Risk shall name the OWNER, ENGINEER, their consultants, sub-consultants, and their officers, directors, agents and employees as additional insured. The Builders Risk insurance shall name the CONTRACTOR, OWNER, and ENGINEER as named insured.
- E. All policies shall provide for thirty days notice prior to any cancellation, reduction in coverage or nonrenewal.

**SGC-5.2C INSURANCE:**

Add the following to Paragraph 5.2C of the General Conditions:

The CONTRACTOR shall also name the City of Edinburg and its officers, directors, agents, and employees as "additional insured's" under the insurance policies.

**SGC-6.5 SUBSTITUTES OR "OR EQUAL" ITEMS:**

Add the following to Paragraph 6.5 of the General Conditions:

- A. Whenever materials or equipment are indicated in the Contract Documents by using the name of a proprietary item or the name of a particular manufacturer, the naming of the item is intended to establish the type, function, and quality required. If the name is followed by the words "or equal" indicating that a substitution is permitted, materials or equipment of other manufacturers may be accepted if sufficient information is submitted by the CONTRACTOR to allow the ENGINEER to determine that the material or equipment proposed is equivalent or equal to that named, subject to the following requirements:
  1. The burden of proof as to the type, function, and quality of any such substitution product, material or equipment shall be upon the CONTRACTOR.
  2. The ENGINEER will be the sole judge as to the type, function, and quality of any such substitution and the ENGINEER's decision shall be final.
  3. The ENGINEER may require the CONTRACTOR to furnish additional data about the proposed substitution.
  4. The OWNER may require the CONTRACTOR to furnish a special performance guarantee or other surety with respect to any substitution.
  5. Acceptance by the ENGINEER of a substitution item proposed by the CONTRACTOR shall not relieve the CONTRACTOR of the responsibility for full compliance with the Contract Documents and for adequacy of the substitution.

6. The CONTRACTOR shall pay all costs of implementing accepted substitutions, including redesign and changes to WORK necessary to accommodate the substitution.
- B. The procedure for review by the ENGINEER will include the following:
1. If the CONTRACTOR wishes to provide a substitution item, the CONTRACTOR shall make written application to the ENGINEER on the "Substitution Request Form."
  2. Unless otherwise provided by law or authorized in writing by the ENGINEER, the "Substitution Request Form(s)" shall be submitted within the 35-day period after award of the Contract.
  3. Wherever a proposed substitution item has not been submitted within said 35-day period, or wherever the submission of a proposed substitution material or equipment has been judged to be unacceptable by the ENGINEER, the CONTRACTOR shall provide the material or equipment indicated in the Contract Documents.
  4. The CONTRACTOR shall certify by signing the form that the list of paragraphs on the form are correct for the proposed substitution.
  5. The ENGINEER will evaluate each proposed substitution within a reasonable period of time.
  6. As applicable, no shop drawing submittals shall be made for a substitution item nor shall any substitution item be ordered, installed, or utilized without the ENGINEER'S prior written acceptance of the CONTRACTOR'S "Substitution Request Form."
  7. The ENGINEER will record the time required by the ENGINEER in evaluating substitutions proposed by the CONTRACTOR and in making changes by the CONTRACTOR in the Contract Documents occasioned thereby.
- C. The CONTRACTOR's application shall address the following factors which will be considered by the ENGINEER in evaluating the proposed substitution:
1. Whether the evaluation and acceptance of the proposed substitution will prejudice the CONTRACTOR's achievement of Substantial Completion on time.
  2. Whether acceptance of the substitution for use in the WORK will require a change in any of the Contract Documents to adapt the design to the proposed substitution.
  3. Whether incorporation or use of the substitution in connection with the WORK is subject to payment of any license fee or royalty.
  4. Whether all variations of the proposed substitution from the items originally specified are identified.
  5. Whether available maintenance, repair, and replacement service are indicated. The manufacturer shall have a local service agency (within 50 miles of the site) which maintains properly trained personnel and adequate spare parts and is able to respond and complete repairs within 24 hours.
  6. Whether an itemized estimate is included of all costs that will result directly or indirectly from acceptance of such substitution, including cost of redesign and claims of other contractors affected by the resulting change.
  7. Whether the proposed substitute item meets or exceeds the experience and/or equivalency requirements listed in the appropriate technical specifications.

- D. Without any increase in cost to the OWNER, the CONTRACTOR shall be responsible for and pay all costs in connection with proposed substitutions and of inspections and testing of equipment or materials submitted for review prior to the CONTRACTOR's purchase thereof for incorporation in the WORK, whether or not the ENGINEER accepts the proposed substitution or proposed equipment or material. The CONTRACTOR shall reimburse the OWNER for the charges of the ENGINEER for evaluating each proposed substitution.

**SGC-6.6 SUBCONTRACT LIMITATIONS:**

Add the following as Paragraph 6.6B of the General Conditions:

- B. The CONTRACTOR shall perform not less than 20 percent of the WORK with its own forces (i.e., without subcontracting). The 20 percent requirement shall apply to the Contract Price less the values of OWNER-assigned contracts and allowances in the Bid for pre-negotiated WORK.

**SGC-6.7 PERMITS:**

- A. Except for the permits specifically set forth in A above, the CONTRACTOR shall acquire all permits required by Laws or Regulations, including, without limitation, the following specific permits (if applicable):
1. Local jurisdiction building permits. OWNER will pay for local jurisdiction building permit. CONTRACTOR will be responsible for acquiring permit.
  2. State permits to construct and/or operate sources of air pollution.
  3. Certificates and permits are required for sources such as, but not limited to:
    - a. Fuel burning equipment
    - b. Gasoline and petroleum distillate storage containers
    - c. Land disturbing activities
    - d. Processing equipment (sand, gravel, concrete batch plant, etc.)
    - e. Odors
  4. Permits to construct and/or operating permits for construction should be obtained from: United Irrigation District
  5. Stormwater Permit.
  6. Permit-Required Confined Space - The workplace in which the WORK is to be performed may contain permit-required confined spaces (permit spaces) as defined 29 CFR 1910.146 and, if so, permit space entry is allowed only through compliance with a confined space entry program meeting the requirements of 29 CFR 1910.146.

**SGC-6.17 INDEMNIFICATION:**

Add the following to Paragraph 6.17A of the General Conditions:

The CONTRACTOR shall also indemnify, defend, and hold harmless the City of Edinburg, and its officers, directors, agents, and employees, against and from all claims and liability arising under or by reason of the Agreement or any performance of the WORK, but not from the sole negligence or willful misconduct of the City of Edinburg.

### **SGC-9.3 PROJECT REPRESENTATION:**

- A. The Owner, authorized representatives and agents of the Owner shall, at all times have access to and be permitted to observe and review all work, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this Contract. The Resident Project Representative, who is the OWNER's agent, will act as directed by and under the supervision of the OWNER and will confer with the ENGINEER regarding its actions. The Resident Project Representative's dealings in matters pertaining to the WORK shall, in general, be only with the ENGINEER and the CONTRACTOR, and dealings with Subcontractors shall only be through or with the full knowledge of the CONTRACTOR. Written communication with the OWNER will be only through or as directed by the ENGINEER.
- B. The Resident Project Representative shall have the duties and responsibilities set forth in this paragraph.
1. Review the progress schedule of Shop Drawing submittals and schedule of values prepared by the CONTRACTOR and consult with the ENGINEER concerning their acceptability.
  2. Attend preconstruction conferences. Arrange a schedule of progress meetings and other job conferences as required in consultation with the ENGINEER and notify in advance those expected to attend. Attend meetings and maintain and circulate copies of minutes thereof.
  3. Serve as the ENGINEER's liaison with the CONTRACTOR, working principally through the CONTRACTOR's superintendent and assist said superintendent in understanding the intent of the Contract Documents. Assist the ENGINEER in serving as the OWNER's liaison with the CONTRACTOR.
  4. Receive Shop Drawings and samples furnished by the CONTRACTOR.
  5. Conduct on-site observations of the WORK in progress to assist the ENGINEER in determining if the WORK is proceeding in accordance with the Contract Documents.
  6. Verify that the tests, equipment, and systems startups and operating and maintenance instruction are conducted as required by the Contract documents and in presence of the required personnel, and that the CONTRACTOR maintains adequate records thereof.
  7. Transmit to the CONTRACTOR the ENGINEER's clarifications and interpretations of the Contract Documents.
  8. Consider and evaluate the CONTRACTOR's suggestions for modifications in the Contract Documents and report them with recommendations to the ENGINEER.
  9. Review applications for payment with the CONTRACTOR for compliance with the established procedure for their submittal and forward them with recommendations to the ENGINEER, noting particularly their relation to the schedule of values, work completed, and materials and equipment delivered at the Site but not incorporated in the WORK.
  10. During the course of the WORK, verify that certificates, maintenance and operation manuals, and other data required to be assembled and furnished by the CONTRACTOR are applicable to the items actually installed.
  11. Before the ENGINEER prepares a Notice of Completion, as applicable, submit to the CONTRACTOR a list of observed items requiring completion or correction.

12. Conduct final inspection in the company of the ENGINEER, the OWNER, and the CONTRACTOR, and prepare a punch list of items to be completed or corrected.
13. Verify that all items on the punch list have been completed or corrected and make recommendations to the ENGINEER concerning acceptance.

### **SGC-11.3D EQUIPMENT**

The CONTRACTOR will be paid for the use of equipment at the rental rate listed for such equipment specified in the current edition of the following reference publication:

- A. "Rental Rate Blue Book for Construction Machinery" as published by the Machinery Information Division of the K-III Directory Corporation, (800) 669-3282.

### **SGC-12.2 WEATHER DELAYS:**

Delete paragraphs 12.2.A and 12.2.B. Add the following:

- A. The occurrence of unusually severe weather during the life of the Contract will be considered a basis for extending contract time when work is not already suspended for other reasons. Unusually severe weather means weather, which at the time of year that it occurs, is unusual for the place in which it occurs.
- B. Extension of time for unusually severe weather will be determined on a monthly basis and will include only those actual adverse weather days in excess of the normal adverse weather days included in the Contract Time. Normal adverse weather means adverse weather which, regardless of its severity, is to be reasonable expected for that particular place at that particular time of year. The normal adverse weather days included in the Contract Time are based on historical records of temperature and precipitation.
- C. Actual adverse weather days are those days meeting one or more of the criteria listed below. Time extensions for more than one criterion will take into consideration only that criterion having the greatest impact. Those actual adverse weather days in excess of the days listed in Table 12-1 will be allowed without regard to when they occur (except prior to mobilization or during suspension for other reasons) or their impact on contract completion.
  1. Days with maximum temperature of 32 degrees F or less – one full day allowed.
  2. Days with minimum temperature of 32 degrees F or less, but whose maximum temperature is over 32 degrees F – one-half day allowed.
  3. Days when ½" or more of precipitation (rain or snow equivalent) occurs – one full day allowed.
- D. Attached to the monthly Extension of Time Request, the CONTRACTOR shall submit a summary statement showing the number of days charged to the Contract for the preceding period
  1. An itemized account of each day of the month showing which days meet one of the criteria outlined above.
  3. A total number of adverse weather days.

4. The total number of days due to the CONTRACTOR for adverse weather days in excess of the normal adverse weather days.

**SGC-14.3C AMOUNT OF RETENTION:**

Add the following to Paragraph 14.3C of the General Conditions:

Unless otherwise prescribed by law, the OWNER may retain a portion of the amount otherwise due to the CONTRACTOR, as follows:

1. Contracts equaling a total amount of \$500,000.00 or over will bear a retainage of five (5) percent (%) on each partial disbursement. Contracts totaling less than \$500,000.00 will bear a retainage of ten (10) percent (%) on each partial disbursement.

**SGC-14.3D VALUE OF MATERIALS STORED AT THE SITE:**

Unless otherwise prescribed by law, the value of materials stored at the Site shall be 90% of the value of such materials.

**SGC-16.8 OPERATION AND MAINTENANCE MANUALS AND TRAINING:**

- A. The Contractor shall obtain installation, operation, and maintenance manuals from manufacturers and suppliers for equipment furnished under the contract. The Contractor shall submit three copies of each complete manual to the Engineer within 90 days after approval of shop drawings, product data, and samples, and not later than the date of shipment of each item of equipment to the project site or storage location.
- B. Each manual is to be bound in a folder and labeled to identify the contents and project to which it applies. The manual shall contain the following applicable items:
  1. A listing of the manufacturer's identification, including order number, model, serial number, and location of parts and service centers.
  2. A list of recommended stock of parts, including part number and quantity.
  3. Complete replacement parts list.
  4. Performance data and rating tables.
  5. Specific instructions for installation, operation, adjustment, and maintenance.
  6. Exploded view drawings for major equipment items.
  7. Lubrication requirements.
  8. Complete equipment wiring diagrams and control schematics with terminal identification.
- C. Operations and maintenance manuals specified herein are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start-up the equipment.
- D. The Owner shall require the Engineer to promptly review each manual submitted, noting necessary corrections and revisions. If the Engineer rejects the manual, the Contractor shall correct and resubmit the manual until it is acceptable to Engineer as

being in conformance with design concept of project and for compliance with information given in the Contract Documents. Owner may assess Contractor a charge for reviews of same items in excess of three (3) times. Such procedure shall not be considered cause for delay. Acceptance of manuals by Engineer does not relieve Contractor of any requirements or terms of the Contract.

- E. The Contractor shall provide the services of trained, qualified technicians to check final equipment installation, to assist as required in placing same in operation, and to instruct operating personnel in the proper manner of performing routine operation and maintenance of the equipment.

**SGC-16.9 AS-BUILT DIMENSION & DRAWINGS.**

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

**END OF SUPPLEMENTARY GENERAL CONDITIONS**

## **02101 – PREPARATION OF RIGHT-OF-WAY**

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### **PART 1 - GENERAL**

#### **1.01 GENERAL DESCRIPTION OF WORK:**

- A. Relocation or removal and proper disposal of all obstructions (as applicable) from the right-of-way and from designated easements.
- B. Obstructions shall include:
  - 1. Remains of houses not completely removed by others.
  - 2. Concrete, foundations, floor slabs, curb and gutter, driveways, and sidewalk.
  - 3. Building materials such as brick, lumber and plaster.
  - 4. Water wells, septic tanks, manholes, inlets, utility pipes and conduits.
  - 5. Underground service station tanks, equipment or other foundations.
  - 6. Fencing and retaining walls.
  - 7. Paved parking areas.
  - 8. Abandoned railroad tracks, ties, and scrap iron.
  - 9. Ancillary structures such as shacks and outhouses.
  - 10. Trees, stumps, bushes, shrubs, roots, limbs and logs.
  - 11. All rubbish and debris whether above or below ground.
  - 12. Power poles, telephone poles and service poles.
  - 13. Mail boxes.

### **PART 2 - PRODUCTS**

#### **2.01 MATERIALS**

- A. Provide materials required to perform work as specified.

### **PART 3 - EXECUTION**

#### **3.01 GENERAL**

- A. Clear entire project right-of-way and such other areas, including public or corporate lands, specified in the plans of all structures and obstructions.
- B. Trim carefully all trees and shrubs designated for preservation and protect from scarring or other injuries during construction operation.
- C. Removal of all foundations and underground obstructions, unless otherwise specified, shall be removed to the following depths:
  - 1. In embankment areas, two (2) feet below natural ground.

2. In excavation areas, two (2) feet below the lower elevation of excavation.
  3. In all other areas, one (1) foot below natural grade.
- D. Backfill all holes, as directed by the ENGINEER, resulting from all removals.
- E. Complete the preparation of right-of-way such that prepared right-of-way is free of holes, ditches and other abrupt changes in elevations and irregularities to contours.
- F. Plug the remaining ends of all abandoned storm sewers, culverts, sanitary sewers, conduits, and utility pipes with concrete, as specified by the ENGINEER, to form a tight closure.
- G. On existing concrete where only a portion is to be removed, care shall be exercised to avoid damage to remaining concrete. Where concrete reinforcement is encountered in removed portions, a minimum of one (1) foot of such reinforcement shall be cleaned of old concrete and left in place to tie into new construction. Concrete to be preserved, but subsequently destroyed by the CONTRACTOR's operations, shall be replaced by the CONTRACTOR at his expense in accordance with City Specifications, or as directed by the ENGINEER.
- H. The necessary Replacement or Relocation of obstructions shall be considered incidental work to this Section and will not be paid for directly.

#### **PART 4 - MEASUREMENT AND PAYMENT**

##### **4.01 PREPARATION OF RIGHT-OF-WAY**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **09100 – BARRICADES, SIGNS, AND TRAFFIC HANDLING**

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*(Referenced from 2004 TxDOT, ITEM 502 Barricades, Signs and Traffic Handling – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**09100.1. Description.** Provide, install, move, replace, maintain, clean, and remove upon completion of work all barricades, signs, cones, lights, and other traffic control devices used for traffic handling as indicated on the plans and as directed.

**09100.2. Construction.** Provide traffic control devices that conform to details shown on the plans, the TMUTCD, and the Compliant Work Zone Traffic Control Device List (CWZTCDL) maintained by the Traffic Operations Division.

**A. Implementation.** Before beginning work, designate in writing a Contractor's Responsible Person (CRP) to be the representative of the Contractor who is responsible for taking or directing corrective measures of installation and maintenance deficiencies as soon as possible. The CRP must be accessible by phone and able to respond to emergencies 24 hours per day.

Follow the traffic control plan (TCP) and install traffic control devices as shown on the plans and as directed. Install traffic control devices straight and plumb. Do not make changes to the location of any device or implement any other changes to the TCP without the approval of the Engineer. Minor adjustments to meet field constructability and visibility are allowed.

Submit Contractor-proposed TCP changes, signed and sealed by a licensed professional engineer, to the Engineer for approval. The Engineer may develop, sign, and seal Contractor-proposed changes. Changes must conform to guidelines established in the TMUTCD using approved products from the CWZTCDL.

Maintain traffic control devices by taking corrective action as soon as possible. Corrective action includes but is not limited to cleaning, replacing, straightening, covering, or removing devices. Maintain the devices such that they are properly positioned, spaced, and legible, and that retroreflective characteristics meet requirements during darkness and rain.

**B. Flaggers.** Provide a Contractor representative who has been certified as a flagging instructor through courses offered by the Texas Engineering Extension Service, the American Traffic Safety Services Association, the National Safety Council, or other approved organizations. Provide the certificate indicating course completion when requested. This representative is responsible for training and assuring that all flaggers are qualified to perform flagging duties. A qualified flagger must be independently certified by one of the organizations listed above or trained by the Contractor's certified flagging instructor. Provide the Engineer with a current list of qualified flaggers before beginning flagging activities. Use only flaggers on the qualified list.

Flaggers must be courteous and able to effectively communicate with the public. When

directing traffic, flaggers must use standard attire, flags, signs, and signals and follow the flagging procedures set forth in the TMUTCD.

- C. **Removal.** Upon completion of work, remove all barricades, signs, cones, lights, and other traffic control devices used for work-zone traffic handling, unless otherwise shown on the plans.

### **09100.3. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## 01568 - EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION

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*(Referenced from 2004 TX-DOT, ITEM 506-TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS – references made to any other Sections of the 2004 TX-DOT Manual shall become part of the Contract to be followed)*

**01568.1 DESCRIPTION.** Install, maintain, and remove erosion, sedimentation, and environmental control devices. Remove accumulated sediment and debris.

### 01568.2 MATERIALS.

#### A. Rock Filter Dams.

1. **Aggregate.** Furnish aggregate with hardness, durability, cleanliness, and resistance to crumbling, flaking, and eroding acceptable to the Engineer. Provide the following:
  - **Types 1, 2, and 4 Rock Filter Dams.** Use 3 to 6 in. aggregate.
  - **Type 3 Rock Filter Dams.** Use 4 to 8 in. aggregate.
2. **Wire.** Provide minimum 20 gauge galvanized wire for the steel wire mesh and tie wires for Types 2 and 3 rock filter dams. Type 4 dams require:
  - a double-twisted, hexagonal weave with a nominal mesh opening of 2-1/2 in. x 3-1/4 in.;
  - minimum 0.0866 in. steel wire for netting;
  - minimum 0.1063 in. steel wire for selvages and corners; and minimum 0.0866 in. for binding or tie wire.
3. **Sandbag Material.** Furnish sandbags meeting Section 506.2.I, "Sandbags," except that any gradation of aggregate may be used to fill the sandbags.

**B. Temporary Pipe Slope Drains.** Provide corrugated metal pipe, polyvinyl chloride (PVC) pipe, flexible tubing, watertight connection bands, grommet materials, prefabricated fittings, and flared entrance sections that conform to the plans. Recycled and other materials meeting these requirements are allowed if approved. Furnish concrete in accordance with Item 432, "Riprap."

**C. Baled Hay.** Provide hay bales weighing at least 50 lb., composed entirely of vegetable matter, measuring 30 in. or longer, and bound with wire, nylon, or polypropylene string.

**D. Temporary Paved Flumes.** Furnish asphalt concrete, hydraulic cement concrete, or other comparable non-erodible material that conforms to the plans. Provide rock or rubble with a minimum diameter of 6 in. and a maximum volume of 1/2 cu. ft. for the construction of energy dissipaters.

**E. Construction Exits.** Provide materials that meet the details shown on the plans and this Section.

1. **Rock Construction Exit.** Provide crushed aggregate for long and short-term construction exits. Furnish aggregates that are clean, hard, durable, and free from adherent coatings such as salt, alkali, dirt, clay, loam, shale, soft, or flaky materials and organic and injurious matter. Use 4- to 8-in. aggregate for Type 1 and 2- to 4- in. aggregate for Type 3.
2. **Timber Construction Exit.** Furnish No. 2 quality or better railroad ties and timbers for long-term construction exits, free of large and loose knots and treated to control rot. Fasten

timbers with nuts and bolts or lag bolts, of at least 1/2 in. diameter, unless otherwise shown on the plans or allowed. For short-term exits, provide plywood or pressed wafer board at least 1/2 in. thick.

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

**F. Embankment for Erosion Control.** Provide rock, loam, clay, topsoil, or other earth materials that will form a stable embankment to meet the intended use.

**G. Pipe.** Provide pipe outlet material in accordance with Item 556, "Pipe Under drains," and details shown on the plans.

**H. Construction Perimeter Fence.**

**1. Posts.** Provide essentially straight wood or steel posts that are at least 60 in. long. Furnish soft wood posts with a minimum diameter of 3 in. or use 2 x 4 boards. Furnish hardwood posts with a minimum cross-section of 1-1/2 x 1-1/5 in. Furnish T- or L-shaped steel posts with a minimum weight of 1.3 lb. per foot.

**2. Fence.** Provide orange construction fencing as approved by the Engineer.

**3. Fence Wire.** Provide 12-1/2 gauge or larger galvanized smooth or twisted wire. Provide 16 gauge or larger tie wire.

**4. Flagging.** Provide brightly-colored flagging that is fade-resistant and at least 3/4 in. wide to provide maximum visibility both day and night.

**5. Staples.** Provide staples with a crown at least 1/2 in. wide and legs at least 1/2 in. long.

**6. Used Materials.** Previously used materials meeting the applicable requirements may be used if accepted by the Engineer.

**I. Sandbags.** Provide sandbag material of polypropylene, polyethylene, or polyamide woven fabric with a minimum unit weight of 4 oz. per square yard, a Mullen burst-strength exceeding 300 psi, and an ultraviolet stability exceeding 70%. Use natural coarse sand or manufactured sand meeting the gradation given in Table 1 to fill sandbags. Filled sandbags must be 24 to 30 in. long, 16 to 18 in. wide, and 6 to 8 in. thick.

**Table 1  
Sand Gradation**

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

**J. Temporary Sediment Control Fence.** Provide a net-reinforced fence using woven geo-textile fabric. Logos visible to the traveling public will not be allowed.

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

**2. Posts.** Provide essentially straight wood or steel posts with a minimum length of 48 in., unless otherwise shown on the plans. Soft wood posts must be at least 3 in. in diameter or

nominal 2 x 4 in. Hardwood posts must have a minimum cross-section of 1-1/2 x 1-1/2 in. T- or L-shaped steel posts must have a minimum weight of 1.3 lb. per foot.

3. **Net Reinforcement.** Provide net reinforcement of at least 12-1/2 gauge galvanized welded wire mesh, with a maximum opening size of 2 x 4 in., at least 24 in. wide, unless otherwise shown on the plans.
4. **Staples.** Provide staples with a crown at least 3/4 in. wide and legs 1/2 in. long.
5. **Used Materials.** Use recycled material meeting the applicable requirements if accepted by the Engineer.

**01568.3 EQUIPMENT.** Provide a backhoe, front end loader, blade, scraper, bulldozer, or other equipment as required when "Earthwork for Erosion Control" is specified on the plans as a bid item.

#### **01568.4 CONSTRUCTION.**

**A. Contractor Responsibilities.** Implement the Department's Storm Water Pollution Prevention Plan (SWP3) for the project site in accordance with the specific or general storm water permit requirements. Develop and implement an SWP3 for project-specific material supply plants within and outside of the Department's right of way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.

#### **B. General.**

1. **Phasing.** Implement control measures in the area to be disturbed before beginning construction, or as directed. Limit the disturbance to the area shown on the plans or as directed. If, in the opinion of the Engineer, the Contractor cannot control soil erosion and sedimentation resulting from construction operations, the Engineer will limit the disturbed area to that which the Contractor is able to control. Minimize disturbance to vegetation.
2. **Maintenance.** Immediately correct ineffective control measures. Implement additional controls as directed. Remove excavated material within the time requirements specified in the applicable storm water permit.
3. **Stabilization.** Stabilize disturbed areas where construction activities will be temporarily stopped in accordance with the applicable storm water permit. Establish a uniform vegetative cover. The project will not be accepted until a 70% density of existing adjacent undisturbed areas is obtained, unless otherwise shown on the plans. When shown on the plans, the Engineer may accept the project when adequate controls are in place that will control erosion, sedimentation, and water pollution until sufficient vegetative cover can be established.
4. **Finished Work.** Upon acceptance of vegetative cover, remove and dispose of all temporary control measures, temporary embankments, bridges, matting, false work, piling, debris, or other obstructions placed during construction that are not a part of the finished work, or as directed.
5. **Restricted Activities.** Do not locate disposal areas, stockpiles, or haul roads in any wetland, water body, or streambed. Do not install temporary construction crossings in or across any water body without the prior approval of the appropriate resource agency and the Engineer. Restrict construction operations in any water body to the necessary areas as shown on the plans or applicable permit, or as directed. Use temporary bridges, timber mats, or other

structurally sound and non-eroding material for stream crossings. Provide protected storage area for paints, chemicals, solvents, and fertilizers at an approved location. Keep paints, chemicals, solvents, and fertilizers off bare ground and provide shelter for stored chemicals.

**C. Installation, Maintenance, and Removal Work.** Perform work in accordance with the specific or general storm water permit. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until earthwork construction and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Engineer. If a device ceases to function as intended, repair or replace the device or portions thereof as necessary. Remove sediment, debris, and litter. When approved, sediments may be disposed of within embankments, or in the right of way in areas where the material will not contribute to further siltation. Dispose of removed material in accordance with federal, state, and local regulations. Remove devices upon approval or when directed. Upon removal, finish-grade and dress the area. Stabilize disturbed areas in accordance with the permit, and as shown on the plans or directed. The Contractor retains ownership of stockpiled material and must remove it from the project when new installations or replacements are no longer required.

**1. Rock Filter Dams for Erosion Control.** Remove trees, brush, stumps, and other objectionable material that may interfere with the construction of rock filter dams. Place sandbags as a foundation when required or at the Contractor's option. For Types 1, 2, 3, and 5, place the aggregate to the lines, height, and slopes specified, without undue voids. For Types 2 and 3, place the aggregate on the mesh and then fold the mesh at the upstream side over the aggregate and secure it to itself on the downstream side with wire ties, or hog rings, or as directed. Place rock filter dams perpendicular to the flow of the stream or channel unless otherwise directed. Construct filter dams according to the following criteria, unless otherwise shown on the plans:

**a. Type 1 (Non-reinforced).**

(1) **Height.** At least 18 in. measured vertically from existing ground to top of filter dam.

(2) **Top Width.** At least 2 ft.

(3) **Slopes.** At most 2:1.

**b. Type 2 (Reinforced).**

(1) **Height.** At least 18 in. measured vertically from existing ground to top of filter dam.

(2) **Top Width.** At least 2 ft.

(3) **Slopes.** At most 2:1.

**c. Type 3 (Reinforced).**

(1) **Height.** At least 36 in. measured vertically from existing ground to top of filter dam.

(2) **Top Width.** At least 2 ft.

(3) **Slopes.** At most 2:1.

**d. Type 4 (Sack Gabions).** Unfold sack gabions and smooth out kinks and bends. For vertical filling, connect the sides by lacing in a single loop-double loop pattern on 4- to 5-in. spacing. At one end, pull the end lacing rod until tight, wrap around the end, and twist 4 times. At the filling end, fill with stone, pull the rod tight, cut the wire with approximately 6 in. remaining, and twist wires 4 times. For horizontal filling, place sack flat in a filling trough, fill with stone, and connect sides and secure ends as described above. Lift and place without damaging the gabion. Shape sack gabions to existing

contours.

- e. **Type 5.** Provide rock filter dams as shown on the plans.
2. **Temporary Pipe Slope Drains.** Install pipe with a slope as shown on the plans or as directed. Construct embankment for the drainage system in 8-in. lifts to the required elevations. Hand-amp the soil around and under the entrance section to the top of the embankment as shown on the plans or as directed. Form the top of the embankment or earth dike over the pipe slope drain at least 1 ft. higher than the top of the inlet pipe at all points. Secure the pipe with hold-downs or hold-down grommets spaced a maximum of 10 ft. on center. Construct the energy dissipaters or sediment traps as shown on the plans or as directed. Construct the sediment trap using concrete or rubble riprap in accordance with Item 432, "Riprap," when designated on the plans.
3. **Baled Hay for Erosion and Sedimentation Control.** Install hay bales at locations shown on the plans by embedding in the soil at least 4 in. and, where possible, approximately 1/2 the height of the bale, or as directed. Fill gaps between bales with hay.
4. **Temporary Paved Flumes.** Construct paved flumes as shown on the plans or as directed. Provide excavation and embankment (including compaction of the subgrade) of material to the dimensions shown on the plans, unless otherwise indicated. Install a rock or rubble riprap energy dissipater, constructed from the materials specified above to a minimum depth of 9 in. at the flume outlet to the limits shown on the plans or as directed.
5. **Construction Exits.** When tracking conditions exist, prevent traffic from crossing or exiting the construction site or moving directly onto a public roadway, alley, sidewalk, parking area, or other right of way areas other than at the location of construction exits. Construct exits for either long or short-term use.
  - a. **Long-Term.** Place the exit over a foundation course, if necessary. Grade the foundation course or compacted subgrade to direct runoff from the construction exits to a sediment trap as shown on the plans or as directed. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed.
    - (1) **Type 1.** Construct to a depth of at least 8 in. using crushed aggregate as shown on the plans or as directed.
    - (2) **Type 2.** Construct using railroad ties and timbers as shown on the plans or as directed.
  - b. **Short-Term.**
    - (1) **Type 3.** Construct using crushed aggregate, plywood, or wafer board. This type of exit may be used for daily operations where long-term exits are not practical.
    - (2) **Type 4.** Construct as shown on the plans or as directed.
6. **Earthwork for Erosion Control.** Perform excavation and embankment operations to minimize erosion and to remove collected sediments from other erosion control devices.
  - a. **Excavation and Embankment for Erosion Control Features.** Place earth dikes, swales, or combinations of both along the low crown of daily lift placement, or as directed, to prevent runoff spillover. Place swales and dikes at other locations as shown on the plans or as directed to prevent runoff spillover or to divert runoff. Construct cuts with the low end blocked with undisturbed earth to prevent erosion of hillsides. Construct sediment traps at drainage structures in conjunction with other erosion control measures as shown on the plans or as directed. Where required, create a sediment basin providing 3,600 cu. ft. of storage per acre drained, or equivalent control measures for

drainage locations that serve an area with 10 or more disturbed acres at one time, not including offsite areas.

- b. Excavation of Sediment and Debris.** Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed.
- 7. Construction Perimeter Fence.** Construct, align, and locate fencing as shown on the plans or as directed.
  - a. Installation of Posts.** Embed posts 18 in. deep or adequately anchor in rock, with a spacing of 8 to 10 ft.
  - b. Wire Attachment.** Attach the top wire to the posts at least 3 ft. from the ground. Attach the lower wire midway between the ground and the top wire.
  - c. Flag Attachment.** Attach flagging to both wire strands midway between each post. Use flagging at least 18 in. long. Tie flagging to the wire using a square knot.
- 8. Sandbags for Erosion Control.** Construct a berm or dam of sandbags that will intercept sediment-laden storm water runoff from disturbed areas, create a retention pond, detain sediment, and release water in sheet flow. Fill each bag with sand so that at least the top 6 in. of the bag is unfilled to allow for proper tying of the open end. Place the sandbags with their tied ends in the same direction. Offset subsequent rows of sandbags 1/2 the length of the preceding row. Place a single layer of sandbags downstream as a secondary debris trap. Place additional sandbags as necessary or as directed for supplementary support to berms or dams of sandbags or earth.
- 9. Temporary Sediment-Control Fence.** Provide temporary sediment-control fence near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the fence into erosion-control measures used to control sediment in areas of higher flow. Install the fence as shown on the plans, as specified in this Section, or as directed.
  - a. Installation of Posts.** Embed posts at least 18 in. deep, or adequately anchor, if in rock, with a spacing of 6 to 8 ft. and install on a slight angle toward the run-off source.
  - b. Fabric Anchoring.** Dig trenches along the uphill side of the fence to anchor 6 to 8 in. of fabric. Provide a minimum trench cross-section of 6 x 6 in. Place the fabric against the side of the trench and align approximately 2 in. of fabric along the bottom in the upstream direction. Backfill the trench, then hand-tamp.
  - c. Fabric and Net Reinforcement Attachment.** Unless otherwise shown under the plans, attach the reinforcement to wooden posts with staples, or to steel posts with T-clips, in at least 4 places equally spaced. Sewn vertical pockets may be used to attach reinforcement to end posts. Fasten the fabric to the top strand of reinforcement by hog rings or cord every 15 in. or less.
  - d. Fabric and Net Splices.** Locate splices at a fence post with a minimum lap of 6 in. attached in at least 6 places equally spaced, unless otherwise shown under the plans. Do not locate splices in concentrated flow areas. Requirements for installation of used temporary sediment control fence include the following:
    - fabric with minimal or no visible signs of biodegradation (weak fibers),
    - fabric without excessive patching (more than 1 patch every 15 to 20 ft.),
    - posts without bends, and
    - backing without holes.

**01568.5 PAYMENT.** The following will not be paid for directly but are subsidiary to pertinent Items:

- erosion-control measures for Contractor project-specific locations (PSLs) inside and outside the right of way (such as construction and haul roads, field offices, equipment and supply areas, plants, and material sources);
- removal of litter;
- repair to devices and features damaged by Contractor operations;
- added measures and maintenance needed due to negligence, carelessness, lack of maintenance, and failure to install permanent controls;
- removal and reinstallation of devices and features needed for the convenience of the Contractor;
- finish grading and dressing upon removal of the device; and
- minor adjustments including but not limited to plumbing posts, reattaching fabric, minor grading to maintain slopes on an erosion embankment feature, or moving small numbers of sandbags. The Contractor will be reimbursed in accordance with pertinent Items or Article 9.5, "Force Account," for maintenance, repair, or reinstallation of devices and features when the need for additional control measures cannot be attributed to the above, as determined by the Engineer. Stabilization of disturbed areas will be paid for under pertinent Items. Furnishing and installing pipe for outfalls associated with sediment traps and ponds will not be paid for directly but is subsidiary to the excavation and embankment under this Item.

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

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

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

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

Earthwork required for the pipe slope drain installation, including construction of the sediment trap, will be measured and paid for under Section 506.5.F, "Earthwork for Erosion and Sediment Control."

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

- C. Baled Hay.** 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 "Baled Hay." This price is full compensation for furnishing and placing bales, excavating trenches, removal and disposal, equipment, labor, tools, and incidentals. When the Engineer directs that the baled hay installation (or portions thereof) be replaced, payment will be made at the unit price bid for "Baled Hay," which is full compensation for removal and reinstallation of the baled hay.
- D. Temporary Paved Flumes.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Temporary Paved Flume (Install)" or "Temporary Paved Flume (Remove)." This price is full compensation for furnishing and placing materials, removal and disposal, equipment, labor, tools, and incidentals.

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

Earthwork required for the paved flume installation, including construction of a sediment trap, will be measured and paid for under Section 506.5.F, "Earthwork for Erosion and Sediment Control."

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

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

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

Construction of sediment traps used in conjunction with the construction exit will be measured and paid for under Section 506.5.F, "Earthwork for Erosion and Sediment Control."

- F. Earthwork for Erosion and Sediment Control.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Excavation (Erosion and Sediment Control, In Place)," "Embankment (Erosion and Sediment Control, In Place)," "Earthwork (Erosion and Sediment Control, In Vehicles)," "Dragline Work (Erosion and Sediment Control)," "Backhoe Work (Erosion and Sediment Control)," "Excavator Work (Erosion and Sediment Control)," "Front End Loader Work (Erosion and Sediment Control)," "Blading Work (Erosion and Sediment Control)," "Scraper Work (Erosion and Sediment Control)," or "Bulldozer Work (Erosion and Sediment Control)."

This price is full compensation for excavation including removal of accumulated sediment in various erosion control installations as directed, hauling, and disposal of material not used elsewhere on the project; excavation for construction of erosion-control features; embankments including furnishing material from approved sources and construction of erosion-control features; sandbags; plywood; stage construction for curb inlets involved in curb-inlet sediment traps; and equipment, labor; tools, and incidentals.

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

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

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

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

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

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

- I. Temporary Sediment-Control Fence.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the

unit price bid for "Temporary Sediment-Control Fence." This price is full compensation for furnishing and placing the fence; trenching, fence posts, fabric and backfill; removal and disposal; and equipment, labor, tools, and incidentals.

Removal of temporary sediment-control fence will not be paid for directly but is subsidiary to the installation Item. When the Engineer directs that the temporary sedimentation control fence installation or portions thereof be replaced, payment will be made at the unit price bid for "Temporary Sediment-Control Fence," which is full compensation for the removal and reinstallation of the temporary sediment-control fence.

#### **01568.6 - MEASUREMENT AND PAYMENT**

#### **01568.7 EROSION AND SEDIMENT CONTROL DURING CONSTRUCTION**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## 02210 – SUBGRADE PREPARATION (LIME TREATED)

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*(Referenced from 2004 TX-Dot, ITEM 260 Lime Treatment (Road-Mixed) – references made to any other Sections of the 2004 TX-Dot Manual shall become part of the Contract to be followed)*

**260. Description.** Mix and compact lime, water, and sub-grade or base (with or without asphaltic concrete pavement) in the roadway.

**260.2. Materials.** Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of the proposed material sources and of changes to material sources. Obtain verification from the Engineer that the specification requirements are met before using the sources. The Engineer may sample and test project materials at any time before compaction. Use Tex-100-E for material definitions.

- A. Lime.** Furnish lime that meets the requirements of DMS-6350 “Lime and Lime Slurry,” and DMS-6330, “Lime Sources Prequalification of Hydrated Lime and Quicklime.” Use hydrated lime, commercial lime slurry, or quicklime, as shown on the plans. When furnishing quicklime, provide it in bulk.
- B. Flexible Base.** Furnish base material that meets the requirements of Section 02601, “Flexible Base,” for the type and grade shown on the plans, before the addition of lime.
- C. Water.** Furnish water free of industrial wastes and other objectionable material.
- D. Asphalt.** When asphalt or emulsion is permitted for curing purposes, furnish materials that meet the requirements of Section 02577, “Asphalts, Oils, and Emulsions,” as shown on the plans or as directed.
- E. Mix Design.** The Engineer will determine the target lime content and optimum moisture content in accordance with Tex-121-E or prior experience with the project materials. The Contractor may propose a mix design developed in accordance with Tex-121-E. The Engineer will use Tex-121-E to verify the Contractor’s proposed mix design before acceptance. Reimburse the Department for subsequent mix designs or partial designs necessitated by changes in the material or requests by the Contractor. When treating existing materials, limit the amount of asphalt concrete pavement to no more than 50% of the mix unless otherwise shown on the plans or directed.

**260.3. Equipment.** Provide machinery, tools, and equipment necessary for proper execution of the work. Provide rollers in accordance with Section 00210, “Rolling.” Provide proof rollers in accordance with Section 00216, “Proof Rolling,” when required.

- A. Storage Facility.** Store quicklime and dry hydrated lime in closed, weatherproof containers.
- B. Slurry Equipment.** Use slurry tanks equipped with agitation devices to slurry hydrated lime or quicklime on the project or other approved location. The Engineer may approve other slurring methods.

Provide a pump for agitating the slurry when the distributor truck is not equipped with an agitator. Equip the distributor truck with a sampling device in accordance with Tex-600-J, Part I, when using commercial lime slurry.

**C. Pulverization Equipment.** Provide pulverization equipment that:

- cuts and pulverizes material uniformly to the proper depth with cutters that plane to a uniform surface over the entire width of the cut,
- provides a visible indication of the depth of cut at all times, and
- uniformly mixes the materials.

**260.4. Construction.** Construct each layer uniformly, free of loose or segregated areas, and with the required density and moisture content. Provide a smooth surface that conforms to the typical sections, lines, and grades shown on the plans or as directed.

**A. Preparation of Subgrade or Existing Base for Treatment.** Before treating, remove existing asphalt concrete pavement when shown on the plans or as directed. Shape existing material in accordance with applicable bid items to conform to typical sections shown on the plans and as directed.

When shown on the plans or directed, proof roll the roadbed in accordance with Section 00216, "Proof Rolling," before pulverizing or scarifying existing material. Correct soft spots as directed.

When new base material is required to be mixed with existing base, deliver, place, and spread the new material in the required amount per station. Manipulate and thoroughly mix new base with existing material to provide a uniform mixture to the specified depth before shaping.

**B. Pulverization.** Pulverize or scarify existing material after shaping so that 100% passes a 2-1/2-in. sieve. If the material cannot be uniformly processed to the required depth in a single pass, excavate and windrow the material to expose a secondary grade to achieve processing to plan depth.

**C. Application of Lime.** Uniformly apply lime using dry or slurry placement as shown on the plans or as directed. Add lime at the percentage determined in Section 260.2.E, "Mix Design." Apply lime only on an area where mixing can be completed during the same working day.

Start lime application only when the air temperature is at least 35°F and rising or is at least 40°F. The temperature will be taken in the shade and away from artificial heat. Suspend application when the Engineer determines that weather conditions are unsuitable.

Minimize dust and scattering of lime by wind. Do not apply lime when wind conditions,

in the opinion of the Engineer, cause blowing lime to become dangerous to traffic or objectionable to adjacent property owners. When pebble grade quicklime is placed dry, mix the material and lime thoroughly at the time of lime application. *Use of quicklime can be dangerous. Inform users of the recommended precautions for handling and storage.*

1. **Dry Placement.** Before applying lime, bring the prepared roadway to approximately optimum moisture content. When necessary, sprinkle in accordance with Section 00204, "Sprinkling." Distribute the required quantity of hydrated lime or pebble grade quicklime with approved equipment. Only hydrated lime may be distributed by bag. Do not use a motor grader to spread hydrated lime.
2. **Slurry Placement.** Provide slurry free of objectionable materials, at or above the approved minimum dry solids content, and with a uniform consistency that will allow ease of handling and uniform application. Deliver commercial lime slurry to the jobsite or prepare lime slurry at the jobsite or other approved location by using hydrated lime or quicklime, as specified.

Distribute slurry uniformly by making successive passes over a measured section of roadway until the specified lime content is reached. Uniformly spread the residue from quicklime slurry over the length of the roadway being processed, unless otherwise directed.

- D. Mixing.** Begin mixing within 6 hours of application of lime. Hydrated lime exposed to the open air for 6 hours or more between application and mixing, or that experiences excessive loss due to washing or blowing, will not be accepted for payment.

Thoroughly mix the material and lime using approved equipment. Allow the mixture to mellow for 1 to 4 days, as directed. When pebble grade quicklime is used, allow the mixture to mellow for 2 to 4 days, as directed. Sprinkle the treated materials during the mixing and mellowing operation, as directed, to achieve adequate hydration and proper moisture content. After mellowing, resume mixing until a homogeneous, friable mixture is obtained.

After mixing, the Engineer will sample the mixture at roadway moisture and test in accordance with Tex-101-E, Part III, to determine compliance with the gradation requirements in Table 1.

**Table 1 Gradation Requirements (Minimum % Passing)**

Sieve Size	Base	Subgrade
1-3/4 in.	100	100
3/4 in.	85	85
No. 4	—	60

- E. Compaction.** Compact the mixture using density control, unless otherwise shown on the plans. Multiple lifts are permitted when shown on the plans or approved. Bring each layer to the moisture content directed. When necessary, sprinkle the treated material in accordance with Section 00204, "Sprinkling." Determine the moisture content of the mixture at the beginning and during compaction in accordance with Tex-103-E.

Begin rolling longitudinally at the sides and proceed toward the center, overlapping on successive trips by at least one-half the width of the roller unit. On super elevated curves, begin rolling at the low side and progress toward the high side. Offset alternate trips of the roller. Operate rollers at a speed between 2 and 6 MPH, as directed. Rework, re-compact, and refinish material that fails to meet or that loses required moisture, density, stability, or finish before the next course is placed or the project is accepted. Continue work until specification requirements are met. Rework in accordance with Section 260.4.F, "Reworking a Section." Perform the work at no additional expense to the Department.

- 1. Ordinary Compaction.** Roll with approved compaction equipment, as directed. Correct irregularities, depressions, and weak spots immediately by scarifying the areas affected, adding or removing treated material as required, reshaping, and re-compacting.
  - 2. Density Control.** The Engineer will determine roadway density of completed sections in accordance with Tex-115-E. The Engineer may accept the section if no more than 1 of the 5 most recent density tests is below the specified density and the failing test is no more than 3 pcf below the specified density.
    - a. Subgrade.** Compact to at least 95% of the maximum density determined in accordance with Tex-121-E, unless otherwise shown on the plans.
    - b. Base.** Compact the bottom course to at least 95% of the maximum density determined in accordance with Tex-121-E, unless otherwise shown on the plans. Compact subsequent courses treated under this Item to at least 98% of the maximum density determined in accordance with Tex-121-E, unless otherwise shown on the plans.
- F. Reworking a Section.** When a section is reworked within 72 hours after completion of compaction, rework the section to provide the required density. When a section is reworked more than 72 hr. after completion of compaction, add additional lime at 25% of the percentage determined in Section 260.2.E, "Mix Design." Reworking includes loosening, adding material or removing unacceptable material if necessary, mixing as directed, compacting, and finishing. When density control is specified, determine a new maximum density of the reworked material in accordance with Tex-121-E, and compact to at least 95% of this density or as shown on the plans.
- G. Finishing.** Immediately after completing compaction of the final course, clip, skin, or tight-blade the surface of the lime-treated material with a maintainer or sub-grade trimmer to a depth of approximately 1/4 in. Remove loosened material and dispose of at an approved

location. Roll the clipped surface immediately with a pneumatic tire roller until a smooth surface is attained. Add small amounts of water as needed during rolling. Shape and maintain the course and surface in conformity with the typical sections, lines, and grades shown on the plans or as directed.

Finish grade of constructed sub-grade in accordance with Section 132.3.F.1, "Grade Tolerances." Finish grade of constructed base in accordance with Section 02601.4.D, "Finishing."

- H. Curing.** Cure for the minimum number of days shown in Table 2 by sprinkling in accordance with Section 00204, "Sprinkling," or by applying an asphalt material at a rate of 0.05 to 0.20 gal. per square yard as directed. Maintain moisture during curing. Upon completion of curing, maintain the moisture content in accordance with Article 132.3E, "Maintenance of Moisture and Reworking" for sub-grade and Article 247.4E, "Curing" for bases prior to placing subsequent courses. Do not allow equipment on the finished course during curing except as required for sprinkling, unless otherwise approved. Apply seals or additional courses within 14 calendar days of final compaction.

**Table 2 Minimum Curing Requirements Before Placing Subsequent Courses<sup>1</sup>**

<b>Untreated Material</b>	<b>Curing (Days)</b>
PI ≤ 35	2
PI > 35	5

**260.5 MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **ITEM 247, Flexible Base Parameters**

Flexible Base Type E will be composed of caliche (argillaceous Limestone, calcareous or calcareous clay particles) and may contain stone, conglomerate, gravel, sand or granular materials when these materials are in situ with the caliche.

### Blended material for Flexible Base TY E GR 4

The Contractor may blend base material with another caliche source or with crushed concrete, meeting the requirements for TY "D" materials, provided a minimum of 50% caliche is used. The crushed concrete may contain sand or granular materials. Stabilizing additives will not be allowed in the raw crushed concrete base. Acceptance will be under the following conditions:

Condition One (1): When both components of the blend in their individual stockpiles meet all the physical requirements of this Item, the field blending will be allowed.

Condition Two (2): When only one component of the blend passes the physical requirements of this Item, the materials shall be blended through a plant for stockpile testing and approval.

Flexible Base (TY E GR 4) shall conform to the following requirements:

### BEFORE LIME IS ADDED

Retained on Sq. Sieve	Percent Required
2"	0
1/2"	20-60
No. 4	40-75
No. 40	70-90
Max. PI:	15
Max. Wet Ball PI:	15
Wet Ball Mill Max Amount	50

The Wet Ball Test (Tex-116-E) shall be run and the Plasticity Index of the material passing the No. 40 sieve shall be determined (Wet Ball PI).

### After 1% lime (laboratory) is added to unlimed material

Min. Strength Triaxial Class 1. Triaxial Test (Lime Treated)	Tex-121-E
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Two (2) percent lime (by weight) will be incorporated into the Flexible Base in the field at the State's expense in accordance with the provisions of Items 260.

The percent of density as determined by Compaction Ratio (Tex-113-E) for the new Flexible Base shall be a minimum of 98%.

The Contractor's attention is called to the fact that certain existing and/or proposed structures may be within the limits of the Flexible Base. It shall be the Contractor's responsibility to perform construction operations without damage to these structures.

For water added under Item 247, the sulfate content should not exceed 3000-ppm and the chloride content should not exceed 3000-ppm.

Perform base ride quality testing for all base with only one lift of ACP or a seal coat as the final surface in accordance with the Pharr District Special Provision for flexbase ride testing. Perform base ride quality testing before placing the ACP or seal coat.

## 02601 – FLEXIBLE BASE

*(Referenced from 2004 TxDOT, ITEM 247 Flexible Base – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**02601.1. Description.** Construct a foundation course composed of flexible base.

**02601.2. Materials.** Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of the proposed material sources and of changes to material sources. The Engineer may sample and test project materials at any time before compaction throughout the duration of the project to assure specification compliance. Use Tex-100-E material definitions.

**A. Aggregate.** Furnish aggregate of the type and grade shown on the plans and conforming to the requirements of Table 1. Each source must meet Table 1 requirements for liquid limit, plasticity index, and wet ball mill for the grade specified. Do not use additives such as but not limited to lime, cement, or fly ash to modify aggregates to meet the requirements of Table 1, unless shown on the plans.

**Table 1**  
**Material Requirements**

Property	Test Method	Grade 1	Grade 2	Grade 3	Grade 4
Master gradation sieve size (% retained)	Tex-110-E				As shown on the plans
2-1/2 in.		–	0	0	
1-3/4 in.		0	0–10	0–10	
7/8 in.		10–35	–	–	
3/8 in.		30–50	–	–	
No. 4		45–65	45–75	45–75	
No. 40		70–85	60–85	50–85	
Liquid limit, % max. <sup>1</sup>	Tex-104-E	35	40	40	As shown on the plans
Plasticity index, max. <sup>1</sup>	Tex-106-E	10	12	12	As shown on the plans
Plasticity index, min. <sup>1</sup>		As shown on the plans			
Wet ball mill, % max. <sup>2</sup>	Tex-116-E	40	45	–	As shown on the plans
Wet ball mill, % max. increase passing the No. 40 sieve		20	20	–	
Classification <sup>3</sup>	Tex-117-E	1.0	1.1–2.3	–	As shown on the plans
Min. compressive strength <sup>3</sup> , psi					As shown on the plans
lateral pressure 0 psi		45	35	–	
lateral pressure 15 psi		175	175	–	

1. Determine plastic index in accordance with Tex-107-E (linear shrinkage) when liquid limit is unattainable as defined in Tex-104-E.
2. When a soundness value is required by the plans, test material in accordance with Tex-411-A.
3. Meet both the classification and the minimum compressive strength, unless otherwise shown on the plans.

**1. Material Tolerances.** The Engineer may accept material if no more than 1 of the 5 most recent gradation tests has an individual sieve outside the specified limits of the gradation. When target grading is required by the plans, no single failing test may exceed the master grading by more than 5 percentage points on sieves No. 4 and larger or 3 percentage points on sieves smaller than No. 4.

The Engineer may accept material if no more than 1 of the 5 most recent plasticity index tests is outside the specified limit. No single failing test may exceed the allowable limit by more than 2 points.

**2. Material Types.** Do not use fillers or binders unless approved. Furnish the type specified on the plans in accordance with the following.

**a.** Type A. Crushed stone produced and graded from oversize quarried aggregate that originates from a single, naturally occurring source. Do not use gravel or multiple sources.

**b.** Type B. Crushed or uncrushed gravel. Blending of 2 or more sources is allowed.

**c.** Type C. Crushed gravel with a minimum of 60% of the particles retained on a No. 4 sieve with 2 or more crushed faces as determined by Tex-460-A, Part I. Blending of 2 or more sources is allowed.

**d.** Type D. Type A material or crushed concrete. Crushed concrete containing gravel will be considered Type D material. Crushed concrete must meet the requirements in Section 02601.2.A.3.b, "Recycled Material (Including Crushed Concrete) Requirements," and be managed in a way to provide for uniform quality. The Engineer may require separate dedicated stockpiles in order to verify compliance.

**e.** Type E. As shown on the plans.

**3. Recycled Material.** Recycled asphalt pavement (RAP) and other recycled materials may be used when shown on the plans. Request approval to blend 2 or more sources of recycled materials.

**a. Limits on Percentage.** When RAP is allowed, do not exceed 20% RAP by weight unless otherwise shown on the plans. The percentage limitations for other recycled materials will be as shown on the plans.

**b. Recycled Material (Including Crushed Concrete) Requirements.**

**(1) Contractor Furnished Recycled Materials.** When the Contractor furnishes

the recycled materials, including crushed concrete, the final product will be subject to the requirements of Table 1 for the grade specified. Certify compliance with DMS-11000, "Evaluating and Using Nonhazardous Recyclable Materials Guidelines," for Contractor furnished recycled materials. In addition, recycled materials must be free from reinforcing steel and other objectionable material and have at most 1.5% deleterious material when tested in accordance with Tex-413-A. For RAP, do not exceed a maximum percent loss from decantation of 5.0% when tested in accordance with Tex-406-A. Test RAP without removing the asphalt.

**(2) Department Furnished Required Recycled Materials.**

When the Department furnishes and requires the use of recycled materials, unless otherwise shown on the plans:

- Department required recycled material will not be subject to the requirements in Table 1,
- Contractor furnished materials are subject to the requirements in Table 1 and this Item,
- the final product, blended, will be subject to the requirements in Table 1, and
- for final product, unblended (100% Department furnished required recycled material), the liquid limit, plasticity index, wet ball mill, classification, and compressive strength is waived.

Crush Department-furnished RAP so that 100% passes the 2 in. sieve. The Contractor is responsible for uniformly blending to meet the percentage required.

**(3) Department Furnished and Allowed Recycled Materials.** When the Department furnishes and allows the use of recycled materials or allows the Contractor to furnish recycled materials, the final blended product is subject to the requirements of Table 1 and the plans.

c. **Recycled Material Sources.** Department-owned recycled material is available to the Contractor only when shown on the plans. Return unused Department-owned recycled materials to the Department stockpile location designated by the Engineer unless otherwise shown on the plans. The use of Contractor-owned recycled materials is allowed when shown on the plans. Contractor-owned surplus recycled materials remain the property of the Contractor. Remove Contractor-owned recycled materials from the project and dispose of them in accordance with federal, state, and local regulations before project acceptance. Do not intermingle Contractor-owned recycled material with Department-owned recycled material unless approved by the Engineer.

**B. Water.** Furnish water free of industrial wastes and other objectionable matter.

**C. Material Sources.** When non-commercial sources are used, expose the vertical faces of all strata of material proposed for use. Secure and process the material by successive vertical cuts extending through all exposed strata, when directed.

**02601.3. Equipment.** Provide machinery, tools, and equipment necessary for proper execution of the work. Provide rollers in accordance with Item 210, "Rolling." Provide proof rollers in accordance with Item 216, "Proof Rolling," when required.

**02601.4. Construction.** Construct each layer uniformly, free of loose or segregated areas, and with the required density and moisture content. Provide a smooth surface that conforms to the typical sections, lines, and grades shown on the plans or as directed. Stockpile base material temporarily at an approved location before delivery to the roadway. Build stockpiles in layers no greater than 2 ft. thick. Stockpiles must have a total height between 10 and 16 ft. unless otherwise shown on the plans. After construction and acceptance of the stockpile, loading from the stockpile for delivery is allowed. Load by making successive vertical cuts through the entire depth of the stockpile. Do not add or remove material from temporary stockpiles that require sampling and testing before delivery unless otherwise approved. Charges for additional sampling and testing required as a result of adding or removing material will be deducted from the Contractor's estimates. Haul approved flexible base in clean trucks. Deliver the required quantity to each 100-ft. station or designated stockpile site as shown on the plans. Prepare stockpile sites as directed. When delivery is to the 100-ft. station, manipulate in accordance with the applicable Items.

- A. Preparation of Subgrade or Existing Base.** Remove or scarify existing asphalt concrete pavement in accordance with Item 105, "Removing Stabilized Base and Asphalt Pavement," when shown on the plans or as directed. Shape the subgrade or existing base to conform to the typical sections shown on the plans or as directed. When new base is required to be mixed with existing base, deliver, place, and spread the new flexible base in the required amount per station. Manipulate and thoroughly mix the new base with existing material to provide a uniform mixture to the specified depth before shaping. When shown on the plans or directed, proof roll the roadbed in accordance with Item 216, "Proof Rolling," before pulverizing or scarifying. Correct soft spots as directed.
- B. Placing.** Spread and shape flexible base into a uniform layer with an approved spreader the same day as delivered unless otherwise approved. Construct layers to the thickness shown on the plans. Maintain the shape of the course. Control dust by sprinkling, as directed. Correct or replace segregated areas as directed, at no additional expense to the Department. Place successive base courses and finish courses using the same construction methods required for the first course.
- C. Compaction.** Compact using density control unless otherwise shown on the plans. Multiple lifts are permitted when shown on the plans or approved. Bring each layer to the moisture content directed. When necessary, sprinkle the material in accordance with Item 204, "Sprinkling." Begin rolling longitudinally at the sides and proceed towards the center, overlapping on successive trips by at least 1/2 the width of the roller unit. On superelevated curves, begin rolling at the low side and progress toward the high side. Offset alternate trips of the roller. Operate rollers at a speed between 2 and 6 mph as directed. Rework, recompact, and refinish material that fails to meet or that loses required moisture, density, stability, or finish before the next course is placed or the project is accepted. Continue work until specification requirements are met. Perform the work at no

additional expense to the Department.

**1. Ordinary Compaction.** Roll with approved compaction equipment as directed. Correct irregularities, depressions, and weak spots immediately by scarifying the areas affected, adding or removing approved material as required, reshaping, and recompacting.

**2. Density Control.** Compact to at least 100% of the maximum density determined by Tex-113-E unless otherwise shown on the plans. Determine the moisture content of the material at the beginning and during compaction in accordance with Tex-103-E. The Engineer will determine roadway density of completed sections in accordance with Tex-115-E. The Engineer may accept the section if no more than 1 of the 5 most recent density tests is below the specified density and the failing test is no more than 3 pcf below the specified density.

**D. Finishing.** After completing compaction, clip, skin, or tight-blade the surface with a maintainer or subgrade trimmer to a depth of approximately 1/4 in. Remove loosened material and dispose of it at an approved location. Seal the clipped surface immediately by rolling with a pneumatic tire roller until a smooth surface is attained. Add small increments of water as needed during rolling. Shape and maintain the course and surface in conformity with the typical sections, lines, and grades as shown on the plans or as directed. In areas where surfacing is to be placed, correct grade deviations greater than 1/4 in. in 16 ft. measured longitudinally or greater than 1/4 in. over the entire width of the cross-section. Correct by loosening, adding, or removing material. Reshape and recompact in accordance with Section 02601.4.C, "Compaction."

**E. Curing.** Cure the finished section until the moisture content is at least 2 percentage points below optimum or as directed before applying the next successive course or prime coat.

#### **02601.5. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **00529 – CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER**

*(Referenced from 2004 TxDOT, ITEM 529 Concrete Curb, Gutter, and Combined Curb and Gutter – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**00529.1. DESCRIPTION.** Construct hydraulic cement concrete curb, gutter, and combined curb and gutter.

**00529.2. MATERIALS.** Furnish materials conforming to:

- Item 360, “Concrete Pavement”
- Item 420, “Concrete Structures”
- Item 421, “Hydraulic Cement Concrete”
- Item 440, “Reinforcing Steel.”

Use Class A concrete or material specified in the plans. Use Grade 8 coarse aggregate for extruded Class A concrete. Use other grades if approved by the Engineer.

**529.3. CONSTRUCTION.** Provide finished work with a well-compacted mass and a surface free from voids and honeycomb, in the required shape, line, and grade. Round exposed edges with an edging tool of the radius shown on the plans. Mix, place, and cure concrete in accordance with Item 420, “Concrete Structures.” Construct joints at locations shown on the plans. Cure for at least 72 hr. Furnish and place reinforcing steel in accordance with Item 440, “Reinforcing Steel.” Set and maintain a guideline that conforms to alignment data shown on the plans, with an outline that conforms to the details shown on the plans.

**A. Conventionally Formed Concrete.** Shape and compact subgrade, foundation, or pavement surface to the line, grade, and cross section shown on the plans. Lightly sprinkle subgrade or foundation material immediately before concrete placement. Pour concrete into forms, and strike off with a template 1/4 to 3/8 in. less than the dimensions of the finished curb unless otherwise approved. After initial set, plaster surface with mortar consisting of 1 part hydraulic cement and 2 parts fine aggregate. Brush exposed surfaces to a uniform texture.

Place curbs, gutters, and combined curb and gutters in 50-ft. maximum sections unless otherwise approved.

**B. Extruded or Slipformed Concrete.** Hand-tamp and sprinkle subgrade or foundation material before concrete placement. Provide clean surfaces for concrete placement. If required, coat cleaned surfaces with approved adhesive or coating at the rate of application shown on the plans or as directed. Place concrete with approved self-propelled equipment. The forming tube of the extrusion machine or the form of the slipform machine must be easily adjustable vertically during the forward motion of the machine to provide variable heights necessary to conform to the

established gradeline.

Attach a pointer or gauge to the machine so that a continual comparison can be made between the extruded or slipform work and the grade guideline. Other methods may be used when approved.

Finish surfaces immediately after extrusion or slipforming.

#### **00529.4. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **00421 – HYDRAULIC CEMENT CONCRETE**

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*(Referenced from 2004 TxDOT, ITEM 421 Hydraulic Cement Concrete – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**00421.1. DESCRIPTION.** Furnish hydraulic cement concrete for concrete pavements, concrete structures, and other concrete construction.

### **00421.2. MATERIALS.**

**A. Cement.** Furnish cement conforming to DMS-4600, “Hydraulic Cement.”

#### **B. Supplementary Cementing Materials (SCM).**

**1. Fly Ash.** Furnish fly ash conforming to DMS-4610, “Fly Ash.”

**2. Ultra-Fine Fly Ash (UFFA).** Furnish UFFA conforming to DMS-4610, “Fly Ash.”

**3. Ground Granulated Blast-Furnace Slag (GGBFS).** Furnish GGBFS conforming to DMS-4620, “Ground Granulated Blast- Furnace Slag,” Grade 100 or 120.

**4. Silica Fume.** Furnish silica fume conforming to DMS-4630, “Silica Fume.”

**5. Metakaolin.** Furnish metakaolin conforming to DMS-4635, “Metakaolin.”

**C. Chemical Admixtures.** Furnish admixtures conforming to DMS-4640, “Chemical Admixtures for Concrete.” Do not use calcium chloride.

**D. Water.** Furnish mixing and curing water that is free from oils, acids, organic matter, or other deleterious substances. Water from municipal supplies approved by the Texas Department of Health will not require testing. When using water from other sources, provide test reports showing compliance with Table 1 before use. Water that is a blend of concrete wash water and other acceptable water sources, certified by the concrete producer as complying with the requirements of both Table 1 and Table 2, may be used as mix water. Test the blended water weekly for 4 weeks for compliance with Table 1 and Table 2 or provide previous test results. Then test every month for compliance. Provide water test results upon request.

**Table 1**  
**Chemical Limits for Mix Water**

Contaminant	Test Method	Maximum Concentration (ppm)
Chloride (Cl)	ASTM D 512	
Prestressed concrete		500
Bridge decks & superstructure		500
All other concrete		1,000
Sulfate (SO <sub>4</sub> )	ASTM D 516	1,000
Alkalies (Na <sub>2</sub> O + 0.658K <sub>2</sub> O)	ASTM D 4191 & ASTM D 4192	600
Total solids	AASHTO T 26	50,000

**Table 2**  
**Acceptance Criteria for Questionable Water Supplies**

Property	Test Method	Limits
Compressive strength, min % control at 7 days	ASTM C 109 <sup>1</sup>	90
Time of set, deviation from control, Min.	ASTM C 191 <sup>1</sup>	from 60 early to 90 later

1. Base comparisons on fixed proportions and the same volume of test water compared to the control mix using city water or distilled water.

Do not use mix water that has an adverse effect on the air-entraining agent, on any other chemical admixture, or on strength or time of set of the concrete. When using white hydraulic cement, use mixing and curing water free of iron and other impurities that may cause staining or discoloration.

**E. Aggregate.** Supply aggregates that meet the definitions in Tex-100-E. Provide coarse and fine aggregates from sources listed in the Department's Concrete Rated Source Quality Catalog (CRSQC).

Provide aggregate from non-listed sources only when tested and approved by the Engineer before use. Allow 30 calendar days for the Engineer to sample, test, and report results for non-listed sources. Do not combine approved material with unapproved material.

- 1. Coarse Aggregate.** Provide coarse aggregate consisting of durable particles of gravel, crushed blast furnace slag, recycled crushed hydraulic cement concrete, crushed stone, or combinations thereof that are free from frozen material and from injurious amounts of

salt, alkali, vegetable matter, or other objectionable material, either free or as an adherent coating. Provide coarse aggregate of uniform quality throughout.

Provide coarse aggregate that, when tested in accordance with Tex-413-A, has:

- at most 0.25% by weight of clay lumps,
- at most 1.0% by weight of shale, and
- at most 5.0% by weight of laminated and friable particles.

Wear must not be more than 40% when tested in accordance with Tex-410-A. Unless otherwise shown on the plans, provide coarse aggregate with a 5-cycle magnesium sulfate soundness of not more than 18% when tested in accordance with Tex-411-A. Crushed recycled hydraulic cement concrete is not subject to the 5-cycle soundness test.

The loss by decantation as tested in accordance with Tex-406-A, plus the allowable weight of clay lumps, must not exceed 1.0% or the value shown on the plans, whichever is smaller. In the case of aggregates made primarily from crushing stone, if the material finer than the No. 200 sieve is established to be the dust of fracture and essentially free from clay or shale as established by Tex-406-A, Part III, the limit may be increased to 1.5%. When crushed limestone coarse aggregate is used in concrete pavements, the decant may exceed 1.0% but not more than 3.0% if the material finer than the No. 200 sieve is determined to be at least 67% calcium carbonate in accordance with Tex-406-A, Part III.

Unless otherwise specified, provide aggregate conforming to the gradation requirements shown in Table 3 when tested in accordance with Tex-401-A.

**Table 3**  
**Coarse Aggregate Gradation Chart**

Aggregate Grade No. <sup>1</sup>	Nominal Size	Percent Passing on Each Sieve								
		2-1/2"	2"	1-1/2"	1"	3/4"	1/2"	3/8"	No. 4	No. 8
1	2"	100	80-100	50-85		20-40			0-5	
2 (467)	1-1/2"		100	95-100		35-70		10-30	0-5	
3	1-1/2"		100	95-100		60-90	25-60		0-5	
4 (57)	1"			100	95-100		25-60		0-10	0-5
5 (67)	3/4"				100	90-100		20-55	0-10	0-5
6 (7)	1/2"					100	90-100	40-70	0-15	0-5
7	3/8"						100	70-95	0-25	
8	3/8"						100	95-100	20-65	0-10

1. Corresponding ASTM C 33 gradation shown in parentheses.

2. **Fine Aggregate.** Provide fine aggregate consisting of clean, hard, durable particles of natural or manufactured sand or a combination thereof with or without mineral filler. Provide fine aggregate free from frozen material and from injurious amounts of salt, alkali, vegetable matter, or other objectionable material, and containing no more than 0.5% clay lumps by weight in accordance with Tex-413-A.

Provide fine aggregate that does not show a color darker than standard when subjected to the color test for organic impurities in accordance with Tex-408-A. Unless otherwise shown on the plans, use fine aggregate with an acid insoluble residue of at least 60% by weight when tested in accordance with Tex-612-J in all concrete subject to direct traffic.

Unless otherwise shown on the plans, when necessary, blend the fine aggregate to meet the acid insoluble residue requirement.

When blending, use the following equation:

Acid Insoluble (%) =  $\{(AI)(P1)+(A2)(P2)\}/100$  where:

$A1$  = acid insoluble (%) of aggregate 1

$A2$  = acid insoluble (%) of aggregate 2

$P1$  = percent by weight of  $A1$  of the fine aggregate blend

$P2$  = percent by weight of  $A2$  of the fine aggregate blend.

Provide fine aggregate or combinations of aggregates, including mineral filler, conforming to the gradation requirements shown in

**Table 4**  
**Fine Aggregate Gradation Chart (Grade 1)**

Sieve Size	Percent Passing
3/8 in.	100
No. 4	95–100
No. 8	80–100
No. 16	50–85
No. 30	25–65
No. 50	10–35 <sup>1</sup>
No. 100	0–10
No. 200	0–3 <sup>2</sup>

1. 6–35 when sand equivalent value is greater than 85.

2. 0–6 for manufactured sand.

Unless otherwise shown on the plans, provide fine aggregate with a sand equivalent of at least 80 in accordance with Tex-203-F. For all classes of concrete except Class K, provide fine aggregate with a fineness modulus between 2.30 and 3.10 as determined by Tex-402-A. For Class K concrete, provide a fine aggregate with a fineness modulus between 2.60 to 2.80 unless otherwise shown on the plans.

3. **Mineral Filler.** Provide mineral filler consisting of stone dust, clean crushed sand, or other approved inert material with 100% passing the No. 30 sieve and 65 to 100% passing the No. 200 sieve when tested in accordance with Tex-401-A.

**F. Mortar and Grout.** When required or shown on the plans, provide mortar and grout consisting of 1 part hydraulic cement, 2 parts sand, and sufficient water to provide the desired consistency. Provide mortar with a consistency such that the mortar can be easily handled and spread by trowel. Provide grout of a consistency that will flow into and completely fill all voids.

### 00421.3. EQUIPMENT.

**A. Concrete Plants and Mixing Equipment.** Except for volumetric mixers (auger/mixer), each plant and truck mixer must be currently certified by the National Ready Mixed Concrete Association (NRMCA) or have an inspection report signed and sealed by a licensed professional engineer showing that concrete measuring, mixing, and delivery equipment meets all requirements of ASTM C 94. A new certification or signed and sealed report is required every time a plant is moved. Plants with a licensed engineer's inspection require reinspection every 2 years. Provide a copy of the certification or the signed and sealed inspection report to the Engineer. When equipment or facilities fail to meet specification requirements, remove them from service until corrected.

1. **Scales.** Check all scales prior to beginning of operations, after each move, or whenever their accuracy or adequacy is questioned, and at least once every 6 mo. Immediately correct deficiencies, and recalibrate. Provide a record of calibration showing scales in compliance with ASTM C 94 requirements. Check batching accuracy of volumetric water batching devices and admixture dispensing devices at least every 90 days. Perform daily checks as necessary to ensure measuring accuracy.
2. **Volumetric Mixers.** Provide volumetric mixers with rating plates defining the capacity and the performance of the mixer in accordance with the Volumetric Mixer Manufacturers Bureau or equivalent. Provide volumetric mixers that comply with ASTM C 685. Provide test data showing mixers meet the uniformity test requirements of Tex-472-A.
3. **Agitators and Truck and Stationary Mixers.** Inspect and furnish inspection reports on truck mixers and agitators annually. If an inspection within 12 mo. is not practical, a 2-mo. grace period (for a maximum of 14 mo. between inspections) is permitted. Include in the report the condition of blades and fins and their percent wear from the original manufacturer's design. Repair mixing equipment exhibiting 10% or more wear before

use. Provide truck mixers and agitators equipped with means to readily verify the number of revolutions of the drum, blades, or paddles.

Provide stationary and truck mixers capable of combining the ingredients of the concrete within the specified time or the number of revolutions specified into a thoroughly mixed and uniform mass and capable of discharging the concrete so that at least 5 of the 6 requirements of Tex-472-A are met. As directed, to resolve issues of mix uniformity and mixer performance, perform concrete uniformity tests on mixers or agitators in accordance with Tex-472-A.

Perform the mixer or agitator uniformity test at the full rated capacity of the equipment and within the maximum mixing time or maximum number of revolutions. Remove from service all equipment that fails the uniformity test.

Inspect and maintain mixers and agitators. Keep them reasonably free of concrete buildup, and repair or replace worn or damaged blades or fins.

Ensure all mixers have a plate affixed showing manufacturer's recommended operating speed and rated capacity for mixing and agitating.

**B. Hauling Equipment.** Provide hauling equipment capable of maintaining the mixed concrete in a thoroughly mixed and uniform mass and of discharging the concrete with a satisfactory degree of uniformity.

When using non-agitating equipment for transporting concrete, provide equipment with smooth, mortar-tight metal containers equipped with gates that prevent accidental discharge of the concrete.

**C. Testing Equipment.** Unless otherwise shown on the plans or specified, in accordance with the pertinent test procedure, furnish and maintain:

- test molds,
- curing facilities,
- maturity meters if used, and
- wheelbarrow or other container acceptable for the sampling of the concrete.

Provide strength-testing equipment in accordance with the Contract controlling test unless shown otherwise.

#### **00421.4. CONSTRUCTION.**

**A. Classification and Mix Design.** Furnish mix designs using ACI 211, "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete," or other approved procedures for the classes of concrete required in accordance with Table 5. Do not exceed the maximum water-to-cementitious-material ratio.

A higher-strength class of concrete with equal or lower water-to-cementitious-material ratio may be substituted for the specified class of concrete.

To account for production variability and ensure minimum compressive strength requirements are met, over-design the mix in accordance with Table 6.

- 1. Cementitious Materials.** Use cementitious materials from prequalified sources; otherwise, request sampling and testing for approval before use. Unless otherwise specified or approved, limit cementitious material content to no more than 700 lb. per cubic yard. When supplementary cementing materials are used, “cement” is defined as “cement plus supplementary cementing material.” Use Type III cement only in precast concrete or when specified or permitted.

For monolithic placements, use cement of the same type and from the same source. When sulfate-resistant concrete is required, use mix design options 1, 2, 3, or 4 given in Section 421.4.A.6, “Mix Design Options,” using Type I/II, II, V, IP, or IS cement. Do not use Class C fly ash in sulfate-resistant concrete. Do not use supplementary cementing materials when white hydraulic cement is specified.

**Table 5  
Concrete Classes**

Class of Concrete	Design Strength, Min. 28-day $f'_c$ (psi)	Maximum W/C Ratio <sup>1</sup>	Coarse Aggregate Grades <sup>2,3</sup>	General Usage <sup>4</sup>
A	3,000	0.60	1-4, 8	Inlets, manholes, curb, gutter, curb & gutter, conc. retards, sidewalks, driveways, backup walls, anchors
B	2,000	0.60	2-7	Riprap, small roadside signs, and anchors
C <sup>5</sup>	3,600	0.45	1-6	Drilled shafts, bridge substructure, bridge railing, culverts except top slab of direct traffic culverts, headwalls, wing walls, approach slabs, concrete traffic barrier (cast-in-place)
D	1,500	0.60	2-7	Riprap
E	3,000	0.50	2-5	Seal concrete
F <sup>5</sup>	Note 6	0.45	2-5	Railroad structures; occasionally for bridge piers, columns, or bents
H <sup>5</sup>	Note 6	0.45	3-6	Prestressed concrete beams, boxes, piling, and concrete traffic barrier (precast)
S <sup>5</sup>	4,000	0.45	2-5	Bridge slabs, top slabs of direct traffic culverts
P	See Item 360	0.45	2-3	Concrete pavement
DC <sup>5</sup>	5,500	0.40	6	Dense conc. overlay
CO <sup>5</sup>	4,600	0.40	6	Conc. overlay
LMC <sup>5</sup>	4,000	0.40	6-8	Latex-modified concrete overlay
SS <sup>5</sup>	Note 7	0.45	4-6	Slurry displacement shafts, underwater drilled shafts
K <sup>5</sup>	Note 6	0.45	Note 6	Note 6
HES	Note 6	0.45	Note 6	Note 6

1. Maximum water-cement or water-cementitious ratio by weight.
2. Unless otherwise permitted, do not use Grade 1 coarse aggregate except in massive foundations with 4-in. minimum clear spacing between reinforcing steel bars. Do not use Grade 1 aggregate in drilled shafts.
3. Unless otherwise approved, use Grade 8 aggregate in extruded curbs.
4. For information only.
5. Structural concrete classes.
6. As shown on the plans or specified.
7. Cementitious material content shall be minimum 658 lb/cy of concrete.

**Table 6**  
**Over Design to Meet Compressive Strength Requirements<sup>1</sup>**

No. of Tests <sup>2,3</sup>	Standard Deviation, psi				
	300	400	500	600	700
15	470	620	850	1,120	1,390
20	430	580	760	1,010	1,260
30 or more	400	530	670	900	1,130

1. When designing the mix, add the tabulated amounts to the minimum design strength in Table 5.

2. Number of tests of a concrete mixture used to estimate the standard deviation of a concrete production facility. Test of another mix within 1,000 psi of the specified strength may be used.

3. If less than 15 prior tests are available, the overdesign should be 1,000 psi for specified strength less than 3,000 psi, 1,200 psi for specified strengths from 3,000 to 5,000 psi and 1,400 psi for specified strengths greater than 5,000 psi.

2. **Aggregates.** Limit the use of recycled crushed hydraulic cement concrete as a coarse or fine aggregate to Class A, B, D, E, and P concrete. Limit recycled crushed concrete fine aggregate to a maximum of 20% of the fine aggregate. When white hydraulic cement is specified, use light-colored aggregates.
3. **Chemical Admixtures.** Use only preapproved concrete chemical admixtures from the list of prequalified concrete admixtures maintained by the Construction Division. Submit non-preapproved admixtures for testing to the Engineer for approval. Do not use high-range water-reducing admixtures (Type F or G) or accelerating admixtures (Type C or E) in bridge deck concrete.
4. **Air Entrainment.** Air-entrain all concrete except for Class B in accordance with Table 7 unless otherwise shown on the plans. Use moderate exposure values unless otherwise specified. If the air content is more than 1-1/2 percentage points below or 3 percentage points above the required air, the load of concrete will be rejected. If the air content is more than 1-1/2 but less than 3 percentage points above the required air, the concrete may be accepted based on strength tests.

**Table 7**  
**Air Entrainment**

Nominal Maximum Aggregate Size, in.	% Air <sup>1</sup>	
	Moderate Exposure	Severe Exposure
3/8 (Grades 7 & 8)	6	7-1/2
1/2 (Grade 6)	5-1/2	7
3/4 (Grade 5)	5	6
1 (Grade 4)	4-1/2	6
1-1/2 (Grades 2 & 3)	4-1/2	5-1/2
2 (Grade 1)	4	5

1. For specified concrete strengths above 5,000 psi a reduction of 1 percentage point is permitted.

5. **Slump.** Unless otherwise specified, provide concrete slump in accordance with Table 8 using the lowest slump possible that can be placed and finished efficiently without segregation or honeycombing. Concrete that exceeds the maximum acceptable placement slump at time of delivery will be rejected. When approved, the slump of a given concrete mix may be increased above the values shown in Table 8 using chemical admixtures, provided that the admixture-treated concrete has the same or lower water-cement or water-cementitious-material ratio and does not exhibit segregation or excessive bleeding. Request approval for the mix design sufficiently in advance for proper evaluation by the Engineer.

**Table 8  
Slump Requirements**

Concrete Designation	Recommended Design and Placement Slump, in.	Maximum Acceptable Placement Slump, in.
Drilled shafts	See Item 416	See Item 416
Thin walled section (9 in. or less)	4	6-1/2
Approach slabs, concrete overlays, caps, columns, piers, wall sections (over 9 in.)	3	5
Bridge slabs	4	5-1/2
Prestressed concrete members <sup>1</sup>	4	6-1/2
Concrete traffic barrier, concrete bridge railing	4	6-1/2
Dense concrete overlay	3/4	2
Latex-modified conc. for bridge deck overlays	3	7-1/2
Concrete placed underwater	6	8-1/2
Concrete pavement (slip-formed)	1-1/2	3
Concrete pavement (formed)	4	6-1/2
Riprap, curb, gutter, slip-formed, and extruded concrete	As approved	As approved

1. If a high-range water reducer (HRWR) is used, maximum acceptable placement slump will be 9 in.

6. **Mix Design Options.** For structural concrete identified in Table 5 and any other class of concrete designed using more than 520 lb. of cementitious material per cubic yard, use one of the mix design Options 1–8 shown below. For concrete classes not identified as structural concrete and designed using less than 520 lb. of cementitious material per cubic yard, use one of the mix design Options 1–8 shown in Table 5, except that Class C fly ash may be used instead of Class F fly ash for Options 1, 3, and 4 unless sulfate-resistant concrete is required.

a. **Option 1.** Replace 20 to 35% of the cement with Class F fly ash.

b. **Option 2.** Replace 35 to 50% of the cement with GGBFS.

**c. Option 3.** Replace 35 to 50% of the cement with a combination of Class F fly ash, GGBFS, or silica fume. However, no more than 35% may be fly ash, and no more than 10% may be silica fume.

**d. Option 4.** Use Type IP or Type IS cement. (Up to 10% of a Type IP or Type IS cement may be replaced with Class F fly ash, GGBFS, or silica fume.)

**e. Option 5.** Replace 35 to 50% of the cement with a combination of Class C fly ash and at least 6% of silica fume, UFFA, or metakaolin. However, no more than 35% may be Class C fly ash, and no more than 10% may be silica fume.

**f. Option 6.** Use a lithium nitrate admixture at a minimum dosage of 0.55 gal. of 30% lithium nitrate solution per pound of alkalis present in the hydraulic cement.

**g. Option 7.** When using hydraulic cement only, ensure that the total alkali contribution from the cement in the concrete does not exceed 4.00 lb. per cubic yard. of concrete when calculated as follows:

$$\text{lb. alkali per cu. yd.} = \frac{(\text{lb. cement per cu. yd.}) \times (\% \text{ Na}_2\text{O equivalent in cement})}{100}$$

In the above calculation, use the maximum cement alkali content reported on the cement mill certificate.

**h. Option 8.** For any deviations from Options 1–7, perform the following:

- Test both coarse and fine aggregate separately in accordance with ASTM C 1260, using 440 g of the proposed cementitious material in the same proportions of hydraulic cement to supplementary cementing material to be used in the mix.
- Before use of the mix, provide the certified test report signed and sealed by a licensed professional engineer demonstrating that the ASTM C 1260 test result for each aggregate does not exceed 0.10% expansion.

**B. Trial Batches.** Perform all preliminary trial batches and testing necessary to substantiate the proposed mix designs, and provide documentation including mix design, material proportions, and test results substantiating that the mix design conforms to specification requirements. Make all final trial batches using the proposed ingredients in a mixer that is representative of the mixers to be used on the job. Make the batch size at least 50% of the mixer's rated capacity. Perform fresh concrete tests for air and slump, and make, cure, and test strength specimens for compliance with specification requirements. Test at least 3 sets of design strength specimens with 2 specimens per set in accordance with Tex-418-A or Tex-448-A for each test age. Before placing, provide the Engineer the option of witnessing final trial batches, including the testing of the concrete. If not provided this option, the Engineer may require additional trial batches, including testing, before the concrete is placed.

Establish 7-day compressive strength target values using the following formula for each concrete mix to be used:

$$\text{Target value} = \text{Minimum design strength} \times \frac{7\text{-day avg. trial batch strength}}{28\text{-day avg. trial batch strength}}$$

When there are changes in aggregates or in type, brand, or source of cement, SCM, or chemical admixtures, reevaluate the mix as a new mix design. A change in vendor does not necessarily constitute a change in materials or source. When only the brand or source of cement is changed and there is a prior record of satisfactory performance of the cement with the ingredients, new trial batches may be waived by the Engineer. When the maturity method is specified or permitted, establish the strength–maturity relationship in accordance with Tex-426-

A. When using the maturity method any changes in any of the ingredients, including changes in proportions, will require the development of a new strength–maturity relationship for the mix.

### C. Storage of Materials.

1. **Cement, Supplementary Cementing Materials, and Mineral Filler.** Store all cement, supplementary cementing materials, and mineral filler in weatherproof enclosures that will protect them from dampness or absorption of moisture. When permitted, small quantities of sacked cement may be stored in the open, on a raised platform, and under waterproof covering for up to 48 hours.
2. **Aggregates.** Handle and store concrete aggregates in a manner that prevents contamination with foreign materials. If the aggregates are stored on the ground, clear the sites for the stockpiles of all vegetation, level the sites, and do not use the bottom 6-in. layer of aggregate without cleaning the aggregate before use. When conditions require the use of 2 or more grades of coarse aggregates, maintain separate stockpiles and prevent intermixing.

Where space is limited, separate the stockpiles using physical barriers. Store aggregates from different sources in different stockpiles unless the Engineer authorizes pre-blending of the aggregates. Minimize segregation in stockpiles. Remix and test stockpiles when segregation is apparent. Sprinkle stockpiles to control moisture and temperature as necessary. Maintain reasonably uniform moisture content in aggregate stockpiles.

3. **Admixtures.** Store admixtures in accordance with manufacturer's recommendations and prevent admixtures from freezing.

**D. Measurement of Materials.** Except for volumetric mixers, measure concrete materials by weight. Measure mixing water, consisting of water added to the batch, ice added to the batch, water occurring as surface moisture on the aggregates, and water introduced in the form of admixtures, by volume or weight. Measure ice by weight. Measure cement and supplementary cementing materials in a weigh hopper and on a separate scale from those used for other materials. Measure the cement first when measuring the cumulative weight. Measure concrete chemical admixtures in powdered form by weight. Measure concrete chemical admixtures in liquid form by weight or volume. Measure batch materials within the tolerances of Table 9.

**Table 9**  
**Measurement Tolerances – Non-Volumetric Mixers**

Material	Tolerance (%)
Cement, wt.	±1
Mineral admixture, wt.	±1
Cement + SCM (cumulative weighing), wt.	±1
Water, wt. or volume	±3
Fine aggregate, wt.	±2
Coarse aggregate, wt.	±2
Fine + coarse aggregate (cumulative weighing), wt.	±1
Chemical admixtures, wt. or volume	±3

When measuring cementitious materials at less than 30% of scale capacity, ensure that the quantity measured is accurate to not less than the required amount and not more than 4% in excess. When measuring aggregates in a cumulative weigh batcher at less than 30% of the scale capacity, ensure that the cumulative quantity is measured accurate to ±0.3% of scale capacity or ±3% of the required cumulative weight, whichever is less. For volumetric mixers, base tolerances on volume-weight relationship established by calibration, and measure the various ingredients within the tolerances of Table 10.

Correct batch weight measurements for moisture. When approved, under special circumstances, measure cement in bags of standard weight. Weighing of sacked cement is not required. Do not use fractional bags except for small hand-mixed batches of approximately 5 cu. ft. or less and when an approved method of volumetric or weight measurement is used.

**Table 10**  
**Measurement Tolerances – Volumetric Mixers**

Material	Tolerance
Cement, wt. %	0 to +4
SCM, wt. %	0 to +4
Fine aggregate, wt. %	±2
Coarse aggregate, wt. %	±2
Admixtures, wt. or volume %	±3
Water, wt. or volume %	±1

**E. Mixing and Delivering Concrete.** Mix and deliver concrete by means of one of the following operations:

- central-mixed,
- shrink-mixed,
- truck-mixed,
- volumetric mixer-mixed, or
- hand-mixed.

Operate mixers and agitators within the limits of the rated capacity and speed of rotation for mixing and agitation as designated by the manufacturer of the equipment. For shrink-mixed and truck-mixed concrete, when there is a reason to suspect the uniformity of concrete delivered using a truck mixer or truck agitator, conduct slump tests of 2 individual samples taken after discharging approximately 15% and 85% of the load as a quick check of the probable degree of uniformity. Take the 2 samples within an elapsed time of at most 15 min. If the slumps of the 2 samples differ by more than the values shown in Table 11, investigate the causes and take corrective actions including adjusting the batching sequence at the plant and the mixing time and number of revolutions. Delivery vehicles that fail to meet the mixing uniformity requirements must not be used until the condition is corrected.

**Table 11**  
**Slump Tolerance<sup>1</sup>**

Average Slump	Slump Tolerance <sup>2</sup>
4 in. or less	1.0 in.
4 to 6 in.	1.5 in.

1. Do not apply these tolerances to the required slumps in Table 8.
2. Maximum permissible difference in results of test of samples from 2 locations in the concrete batch.

Re-tempering or adding concrete chemical admixtures is only permitted at the job site when concrete is delivered in a truck mixer. Do not add water after the introduction of mixing water at the batch plant except on arrival at the job site, with approval, to adjust the slump of the concrete. When this water is added, do not exceed the mix design water-cementitious-material ratio. Turn the drum or blades at least 30 additional revolutions at mixing speed to ensure thorough and uniform mixing of the concrete. Do not add water or chemical admixtures to the batch after any concrete has been discharged.

Maintain concrete delivery and placement rates sufficient to prevent cold joints. Before unloading, furnish the delivery ticket for the batch of concrete containing the information required on Department Form 596, "Concrete Batch Ticket." When the concrete contains silica fume, adjust mixing times and batching operations as necessary to ensure the material is completely and uniformly dispersed in the mix. The dispersion of the silica fume within the mix will be verified by the Construction Division, Materials and Pavements Section, using cylinders made from trial batches. If uniform dispersion is not achieved, make necessary changes to the batching operations until uniform and complete dispersion of the silica fume is achieved.

1. **Central-Mixed Concrete.** Provide concrete that is mixed completely in a stationary mixer. Mix concrete for a period of 1 min. for 1 cu. yd. and 15 sec. for each additional cu.

yd. of rated capacity of the mixer unless mixer performance test data demonstrate that shorter mixing times can be used to obtain a uniform mix in accordance with Tex-472-A. Count the mixing time from the time all the solid materials are in the drum. Charge the mixer so that some water will enter before the cement and aggregate. Ensure that all water is in the drum by the end of the first 1/4 of the specified mixing time. Adjust the mixing time if necessary to achieve a uniform mix. Concrete mixed completely in a stationary mixer must be delivered to the project in a truck mixer, truck agitator, or non-agitating delivery vehicle. When a truck mixer or truck agitator is used for transporting concrete, use the manufacturer's designated agitating speed for any turning during transportation. Non-agitating delivery vehicles must be clean and free of built-up concrete with adequate means to control concrete discharge. Deliver the concrete to the project in a thoroughly mixed and uniform mass, and discharge the concrete with a satisfactory degree of uniformity. Resolve questions regarding the uniformity of the concrete by testing when directed by the Engineer in accordance with Tex-472-A.

2. **Shrink-Mixed Concrete.** Provide concrete that is first partially mixed in a stationary mixer and then mixed completely in a truck mixer. Partially mix for the minimum time required to intermingle the ingredients in the stationary mixer, and then transfer to a truck mixer and mix the concrete at the manufacturer's designated mixing speed for an adequate amount of time to produce thoroughly mixed concrete. Deliver the concrete to the project in a thoroughly mixed and uniform mass, and discharge the concrete with a satisfactory degree of uniformity.
3. **Truck-Mixed Concrete.** Mix the concrete in a truck mixer from 70 to 100 revolutions at the mixing speed designated by the manufacturer to produce a uniform concrete mix. Deliver the concrete to the project in a thoroughly mixed and uniform mass and discharge the concrete with a satisfactory degree of uniformity. Additional mixing at the job site at the mixing speed designated by the manufacturer is allowed as long as concrete is discharged before the drum has revolved a total of 300 revolutions after the introduction of the mixing water to the cement and the aggregates.
4. **Volumetric Mixer-Mixed Concrete.** Unless otherwise specified or permitted, perform all mixing operations in accordance with manufacturer's recommended procedures. Provide an accurate method of measuring all ingredients by volume, and calibrate equipment to assure correct measurement of materials within the specified tolerances.
5. **Hand-Mixed Concrete.** When permitted, for small placements of less than 2 cu. yd., mix up to a 2-sack batch of concrete by hand methods or in a small motor-driven mixer. For such placements, proportion the mix by volume or weight.

**F. Placing, Finishing, and Curing Concrete.** Place, finish, and cure concrete in accordance with the pertinent Items.

**G. Sampling and Testing of Concrete.** Unless otherwise specified, all fresh and hardened concrete is subject to testing as follows:

1. **Sampling Fresh Concrete.** Provide all material to be tested. Fresh concrete will be sampled for testing at the discharge end if using belt conveyors or pumps. When it is impractical to sample at the discharge end, a sample will be taken at the time of discharge from the delivery equipment and correlation testing will be performed and documented to ensure specification requirements are met at the discharge end.
2. **Testing of Fresh Concrete.**
  - a. **Air Content.** Tex-414-A or Tex-416-A.
  - b. **Slump.** Tex-415-A.
  - c. **Temperature.** Tex-422-A.
  - d. **Making and Curing Strength Specimens.** Tex-447-A.
3. **Testing of Hardened Concrete.** Only compressive strength testing will be used unless otherwise specified or shown on the plans.
  - a. **Compressive Strength.** Tex-418-A.
  - b. **Flexural Strength.** Tex-448-A.
  - c. **Maturity.** Tex-426-a.
4. **Certification of Testing Personnel.** Contractor personnel performing testing must be either ACI-certified or qualified by a Department-recognized equivalent written and performance testing program for the tests being performed. Personnel performing these tests are subject to Department approval. Use of a commercial laboratory is permitted. All personnel performing testing using the maturity method must be qualified by a training program recognized by the Department before using this method on the job.
5. **Adequacy and Acceptance of Concrete.** The Engineer will sample and test the fresh and hardened concrete for acceptance. The test results will be reported to the Contractor and the concrete supplier. For any concrete that fails to meet the required strengths as outlined below, investigate the quality of the materials, the concrete production operations, and other possible problem areas to determine the cause. Take necessary actions to correct the problem including redesign of the concrete mix. The Engineer may suspend all concrete operations under the pertinent Items if the Contractor is unable to identify, document, and correct the cause of the low strengths in a timely manner. Resume concrete operations only after obtaining approval for any proposed corrective actions.
  - a. **Structural Concrete.** For concrete classes identified as structural concrete in Table 5, the Engineer will make and test 7-day and 28-day specimens. Acceptance will be based on the design strength given in Table 5. The Engineer will evaluate the adequacy of the concrete by comparing 7-day test results to the target value established in accordance with Section 421.4.B, "Trial Batches."
  - b. **All Other Concrete.** For concrete classes not identified as structural concrete in Table 5, the Engineer will make and test 7-day specimens. The Engineer will base acceptance

on the 7-day target value established in accordance with Section 421.4.B, "Trial Batches."

**6. Test Sample Handling.** Unless otherwise shown on the plans or directed, remove forms and deliver department test specimens to curing facilities, in accordance with pertinent test procedures. Clean and prepare forms for reuse.

#### **00421.4. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **00440 – REINFORCING STEEL**

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*(Referenced from 2004 TxDOT, ITEM 440 Reinforcing Steel – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**440.1. Description.** Furnish and place reinforcing steel of the sizes and details shown on the plans.

### **440.2. Materials.**

**A. Approved Mills.** Before furnishing steel, producing mills of reinforcing steel for the Department must be pre-approved in accordance with DMS-7320, “Qualification Procedure for Reinforcing Steel Mills,” by the Construction Division, which maintains a list of approved producing mills. Reinforcing steel obtained from unapproved sources will not be accepted.

**B. Deformed Bar and Wire Reinforcement.** Unless otherwise shown on the plans, reinforcing steel must be Grade 60, and bar reinforcement must be deformed. Reinforcing steel must conform to one of the following:

- ASTM A 615, Grades 40 or 60;
- ASTM A 996, Type A, Grades 40 or 60;
- ASTM A 996, Type R, Grade 60, permitted in concrete pavement only (Furnish ASTM A 996, Type R bars as straight bars only and do not bend them. Bend tests are not required.); or
- ASTM A 706.

The provisions of this Item take precedence over ASTM provisions.

The nominal size, area, and weight of reinforcing steel bars covered by this Item are shown in Table 1. Designate smooth bars up to No. 4 by size number and above No. 4 by diameter in inches.

**Table 1**  
**Size, Area, and Weight of Reinforcing Steel Bars**

Bar Size Number (in.)	Bar Size Number (mm)	Diameter (in.)	Area (Sq. in.)	Weight per Ft.
3	10	0.375	0.11	0.376
4	13	0.500	0.20	0.668
5	16	0.625	0.31	1.043
6	19	0.750	0.44	1.502
7	22	0.875	0.60	2.044
8	25	1.000	0.79	2.670
9	29	1.128	1.00	3.400
10	32	1.270	1.27	4.303
11	36	1.410	1.56	5.313
14	43	1.693	2.25	7.650
18	57	2.257	4.00	13.60

Note: Bar size numbers (in.) are based on the number of eighths of an inch included in the nominal diameter of the bar. Bar size numbers (mm) approximate the number of millimeters included in the nominal diameter of the bar.

**C. Smooth Bar and Spiral Reinforcement.** Smooth bars and dowels for concrete pavement must have a minimum yield strength of 60 ksi and 644 meet ASTM A 615. For smooth bars that are larger than No. 3, provide steel conforming to ASTM A 615 or meet the physical requirements of ASTM A 36.

Spiral reinforcement may be smooth or deformed bars or wire of the minimum size or gauge shown on the plans. Bars for spiral reinforcement must comply with ASTM A 615, Grade 40; ASTM A 996, Type A, Grade 40; or ASTM A 675, Grade 80, meeting dimensional requirements of ASTM A 615. Smooth wire must comply with ASTM A 82, and deformed wire must comply with ASTM A 496.

**D. Weldable Reinforcing Steel.** Reinforcing steel to be welded must comply with ASTM A 706 or have a carbon equivalent (C.E.) of at most 0.55%. A report of chemical analysis showing the percentages of elements necessary to establish C.E. is required for reinforcing steel that does not meet ASTM A 706 to be structurally welded. These requirements do not pertain to miscellaneous welds on reinforcing steel as defined in Section 448.4.B.1.a, "Miscellaneous Welding Applications."

Calculate C.E. using the following formula:

$$C.E. = \%C + \frac{\%Mn}{6} + \frac{\%Cu}{40} + \frac{\%Ni}{20} + \frac{\%Cr}{10} - \frac{\%Mo}{50} - \frac{\%V}{10}$$

**E. Welded Wire Fabric.** For fabric reinforcement, use wire that conforms to ASTM A 82 or A 496. Use wire fabric that conforms to ASTM A 185 or A 497. Observe the relations shown in Table 2 among size number, diameter in inches, and area when ordering wire by size numbers, unless otherwise specified. Precede the size number for deformed wire with “D” and for smooth wire with “W.”

Designate welded wire fabric as shown in the following example: 6 × 12 – W16 × W8 (indicating 6-in. longitudinal wire spacing and 12-in. transverse wire spacing with smooth No. 16 wire longitudinally and smooth No. 8 wire transversely).

Table 2  
Wire Size Number, Diameter, and Area

Size Number (in.)	Size Number (mm)	Diameter (in.)	Area (sq. in.)
31	200	0.628	0.310
30	194	0.618	0.300
28	181	0.597	0.280
26	168	0.575	0.260
24	155	0.553	0.240
22	142	0.529	0.220
20	129	0.505	0.200
18	116	0.479	0.180
16	103	0.451	0.160
14	90	0.422	0.140
12	77	0.391	0.120
10	65	0.357	0.100
8	52	0.319	0.080
7	45	0.299	0.070
6	39	0.276	0.060
5.5	35	0.265	0.055
5	32	0.252	0.050
4.5	29	0.239	0.045
4	26	0.226	0.040
3.5	23	0.211	0.035
2.9	19	0.192	0.035
2.5	16	0.178	0.025
2	13	0.160	0.020
1.4	9	0.134	0.014
1.2	8	0.124	0.012
0.5	3	0.080	0.005

Note: Size numbers (in.) are the nominal cross-sectional area of the wire in hundredths of a square inch. Size numbers (mm) are the

nominal cross-sectional area of the wire in square millimeters. Fractional sizes between the sizes listed above are also available and acceptable for use.

**F. Epoxy Coating.** Epoxy coating will be required as shown on the plans. Before furnishing epoxy-coated reinforcing steel, an epoxy applicator must be pre-approved in accordance with DMS-7330, "Qualification Procedure for Reinforcing Steel Epoxy Coating Applicators." The Construction Division maintains a list of approved applicators.

Coat reinforcing steel in accordance with Table 3.

**Table 3**  
**Epoxy Coating Requirements for Reinforcing Steel**

Material	Specification
Bar	ASTM A 775 or A 934
Wire or fabric	ASTM A 884 Class A or B
Mechanical couplers	As shown on the plans
Hardware	As shown on the plans

Use epoxy coating material and coating repair material that complies with DMS-8130, "Epoxy Powder Coating for Reinforcing Steel." Do not patch more than 1/4 in. total length in any foot at the applicator's plant.

Epoxy-coated reinforcement will be sampled and tested in accordance with Tex-739-I.

Maintain identification of all reinforcing throughout the coating and fabrication and until delivery to the project site.

Furnish 1 copy of a written certification that the coated reinforcing steel meets the requirements of this Item and 1 copy of the manufacturer's control tests.

**G. Mechanical Couplers.** When mechanical splices in reinforcing steel bars are shown on the plans, use the following types of coupler:

- sleeve-filler,
- sleeve-threaded,
- sleeve-swaged, or
- sleeve-wedge.

Furnish only couplers that have been produced by a manufacturer that has been prequalified in accordance with DMS-4510, "Mechanical Couplers." Sleeve-wedge type couplers will not be permitted on coated reinforcing. Couplers for use on individual projects must be sampled and tested in accordance with DMS-4510. Furnish couplers only at locations shown on the plans.

### 440.3. Construction.

**A. Bending.** Cold-bend the reinforcement accurately to the shapes and dimensions shown on the plans. Fabricate in the shop if possible. Field-fabricate, if permitted, using a method approved by the Engineer. Replace improperly fabricated, damaged, or broken bars at no additional expense to the Department. Repair damaged or broken bars embedded in a previous concrete placement using a method approved by the Engineer.

Unless otherwise shown on the plans, the inside diameter of bar bends, in terms of the nominal bar diameter (d), must be as shown in Table 4.

**Table 4**  
**Minimum Inside Diameter of Bar Bends**

<b>Bend</b>	<b>Bar Size Number (in.)</b>	<b>Bar Size Number (mm)</b>	<b>Diameter</b>
Bends of 90° and greater in stirrups, ties, and other secondary bars that enclose another bar in the bend	3, 4, 5	10, 13, 16	4d
	6, 7, 8	19, 22, 25	6d
Bends in main bars and in secondary bars not covered above	3 through 8	10 through 25	6d
	9, 10, 11	29, 32, 36	8d
	14, 18	43, 57	10d

Note: Bar size numbers (in.) are based on the number of eighths of an inch included in the nominal diameter of the bar. Bar size numbers (mm) approximate the number of millimeters included in the nominal diameter of the bar.

Where bending No. 14 or No. 18 Grade 60 bars is required, bend-test representative specimens as described for smaller bars in the applicable ASTM specification. Make the required 90° bend around a pin with a diameter of 10 times the nominal diameter of the bar.

**B. Tolerances.** Fabrication tolerances for bars are shown in Figure 1.

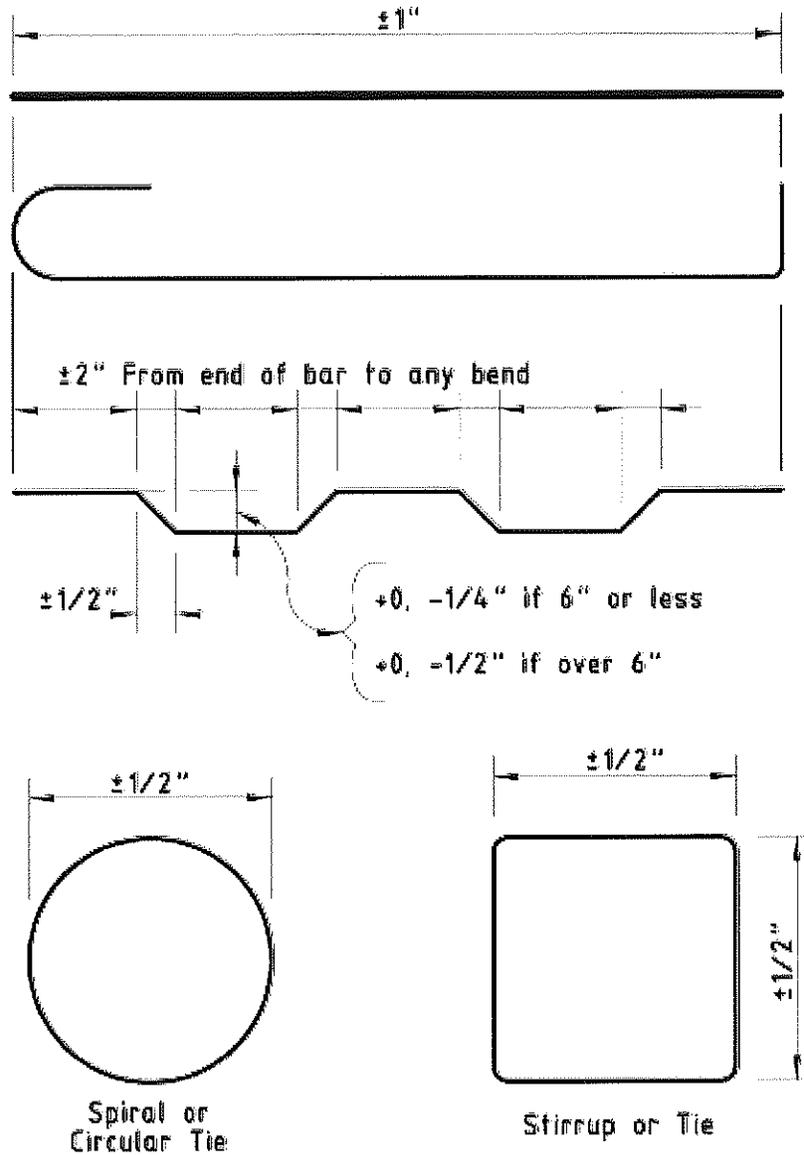


Figure 1  
Fabrication tolerances for bars.

**C. Storage.** Store steel reinforcement above the ground on platforms, skids, or other supports, and protect it from damage and deterioration. Ensure that reinforcement is free from dirt, paint, grease, oil, and other foreign materials when it is placed in the work. Use reinforcement free from defects such as cracks and delaminations. Rust, surface seams, surface irregularities, or mill scale will not be cause for rejection if the minimum cross-sectional area of a hand wire-brushed specimen meets the requirements for the size of steel specified.

**D. Splices.** Lap-splice, weld-splice, or mechanically splice bars as shown on the plans.

Additional splices not shown on the plans will require approval. Splices not shown on the plans will be permitted in slabs 15 in. or less in thickness, columns, walls, and parapets. x Unless otherwise approved, splices will not be permitted in bars 30 ft. or less in plan length. For bars exceeding 30 ft. in plan length, the distance center-to-center of splices must be at least 30 ft. minus 1 splice length, with no more than 1 individual bar length less than 10 ft. Make lap splices not shown on the plans, but otherwise permitted, in accordance with Table 5. Maintain the specified concrete cover and spacing at splices, and place the lap-spliced bars in contact, securely tied together.

**Table 5**  
**Minimum Lap Requirements for Bar Sizes through No. 11**

<b>Bar Size Number (in.)</b>	<b>Bar Size Number (mm)</b>	<b>Uncoated Lap Length</b>	<b>Coated Lap Length</b>
3	10	1 ft. 4 in.	2 ft. 0 in.
4	13	1 ft. 9 in.	2 ft. 8 in.
5	16	2 ft. 2 in.	3 ft. 3 in.
6	19	2 ft. 7 in.	3 ft. 11 in.
7	22	3 ft. 5 in.	5 ft. 2 in.
8	25	4 ft. 6 in.	6 ft. 9 in.
9	29	5 ft. 8 in.	8 ft. 6 in.
10	32	7 ft. 3 in.	10 ft. 11 in.
11	36	8 ft. 11 in.	13 ft. 5 in.

Note: Bar size numbers (in.) are based on the number of eighths of an inch included in the nominal diameter of the bar. Bar size numbers (mm) approximate the number of millimeters included in the nominal diameter of the bar.

- Do not lap No. 14 or No. 18 bars.
- Lap spiral steel at least 1 turn.
- Splice welded wire fabric using a lap length that includes the overlap of at least 2 cross wires plus 2 in. on each sheet or roll. Splices using bars that develop equivalent strength and are lapped in accordance with Table 5 are permitted.
- For box culvert extensions with less than 1 ft. of fill, lap the existing longitudinal bars with the new bars as shown in Table 3. For extensions with more than 1 ft. of fill, lap at least 1 ft. 0 in.
- Ensure that welded splices conform to the requirements of the plans and of Item 448, "Structural Field Welding." Field-prepare ends of reinforcing bars if they will be butt-welded. Delivered bars must be long enough to permit weld preparation.
- Install mechanical coupling devices in accordance with the manufacturer's recommendations at locations shown on the plans. Protect threaded male or female connections, and make sure the threaded connections are clean when making the connection. Do not repair damaged threads.
- Mechanical coupler alternate equivalent strength arrangements, to be accomplished by substituting larger bar sizes or more bars, will be considered if approved in writing before

fabrication of the systems.

**E. Placing.** Unless otherwise shown on the plans, dimensions shown for reinforcement are to the centers of the bars. Place reinforcement as near as possible to the position shown on the plans. In the plane of the steel parallel to the nearest surface of concrete, bars must not vary from plan placement by more than 1/12 of the spacing between bars. In the plane of the steel perpendicular to the nearest surface of concrete, bars must not vary from plan placement by more than 1/4 in. Cover of concrete to the nearest surface of steel must be at least 1 in. unless otherwise shown on the plans.

For bridge slabs, the clear cover tolerance for the top mat of reinforcement is  $\pm 0, +1/2$  in.

Locate the reinforcement accurately in the forms, and hold it firmly in place before and during concrete placement by means of bar supports that are adequate in strength and number to prevent displacement and to keep the steel at the proper distance from the forms. Support bars by standard bar supports with plastic tips, approved plastic bar supports, or precast mortar or concrete blocks when supports are in contact with removable or stay-in-place forms. Use bright basic bar supports to support reinforcing steel placed in slab overlays on concrete panels or on existing concrete slabs. Bar supports in contact with soil or subgrade must be approved.

For bar supports with plastic tips, the plastic protection must be at least 3/32 in. thick and extend upward on the wire to a point at least 1/2 in. above the formwork. All accessories such as tie wires, bar chairs, supports, or clips used with epoxy-coated reinforcement must be of steel, fully coated with epoxy or plastic. Plastic supports approved by the Engineer may also be used with epoxy-coated reinforcement.

Cast mortar or concrete blocks to uniform dimensions with adequate bearing area. Provide a suitable tie wire in each block for anchoring to the steel. Cast the blocks to the thickness required in approved molds. The surface placed adjacent to the form must be a true plane, free of surface imperfections. Cure the blocks by covering them with wet burlap or mats for a period of 72 hr. Mortar for blocks should contain approximately 1 part hydraulic cement to 3 parts sand. Concrete for blocks should contain 850 lb. of hydraulic cement per cubic yard of concrete.

Place individual bar supports in rows at 4-ft. maximum spacing in each direction. Place continuous type bar supports at 4-ft. maximum spacing. Use continuous bar supports with permanent metal deck forms.

The exposure of the ends of longitudinals, stirrups, and spacers used to position the reinforcement in concrete pipe and in precast box culverts or storm drains is not cause for rejection.

Tie reinforcing steel for bridge slabs, top slabs of direct traffic culverts, and top slabs of prestressed box beams at all intersections, except tie only alternate intersections where spacing is less than 1 ft. in each direction. For reinforcing steel cages for other structural members, tie the

steel at enough intersections to provide a rigid cage of steel. Fasten mats of wire fabric securely at the ends and edges.

Before concrete placement, clean mortar, mud, dirt, debris, oil, and other foreign material from the reinforcement. Do not place concrete until authorized.

If reinforcement is not adequately supported or tied to resist settlement, reinforcement is floating upward, truss bars are overturning, or movement is detected in any direction during concrete placement, stop placement until corrective measures are taken.

#### **F. Handling, Placement, and Repair of Epoxy-Coated Reinforcing Steel.**

**1. Handling.** Provide systems for handling coated reinforcement with padded contact areas. Pad bundling bands or use suitable banding to prevent damage to the coating. Lift bundles of coated reinforcement with a strongback, spreader bar, multiple supports, or a platform bridge. Transport the bundled reinforcement carefully, and store it on protective cribbing. Do not drop or drag the coated reinforcement.

**2. Construction Methods.** Do not flame-cut coated reinforcement. Saw or shear-cut only when approved. Coat cut ends as specified in Section 440.3.F.3, "Repair of Coating."

Do not weld or mechanically couple coated reinforcing steel except where specifically shown on the plans. Remove the epoxy coating at least 6 in. beyond the weld limits before welding and 2 in. beyond the limits of the coupler before assembly. After welding or coupling, clean the steel of oil, grease, moisture, dirt, welding contamination (slag or acid residue), and rust to a near-white finish. Check the existing epoxy for damage. Remove any damaged or loose epoxy back to sound epoxy coating.

After cleaning, coat the splice area with epoxy repair material to a thickness of 7 to 17 mils after curing. Apply a second application of repair material to the bar and coupler interface to ensure complete sealing of the joint.

**3. Repair of Coating.** For repair of the coating, use material that complies with the requirements of this Item and ASTM D 3963. Make repairs in accordance with procedures recommended by the manufacturer of the epoxy coating powder. For areas to be patched, apply at least the same coating thickness as required for the original coating. Repair all visible damage to the coating. Repair sawed and sheared ends, cuts, breaks, and other damage promptly before additional oxidation occurs. Clean areas to be repaired to ensure that they are free from surface contaminants. Make repairs in the shop or in the field as required.

#### **00440.4. MEASUREMENT AND PAYMENT**

A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.

- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

**02577 – ASPHALTS, OILS AND EMULSIONS**

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*(Referenced from 2004 TxDOT, ITEM 300 Asphalts, Oils, and Emulsions – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**02577.1. Description.** Provide asphalt cements, cutback and emulsified asphalts, performance-graded asphalt binders, and other miscellaneous asphalt materials as specified on the plans.

**02577.2. Materials.** Provide asphalt materials that meet the stated requirements when tested in accordance with the referenced Department, AASHTO, and ASTM test methods. Refer to the Material Inspection Guide (maintained by the Construction Division), Section 11. “Asphalt Inspection, Quality Control and Quality Assurance,” for sampling and testing requirements.

Acronyms used in this Item are defined in Table 1.

**Table 1  
Acronyms**

<b>Acronym</b>	<b>Definition</b>
Test Procedure Designations	
Tex	Department
T or R	AASHTO
D	ASTM
Polymer Modifier Designations	
P	polymer-modified
SBR or L	styrene-butadiene rubber (latex)
SBS	styrene-butadiene-styrene block co-polymer
TR	tire rubber (from ambient temperature grinding of truck and passenger tires)
AC	asphalt cement
AE	asphalt emulsion
AE-P	asphalt emulsion prime
A-R	asphalt-rubber
C	cationic
EAP&T	emulsified asphalt prime and tack
H-suffix	harder residue (lower penetration)
HF	high float
MC	medium-curing

**Table 1 (continued)**  
**Acronyms**

Acronym	Definition
MS	medium-setting
PCE	prime, cure, and erosion control
PG	performance grade
RC	rapid-curing
RS	rapid-setting
S-suffix	stockpile usage
SCM	special cutback material
SS	slow-setting

- A. Asphalt Cement.** Asphalt cement must be homogeneous, water-free, and nonfoaming when heated to 347°F, and must meet Table 2 requirements.

**Table 2**  
**Asphalt Cement**

Property	Test Procedure	Viscosity Grade									
		AC-0.6		AC-1.5		AC-3		AC-5		AC-10	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Viscosity 140°F, poise	T 202	40	80	100	200	250	350	400	600	800	1,200
275°F, poise		0.4	—	0.7	—	1.1	—	1.4	—	1.9	—
Penetration, 77°F, 100g, 5 sec.	T 49	350	—	250	—	210	—	135	—	85	—
Flash point, C.O.C., °F	T 48	425	—	425	—	425	—	425	—	450	—
Solubility in trichloroethylene, %	T 44	99.0	—	99.0	—	99.0	—	99.0	—	99.0	—
Spot test	Tex-509-C	Neg.		Neg.		Neg.		Neg.		Neg.	
Tests on residue from Thin-Film Oven Test:	T 179										
Viscosity, 140°F, poise	T 202	—	180	—	450	—	900	—	1,500	—	3,000
Ductility <sup>1</sup> , 77°F 5 cm/min., cm	T 51	100	—	100	—	100	—	100	—	100	—

1. If AC-0.6 or AC-1.5 ductility at 77°F is less than 100 cm, material is acceptable if ductility at 60°F is more than 100 cm.

- B. Polymer-Modified Asphalt Cement.** Polymer-modified asphalt cement must be smooth and homogeneous, and comply with the requirements of Table 3. If requested, supply samples of the base asphalt cement and polymer additives.

**Table 3**  
**Polymer-Modified Asphalt Cement**

Property	Test Procedure	Polymer-Modified Viscosity Grade							
		AC-5 w/2% SBR		AC-10 w/2% SBR		AC-15P		AC-20-STR	
		Min	Max	Min	Max	Min	Max	Min	Max
Polymer		SBR		SBR		SBS		TR	
Polymer content, % (solids basis)	Tex-533-C	2.0	--	2.0	--	3.0	--	5.0	--
Dynamic shear, G*/sin δ, 64°C, 10 rad/s, kPa	T 315	--	--	--	--	--	--	1.0	--
Viscosity									
140°F, poise	T 202	700	--	1,300	--	1,500	--	2,000	--
275°F, poise	T 202	--	7.0	--	8.0	--	8.0	--	10.0
Penetration, 77°F, 100 g, 5 sec.	T 49	120	--	80	--	100	150	75	115
Ductility, 5cm/min., 39.2°F, cm	T 51	70	--	60	--	--	--	--	--
Elastic recovery, 50°F, %	Tex-539-C	--	--	--	--	55	--	55	--
Softening point, °F	T 53	--	--	--	--	--	--	120	--
Polymer separation, 48 hr.	Tex-540-C	None		None		None		None	
Flash point, C.O.C., °F	T 48	425	--	425	--	425	--	425	--
Tests on residue from Thin-Film Oven Test:									
Retained penetration ratio, 77°F	T 179 T 49	--	--	--	--	0.60	1.00	0.60	1.00
Tests on residue from RTFOF aging and pressure aging:									
Creep stiffness	Tex-541-C and R 28								
<i>S</i> , -18°C, MPa	T 313	--	--	--	--	--	--	--	300
<i>m</i> -value, -18°C		--	--	--	--	--	--	0.300	--

**C. Cutback Asphalt.** Cutback asphalt must meet the requirements of Tables 4, 5, and 6 for the specified type and grade. If requested, supply samples of the base asphalt cement and polymer additives.

**Table 4**  
**Rapid-Curing Cutback Asphalt**

Property	Test Procedure	Type-Grade					
		RC-250		RC-800		RC-3000	
		Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	250	400	800	1,600	3,000	6,000
Water, %	T 55	--	0.2	--	0.2	--	0.2
Flash point, T.O.C., °F	T 79	80	--	80	--	80	--
Distillation test:	T 78						
Distillate, percentage by volume of total distillate to 680°F							
to 437°F		40	75	35	70	20	55
to 500°F		65	90	55	85	45	75
to 600°F		85	--	80	--	70	--
Residue from distillation, volume %		70	--	75	--	82	--
Tests on distillation residue:							
Penetration, 100 g, 5 sec., 77°F	T 49	80	120	80	120	80	120
Ductility, 5 cm/min., 77°F, cm	T 51	100	--	100	--	100	--
Solubility in trichloroethylene, %	T 44	99.0	--	99.0	--	99.0	--
Spot test	Tex-509-C	Neg.		Neg.		Neg.	

**Table 5**  
**Medium-Curing Cutback Asphalt**

Property	Test Procedure	Type-Grade							
		MC-30		MC-250		MC-800		MC-3000	
		Min	Max	Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	30	60	250	500	800	1,600	3,000	6,000
Water, %	T 55	-	0.2	-	0.2	-	0.2	-	0.2
Flash point, T.O.C., °F	T 79	100	-	150	-	150	-	150	-
Distillation test:	T 78								
Distillate, percentage by volume of total distillate to 680°F									
to 437°F		-	25	-	10	-	-	-	-
to 500°F		40	70	15	55	-	35	-	15
to 600°F		75	93	60	87	45	80	15	75
Residue from distillation, volume %		50	-	67	-	75	-	80	-
Tests on distillation residue:									
Penetration, 100 g, 5 sec., 77°F	T 49	120	250	120	250	120	250	120	250
Ductility, 5 cm/min., 77°F, cm <sup>1</sup>	T 51	100	-	100	-	100	-	100	-
Solubility in trichloroethylene, %	T 44	99.0	-	99.0	-	99.0	-	99.0	-
Spot test	Tex-509-C	Neg.		Neg.		Neg.		Neg.	

1. If the penetration of residue is more than 200 and the ductility at 77°F is less than 100 cm, the material is acceptable if its ductility at 60°F is more than 100 cm.

**Table 6**  
**Special-Use Cutback Asphalt**

Property	Test Procedure	Type-Grade					
		MC-2400L		SCM I		SCM II	
		Min	Max	Min	Max	Min	Max
Kinematic viscosity, 140°F, cSt	T 201	2,400	4,800	500	1,000	1,000	2,000
Water, %	T 55	-	0.2	-	0.2	-	0.2
Flash point, T.O.C., °F	T 79	150	-	175	-	175	-
Distillation test:	T 78						
Distillate, percentage by volume of total distillate to 680°F							
to 437°F		-	-	-	-	-	-
to 500°F		-	35	-	0.5	-	0.5
to 600°F		35	80	20	60	15	50
Residue from distillation, volume %		78	-	76	-	82	-
Tests on distillation residue:							
Polymer		SBR					
Polymer content, % (solids basis)	Tex-533-C	2.0	-	-	-	-	-
Penetration, 100 g, 5 sec., 77°F	T 49	150	300	180	-	180	-
Ductility, 5 cm/min., 39.2°F, cm	T 51	50	-	-	-	-	-
Solubility in trichloroethylene, %	T 44	99.0	-	99.0	-	99.0	-

- D. Emulsified Asphalt.** Emulsified asphalt must be homogeneous, not separate after thorough mixing, and meet the requirements for the specified type and grade in Tables 7, 8, 9, and 10.

**Table 7**  
**Emulsified Asphalt**

Property	Test Procedure	Type-Grade									
		Rapid-Setting		Medium-Setting		Slow-Setting					
		HRS-2		MS-2		AES-300		SS-1		SS-1H	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Viscosity, Saybolt Furol 77°F, sec.	T 72	-	-	-	-	75	400	20	100	20	100
		150	400	100	300	-	-	-	-	-	-
Sieve test, %	T 59	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1
Miscibility	T 59	-	-	-	-	-	-	Pass	Pass	Pass	Pass
Cement mixing, %	T 59	-	-	-	-	-	-	-	2.0	-	2.0
Coating ability and water resistance: dry aggregate/after spray	T 59	-	-	-	-	Good/Fair	-	-	-	-	-
		-	-	-	-	Fair/Fair	-	-	-	-	-
Demulsibility, 35 ml of 0.02 N CaCl <sub>2</sub> , %	T 59	50	-	-	30	-	-	-	-	-	-
Storage stability, 1 day, %	T 59	-	1	-	1	-	1	-	1	-	1
Freezing test, 3 cycles <sup>1</sup>	T 59	-	-	-	-	-	-	Pass	Pass	Pass	Pass
Distillation test: Residue by distillation, % by wt.	T 59	65	-	65	-	65	-	60	-	60	-
		-	0.5	-	0.5	-	5	-	0.5	-	0.5
Oil distillate, % by volume of emulsion	T 59	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-
Tests on residue from distillation: Penetration, 77°F, 100 g, 5 sec.	T 49	100	140	120	160	300	-	120	160	70	100
Solubility in trichloroethylene, %	T 44	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility, 77°F, 5 cm/min., cm	T 51	100	-	100	-	-	-	100	-	80	-
Flout test, 140°F, sec.	T 50	1,200	-	-	-	1,200	-	-	-	-	-

1. Applies only when the Engineer designates material for winter use.

**Table 8**  
**Cationic Emulsified Asphalt**

Property	Test Procedure	Type-Grade											
		Rapid-Setting		Medium-Setting		Slow-Setting							
		CRS-2		CRS-2H		CMS-2		CMS-2S		CSS-1		CSS-1H	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
Viscosity, Saybolt Furol 77°F, sec.	T 72	-	-	-	-	-	-	20	100	20	100	-	-
		150	400	150	400	100	300	100	300	-	-	-	-
Sieve test, %	T 59	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1
Cement mixing, %	T 59	-	-	-	-	-	-	-	2.0	-	2.0	-	2.0
Coating ability and water resistance: dry aggregate/after spray	T 59	-	-	-	-	Good/Fair	Good/Fair	-	-	-	-	-	-
		-	-	-	-	Fair/Fair	Fair/Fair	-	-	-	-	-	-
Demulsibility, 35 ml of 0.8% sodium dioctyl sulfosuccinate, %	T 59	70	-	70	-	-	-	-	-	-	-	-	-
Storage stability, 1 day, %	T 59	-	1	-	1	-	1	-	1	-	1	-	1
Particle charge	T 59	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Distillation test: Residue by distillation, % by wt.	T 59	65	-	65	-	65	-	65	-	60	-	60	-
		-	0.5	-	0.5	-	7	-	5	-	0.5	-	0.5
Oil distillate, % by volume of emulsion	T 59	-	-	-	-	-	-	-	-	-	-	-	-
		-	-	-	-	-	-	-	-	-	-	-	-
Tests on residue from distillation: Penetration, 77°F, 100 g, 5 sec.	T 49	120	160	70	110	120	200	300	-	120	160	70	110
Solubility in trichloroethylene, %	T 44	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-	97.5	-
Ductility, 77°F, 5 cm/min., cm	T 51	100	-	80	-	100	-	-	-	100	-	80	-

**Table 9  
Polymer-Modified Emulsified Asphalt**

Property	Test Procedure	Type-Grade											
		Rapid-Setting				Medium-Setting				Slow-Setting			
		RS-1P		HFRS-2P		AES-150P		AES-300P		AES-300S		SS-1P	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
Viscosity, Saybolt Furol 77°F, sec. 122°F, sec.	T 72	-	-	-	-	75	400	75	400	75	400	30	100
Sieve test, %	T 59	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1	-	0.1
Miscibility	T 59	-	-	-	-	-	-	-	-	-	-	-	Pass
Coating ability and water resistance: dry aggregate/after spray wet aggregate/after spray	T 59	-	-	-	-	Good/Fair Fair/Fair	Good/Fair Fair/Fair	Good/Fair Fair/Fair	Good/Fair Fair/Fair	Good/Fair Fair/Fair	Good/Fair Fair/Fair	-	-
Demulsibility, 3.5 ml of 0.02 N CaCl <sub>2</sub> , %	T 59	60	-	50	-	-	-	-	-	-	-	-	-
Storage stability, 1 day, %	T 59	-	1	-	1	-	1	-	1	-	1	-	1
Breaking index, g	Tex-542-C	-	80	-	-	-	-	-	-	-	-	-	-
Distillation test: Residue by distillation, % by wt. Oil distillate, % by volume of emulsion	T 59	65	-	65	-	65	-	65	-	65	-	60	-
Tests on residue from distillation: Polymer content, wt. % (solids basis)	Tex-533-C	-	-	3.0	-	-	-	-	-	-	-	3.0	-
Penetration, 77°F, 100 g, 5 sec.	T 49	225	300	90	140	150	300	300	-	300	-	100	140
Solubility in trichloroethylene, %	T 44	97.0	-	97.0	-	97.0	-	97.0	-	97.0	-	97.0	-
Viscosity, 140°F, poise	T 202	-	-	1,500	-	-	-	-	-	-	-	1,300	-
Float test, 140°F, sec.	T 50	-	-	1,200	-	1,200	-	1,200	-	1,200	-	-	-
Ductility <sup>1</sup> , 39.2°F, 5 cm/min., cm	T 51	-	-	50	-	-	-	-	-	-	-	50	-
Elastic recovery <sup>2</sup> , 50°F, %	Tex-539-C	55	-	55	-	-	-	-	-	-	-	-	-
Tests on RTFO curing of distillation residue Elastic recovery, 50°F, %	Tex-541-C Tex-539-C	-	-	-	-	50	-	50	-	30	-	-	-

- Exception to T 59: Bring the temperature on the lower thermometer slowly to 350°F ±10°F. Maintain at this temperature for 20 min. Complete total distillation in 60 ±5 min. from the first application of heat.
- HFRS-2P must meet one of either the ductility or elastic recovery requirements.

**Table 10**  
**Polymer-Modified Cationic Emulsified Asphalt**

Property	Test Procedure	Type-Grade					
		Rapid-Setting				Slow-Setting	
		CRS-1P		CRS-2P		CSS-1P	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol 77°F, sec. 122°F, sec.	T 72	-	-	-	-	20	100
Sieve test, %	T 59	-	0.1	-	0.1	-	0.1
Demulsibility, 35 ml of 0.8% sodium dioctyl sulfosuccinate, %	T 59	60	-	70	-	-	-
Storage stability, 1 day, %	T 59	-	1	-	1	-	1
Breaking index, g	Tex-542-C	-	80	-	-	-	-
Particle charge	T 59	Positive		Positive		Positive	
Distillation test: <sup>1</sup> Residue by distillation, % by weight Oil distillate, % by volume of emulsion	T 59	65	-	65	-	62	-
		-	3	-	0.5	-	0.5
Tests on residue from distillation: Polymer content, wt. % (solids basis)	Tex-533-C	-	-	3.0	-	3.0	-
Penetration, 77°F, 100 g, 5 sec.	T 49	225	300	90	150	55	90
Viscosity, 140°F, poise	T 202	-	-	1,300	-	-	-
Solubility in trichloroethylene, %	T 44	97.0	-	97.0	-	97.0	-
Softening point, °F	T 53	-	-	-	-	135	-
Ductility, 77°F, 5 cm/min., cm	T 51	-	-	-	-	70	-
Ductility <sup>2</sup> , 39.2°F, 5 cm/min., cm	T 51	-	-	50	-	-	-
Elastic recovery <sup>2</sup> , 50°F, %	Tex-539-C	45	-	55	-	-	-

1. Exception to T 59: Bring the temperature on the lower thermometer slowly to 350°F ±0°F. Maintain at this temperature for 20 min. Complete total distillation in 60 ±5 min. from the first application of heat.
2. CRS-2P must meet one of either the ductility or elastic recovery requirements.

**E. Specialty Emulsions.** Specialty emulsions may be either asphalt-based or resin-based and must meet the requirements of Table 11.

**Table 11  
Specialty Emulsions**

Property	Test Procedure	Type-Grade					
		Medium-Setting				Slow-Setting	
		AE-P		EAP&T		PCE <sup>1</sup>	
		Min	Max	Min	Max	Min	Max
Viscosity, Saybolt Furol 77°F, sec. 122°F, sec.	T 72	-	-	-	-	10	100
Sieve test, %	T 59	-	0.1	-	0.1	-	0.1
Miscibility <sup>2</sup>	T 59	-	-	Pass	-	Pass	-
Demulsibility, 35 ml of 0.10 N CaCl <sub>2</sub> , %	T 59	-	70	-	-	-	-
Storage stability, 1 day, %	T 59	-	1	-	1	-	-
Particle size <sup>5</sup> , % by volume < 2.5 µm	Tex-238-F <sup>3</sup>	-	-	90	-	90	-
Asphalt emulsion distillation to 500°F followed by Cutback asphalt distillation of residue to 680°F: Residue after both distillations, % by wt. Total oil distillate from both distillations, % by volume of emulsion	T 59 & T 78	40	-	-	-	-	-
Residue by distillation, % by wt.	T 59	-	-	60	-	-	-
Residue by evaporation <sup>4</sup> , % by wt.	T 59	-	-	-	-	60	-
Tests on residue after all distillation(s): Viscosity, 140°F, poise	T 202	-	-	800	-	-	-
Kinematic viscosity <sup>5</sup> , 140°F, cSt	T 201	-	-	-	-	100	350
Flash point C.O.C., °F	T 48	-	-	-	-	400	-
Solubility in trichloroethylene, %	T 44	97.5	-	-	-	-	-
Float test, 122°F, sec.	T 50	50	200	-	-	-	-

1. Supply with each shipment of PCE: a) a copy of a lab report from an approved analytical lab, signed by a lab official, indicating the PCE formulation does not meet any characteristics of a Resource Conservation Recovery Act (RCRA) hazardous waste; b) a certification from the producer that the formulation supplied does not differ from the one tested and that no listed RCRA hazardous wastes or PCBs have been mixed with the product; and c) a Material Safety Data Sheet.
  2. Exception to T 59: In dilution, use 350 ml of distilled or deionized water and a 1,000-ml beaker.
  3. Use Tex-238-F, beginning at “Particle Size Analysis by Laser Diffraction,” with distilled or deionized water as a medium and no dispersant, or use another approved method.
  4. Exception to T 59: Leave sample in the oven until foaming ceases, then cool and weigh.
  5. PCE must meet either the kinematic viscosity requirement or the particle size requirement.
- F. Recycling Agent.** Recycling agent and emulsified recycling agent must meet the requirements in Table 12. Additionally, recycling agent and residue from emulsified recycling agent, when added in the specified proportions to the recycled asphalt, must meet the properties specified on the plans.

**Table 12**  
**Recycling Agent and Emulsified Recycling Agent**

Property	Test Procedure	Recycling Agent		Emulsified Recycling Agent	
		Min	Max	Min	Max
Viscosity, Saybolt Furol, 77°F, sec.	T 72	–	–	15	100
Sieve test, %	T 59	–	–	–	0.1
Miscibility <sup>1</sup>	T 59	–	–	No coagulation	
Residue by evaporation <sup>2</sup> , % by wt.	T 59	–	–	60	–
Tests on recycling agent or residue from evaporation:					
Flash point, C.O.C., °F	T 48	400	–	400	–
Kinematic viscosity,	T 201				
140°F, cSt		75	200	75	200
275°F, cSt		–	10.0	–	10.0

1. Exception to T 59: Use 0.02 N CaCl<sub>2</sub> solution in place of water.
2. Exception to T 59: Maintain sample at 300°F until foaming ceases, then cool and weigh.

**G. Crumb Rubber Modifier.** Crumb rubber modifier (CRM) consists of automobile and truck tires processed by ambient temperature grinding. CRM must be:

- free from contaminants including fabric, metal, and mineral and other nonrubber substances;
- free-flowing; and
- nonfoaming

When added to hot asphalt binder. When tested in accordance with Tex-200-F, Part I, using a 50-g sample, the rubber gradation must meet the requirements of the grades in Table 13.

**Table 13**  
**CRM Gradations**

Sieve Size (% Passing)	Grade A		Grade B		Grade C		Grade D	Grade E
	Min	Max	Min	Max	Min	Max		
#8	100	–	–	–	–	–	As shown on the plans	As approved
#10	95	100	100	–	–	–		
#16	–	–	70	100	100	–		
#30	–	–	25	60	90	100		
#40	–	–	–	–	45	100		
#50	0	10	–	–	–	–		
#200	–	–	0	5	–	–		

**H. Crack Sealer.** Polymer modified asphalt-emulsion crack sealer must meet the requirements of Table 14. Rubber-asphalt crack sealer must meet the requirements of Table 15.

**Table 14**  
**Polymer-Modified Asphalt Emulsion Crack Sealer**

Property	Test Procedure	Min	Max
Rotational viscosity, 77°F, cP	D 2196, Method A	10,000	25,000
Sieve test, %	T 59	—	0.1
Storage stability, 1 day, %	T 59	—	1
Evaporation Residue by evaporation, % by wt.	Tex-543-C	65	—
Tests on residue from evaporation:			
Penetration, 77°F, 100 g, 5 sec.	T 49	35	75
Softening point, °F	T 53	140	—
Ductility, 39.2°F, 5 cm/min., cm	T 51	100	—

**Table 15**  
**Rubber-Asphalt Crack Sealer**

Property	Test Procedure	Class A		Class B	
		Min	Max	Min	Max
CRM content, Grade A or B, % by wt.	Tex-544-C	22	26	—	—
CRM content, Grade B, % by wt.	Tex-544-C	—	—	13	17
Virgin rubber content <sup>1</sup> , % by wt.		—	—	2	—
Flash point <sup>2</sup> , COC, °F	T 48	400	—	400	—
Penetration <sup>3</sup> , 77°F, 150 g, 5 sec.	T 49	30	50	30	50
Penetration <sup>3</sup> , 32°F, 200 g, 60 sec.	T 49	12	—	12	—
Softening point, °F	T 53	—	—	170	—
Bond <sup>4</sup>	D5329	—	—	Pass	—

1. Provide certification that the min. % virgin rubber was added.
  2. Before passing the test flame over the cup, agitate the sealing compound with a 3/8- to 1/2-in. (9.5- to 12.7-mm) wide, square-end metal spatula in a manner so as to bring the material on the bottom of the cup to the surface, i.e., turn the material over. Start at one side of the thermometer, move around to the other, and then return to the starting point using 8 to 10 rapid circular strokes. Accomplish agitation in 3 to 4 sec. Pass the test flame over the cup immediately after stirring is completed.
  3. Exception to T 49: Substitute the cone specified in ASTM D 217 for the penetration needle.
  4. No crack in the crack sealing materials or break in the bond between the sealer and the mortar blocks over 1/4 in. deep for any specimen after completion of the test.
- I. Asphalt-Rubber Binders.** Asphalt-rubber (A-R) binders are mixtures of asphalt binder and CRM, which have been reacted at elevated temperatures. The A-R binders meet D 6114 and contain a minimum of 15% CRM by weight. Types I or II, containing CRM Grade C, are used for hot mixed aggregate mixtures. Types II or III, containing CRM Grade B, are used for surface treatment binder. Table 16 describes required binder properties.

**Table 16  
A-R Binders**

Property	Test Procedure	Binder Type					
		Type I		Type II		Type III	
		Min	Max	Min	Max	Min	Max
Apparent viscosity, 347°F, cP	D 2196, Method A	1,500	5,000	1,500	5,000	1,500	5,000
Penetration, 77°F, 100 g, 5 sec.	T 49	25	75	25	75	50	100
Penetration, 39.2°F, 200 g, 60 sec.	T 49	10	—	15	—	25	—
Softening point, °F	T 53	135	—	130	—	125	—
Resilience, 77°F, %	D 5329	25	—	20	—	10	—
Flash point, C.O.C., °F	T 48	450	—	450	—	450	—
Tests on residue from Thin-Film Oven Test:	T 179						
Retained penetration ratio, 39.2°F, 200 g, 60 sec., % of original	T 49	75	—	75	—	75	—

**J. Performance-Graded Binders.** PG binders must be smooth and homogeneous, show no separation when tested in accordance with Tex-540-C, and meet Table 17 requirements.

Separation testing is not required if:

- a modifier is introduced separately at the mix plant either by injection in the asphalt line or mixer,
- the binder is blended on site in continuously agitated tanks, or
- binder acceptance is based on field samples taken from an in-line sampling port at the hot mix plant after the addition of modifiers.

**Table 17  
Performance-Graded Binders**

Property and Test Method	Performance Grade																	
	PG 58			PG 64			PG 70			PG 76			PG 82					
	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28
Average 7-day max pavement design temperature, °C <sup>1</sup>	< 58			< 64			< 70			< 76			< 82					
Min pavement design temperature, °C <sup>1</sup>	>=22	>=28	>=34	>=16	>=22	>=28	>=34	>=16	>=22	>=28	>=34	>=16	>=22	>=28	>=34	>=16	>=22	>=28
<b>ORIGINAL BINDER</b>																		
Flash point, T 48, Min, °C	230																	
Viscosity, T 316: <sup>2,3</sup> Max, 3.0 Pa-s, test temperature, °C	135																	
Dynamic shear, T 315: <sup>4</sup> G*/sin(δ), Min, 1.00 kPa Test temperature @: 10 rad/sec., °C	58			64			70			76			82					
Elastic recovery, D 6084, 50°F, % Min	—	—	30	—	—	30	50	—	30	50	60	30	50	60	70	50	60	70
<b>ROLLING THIN-FILM OVEN (Tex-541-C)</b>																		
Mass loss, Tex-541-C, Max, %	1.0																	
Dynamic shear, T 315: G*/sin(δ), Min, 2.20 kPa Test temperature @: 10 rad/sec., °C	58			64			70			76			82					
<b>PRESSURE AGING VESSEL (PAV) RESIDUE (R 28)</b>																		
PAV aging temperature, °C	100																	
Dynamic shear, T 315: G*/sin(δ), Max, 5000 kPa Test temperature @: 10 rad/sec., °C	25	22	19	28	25	22	19	28	25	22	19	28	25	22	19	28	25	22

**Table 17 (continued)**  
**Performance-Graded Binders**

Property and Test Method	Performance Grade																	
	PG 58			PG 64			PG 70			PG 76			PG 82					
	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28	-34	-16	-22	-28
Average 7-day max pavement design temperature, °C <sup>1</sup>	< 58			< 64			< 70			< 76			< 82					
Min pavement design temperature, °C <sup>2</sup>	>-22	>-28	>-34	>-16	>-22	>-28	>-34	>-16	>-22	>-28	>-34	>-16	>-22	>-28	>-34	>-16	>-22	>-28
Creep stiffness, T 313; <sup>3,6</sup> S, max, 300 MPa, m-value, min, 0.300 Test temperature @ 60 sec., °C	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18
Direct tension, T 314; <sup>5</sup> Failure strain, min, 1.0% Test temperature @ 1.0 mm/min., °C	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18	-24	-6	-12	-18

1. Pavement temperatures are estimated from air temperatures using an algorithm contained in a Department-supplied computer program, may be provided by the Department, or by following the procedures outlined in AASHTO MP 2 and PP 28.
2. This requirement may be waived at the Department's discretion if the supplier warrants that the asphalt binder can be adequately pumped, mixed, and compacted at temperatures that meet all applicable safety, environmental, and constructability requirements. At test temperatures where the binder is a Newtonian fluid, any suitable standard means of viscosity measurement may be used, including capillary (T 201 or T 202) or rotational viscometry (T 316).
3. Viscosity at 135°C is an indicator of mixing and compaction temperatures that can be expected in the lab and field. High values may indicate high mixing and compaction temperatures. Additionally, significant variation can occur from batch to batch. Contractors should be aware that variation could significantly impact their mixing and compaction operations. Contractors are therefore responsible for addressing any constructability issues that may arise.
4. For quality control of unmodified asphalt binder production, measurement of the viscosity of the original asphalt binder may be substituted for dynamic shear measurements of  $G^*/\sin(\delta)$  at test temperatures where the asphalt is a Newtonian fluid. Any suitable standard means of viscosity measurement may be used, including capillary (T 201 or T 202) or rotational viscometry (T 316).
5. Silicone beam molds, as described in AASHTO TP 1-93, are acceptable for use.
6. If creep stiffness is below 300 MPa, direct tension test is not required. If creep stiffness is between 300 and 600 MPa, the direct tension failure strain requirement can be used instead of the creep stiffness requirement. The m-value requirement must be satisfied in both cases.

**02577.3. Equipment.** Provide all equipment necessary to transport, store, sample, heat, apply, and incorporate asphalts, oils, and emulsions.

**02577.4. Construction.**

**A. Typical Material Use.** Table 18 shows typical materials used for specific applications.

These are typical uses only. Circumstances may require use of other material.

**Table 18  
Typical Material Use**

<b>Material Application</b>	<b>Typically Used Materials</b>
Hot-mixed, hot-laid asphalt mixtures	PG binders, A-R binders Types I and II
Surface treatment	AC-5, AC-10, AC-5 w/2% SBR, AC-10 w/2% SBR, AC-15P, AC-20-5TR, HFRS-2, MS-2, CRS-2, CRS-2H, HFRS-2P, CRS-2P, A-R binders Types II and III
Surface treatment (cool weather)	RS-1P, CRS-1P, RC-250, RC-800, RC-3000, MC-250, MC-800, MC-3000, MC-2400L
Precoating	AC-5, AC-10, PG 64-22, SS-1, SS-1H, CSS-1, CSS-1H
Tack coat	PG Binders, SS-1H, CSS-1H, EAP&T
Fog seal	SS-1, SS-1H, CSS-1, CSS-1H
Hot-mixed, cold-laid asphalt mixtures	AC-0.6, AC-1.5, AC-3, AES-300, AES-300P, CMS-2, CMS-2S
Patching mix	MC-800, SCM 1, SCM II, AES-300S
Recycling	AC-0.6, AC-1.5, AC-3, AES-150P, AES-300P, recycling agent, emulsified recycling agent
Crack sealing	SS-1P, polymer mod AE crack sealant, rubber asphalt crack sealers (Class A, Class B)
Microsurfacing	CSS-1P
Prime	MC-30, AE-P, EAP&T, PCE
Curing membrane	SS-1, SS-1H, CSS-1, CSS-1H, PCE
Erosion control	SS-1, SS-1H, CSS-1, CSS-1H, PCE

- B. Storage and Application Temperatures.** Use storage and application temperatures in accordance with Table 19. Store and apply materials at the lowest temperature yielding satisfactory results. Follow the manufacturer’s instructions for any agitation requirements in storage. Manufacturer’s instructions regarding recommended application and storage temperatures supercede those of Table 19.

**Table 19  
Storage and Application Temperatures**

Type-Grade	Application		Storage Maximum (°F)
	Recommended Range, °F	Maximum Allowable (°F)	
AC-0.6, AC-1.5, AC-3	200-300	350	350
AC-5, AC-10	275-350	350	350
AC-5 w/2% SBR, AC-10 w/2% SBR, AC-15P, AC-20-5TR	300-375	375	360
RC-250	125-180	200	200
RC-800	170-230	260	260
RC-3000	215-275	285	285
MC-30, AE-P	70-150	175	175
MC-250	125-210	240	240
MC-800, SCMI, SCM II	175-260	275	275
MC-3000, MC-2400L	225-275	290	290
HFRS-2, MS-2, CRS-2, CRS-2H, HFRS-2P, CRS-2P, CMS-2, CMS-2S, AES-300, AES-300S, AES-150P, AES-300P	120-160	180	180
SS-1, SS-1H, CSS-1, CSS-1H, PCE, EAP&T, SS-1P, RS-1P, CRS-1P, CSS-1P, recycling agent, emulsified recycling agent, polymer mod AE crack sealant	50-130	140	140
PG binders	275-350	350	350
Rubber asphalt crack sealers (Class A, Class B)	350-375	400	-
A-R binders Types I, II, and III	325-425	425	425

**02577.5. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with “Measurement and Basis of Payment” section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## **02612 – DENSE-GRADED HOT-MIX ASPHALT (METHOD)**

*(Referenced from 2004 TX-Dot, ITEM 340 Dense-Graded Hot-Mix Asphalt (Method) – references made to any other Sections of the 2004 TX-Dot Manual shall become part of the Contract to be followed)*

**02612.1. Description.** Construct a pavement layer composed of a compacted, dense-graded mixture of aggregate and asphalt binder mixed hot in a mixing plant.

**02612.2. Materials.** Furnish uncontaminated materials of uniform quality that meet the requirements of the plans and specifications. Notify the Engineer of all material sources. Notify the Engineer before changing any material source or formulation. When the Contractor makes a source or formulation change, the Engineer will verify that the requirements of this Item are met and may require a new laboratory mixture design, trial batch, or both. The Engineer may sample and test project materials at any time during the project to verify compliance.

**A. Aggregate.** Furnish aggregates from sources that conform to the requirements shown in Table 1, and as specified in this Section, unless otherwise shown on the plans. Provide aggregate stockpiles that meet the definition in this Section for either coarse aggregate or fine aggregate. When reclaimed asphalt pavement (RAP) is allowed by plan note, provide RAP stockpiles in accordance with this Section. Aggregate from RAP is not required to meet Table 1 requirements unless otherwise shown on the plans. Supply mechanically crushed gravel or stone aggregates that meet the definitions in Tex-100-E. The Engineer will designate the plant or the quarry as the sampling location. Samples must be from materials produced for the project. The Engineer will establish the surface aggregate classification (SAC) and perform Los Angeles abrasion, magnesium sulfate soundness, and Micro-Deval tests. Perform all other aggregate quality tests listed in Table 1. Document all test results on the mixture design report. The Engineer may perform tests on independent or split samples to verify Contractor test results. Stockpile aggregates for each source and type separately. Determine aggregate gradations for mixture design and production testing based on the washed sieve analysis given in Tex-200-F, Part II. Do not add material to an approved stockpile from sources that do not meet the aggregate quality requirements of the Department's *Bituminous Rated Source Quality Catalog (BRSQC)* unless otherwise approved.

- 1. Coarse Aggregate.** Coarse aggregate stockpiles must have no more than 20% material passing the No. 8 sieve. Provide aggregates from sources listed in the BRSQC. Provide aggregate from non-listed sources only when tested by the Engineer and approved before use. Allow 30 calendar days for the Engineer to sample, test, and report results for non-listed sources. Provide coarse aggregate with at least the minimum SAC shown on the plans. SAC requirements apply only to aggregates used on the surface of travel lanes, unless otherwise shown on the plans. The SAC for sources on the Department's AQMP is listed in the BRSQC.

Class B aggregate meeting all other requirements in Table 1 may be blended with a Class A aggregate in order to meet requirements for Class A materials. When

blending Class A and B aggregates to meet a Class A requirement, ensure that at least 50% by weight of the material retained on the No. 4 sieve comes from the Class A aggregate source. Blend by volume if the bulk specific gravities of the Class A and B aggregates differ by more than 0.300. When blending, do not use Class C or D aggregates. For blending purposes, coarse aggregate from RAP will be considered as Class B aggregate.

2. **RAP.** RAP is salvaged, milled, pulverized, broken, or crushed asphalt pavement. Crush or break RAP so that 100% of the particles pass the 2-in. sieve.

RAP from either Contractor- or Department-owned sources, including RAP generated during the project, is permitted only when shown on the plans. Department-owned RAP, if allowed for use, will be available at the location shown on the plans. When RAP is used, determine asphalt content and gradation for mixture design purposes. Perform other tests on RAP when shown on the plans.

When RAP is allowed by plan note, use no more than 30% RAP in Type A or B mixtures unless otherwise shown on the plans. For all other mixtures, use no more than 20% RAP unless otherwise shown on the plans.

Do not use RAP contaminated with dirt or other objectionable materials. Do not use the RAP if the decantation value exceeds 5% and the plasticity index is greater than 8. Test the stockpiled RAP for decantation in accordance with the laboratory method given in Tex-406-A, Part I. Determine the plasticity index using Tex-106-E if the decantation value exceeds 5%. The decantation and plasticity index requirements do not apply to RAP samples with asphalt removed by extraction.

Do not intermingle Contractor-owned RAP stockpiles with Department-owned RAP stockpiles. Remove unused Contractor-owned RAP material from the project site upon completion of the project. Return unused Department-owned RAP to the designated stockpile location.

3. **Fine Aggregate.** Fine aggregates consist of manufactured sands, screenings, and field sands. Fine aggregate stockpiles must meet the gradation requirements in Table 2. Supply fine aggregates that are free from organic impurities. The Engineer may test the fine aggregate in accordance with Tex-408-A to verify the material is free from organic impurities. At most 15% of the total aggregate may be field sand or other uncrushed fine aggregate. With the exception of field sand, use fine aggregate from coarse aggregate sources that meet the requirements shown in Table 1, unless otherwise approved.

If 10% or more of the stockpile is retained on the No. 4 sieve, test the stockpile and verify that it meets the requirements in Table 1 for coarse aggregate angularity (Tex-460-A) and flat and elongated particles (Tex-280-F).

**Table 1 Aggregate Quality Requirements**

<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
<b>Coarse Aggregate</b>		
SAC	AQMP	As shown on plans
Deleterious material, %, max	Tex-217-F, Part I	1.5
Decantation, %, max	Tex-217-F, Part II	1.5
Micro-Deval abrasion, %, max	Tex-461-A	Note 1
Los Angeles abrasion, %, max	Tex-410-A	40
Magnesium sulfate soundness, 5 cycles, %, max	Tex-411-A	302
Coarse aggregate angularity, 2 crushed faces, %, min	Tex 460-A, Part I	853
Flat and elongated particles @ 5:1, %, max	Tex-280-F	10
<b>Fine Aggregate</b>		
Linear shrinkage, %, max	Tex-107-E	3
<b>Combined Aggregate<sup>4</sup></b>		
Sand equivalent, %, min	Tex-203-F	45

1. Not used for acceptance purposes. Used by the Engineer as an indicator of the need for further investigation.
2. Unless otherwise shown on the plans.
3. Unless otherwise shown on the plans. Only applies to crushed gravel.
4. Aggregates, without mineral filler, RAP, or additives, combined as used in the job-mix formula (JMF).

**Table 2 Gradation Requirements for Fine Aggregate**

Sieve Size	% Passing by Weight or Volume
3/8"	100
#8	70-100
#200	0-30

**B. Mineral Filler.** Mineral filler consists of finely divided mineral matter such as agricultural lime, crusher fines, hydrated lime, cement, or fly ash. Mineral filler is allowed unless otherwise shown on the plans. Do not use more than 2% hydrated lime or cement, unless otherwise shown on the plans. The plans may require or disallow specific mineral fillers. When used, provide mineral filler that:

- is sufficiently dry, free-flowing, and free from clumps and foreign matter;
- does not exceed 3% linear shrinkage when tested in accordance with Tex-107-E; and
- meets the gradation requirements in Table 3.

**Table 3 Gradation Requirements for Mineral Filler**

Sieve Size	% Passing by Weight or Volume
#8	100
#200	55-100

**C. Bag house Fines.** Fines collected by the bag house or other dust-collecting equipment may be reintroduced into the mixing drum.

**D. Asphalt Binder.** Furnish the type and grade of performance-graded (PG) asphalt binder specified on the plans in accordance with Section 300.2.J, "Performance-Graded Binders."

**E. Tack Coat.** Unless otherwise shown on the plans or approved, furnish CSS-1H, SS-1H, or a PG binder with a minimum high-temperature grade of PG 58 for tack coat binder in accordance with Item 300, "Asphalts, Oils, and Emulsions."

Do not dilute emulsified asphalts at the terminal, in the field, or at any other location before use. If required, verify that emulsified asphalt proposed for use meets the minimum residual asphalt percentage specified in Item 300, "Asphalts, Oils, and Emulsions."

The Engineer will obtain at least 1 sample of the tack coat binder per project and test it to verify compliance with Item 300. The Engineer will obtain the sample from the asphalt distributor immediately before use.

**F. Additives.** When shown on the plans, use the type and rate of additive specified. Other additives that facilitate mixing or improve the quality of the mixture may be allowed when approved.

If lime or a liquid anti-stripping agent is used, add in accordance with Item 301, "Asphalt Anti-stripping Agents." Do not add lime directly into the mixing drum of any plant where lime is removed through the exhaust stream unless the plant has a bag house or dust collection system that reintroduces the lime back into the drum.

**02612.3. Equipment.** Provide required or necessary equipment in accordance with Item 320, "Equipment for Asphalt Concrete Pavement."

**02612.4. Construction.** Design, produce, store, transport, place, and compact the specified paving mixture in accordance with the requirements of this Item. Unless otherwise shown on the plans, provide the mix design. The Department will perform quality assurance (QA) testing. Provide quality control (QC) testing as needed to meet the requirements of this Item.

**A. Mixture Design.**

**1. Design Requirements.** Use a Level II specialist certified by a Department-approved hot-mix asphalt certification program to develop the mixture design. Have the Level II specialist sign the design documents. Unless otherwise shown on the plans, use the typical weight design example given in Tex-204-F, Part I, to design a mixture meeting the requirements listed in Tables 1 through 6. Use an approved laboratory to perform the Hamburg Wheel test and provide results with the mixture design, or provide the laboratory mixture and request that the Department perform the Hamburg Wheel test. The Construction Division maintains a list of approved laboratories. Furnish the Engineer with representative samples of all materials used in the mixture design. The Engineer will verify the mixture design. If the design cannot be verified by the Engineer, furnish another mixture design.

The Contractor may submit a new mixture design at anytime during the project. The Engineer will approve all mixture designs before the Contractor can begin production. Provide the Engineer with a mixture design report using Department-provided software. Include the following items in the report:

- the combined aggregate gradation, source, specific gravity, and percent of each material used;
- results of all applicable tests;
- the mixing and molding temperatures;
- the signature of the Level II person or persons who performed the design;
- the date the mixture design was performed; and
- a unique identification number for the mixture design.

**Table 4 Master Gradation Bands (% Passing by Weight or Volume) and Volumetric Properties**

<b>Sieve Size</b>	<b>A Coarse Base</b>	<b>B Fine Base</b>	<b>C Coarse Surface</b>	<b>D Fine Surface</b>	<b>F Fine Mixture</b>
1-1/2"	98.0–100.0	–	–	–	–
1"	78.0–94.0	98.0–100.0	–	–	–
3/4"	64.0–85.0	84.0–98.0	95.0–100.0	–	–
1/2"	50.0–70.0	–	–	98.0–100.0	–
3/8"	–	60.0–80.0	70.0–85.0	85.0–100.0	98.0–100.0
#4	30.0–50.0	40.0–60.0	43.0–63.0	50.0–70.0	80.0–86.0
#8	22.0–36.0	29.0–43.0	32.0–44.0	35.0–46.0	38.0–48.0
#30	8.0–23.0	13.0–28.0	14.0–28.0	15.0–29.0	12.0–27.0
#50	3.0–19.0	6.0–20.0	7.0–21.0	7.0–20.0	6.0–19.0
#200	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0	2.0–7.0
<b>Design VMA1, % Minimum</b>					
–	12.0	13.0	14.0	15.0	16.0
<b>Plant-Produced VMA, % Minimum</b>					
–	11.0	12.0	13.0	14.0	15.0

1. Voids in Mineral Aggregates.

**Table 5 Laboratory Mixture Design Properties**

<b>Property</b>	<b>Test Method</b>	<b>Requirement</b>
Target laboratory-molded density, %	Tex-207-F	96.01
Tensile strength (dry), psi (molded to 93% ±1% density)	Tex-226-F	85–2002
Boil test <sup>3</sup>	Tex-530-C	–

1. Unless otherwise shown on the plans.
2. May exceed 200 psi when approved and may be waived when approved.
3. Used to establish baseline for comparison to production results. May be waived when

approved.

**Table 6 Hamburg Wheel Test Requirements**<sup>1</sup>

<b>High-Temperature Binder Grade</b>	<b>Minimum # of Passes<sup>2</sup> @ 0.5" Rut Depth, Tested @ 122°F</b>
PG 64 or lower	10,000
PG 70	15,000
PG 76 or higher	20,000

1. Tested in accordance with Tex-242-F.
2. May be decreased or waived when shown on the plans.

**B. Job-Mix Formula Approval.** The job-mix formula (JMF) is the combined aggregate gradation and target asphalt percentage used to establish target values for mixture production. JMF is the original laboratory mixture design used to produce the trial batch. The Engineer and the Contractor will verify JMF based on plant-produced mixture from the trial batch unless otherwise approved. The Engineer may accept an existing mixture design previously used on a Department project and may waive the trial batch to verify JMF. If the JMF is not verified by the Engineer from the trial batch, adjust the JMF or redesign the mix and produce as many trial batches as necessary to verify the JMF.

Provide the Engineer with split samples of the mixtures and blank samples used to determine the ignition oven correction factors. The Engineer will determine the aggregate and asphalt correction factors from the ignition oven using Tex-236-F.

The Engineer will use a Texas gyratory compactor calibrated in accordance with Tex-914-F in molding production samples. The Engineer will perform Tex-530-C and retain the tested sample for comparison purposes during production. The Engineer may waive the requirement for the boil test.

**C. JMF Field Adjustments.** Produce a mixture of uniform composition closely conforming to the approved JMF. If, during initial days of production, the Contractor or Engineer determines that adjustments to the JMF are necessary to achieve the specified requirements, or to more nearly match the aggregate production, the Engineer may allow adjustment of the JMF within the tolerances of Table 7 without a laboratory redesign of the mixture.

**The Engineer will adjust the asphalt content to maintain desirable laboratory density near the optimum value while achieving other mix requirements.**

**Table 7 Operational Tolerances**

<b>Description</b>	<b>Test Method</b>	<b>Allowable Difference from JMF Target</b>
Individual % retained for #8 sieve and larger		±5.01
Individual % retained for sieves smaller than #8 and larger than #200	Tex-200-F or Tex-236-F	±3.01
% passing the #200 sieve		±2.01
Asphalt content, %	Tex-236-F	±0.31
Laboratory-molded density, %		±1.0
VMA, %, min	Tex-207-F	Note 2

1. When within these tolerances, mixture production gradations may fall outside the master grading limits; however, the percent passing the #200 sieve will be considered out of tolerance when outside the master grading limits.
2. Test and verify that Table 4 requirements are met.

**D. Production Operations.** Perform a new trial batch when the plant or plant location is changed. The Engineer may suspend production for noncompliance with this Item. Take corrective action and obtain approval to proceed after any production suspension for noncompliance.

1. **Operational Tolerances.** During production, do not exceed the operational tolerances in Table 7. Stop production if testing indicates tolerances are exceeded on:
  - 3 consecutive tests on any individual sieve,
  - 4 consecutive tests on any of the sieves, or
  - 2 consecutive tests on asphalt content. Begin production only when test results or other information

indicate, to the satisfaction of the Engineer, that the next mixture produced will be within Table 7 tolerances.

1. **Storage and Heating of Materials.** Do not heat the asphalt binder above the temperatures specified in Item 300, “Asphalts, Oils, and Emulsions” or outside the manufacturer’s recommended values. On a daily basis, provide the Engineer with the records of asphalt binder and hot-mix asphalt discharge temperatures in accordance with Item 320, “Equipment for Asphalt Concrete Pavement.” Unless otherwise approved, do not store mixture for a period long enough to affect the quality of the mixture, nor in any case longer than 12 hr.

2. **Mixing and Discharge of Materials.** Notify the Engineer of the target discharge temperature and produce the mixture within 25°F of the target. Monitor the temperature of the material in the truck

before shipping to ensure that it does not exceed 350°F. The Department will not pay for or allow placement of any mixture produced at more than 350°F. Control the mixing time and temperature so that substantially all moisture is removed from the mixture before discharging from the plant.

- E. **Hauling Operations.** Before use, clean all truck beds to ensure mixture is not contaminated. When a release agent is necessary to coat truck beds, use a release agent on the approved list maintained by the Construction Division.
- F. **Placement Operations.** Prepare the surface by removing raised pavement markers and objectionable material such as moisture, dirt, sand, leaves, and other loose impediments from the surface before placing mixture. Remove vegetation from pavement edges. Place the mixture to meet the typical section requirements and produce a smooth, finished surface with a uniform appearance and texture. Offset longitudinal joints of successive courses of hot mix by at least 6 in. Place mixture so longitudinal joints on the surface course coincide with lane lines, or as directed. Ensure that all finished surfaces will drain properly. Place mixture within the compacted lift thickness shown in Table 8, unless otherwise shown on the plans or allowed.

**Table 8 Compacted Lift Thickness and Required Core Height**

Mixture Type	Compacted Lift Thickness	
	Minimum (in.)	Maximum (in.)
A	3.00	6.00
B	2.50	5.00
C	2.00	4.00
D	1.50	3.00
F	1.25	2.50

1. **Weather Conditions.** Place mixture when the roadway surface temperature is 60°F or higher unless otherwise approved. Measure the roadway surface temperature with a handheld infrared thermometer. Unless otherwise shown on the plans, place mixtures only when weather conditions and moisture conditions of the roadway surface are suitable in the opinion of the Engineer.
2. **Tack Coat.** Clean the surface before placing the tack coat. Unless otherwise approved, apply tack coat uniformly at the rate directed by the Engineer. The Engineer will set the rate between 0.04 and 0.10 gal. of residual asphalt per square yard of surface area. Apply a thin, uniform tack coat to all contact surfaces of curbs, structures, and all joints. Prevent splattering of tack coat when placed adjacent to curb, gutter, and structures. Roll the tack coat with a pneumatic-tire roller when directed. The Engineer may use Tex-243-F to verify that the tack coat has adequate adhesive properties. The Engineer may suspend

paving operations until there is adequate adhesion.

**G. Lay-Down Operations.**

1. **Minimum Mixture Placement Temperatures.** Use Table 9 for suggested minimum mixture placement temperatures.
2. **Windrow Operations.** When hot mix is placed in windrows, operate windrow pickup equipment so that substantially all the mixture deposited on the roadbed is picked up and loaded into the paver.

**Table 9 Suggested Minimum Mixture Placement Temperature**

<b>High-Temperature Binder Grade</b>	<b>Minimum Placement Temperature (Before Entering Paver)</b>
PG 64 or lower	260°F
PG 70	270°F
PG 76	280°F
PG 82 or higher	290°F

- H. Compaction.** Use air void control unless ordinary compaction control is specified on the plans. Avoid displacement of the mixture. If displacement occurs, correct to the satisfaction of the Engineer. Ensure pavement is fully compacted before allowing rollers to stand on the pavement. Unless otherwise directed, use only water or an approved release agent on rollers, tamps, and other compaction equipment. Keep diesel, gasoline, oil, grease, and other foreign matter off the mixture. Unless otherwise directed, operate vibratory rollers in static mode when not compacting, when changing directions, or when the plan depth of the pavement mat is less than 1-1/2 in.

Use tamps to thoroughly compact the edges of the pavement along curbs, headers, and similar structures and in locations that will not allow thorough compaction with the rollers. The Engineer may require rolling with a trench roller on widened areas, in trenches, and in other limited areas.

Allow the compacted pavement to cool to 160°F or lower before opening to traffic unless otherwise directed. When directed, sprinkle the finished mat with water or limewater to expedite opening the roadway to traffic.

1. **Air Void Control.** Compact dense-graded hot-mix asphalt to contain from 5% to 9% in-place air voids. Do not increase the asphalt content of the mixture to reduce pavement air voids.
2. **Ordinary Compaction Control.** Furnish the type, size, and number of rollers required for compaction, as approved. Furnish at least 1 medium pneumatic-tire roller (minimum 12-ton weight). Use the control strip method given in Tex-207-F, Part IV, to establish rolling patterns that achieve maximum compaction.

- a. **Rollers.** Furnish the type, size, and number of rollers required for compaction, as approved. Use a pneumatic-tire roller to seal the surface, unless otherwise shown on the plans. Use additional rollers as required to remove any roller marks.
- b. **Air Void Determination.** Unless otherwise shown on the plans, obtain 2 roadway specimens at each location selected by the Engineer for in-place air void determination. The Engineer will measure air voids in accordance with Tex-207-F and Tex-227-F. Before drying to a constant weight, cores may be predried using a Corelok or similar vacuum device to remove excess moisture. The Engineer will use the average air void content of the 2 cores to calculate the in-place air voids at the selected location.
- c. **Air Voids Out of Range.** If the in-place air void content in the compacted mixture is below 5% or greater than 9%, change the production and placement operations to bring the in-place air void content within requirements. The Engineer may suspend production until the in-place air void content is brought to the required level, and may require a test section as described in Section 340.4.H.1.d, "Test Section."
- d. **Test Section.** Construct a test section of 1 lane-width and at most 0.2 mi. in length to demonstrate that compaction to between 5% and 9% in-place air voids can be obtained. Continue this procedure until a test section with 5% to 9% in-place air voids can be produced. The Engineer will allow only 2 test sections per day. When a test section producing satisfactory in-place air void content is placed, resume full production.

Follow the selected rolling pattern unless changes that affect compaction occur in the mixture or placement conditions. When such changes occur, establish a new rolling pattern. Compact the pavement to meet the requirements of the plans and specifications.

When rolling with the 3-wheel, tandem or vibratory rollers, start by first rolling the joint with the adjacent pavement and then continue by rolling longitudinally at the sides. Proceed toward the center of the pavement, overlapping on successive trips by at least 1 ft., unless otherwise directed. Make alternate trips of the roller slightly different in length. On superelevated curves, begin rolling at the low side and progress toward the high side unless otherwise directed.

- I. **Irregularities.** Immediately take corrective action if surface irregularities, including but not limited to segregation, rutting, raveling, flushing, fat spots, mat slippage, color, texture, roller marks, tears, gouges, streaks, or uncoated aggregate particles, are detected. The Engineer may suspend production or placement operations until the problem is corrected.

At the expense of the Contractor and to the satisfaction of the Engineer, remove and

replace any mixture that does not bond to the existing pavement or that has other surface irregularities identified above.

- J. Ride Quality.** Use Surface Test Type A to evaluate ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces," unless otherwise shown on the plans.

**02612.5. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with "Measurement and Basis of Payment" section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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

## 00216 – PROOF ROLLING

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*(Referenced from 2004 TxDOT, ITEM 216 Proof Rolling – references made to any other Sections of the 2004 TxDOT Manual shall become part of the Contract to be followed)*

**00216.1. Description.** Proof-roll earthwork, base, or both to locate unstable areas.

### **00216.2. Equipment.**

- A. **Specified Equipment.** Furnish rollers that when loaded weigh at least 25 tons. The maximum acceptable load is 50 tons. Provide rollers that meet the requirements of Section 210.2.D, “Pneumatic Tire Rollers.”
- B. **Alternative Equipment.** Instead of the specified equipment, the Contractor may, as approved, operate other compaction equipment that produces equivalent results in the same period of time. Discontinue the use of the alternative equipment and furnish the specified equipment if the desired results are not achieved.

**00216.3. Construction.** Perform proof rolling as directed. Adjust the load and tire inflation pressures within the range of the manufacturer’s charts or tabulations, as directed. Make at least 2 coverages with the proof roller. Offset each trip of the roller by at most 1 tire width. Operate rollers at a speed between 2 and 6 miles per hour, as directed. If an unstable or nonuniform area is found, correct the area in accordance with the applicable Item.

### **00216.4. MEASUREMENT AND PAYMENT**

- A. When listed as a separate contract pay item, shall be measured in accordance with “Measurement and Basis of Payment” section or as shown on the Bid Proposal Form.
- B. When not listed as a separate contract pay item, shall be considered as incidental work, and the cost thereof shall be included in such contract pay item(s) as are provided in the proposal contract.
- C. Compensation, whether by contract pay item or incidental work will be for furnishing all materials, labor, equipment, tools and incidentals required for the work, all in accordance with the plans and these specifications.

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